

the determination of Company A's loss of foreign tax credit under the facts of this question. (To determine the denial of the section 902 indirect foreign tax credit for foreign income taxes paid by Company C, see the answer to Question A-19.)

Dated: December 30, 1976.

GEORGE H. DIXON,
Acting Secretary.

[FR Doc. 77-352 Filed 1-4-77; 8:45 am]

[Supplement to Department Circular; Public Debt Series No. 34-76]

TREASURY NOTES OF SERIES D-1982 Interest Rate

DECEMBER 29, 1976.

The Secretary of the Treasury announced on December 28, 1976, that the interest rate on the notes described in Department Circular—Public Debt Series—No. 34-76, dated December 17, 1976, will be 6½ percent per annum. Accordingly, the notes are hereby redesignated 6½ percent Treasury Notes of Series D-1982. Interest on the notes will be payable at the rate of 6½ percent per annum.

DAVID MOSSE,
Fiscal Assistant Secretary.

[FR Doc. 77-322 Filed 1-4-77; 8:45 am]

U.S. ARMS CONTROL AND DISARMAMENT AGENCY

ADVISORY COMMITTEE

Renewal

Notice is hereby given in accordance with paragraph 7(a) of Office of Management and Budget Circular No. A-63 (Rev'd, March 27, 1974), as amended by Transmittal Memorandum No. 1 (July 19, 1974), that the General Advisory Committee has been renewed effective January 5, 1977.

Dated: December 30, 1976.

FRED C. IKLE,
Director, U.S. Arms Control
and Disarmament Agency.

[FR Doc. 77-377 Filed 1-4-77; 8:45 am]

INTERSTATE COMMERCE COMMISSION

[Notice No. 227]

ASSIGNMENT OF HEARINGS

DECEMBER 30, 1976.

Cases assigned for hearing, postponement, cancellation of oral argument appear below and will be published only once. This list contains prospective assignments only and does not include cases previously assigned hearing dates. The hearings will be on the issues as presently reflected in the Official Docket of the Commission. An attempt will be made to publish notices of cancellation of hearings as promptly as possible, but interested parties should take appropriate steps to insure that they are notified of

cancellation or postponements of hearings in which they are interested.

MC-C-8917, Dignan Trucking, Inc., et al. v. Southern Maryland Transportation Company, Inc., now assigned January 25, 1977, at Washington, D.C. is postponed to January 27, 1977, at the Offices of the Interstate Commerce Commission, Washington, D.C. MC 107487 (Sub-No. 6), Columbia Freight Lines, Inc., now assigned February 1, 1977, at Indianapolis, Ind., is canceled and application dismissed.

MC 114737 Sub 7, O & A Tex-Pack Express, Inc., now being assigned March 22, 1977 (9 Days), at El Paso, Texas, in a hearing room to be later designated.

ROBERT L. OSWALD,
Secretary.

[FR Doc. 77-382 Filed 1-4-77; 8:45 am]

FOURTH SECTION APPLICATION FOR RELIEF

DECEMBER 30, 1976.

An application, as summarized below, has been filed requesting relief from the requirements of section 4 of the Interstate Commerce Act to permit common carriers named or described in the application to maintain higher rates and charges at intermediate points than those sought to be established at more distant points.

Protests to the granting of an application must be prepared in accordance with Rule 40 of the General Rules of Practice (49 CFR 1100.40) and filed on or before January 21, 1977.

PSA No. 43291—Joint Water-Rail Container Rates—Black Sea Shipping Company. Filed by Black Sea Shipping Company, (No. 102), for itself and interested rail carriers. Rates on general commodities, between rail and water carrier terminals on the U.S. Pacific Coast Seaboard, on the one hand, and, on the other, ports and terminals in Europe.

Grounds for relief—Water competition.

PSA No. 43292—Joint Rail-Water Container Rates—American Export Lines, Inc. Filed by American Export Lines, Inc., (No. 9), for itself and interested rail carriers. Rates on general commodities, from rail carrier terminals on the U.S. Gulf Seaboard, to ports in the United Kingdom and Continental Europe.

Grounds for relief—Water competition.

Tariff—American Export Lines, Inc., tariff No. 1, I.C.C. No. 7. Rates are published to become effective on January 26, 1977.

By the Commission.

ROBERT L. OSWALD,
Secretary.

[FR Doc. 77-379 Filed 1-4-77; 8:45 am]

[Notice No. 99]

MOTOR CARRIER BOARD TRANSFER PROCEEDINGS

JANUARY 5, 1977.

Synopses of orders entered by the Motor Carrier Board of the Commission

pursuant to sections 212(b), 206(a), 211, 312(b), and 410(g) of the Interstate Commerce Act, and rules and regulations prescribed thereunder (49 CFR Part 1132), appear below:

Each application (except as otherwise specifically noted) filed after March 27, 1972, contains a statement by applicants that there will be no significant effect on the quality of the human environment resulting from approval of the application. As provided in the Commission's Special Rules of Practice any interested person may file a petition seeking reconsideration of the following numbered proceedings on or before January 25, 1977. Pursuant to section 17(8) of the Interstate Commerce Act, the filing of such a petition will postpone the effective date of the order in that proceeding pending its disposition. The matters relied upon by petitioners must be specified in their petitions with particularity.

No. MC-FC-76152. By order entered December 21, 1976 the Motor Carrier Board approved the transfer to Trecho Transport, Inc., York, N.Y., of the operating rights set forth in Certificate No. MC 138217 (Sub-No. 2), issued November 21, 1975, to Betaways Cargo Carriers, Inc., Buffalo, N.Y., authorizing the transportation of frozen foods, in vehicles equipped with mechanical refrigeration, from Buffalo, N.Y., to points in Erie, Mercer, Blair, Allegheny, Westmoreland, and Cambria Counties, Pa. S. Michael Richards, 44 North Ave., Webster, N.Y. 14580, practitioner for applicants.

ROBERT L. OSWALD,
Secretary.

[FR Doc. 77-383 Filed 1-4-77; 8:45 am]

[Notice No. 173]

MOTOR CARRIER TEMPORARY AUTHORITY APPLICATIONS

IMPORTANT NOTICE

DECEMBER 28, 1976.

The following are notices of filing of applications for temporary authority under section 210(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 35628 (Sub-No. 388TA), filed December 17, 1976. Applicant: INTERSTATE MOTOR FREIGHT SYSTEM, 134 Grandville Ave., S.W., Grand Rapids, Mich. 49502. Applicant's representative: Michael P. Zell (same address as applicant). Authority sought to operate as a common carrier, by motor vehicle, over irregular routes, transporting: *Meats, meat products, meat by-products and articles distributed by meat packing-houses*, 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), and foodstuffs, from the plantsite and/or warehouse facility utilized by Geo. A. Hormel & Co., at or near Fremont, Nebr., to points in Kansas and Missouri, for 180 days. Supporting shipper: Geo. A. Hormel & Company, Box 800, Austin, Minn. 55912. Send protests to C. R. Flemming, District Supervisor, Bureau of Operations, Interstate Commerce Commission, 225 Federal Bldg., Lansing, Mich. 48933.

No. MC 41951 (Sub-No. 30TA), filed December 17, 1976. Applicant: WHEATLEY TRUCKING, INC., P.O. Box 458, 125 Brohawn Ave., Cambridge, Md. 21613. Applicant's representative: James H. Sweeney, P.O. Box 684, Woodbury, N.J. 08096. Authority sought to operate as a common carrier, by motor vehicle, over irregular routes, transporting: *Foodstuffs*, from Hallwood, Va., to points in Ohio, Indiana, Michigan, Illinois, and Wisconsin, for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper: John W. Taylor Packing Co., Inc., Hallwood, Va. 23359. Send protests to: Interstate Commerce Commission, 12th & Constitution Ave., N.W., Room 1413, W. C. Hersman, District Supervisor, Washington, D.C. 20423.

No. MC 49368 (Sub-No. 99TA), filed December 15, 1976. Applicant: COMPLETE AUTO TRANSIT, INC., East 4111 Andover Road, Bloomfield Hills, Mich. 48013. Applicant's representative: Eugene C. Ewald, 100 W. Long Lake Road, Suite 102, Bloomfield Hills, Mich. 48013. Authority sought to operate as a contract carrier, by motor vehicle, over irregular routes, transporting: *Motor vehicles*, in initial movements, in truck-away service; (1) from the plantsites of

General Motors Corporation, located at Atlanta and Doraville, Ga., to points in Iowa and Kansas; and (2) from the plantsite of General Motors Corporation, at St. Louis, Mo., to points in Florida, Georgia, North Carolina and South Carolina, under a continuing contract with General Motors Corporation, for 180 days. Supporting shipper: General Motors Corporation, Director, Transportation Economics, E. R. Wiseman, G. M. Logistics Operations, 30007 Van Dyke Ave., Warren, Mich. 48090. Send protests to: James A. Augustyn, District Supervisor, Interstate Commerce Commission, Bureau of Operations, 1110 Broderick Tower, 10 Witherell Ave., Detroit, Mich. 48226.

No. MC 51146 (Sub-No. 480TA) (Correction), filed November 22, 1976, published in the FEDERAL REGISTER issue of December 3, 1976, and republished as corrected this issue. Applicant: SCHNEIDER TRANSPORT, INC., 2661 S. Broadway, P.O. Box 2298, Green Bay, Wis. 54304. Applicant's representative: Neil A. DuJardin, P.O. Box 2298, Green Bay, Wis. 54306. Authority sought to operate as a common carrier, by motor vehicle over irregular routes, transporting: (1) *Such merchandise as is dealt in by department stores (except foodstuffs, furniture, and commodities in bulk)*, and (2) *Foodstuffs (except frozen foods and commodities in bulk)*, and furniture, moving in mixed loads with the commodities described in (1) above, from Secaucus and Jersey City, N.J., and Charlotte, N.C., to Cleveland, Ohio, for 180 days. Supporting shipper: The May Company, 158218 Euclid Ave., Cleveland, Ohio 44114. Send protests to: Gail Daugherty, Transportation Assistant, Interstate Commerce Commission, Bureau of Operations, U.S. Federal Bldg., & Courthouse, 517 E. Wisconsin Ave., Room 619, Milwaukee, Wis. 53202. The purpose of this republication is to correct the territorial description in this proceeding.

No. MC 103066 (Sub-No. 50TA), filed December 14, 1976. Applicant: STONE TRUCKING CO., 4927 S. Tacoma, P.O. Box 2014, Tulsa, Okla. 74101. Applicant's representative: C. L. Phillips, Room 248, Classen Blvd., 1411 N. Classen, Oklahoma City, Okla. 73106. Authority sought to operate as a common carrier, by motor vehicle, over irregular routes, transporting: *Foodstuffs, including dairy products*, in vehicles equipped with mechanical refrigeration, from the plantsites and/or storage facilities of Borden Foods, Division of Borden, Inc., at or near Plymouth, Wis., to points in California, for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper: Borden Foods, Division of Borden, Inc., 180 E. Broad St., Columbus, Ohio 43215. Send protests to: Joe Green, District Supervisor, Room 240 Old Post Office Bldg., 215 N.W. Third St., Oklahoma City, Okla. 73102.

No. MC 115904 (Sub-No. 68TA), filed December 16, 1976. Applicant: GROVER TRUCKING CO., 1710 W. Broadway,

Idaho Falls, Idaho 83401. Applicant's representative: Irene Warr, 430 Judge Bldg., Salt Lake City, Utah 84111. Authority sought to operate as a common carrier, by motor vehicle, over irregular routes, transporting: (1) *Gypsum*; and (2) *Gypsum wallboard paper*; (1) from the facilities of American Gypsum, at or near Albuquerque, N. Mex., to points in Arizona and Colorado; and (2) from Denver, Colo., and points in the commercial zone thereof to the plantsite of American Gypsum, at or near Albuquerque, N. Mex., for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper: American Gypsum Company, P.O. Box 6345, Albuquerque, N. Mex. 87107. Send protests to: Interstate Commerce Commission, Barney L. Hardin, District Supervisor, 550 W. Fort St., P.O. Box 07, Boise, Idaho 83724.

No. MC 116077 (Sub-No. 375 TA), filed December 16, 1976. Applicant: ROBERTSON TANK LINES, INC., 2000 W. Loop South, Suite 1800, Houston, Tex. 77027. Applicant's representative: J. C. Browder, P.O. Box 1505, Houston, Tex. 77001. Authority sought to operate as a common carrier, by motor vehicle, over irregular routes, transporting: *Nodular pulp*, in bulk, in tank vehicles, from Evadale, Tex., to Ashdown, Ark., for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper: Eastex Division Temple-Eastex Incorporated, P.O. Box 816 Silsbee, Tex. 77656. Send protests to: John F. Mensing, Interstate Commerce Commission, 8610 Federal Bldg., 515 Rusk Ave., Houston, Tex. 77002.

No. MC 119880 (Sub-No. 94 TA), filed December 15, 1976. Applicant: DRUM TRANSPORT INC., 617 Chicago St., P.O. Box 2056, East Peoria, Ill. 61611. Applicant's representative: B. N. Drum (same address as applicant). Authority sought to operate as a common carrier, by motor vehicle, over irregular routes, transporting: *Grain neutral spirits; alcohol and alcoholic liquors*, in bulk, in tank vehicles, from Peoria, and Delavan, Ill., to points in Kentucky, for 180 days. Supporting shipper: Hiram Walker & Sons, Inc., D. J. Anderson, General Traffic Manager, Foot of Edmund St., Peoria, Ill. 61601. Send protests to: Patricia A. Roscoe, Transportation Assistant, Interstate Commerce Commission, Everett McKinley Dirksen Bldg., 219 S. Dearborn St., Room 1386, Chicago, Ill. 60604.

No. MC 119934 (Sub-No. 209 TA), filed December 16, 1976. Applicant: ECOFF TRUCKING, INC., 625 E. Broadway, Fortville, Ind. 46040. Applicant's representative: Robert W. Loser, II, 1009 Chamber of Commerce Bldg., Indianapolis, Ind. 46204. Authority sought to operate as a common carrier, by motor vehicle, over irregular routes, transporting: *Molasses, edible*, in bulk, in tank vehicles, from Edgard, La., to Oakland, Calif.; Sayreville, Woodbridge, and Port Reading, N.J.; Philadelphia, Pa.; Cincinnati, Ohio; Collegedale, Tenn.; Atlanta, Ga.;

St. Louis, Mo.; Houston, Tex., and Chicago, Ill., for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper: Caire & Gagnard, P.O. Box 7, Edgard, La. 70049. Send protests to: Fran Sterling, Transportation Assistant, Interstate Commerce Commission, Federal Bldg. & U.S. Courthouse, 46 E. Ohio St., Room 429, Indianapolis, Ind. 46204.

No. MC 129034 (Sub-No. 13 TA), filed December 17, 1976. Applicant: LOOMIS COURIER SERVICE, INC., 55 Battery St., Seattle, Wash. 98121. Applicant's representative: George H. Hart, 1100 IBM Bldg., Seattle, Wash. 98101. Authority sought to operate as a *contract carrier*, by motor vehicle, over irregular routes, transporting: *Cash letters*, between Seattle, Wash., and the Port of Entry on the United States-Canada border at or near Blaine, Wash., restricted to traffic originating or terminating at Vancouver, British Columbia, Canada, under a continuing contract or contracts with banks or banking institutions, for 180 days. Supporting shippers: There are approximately 7 statements of support attached to the application, which may be examined at the Interstate Commerce Commission in Washington, D.C., or copies thereof which may be examined at the field office named below. Send protests to: Claud W. Reeves, District Supervisor, 211 Main, Suite 500, San Francisco, Calif. 94105.

No. MC 129086 (Sub-No. 22 TA), filed December 17, 1976. Applicant: SPENCER TRUCKING CORPORATION, Rt. 2, Box 254A, Keyser, W. Va. 26726. Applicant's representative: Charles E. Creager, 1329 Pennsylvania Ave., P.O. Box 1417, Hagerstown, Md. 21740. Authority sought to operate as a *common carrier*, by motor vehicle, over irregular routes, transporting: *Soda ash*, in bulk, from the plant-site and shipping facilities of FMC, at or near South Heights, Pa., to Keyser, W. Va., and its commercial zone, for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting Shipper: Chattanooga Glass Company, 400 W. 45th St., Chattanooga, Tenn. 37410. SEND PROTESTS TO: Joseph A. Nigemyer, District Supervisor, Interstate Commerce Commission, Bureau of Operations, 416 Old Post Office Bldg., Wheeling, W. Va. 26003.

No. MC 129537 (Sub-No. 18 TA), filed December 14, 1976. Applicant: REEVES TRANSPORTATION CO., Route 5, Dew's Pond Road, Calhoun, Ga. 30701. Applicant's representative: John C. Vogt, Jr., 406 N. Morgan St., Tampa, Fla. 33602. Authority sought to operate as a *common carrier*, by motor vehicle, over irregular routes, transporting: *Carpets and rugs*, from points in Floyd, Bartow, Chatooga, Muscogee, Gordon, Whitfield, Murray, Walker, Catoosa and Troup Counties, Ga., to points in Mississippi, for 180 days. Supporting shippers: There are approximately 70 statements of support attached to the application, which may be examined at the Interstate Commerce Commission in Washington, D.C.,

or copies thereof which may be examined at the field office named below. Send protests to: Sara K. Davis, Transportation Assistant, Bureau of Operations, Interstate Commerce Commission, 1252 W. Peachtree St., N.W., Room 546, Atlanta, Ga. 30309.

No. MC 134477 (Sub-No. 129 TA), filed December 16, 1976. Applicant: SCHANO TRANSPORTATION, INC., 5 West Mendota Road, West St. Paul, Minn. 55118. Applicant's representative: Robert P. Sack, P.O. Box 6010, West St. Paul, Minn. 55118. Authority sought to operate as a *common carrier*, by motor vehicle, over irregular routes, transporting: *Meat, meat products, 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 hide and commodities in bulk), from Huron, S. Dak., to Chicago, Ill.; Plainwell, Mich.; Newark, N.J.; New York, N.Y.; St. Mary's and Bellefontaine, Ohio; and New London and Eau Claire, Wis., for 180 days. Supporting shipper: Huron Dressed Beef, Inc., P.O. Box 924, Huron, S. Dak. Send protests to: Marion L. Cheney, Transportation Assistant, Interstate Commerce Commission, Bureau of Operations, 414 Federal Bldg., U.S. Courthouse, 110 S. 4th St., Minneapolis, Minn. 55401.

No. MC 134755 (Sub-No. 84 TA) (Correction), filed November 23, 1976, published in the FEDERAL REGISTER issue of December 7, 1976, and republished as corrected this issue. Applicant: CHARTER EXPRESS, INC., 1959 E. Turner St., P.O. Box 3772, Springfield, Mo. 65804. Applicant's representative: Larry D. Knox, 900 Hubbell Bldg., Des Moines, Iowa 50309. Authority sought to operate as a *common carrier*, by motor vehicle, over irregular routes, transporting: *Meats, meat products, meat by-products and articles distributed by meat packing houses*, 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 the facilities of Farmland Foods, Inc., at or near Crete, Neb., and Denison, Carroll and Iowa Falls, Iowa, to points in Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, District of Columbia, Tennessee, Alabama, Mississippi, Louisiana, Virginia, West Virginia, North Carolina, South Carolina, Kentucky, Georgia and Florida, for 180 days. Supporting shipper: Farmland Foods, Inc., P.O. Box 403, Denison, Iowa 51442. Send protests to: John V. Barry, District Supervisor, Interstate Commerce Commission, 600 Federal Bldg., 911 Walnut St., Kansas City, Mo. 64106. The purpose of this republication is to correct the territorial description in this proceeding.

No. MC 134922 (Sub-No. 211 TA), filed December 16, 1976. Applicant: B. J. McADAMS, INC., Route 6, Box 15, North Little Rock, Ark. 72118. Applicant's rep-

resentative: Bob McAdams (same address as applicant). Authority sought to operate as a *common carrier*, by motor vehicle, over irregular routes, transporting: *Rubber articles*, from Tyler, Tex., to Petaluma, Calif., for 180 days. Supporting shipper: Triple S Tire Center, 412 Madison St., Petaluma, Calif. 94952. Send protests to: William H. Land, Jr., District Supervisor, 3108 Federal Office Bldg., 700 W. Capitol, Little Rock, Ark. 72201.

No. MC 135236 (Sub-No. 13 TA), filed December 15, 1976. Applicant: LOGAN TRUCKING, INC., 801 Erie Ave., Logansport, Ind. 46947. Applicant's representative: Donald W. Smith, One Indiana Square, Suite 2465, Indianapolis, Ind. 46204. Authority sought to operate as a *common carrier*, by motor vehicle, over irregular routes, transporting: *Shortening, lard, tallow, cooking oil and margarine* (except in bulk), in vehicles equipped with mechanical refrigeration, from the plantsite and storage facilities of Swift Edible Oil Co., at or near Bradley, Ill., to points in New Jersey, New York, Maryland, Pennsylvania, Massachusetts and the District of Columbia, and Manassas, Williamsburg, Richmond and Newport News, Va.; Dover, Rehoboth Beach and Wilmington, Del.; Levitt City, New Haven, New London, Hartford, Meriden, Colchester and Stamford, Conn.; Burlington, Brattleboro, Rutland and White River Junction, Vt.; Concord and Manchester, N.H.; Providence and Cranston, R.I.; Fairfield, Lewiston, Portland and Augusta, Maine and to points in the Commercial Zones of the respective named cities, for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper: Swift Edible Oil Co., Division of Swift & Co., 115 W. Jackson Blvd., Chicago, Ill. 60604. Send protests to: J. H. Gray, District Supervisor, Bureau of Operations, Interstate Commerce Commission, 343 W. Wayne St., Suite 113, Fort Wayne, Ind. 46802.

No. MC 136000 (Sub-No. 25TA) filed December 17, 1976. Applicant: ARTHUR H. FULTON, P.O. Box 86, Stephens City, Va. 22655. Applicant's representative: Edward N. Button, 1329 Pennsylvania Ave., P.O. Box 1417, Hagerstown, Md. 21740. Authority sought to operate as a *common carrier*, by motor vehicle, over irregular routes, transporting: *Malt beverages*, from Detroit, Mich., and its commercial zone, to Elizabeth City, N.C., and its commercial zone and Washington, D.C., and its commercial zone, for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shippers: Potomac Distributing Company, 3010 Earl Place, N.W., Washington, D.C. 20010. Albermarle Distributing Company, Elizabeth City, N.C. 27909. Send Protests to: Interstate Commerce Commission, 12th & Constitution Ave., N.W., Room 1413, W. C. Hersman, District Supervisor, Washington, D.C. 20423.

No. MC 141776 (Sub-No. 2TA) (Correction) filed November 23, 1976, published in the FEDERAL REGISTER issue of December 6, 1976, and republished as

corrected this issue. Applicant: FOOD-TRAIN, INC., Spring and South Centre Sts., Ringtown, Pa. 17967. Applicant's representative: Richard Rueda, Suite 612, Two Penn Center Plaza, Philadelphia, Pa. 19102. Authority sought to operate as a common carrier, by motor vehicle, over irregular routes, transporting: Candy and confectioneries NOI, candy cough drops, and hollow mold chocolate candy, from the plant and warehouse sites of Luden's, Incorporated, Reading, Pa., to Cleveland and Cincinnati, Ohio; Detroit and Grand Rapids, Mich.; Melrose Park, Ill.; Milwaukee, Wis.; Minneapolis, Minn.; Des Moines, Iowa, and New Orleans, La., with the right to return refused, exchanged, rejected or damaged merchandise, for 180 days. Supporting shipper: Luden's Incorporated, Reading, Pa. 19603. Send protests to: Paul J. Kenworthy, District Supervisor, Bureau of Operations, Interstate Commerce Commission, 314 U.S. Post Office Bldg., Scranton, Pa. 18503. The purpose of this republication is to add the origin point in this proceeding.

No. MC 142355 (Sub-No. 2TA) filed December 15, 1976. Applicant: TRANS-WESTERN EXPRESS, L.T.D., 48 E. 56th Ave., Denver, Colo. 80216. Applicant's representative: Charles J. Kimball, 350 Capitol Life Center, 1600 Sherman St., Denver, Colo. 80203. Authority sought to operate as a contract carrier, by motor vehicle, over irregular routes, transporting: (1) Plastic granules and related materials and supplies, from points in Larimer County, Colo., to Salt Lake City, Utah and its commercial zone; and (2) Plastic handles and related materials and supplies, from Salt Lake City, Utah and its commercial zone, to points in Larimer County, Colo., restricted to services performed under a continuing contract with Teledyne Water Pk., for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper: Teledyne Water Pk., 1730 E. Prospect, Fort Collins, Colo. 80521. Send protests to: Roger L. Buchanan, District Supervisor, Interstate Commerce Commission, 721 19th St., 492 U.S. Customs House, Denver, Colo. 80202.

No. MC 142666TA (Correction) filed November 2, 1976, published in the FEDERAL REGISTER issue of December 6, 1976, and republished as corrected this issue. Applicant: J & J TRUCKING, East Wood St., Paris, Ark. 72855. Applicant's representative: James M. Duckett, 1021 Pyramid Life Bldg., Little Rock, Ark. 72201. Authority sought to operate as a common carrier, by motor vehicle, over irregular routes, transporting: Coal, in bulk, in dump vehicles, between points in Franklin, Johnson, Logan and Pope Counties, Ark.; and from points in these counties, to Fort Smith and Van Buren, Ark.; restricted to transportation of traffic having a prior or subsequent movement by rail, for 180 days. Supporting shippers: B & D Construction, Inc.; and Multi-Minerals Corp., Star Rt. 2,

Ozark, Ark. 72949. Send protests to: William H. Land, Jr., District Supervisor, 3108 Federal Office Bldg., 700 W. Capitol, Little Rock, Ark. 72201. The purpose of this republication is to add the other supporting shipper, which was omitted in the previous publication.

No. MC 142696 (Sub-No. 1TA), filed December 20, 1976. Applicant: GREENE'S CARTAGE CO., INC., 1934 Avalon Ave., Muscle Shoals, Ala. 35660. Applicant's representative: R. S. Richard 57 Adams Ave., P.O. Box 2069, Montgomery, Ala. 36103. Authority sought to operate as a contract carrier, by motor vehicle, over irregular routes, transporting: Such merchandise as is dealt in by home product distributors, restricted to home delivery, from Memphis, Tenn., to points to Tennessee, Alabama and Mississippi, under a continuing contract with Stanley Home Products, Inc., for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper: Stanley Home Products, Inc., 700 Firestone, Memphis, Tenn. 38107. Send protests to: Clifford W. White, District Supervisor, Bureau of Operations, Interstate Commerce Commission, Room 1616, 2121 Bldg., Birmingham, Ala. 35203.

No. MC 142732TA filed December 16, 1976. Applicant: TIFFANY TRANSPORTATION COMPANY, INC., 3346 N.W. 78th Ave., Miami, Fla. 33122. Applicant's representative: John P. Bond, 2766 Douglas Road, Miami, Fla. 33133. Authority sought to operate as a common carrier, by motor vehicle, over irregular routes, transporting: General commodities (except in bulk, Classes A and B explosives, livestock, household goods, commodities requiring special handling and special equipment and cement), between points in Dade County, Fla., lying east of State Road 27, south of State Road 826, north of State Road 94, and west of the Atlantic Ocean; all shipments having a prior or subsequent movement by water, for 180 days. Supporting shippers: There are approximately 5 statements of support attached to the application, which may be examined at the Interstate Commerce Commission in Washington, D.C., or copies thereof which may be examined at the field office named below. Send protests to: Joseph B. Telchert, District Supervisor, Bureau of Operations, Monterey Bldg., Suite 101, 8410 N.W. 53rd Terrace, Miami, Fla. 33166.

No. MC 142735TA filed December 20, 1976. Applicant: FLAMINGO TRANSPORT, INC., 1530 Hammondville Road, Pompano Beach, Fla. 33062. Applicant's representative: Frank Linn (same address as applicant). Authority sought to operate as a contract carrier, by motor vehicle, over irregular routes, transporting: Aluminum and aluminum products (except in bulk and those which because of size or weight require specialized transportation equipment), from the facilities of Alumac Mill Products, Inc.,

in Grundy County, Ill., to Lebanon, Nashville and Sparta, Tenn.; Peachtree City, Ga.; Reidsville, Charlotte and Greensboro, N.C., and Hialeah, Jacksonville, Miami, Ocala, St. Petersburg and Tampa, Fla., under a continuing contract with Alumac Mill Products, Inc., for 180 days. Supporting shipper: Alumac Mill Products, Inc., 5555 E. Highway 6, Morris, Ill. 60450. Send protests to: Joseph B. Telchert, District Supervisor, Interstate Commerce Commission, Bureau of Operations, Monterey Bldg., Suite 101, 8410 N.W. 53rd Terrace, Miami, Fla. 33166.

No. MC142737TA filed December 20, 1976. Applicant: CLAYTON PUGH, doing business as CLAYTON PUGH TRUCKING, 3819 14th Ave., South, Seattle, Wash. 98108. Applicant's representative: Robert G. Gleason, 15 Court Grady Way, Renton, Wash. 98055. Authority sought to operate as a common carrier, by motor vehicle, over irregular routes, transporting: Meat and meat products, fresh and frozen; cheese and cheese products, and shortenings, canned or cubed, between points in Washington and Oregon west of the Cascade Mountain Range and points in California, for 180 days. Supporting shippers: There are approximately 7 statements of support attached to the application, which may be examined at the Interstate Commerce Commission in Washington, D.C., or copies thereof which may be examined at the field office named below. Send protests to: L. D. Boone, Transportation Specialist, Bureau of Operations, Interstate Commerce Commission, 858 Federal Bldg., 915 Second Ave., Seattle, Wash. 98174.

By the Commission.

ROBERT L. OSWALD,
Secretary.

[FR Doc.77-380 Filed 1-4-77; 8:45 am]

[Notice No. 174]

MOTOR CARRIER TEMPORARY AUTHORITY APPLICATIONS

IMPORTANT NOTICE

DECEMBER 30, 1976.

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 45764 (Sub-No. 28TA) filed December 20, 1976. Applicant: ROBBINS MOTOR TRANSPORTATION, INC., Industrial Highway & Saville Ave., P.O. Box 38, Eddystone, Pa. 19013. Applicant's representative: Edward Kells (same address as applicant). Authority sought to operate as a *contract carrier*, by motor vehicle, over irregular routes, transporting: *Industrial machinery*, the transportation of which because of size or weight requires the use of special equipment or special handling and related machinery parts moving on through trailers, in foreign commerce, from Detroit, Mich., to Toluca, Mex., via the International Boundary at Laredo, Tex., under a continuing contract with Chrysler de Mexico, S.A., for 180 days. Supporting shipper: Chrysler de Mexico, S.A., P.O. Box 1888, Detroit, Mich. 48231. Send protests to: Monica A. Blodgett, Transportation Assistant, Interstate Commerce Commission, 600 Arch St., Room 3238, Philadelphia, Pa. 19106.

No. MC 94350 (Sub-No. 372TA) filed December 20, 1976. Applicant: TRANSIT HOMES, INC., P.O. Box 1628, Haywood Road at Transit Drive, Greenville, S.C. 29602. Applicant's representative: Mitchell King, Jr. (same address as applicant). Authority sought to operate as a *common carrier*, by motor vehicle, over irregular routes, transporting: *Single-wide and double-wide mobile homes*, from points in Montgomery County, Tenn., to points in Illinois, Indiana, Kentucky, Missouri, North Carolina, Tennessee and West Virginia, for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper: Modular Structures, P.O. Box 2296, Clarksville, Tenn. 37040. Send protests to: E. E. Strotheid, District Supervisor, Interstate Commerce Commission, Room 302, 1400 Pickens St., Columbia, S.C. 29201.

No. MC 103051 (Sub-No. 383TA) filed December 20, 1976. Applicant: FLEET TRANSPORT COMPANY, INC., 934 44th Ave., North, P.O. Box 90408, Nashville, Tenn. 37209. Applicant's representative: David L. Morgan (same address as ap-

plicant). Authority sought to operate as a *common carrier*, by motor vehicle, over irregular routes, transporting: *Starch*, in bulk, in tank or hopper type vehicles, from Decatur, Ala., to points in Arkansas, Florida, Georgia, Indiana, Illinois, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia and West Virginia, for 180 days. Supporting shipper: American Maize Products Co., 113th St., & Indianapolis Blvd., Hammond, Ind. 46326. Send protests to: Joe J. Tate, District Supervisor, Bureau of Operations, Interstate Commerce Commission, Suite A-422 U.S. Courthouse, 801 Broadway, Nashville, Tenn. 37203.

No. MC 108761 (Sub-No. 4 TA) filed December 15, 1976. Applicant: THRONE AUTO SERVICE, INC., 3268 Upton Ave., Toledo, Ohio 43613. Applicant's representative: Michael M. Briley, 300 Madison Ave., Toledo, Ohio 43603. Authority sought to operate as a *common carrier*, by motor vehicle, over irregular routes, transporting: *Wrecked or disabled vehicles and replacement vehicles for wrecked or disabled vehicles*, by use of wrecker equipment only, between Toledo, Ohio on the one hand, and, on the other, points in Michigan (except Wayne County); Indiana (except Steuben County); Illinois (except Cook County); and Erie and Pittsburgh, Pa., for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper: Rollins Leasing Corp., 411 Arco, Toledo, Ohio; Central Transport, 210 City Park, Toledo, Ohio; and Ryder Truck Rental, 1929 E. Manhattan Blvd., Toledo, Ohio. Send protests to: Keith D. Warner, District Supervisor, Bureau of Operations, Interstate Commerce Commission, 313 Federal Office Bldg., 234 Summit St., Toledo, Ohio 43604.

No. MC 117688 (Sub-No. 160TA) filed December 20, 1976. Applicant: HIRSCHBACH MOTOR LINES, INC., 5000 S. Lewis Blvd., P.O. Box 417, Sioux City, Iowa 51102. Applicant's representative: George L. Hirschbach (same address as applicant). Authority sought to operate as a *common carrier*, by motor vehicle, over irregular routes, transporting: *Frozen foods*, from Minneapolis, Minn., to points in Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, Oklahoma, Tennessee and Texas, restricted to traffic originating at the plantsite and storage facilities of the Pillsbury Co., at or near Minneapolis, Minn., for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper: Olivia Bradley, Transportation Manager, Pillsbury Company, Frozen Food Division, 7350 Commerce Lane, Minneapolis, Minn. 55432. Send protests to: Carroll Russell, District Supervisor, Interstate Commerce Commission, Suite 620, 110 N. 14th St., Omaha, Nebr. 68102.

No. MC 123640 (Sub-No. 23TA) filed December 20, 1976. Applicant: SUMMIT CITY ENTERPRISES, INC., 3200 Mau-

mee Ave., Fort Wayne, Ind. 46803. Applicant's representative: Irving Klein, 371 Seventh Ave., New York, N.Y. 10001. Authority sought to operate as a *contract carrier*, by motor vehicle, over irregular routes, transporting: *Footwear, footwear accessories, footwear display cases, and display materials, and materials and supplies used in the distribution of footwear*, between Huntington, Ind., on the one hand, and, on the other, points in Illinois, Indiana, Ohio, Michigan and Kentucky, under a continuing contract with Meldisco, a Division of Melville Corporation, for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper: Meldisco, a Division of Melville Corporation, 401 Hackensack Ave., Hackensack, N.J. Send protests to: J. H. Gray, District Supervisor, Bureau of Operations, Interstate Commerce Commission, Suite 113, 343 W. Wayne St., Fort Wayne, Ind. 46802.

No. MC 123872 (Sub-No. 61TA) filed December 17, 1976. Applicant: W & L MOTOR LINES, INC., P.O. Drawer 2607, State Road 1148, Hickory, N.C. 28601. Applicant's representative: Allen E. Bowman (same address as applicant). Authority sought to operate as a *common carrier*, by motor vehicle, over irregular routes, transporting: *New furniture and furniture parts*, from points in Alexander and Iredell Counties, N.C., to points in New Mexico, Oklahoma and Texas, for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shippers: Gilliam Furniture, Inc., P.O. Box 1610; Blackwelder Furniture Co., P.O. Box 1810; and Statesville Chair Co., Statesville, N.C. Lewittes Furniture Enterprises, Inc., P.O. Box 1027, Taylorsville, N.C. 28681. Send protests to: Terrell Price, District Supervisor, 800 Briar Creek Road, Room CC516, Mart Office Bldg., Charlotte, N.C. 28205.

No. MC 124896 (Sub-No. 18TA) filed December 14, 1976. Applicant: WILLIAMS SAASON TRUCK LINES, INC., Thorne & Ralson Sts., P.O. Box 3485, Wilson, N.C. 27893. Applicant's representative: Jack H. Blanshan, Suite 200, 205 W. Touhy Ave., Park Ridge, Ill. 60068. Authority sought to operate as a *common carrier*, by motor vehicle, over irregular routes, transporting: *Meat, meat products, 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 the plantsites and storage facilities of Farmland Foods, Inc., at or near Carroll, Denison and Iowa Falls, Iowa, to Anniston, Birmingham, Dothan, Leeds, Mobile, Montgomery, Selma and Tuscaloosa, Ala.; Daytona Beach, Ft. Lauderdale, Gainesville, Hollywood, Jacksonville, Miami, Orlando, Plant City, Pompano Beach, Tallahassee and Tampa, Fla.; Albany, Athens, Atlanta, Columbus, Doraville, Dublin, Macon, Rome, Savannah, Thomasville and Way-

cross, Ga.; Greenville, Lexington and Louisville, Ky.; Asheville, Charlotte, Durham, Greensboro, Greenville, Hickory, Holly Ridge, Kernsville, Loringburg, Raleigh, Wilmington, Winston-Salem and Wilson, N.C.; Alken, Charleston, Columbia, Dillon, Evergreen, Florence, Greenville, Orangeburg and Sumter, S.C.; and Chattanooga, Greenville, Jackson, Johnson City, Knoxville, Memphis, Murfreesboro and Nashville, Tenn., restricted to the transportation of traffic originating at the named origins and destined to the destinations, for 180 days. Supporting shipper: Farmland Foods, Inc., Denison, Iowa 51442. Send protests to: Archie W. Andrews, District Supervisor, Bureau of Operations, Interstate Commerce Commission, P.O. Box 26896, Raleigh, N.C. 27611.

No. MC 127616 (Sub-No. 24TA) filed December 20, 1976. Applicant: SAVAGE TRUCKING CO., INC., Elm Street, P.O. Box 27, Chester Depot, Vt. 05144. Applicant's representative: Clarence D. Horton (same address as applicant). Authority sought to operate as a common carrier, by motor vehicle, over irregular routes, transporting: *Pre-cut timber frame buildings*, from Claremont, N.H., to points in Delaware, Connecticut, Illinois, Indiana, Kentucky, Maine, Maryland, Massachusetts, Michigan, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, Virginia, West Virginia, Wisconsin, 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: Cluster Shed, Inc., Division of Vermont Log Bldgs., Box 202, Hartland, Vt. 05048. Send protests to: David A. Demers, District Supervisor, Interstate Commerce Commission, P.O. Box 548, Montpelier, Vt. 05602.

No. MC 134314 (Sub-No. 6TA) filed December 20, 1976. Applicant: CHARLES R. STROP, doing business as STROP TRANSPORTATION, R.R. One, Hastings, Nebr. 68901. Applicant's representative: Arlyn L. Westergren, 530 Univac Bldg., 7100 W. Center Road, Omaha, Nebr. 68106. Authority sought to operate as a common carrier, by motor vehicle, over irregular routes, transporting: *Meats and packinghouse products*, from the plantsite of Dubuque Packing Company, at or near Mankato, Kans., to points in Rhode Island, Connecticut, Florida, Georgia, Illinois, Indiana, Iowa, Maine, Massachusetts, Michigan, Missouri, New Jersey, New York, Nebraska, Ohio, Pennsylvania and Wisconsin, for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper: Earl Skahill, General Manager, Dubuque Packing Company, Box 282, Mankato, Kans. 66956. Send protests to: Max H. Johnston, District Supervisor, 285 Federal Bldg., and Courthouse, 100 Centennial Mall North, Lincoln, Nebr. 68508.

No. MC 134824 (Sub-No. 4TA) filed December 15, 1976. Applicant: FOREST PRODUCTS TRANSPORTS, INC., 216

Newsom Bldg., P.O. Box 567, Columbia, Miss. 39429. Applicant's representative: Harold D. Miller, Jr., 1700 Deposit Guaranty Plaza, P.O. Box 22567, Jackson, Miss. 39205. Authority sought to operate as a contract carrier, by motor vehicle, over irregular routes, transporting: *Wood chips*, from the plantsites of Georgia-Pacific Corporation, located at or near Gloster and Roxie, Miss., and the plantsite of St. Regis Company, located at or near Magnolia, Miss., to the plantsite of Georgia-Pacific Corporation, at or near Port Hudson, La., under a continuing contract with Georgia-Pacific Corporation, for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper: Georgia-Pacific Corporation, P.O. Box 520, Crossett, Ark. 71635. Send protests to: Alan C. Tarant, District Supervisor, Interstate Commerce Commission, Room 212, 145 E. Amite Bldg., Jackson, Miss. 39201.

No. MC 136818 (Sub-No. 12TA) (Correction) filed October 5, 1976, published in the FEDERAL REGISTER issue of October 19, 1976, and republished as corrected this issue. Applicant: SWIFT TRANSPORTATION COMPANY, INC., 335 W. Elwood, Phoenix, Ariz. 85031. Applicant's representative: Donald Ferns, 4040 E. McDowell Road, Suite 312, Phoenix, Ariz. 85003. Authority sought to operate as a common carrier, by motor vehicle, over irregular routes, transporting: *Cheese*, from Thayne, Wyo., to points in California, Illinois, Minnesota, Wisconsin, Pennsylvania and New York, for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper: Star Valley Cheese Corp., Thayne, Wyo. 83127. Send protests to: Andrew V. Baylor, District Supervisor, Interstate Commerce Commission, 3427 Federal Bldg., 230 N. First Ave., Phoenix, Ariz. 85025. The purpose of this republication is to add the state of Illinois as a destination point in this proceeding.

No. MC 142145 (Sub-No. 3TA), filed December 20, 1976. Applicant: LINDSAY TRANSPORTATION, INC., Lindsay, Nebr. 68644. Applicant's representative: Steven K. Kuhlmann, P.O. Box 82028, Lincoln, Nebr. 68501. Authority sought to operate as a contract carrier, by motor vehicle, over irregular routes, transporting: *Irrigation systems and parts, equipment, materials and supplies used in irrigation systems*, their shipment or their installation (except commodities in bulk, in tank vehicles), from the facilities utilized by Lindsay Manufacturing Co., at or near Amarillo, Tex., to points in the United States (except Alaska and Hawaii); and *equipment materials and supplies* utilized in the manufacture of irrigation systems (except commodities in bulk, in tank vehicles), from points in the United States (except Alaska and Hawaii), to the facilities of Lindsay Manufacturing Co., at or near Amarillo, Tex., restricted to a transportation service to be performed under a continuing contract with Lindsay Manufacturing

Co., for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper: Gerald L. Abts, Vice-President, Finance, Lindsay Manufacturing Co., Box 156, Lindsay, Nebr. 68644. Send protests to: Max H. Johnston, District Supervisor, 285 Federal Bldg., and Courthouse, 100 Centennial Mall North, Lincoln, Nebr. 68508.

No. MC 142483 (Sub-No. 1TA), filed December 17, 1976. Applicant: W & L MOTOR LINES, INC., P.O. Box 2607, State Road 1148, Hickory, N.C. 28601. Applicant's representative: Allen E. Bowman (same address as applicant). Authority sought to operate as a contract carrier, by motor vehicle, over irregular routes, transporting: *Communications cable* (except commodities in bulk and those which because of size or weight require special equipment), from the plantsite and manufacturing facilities of Comm/Scope Company, located at or near Sherrills Ford, Catawba County, N.C., to points in Arizona, California, Colorado, Idaho, Iowa, Kansas, Minnesota, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington and Wyoming, under a continuing contract with Comm/Scope Company, Inc., for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper: Comm/Scope Company, Rt. 1, Box 199A, Catawba, N.C. 28609. Send protests to: Terrell Price, District Supervisor, 800 Briar Creek Road, Room CC516, Mart Office Bldg., Charlotte, N.C. 28205.

No. MC 142682 (Sub-No. 1 TA) (correction), filed November 23, 1976, published in the FEDERAL REGISTER issue of December 10, 1976, and republished as corrected this issue. Applicant: LARRY A. SANDBERG & NADINE C. SANDBERG, doing business as L & N HOG MARKET, Rural Route, Rowley, Iowa 52329. Applicant's representative: Thomas E. Leahy, Jr., 1980 Financial Center, Des Moines, Iowa 50309. Authority sought to operate as a common carrier, by motor vehicle, over irregular routes, transporting: *Dairy products* (except in bulk), from the plantsite and storage facilities of Wapsie Valley Creamery, Inc., at or near Independence, Iowa, to points in Missouri, for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shipper: Wapsie Valley Creamery, Inc., 300 10th St. N.E., Independence, Iowa 50644. Send protests to: Herbert W. Allen, District Supervisor, Bureau of Operations, Interstate Commerce Commission, 518 Federal Bldg., Des Moines, Iowa 50309. The purpose of this republication is to change docket number MC 142682 (Sub-No. 1) in lieu of MC 142691 TA which was previously published in error.

No. MC 142730 (Sub-No. 1 TA), filed December 16, 1976. Applicant: THOMAS MCGINNIS, doing business as T. MCGIN-

NIS TRUCKING CO., Route 3, Box 329, Catlettsburg, Ky. 41129. Applicant's representative: John M. Friedman, 2930 Putnam Ave., Hurricane, W. Va. 25526. Authority sought to operate as a contract carrier, by motor vehicle, over irregular routes, transporting: (a) (1) *Face brick*; (2) *clay and shale*; (3) *concrete materials*, viz: sand and gravel, in bulk, in dump vehicles; (4) *concrete materials*, viz: Limestone, sand, and gravel, in bulk, in dump vehicles; (5) *concrete materials*, viz: Patio blocks, concrete lintels, parking curbs and decorative blocks; and (6) *concrete materials*, viz: decorative blocks and concrete blocks in special shapes; and (b) (1) Those commodities named in (1) and (2) above, from Marion, Glasgow and Richlands, Va., to points in Boyd, Greenup, Carter and Lawrence Counties, Ky.; Gallia, Meigs and Lawrence Counties, Ohio; and Cabell and Wayne Counties, W. Va.; (2) Those commodities named in (3) above, from points in Scioto County, Ohio, to Catlettsburg and Greenup, Ky.; (3) Those commodities named in (4) above, from points in Adams County, Ohio, to Catlettsburg and Greenup, Ky.; (4) Those commodities named in (5) above, from points in Franklin County, Ohio, to Catlettsburg and Greenup, Ky.; and (5) Those commodities named in (6) above, from points in Ross County, Ohio, to Catlettsburg, Ky., under a continuing contract with H & H Supply, Inc., for 180 days. Applicant has also filed an under-

lying ETA seeking up to 90 days of operating authority. Supporting shipper: H & H Supply, Inc., 1029 Center St., Catlettsburg, Ky. 41129. Send protests to: H. C. Morrison, Sr., District Supervisor, Interstate Commerce Commission, Room 216 Bakhaus Bldg., 1500 W. Main St., Lexington, Ky. 40505.

PASSENGER APPLICATIONS

No. MC 142652 (Sub-No. 1 TA), filed December 20, 1976. Applicant: BRANDON TRANSPORT INC., 143 Dequoy, St-Gabriel-de-Brandon, Quebec, Canada JOK 2N0. Applicant's representative: Guy Poliquin, Room 140, 580 E. Grande-Allee, Quebec, Quebec, Canada G1R 2K3. Authority sought to operate as a common carrier, by motor vehicle, over irregular routes, transporting: *Passengers and their baggage*, in charter and special operations, from points on the International Boundary line in the states of Maine, New Hampshire, Vermont, New York and Michigan, to points in the United States (except Alaska and Hawaii), restricted to traffic originating at Montreal, St-Gabriel-de-Brandon in the Province of Quebec, Canada, for 180 days. Supporting shipper: Agence de Voyages Brandon Enrg, 143 Dequoy, St-Gabriel de Brandon, Quebec, Canada. Send protests to: David A. Demers, District Supervisor, Interstate Commerce Commission, P.O. Box 548, Montpelier, Vt. 05602.

No. MC 142691 (Sub-No. 1 TA) (Correction), filed November 30, 1976, published in the FEDERAL REGISTER issue of December 13, 1976, and republished as corrected this issue. Applicant: SOUTHBOUND, INC., P.O. Box 45157, Baton Rouge, La. 70895. Applicant's representative: E. J. Dominguez, Sr. (same address as applicant). Authority sought to operate as a common carrier, by motor vehicle, over irregular routes, transporting: *Passengers*, in round-trip special operations, between Shreveport, Minden, Ruston and Monroe, La., on the one hand, and, on the other, Louisiana State Penitentiary, at or near Tunica, La., for 180 days. Applicant has also filed an underlying ETA seeking up to 90 days of operating authority. Supporting shippers: Helen Walker, 4102 Martha St., Shreveport, La. 71109. Ida Edwards, 4200 Ester Ave., Monroe, La. 71201. Alton Gandy, c/o Amaco Station Dennis Drive Hwy. 7, Minden, La. 71055. Ada C. Veal, 412 Main St., Grambling, La. 71245. Send protests to: Ray C. Armstrong, Jr., District Supervisor, 701 Loyola Ave., 9033 Federal Bldg., New Orleans, La. 70113. The purpose of this republication is to change docket number MC 142691 (Sub-No. 1) in lieu of MC 142682 TA which was previously published in error.

By the Commission.

ROBERT L. OSWALD,
Secretary.

[FR Doc.77-381 Filed 1-4-77; 8:45 am]

federal register

WEDNESDAY, JANUARY 5, 1977

PART II



ENVIRONMENTAL PROTECTION AGENCY



AIR POLLUTION CONTROL

**Certification and Test Procedures for
New Motorcycles; Emission Regulations
and Appendices**

Title 40—Protection of Environment
CHAPTER 1—ENVIRONMENTAL
PROTECTION AGENCY
[FRL 659-1]

PART 86—CONTROL OF AIR POLLUTION
FROM NEW MOTOR VEHICLES AND
NEW MOTOR VEHICLE ENGINES: CER-
TIFICATION AND TEST PROCEDURES

Emission Regulations for New Motorcycles

On October 22, 1975 a Notice of Proposed Rule Making (NPRM) was published in the FEDERAL REGISTER (40 FR 49496) for the control of exhaust and crankcase emissions from new motorcycles. Comments by interested parties to that NPRM received prior to February 10, 1976 were considered in the preparation of this final rule making.

Basis for motorcycle regulations. In the development of the final rule making, the effects of motorcycle emissions on ambient air quality on a national basis and in certain air quality control regions were reevaluated. Even with the use of reduced growth rates as recommended by some of those commenting on the NPRM, the analysis concludes that the control of motorcycle emissions is a reasonable strategy to reduce air pollution caused by motor vehicles. The projected contribution of motorcycles in 1985 ranges from 3 to 18 percent of the hydrocarbons and 3 to 5 percent of the carbon monoxide allowable to meet ambient air quality standards in the five air quality control regions assessed. In the time frame considered no single source will be a major contributor, and meeting the ambient air quality standards will require control of many sources each of which considered individually may not be a large contributor to air pollution. However, control in the aggregate will contribute significantly to needed reductions in ambient pollutant concentrations.

Emission standards and implementation dates. The NPRM contained proposed emission standards for 1978 and 1979 model year motorcycles of 5 grams/kilometre (5 g/km or 8 g/mi) hydrocarbons (HC) for engine displacements less than 170 cc, 5 to 14 g/km (22.5 g/mi) for displacements between 170 cc and 750 cc and 14 g/km above 750 cc. The carbon monoxide (CO) and nitrogen oxides (NOx) standards proposed were 17 g/km (27.4 g/mi) and 1.2 g/km (1.9 g/mi), respectively. For model year 1980 and later it was proposed that motorcycles be controlled to the ultimate light duty vehicle standards set forth in section 202 of the Clean Air Act, as amended, 42 U.S.C. 1857f-1 (commonly known as the "statutory standards"). In general the response to the proposed action was that the 1978 standards were achievable but that implementation of the statutory standards was not technically feasible as early as 1980, and that control to that level would not be cost effective.

An analysis of the costs and lead time for the 1978 standards confirmed that the proposed levels are a reasonable and cost effective means of control, and therefore, with the exception of the NOx

standard, they are hereby being promulgated as proposed. The NOx standard has been deleted because an air quality analysis indicates that the motorcycle contribution to motor vehicle NOx emissions is negligible, being less than one half of one percent in 1990.

The analysis of the 1978 standards revealed that a level of control more stringent than the 1978 standards is feasible for model year 1980 at reasonable costs using available technology. Two levels of HC control, both of which eliminate the displacement dependency of the HC standard, were evaluated. These levels were 5 g/km HC (8 g/mi) and 2 g/km HC (3.2 g/mi). The 5 g/km standard proved to be as cost-effective as the 1978 standards and achieved only slightly less control than the 2 g/km standard. The analysis indicated that the 5 g/km HC standard could be implemented in 1980; the 2 g/km standard would require several years more lead time to avoid major disruption to the industry since it is likely that most two stroke motorcycles would need to be converted to a four stroke design to comply with a 2 g/km standard. Based on this analysis, a follow-on standard of 5.0 g/km HC and 12 g/km CO applicable for the 1980 model year is hereby being promulgated. Data indicate that the 12 g/km (19.3 g/mi) CO level is achievable at low cost using available technology.

The 1978 standards will result in an average 34 percent reduction in HC and an average 36 percent reduction in CO emissions compared to the uncontrolled motorcycles. The 1980 standards will increase these percentage reductions to 54 and 49 percent, respectively.

The proposal for the 1980 motorcycle standards equivalent to the light duty vehicle statutory standards is being withdrawn at this time. Depending upon future air quality needs and the determination of the cost effectiveness, the Agency may, in the future, repropose those levels of control to become effective in the time frame beyond 1980.

Economic impact. EPA studies using information supplied by various manufacturers indicate that the cost of compliance with the promulgated emission standards for 1978 will result in an average increase in retail cost of 47 dollars per motorcycle. This cost will be partially offset by an average discounted lifetime fuel savings of 33 dollars and an undetermined savings in maintenance and improved reliability of the product. The average incremental cost increase for the 1980 standards is estimated to be \$9 which includes a small additional improvement in fuel economy. The manufacturers estimated that fuel economy improvements associated with the 1978 emission standards would range as high as 65 percent with an average increase of 20 percent. No significant decrease in sales or shift in market shares (between manufacturers) is expected to result from the implementation of this regulation.

Applicability of emission regulations. The motorcycle definition has been changed to include 2 wheel vehicles and

all 3 wheel vehicles having a curb mass of less than or equal to 680 kilograms (1500 lbs.). This definition provides objective criteria for determining a vehicle's class while maintaining consistency with the previous light duty vehicle motorcycle exclusion.

The preamble to the Notice of Proposed Rule Making stated that under the Clean Air Act, the EPA does not have the authority to prescribe standards for vehicles not designed for use on streets or highways. Some confusion was expressed by commenters over what constituted a motorcycle designed for use on streets or highways. The applicability section has been rewritten to state that these standards apply to new motorcycles which have a headlight, taillight and stoplight.

The applicability to only those motorcycles with displacements of at least 50 cc remains. Motorcycles with top speeds under 40 km/h (25 mi/h) or which cannot start from a stop using power from only the engine (e.g. most mopeds) have been excluded.

Certification procedure. In an effort to minimize the costs and certification time while obtaining reasonable assurance that newly manufactured motorcycles will comply with the standards for their useful life, substantial changes to the proposed certification procedure have been made.

The NPRM proposed that durability vehicles accumulate the entire mileage defined as its useful life and that a deterioration factor be calculated from the emissions test results for this vehicle. Then a separate (emission data) vehicle, calibrated to production specifications would accumulate sufficient mileage to stabilize emissions and compliance would be determined by applying the deterioration factor to this level of emissions. Under the promulgated procedure, the emission data and durability vehicles will be combined into one certification test vehicle and the test distance reduced to one half of the useful life distance. Cutting in half the test distance will reduce the lead time and cost required to accumulate test mileage and will permit the use of production calibrations on vehicles used to calculate deterioration factors. By combining durability and emissions data vehicles into one test motorcycle calibrated to production specifications, and by testing one such vehicle for each engine family-displacement system combination, added confidence in the representativeness of the resulting deterioration factor is gained.

Another change made to the certification procedures concerns test vehicle selection. The product line is grouped, by engine displacement in cubic centimetres (cc), into three vehicle classes. These classes are: I, 50-169 cc; II, 170-279 cc; III, 280 cc and greater engine displacement. Within each class the vehicles will further be grouped by engine family-displacement-control system combinations. Within each combination EPA will select the "worst case" vehicle to be tested for the purpose of demonstrating compliance with the emission standards. Only one

vehicle per engine family-displacement-control system combination will be selected for such testing. For engine families with less than 5000 annual sales, the manufacturer may request that only one vehicle per engine family be selected.

The test vehicle will be built to production tolerances and will accumulate distance to one half its useful life. A minimum of four emission tests performed by the manufacturer will be required, and from these data a deterioration factor line will be calculated and extrapolated to the useful life. If the deterioration factor line is below the standard, or all test points are below the standard, the vehicle will then be tested by EPA. If the results of applying the deterioration factors multiplicatively to the EPA test results are also below the standard (and all other procedural requirements are met), certification will be granted. For vehicles whose emissions exceed the standard when projected to the useful life, the manufacturer may elect to continue service accumulation to the useful life and demonstrate that emissions throughout the useful life will be below the standard.

Several comments were received requesting exclusion of low volume manufacturers from the regulations. An analysis of the effort required to reduce emissions to the promulgated standards revealed that low volume manufacturers will not incur unreasonably high per unit increases in cost, and consequently should not be excluded from complying with the regulations. However, to minimize certification costs both for the manufacturers and for the government, an experimental provision for low volume manufacturers has been adopted. Manufacturers with total U.S. sales of less than 10,000 vehicles will not be required to submit vehicles for certification testing by EPA. These manufacturers will be required to affirm in writing to EPA that their motorcycles conform to the applicable standards as confirmed by emission test data generated by or for the manufacturers (and retained in the records of the manufacturer) and that the aggregate model year sales of motorcycles to be covered by the certificate of conformity will be less than 10,000. The manufacturer must also retain in his records all of the data that would otherwise be required to be submitted to EPA in the completed application for certification; this documentation need not be submitted to EPA unless specifically requested by EPA at some subsequent time.

The procedure described above reduces the number of motorcycles required to be tested by EPA by approximately 60 percent from the procedure proposed in the NPRM. This is accomplished by revised vehicle selection criteria, the combining of durability and data vehicles into one test vehicle, and the special provisions for manufacturers with less than 10,000 annual sales. The Agency recognizes that this certification procedure is new and untried, and may require modification at a future date should it fail to result in assuring that motorcycles are

designed to meet the emission standards for their useful life. However, the risk of this experiment is negated by the relatively small contribution of low volume manufactured motorcycles to air pollution. Currently there are only five manufacturers who sell more than 10,000 vehicles per year in the United States. Collectively these five produce over 90 percent of all motorcycles sold in this market while approximately 27 other manufacturers produce the remainder. If a special provision were not made to preclude small volume manufacturers from full certification, EPA would have to devote almost a quarter of its motorcycle certification resources to test vehicles which account for less than 5 percent of motorcycle emissions. While the special provisions in the final rule will allow the Agency and the smaller manufacturers to realize some cost savings they in no way reduce the manufacturer's obligation to comply with such standards. Since the Agency expects to include production motorcycles made by small volume manufacturers in one or more surveillance testing programs, the desired control will be obtained.

Useful life. In the NPRM useful life was described as the average distance a motorcycle could be expected to travel in its lifetime. The definition of useful life adopted by EPA for final rule making is of considerable import to the industry for two reasons. First, the definition of useful life affects the design of vehicles capable of meeting the emission standards in the preproduction design evaluation process ("certification"). To show compliance with a given emission standard over a greater distance requires emission control equipment which either is more durable or meets lower initial targets in order to continue meeting the emission standards after deterioration has occurred. Second, the useful life definition affects the duration of the warranties and the applicability of recall provisions in section 207 of the Act. Thus, the longer the useful life, the more extensive will be the manufacturer's liability under the warranty provisions and the greater his jeopardy under the recall provisions.

EPA has believed since the initial development of this regulation that its obligation is to obtain the maximum emission reduction which the technology allows, giving appropriate consideration to the cost of compliance. Obtaining the maximum reduction could theoretically be accomplished either of two ways—by specifying a given set of emission standards with a requirement that they be met for a useful life equal to their average total lives; or by specifying a shorter useful life mileage during which the standards are applicable (if permissible under the law), while setting correspondingly more stringent emission standards. EPA chose the first option in its proposal (namely, a set of standards which appeared feasible if they had to be met for average total life), because a longer period of useful life ensures some degree of pollution control for a greater proportion of the population of motor vehicles

in use at any point in time and because EPA believed its discretion to specify useful life was limited by explicit statutory guidance (as will be explained below). The option of a shorter useful life with a tighter emission standard would be more likely to lead to gross emitters in the second half of a vehicle's life, particularly for a type of vehicle for which owner maintenance is the rule rather than the exception, and would not come as close as possible to the only useful life mileage for any vehicles given in the statute. Thus EPA believes that the proposed specification of useful life distance as average total life distance was supported by either of two independent considerations: It was closest to the statutory intent and, even if the statute is read to give EPA discretion to adopt a shorter period, the longer period was preferable public policy.

The comments submitted in response to the notice of proposed rule making did not lead EPA to conclude that it was wrong on the law, or provide any data or arguments (such as cost-effectiveness comparisons or demonstrations that compliance for average total life was infeasible) leading EPA to conclude that it had chosen an undesirable policy. Therefore EPA has decided to adopt the specification of "useful life" for motorcycles as average total life distance or five years, whichever comes first. EPA is aware that the manufacturers are already devoting their programs toward meeting the proposed emission standard for the life of their vehicles.

The policy issue will be discussed first. Even those manufacturers who argued that the Administrator was legally obligated to use half life as the basis of useful life nevertheless conceded that the Administrator could choose a longer period of time if he determined it was "appropriate," under section 202(d)(2) of the Act.¹ Although he does not believe the statute requires, or even allows (see below), useful life for motorcycles to be defined as half life, the Administrator determined that he should analyze the "appropriate" useful life, in case a court should agree with the legal views of these commenters. It has been determined that for motorcycles it is appropriate to specify a useful life of average total life for several reasons.

First, shorter useful lives are a compromise with what can be done in air pollution control, since they allow vehicles to escape regulation completely once a certain point is passed.

Second, technology allows motorcycles to be designed such that their emission control features are durable for their total lives, which are in all cases

¹ These manufacturers argued that EPA has discretion to classify motorcycles as "other" motor vehicles subject to section 202(d)(2) for purposes of determining useful life. As the D.C. Circuit has emphasized, Congress, in using the term "light duty vehicle", had in mind passenger cars exclusively or almost exclusively. *International Harvester Co. v. Ruckelshaus*, 478 F.2d 615, 639 (D.C. Cir. 1973).

less than two fifths the mileages for which automobile manufacturers and all other regulated manufacturers must design their emission control devices and systems to properly function.

None of the major manufacturers argued that they would be unable to meet the proposed 1978 standards over the full lifetime of their vehicles. Two manufacturers stated that a few of their models have generally low durability for some components which will ultimately cause the vehicle to be inoperative and that this could lead to difficulties during certification testing if tests had to be run for the full lifetime mileage. (As will be noted later this problem has been alleviated by permitting anticipated maintenance during the durability test.) In their comments on the NPRM manufacturers told EPA that their development efforts directed towards meeting the proposed 1978 federal standards for the full lifetime of their motorcycles were already underway.

The 1980 standards initially proposed by EPA (0.25 grams/kilometre—HC, 2.1 grams/kilometre—CO, and 0.25 grams/kilometre—NOx) were the equivalent values to the light duty vehicle statutory standards. Most motorcycle manufacturers claimed that this level of emission control was currently technologically infeasible for motorcycles and that sufficient lead time was not available to develop the new technologies necessary to meet these standards by 1980. As a result EPA has adjusted the 1980 standards to levels which in EPA's technical judgment can be met by manufacturers without undue hardship. Manufacturers have known about the revised 1980 standards for almost five months and have not called on EPA to halt their implementation on the grounds that they were infeasible. Further reason to believe that manufacturers can achieve at least a 5.0 gram/kilometer standard for HC emissions is based on the data supplied to the Administrator by the industry which led the Administrator to conclude in his California Waiver decision (41 FR 44209, October 7, 1976) that lead time and technology were available for manufacturers to comply with this level of stringency even though it might require two-stroke engines of greater than 250 cc displacement to convert to four-stroke engines.

Third, apart from issues of technological feasibility, the manufacturers might have offered data suggesting that for a given level of stringency in the standard the use of the total life concept was less cost-effective than use of a half life concept. But no conclusive arguments to this effect were offered for the 1978 standards which were proposed.

In summary, the Administrator has found several reasons of public policy which have led him to determine that the periods of useful life set forth in these regulations are appropriate.

EPA believes that the mileages set forth in these regulations are the required ones under section 202(d) of the Clean Air Act. Some commenters dis-

agreed. These commenters argued not only that average total life was not required as the useful life for motorcycles under the Act, but that "half life" was. After careful consideration of the arguments and research offered by these commenters on the question, EPA has concluded that they are in error.

In section 202(d) (1) of the Act Congress specified the useful life of "light duty vehicles" as a period of 5 years or 50,000 miles (or the equivalent). For "any other motor vehicle," section 202 (d) (2) requires the same or a "greater duration or mileage." Thus, whether motorcycles are light duty vehicles or "other" vehicles, the same floor of 5 years/50,000 miles appears to be the minimum allowed by the Act. Some manufacturers have suggested that the phrase "(or the equivalent)" which follows "50,000 miles" in section 202(d) (1) (and by implication in section 202(d) (2)) evidences a Congressional intent that the floor, or minimum, useful life for any vehicle is its "half life," rather than 5 years/50,000 miles. While it is true that 5 years or 50,000 miles happens to equate approximately with half of the total lifetime usage of passenger cars (which are the sole, or at least major, category of light duty vehicles), neither the language of the Act nor the legislative history indicates a Congressional intent that the half-life concept be applied as the minimum for other classes of vehicles, or that the words "(or the equivalent)" have that meaning.

The inclusion of the word "equivalent" in section 202(d) simply took account of the long-standing administrative policy of the Department of Health, Education, and Welfare (which regulated motor vehicle emissions prior to the creation of EPA) that the emission standards must be applicable to vehicles during the "normal service in the hands of the public" or during the test track "equivalent" of such normal service, since accumulation of mileage during certification was required to take place on a test track according to a specified urban driving cycle. See 45 CFR 85.87, 31 FR 5177 (March 30, 1966); § 85.92, 33 FR 8317 (June 4, 1968); § 85.92, 35 FR 17303 (November 10, 1970). For heavy duty vehicles, HEW required that the standards be applicable during "[n]ormal service

in an urban area (or its dynamometer operation equivalent)." Proposed 45 CFR 85.113, 33 FR 126 (January 4, 1968); see §§ 85.113, 85.133, 33 FR 8319, 8322 (June 4, 1968); §§ 85.113, 85.133, 35 FR 17307, 17310, (November 10, 1970).

In sum, the origin of the phrase "(or the equivalent)" in section 202(d) of the Act was simply the administrative practice of allowing a variety of different "equivalent" methods of accumulating mileage or time to be used to prove the same things. This practice existed even prior to 1970 and the phrase has been consistently interpreted by EPA since 1970 for the same purpose. The phrase was not intended by Congress to be a code word for "half life," which could have been expressed in explicit language if such had been the intention. Thus the contention that there is a legal requirement for the Administrator to adopt half life as useful life is not valid.

As mentioned above, EPA believes that it is constrained by the statute from choosing a shorter period than it has done for motorcycles. In fact, EPA would have felt obligated to specify 50,000 miles if motorcycles lasted that long in actual service. Section 202(d) (1) of the Act established 5 years or 50,000 miles as the floor for useful life for light duty vehicles, and section 202(d) (2) incorporates this by reference as a floor for all other vehicles. However, it is obvious that few, if any, motorcycles last 50,000 miles (although they do last 5 years or more). This presented EPA with the choice between mandating a useful life mileage for motorcycles which is longer than the life of the vehicle (and therefore could not be met in a certification durability test) or selecting a useful life which comes as close as possible to the statutory floor of 50,000 miles. EPA concluded that the Congressional standard of a 50,000 mile useful life could best be met, for a vehicle which did not last 50,000 miles, by specifying a useful life as close to it as possible. Since specifying useful life as average total life distance leads to a much closer approximation of the 50,000

* After the 1970 amendments of the Act, the regulations were restructured to provide for expressing the applicability of emission standards in terms of the phrase "useful life," and the "equivalences" to normal mileage accumulation were transferred to the definitional sections of the regulation. It was not considered necessary to continue the phrase "equivalent" for light duty vehicles, but the phrase was continued for heavy duty engines, for which durability testing is normally done on an engine dynamometer, and the length of the test is defined in terms of hours instead of miles. 45 CFR 1201.1(a) (53) (ii) and (iii), 36 FR 16905 (August 26, 1971). These definitions, using the term "equivalent," are currently set forth in 40 CFR 85.702(a) (17), and 85.802(a) (26); cf. § 85.902 (1976).

* Indeed, to adopt the view that "equivalent" means "half life" would confer on the Administrator discretion to change even the five year/fifty thousand mile provision of 202(d) (1) for passenger cars if he found from new data that some other figures were "equivalent" to half life. This conclusion would be at odds with the express intent of Congress that it, not the Administrator, set the useful life for automobiles.

* One of the manufacturers argued that the phrase "(or the equivalent)" requires that useful life for motorcycles be the portion of a motorcycle's total life that is equivalent to the portion that 50,000 miles represents in a passenger car's total life, and stated that this was 60 percent; in other words, this comment stated that the statute required three-fifths life, rather than half life or total life. Another, which at a later stage argued that the statute required half life, had earlier argued that the phrase "(or the equivalent)" means the mileage equivalent of 5 years of use, without regard to what portion of the vehicle's total life that figure would represent. For the reasons stated in the text neither of these positions is demonstrated by the legislative history.

* See *International Harvester Co. v. Ruckelshaus*, 478 F. 2d 616, 639 (D.C. Cir. 1973); S. Rep. No. 91-1196, 91st Cong., 2d Sess. 24 (1970).

mile floor than would average half life distance, this becomes the mandatory floor.

As noted earlier, several manufacturers commented on the appropriateness of the specific values EPA had calculated for average lifetime mileage in the NPRM. Numerous detailed analyses of motorcycle average total life mileage based, as the EPA study was, on the Gallup Motorcycle Survey data, were received as comments to the NPRM. In calculating the useful life values contained in this final rule making, the best features of these analyses were combined with EPA's original analysis to obtain the most appropriate values, and these are used in the useful life definition contained in this final rule making. Life time mileages for three displacement classes were determined to be necessary and are as follows: 12,000 kilometres (7,456 miles) for small displacement motorcycles; 18,000 kilometres (11,185 miles) for medium displacement motorcycles; and 30,000 kilometres (18,641 miles) for large displacement motorcycles.

In the NPRM EPA did not propose a period of time to accompany mileage as a part of the useful life definition. For the certification-compliance testing section of the regulations a time period is irrelevant. For the warranty or recall provisions, however, a time period is useful to provide the manufacturer some specific limit to the period during which the vehicles must conform to applicable emission standards. Section 202(d) of the Act requires that EPA must set as useful life a period of five years or, if appropriate, some greater value. In this case EPA will set the minimum period that the law allows, or five years, as the useful life of a motorcycle. This value will apply regardless of the engine displacement of the vehicle.

Maintenance. The manufacturers requested that break-in maintenance and decarbonization be allowed as scheduled maintenance, and that combustion chamber access be allowed as unscheduled maintenance. Under the promulgated regulations, scheduled maintenance has been divided into two classes: Periodic maintenance and anticipated maintenance. Periodic maintenance will cover all those items which are required at fixed distance or time intervals, such as oil changes, tune-ups, etc. Any periodic maintenance not specifically authorized by the regulations may be performed as long as a showing is made that this maintenance will be performed by most owners in actual use. Anticipated maintenance will cover those types of failures which are likely to occur and for which no preventive maintenance is appropriate, and whose occurrence is manifested by an overt indication to the owner.

Examples of anticipated maintenance items are piston seizure which results in the vehicle being inoperative, or the need for cylinder head decarbonization, manifested by an obvious loss of power or surging. To qualify for anticipated maintenance, a manufacturer must specify in his application for certification the approximate distance at which the

need for anticipated maintenance will occur, and must include the maintenance item in the owner's maintenance instructions. Anticipated maintenance must be approved by the Administrator prior to service accumulation. During testing the maintenance may be performed if there is an overt indication of the failure, and if the failure does not otherwise render the vehicle unrepresentative. Access to the combustion chamber will be allowed only if the manufacturer indicates prior to testing that such a failure is anticipated to occur and if he makes a showing that the type of maintenance which will alleviate the failure is likely to be done in the field.

Both the 207(a) warranty and the recall provision apply to motorcycles. The application of these requirements is neither affected by, nor in conflict with, the concept of anticipated maintenance. Anticipated maintenance instructions are premised on the catastrophic failure of parts to which they apply and the fact that such parts have a known service life less than the useful life of the motorcycle and must be installed and functioning in order for the motorcycle to operate. A catastrophic failure as used here is one which occurs without a significant period of degradation of either components or emissions performance. It is also a failure which renders the motorcycle inoperative. Thus, no amount of adjustment or modification would allow the motorcycle to operate.

Because of the nature of catastrophic failures, components which fail in such a manner pose no threat to the emissions performance of motorcycles. Such failures covered by anticipated maintenance instructions may not be subject to a claim under the section 207(a) warranty or recall under section 207(c) (1). However, the existence of an anticipated maintenance instruction will not insulate a manufacturer from recall or warranty actions if a component to which such an instruction applies fails in a non-catastrophic mode. If such a component actually deteriorates and emissions exceed standards (as a direct consequence of the failure or as a result of engine adjustment to improve driveability), nonconforming motorcycles may be remedied by a claim under the warranty and/or the recall provision.

Beginning with the 1980 model year, EPA will specify as part of scheduled maintenance the adjustment settings of any components which are capable of being adjusted and which would be expected to affect emission levels. Those adjustments within the physically allowable range that are expected to maximize driver perceived performance characteristics will be specified. For example, settings for the idle mixture, carburetor fuel metering rod and spark timing will be specified, where adjustment is available. Therefore, the manufacturers will be required to either calibrate the vehicle so that it meets the standards at all adjustments or to physically and permanently constrain the range of adjustment to the degree neces-

sary so that the required emission levels will be achieved at any adjustment within that range. It is expected that motorcycle manufacturers will comply with this requirement by eliminating the need for certain in-use adjustments and by providing physical limitations (positive stops) to the range of any remaining maintenance adjustments. This procedure is being adopted because motorcycles to a large extent are maintained by their owners, and these vehicles are expected to be set by the owner to those adjustment points that he or she perceives will provide optimum performance by improving either the power or the fuel economy.

This procedure is intended to prevent the above standard emission levels otherwise associated with maladjustment. This provision of the regulations is especially important to the effective implementation of the 1980 standards since it is expected that the technology to be used to meet these standards will be basically engine adjustment technology. If limitations are not placed on such adjustments, it would be reasonably expected that the effectiveness of emission control would be largely negated as an inherent result of in-use maintenance practices.

Test Procedures. In general only minor adverse comments were received with respect to the test procedures. As stated in the NPRM preamble, consideration was being given to the use of the Critical Flow Venturi sampling system. This system has been adopted as an allowable alternative to the proposed Positive Displacement Pump constant volume sampler.

Manufacturers commented that the pre-emission test soak period was unnecessarily long especially for the small displacement motorcycles. Based on manufacturer and EPA data, the soak period has been revised to require soak periods of 6, 8 and 12 hours for Classes I through III, respectively.

Opposition to the 12 hour cyclic accumulation of durability distance was stated by some manufacturers. It was their opinion that this procedure added substantial cost and delay to distance accumulation and the effect on durability was uncertain. EPA maintains that this procedure is relevant to durability test cycles, and considers its use appropriate. The Agency concluded that the non-operating period should be reduced to 8 hours in order to minimize distance accumulation time while still achieving the objectives of the procedure. Since the time required to accumulate the specified distances is 9 to 22 days, depending on the class, this requirement is not considered unreasonable.

The emission test dynamometer requirements have been restricted to performance requirements in terms of the road load characteristics and cooling. This was done to allow the maximum amount of test equipment flexibility for motorcycle manufacturers. The road load requirements have been changed from the single velocity specification to a two term equation of simulated road force as a function of velocity. The specified road load force at 65 km/h must be simulated

within a 5 newton (1.1 pounds force) tolerance. The forces at other speeds are simulated to the best ability of the equipment being used. It is the Agency's intention to specify a force tolerance over the entire test speed range if tests indicate there are significant errors in emissions or fuel economy measurement resulting from the use of equipment which does not accurately simulate the specified road load. These tests will be performed after the dynamometer being procured by EPA becomes operational; and tolerances, if determined necessary, will be issued for the 1980 model year.

One manufacturer was opposed to the emission driving schedule because of the need for the very small motorcycles to operate at wide open throttle during part of the driving schedule. The required maximum speed of 59 km/h (37 mi/h) for urban driving is considered by EPA to be a representative top speed for non-freeway traffic. EPA tests revealed that only motorcycles with certain combinations of gearing and wheel size have difficulty achieving the maximum speed. The present procedure which allows wide open throttle operation in place of achieving the required speed is considered representative of actual use, therefore the driving schedule as proposed is specified.

Manufacturers commented that the speeds in the durability cycle were also not representative for certain motorcycles. An analysis of the durability driving schedule speeds determined that certain modifications to the lap speeds should be made. The final rule making reflects these revised speeds.

Based on comments by one manufacturer, the displacement applicability of the two sets of shift points has been changed from above and below 170 cc to above and below 280 cc. A requirement for downshifting at the same vehicle speed as the upshift has been added. The use of manufacturer's recommended shift procedures is still allowable.

Motorcycle manufacturers have requested the use of indoor dynamometers for distance accumulation. There are no specific provisions for this in the regulations. However, the EPA will not disallow the use of a chassis dynamometer solely because it is located within a building. Indoor ambient temperature and the temperature measured at the cooling fan that are within 5° C of outdoor ambient are considered reasonable. Manufacturers wishing to use an indoor chassis dynamometer must request this in their application for certification.

Comments which were received in response to the NPRM are available for inspection and copying during normal business hours at the U.S. Environmental Protection Agency, Public Information Reference Unit, Room 2922 (EPA Library), 401 M St. S.W., Washington, D.C. 20460. As provided for in 40 CFR Part 2, a reasonable fee may be charged for copying services.

Single copies of EPA's detailed analysis of the comments received, entitled "Motorcycle Emission Regulations—

Summary and Analysis of NPRM Comments", as well as copies of the Final Environmental Impact Statement are available upon request from the Public Information Center (PM-215), U.S. Environmental Protection Agency, 401 M Street, S.W., Washington, D.C. 20460.

This Notice of Final Rulemaking is issued under the authority of sections 202, 206, 208 and 301(a) of the Clean Air Act, as amended (42 U.S.C. 1857f-1, 1857f-5, 1857f-6, 1857g(a)).

Effective date: This regulation becomes effective on February 4, 1977.

NOTE.—The Environmental Protection Agency has determined that this document contains a major regulation requiring preparation of an Inflation Impact Statement under Executive Order 11821 and OMB Circular A-107 and certifies that an Inflation Impact Statement has been prepared.

Dated: December 23, 1976.

JOHN QUARLES,
Acting Administrator.

Subparts E and F are added as follows:

Subpart E—Emission Regulations for 1978 and Later New Motorcycles, General Provisions

- | | |
|-----------|---|
| Sec. | General applicability. |
| 86.401-78 | Definitions. |
| 86.402-78 | Abbreviations. |
| 86.403-78 | Section numbering. |
| 86.404-78 | Measurement system. |
| 86.405-78 | Introduction, structure of subpart, further information. |
| 86.406-78 | Certificate of conformity required. |
| 86.407-78 | General standards; increase in emissions unsafe conditions. |
| 86.408-78 | Defeat devices, prohibition. |
| 86.409-78 | Emission standards for 1978 motorcycles. |
| 86.410-78 | Emission standards for 1980 motorcycles. |
| 86.411-78 | Maintenance instructions, vehicle purchaser. |
| 86.412-78 | Maintenance instructions, submission to Administrator. |
| 86.413-78 | Labeling. |
| 86.414-78 | Submission of vehicle identification numbers. |
| 86.415-78 | Production vehicles. |
| 86.416-78 | Application for certification. |
| 86.417-78 | Approval of application for certification. |
| 86.418-78 | Test fleet selection. |
| 86.419-78 | Engine displacement, motorcycle classes. |
| 86.420-78 | Engine families. |
| 86.421-78 | Test fleet. |
| 86.422-78 | Administrator's fleet. |
| 86.423-78 | Test vehicles. |
| 86.424-78 | Service accumulation, testing and maintenance. |
| 86.425-78 | Test procedures. |
| 86.426-78 | Service accumulation. |
| 86.427-78 | Emission tests. |
| 86.428-78 | Maintenance, scheduled; test vehicles. |
| 86.429-78 | Maintenance, unscheduled; test vehicles. |
| 86.430-78 | Vehicle failure. |
| 86.431-78 | Data submission. |
| 86.432-78 | Deterioration factor. |
| 86.433-78 | [Reserved] |
| 86.434-78 | Official emission tests. |
| 86.435-78 | Extrapolated emission values. |
| 86.436-78 | Additional service accumulation. |
| 86.437-78 | Certification. |
| 86.438-78 | Amendments to the application. |

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| Sec. | Alternative procedure for amending certificates of conformity. |
| 86.439-78 | Maintenance of records. |
| 86.440-78 | Right of entry. |
| 86.441-78 | Denial, revocation or suspension of certification. |
| 86.442-78 | Request for hearing. |
| 86.443-78 | Hearings on certification. |
| 86.444-78 | |

Subpart F—Emission Regulations for 1978 and Later New Motorcycles; Test Procedures

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|-----------|---|
| 86.501-78 | Applicability. |
| 86.502-78 | Definitions. |
| 86.503-78 | Abbreviations. |
| 86.504-78 | Section numbering. |
| 86.505-78 | Introduction; structure of subpart. |
| 86.506 | [Reserved] |
| 86.507 | [Reserved] |
| 86.508-78 | Dynamometer. |
| 86.509-78 | Exhaust gas sampling system. |
| 86.510 | [Reserved] |
| 86.511-78 | Exhaust gas analytical system. |
| 86.512 | [Reserved] |
| 86.513-78 | Fuel and engine lubricant specifications. |
| 86.514-78 | Analytical gases. |
| 86.515-78 | EPA Urban Dynamometer Driving Schedule. |
| 86.516-78 | Calibrations, frequency and overview. |
| 86.517 | [Reserved] |
| 86.518-78 | Dynamometer calibration. |
| 86.519-78 | Constant volume sampler calibration. |
| 86.520 | [Reserved] |
| 86.521-78 | Hydrocarbon analyzer calibration. |
| 86.522-78 | Carbon monoxide analyzer calibration. |
| 86.523-78 | Oxides of nitrogen analyzer calibration. |
| 86.524-78 | Carbon dioxide analyzer calibration. |
| 86.525 | [Reserved] |
| 86.526-78 | Calibration of other equipment. |
| 86.527-78 | Test procedures, overview. |
| 86.528-78 | Transmissions. |
| 86.529-78 | Road load force and inertia weight determination. |
| 86.530-78 | Test sequence, general requirements. |
| 86.531-78 | Vehicle preparation. |
| 86.532-78 | Vehicle preconditioning. |
| 86.533 | [Reserved] |
| 86.534 | [Reserved] |
| 86.535-78 | Dynamometer procedure. |
| 86.536-78 | Engine starting and restarting. |
| 86.537-78 | Dynamometer test runs. |
| 86.538 | [Reserved] |
| 86.539 | [Reserved] |
| 86.540-78 | Exhaust sample analysis. |
| 86.541 | [Reserved] |
| 86.542-78 | Records required. |
| 86.543 | [Reserved] |
| 86.544-78 | Calculations; exhaust emissions. |

AUTHORITY: Secs. 202, 206, 207, 208, and 301(a) of the Clean Air Act, as amended (42 U.S.C. 1857f-1, 1857f-5, 1857f-6, 1857f-8, 1857g(a)).

Subpart E—Emission Regulations for 1978 and Later New Motorcycles, General Provisions

§ 86.401-78 General applicability.
(a) This subpart applies to 1978 and later model year, new gasoline-fueled motorcycles built after 31 December 1977.

(b) Motorcycles with engine displacements less than 50 cc (3.1 cu. in.) are excluded from the requirements of this subpart.

(c) A motorcycle is excluded from the requirements of this subpart, if, with an 80 kg (176 lb) driver, it cannot:

- (1) Start from a dead stop using only the engine, or
- (2) Exceed a maximum speed of 40 km/h (24.9 mph) level paved surfaces.

§ 86.402-78 Definitions.

(a) The definitions in this section apply to this subpart and also to Subpart F. "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. "Class", see § 86.419.

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

"Curb mass" means the actual or manufacturer's estimated mass of the vehicle with fluids at nominal capacity and with all equipment specified by the Administrator.

"Displacement", and "Displacement Class", see § 86.419.

"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 § 86.420.

"Engine-displacement-system combination" means an engine family-displacement-emission control system 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 system" means the combination of fuel tank, fuel pump, fuel lines, oil injection metering system, and carburetor or fuel injection components, and includes all fuel system vents.

"Loaded vehicle mass" means curb mass plus 80 kg (176 lb.), average driver mass.

"Model year" means the manufacturer's annual production period (as determined by the Administrator) which includes January first of such calendar year. If the manufacturer has no annual production period, the term "model year" shall mean the calendar year.

"Motorcycle" means any motor vehicle with a headlight, taillight, and stoplight and having: Two wheels, or Three wheels and a curb mass less than or equal to 680 kilograms (1499 pounds).

"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.

"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 malfunction, or anticipated as necessary to correct an overt indication of vehicle malfunction

or failure for which periodic maintenance is not appropriate.

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

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

"Useful life" is defined for each class (see § 86.419) of motorcycle:

Class I—5.0 years or 12,000 km (7,456 miles), whichever first occurs.

Class II—5.0 years or 18,000 km (11,185 miles), whichever first occurs.

Class III—5.0 years or 30,000 km (18,641 miles), whichever first occurs.

"Unscheduled maintenance" means any inspection, adjustment, repair, removal, disassembly, cleaning, or replacement of vehicle components or systems which is performed to correct or diagnose a part failure or vehicle malfunction which was not anticipated.

"Zero (0) kilometers (miles)" means that point after initial engine starting at which normal assembly line operations and adjustments are completed.

§ 86.403-78 Abbreviations.

The abbreviations used in this subpart have the following meanings in both capital and lowercase:

- ASTM—American Society for Testing and Materials.
- C—Celsius.
- cc—Cubic centimetre(s).
- cfh—Cubic feet per hour.
- cfm—Cubic feet per minute.
- cm—Centimetre(s).
- CO—Carbon monoxide.
- CO₂—Carbon dioxide.
- Conc—Concentration.
- cu.—Cubic.
- CVS—Constant volume sampler.
- EGR—Exhaust gas recirculation.
- EP—End point.
- EPA—Environmental Protection Agency.
- F—Fahrenheit.
- h—hour.
- HC—Hydrocarbon(s).
- Hg—Mercury.
- H₂O—Water.
- in.—Inch(es).
- K—Kelvin.
- kg—Kilogram(s).
- km—Kilometre(s).
- kpa—Kilopascals.
- lb—Pound(s).
- m—Metre(s).
- mph—Miles per hour.
- mm—Millimetre(s).
- N₂—Nitrogen.
- NOx—Oxides of nitrogen.
- No.—Number.
- O₂—Oxygen.
- Pa—Pascal(s).
- Pb—lead.
- ppm—Parts per million by volume.
- psi—Pounds per square inch.
- psig—Pounds per square inch gauge.
- R—Rankine.
- rpm—Revolutions per minute.
- wt—Weight.
- °—Degree(s).
- %—Percent.

§ 86.404-78 Section numbering.

(a) The year of initial applicability of a section is indicated by its 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 86.411-78 applies to 1978 and subsequent model years until it is superseded. If a § 86.411-81 is promulgated it would take effect beginning with 1981; § 86.411-78 would apply to years 1978 through 1980.

(b) A reference to a section without a year designation implies the appropriate model year.

Example. When considering 1979 vehicles a reference to § 86.411 implies § 86.411-79. However if no § 86.411-79 has been promulgated then § 86.411-78 is implied; See paragraph (a) of this section.

§ 86.405-78 Measurement system.

(a) This subpart and Subpart F have been written using System International (SI) units. SI units will be used to determine compliance with these regulations. English equivalents have been indicated solely for the user's convenience.

§ 86.406-78 Introduction, structure of subpart, further information.

(a) This subpart contains general provisions regulating the emission of air pollution from new motorcycles. Test procedures are found in Subpart F.

(b) Several discrete concepts are addressed:

- (1) *Requirements.* §§ 86.407 to 86.415.
- (2) *Application for certification.* §§ 86.416 and 86.417.
- (3) *Test fleet selection.* §§ 86.418 to 86.423.
- (4) *Service accumulation, testing, maintenance, certification.* §§ 86.424 to 86.439.
- (5) *Administrative provisions.* §§ 86.440 to 86.444.

(c) The certification procedure to be followed depends upon the manufacturer's projected sales.

(1) New motorcycles, produced by a manufacturer whose projected U.S. sales of motorcycles is 10,000 or more units (for the model year in which certification is sought) shall demonstrate compliance with all general standards and all specific emission requirements before they can be sold in the United States. The manufacturer is required to submit an application with sales data, product information, required maintenance, testing and service accumulation procedures. The Administrator will select vehicle(s) which will represent the manufacturer's product line. The manufacturer is required to construct these vehicles to be representative of actual production. Service is accumulated and emission tests performed with data submitted to the Administrator. The Administrator may run his own tests to confirm the manufacturer's results. The Administrator will review the data and either grant or deny certification. If the manufacturer wishes to make changes to a certified vehicle, or to produce a new vehicle, the Administrator must be notified. The Administrator may require testing to demonstrate continued compliance with emission standards. Each vehicle must be labeled with tune up specifications

and the purchaser must be supplied with maintenance instructions. Also, information on production vehicles must be supplied to the Administrator.

(2) New motorcycles produced by a manufacturer whose projected U.S. sales of motorcycles is less than 10,000 units (for the model year in which certification is sought) shall meet both the general standards and specific emission requirements described in § 86.401 through § 86.417, § 86.425, § 86.437, and § 86.440 through § 86.444 of this subpart before they can be sold in the United States. The manufacturer is required to submit an application containing a statement that his vehicles conform to the applicable emission standards. The manufacturer is required to retain in his records, but not submit with the application, valid emission test data which support his statement. The Administrator will review the application and either grant or deny certification. Each vehicle must be labeled with tune up specifications and the purchaser must be supplied with maintenance instructions. Also, information on production vehicles must be supplied to the Administrator.

(d) Manufacturers who are considering an application should contact: Director, Certification Division, Environmental Protection Agency, 2565 Plymouth Rd., Ann Arbor, Michigan 48105 and state whether he plans to certify for total sales of greater than or less than 10,000 vehicles for the applicable model year.

§ 86.407-78 Certificate of conformity required.

Every new motorcycle manufactured for sale, sold, offered for sale, introduced or delivered for introduction into commerce, or imported into the United States which is subject to any of the standards prescribed in this subpart is required to be covered by a certificate of conformity issued pursuant to this subpart.

§ 86.408-78 General standards; increase in emissions; unsafe conditions.

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

(1) 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 without such system, except as specifically permitted by regulation; and

(2) Shall not in its operation, function, or malfunction result in any unsafe condition endangering the motorcycle, its rider(s), or persons or property in close proximity to the vehicle.

(b) Every manufacturer of new motorcycles 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 motorcycles in accordance with good engineering practice to ascertain that such test vehicles will meet the requirements of this section for the useful life of the vehicle.

§ 86.409-78 Defeat devices, prohibition.

(a) No motorcycle shall be equipped with a defeat device.

(b) Defeat device means any element of design which:

(1) 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 and

(2) 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

(i) Such conditions are substantially included in the Federal emission test procedure, or

(ii) The need for the device is justified in terms of protecting the vehicle against damage or accident, or

(iii) The device does not go beyond the requirements of engine starting or warm-up.

§ 86.410-78 Emission standards for 1978 motorcycles.

(a) (1) Exhaust emissions from 1978 model year motorcycles shall not exceed:

(i) *Hydrocarbons*. (A) For vehicles with engine displacements equal to or greater than 50 cc (3.1 cu. in.) but less than 170 cc (10.4 cu. in.), 5.0 grams per vehicle kilometre.

(B) For vehicles with engine displacements equal to or greater than 170 cc (10.4 cu. in.) but less than 750 cc (45.8 cu. in.), the standard is computed by use of the following formula, rounded in accordance with ASTM E 29-67 to two significant figures:

Hydrocarbon standard in grams per vehicle kilometre = $5.0 + 0.0155 \times (D - 170)$.

where:

D = engine displacement of the motorcycle in cubic centimetres, see § 86.419.

(C) For vehicles with engine displacements equal to or greater than 750 cc (45.8 cu. in.), 14 grams per vehicle kilometre.

(ii) *Carbon monoxide*: 17 grams per vehicle kilometre.

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

(b) No crankcase emissions shall be discharged into the ambient atmosphere from any new motorcycle subject to this subpart.

§ 86.410-80 Emission standards for 1980 motorcycles.

(a) (1) Exhaust emissions from 1980 model year motorcycles shall not exceed:

(i) *Hydrocarbons*. 5.0 grams per vehicle kilometre.

(ii) *Carbon monoxide*. 12 grams per vehicle kilometre.

(2) The standards set forth in paragraph (a) (1) of this section refer to the exhaust emitted over driving schedules as set forth in Subpart F and measured

and calculated in accordance with those procedures.

(b) No crankcase emissions shall be discharged into the ambient atmosphere from any new motorcycle subject to this subpart.

§ 86.411-78 Maintenance instructions, vehicle purchaser.

(a) The manufacturer shall furnish or cause to be furnished to the ultimate purchaser of each new motorcycle the written instructions for the periodic and anticipated maintenance and use of the vehicle by the ultimate purchaser as may be reasonable and necessary to assure the proper functioning of emission control systems for the vehicle's useful life.

(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 the English language and in clear, and to the extent practicable, nontechnical language.

(b) The maintenance instructions required by this section shall:

(1) 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, and

(2) Specify the performance of all scheduled maintenance performed by the manufacturer under § 86.428.

§ 86.412-78 Maintenance instructions, submission to Administrator.

(a) *Instructions for ultimate purchaser*. (1) The manufacturer shall provide to the Administrator, at least 30 days before being supplied to the ultimate purchaser (unless the Administrator consents to a lesser period of time), a copy of the maintenance instructions which the manufacturer proposes to supply to the ultimate purchaser. The instructions must include the periodic and anticipated maintenance contained in the application for certification or contained in the manufacturers' records (if anticipated sales are less than 10,000 units). Such instructions must be reasonable and necessary to assure the proper functioning of the vehicle's emission control systems.

(2) 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.

(b) *Other instructions*. The manufacturer of any new motorcycle 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 sales brochures, instructions, or explanations regarding the use, repair, adjustment, maintenance, or testing of such vehicle relevant to the control of crankcase or exhaust emissions, issued by the manufacturer for use by other manufacturers, assembly plants,

distributors, dealers, repair facilities, and ultimate purchasers. Any material not translated into the English language need not be submitted unless specifically requested by the Administrator.

§ 86.413-78 Labeling.

(a) (1) The manufacturer of any motorcycle 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 available for sale to the public and covered by a certificate of conformity.

(2) A plastic or metal label shall be welded, riveted, or otherwise permanently attached and must be readily accessible. Multi-part labels may be used.

(3) 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.

(4) 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:

(i) The label heading, Vehicle Emission Control Information;

(ii) Full corporate name and trademark of the manufacturer;

(iii) Engine displacement (in cubic centimetres) and engine family identification;

(iv) Engine tune up 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). These specifications shall indicate the proper transmission position during tune up;

(v) Any specific fuel or engine lubricant requirements (e.g., lead content, Research octane number, engine lubricant type);

(vi) An unconditional statement of conformity to USEPA regulations which includes the model year; for example, This Vehicle Conforms to USEPA Regulation Applicable to ——— Model Year New Motorcycles.

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

§ 86.414-78 Submission of vehicle identification numbers.

(a) Upon request by the Administrator, the manufacturer of any motorcycle covered by a certificate of conformity shall, within 30 days, identify by vehicle identification number, the vehicle(s) covered by the certificate of conformity.

(b) The manufacturer of any motorcycle covered by a certificate of conformity shall furnish to the Administrator, at the beginning of each model year, any vehicle identification number coding system which identifies whether such vehicle(s) are covered by a certificate of conformity.

§ 86.415-78 Production vehicles.

(a) Any manufacturer obtaining certification shall supply to the Administrator, upon his request, a reasonable number of production vehicles 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 shall be supplied for testing at such time and place and for such reasonable periods as the Administrator may require.

(b) Any manufacturer obtaining certification shall notify the Administrator, on a quarterly basis, of the number of vehicles of each engine family-engine displacement-emission control system-fuel system-transmission type-inertial mass category combination produced for sale in the United States during the preceding quarter.

(c) All motorcycles covered by a certificate of conformity shall prior to delivery to the ultimate purchaser be adjusted, by the manufacturer or his agent, to the ignition timing specification detailed in § 86.413.

§ 86.416-78 Application for certification.

(a) New motorcycles produced by a manufacturer whose projected sales in the United States is 10,000 or more units (for the model year in which certification is sought) are covered by the following:

(1) An application for a certificate of conformity to the regulations in the English language applicable to new motorcycles shall be made to the Administrator by the manufacturer and shall be updated and corrected by amendment. Where possible, a manufacturer should include in a single application for certification, a description of all vehicles in each class 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 and the computation of test results will be determined separately for each application.

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

(i) Identification and description of the vehicles covered by the application and a description of their engine, emission control system and fuel system components. This shall include a detailed description of each auxiliary emission control device. Transmission gear ratios, overall drive ratios and vehicle mass (or range of mass) shall also be included. The label and its location shall be specified,

§ 86.413. Available optional equipment shall be described.

(ii) The range of available fuel and ignition system adjustments.

(iii) Projected U.S. sales data sufficient to enable the Administrator to select a test fleet representative of the vehicles for which certification is requested. If reduced testing based on low sales volume is requested the method of predicting sales shall be described.

(iv) A description of the test equipment (if applicable) and fuel and engine lubricant proposed to be used.

(v) A description of the proposed service accumulation procedure and a description of the proposed scheduled maintenance.

(vi) A statement of recommended periodic and anticipated maintenance and procedures necessary to assure that the vehicles covered by a certificate of conformity in operation conform to the regulations, listings of the fuels and lubricants to be recommended to the ultimate purchaser and a description of the program for training of personnel for such maintenance, and the equipment required to perform this maintenance.

(vii) A description of normal assembly line operations and adjustments if such procedures exceed 10 km (6.2 miles) or one hour of engine operation.

(3) Completed copies of the application and of any amendments thereto, and all notifications under §§ 86.438 and 86.439 shall be submitted in such multiple copies as the Administrator may require.

(4) For purposes of this section, "auxiliary emission control device" 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.

(b) New motorcycles produced by a manufacturer whose projected sales in the United States is less than 10,000 units (for the model year in which certification is sought) are covered by the following:

(1) All the information that would otherwise be required to be submitted to EPA under paragraph (a) (2) of this section must be made a part of the manufacturer's records, except there is no requirement to submit the information to the Administrator or receive approval from the Administrator.

(2) Section 86.437 details the statements that these manufacturers are required to provide to the Administrator.

(c) For the purpose of determining applicability of paragraphs (a) or (b) of this section, where there is more than one importer or distributor of vehicles manufactured by the same person, the projected sales shall be the aggregate of the projected sales of those vehicles by such importers or distributors.

§ 86.417-78 Approval of application for certification.

(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 as appropriate.

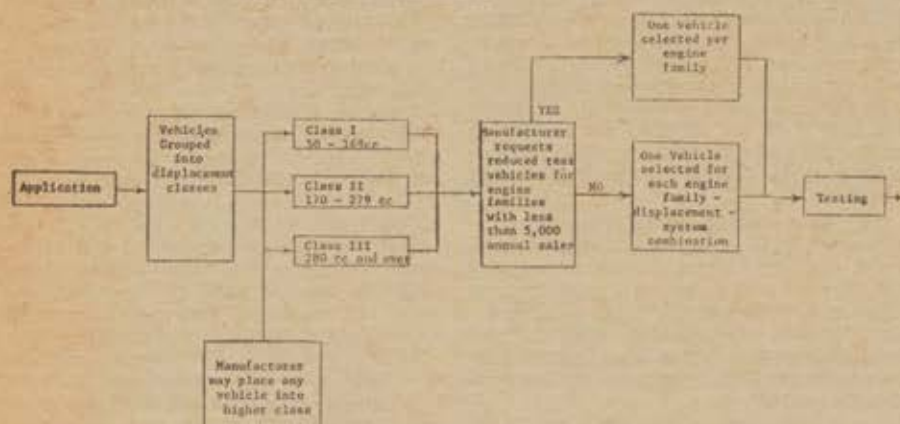
(b) The Administrator may disapprove in whole or in part an application for certification for reasons including incompleteness, inaccuracy, inappropriate proposed distance accumulation procedures, maintenance, test equipment, label content or location, fuel or lubricant, and incorporation of defeat devices in vehicles described by the application. Where any part of an application is rejected, the

Administrator shall notify the manufacturer in writing and set forth the reasons for such rejection. The manufacturer may request a hearing under § 86.443.

§ 86.418-78 Test fleet selection.

(a) Test fleet selection and requirements on test vehicles are found in §§ 86.419 to 86.423. This selection process is also graphically depicted in Figure E78-1.

Figure E78-1 Selection Process



§ 86.419-78 Engine displacement, motorcycle classes.

(a) (1) Engine displacement shall be calculated using nominal engine values and rounded to the nearest whole cubic centimetre, in accordance with ASTM E 29-67.

(2) For rotary engines, displacement means the maximum volume of a combustion chamber between two rotor tip seals minus the minimum volume of that combustion chamber between those two rotor tip seals times three times the number of rotors.

$$cc = (\max. \text{ chamber volume} - \min. \text{ chamber volume}) \times 3 \times \text{no. of rotors}$$

(b) Motorcycles will be divided into classes based on engine displacement.

(1) Class I—50 to 169 cc (3.1 to 10.4 cu. in.).

(2) Class II—170 to 279 cc (10.4 to 17.1 cu. in.).

(3) Class III—280 cc and over (17.1 cu. in. and over).

(c) At the manufacturer's option, a vehicle described in an application for certification may be placed in a higher class (larger displacement). All procedures for the higher class must then be complied with, compliance with emission standards will be determined on the basis of engine displacement.

§ 86.420-78 Engine families.

(a) The vehicles covered in the application will be divided into groupings whose engines 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.

(b) *Reciprocating families.* To be classed in the same engine family, reciprocating engines must be identical in all of the following applicable respects:

- (1) The combustion cycle.
- (2) The cooling mechanism.
- (3) The cylinder configuration (inline, vee, opposed, bore spacings, etc.).
- (4) The number of cylinders.
- (5) The engine displacement class, § 86.419.
- (6) The method of air aspiration.
- (7) The number of catalytic converters, location, volume, and composition.
- (8) The thermal reactor characteristics.
- (9) The number of carburetors.
- (10) The prechamber characteristics.
- (11) The number of tune ups to be performed during service accumulation.

(c) At the manufacturer's option, reciprocating engines identical in all the respects listed in paragraph (b) 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 features such as:

- (1) The bore and stroke.
- (2) The combustion chamber configuration.
- (3) The intake and exhaust timing method of actuation (poppet valve, reed valve, rotary valve, etc.).
- (4) The intake and exhaust valve or port sizes, as applicable.
- (5) The fuel system.
- (6) The exhaust system.

(d) *Rotary families.* To be classed in the same engine family, rotary combustion cycle engines must be identical in all of the following applicable respects:

- (1) The major axis of the epitrochoidal curve.
- (2) The minor axis of the epitrochoidal curve.
- (3) The generating radius of the epitrochoidal curve.
- (4) The cooling mechanism.
- (5) The number of rotors.
- (6) The engine displacement class, § 86.419.
- (7) The method of air aspiration.
- (8) The number of catalytic converters, location, volume and composition.
- (9) The thermal reactor characteristics.
- (10) The number of carburetors.
- (11) The prechamber characteristics.
- (12) The number of tune ups to be performed during service accumulation.

(e) At the manufacturer's option, rotary combustion cycle engines identical in all the respects listed in paragraph (d) 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 features, such as:

- (1) The width of the rotor housing.
- (2) The type and location of intake port (side, peripheral, combination, etc.).
- (3) The number of spark plugs per rotor.
- (4) The fuel system.
- (5) The exhaust system.

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

(1) The major axis of the epitrochoidal curve.

(2) The minor axis of the epitrochoidal curve.

(3) The generating radius of the epitrochoidal curve.

(4) The cooling mechanism.

(5) The number of rotors.

(6) The engine displacement class, § 86.419.

(7) The method of air aspiration.

(8) The number of catalytic converters, location, volume and composition.

(9) The thermal reactor characteristics.

(10) The number of carburetors.

(11) The prechamber characteristics.

(12) The number of tune ups to be performed during service accumulation.

(e) At the manufacturer's option, rotary combustion cycle engines identical in all the respects listed in paragraph (d) 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 features, such as:

- (1) The width of the rotor housing.
- (2) The type and location of intake port (side, peripheral, combination, etc.).
- (3) The number of spark plugs per rotor.
- (4) The fuel system.
- (5) The exhaust system.

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

§ 86.421-78 Test fleet.

(a) A test vehicle will be selected by the Administrator to represent each engine-displacement-system combination. The configuration (engine calibration, transmission, drive ratio, mass, options, etc.) in the manufacturer's application which the Administrator believes has the greatest probability of exceeding the standards will be selected.

(b) At the manufacturer's option, the Administrator will only select one vehicle to represent each engine family where the total projected annual sales for that family are less than 5,000 vehicles.

(c) A manufacturer may elect to operate and test additional vehicles which are identical to those selected by the Administrator. Written notice of a commitment to operate and test additional vehicles shall be given to the Administrator prior to the start of testing and not later than 30 days following notification of the test fleet selection. The results of tests performed by the manufacturer will be combined to determine deterioration factors. Each vehicle must meet applicable standards when tested by the Administrator and when those results are projected to the useful life.

(d) In lieu of testing a test vehicle and submitting data therefore, a manufacturer may, with the prior written ap-

approval of the Administrator, submit exhaust emission data on a similar vehicle for which certification has previously been obtained or for which all applicable data has previously been submitted.

§ 86.422-78 Administrator's fleet.

The Administrator may require additional test vehicles identical in all material respects to vehicles selected in accordance with § 86.421. The number of vehicles selected shall not increase the size of the test fleet by more than 20 percent or one vehicle, whichever is greater.

§ 86.423-78 Test vehicles.

(a) At zero kilometres before testing or beginning to accumulate service on the test vehicle, the manufacturer shall provide the zero kilometre documents as required by the Administrator, and make the vehicle available for such testing or inspection as the Administrator may require. Testing or service accumulation shall not begin until authorized by the Administrator. Failure to comply with

these requirements will invalidate all test data submitted for the vehicle.

(b) Once a manufacturer begins to operate a test vehicle, as indicated by compliance with paragraph (a) of this section, the data from the vehicle will be used, unless specified otherwise by the Administrator. Discontinuation of a vehicle shall be allowed only with the written consent of the Administrator.

(c) Test vehicles shall be calibrated at zero kilometres within the production tolerances applicable to the manufacturer's specifications.

(d) The Administrator may disqualify a vehicle which receives assembly line operations and adjustments which will not be performed on production vehicles.

§ 86.424-78 Service accumulation, testing and maintenance.

(a) Service accumulation, emission testing and maintenance are described in §§ 86.425 to 86.429. The testing and certification procedures are graphically depicted in Figure E78-2.

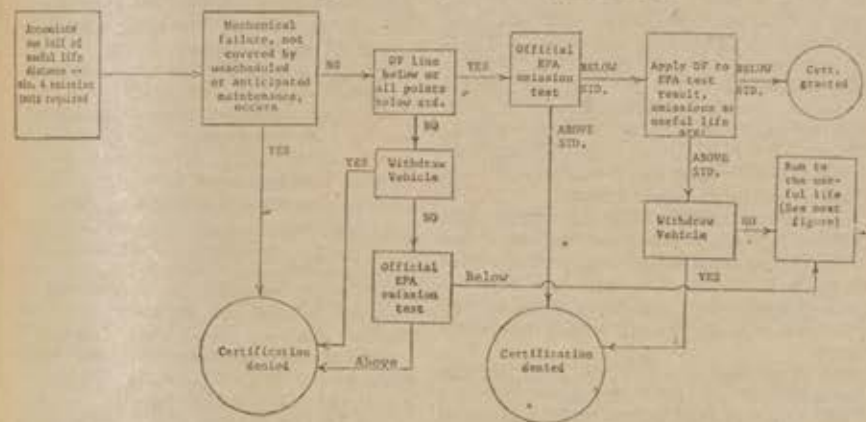


Figure E78-2 Testing and Certification

§ 86.425-78 Test procedures.

(a) Motorcycle emission test procedures are found in Subpart F.

(b) The Administrator may prescribe emission test procedures for any motorcycle which he determines is not susceptible to satisfactory testing by the procedures set forth in Subpart F.

(c) Testing of any type with respect to any test vehicle other than that specified in this subpart and Subpart F is not allowed except as specifically authorized by the Administrator.

§ 86.426-78 Service accumulation.

(a) The procedure for service accumulation will be the Durability Driving Schedule as specified in Appendix IV to 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 distance at a measured curb mass which is within 5 kg (11.0 lb) of the curb mass specified by the Administrator.

(b) During service accumulation, vehicles shall not be operated for more than 12 hours during an operating sequence.

Engine shutdowns are permitted during the operating sequence, but the periods of shutdown are not included in the 12 hour total. Following each operating sequence, the vehicle shall soak, without operation, for a minimum of 8 hours. During soak periods, the vehicle shall be exposed to normal outside ambient temperatures and humidity conditions unless vehicle maintenance or servicing is being performed.

§ 86.427-78 Emission tests.

(a) Each test vehicle shall be driven with all emission control systems installed and operating for the following total test distances, or for such lesser distance as the Administrator may agree to as meeting the objectives of this procedure. (See § 86.419 for class explanation).

Displacement class	Total test distance (kilometers)	Minimum test distance (kilometers)	Minimum number of tests
I.....	6,000	2,500	4
II.....	9,000	2,500	4
III.....	15,000	3,500	4

(b) All vehicles shall undergo at least four emission tests; one at the minimum test distance, one before and one after periodic maintenance, and one at the total test distance. If no maintenance is scheduled, then at least two tests will be performed, at equal intervals, between the minimum and total test distances. Additional tests may be performed; such tests must be at equal intervals and approved by the Administrator prior to starting service accumulation.

(c) Where the Administrator agrees to a lesser distance for service accumulation, he may modify the maintenance provisions of this Subpart.

(d) All tests required by this subpart must be conducted at an accumulated distance within 250 kilometers (155 mi) of the nominal distance at each test point.

(e) Up to three valid tests may be conducted at each test point. The number of valid tests must be the same at each test point for a given vehicle.

(f) The Administrator may require that any one or more of the test vehicles be submitted to him, at such 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.

(g) Whenever the Administrator conducts a test on a test vehicle, the results of that test, unless subsequently invalidated by the Administrator, shall comprise the data for the vehicle 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.

§ 86.428-78 Maintenance, scheduled; test vehicles.

(a) Periodic maintenance on the engine, emission control system, and fuel system of test vehicles shall be scheduled for performance at the same distance intervals that will be specified in the manufacturer's maintenance instructions furnished to the ultimate purchaser. Such maintenance shall be performed only under the following provisions.

(b) Periodic major engine tune-ups to the manufacturer's specifications may be performed no more frequently than as follows nor may any tune-up be performed within 1000 km prior to the total test distance.

Displacement class:	Minimum interval (kilometers)
I.....	3,000
II.....	3,000
III.....	4,000

(c) A scheduled major engine tune up shall be restricted to items listed below 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) Breaker points, timing, (2) idle speed and idle air/fuel mixture, (3) valve lash, (4) engine bolt torque, and (5) spark plugs.

(d) [Reserved]

(e) Periodic change of engine and transmission oil, and change or service of oil, air, and fuel filters will be allowed at the same distance intervals that will be specified in the manufacturer's maintenance instructions.

(f) Requests for authorization of periodic maintenance of emission control related components not specifically authorized to be maintained by this section, and for anticipated maintenance (see § 86.428), must be made prior to the beginning of distance accumulation. The Administrator will approve the performance of such maintenance in the manufacturer makes a satisfactory showing that the maintenance will be performed on vehicles in use and that the maintenance is reasonable and necessary.

(1) The EGR system may be serviced a maximum of two times during the durability service accumulation 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, or if the need for periodic maintenance of the EGR system is overtly signalled to the vehicle operator by an appropriate means, e.g., an indicator light or significantly reduced driveability performance.

(2) The catalytic converter may be serviced only once during the durability service accumulation if failure of the catalytic converter activates an audible and/or visual signal approved by the Administrator which alerts the vehicle operator to the need for catalytic converter maintenance, or if the need for periodic maintenance of the catalytic converter is overtly signalled to the vehicle operator by an appropriate means, e.g., an indicator light or significantly reduced driveability performance.

(g) Certain engine components may require maintenance which, by its nature, cannot be scheduled for periodic intervals, but which the manufacturer believes will be necessary. For example, piston and cylinder replacement caused by piston seizure which results in the vehicle being inoperative; or, in the case of two-stroke engines, decarbonization, the need for which is signalled to the vehicle operator by significantly reduced driveability performance. Such maintenance is designated anticipated maintenance. Anticipated maintenance must be identified by the manufacturer and approved as being appropriate by the Administrator prior to the start of service accumulation. The approximate distance at which the need for anticipated maintenance may arise must be specified in the application for certification.

(h) Complete emission tests (see Subpart F) are required, unless waived by the Administrator, before and after any vehicle maintenance which may reasonably be expected to affect emissions.

§ 86.428-30 Maintenance, scheduled; test vehicles.

(a) Periodic maintenance on the engine, emission control system, and fuel system of test vehicles shall be scheduled for performance at the same distance intervals that will be specified in the manufacturer's maintenance instructions furnished to the ultimate purchaser. Such maintenance shall be performed only under the following provisions.

(b) Periodic major engine tune-ups to the manufacturer's specifications may be performed no more frequently than as follows nor may any tune-up be performed within 1000 km prior to the official test.

Displacement class:	Minimum interval (Kilometer)
I	3,000
II	3,000
III	4,000

(c) A scheduled major engine tune-up shall be restricted to items listed below 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) Breaker points, timing, (2) idle speed and idle air/fuel mixture, (3) valve lash, (4) engine bolt torque, and (5) spark plugs.

(d) The Administrator will specify the ignition timing, idle air fuel mixture and other fuel system adjustments to be used at each tune-up. The settings selected will be those the Administrator deems appropriate within the physically available range.

(e) Periodic change of engine and transmission oil, and change or service of oil, air, and fuel filters will be allowed at the same distance intervals that will be specified in the manufacturer's maintenance instructions.

(f) Requests for authorization of periodic maintenance of emission control related components not specifically authorized to be maintained by this section, and for anticipated maintenance (see § 86.428), must be made prior to the beginning of distance accumulation. 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 and that the maintenance is reasonable and necessary.

(1) The EGR system may be serviced a maximum of two times during the durability service accumulation 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, or if the need for periodic maintenance of the EGR system is overtly signalled to the vehicle operator by an appropriate means, e.g., an indicator light or significantly reduced driveability performance.

(2) The catalytic converter may be serviced only once during the durability service accumulation if failure of the

catalytic converter activates an audible and/or visual signal approved by the Administrator which alerts the vehicle operator to the need for catalytic converter maintenance, or if the need for periodic maintenance of the catalytic converter is overtly signalled to the vehicle operator by an appropriate means, e.g., an indicator light or significantly reduced driveability performance.

(g) Certain engine components may require maintenance which, by its nature, cannot be scheduled for periodic intervals, but which the manufacturer believes will be necessary. For example, piston and cylinder replacement caused by piston seizure which results in the vehicle being inoperative; or in the case of two-stroke engines, decarbonization, the need for which is signalled to the vehicle operator by significantly reduced driveability performance. Such maintenance is designated anticipated maintenance. Anticipated maintenance must be identified by the manufacturer and approved as being appropriate by the Administrator prior to the start of service accumulation. The approximate distance at which the need for anticipated maintenance may arise must be specified in the application for certification.

(h) Complete emission tests (see Subpart F) are required, unless waived by the Administrator, before and after any vehicle maintenance which may reasonably be expected to affect emissions.

§ 86.429-78 Maintenance, unscheduled; test vehicles.

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

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

(i) 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; and

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

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

(b) Repairs to vehicle components of test vehicles, 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.

(c) The Administrator shall be given the opportunity to verify the extent of an overt indication of part failure and/or

vehicle malfunction (e.g., misfire, stall), 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.

(d) 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 at dealerships and other service outlets and

(1) Are used in conjunction with scheduled maintenance on such components, and

(2) Are used subsequent to the identification of a vehicle or engine malfunction, as provided in paragraph (a) (1) of this section for durability or emission data vehicles, or

(3) Unless specifically authorized by the Administrator.

(e) 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 test vehicle.

(f) Complete emission tests are required, unless waived by the Administrator, before and after any vehicle maintenance which may reasonably be expected to affect emissions.

§ 86.430-78 Vehicle failure.

(a) Any test vehicle which incurs major mechanical failure necessitating disassembly of the engine shall not be used as a test vehicle. This prohibition does not apply to failures occurring after the official test at the total test distance.

§ 86.431-78 Data submission.

(a) Data from all tests (including voided tests) shall be air posted to the Administrator within 72 hours (or delivered within five working days). In addition, all test data shall be compiled and provided to the Administrator. Failure to comply with these requirements may invalidate all test data submitted for the test vehicle.

(b) 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. If the Administrator determines that voiding the test was not appropriate, the Administrator may require that the data from that test be used in the calculation of the deterioration factor for emissions.

(c) When unscheduled or anticipated maintenance is performed, a complete record of all pertinent maintenance, including a preliminary engineering report

of any malfunction diagnosis and the corrective action taken shall be included with the test data. 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.

(d) A complete record of all maintenance shall be supplied.

§ 86.432-78 Deterioration factor.

(a) Deterioration factors shall be developed for each test vehicle from the emission test results. A separate factor shall be developed for each pollutant. Results of all valid tests performed by the manufacturer shall be used. When the Administrator conducts service accumulation, results from all tests he performed shall be used.

(b) Emission results which are less than 0.10 g/km shall be considered to be 0.10 g/km for purposes of this section.

(c) Test results for each pollutant shall be plotted as a function of the service accumulated at the start of the emission test, rounded to the nearest kilometre. These results shall be correlated to a straight line, fit by the method of least squares.

(d) An exhaust emission deterioration factor will be calculated by dividing the predicted emissions at the useful life distance by the predicted emissions at the total test distance. Predicted emissions are obtained from the correlation developed in paragraph (c) of this section.

$$\text{Factor} = \frac{\text{Predicted total distance emissions}}{\text{Predicted total test distance emissions}}$$

These interpolated and extrapolated values shall be carried out to 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.

(e) Deterioration factors computed to be less than 1.0 shall be 1.0.

§ 86.433-78 [Reserved]

§ 86.434-78 Official emission tests.

(a) At the conclusion of service accumulation, and after emission tests for deterioration, the vehicle shall receive an official emission test. The Administrator shall designate where this test will occur.

(b) The manufacturer may request a second official test. The results of the second test will be used to determine compliance.

(c) If the emission results from the official test exceed the standards (with-

out correction for deterioration), certification will be denied.

§ 86.435-78 Extrapolated emission values.

(a) If the deterioration factor lines are below the standards between the minimum test distance and the useful life, or if all points used to generate the lines are below the standards, predicted useful life emissions shall be calculated. If not, the manufacturers may elect to withdraw the vehicle or accumulate additional service.

(b) The emission results of each pollutant obtained from the official test will be multiplied by the appropriate deterioration factor to determine useful life emissions.

(1) If the useful life emissions are below the standards, certification will be granted.

(2) If any of the useful life emissions exceed the emission standards, the vehicle must (if not withdrawn) accumulate distance to the useful life.

§ 86.436-78 Additional service accumulation.

(a) Additional service up to the useful life will be accumulated under the same conditions as the initial service accumulation.

(b) New deterioration lines will be generated using all test points (except the first official EPA test) up to the useful life. The same procedures for determining the original deterioration line will be used.

(c) The vehicle will receive a final EPA official test. The manufacturer may request a second test. The results of the second test will be used to determine compliance.

(d) To qualify for certification:

(1) The final EPA official test results must be below the standards, and

(2) The deterioration line must be below the standard at the minimum test distance and the useful life, or all points used to generate the line, must be below the standard.

(e) If the vehicle is unable to complete the total distance due to engine mechanical failure, certification will be granted if:

(1) The mechanical failure was anticipated, § 86.428, and

(2) A new deterioration line using all available data, except the official EPA test, is below the standard at the minimum test distance and at the useful life, and

(3) The results of the EPA official test, when adjusted by the new deterioration factor, are below the standards.

(f) The provisions of this section are graphically depicted in Figure E78-3.

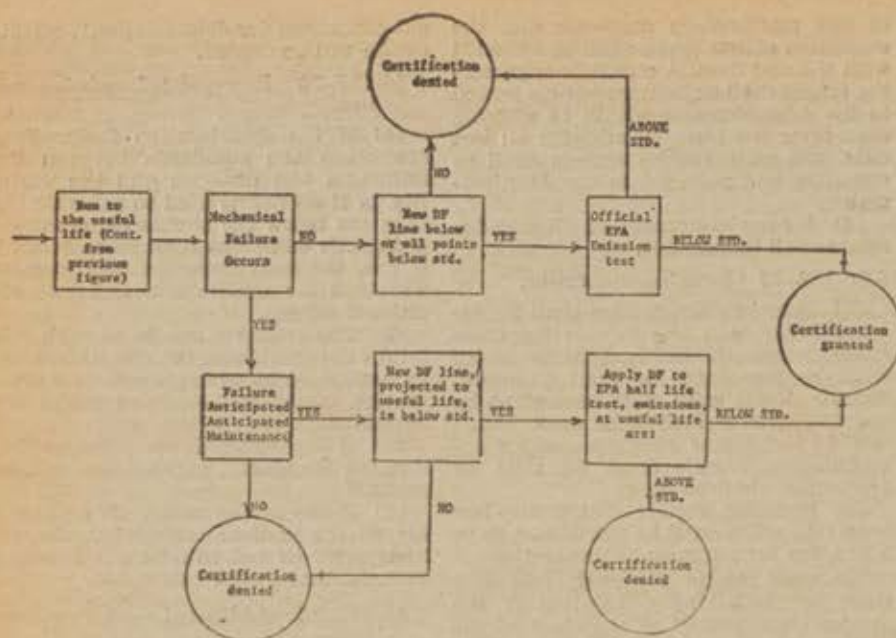


Figure E76-3 Additional Distance Accumulation

§ 86.437-78 Certification.

(a) New motorcycles produced by a manufacturer whose projected sales in the United States is 10,000 or more units (for the model year in which certification is sought) are covered by the following:

(1) The manufacturer shall submit to the Administrator a statement that the test vehicles with respect to which data are submitted have been tested in accordance with the applicable test procedures, that they meet the requirements of such tests, and that, on the basis of such tests, they conform to the requirements of the regulations in this part. If such statements cannot be made with respect to any vehicle tested, the vehicle shall be identified, and all pertinent test data relating thereto shall be supplied.

(2) (i) If, after a review of the test reports and data submitted by the manufacturer, data derived from any inspection carried out under § 86.441 and any other pertinent data or information, the Administrator determines that a test vehicle(s) meets the requirements of the Act and of this subpart, he will issue a certificate of conformity with respect to such vehicle(s) except in cases covered by § 86.442.

(ii) 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 motorcycle covered by the certificate will meet the requirements of the Act and of this subpart. Each such certificate shall contain the following language:

This certificate covers only those new motorcycles which conform in all material respects, to the design specifications that applied to those vehicles described in the application for certification and which are pro-

duced during the ---- model year period of the said manufacturer, as defined in 40 CFR § 86.402.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 86.441 which concern either the vehicle certified, or any production vehicle covered by this certificate, or any production vehicle which when completed will be claimed to be covered by this certificate. Failure to comply with all the requirements of § 86.441 with respect to any such vehicle may lead to revocation or suspension of this certificate as specified in 40 CFR 86.442. It is also a term of this certificate that this certificate may be revoked or suspended for the other reasons stated in § 86.442.

(iii) The certificate will cover all vehicles represented by the test vehicle and will certify compliance with no more than one set of applicable standards.

(3) (i) If, after a review of the test reports and data submitted by the manufacturer, data derived from any additional testing conducted pursuant to § 86.427, or information derived from any inspection carried out under § 86.441, or any other pertinent data or information, the Administrator determines that one or more test vehicles of the certification test fleet do not meet applicable standards, he will notify the manufacturer in writing, setting forth the basis for his determination. The manufacturer may request a hearing on the Administrator's determination.

(ii) The manufacturer may, at his option, proceed with any of the following alternatives with respect to any vehicles represented by a test vehicle(s) determined not in compliance with applicable standards:

(A) Request a hearing.

(B) Delete from the application for certification the vehicles represented by the failing test vehicle. (Vehicles so deleted may be included in a later request

for certification under paragraph (b) (2) (iii) of this section.) The Administrator will then select in place of each failing vehicle an alternate vehicle chosen in accordance with selection criteria employed in selecting the vehicle that failed, or

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

(iii) If the manufacturer does not request a hearing or present the required data under subparagraph (2) of this paragraph, the Administrator will deny certification.

(b) New motorcycles produced by a manufacturer whose projected sales in the United States is less than 10,000 units (for the model year in which certification is sought) are covered by the following:

(1) The manufacturer shall submit to the Administrator an application for certification containing the following:

(i) A brief description of the vehicles to be covered by the certificate (the manufacturer's sales data book or advertising including specifications will satisfy this requirement for most manufacturers).

(ii) A statement signed by an authorized representative of the manufacturer stating: "The vehicles described herein have been tested in accordance with the provisions of Subpart E, Title 40, United States Code of Federal Regulations, and on the basis of those tests are in conformance with that Subpart. All of the data and records required by that Subpart are on file and are available for inspection by the Administrator. Total sales of vehicles subject to this Subpart will be limited to less than 10,000 units."

(2) If, after a review of the statement the Administrator determines that the requirements of this subpart have been met, he will issue a certificate of conformity with respect to the described vehicles except in cases covered by § 86.442.

(3) Such certificate will be issued for such a 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 motorcycle covered by the certificate will meet the requirements of the Act and of this subpart. Each such certificate shall contain the following language:

This certificate covers no more than 9999 new motorcycles as described in the application for certification, and the records required in 40 CFR 86.418, manufactured by ---- and which are produced during the ---- model year period of the said manufacturer, as defined in 40 CFR 86.402.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 86.441 which concern either the vehicle certified or any production vehicle covered by this certificate or any production vehicle which when completed will be claimed to be covered by this certificate. Failure to comply with all the requirements of § 86.441 with respect to any such vehicle may lead to revocation or suspension of this certificate as specified in 40 CFR 86.442. It is a term of this certificate that this certificate may be revoked or suspended

for the other reasons stated in § 86.442. It is also a term of this certificate that no changes shall be made to the vehicles covered by this certificate that will cause the vehicle's emissions to exceed the applicable emission standards as set forth in this chapter.

(4) The certificate will cover all vehicles described by the manufacturer.

(5)(i) If, after a review of the statements and descriptions submitted by the manufacturer, the Administrator determines that the applicable requirements have not been met, he will notify the manufacturer in writing, setting forth the basis for his determination. The manufacturer may request a hearing on the Administrator's determination.

(ii) If the manufacturer does not request a hearing or present the required information the Administrator will deny certification.

§ 86.138-78 Amendments to the application.

(a) The manufacturer shall inform the Administrator by way of amendment to the application of any proposed changes to vehicles in production or additional vehicles to be produced. The Administrator will, if appropriate, select a new test vehicle. Except as provided in § 86.439, no changes may be instituted until approved by the Administrator.

(b) The Administrator may allow reduced testing.

§ 86.139-78 Alternative procedure for amending certificates of conformity.

(a) A manufacturer, in lieu of notifying the Administrator in advance of an addition of a vehicle under § 86.438, may notify him by appropriate amendment to the application for certification concurrently with implementation of the change or addition if the manufacturer determines on the basis of emission data that the addition or change will not adversely affect (cause to increase above the applicable standards) emissions from the affected vehicles. Upon such notification, the manufacturer may proceed to put the addition or change into effect. The applicable certificate of conformity then in effect will be deemed amended as set forth in the amended application unless and until the amendment is rejected by the Administrator under paragraph (c) of this section.

(b) The manufacturer may continue to produce vehicles as described in the amendment to the application for certification 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 the description of the amendment to the application, that no additional test data will be required, he will notify the manufacturer in writing of the acceptability of the amended application. If the Administrator determines that additional test data will be required, he will so notify the manufacturer and proceed as in § 86.438.

(d) Election to produce vehicles under this section will be deemed to be a consent to recall all vehicles which the Administrator determines under § 86.438 do not meet applicable standards, and to

cause such nonconformity to be remedied at no expense to the owner.

(e) Any changed or added vehicles produced after the manufacturer is notified of the rejected application amendment will not be covered by a certificate of conformity.

§ 86.440-78 Maintenance of records.

(a) The manufacturer of any motorcycle 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) (A) Identification and description of all certification vehicles 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.

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

(ii) A properly completed application, following the format prescribed by the U.S. EPA for the appropriate year of production, fulfills each of the requirements of this paragraph.

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

(A) In the case where a current production engine is modified for use in a certification vehicle, a description of the process by which the engine was selected and of the modification 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. In the case where the engine for a certification vehicle 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. In both cases above, a description of the origin and selection process for the carburetor, fuel system, emission control system components, and exhaust after treatment device shall be included. The required descriptions shall specify the steps taken to assure that the certification vehicle with respect to its engine, drive train, fuel system, emission control system components, exhaust after treatment device, vehicle mass, or any other device or component that can reasonably be expected to influence exhaust emissions, will be represented of production vehicles, and that either all components and/or vehicle construction processes, component inspection and selection techniques, and assembly techniques employed in constructing such vehicles are reasonably likely to be implemented for production vehicles or that they are as closely analogous as practicable to planned construction and assembly processes.

(B) A complete record of all emission tests performed (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 distance accumulated on the vehicle when the test began and ended; and the names of supervisory personnel responsible for the conduct of the test.

(C) The date and times of each service accumulation run, listing both the distance accumulated and the name of each rider or each operator of the automatic service accumulation device.

(D) If used, the record of any devices employed to record the speed and/or distance in relationship to time of the test vehicle.

(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 subpart 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 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 was idle in storage, in transit or transport, and required soak periods.

(H) A brief description of any significant events affecting the vehicle 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 rider speeding citations or warnings.

(i) Each such history shall be started on the date that the first of any of the selection of build-up activities in paragraph (a) (2) (i) (A) of this section occurred with respect to the certification vehicle, shall be updated each time the operational status of the vehicle changes or additional work is performed 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.

§ 86.441-78 Right of entry.

(a) Any manufacturer who has applied for certification of a new motorcycle subject to certification tests under this Subpart shall admit or cause to be admitted

any EPA Enforcement Officer during operating hours on presentation of any credentials to any of the following:

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

(2) Any facility where any new motorcycle which is being, was or is to be tested is present.

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

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

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

(1) To inspect and monitor any part or aspect of such procedures, activities, and testing facilities, including, but not limited to, monitoring vehicle preconditioning, emissions tests and service accumulation, maintenance, and vehicle soak and storage procedures; and to verify correlation or calibration of test equipment;

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

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

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

(1) 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 is located or carried on; and

(2) Any facility where any motorcycles to be introduced into commerce are manufactured or assembled.

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

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

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

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

(e) 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.

(f) 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 that data. It is the responsibility of the manufacturer to locate its testing and manufacturing facilities in jurisdictions where this situation will not arise.

(g) For purposes of this section:

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

(2) 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.

(3) Where facilities or areas other than those covered by paragraph (g) (2) 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, 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 manufacture or assembly is being carried out in a facility.

(4) "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 which is being, has been, or will be used for certification testing. Such tests shall be nondestructive, but may require appropriate 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. No counsel who accompanies, represents, or advises an employee compelled to appear may accompany, represent, or advise any other person in the investigation.

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

§ 86.442-78 Denial, revocation, or suspension of certification.

(a) Notwithstanding the fact that any certification vehicle(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) if:

(1) The manufacturer submits false or incomplete information in his application of certification thereof; or

(2) The manufacturer renders inaccurate or invalid any test data which he submits pertaining thereto or otherwise circumvents the intent of the Act or of this subpart with respect to such vehicle; or

(3) Any EPA Enforcement Officer is denied access on the terms specified in § 86.441 to any facility or portion thereof which contains any of the following:

(i) The vehicle, or

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

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

(iv) Any step in the construction of a vehicle described in (c) of this subdivision; or

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

(4) Any EPA Enforcement Officer is denied "reasonable assistance" (as defined in § 86.444) in examining any of the items listed in paragraph (a) (1) (iii) of this section.

(b) The sanctions of withholding, denying, revoking, or suspending of a certificate may be imposed for the reasons in paragraph (a) of this section only when the infraction is substantial.

(c) 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 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.

(d) In any case in which certification of a vehicle is proposed to be withheld, denied, revoked, or suspended under paragraphs (a) (3) or (a) (4) of this section, and in which the Administrator has presented to the manufacturer involved reasonable evidence that a violation of § 86.441 in fact occurred, the manufacturer, if he wishes to contend that, even though the violation occurred, the vehicle in question was not involved in the violation to a degree that would warrant withholding, denial, revocation, or suspension of certification under either paragraphs (a) (3) or (a) (4) of this section, shall have the burden of

establishing that contention to the satisfaction of the Administrator.

(e) Any revocation or suspension of certification under paragraph (a) of this section shall:

(1) Be made only after the manufacturer concerned has been offered an opportunity for a hearing conducted in accordance with § 86.444 hereof.

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

(f) The manufacturer may request in the form and manner specified in § 86.443 that any determination made by the Administrator under paragraph (a) of this section to withhold or deny certification be reviewed in a hearing conducted in accordance with § 86.444. 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.

§ 86.443-78 Request for hearing.

Within 30 days following receipt of notification that an application has been rejected or that certification has been denied, 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 with respect to such issue.

§ 86.444-78 Hearings on certification.

(a) (1) After granting a request for a hearing under § 86.443 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 have not been fixed by the Administrator under § 86.443, 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 § 86.437, 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 issue by the Administrator under 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 appeal 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 therefore 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 therefore on all the material issues of fact, law, or discretion presented on the appeal or considered in the review.

Subpart F—Emission Regulations for 1978 and Later New Motorcycles; Test Procedures

§ 86.501-78 Applicability.

(a) This subpart contains the motorcycle test procedures specified in Subpart E.

(b) Provisions of this subpart apply to tests performed by both the Administrator and motor vehicle manufacturers.

§ 86.502-78 Definitions.

(a) The definitions in § 86.402-78 apply to this subpart.

§ 86.503-78 Abbreviations.

(a) The abbreviations in § 86.403-78 apply to this subpart.

§ 86.504-78 Section numbering.

(a) The section numbering system described in § 86.404-78 is used in this subpart.

§ 86.505-78 Introduction: structure of subpart.

(a) This subpart describes the equipment required and the procedures to follow in order to perform exhaust emission tests on motorcycles. Subpart E sets forth the testing requirements and test intervals necessary to comply with EPA certification procedures.

(b) Three topics are addressed in this subpart. Sections 86.508 through 86.515 set forth specifications and equipment requirements; §§ 86.516 through 86.526 discuss calibration methods and frequency; test procedures and data requirements are listed (in approximate order of performance) in §§ 86.527 through 86.544.

§ 86.506 [Reserved]

§ 86.507 [Reserved]

§ 86.508-78 Dynamometer.

(a) The dynamometer shall have a single roll with a diameter of at least 0.400 metre.

(b) The dynamometer shall be equipped with a roll revolution counter for measuring actual distance traveled.

(c) Flywheels or other means shall be used to stimulate the inertia specified in § 86.529 within a tolerance of ± 3 kg.

(d) A variable speed cooling blower shall direct air to the vehicle. The blower outlet shall be at least 0.40 m^2 (4.31 ft^2) and shall be squarely positioned between 0.3 m (0.98 ft) and 0.45 m (1.48 ft) in front of the vehicle's front wheel. The velocity of the air at the blower outlet shall be within the following limits (as a function of roll speed):

Actual roll speed	Allowable cooling air speed
0 km/h to 5 km/h....	0 km/h to 10 km/h.
5 km/h to 10 km/h....	0 km/h to roll speed ± 5 km/h.
10 km/h to 50 km/h....	Roll speed ± 5 km/h.
50 km/h to 70 km/h....	Roll speed ± 10 pct.
Above 70 km/h.....	At least 63 km/h.

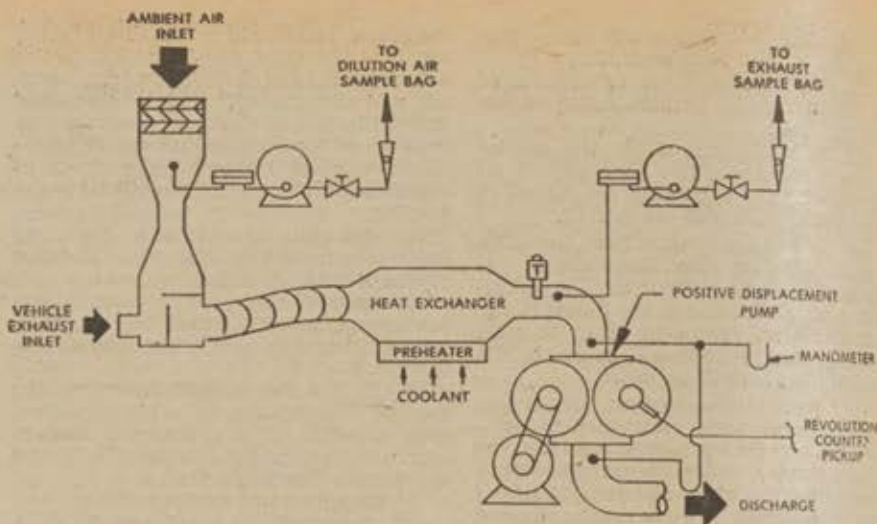
(e) The dynamometer shall comply with the tolerances in § 86.529.

§ 86.509-78 Exhaust gas sampling system.

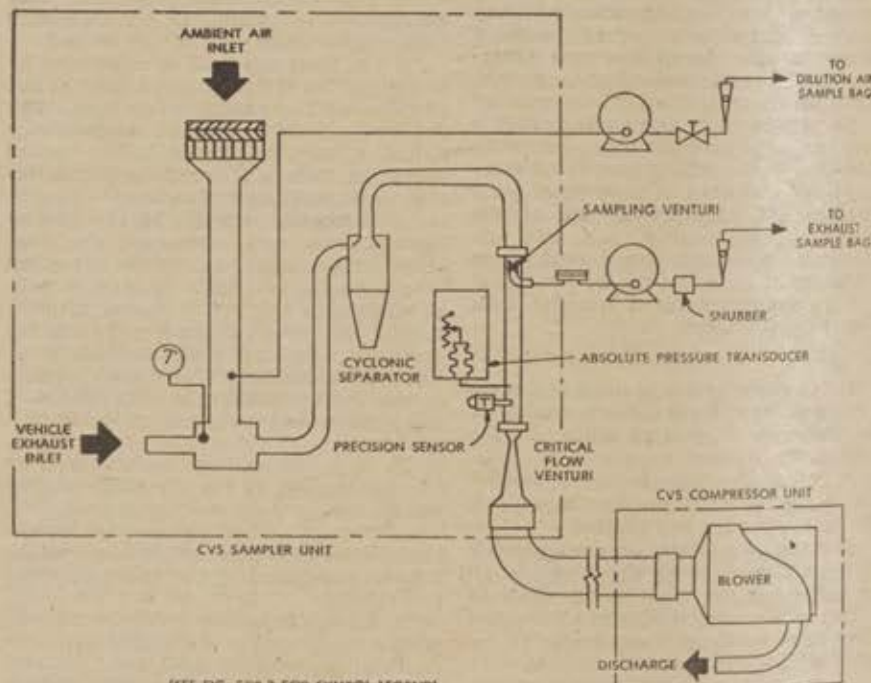
(a) (1) *General.* The exhaust gas sampling system is designed to measure the true mass emissions of vehicle exhaust. In the CVS concept of measuring mass emissions, two conditions must be satisfied: The total volume of the mixture of exhaust and dilution air must be measured, and a continuously proportioned 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 F78-1, 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 Sampler (CFV-CVS), Figure F78-2, is based upon the principles of fluid dynamics associated with critical flow. Proportional sampling is maintained by use of a small CFV in the sample line, which responds to the varying temperatures in the same manner as the main CFV. Total flow per test phase is determined by continuously computing and integrating instantaneous flow. A low response time temperature sensor is necessary for accurate flow calculation.



(SEE FIG. F78-3 FOR SYMBOL LEGEND)
FIGURE F78-1—EXHAUST GAS SAMPLING SYSTEM (PDP-CVS)



(SEE FIG. F78-3 FOR SYMBOL LEGEND)
FIGURE F78-2—EXHAUST GAS SAMPLING SYSTEM (CFV-CVS)

(4) [Reserved]
(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 or an electronic flow integrator without a heat exchanger, with the PDP-CVS).

(b) *Component description, PDP-CVS.* The PDP-CVS, Figure F78-1, 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 ± 1.25 kPa (± 5.02 in. H₂O) 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 ± 0.25 kPa (± 1.00 in. H₂O) 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 $\pm 5^\circ$ C (9° F) 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 $\pm 5^\circ$ C (9° F) during the entire test. The temperature measuring system shall have an accuracy and precision of $\pm 1^\circ$ C (1.8° F).

(3) The pressure gauges shall have an accuracy and precision of ± 0.4 kPa (3 mm Hg).

(4) The location of the dilution air inlet shall be placed and the flow capacity of the CVS shall be large enough to virtually eliminate water condensation in the system.

(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 F78-2, consists of a dilution air filter and mixing assembly, cyclone 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 ± 1.25 kPa (5.02 in. H₂O) 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 ± 0.25 kPa (1.00 in. H₂O) 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 $\pm 1^\circ$ C (1.8° F) and a response time of 0.100 s 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 ± 0.4 kPa (3 mm Hg).

(4) The location of the dilution air inlet shall be placed and the flow capacity of the CVS shall be large enough to virtually eliminate water condensation in the system.

(5) Sample collection bags for dilution air and exhaust samples shall be of sufficient size so as not to impede sample flow.

§ 86.510 [Reserved]

§ 86.511-78 Exhaust gas analytical system.

(a) *Schematic drawing.* Figure F78-3 is a schematic drawing of the exhaust gas analytical system. Since various configurations can produce accurate results, exact conformance with this drawing is not required. Additional components such as instruments, valves, solenoids, pumps, and switches may be used to provide additional information and coordi-

nate the functions of the component systems.

(b) *Major component description.* The analytical system, Figure F78-3, 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, if oxides of nitrogen are measured, a chemiluminescence analyzer (CL) for the determination of oxides of nitrogen. The exhaust gas analytical system shall conform to the following requirements:

(1) The chemiluminescence analyzer 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.

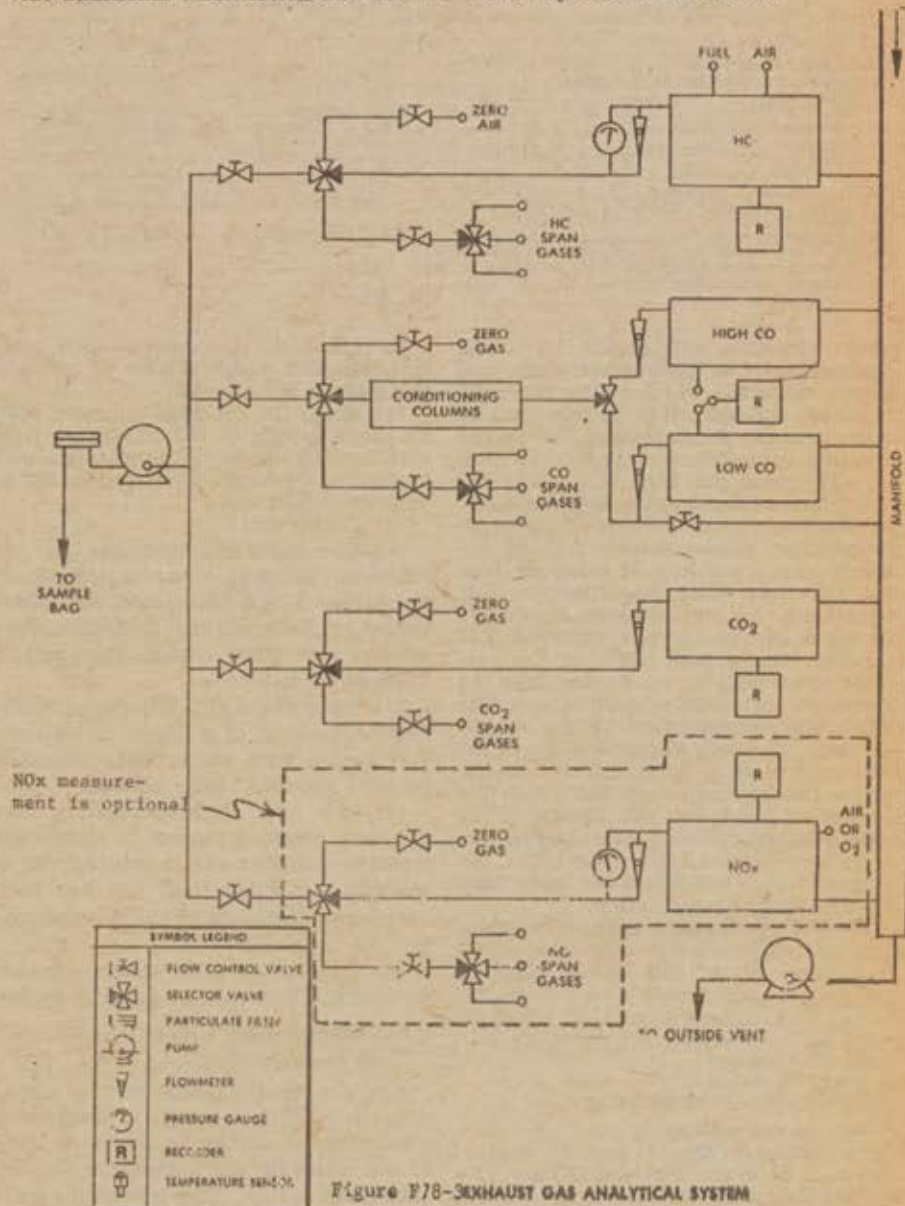


Figure F78-3-EXHAUST GAS ANALYTICAL SYSTEM

(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, and water vapor interference are used, the use of the conditioning column may be deleted, see § 86.522 and § 86.544.

(2) A CO instrument will be considered to be essentially free of CO, and water vapor interference if its response to a mixture of 3 percent CO in N, which has been bubbled through water at room temperature 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 ranges above 300 ppm full scale or less

than 3 ppm on ranges below 300 ppm full scale, see § 86.522.

(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.

§ 86.512 [Reserved]

§ 86.513-78 Fuel and engine lubricant specifications.

(a) Gasoline having the following specifications will be used by the Administrator in exhaust emission testing. Gasoline having the following specifications or substantially equivalent specifications approved by the Administrator, shall be used by the manufacturer for emission testing except that the lead and octane specifications do not apply.

Item	ASTM designation	Leaded	Unleaded
Octane, research minimum	D2699	100	96
Pb (organic), gram/litre (grams/U.S. gallon)		0.370 (1.4) minimum	0.000-0.013 (0.00-0.05)
Distillation range	D86		
IBP, °C (°F)		23.9-35 (75-95)	23.9-35 (75-95)
10 pct point, °C (°F)		48.9-57.2 (120-135)	48.9-57.2 (120-135)
50 pct point, °C (°F)		93.3-110 (200-230)	93.3-110 (200-230)
90 pct point, °C (°F)		148.9-162.8 (300-325)	148.9-162.8 (300-325)
RP, °C (°F), maximum		212.8 (415)	212.8 (415)
Sulfur, mass percent, maximum	D1266	0.10	0.10
Phosphorus, gram/litre (gram/U.S. gallon), maximum		0.0026 (0.01)	0.0013 (0.005)
RVP, kPa (psf)	D323	55.2-63.4 (8.0-9.2)	55.2-63.4 (8.0-9.2)
Hydrocarbon composition	D1319		
Olefins, percent, maximum		10	10
Aromatics, percent, maximum		35	35
Saturates		Remainder	Remainder

(b) Gasoline and engine lubricants representative of commercial fuels and engine lubricants which will be generally available through retail outlets shall be used in scenic accumulation. For leaded gasoline, the minimum lead content shall be 0.370 gram per litre (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 a gasoline with a different lead content. This 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 fuel used shall be characteristic of the motor fuel during the season which the service accumulation takes place. If the manufacturer specifies several lubricants to be used by the ultimate purchaser, the Administrator will select one to be used during service accumulation.

(c) The specification range of the fuels and engine lubricants to be used under paragraph (b) of this section shall be reported in accordance with § 86.416.

(d) The same lubricant(s) shall be used for both service accumulation and emission testing.

§ 86.514-78 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 NO_x concentration of 5 percent of the nominal value using nitrogen as the diluent.

(4) [Reserved]

(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 shall be known to within ± 2 percent of the true values.

§ 86.515-78 EPA Urban Dynamometer Driving Schedule.

(a) The dynamometer driving schedules are listed in Appendix I. The driving schedules are defined by a smooth trace drawn through the specified speed vs. time relationships. They consist of a non-

repetitive series of idle, acceleration, cruise, and deceleration modes of various time sequences and rates. Appropriate driving schedules are as follows:

- Class I—Appendix I(c)
- Class II—Appendix I(b)
- Class III—Appendix I(b)

(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 § 86.537 is defined by upper and lower limits. The upper limit is 3.2 km/h (2 mph) higher than the highest point on the trace within 1 second of the given time. The lower limit is 3.2 km/h (2 mph) 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 § 86.532 the speed tolerance shall be as specified above, except that the upper and lower limits shall be 6.4 km/h (4 mph).

(c) Figure F78-4 shows the range of acceptable speed tolerances for typical points. Figure F78-4(a) is typical of portions of the speed curve which are increasing or decreasing throughout the two second time interval. Figure F78-4(b) is typical of portions of the speed curve which include a maximum or minimum value.

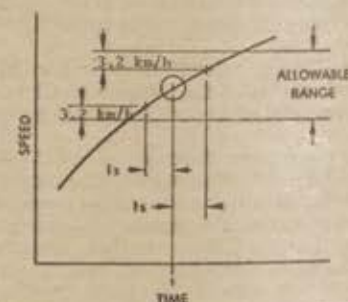


FIGURE F78-4a—DRIVERS TRACE, ALLOWABLE RANGE

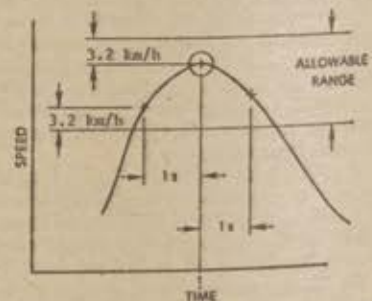


FIGURE F78-4b—DRIVERS TRACE, ALLOWABLE RANGE

§ 86.516-78 Calibrations, frequency and overview.

(a) Calibrations shall be performed as specified in §§ 86.517 through 86.526.

(b) [Reserved]

(c) At least monthly or after any maintenance which could alter calibration, the following calibrations and checks shall be performed:

(1) Calibrate the hydrocarbon analyzer, carbon dioxide analyzer, carbon monoxide analyzer, and, if oxides of nitrogen are measured, 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.

(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, if oxides of nitrogen are measured, 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 § 86.519).

(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.

§ 86.517 [Reserved]

§ 86.518-78 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 dynamometer is driven above the test speed range. The device used to drive the dynamometer is then disengaged from the dynamometer and the roll is 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.

(b) Calibration shall consist of coasting down the dynamometer for each inertia load combination used. Coastdown times for the interval from 70 to 60 km/h shall be within the tolerances specified in § 86.529. The dynamometer adjustments necessary to produce these results shall be noted for future reference.

(c) The performance check consists of conducting a dynamometer coastdown at one or more inertia-horsepower settings and comparing the coastdown time to the table in Figure F78-9 of § 86.529-78. If the coastdown time is outside the tolerance, a new calibration is required.

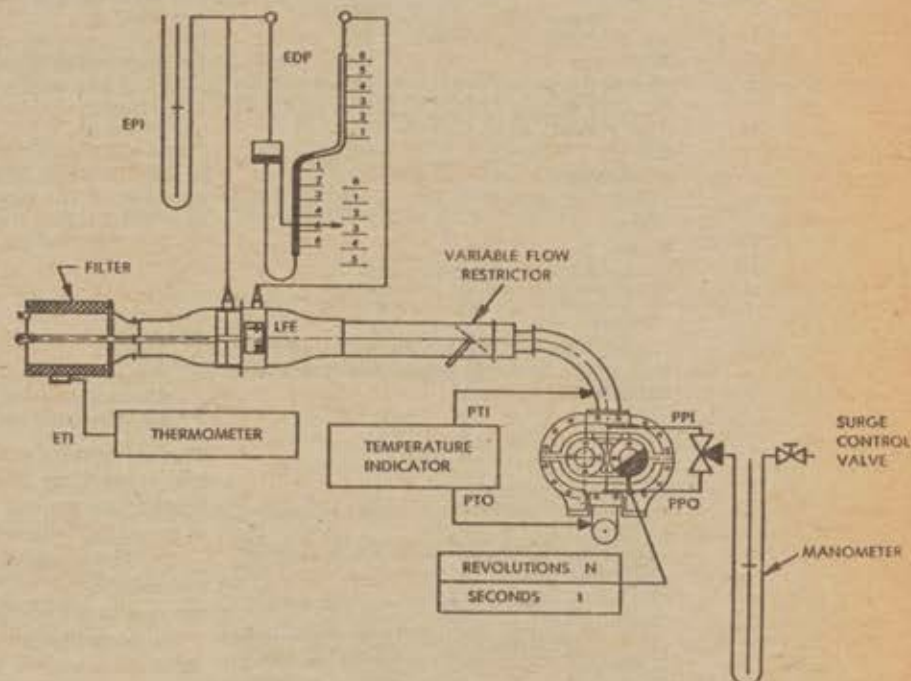
§ 86.519-78 Constant volume sampler calibration.

The CVS (Constant Volume Sampler) 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 (Positive Displacement Pump) and CFV (Critical Flow Venturi) 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 (e) 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 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 (at 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 used must be performed.

(3) 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 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 ($\pm 1^\circ \text{C}$ (1.8°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.



F78-5 - PDP- CVS CALIBRATION CONFIGURATION

(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 F78-5. 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	kPa (in. Hg)	± 0.03 kPa (± 0.01 in. Hg)
Ambient temperature	T_a	$^{\circ}\text{C}$ ($^{\circ}\text{F}$)	$\pm 0.5^{\circ}\text{C}$ ($\pm 0.54^{\circ}\text{F}$)
Air temperature into LFE	ETI	$^{\circ}\text{C}$ ($^{\circ}\text{F}$)	$\pm 0.15^{\circ}\text{C}$ ($\pm 0.27^{\circ}\text{F}$)
Pressure depression upstream of LFE	EPI	kPa (in. H ₂ O)	± 0.01 kPa (± 0.05 in. H ₂ O)
Pressure drop across the LFE matrix	EDP	kPa (in. H ₂ O)	± 0.001 kPa (± 0.005 in. H ₂ O)
Air temperature at CVS pump inlet	PTI	$^{\circ}\text{C}$ ($^{\circ}\text{F}$)	$\pm 0.25^{\circ}\text{C}$ ($\pm 0.45^{\circ}\text{F}$)
Pressure depression at CVS pump inlet	PPI	kPa (in. Fluid)	± 0.021 kPa (± 0.046 in. Fluid)
Specific gravity of manometer fluid (1.75 oil)	Sp. Gr.		
Pressure head at CVS pump outlet	PPO	kPa (in. Fluid)	± 0.021 kPa (± 0.046 in. Fluid)
Air temperature at CVS pump outlet (optional)	PTO	$^{\circ}\text{C}$ ($^{\circ}\text{F}$)	$\pm 0.25^{\circ}\text{C}$ ($\pm 0.45^{\circ}\text{F}$)
Pump revolutions during test period	N	Revs.	± 1 Rev.
Elapsed time for test period	t	s.	± 0.05 s.

(5) After the system has been connected as shown in Figure F78-5, set the variable restrictor in the wide open position and run the CVS pump for twenty minutes. Record the calibration data.

(6) Reset the restrictor valve to a more restricted condition in an increment of pump inlet depression (about 1.0 kPa (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.

(7) Data analysis: (i) The air flow rate, Q_s , at each test point is calculated from the flowmeter data using the manufacturer's prescribed method.

(ii) The air flow rate is then converted to pump flow, V_s , per revolution at absolute pump inlet temperature and pressure.

$$V_s = \frac{Q_s}{n} \times \frac{T_p}{293.15} \times \frac{101.325}{P_p}$$

Where:

V_s = Pump flow, ml/revolution (fl/revolution) at T_p , P_p
 Q_s = Meter air flow rate in standard cubic metres per minute, standard conditions are 30°C , 101.325 kPa (68 $^{\circ}\text{F}$, 29.92 in. Hg).

n = Pump speed in revolutions per minute.

T_p = Pump inlet temperature, K(R) = PTI + 273.15 for English units, T_p = PTI + 459.67

P_p = Absolute pump inlet pressure, kPa (in. Hg) = $P_b - PPI$ for English units, $P_p = P_b - PPI$ (SP. GR./13.57)

Where:

P_b = barometric pressure, kPa (in. Hg)

PPI = Pump inlet depression, kPa (in. Fluid)

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:

$$X_s = \frac{1}{n} \sqrt{\frac{\Delta P_p}{P_p}}$$

Where:

X_s = correlation function.

ΔP_p = The pressure differential from pump inlet to pump outlet, kPa (in. Hg) = $P_p - P_o$

P_o = Absolute pump outlet pressure, kPa (in. Hg) = $P_p + PPO$ for English units, $P_o = P_p + PPO$ (SP. GR./13.57)

Where:

PPO = Pressure head at pump outlet, kPa (in. Fluid)

(iv) A linear least squares fit is performed to generate the calibration equations which have the forms:

$$V_s = D_s - M(X_s)$$

$$n = A - B(\Delta P_p)$$

D_s , M , A , and B are the slope-intercept constants describing the lines.

(8) A CVS system that has multiple speeds shall be calibrated on each speed used. The calibration curves generated for the ranges will be approximately parallel and the intercept values, D_s , 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_o . Values of M will vary from one pump to another, but values of D_s 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 startup 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 Critical Flow Venturi (CFV) is based upon the flow equation for a critical venturi. Gas flow is a function of inlet pressure and temperature:

$$Q_s = \frac{K_s P}{\sqrt{T}}$$

Where:

Q_s = Flow

K_s = 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 for 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	kPa (in. Hg)	± 0.05 kPa (± 0.01 in. Hg).
Air temperature, flowmeter	ETI	$^{\circ}\text{C}$ ($^{\circ}\text{F}$)	$\pm 0.15^{\circ}\text{C}$ ($\pm 0.27^{\circ}\text{F}$).
Pressure depression upstream of LFE	EPI	kPa (in. H ₂ O)	± 0.01 kPa (± 0.05 in. H ₂ O).
Pressure drop across LFE matrix	EDP	kPa (in. H ₂ O)	± 0.001 kPa (± 0.005 in. H ₂ O).
Air flow	Q_s	m ³ /min. (ft ³ /min.)	$\pm 0.5\%$.
CFV inlet depression	PPI	kPa (in. fluid)	± 0.02 kPa (± 0.05 in. fluid).
Temperature at venturi inlet	T_v	$^{\circ}\text{C}$ ($^{\circ}\text{F}$)	$\pm 0.25^{\circ}\text{C}$ ($\pm 0.45^{\circ}\text{F}$).
Specific gravity of manometer fluid (1.75 oil)	Sp. Gr.		

(4) Set up equipment as shown in Figure F78-6 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 from the flow meter data using the manufacturer's prescribed method.

(ii) Calculate values of the calibration coefficient for each test point:

$$K_s = \frac{Q_s \sqrt{T_s}}{P_s}$$

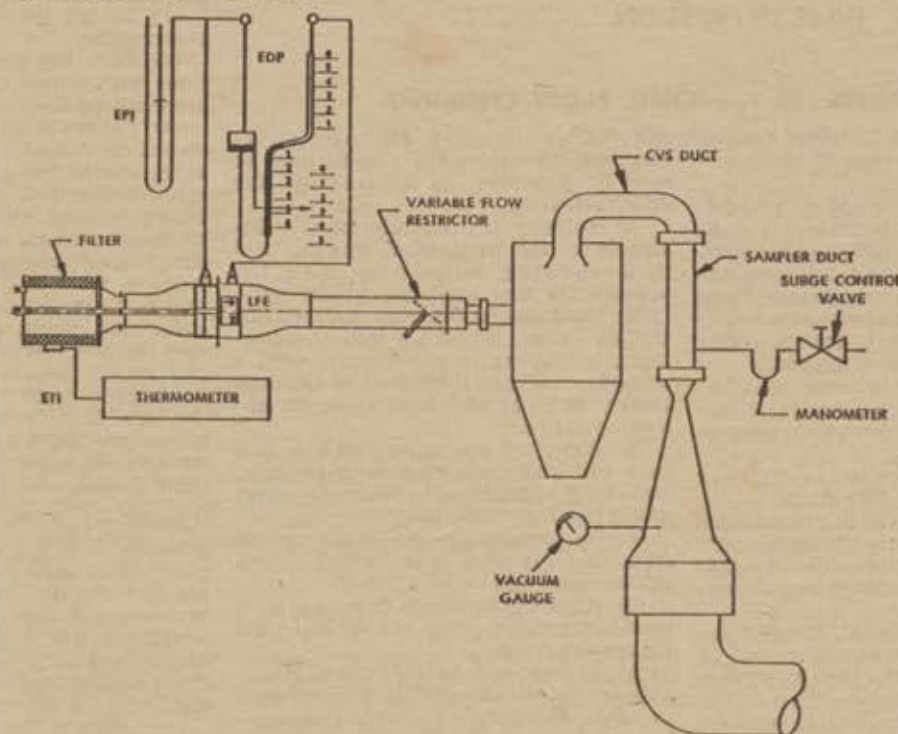


FIGURE F78-6 CFV-CVS CALIBRATION CONFIGURATION

Where:

Q_s = Flow rate, standard conditions are 20°C , 101.325 kPa (68 $^{\circ}\text{F}$, 29.92 in. Hg)
 T_s = Temperature at venturi inlet, K(R).
 P_s = Pressure at venturi inlet, kPa (mm Hg) = $P_B - \text{PPI}$
 for English units $P_s = P_B - \text{PPI}$ (SP. GR./13.57).

Where:

PPI = Venturi inlet pressure depression, kPa (in. fluid).
 SP. GR. = Specific gravity of manometer fluid, relative to water.

(iii) Plot K_s as a function of venturi inlet depression. For sonic flow, K_s will have a relatively constant value. As pressure decreases (vacuum increases), the venturi becomes unchoked and K_s decreases (is no longer constant). See Figure F78-7.

(iv) For a minimum of 8 points in the critical region calculate an average K_s and the standard deviation.

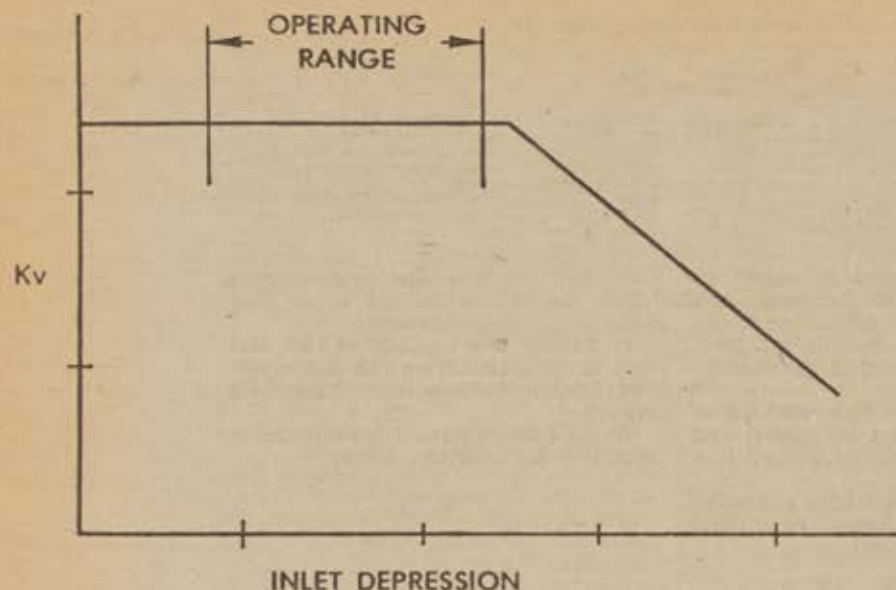


FIGURE F78-7 —SONIC FLOW CHOKING

(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 § 86.544 are performed in the normal way except in the case of propane. The density of propane (0.6109 kg/m³/carbon atom (17.30 g/ft³/carbon atom)) is used in place of the density of exhaust hydrocarbons. In the case of carbon monoxide, the density of 1.164 kg/m³ (32.97 g/ft³) 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.

§ 86.520 [Reserved]

§ 86.521-78 Hydrocarbon analyzer calibration.

(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% 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 50 and 100 percent of that range. Additional calibration points may be generated.

§ 86.522-78 Carbon monoxide analyzer calibration.

(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 CO₂.

(1) Follow the manufacturer's instructions for instrument startup and operation. Adjust the analyzer to optimize performance on the most sensitive range.

(2) Zero the carbon monoxide analyzer with either zero grade air or zero grade nitrogen.

(3) Bubble a mixture of 3% CO in N₂ through water at room temperature and record analyzer response.

(4) An analyzer response of more than 1% 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 N₂ 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.

§ 86.523-78 Oxides of nitrogen analyzer calibration.

(a) Prior to its introduction into service and weekly thereafter, if oxides of nitrogen are measured, the chemiluminescent oxides of nitrogen analyzer shall be checked for NO_x to NO converter efficiency. Figure F78-8 is a reference for the following steps:

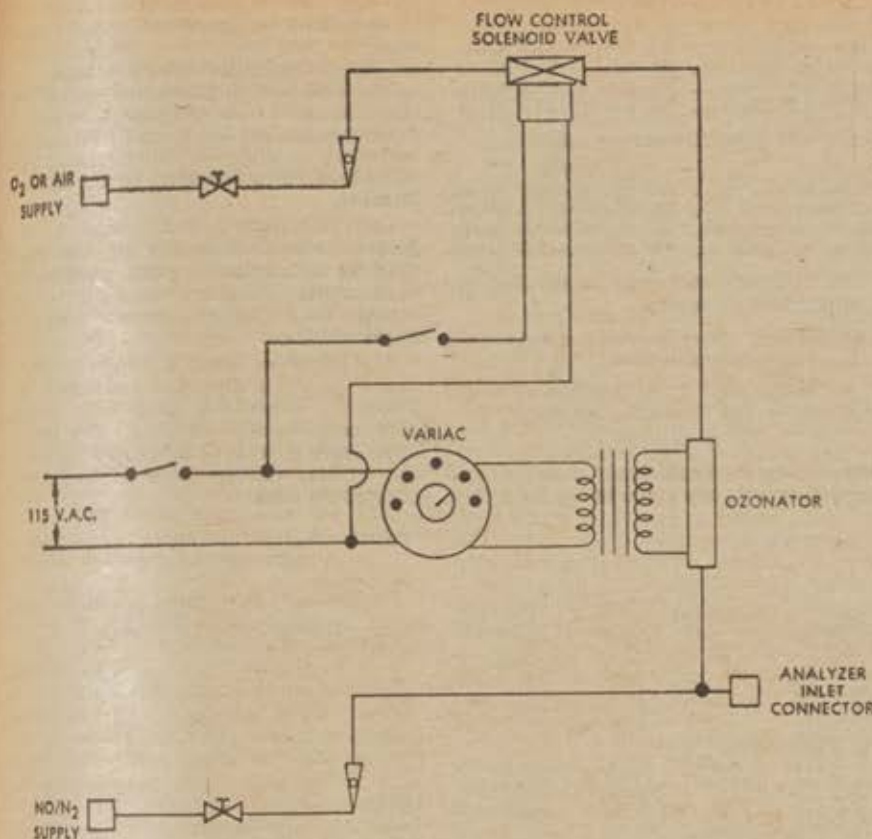
(1) Follow the manufacturer's instructions for instrument startup and operation. Adjust the analyzer to optimize performance.

(2) Zero the oxides of nitrogen analyzer with zero grade air or zero grade nitrogen.

(3) Connect the outlet of the NO_x 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 NO_x generator analyzer-system a NO in nitrogen (N₂) mixture with a NO concentration equal to approximately 80 percent of the most common operating range. The NO content of the gas mixture shall be less than 5 percent of the NO concentration.

(5) With the oxides of nitrogen analyzer in the NO mode, record the concentration of NO indicated by the analyzer.



(SEE FIG F78-3 FOR SYMBOL LEGEND)
FIGURE F78-3—NOx CONVERTER EFFICIENCY DETECTOR

- (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 converter by substituting the concentrations obtained into the following equation:

$$\text{Percent Eff.} = \left(1 + \frac{a-b}{c-d}\right) \times 100$$

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, if oxides of nitrogen are measured, 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.
- (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 with nominal concentrations of 50 and 100 percent of that range. Additional calibration points may be generated.

§ 86.524-78 Carbon dioxide analyzer calibration.

(a) Prior to its introduction into service and monthly thereafter the NDIR carbon dioxide analyzer shall be calibrated:

- (1) Follow the manufacturer's instructions for instrument startup and opera-

tion. Adjust the analyzer to optimize performance.

(2) Zero the carbon dioxide analyzer with either zero grade air or zero grade nitrogen.

(3) 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.

§ 86.525 [Reserved]

§ 86.526-78 Calibration of other equipment.

(a) Other test equipment used for testing shall be calibrated as often as required by the manufacturer or as necessary according to good practice.

§ 86.527-78 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 E.

(a) The overall test consists of prescribed sequences of fueling, parking, and operating conditions.

(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. 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.

(c) [Reserved]

(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 Subpart E.

§ 86.528-78 Transmissions.

(a) Vehicles equipped with transfer cases, multiple sprockets, etc., shall be tested in the manufacturer's recommended configuration for street or highway use. If more than one configuration is recommended or if the recommendation is deemed unreasonable by the Administrator, the Administrator will specify the test configuration.

(b) All tests shall be conducted with automatic transmissions in "Drive" (highest gear). Automatic clutch-torque converter transmissions may be shifted as manual transmissions at the option of the manufacturer.

(c) Idle modes shall be run with automatic transmissions in "Drive" and the

wheels braked, manual transmission shall be in gear with the clutch disengaged; except first idle, see §§ 86.536 and 86.537.

(d) The vehicle shall be driven with minimum throttle movement to maintain the desired speed. No simultaneous use of brake and throttle shall be permitted.

(e) Acceleration modes shall be driven smoothly. Automatic transmissions shall shift automatically through the normal sequence of gears; manual transmissions shall be shifted as recommended by the manufacturer to the ultimate purchaser (unless determined to be unreasonable by the Administrator) with the operator closing the throttle during each shift and accomplishing the shift with minimum time. If the vehicle cannot accelerate at the specified rate, the vehicle shall be operated with the throttle fully opened 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 throttle as necessary to maintain the desired speed. Manual transmission vehicles shall be downshifted using the same shift points as when upshifting or as recommended by the manufacturer in the vehicle owner's manual. All downshifts shall be made smoothly, disengaging the clutch while shifting and engaging the clutch once the lower gear has been selected. For those modes which require the vehicle to decelerate to zero, manual transmission clutches shall be disengaged when the speed drops below 15 km/h (9.3 mph) for vehicles with engine displacements equal to or greater than 280 cc (17.1 cu. in.), when the speed drops below 10 km/h (6.2 mph) for vehicles with engine displacements less than 280 cc (17.1 cu. in.), when engine roughness is evident, or when engine stalling is imminent.

(g) If downshifting during deceleration is not permitted in the vehicle owner's manual, manual transmissions will be downshifted at the beginning of or during a power mode if recommended by the manufacturer or if the engine obviously is lugging. For those modes which require these vehicles to decelerate to zero, manual transmission clutches shall be disengaged when the speed drops below 25 km/h (15.5 mph) for vehicles with engine displacement equal to or greater than 280 cc (17.1 cu. in.), when the speed drops below 20 km/h (12.4 mph) for vehicles with engine displacements less than 280 cc (17.1 cu. in.), when engine roughness is evident, or when engine stalling is imminent. While the clutch is disengaged and during these deceleration modes, the vehicle shall be shifted to the appropriate gear for starting the next mode.

(h) If shift speeds are not recommended by the manufacturer, manual transmission vehicles shall be shifted as follows:

(1) For Class I and II motorcycles:

Shift	Speed
1st to 2d gear.....	19 km/h (11.8 mi/h).
2d to 3d gear.....	33 km/h (20.5 mi/h).
3d to 4th gear.....	44 km/h (27.3 mi/h).
4th to 5th gear.....	53 km/h (32.9 mi/h).

(2) For Class III motorcycles:

Shift	Speed
1st to 2d gear.....	30 km/h (18.6 mi/h).
2d to 3d gear.....	45 km/h (28.0 mi/h).
3d to 4th gear.....	60 km/h (37.3 mi/h).
4th to 5th gear.....	75 km/h (46.6 mi/h).

(3) Higher gears may be used at the manufacturer's option.

§ 86.529-78 Road load force and inertia weight determination.

(a) Road load as a function of speed is given by the following equation:

$$F = A + CV^2$$

The values for coefficients A and C and the test inertia are given in Figure F78-9.

Velocity (V) is in km/h and force (F) is in newtons. The forces given by this equation shall be simulated to the best ability of the equipment being used.

(b) The inertia given in Figure F78-9 shall be used. Motorcycles with loaded vehicle mass outside these limits shall be tested at an equivalent inertial mass and road load force specified by the Administrator.

(c) The dynamometer shall be adjusted to reproduce the specified road load as determined by the most recent calibration. Alternatively, the actual vehicle road load can be measured and duplicated:

(1) Make at least 5 replicate coastdowns in each direction from 70 to 60 km/h on a smooth, level, track under balanced wind conditions. The driver must have a mass of 80 ± 10 kg and be in the normal driving position. Record the coastdown time.

Figure F78-9

VEHICLE MASS (kg)	EQUIVALENT INERTIA (kg)	FORCE COEFFICIENTS		70 TO 60 KM/H COASTDOWN CALIBRATION TIME			
		A (N)	C (N/(km/h) ²)	DOWNWIND (SEC)	UPWIND (SEC)	DOWNWIND (SEC)	UPWIND (SEC)
98 - 102	100	0.0	0.0221	94.0	2.95	3.1	2.0
106 - 110	110	0.03	0.0222	96.0	3.10	3.3	2.0
114 - 118	120	1.70	0.0240	98.0	3.25	3.5	2.2
122 - 126	130	2.57	0.0243	100.0	3.40	3.8	2.4
130 - 134	140	3.44	0.0245	102.0	3.55	4.0	2.6
138 - 142	150	4.32	0.0248	104.0	3.70	4.2	2.8
146 - 150	160	5.19	0.0249	106.0	3.85	4.4	3.0
154 - 158	170	6.06	0.0248	108.0	4.00	4.6	3.2
162 - 166	180	6.94	0.0246	110.0	4.15	4.7	3.4
170 - 174	190	7.81	0.0249	112.0	4.30	4.9	3.6
178 - 182	200	8.69	0.0250	114.0	4.45	5.1	3.8
186 - 190	210	9.56	0.0250	116.0	4.60	5.2	4.0
194 - 198	220	10.43	0.0250	118.0	4.75	5.4	4.2
202 - 206	230	11.31	0.0250	120.0	4.90	5.6	4.4
210 - 214	240	12.18	0.0261	122.0	5.05	5.7	4.6
218 - 222	250	13.06	0.0266	124.0	5.20	5.9	4.8
226 - 230	260	13.93	0.0269	126.0	5.35	6.0	5.0
234 - 238	270	14.80	0.0271	128.0	5.50	6.1	5.2
242 - 246	280	15.68	0.0274	130.0	5.65	6.2	5.4
250 - 254	290	16.55	0.0277	132.0	5.80	6.3	5.6
258 - 262	300	17.43	0.0279	134.0	5.95	6.4	5.8
266 - 270	310	18.31	0.0282	136.0	6.10	6.5	6.0
274 - 278	320	19.19	0.0285	138.0	6.25	6.6	6.2
282 - 286	330	20.06	0.0288	140.0	6.40	6.7	6.4
290 - 294	340	20.92	0.0290	142.0	6.55	6.8	6.6
298 - 302	350	21.80	0.0293	144.0	6.70	6.9	6.8
306 - 310	360	22.69	0.0296	146.0	6.85	7.0	7.0
314 - 318	370	23.57	0.0299	148.0	7.00	7.1	7.2
322 - 326	380	24.45	0.0301	150.0	7.15	7.2	7.4
330 - 334	390	25.32	0.0304	152.0	7.30	7.3	7.6
338 - 342	400	26.20	0.0307	154.0	7.45	7.4	7.8
346 - 350	410	27.08	0.0310	156.0	7.60	7.5	8.0
354 - 358	420	27.96	0.0312	158.0	7.75	7.6	8.2
362 - 366	430	28.84	0.0315	160.0	7.90	7.7	8.4
370 - 374	440	29.72	0.0317	162.0	8.05	7.8	8.6
378 - 382	450	30.60	0.0318	164.0	8.20	7.9	8.8
386 - 390	460	31.48	0.0319	166.0	8.35	8.0	9.0
394 - 398	470	32.36	0.0319	168.0	8.50	8.1	9.2
402 - 406	480	33.24	0.0320	170.0	8.65	8.2	9.4
410 - 414	490	34.12	0.0320	172.0	8.80	8.3	9.6
418 - 422	500	35.00	0.0321	174.0	8.95	8.4	9.8
426 - 430	510	35.88	0.0322	176.0	9.10	8.5	10.0
434 - 438	520	36.76	0.0322	178.0	9.25	8.6	10.2
442 - 446	530	37.64	0.0323	180.0	9.40	8.7	10.4
450 - 454	540	38.52	0.0323	182.0	9.55	8.8	10.6
458 - 462	550	39.40	0.0324	184.0	9.70	8.9	10.8
466 - 470	560	40.28	0.0325	186.0	9.85	9.0	11.0
474 - 478	570	41.16	0.0325	188.0	10.00	9.1	11.2
482 - 486	580	42.04	0.0326	190.0	10.15	9.2	11.4
490 - 494	590	42.92	0.0327	192.0	10.30	9.3	11.6
498 - 502	600	43.80	0.0327	194.0	10.45	9.4	11.8
506 - 510	610	44.68	0.0328	196.0	10.60	9.5	12.0
514 - 518	620	45.56	0.0328	198.0	10.75	9.6	12.2
522 - 526	630	46.44	0.0329	200.0	10.90	9.7	12.4
530 - 534	640	47.32	0.0330				
538 - 542	650	48.20	0.0331				
546 - 550	660	49.08	0.0331				
554 - 558	670	49.96	0.0332				
562 - 566	680	50.84	0.0332				
570 - 574	690	51.72	0.0333				
578 - 582	700	52.60	0.0333				
586 - 590	710	53.48	0.0334				
594 - 598	720	54.36	0.0335				
602 - 606	730	55.24	0.0335				
610 - 614	740	56.12	0.0336				
618 - 622	750	57.00	0.0336				
626 - 630	760	57.88	0.0337				

(2) Average the coastdown times. Adjust the dynamometer load so that the coastdown time is duplicated with the vehicle and driver on the dynamometer.

(3) Alternate procedures may be used if approved in advance by the Administrator.

§ 86.530-78 Test sequence, general requirements.

(a) Ambient temperature levels encountered by the test vehicle throughout the test sequence shall not be less than 20° C (68° F) nor more than 30° C (86° F). The vehicle shall be approximately level during the emission test to prevent abnormal fuel distribution.

§ 86.531-78 Vehicle preparation.

(a) The manufacturer shall provide additional fittings and adapters, as required by the Administrator * * *, such as * * * to accommodate a fuel drain at the lowest point possible in the tank(s) as installed on the vehicle and to provide for exhaust sample collection.

§ 86.532-78 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 charged with the specified test fuel, § 86.513, to half the tank(s) capacity.

(2) The vehicle shall be placed, either by being driven or pushed, on a dynamometer and operated through one Urban Dynamometer Driving Schedule test procedure (see § 86.515 and Appendix D). The vehicle need not be cold, and may be used to set dynamometer horsepower.

(b) Within five (5) minutes of completion of preconditioning, the vehicle shall be removed from the dynamometer and may be driven or pushed to the soak area to be parked. The vehicle shall be stored for not less than the following times prior to the cold start exhaust test.

	hrs.
Class I.....	6
Class II.....	8
Class III.....	12

In no case shall the vehicle be stored for more than 36 hours prior to the cold start exhaust test.

§ 86.533 [Reserved]

§ 86.534 [Reserved]

§ 86.535-78 Dynamometer procedure.

(a) The dynamometer run consists of two tests, a "cold" start test and a "hot" start test following the "cold" start 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, carbon monoxide, carbon dioxide, and, optionally, for oxides of nitrogen. A parallel sample of the dilution air is similarly analyzed for hydrocarbon, carbon monoxide, carbon dioxide, and, optionally, for oxides of nitrogen.

(b) [Reserved]

(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.

(e) The drive wheel tires must be inflated to the manufacturer's recommended pressure, ± 15 kPa (± 2.2 psi). The drive wheel tire pressure shall be reported with the test results.

(f) If the dynamometer has not been operated during the two hour period immediately preceding the test, it shall be warmed up for 15 minutes by operating at 50 km/h (31.1 mph) 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 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.

(h) The driving distance, as measured by counting the number of dynamometer roll revolutions, shall be determined for the transient cold start, stabilized cold start, and transient hot start phases of the test.

§ 86.536-78 Engine starting and re-starting.

(a) (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.

(2) Choke operation. (i) Vehicles equipped with automatic chokes shall be operated according to the instructions 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 operating instructions or owner's manual. Where times are provided in the instructions, the Administrator may specify the specific point for operation, within 15 seconds of the recommended time.

(3) The operator may use the choke, throttle etc. where necessary to keep the engine running.

(4) If the manufacturer's operating instructions or owner's manual do not specify a warm engine starting procedure, the engine (automatic and manual choke engines) shall be started by opening the throttle about half way and cranking the engine until it starts.

(b) [Reserved]

(c) If, during the cold start, the vehicle does not start after 10 seconds of cranking, or ten cycles of the manual starting mechanism, cranking shall cease and the reason for failure to start determined. The revolution counter on the constant volume sampler shall be turned off and the sample solenoid valves placed in the "standby" position during this diagnostic period. In addition, either the CVS blower shall be turned off or the exhaust tube disconnected from the tailpipe during the diagnostic period.

(1) 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 (following the unscheduled maintenance provisions) 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 (following the unscheduled maintenance provisions), and the vehicle rescheduled for test. The reason for the malfunction (if determined) and the corrective action taken shall be reported.

(2) If the vehicle does not start during the hot start after ten seconds of cranking, or ten cycles of the manual starting mechanism, cranking shall cease, the test shall be voided, the vehicle removed from the dynamometer, corrective action taken in accordance with § 86.428 or § 86.429, 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 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 § 86.528.

(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.

§ 86.537-78 Dynamometer test runs.

(a) The vehicle shall be allowed to stand with the engine turned off (see § 86.532 for required time). 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 12.0 km (7.5 miles), (10.9 km (6.8 miles) for Class I motorcycles) and simulates a hot start drive of 12.0 km (7.5 miles), (10.9 km (6.8 miles) for Class I motorcycles). The vehicle is allowed to stand on the dynamometer during the 10 minute period between the cold and hot start tests. The cold start 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 at 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 wheel of vehicle on dynamometer without starting engine.

(2) Activate vehicle cooling fan system.

(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 Constant Volume Sampler (if not already on), the sample pumps, and the temperature recorder. (The heat exchanger of the constant volume sampler, if used, should be preheated to operating temperature before the test begins).

(5) Adjust the sample flow rates to the desired flow rate (minimum of 80 cc/s (10.2 ft³/hr) for PDP-CVS) 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 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 (§ 86.515).

(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 start gas flow measuring device No. 2. Before the acceleration, which begins at 510 seconds, record the roll revolutions. As soon as possible, transfer the "transient" exhaust and dilution samples to the analytical system and process the samples according to § 86.540 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 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 position the sample selector valves to the "standby" position. Record the measured roll revolutions. As soon as possible, transfer the "stabilized" exhaust and dilution air samples to the analytical system and process the samples according to § 86.540 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 vehicle cooling fan system.

(15) Turn off the CVS or disconnect the exhaust tube from the tailpipe 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 gas flow measuring device No. 1 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 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 § 86.540 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 remove vehicle from dynamometer.

(20) The constant volume sampler may be turned off, if desired.

(21) Continuous monitoring of exhaust emissions will not normally be allowed.

Specific written approval must be obtained from the Administrator for continuous monitoring of exhaust emissions.

§ 86.538 [Reserved]

§ 86.539 [Reserved]

§ 86.540-78 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, optionally, NO_x concentrations of samples.

(f) [Reserved]

(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.

§ 86.541 [Reserved]

§ 86.542-78 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: Make, Vehicle identification number, Model year, Transmission type, Odometer reading, Engine displacement, Engine family, Emission control system, Recommended Idle RPM, Nominal fuel tank capacity, Inertial loading, Actual curb mass recorded at 0 kilometres, and Drive wheel tire pressure.

(g) 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) [Reserved]

(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 metres 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 § 86.522 and § 86.544) 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.

§ 86.543. [Reserved]

§ 86.544-78 Calculations; exhaust emissions.

The final reported test results, with oxides of nitrogen being optional, shall be computed by use of the following formulae: (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 standard to three significant figures.)

(a)

$$Y_{wm} = 0.43[(Y_{ct} + Y_s)/(D_{ct} + D_s)] + 0.57[(Y_{ht} + Y_s)/(D_{ht} + D_s)]$$

where:

Y_{wm} —Weighted mass emissions of CO₂ or of each pollutant, i.e., HC, CO, or NO_x, in grams per vehicle kilometre.

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.

D_{ct} —The measured driving distance from the "transient" phase of the cold start test, in kilometres.

D_{ht} —The measured driving distance from the "transient" phase of the hot start test, in kilometres.

D_s —The measured driving distance from the "stabilized" phase of the cold start test, in kilometres.

(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:

$$H_{Cmass} = V_{mix} \times \text{Density}_{HC} \times (H_{Cconc}/1,000,000)$$

(2) Oxides of nitrogen mass:

$$NO_{xmass} = V_{mix} \times \text{Density}_{NO_2} \times (NO_{xconc} \times Kh/1,000,000)$$

(3) Carbon monoxide mass:

$$CO_{mass} = V_{mix} \times \text{Density}_{CO} \times (CO_{conc}/1,000,000)$$

(4) Carbon dioxide mass:

$$CO_2mass = V_{mix} \times \text{Density}_{CO_2} \times (CO_2conc/100)$$

(c) Meaning of symbols:

H_{Cmass} —Hydrocarbon emissions, in grams per test phase.

Density_{HC} —Density of hydrocarbon in the exhaust gas, 0.5767 kg/m³/carbon atom (16.33 g/lb/carbon atom), assuming an average carbon to hydrogen ratio of 1:1.85, at 20°C (68°F) and 101.325 kPa (760 mm Hg) pressure.

H_{Cconc} —Hydrocarbon concentration of the dilute exhaust sample corrected for background, in ppm carbon equivalent, i.e., equivalent propane X3.

$H_{Cconc} = H_{Ce} - H_{Cd} (1-1/DF)$

where:

H_{Ce} —Hydrocarbon concentrations of the dilute exhaust sample as measured, in ppm carbon equivalent. (Propane ppm x 3.)

H_{Cd} —Hydrocarbon concentration of the dilution air as measured, in ppm carbon equivalent. (Propane ppm x 3.)

NO_{xmass} —Oxides of nitrogen emissions, in grams per test phase.

Density_{NO_2} —Density of oxides of nitrogen in the exhaust gas, assuming they are in the form of nitrogen dioxide, 1.913 kg/m³ (54.16 g/lb), at 20°C (68°F) and 101.325 kPa (760 mm Hg) pressure.

NO_{xconc} —Oxides of nitrogen concentration of the dilute exhaust sample corrected for background, in ppm.

$NO_{xconc} = NO_{xe} - NO_{xd} (1-1/DF)$

where:

NO_{xe} —Oxides of nitrogen concentration of the dilute exhaust sample as measured, in ppm.

NO_{xd} —Oxides of nitrogen concentration of the dilution air as measured, in ppm.

CO_{mass} —Carbon monoxide emissions, in grams per test phase.

Density_{CO} —Density of carbon monoxide, 1.164 kg/m³ (32.97 g/lb), at 20°C (68°F) and 101.325 kPa (760 mm Hg) pressure.

CO_{conc} —Carbon monoxide concentration of the dilute exhaust sample corrected for background, water vapor, and CO₂ extraction, in ppm.

$CO_{conc} = CO_e - CO_d (1-1/DF)$

where:

CO_e —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.

$CO_e = (1-0.01925CO_2e - 0.000823R) CO_{em}$

where:

CO_{em} —Carbon monoxide concentration of the dilute exhaust sample as measured, in ppm.

CO_2e —Carbon dioxide concentration of the dilute exhaust sample, in mole percent.

R —Relative humidity of the dilution air, in percent (see § 86.478-22 (n)).

CO_d —Carbon monoxide concentration of the dilution air corrected for water vapor extraction, in ppm.

$CO_d = (1-0.000823R) CO_{dm}$

where:

CO_{dm} —Carbon monoxide concentration of the dilution air sample as measured, in ppm.

Note.—If a CO instrument, which meets the criteria specified in § 86.511 is used and the conditioning column has been deleted, CO_{em} can be substituted directly for CO_e and CO_{dm} can be substituted directly for CO_d .

CO_2mass —Carbon dioxide emissions, in grams per test phase.

Density_{CO_2} —Density of carbon dioxide, 1.843 kg/m³ (52.20 g/lb), at 20°C (68°F) and 101.325 kPa (760 mm Hg) pressure.

CO_2conc —Carbon dioxide concentration of the dilute exhaust sample corrected for background, in percent.

$CO_2conc = CO_2e - CO_2d (1-1/DF) 10^{-4}$

Where:

CO_2d —Carbon dioxide concentration of the dilution air as measured, in ppm.

$DF = 13.4/(CO_2 + (H_{Ce} - H_{Cd}) 10^{-4})$

V_{mix} —Total dilute exhaust volume in cubic metres per test phase corrected to standard conditions (293.15° K (528° R) and 101.325 kPa (760 mm Hg)).

$V_{mix} = V_o \times N \times (P_b - P_i) / [(101.325 \text{ kPa}) (T_p)]$

Where:

V_o —Volume of gas pumped by the positive displacement pump, in cubic metres 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.

P_b —Barometric pressure in kPa.

P_i —Pressure depression below atmospheric measured at the inlet to the positive displacement pump.

T_p —Average temperature of dilute exhaust entering positive displacement pump during test while samples are being collected, in degrees Kelvin.

Kh —Humidity correction factor.

$Kh = 1/[1-0.0329(H-10.71)]$

Where:

H —Absolute humidity in grams of water per kilogram of dry air.

$H = [(6.211) Ra \times Pd]/[P_b - (Pd \times Ra/100)]$

Ra —Relative humidity of the ambient air, in percent.

P_d —Saturated vapor pressure, in kPa at the ambient dry bulb temperature.

(d) Example calculation of mass emission values for vehicles with engine displacements equal to or greater than 170 cc (10.4 cu. in.):

(1) For the "transient" phase of the cold start test, assume $V_o = 0.0077934$ m³ per revolution; $N = 12,115$; $R = 20.5$ percent; $Ra = 20.5$ percent; $P_b = 99.05$ kPa; $P_d = 3.382$ kPa; $P_i = 0.851$ kPa; $T_p = 309.8$ K; $H_{Ce} = 249.75$ ppm carbon equivalent; $NO_{xe} = 38.30$ ppm; $CO_{em} = 311.23$ ppm; $CO_2e = 0.415$ percent; $H_{Cd} = 4.90$ ppm; $NO_{xd} = 0.30$ ppm; $CO_{dm} = 8.13$ ppm; $CO_2d = 370$ ppm; $D_{ct} = 5.650$ km. Then:

$$V_{mix} = [(0.0077934) (12,115) (99.05 - 0.851) (293.15)] / [(101.325) (309.8)]$$

$$V_{mix} = 78.651 \text{ m}^3 \text{ per test phase.}$$

$$H = [(6.211) (20.5) (3.382)] / [(99.05) - (3.382) (20.5/100)]$$

$$H = 4.378 \text{ grams H}_2\text{O per kg dry air.}$$

$$Kh = 1/[1-0.0329(4.378-10.71)]$$

$$Kh = 0.8278$$

$$CO_e = [(1-0.01925(0.415) - 0.000823) (311.23) (20.5)]$$

$$CO_e = 306.68 \text{ ppm.}$$

$$CO_d = [(1-0.000823) (20.5)] 8.13$$

$$CO_d = 8.08 \text{ ppm.}$$

$$DF = 13.4/[0.415 + (249.75 + 306.68) 10^{-4}]$$

$$DF = 28.472$$

$$H_{Cconc} = 249.75 - 4.90(1-1/28.472)$$

$$H_{Cconc} = 245.02 \text{ ppm.}$$

$$H_{Cmass} = (78.651) (245.02) (245.02) 10^{-4}$$

$$H_{Cmass} = 11.114 \text{ grams per test phase}$$

$$NO_{xconc} = 38.30 - 0.30(1-1/28.472)$$

$$NO_{xconc} = 38.01 \text{ ppm.}$$

$$NO_{xmass} = (78.651) (1913) (38.01) (0.8278) 10^{-4}$$

$$NO_{xmass} = 4.733 \text{ grams per test phase.}$$

$$CO_{conc} = 306.68 - 8.08(1-1/28.472)$$

$$CO_{conc} = 298.88 \text{ ppm.}$$

$$CO_{mass} = (78.651) (1164) (298.88) 10^{-4}$$

$$CO_{mass} = 27.362 \text{ grams per test phase.}$$

CO₂conc=0.415-370 (1-1/28.472) 10⁻⁴
 CO₂conc=0.3793 percent.
 CO₂mass=(78.551) (1843) (0.3793) 10⁻²
 CO₂mass=549.81 grams per test phase.

(2) For the "stabilized" portion of the cold start test, assume that similar calculations resulted in HC_{mass}=7.184 grams per test phase; NO_xmass=2.154 grams per test phase; CO_{mass}=61.541 grams per test phase; and CO₂mass=529.52 grams per test phase. Ds=6.070 kilometres.

(3) For the "transient" portion of the hot start test, assume that similar calculations resulted in HC_{mass}=6.122 grams per test phase; NO_xmass=7.056 grams per test phase; CO_{mass}=34.964 grams per test phase; and CO₂mass=480.93 grams per test phase. Dht=5.660 kilometres.

(4) For a 1978 motorcycle with an engine displacement equal to or greater than 170 cc (10.4 cu. in.):

HC_{wm}=0.43[(11.114+7.184)/(5.660+0.070)] +
 0.57[(6.122+7.184)/(5.660+0.070)]
 HC_{wm}=1.318 grams per vehicle kilometre.
 NO_{xwm}=0.43[(4.733+2.154)/(5.660+0.070)] +
 0.57[(7.056+2.154)/(5.660+0.070)]
 NO_{xwm}=0.700 grams per vehicle kilometre.
 CO_{wm}=0.43[(27.382+64.541)/(5.660+
 0.070)] + 0.57[(34.964+64.541)/(5.660+
 0.070)]
 CO_{wm}=8.207 grams per vehicle kilometre.
 CO_{2wm}=0.43[(549.81+529.52)/(5.660+
 0.070)] + 0.57[(480.93+529.52)/(5.660+
 0.070)]
 CO_{2wm}=88.701 grams per vehicle kilometre.

[FR Doc. 77-146 Filed 1-4-77; 8:45 am]

[FRL 658-8]

PART 86—CONTROL OF AIR POLLUTION FROM NEW MOTOR VEHICLES AND NEW MOTOR VEHICLE ENGINES: CER- TIFICATION AND TEST PROCEDURES

Appendices to Motor Vehicle Emission Regulations

On October 22, 1975, a Notice of Proposed Rule Making (NPRM) was published in the FEDERAL REGISTER (40 FR 49517) setting forth revisions to the Appendices to the motor vehicle emission regulations in Part 86 of Title 40 of the Code of Federal Regulations. The proposed changes were needed to complement the publication of the proposed regulations for the control of exhaust and crankcase emissions from new motorcycles (40 FR 49496). In addition, the appendices were proposed in the International System of Units (SI). Comments by interested parties to the NPRM received prior to 10 February 1976 were considered in the preparation of the final rule making.

Presented below is a list of the major changes to the proposed Appendices which are incorporated for final rule making.

(1) Appendix I, the EPA dynamometer driving schedule, is published as proposed in kilometre per hour units. For the con-

venience of the user, the driving schedule in miles per hour units is retained. Manufacturers of light duty vehicles or light duty trucks may use either schedule (a) in miles per hour or schedule (b) in kilometres per hour. The tolerance diagram in the corresponding units should be used. Motorcycles with displacements greater than or equal to 170cc (10.4 cu. in.) are to use schedule (b) and motorcycles with displacements less than 170cc are to use schedule (c).

(2) The proposed revision to Appendix II, Procedures for Dynamometer Road Power Calibration, is dropped from the final rule making. A new motorcycle dynamometer calibration procedure, consistent with the revised motorcycle road load force specification, is incorporated in the body of the motorcycle test procedures, Part 86, Subpart F. For light duty vehicles and light duty trucks, the dynamometer calibration procedure has also been incorporated in the body of the applicable test procedures, Part 86, Subpart B.

(3) The revision to Appendix III, Constant Volume Sampler Flow Calibration, is also dropped from the final rulemaking. The calibration procedure, which now includes a method for calibrating a critical flow venturi constant volume sampler, is incorporated in the applicable test procedure sections of Part 86 for motorcycles and for light duty vehicles and light duty trucks.

(4) Appendix IV(b) has been revised to include the durability driving schedule for each of the three motorcycle classes. For laps 1 through 9, the lap speed in SI units has been revised to more nearly equate these schedules with the English unit schedule for light duty vehicles contained in Appendix IV(a). For motorcycles with engine displacements less than 170cc (10.4 cu. in.), the speeds for laps 10 and 11 have been reduced to reflect the inability of some of the smaller motorcycles to achieve the proposed maximum speeds for those laps. For motorcycles with engine displacements equal to or greater than 170cc and less than 280cc (17.1 cu. in.), the speed for lap 11 has been reduced because motorcycles in this class are often designed for dual-purpose operation and may be incapable of attaining the proposed maximum speed for this lap.

(5) Appendix V continues to be reserved.

(6) Appendix VI, Vehicle and Engine Components, is published as proposed.

(7) Appendix VII, Parameters and Specifications, was proposed on December 23, 1974 (39 FR 44246) as part of the Coverage of Motor Vehicle Certificate of Conformity Regulations. It was proposed for motorcycles on October 22, 1975 with certain modifications applicable to motorcycles included. Appendix VII is not included for final rulemaking at this time because of pending resolution of

comments. It is anticipated final rulemaking, applicable to all motor vehicles, will be published at a later date.

Comments which were received in response to the NPRM and EPA's detailed analysis of the comments are available for inspection and copying during normal business hours at the U.S. Environmental Protection Agency, Public Information Reference Unit, Room 2322 (EPA Library), 401 M Street, S.W., Washington, D.C. 20460. As provided for in 40 CFR Part 2, a reasonable fee may be charged for copying services.

The Environmental Protection Agency 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.

The environmental and economic impacts associated with the regulations published of subparts E and F of Title 40, Part 86, Control of Air Pollution From New Motor Vehicles and New Motor Vehicle Engines: Certification and Test Procedures—Emission Regulations for New Motorcycles, have been analyzed. This analysis is contained in the Environmental and Economic Impact Statement, Motorcycle Exhaust and Crankcase Regulations for the 1978 Model Year, December 1976. Single copies of this document are available from the Public Information Center (PM-215), U.S. Environmental Protection Agency, Washington, D.C. 20460.

This Notice of Final Rulemaking is issued under the authority of sections 202, 206, 207, 208, and 301(a) of the Clean Air Act, as amended (42 U.S.C. 1857f-1, 1857f-5, 1857f-5a, 1857f-6, 1857g(a)).

Effective date: This addition to Part 86 becomes effective on February 22, 1977.

Date: December 23, 1976.

JOHN QUARLES,
Acting Administrator.

The following changes are made to the appendices in Part 86 of Chapter I of Title 40 of the Code of Federal Regulations:

1. Appendix I is revised by redesignating Appendix I of Part 86 as part (a) of Appendix I, adding paragraph (a) prior to the schedule listing, and adding paragraphs (b) and (c) to read as follows:

APPENDIX I—URBAN DYNAMOMETER DRIVING SCHEDULES

(a) EPA Urban Dynamometer Driving Schedule for Light Duty Vehicles and Light Duty Trucks.

(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 (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)
0	37	74	111
1	38	75	112
2	39	76	113
3	40	77	114
4	41	78	115
5	42	79	116
6	43	80	117
7	44	81	118
8	45	82	119
9	46	83	120
10	47	84	121
11	48	85	122
12	49	86	123
13	50	87	124
14	51	88	125
15	52	89	126
16	53	90	127
17	54	91	128
18	55	92	129
19	56	93	130
20	57	94	131
21	58	95	132
22	59	96	133
23	60	97	134
24	61	98	135
25	62	99	136
26	63	100	137
27	64	101	138
28	65	102	139
29	66	103	140
30	67	104	141
31	68	105	142
32	69	106	143
33	70	107	144
34	71	108	145
35	72	109	146
36	73	110	147

Time	Speed (kilo- metres per second): hour	Time	Speed (kilo- metres per second): hour	Time	Speed (kilo- metres per second): hour	Time	Speed (kilo- metres per second): hour
148	0	214	88.7	320	44.3	406	20.1
149	0	215	88.3	321	39.9	407	20.4
150	0	216	88.0	322	34.6	408	20.7
151	0	217	90.3	323	32.3	409	20.9
152	0	218	88.8	324	30.7	410	20.2
153	0	219	81.1	325	29.8	411	21.3
154	0	220	81.3	326	27.4	412	24.3
155	0	221	81.2	327	24.9	413	26.7
156	0	222	80.9	328	20.1	414	28.3
157	0	223	80.9	329	17.4	415	28.4
158	0	224	80.9	330	12.9	416	28.3
159	0	225	80.9	331	7.6	417	27.8
160	0	226	80.9	332	2.3	418	27.2
161	0	227	80.9	333	0	419	26.8
162	0	228	80.8	334	0	420	25.1
163	0	229	80.3	335	0	421	20.2
164	5.3	230	80.8	336	0	422	24.0
165	10.6	231	88.7	337	0	423	29.6
166	16.9	232	87.9	338	0	424	24.3
167	21.2	233	87.3	339	0	425	19.0
168	26.6	234	86.0	340	0	426	12.7
169	31.9	235	88.4	341	0	427	8.4
170	36.7	236	88.3	342	0	428	3.1
171	39.1	237	86.7	343	0	429	0
172	41.6	238	88.9	344	0	430	0
173	42.5	239	87.1	345	0	431	0
174	41.4	240	87.1	346	0	432	0
175	40.4	241	86.6	347	1.6	433	0
176	39.8	242	85.9	348	6.9	434	0
177	40.2	243	85.3	349	12.2	435	0
178	40.6	244	84.7	350	17.5	436	0
179	40.9	245	83.8	351	22.9	437	0
180	41.5	246	84.3	352	27.8	438	0
181	43.8	247	83.7	353	32.2	439	0
182	42.6	248	83.5	354	36.2	440	0
183	38.6	249	83.2	355	38.1	441	0
184	36.5	250	82.9	356	40.6	442	0
185	31.2	251	83.0	357	42.8	443	0
186	28.6	252	83.4	358	45.2	444	0
187	27.7	253	83.8	359	48.3	445	0
188	29.1	254	84.5	360	49.6	446	0
189	29.9	255	85.3	361	50.0	447	0
190	32.2	256	86.1	362	51.7	448	5.3
191	35.7	257	86.9	363	52.8	449	10.6
192	39.4	258	88.4	364	54.1	450	16.9
193	43.9	259	89.2	365	55.5	451	21.2
194	49.1	260	89.5	366	55.7	452	26.6
195	63.9	261	90.1	367	56.2	453	31.9
196	68.3	262	90.1	368	56.0	454	27.2
197	60.0	263	89.8	369	55.5	455	42.5
198	63.2	264	88.8	370	55.8	456	44.7
199	65.2	265	87.7	371	57.1	457	46.8
200	67.8	266	86.3	372	57.9	458	50.7
201	70.0	267	84.5	373	57.9	459	53.1
202	72.6	268	82.9	374	57.9	460	54.1
203	74.0	269	82.9	375	57.9	461	56.0
204	76.3	270	82.9	377	57.9	462	56.5
205	76.4	271	82.2	378	57.9	463	57.3
206	76.4	272	80.0	379	58.1	464	58.1
207	76.1	273	80.6	380	58.0	465	57.9
208	76.0	274	80.0	381	58.7	466	58.1
209	75.6	275	80.5	382	58.6	467	58.3
210	75.6	276	79.8	383	57.9	468	57.9
211	75.6	277	79.7	384	56.5	469	57.5
212	75.6	278	79.7	385	54.9	470	57.9
213	75.6	279	79.7	386	53.9	471	57.9
214	76.0	280	79.0	387	50.5	472	57.3
215	76.3	281	78.2	388	46.7	473	57.1
216	77.1	282	77.4	389	41.4	474	57.0
217	78.1	283	76.0	390	37.0	475	56.6
218	79.0	284	74.2	391	32.7	476	56.6
219	79.7	285	72.4	392	28.2	477	56.6
220	80.5	286	70.5	393	23.3	478	56.6
221	81.4	287	68.6	394	19.3	479	56.6
222	82.1	288	66.8	395	14.0	480	56.0
223	82.9	289	64.9	396	8.7	481	56.2
224	84.0	290	62.0	397	3.4	482	56.5
225	85.6	291	59.5	398	0	483	56.6
226	87.1	292	56.6	399	0	484	57.1
227	87.9	293	54.4	400	0	485	56.6
228	88.4	294	52.3	401	0	486	56.3
229	88.5	295	50.7	402	0	487	56.3
230	88.4	296	49.2	403	0	488	56.3
231	87.9	297	49.1	404	4.3	489	56.9
232	87.9	298	48.3	405	9.5	490	56.7
233	88.2	299	46.7				

Speed (ft/s)		Speed (ft/s)		Speed (ft/s)		Speed (ft/s)	
Amplitude	Height	Amplitude	Height	Amplitude	Height	Amplitude	Height
401	68.8	611	21.4	881	42.1	711	46.0
402	63.8	612	28.2	882	42.2	748	45.9
403	61.5	613	28.5	883	42.5	749	46.4
404	48.4	614	28.6	884	42.6	750	43.1
405	45.1	615	28.2	885	42.9	751	44.3
406	41.0	616	27.4	886	41.8	752	43.1
407	36.2	617	27.2	887	41.0	753	41.0
408	31.9	618	26.7	888	38.9	754	37.8
409	26.0	619	27.4	889	34.4	755	34.6
410	21.2	620	27.5	890	29.8	756	30.9
411	16.6	621	27.4	891	26.4	757	26.0
412	11.6	622	26.7	892	23.3	758	24.1
413	6.4	623	25.0	893	18.7	759	20.2
414	1.0	624	25.6	894	14.0	760	15.2
415	0	625	26.7	895	9.3	761	10.0
416	0	626	27.4	896	5.6	762	4.8
417	0	627	26.2	897	3.2	763	2.4
418	0	628	29.8	898	0	764	2.4
419	0	629	30.9	899	0	765	0.8
420	0	630	32.5	900	0	766	0
421	1.0	631	33.8	901	0	767	4.8
422	5.6	632	34.0	902	0	768	10.1
423	8.9	633	34.1	903	0	769	14.4
424	10.6	634	34.8	904	0	770	20.8
425	13.7	635	35.4	905	0	771	25.4
426	15.4	636	36.0	906	0	772	28.2
427	16.9	637	36.2	907	0	773	29.6
428	19.2	638	36.2	908	0	774	31.4
429	22.5	639	36.2	909	0	775	33.3
430	25.7	640	35.5	910	0	776	35.4
431	28.6	641	33.1	911	0	777	37.3
432	30.6	642	40.4	912	0	778	40.2
433	32.8	643	41.8	913	0	779	42.6
434	33.8	644	42.6	914	2.3	780	44.3
435	35.4	645	43.5	915	5.3	781	45.1
436	37.0	646	42.0	916	7.1	782	46.6
437	38.3	647	36.7	917	10.5	783	46.6
438	39.4	648	31.4	918	14.9	784	46.5
439	40.1	649	26.1	919	18.2	785	42.5
440	40.2	650	20.8	920	21.7	786	46.3
441	40.2	651	15.4	921	23.6	787	45.9
442	40.2	652	10.1	922	26.9	788	45.5
443	40.2	653	4.8	923	25.8	789	45.6
444	40.2	654	0	924	26.6	790	45.5
445	40.2	655	0	925	29.3	791	45.4
446	41.3	656	0	926	30.9	792	44.4
447	41.6	657	0	927	32.3	793	44.3
448	41.8	658	0	928	34.6	794	44.3
449	41.2	659	0	929	36.2	795	44.3
450	40.6	660	0	930	36.2	796	44.3
451	40.2	661	0	931	35.6	797	44.3
452	40.2	662	0	932	36.5	798	44.3
453	40.2	663	0	933	37.5	799	44.4
454	39.3	664	0	934	37.8	800	45.1
455	37.2	665	0	935	36.2	801	45.9
456	31.9	666	0	936	34.6	802	46.3
457	25.6	667	0	937	33.0	803	49.2
458	21.2	668	0	938	29.0	804	51.5
459	15.9	669	0	939	24.1	805	53.1
460	10.6	670	0	940	19.8	806	53.1
461	5.3	671	0	941	14.5	807	54.1
462	0	672	0	942	10.0	808	54.7
463	0	673	0	943	7.2	809	55.2
464	0	674	0	944	4.8	810	55.0
465	0	675	0	945	3.4	811	54.7
466	0	676	0	946	0.8	812	54.6
467	0	677	0	947	0.8	813	54.6
468	0	678	0	948	5.1	814	54.1
469	0	679	0	949	10.5	815	53.3
470	0	680	3.2	950	15.4	816	63.1
471	0	681	7.2	951	20.1	817	52.3
472	0	682	12.6	952	22.5	818	51.5
473	0	683	15.4	953	25.7	819	51.3
474	0	684	20.1	954	29.0	820	50.9
475	0	685	22.5	955	31.5	821	50.7
476	0	686	24.6	956	34.0	822	49.2
477	0	687	28.2	957	37.2	823	48.3
478	0	688	31.5	958	39.4	824	46.1
479	5.3	689	33.8	959	41.0	825	48.1
480	10.6	690	36.7	960	42.6	826	48.1
481	15.9	691	37.5	961	44.4	827	48.1
482	20.9	692	39.4	962	44.4	828	47.6
483	23.8	693	40.7	963	44.9	829	47.5
484	25.7	694	41.2	964	45.6	830	47.5
485	27.4	695	41.8	965	46.0	831	47.5
486	27.4	696	42.1				

RULES AND REGULATIONS

Time	metres per	Time	metres per	Time	metres per	Time	metres per
(seconds): hour		(seconds): hour		(seconds): hour		(seconds): hour	
832	46.5	820	30.4	1,007	41.0	1,095	11.3
833	46.4	821	37.7	1,008	40.2	1,096	8.0
834	44.0	822	38.6	1,009	33.6	1,097	6.0
835	43.5	823	38.9	1,010	38.1	1,098	4.2
836	41.0	824	37.3	1,011	37.3	1,099	1.6
837	38.1	825	40.1	1,012	39.9	1,100	0
838	35.4	826	40.4	1,013	38.2	1,101	0.2
839	33.0	827	40.6	1,014	35.4	1,102	1.0
840	30.9	828	40.7	1,015	31.8	1,103	2.6
841	30.9	829	41.0	1,016	33.0	1,104	5.8
842	32.3	830	40.6	1,017	28.2	1,105	11.1
843	33.6	831	40.3	1,018	22.9	1,106	16.1
844	34.4	832	40.3	1,019	17.5	1,107	20.6
845	35.4	833	42.2	1,020	12.2	1,108	22.6
846	36.4	834	39.8	1,021	6.9	1,109	23.3
847	37.3	835	39.4	1,022	1.6	1,110	25.7
848	38.6	836	39.1	1,023	0	1,111	29.1
849	40.2	837	39.1	1,024	0	1,112	32.2
850	41.8	838	39.4	1,025	0	1,113	33.8
851	42.8	839	40.2	1,026	0	1,114	34.1
852	42.8	840	40.2	1,027	0	1,115	34.3
853	43.1	841	39.6	1,028	0	1,116	34.4
854	43.0	842	39.6	1,029	0	1,117	34.9
855	43.8	843	38.8	1,030	0	1,118	36.2
856	44.7	844	39.4	1,031	0	1,119	37.0
857	45.3	845	40.4	1,032	0	1,120	38.3
858	46.3	846	41.2	1,033	0	1,121	39.4
859	46.6	847	40.4	1,034	0	1,122	40.2
860	46.7	848	38.6	1,035	0	1,123	40.1
861	46.8	849	35.4	1,036	0	1,124	39.9
862	46.7	850	32.3	1,037	0	1,125	40.2
863	45.3	851	27.2	1,038	0	1,126	40.9
864	44.3	852	21.9	1,039	0	1,127	41.5
865	43.6	853	16.6	1,040	0	1,128	41.8
866	41.6	854	11.3	1,041	0	1,129	42.6
867	40.2	855	6.0	1,042	0	1,130	42.8
868	39.4	856	0.6	1,043	0	1,131	43.3
869	39.9	857	0	1,044	0	1,132	43.6
870	40.4	858	0	1,045	0	1,133	43.6
871	41.0	859	0	1,046	0	1,134	43.5
872	41.4	860	3.3	1,047	0	1,135	43.3
873	42.2	861	8.5	1,048	0	1,136	43.1
874	43.3	862	13.8	1,049	0	1,137	43.1
875	44.3	863	19.2	1,050	0	1,138	42.6
876	44.7	864	24.5	1,051	0	1,139	42.5
877	45.7	865	28.2	1,052	0	1,140	41.8
878	46.7	866	29.9	1,053	1.9	1,141	41.0
879	47.0	867	32.2	1,054	6.4	1,142	39.6
880	46.8	868	34.0	1,055	11.7	1,143	37.8
881	46.7	869	35.4	1,056	17.1	1,144	34.8
882	46.6	870	37.0	1,057	22.4	1,145	33.2
883	46.9	871	39.4	1,058	27.4	1,146	28.2
884	46.2	872	42.3	1,059	29.8	1,147	25.7
885	45.1	873	44.3	1,060	32.2	1,148	22.5
886	45.1	874	45.2	1,061	36.1	1,149	17.2
887	44.4	875	45.7	1,062	37.0	1,150	11.9
888	43.8	876	45.0	1,063	38.6	1,151	6.6
889	42.8	877	45.9	1,064	39.9	1,152	1.3
890	43.6	878	45.9	1,065	41.2	1,153	0
891	44.3	879	44.6	1,066	42.6	1,154	0
892	44.7	880	44.3	1,067	43.1	1,155	0
893	45.1	881	43.8	1,068	44.1	1,156	0
894	44.7	882	43.1	1,069	44.9	1,157	0
895	45.1	883	42.0	1,070	45.5	1,158	0
896	45.1	884	41.8	1,071	45.1	1,159	0
897	45.1	885	41.3	1,072	44.3	1,160	0
898	44.6	886	40.6	1,073	43.5	1,161	0
899	44.1	887	38.6	1,074	43.5	1,162	0
900	43.3	888	35.4	1,075	42.3	1,163	0
901	42.8	889	34.6	1,076	39.4	1,164	0
902	42.6	890	34.6	1,077	36.2	1,165	0
903	42.6	891	35.1	1,078	34.6	1,166	0
904	42.6	892	36.2	1,079	33.2	1,167	0
905	42.3	893	37.0	1,080	29.0	1,168	0
906	42.2	894	36.7	1,081	24.1	1,169	3.4
907	42.2	895	36.7	1,082	19.8	1,170	8.7
908	41.7	896	37.0	1,083	17.9	1,171	14.0
909	41.2	897	36.6	1,084	17.1	1,172	19.3
910	41.2	898	36.6	1,085	16.1	1,173	24.6
911	41.7	899	36.6	1,086	15.3	1,174	29.5
912	41.6	900	37.8	1,087	14.6	1,175	34.0
913	41.0	1,001	38.6	1,088	14.0	1,176	37.9
914	39.6	1,002	39.6	1,089	13.8	1,177	37.8
915	37.8	1,003	39.9	1,090	14.2	1,178	37.3
916	35.7	1,004	40.4	1,091	14.6	1,179	36.2
917	34.8	1,005	41.0	1,092	14.0	1,180	32.2
918	34.8	1,006	41.9	1,093	13.8	1,181	26.9
919	31.9			1,094	12.9	1,182	21.6

Time (seconds): hour	Speed (kilo- metres per hour)	Time (seconds): hour	Speed (kilo- metres per hour)	Time (seconds): hour	Speed (kilo- metres per hour)	Time (seconds): hour	Speed (kilo- metres per hour)
1.183	16.3	1.231	31.5	1.279	39.4	1.327	0
1.184	10.9	1.232	31.9	1.280	39.4	1.328	0
1.185	5.6	1.233	32.2	1.281	38.6	1.329	0
1.186	0.3	1.234	31.4	1.282	37.6	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	29.2	1.285	37.8	1.333	0
1.190	0	1.238	16.1	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	0.7	1.288	38.0	1.336	0
1.193	0	1.241	6.4	1.289	38.8	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	40.9	1.341	18.3
1.198	2.4	1.246	0	1.294	41.2	1.342	21.2
1.199	5.6	1.247	0	1.295	41.4	1.343	24.3
1.200	10.5	1.248	0	1.296	41.8	1.344	27.0
1.201	16.8	1.249	0	1.297	42.2	1.345	29.5
1.202	19.3	1.250	0	1.298	43.5	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	1.0	1.301	46.7	1.349	35.2
1.206	20.6	1.254	1.6	1.302	46.8	1.350	35.6
1.207	21.1	1.255	1.6	1.303	46.7	1.351	36.0
1.208	21.1	1.256	1.6	1.304	45.1	1.352	35.4
1.209	22.5	1.257	2.6	1.305	39.8	1.353	34.8
1.210	24.9	1.258	4.8	1.306	34.4	1.354	34.0
1.211	27.4	1.259	6.4	1.307	29.1	1.355	33.0
1.212	29.9	1.260	8.0	1.308	23.8	1.356	32.2
1.213	31.7	1.261	10.1	1.309	18.5	1.357	31.5
1.214	33.8	1.262	12.9	1.310	13.2	1.358	29.8
1.215	34.6	1.263	16.1	1.311	7.9	1.359	28.2
1.216	35.1	1.264	16.9	1.312	2.6	1.360	26.6
1.217	35.1	1.265	15.3	1.313	0	1.361	24.9
1.218	34.6	1.266	13.7	1.314	0	1.362	22.5
1.219	34.1	1.267	12.2	1.315	0	1.363	17.7
1.220	34.6	1.268	14.2	1.316	0	1.364	12.9
1.221	35.1	1.269	17.7	1.317	0	1.365	8.4
1.222	35.4	1.270	21.5	1.318	0	1.366	4.0
1.223	35.2	1.271	27.4	1.319	0	1.367	0
1.224	34.9	1.272	31.4	1.320	0	1.368	0
1.225	34.6	1.273	33.8	1.321	0	1.369	0
1.226	34.6	1.274	35.1	1.322	0	1.370	0
1.227	34.4	1.275	35.7	1.323	0	1.371	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 (kilo- metres per hour)	Time (seconds): hour	Speed (kilo- metres per hour)	Time (seconds): hour	Speed (kilo- metres per hour)	Time (seconds): hour	Speed (kilo- metres 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	33.3	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	35.8	46	34.0
8	0	21	4.8	34	34.6	47	36.6
9	0	22	9.5	35	33.6	48	36.9
10	0	23	13.8	36	32.8	49	36.5
11	0	24	18.5	37	31.9	50	36.4
12	0	25	23.0	38	27.4	51	34.3
13	9	26	27.2	39	24.0	52	30.6

RULES AND REGULATIONS

Time	Speed (kilometres per hour)	Time	Speed (kilometres per hour)	Time	Speed (kilometres per hour)	Time	Speed (kilometres per hour)
53	27.6	137	0	221	53.4	306	46.6
54	28.4	138	0	222	52.6	308	45.4
55	28.6	139	0	223	53.4	307	44.1
56	28.6	140	0	224	54.1	308	43.0
57	31.9	141	0	225	55.1	309	41.8
58	34.8	142	0	226	56.0	310	39.9
59	37.3	143	0	227	56.6	311	38.2
60	38.9	144	0	228	56.9	312	36.5
61	39.6	145	0	229	57.0	313	35.0
62	40.1	146	0	230	56.9	314	33.7
63	40.2	147	0	231	56.6	315	32.6
64	39.6	148	0	232	56.6	316	31.7
65	39.4	149	0	233	56.5	317	31.6
66	39.8	150	0	234	57.1	318	31.1
67	39.9	151	0	235	57.5	319	30.0
68	39.8	152	0	236	57.7	320	28.6
69	39.6	153	0	237	58.1	321	26.7
70	39.6	154	0	238	58.3	322	23.2
71	40.4	155	0	239	58.6	323	20.8
72	41.2	156	0	240	58.7	324	18.6
73	41.4	157	0	241	58.7	325	19.2
74	40.9	158	0	242	58.5	326	17.6
75	40.1	159	0	243	58.5	327	16.1
76	40.2	160	0	244	58.6	328	12.9
77	40.9	161	0	245	58.5	329	11.2
78	41.8	162	0	246	58.5	330	8.3
79	41.8	163	0	247	58.5	331	4.9
80	41.4	164	3.4	248	58.4	332	1.6
81	42.0	165	6.8	249	58.1	333	0
82	43.0	166	10.3	250	57.8	334	0
83	44.2	167	13.7	251	57.1	335	0
84	45.0	168	17.1	252	56.6	336	0
85	47.2	169	20.5	253	56.2	337	0
86	48.0	170	23.0	254	55.9	338	0
87	48.1	171	25.2	255	55.6	339	0
88	48.9	172	26.7	256	55.5	340	0
89	49.4	173	27.4	257	55.8	341	0
90	49.4	174	26.6	258	55.9	342	0
91	49.1	175	26.0	259	56.0	343	0
92	48.9	176	25.6	260	56.0	344	0
93	48.8	177	25.0	261	55.7	345	0
94	48.9	178	26.1	262	55.3	346	0
95	49.0	179	26.3	263	54.9	347	1.6
96	48.9	180	26.7	264	54.5	348	6.9
97	48.1	181	28.2	265	54.0	349	12.2
98	47.5	182	27.5	266	54.3	350	17.5
99	48.0	183	24.9	267	53.9	351	22.9
100	48.8	184	23.5	268	53.8	352	27.8
101	49.4	185	20.1	269	53.6	353	32.2
102	49.7	186	18.3	270	53.4	354	36.2
103	49.9	187	17.8	271	53.5	355	38.1
104	49.7	188	18.8	272	53.7	356	40.6
105	49.9	189	19.3	273	54.0	357	42.8
106	49.9	190	20.7	274	54.4	358	45.2
107	48.1	191	23.0	275	54.9	359	48.2
108	48.6	192	25.4	276	56.4	360	49.6
109	49.4	193	28.3	277	55.9	361	50.9
110	50.2	194	31.6	278	56.9	362	51.7
111	51.2	195	34.7	279	57.4	363	52.8
112	51.8	196	37.6	280	57.5	364	54.1
113	52.1	197	38.6	281	58.0	365	55.6
114	51.8	198	40.7	282	58.0	366	55.7
115	51.0	199	42.0	283	57.8	367	56.2
116	46.0	200	43.6	284	57.2	368	56.0
117	40.7	201	45.1	285	56.5	369	55.5
118	35.4	202	46.7	286	56.5	370	55.8
119	30.1	203	47.7	287	54.4	371	57.1
120	24.8	204	48.5	288	53.4	372	57.9
121	19.5	205	49.2	289	53.4	373	57.9
122	14.2	206	49.2	290	53.4	374	57.9
123	8.9	207	49.0	291	52.9	375	57.9
124	3.5	208	48.9	292	51.9	376	57.9
125	0	209	48.7	293	51.6	377	57.9
126	0	210	48.7	294	51.9	378	58.1
127	0	211	48.7	295	51.8	379	58.6
128	0	212	48.7	296	51.4	380	58.7
129	0	213	48.7	297	51.2	381	58.6
130	0	214	48.9	298	51.2	382	57.9
131	0	215	49.1	299	51.2	383	56.5
132	0	216	49.6	300	50.9	384	54.9
133	0	217	50.2	301	50.3	385	53.9
134	0	218	50.9	302	49.5	386	50.5
135	0	219	51.2	303	48.9	387	46.7
136	0	220	51.8	304	47.6	388	41.4

Time	Speed (kilo- metres per second): hour	Time	Speed (kilo- metres per second): hour	Time	Speed (kilo- metres per second): hour	Time	Speed (kilo- metres per second): hour
389	37.0	473	57.1	557	0	641	0
390	32.7	474	57.0	558	0	642	0
391	28.2	475	56.6	559	0	643	0
392	23.3	476	56.6	560	0	644	0
393	19.3	477	56.6	561	0	645	0
394	14.0	478	56.6	562	0	646	3.2
395	8.7	479	56.6	563	0	647	7.2
396	3.4	480	56.6	564	0	648	12.6
397	0	481	56.3	565	0	649	16.4
398	0	482	56.5	566	0	650	20.1
399	0	483	56.5	567	0	651	22.8
400	0	484	57.1	568	0	652	24.6
401	0	485	56.6	569	5.3	653	28.2
402	0	486	56.3	570	10.6	654	31.6
403	4.2	487	56.3	571	15.9	655	33.8
404	9.5	488	56.3	572	20.9	656	35.7
405	14.8	489	56.0	573	23.5	657	37.5
406	20.1	490	55.7	574	25.7	658	39.4
407	25.4	491	55.6	575	27.4	659	40.7
408	30.7	492	53.9	576	27.4	660	41.2
409	36.0	493	51.5	577	27.4	661	41.8
410	40.2	494	48.4	578	28.2	662	42.0
411	41.2	495	45.1	579	28.5	663	42.2
412	44.3	496	41.0	580	28.6	664	42.2
413	45.7	497	38.2	581	28.2	665	42.5
414	48.3	498	31.9	582	27.4	666	42.6
415	48.4	499	26.6	583	27.2	667	42.6
416	48.3	500	21.2	584	26.7	668	41.8
417	47.8	501	16.6	585	27.4	669	41.0
418	47.2	502	11.6	586	27.5	670	38.0
419	46.3	503	6.4	587	27.4	671	34.4
420	45.1	504	1.6	588	26.7	672	29.8
421	40.3	505	0	589	26.6	673	26.4
422	34.9	506	0	590	26.6	674	23.3
423	29.6	507	0	591	26.7	675	18.7
424	24.3	508	0	592	27.4	676	14.0
425	19.0	509	0	593	28.3	677	9.3
426	13.7	510	0	594	29.8	678	5.6
427	8.4	511	1.9	595	30.9	679	3.2
428	3.1	512	5.8	596	32.5	680	0
429	0	513	8.9	597	33.8	681	0
430	0	514	10.5	598	34.0	682	0
431	0	515	13.7	599	34.1	683	0
432	0	516	15.4	600	34.8	684	0
433	0	517	16.9	601	35.4	685	0
434	0	518	19.2	602	36.0	686	0
435	0	519	22.6	603	36.2	687	0
436	0	520	25.7	604	36.2	688	0
437	0	521	28.5	605	36.2	689	0
438	0	522	30.6	606	36.5	690	0
439	0	523	32.3	607	38.1	691	0
440	0	524	33.8	608	40.4	692	0
441	0	525	35.4	609	41.8	693	0
442	0	526	37.0	610	42.6	694	2.3
443	0	527	38.3	611	43.5	695	5.3
444	0	528	39.4	612	42.0	696	7.1
445	0	529	40.1	613	36.7	697	10.5
446	0	530	40.3	614	31.4	698	14.8
447	0	531	40.2	615	26.1	699	18.2
448	5.3	532	40.2	616	20.8	700	21.7
449	10.6	533	40.2	617	15.4	701	23.5
450	15.9	534	40.2	618	10.1	702	26.4
451	21.2	535	40.2	619	4.8	703	26.9
452	26.6	536	41.2	620	0	704	26.6
453	31.9	537	41.5	621	0	705	26.6
454	37.2	538	41.8	622	0	706	29.3
455	42.5	539	41.2	623	0	707	30.9
456	44.7	540	40.6	624	0	708	32.3
457	46.8	541	40.2	625	0	709	34.6
458	50.7	542	40.2	626	0	710	36.2
459	53.1	543	40.2	627	0	711	36.2
460	54.1	544	39.3	628	0	712	35.0
461	56.0	545	37.2	629	0	713	36.6
462	56.5	546	31.9	630	0	714	37.5
463	57.3	547	26.6	631	0	715	37.8
464	58.1	548	21.2	632	0	716	36.2
465	57.9	549	15.9	633	0	717	34.0
466	58.1	550	10.6	634	0	718	33.0
467	58.3	551	6.3	635	0	719	28.0
468	57.9	552	0	636	0	720	24.1
469	57.5	553	0	637	0	721	19.3
470	57.2	554	0	638	0	722	14.6
471	57.9	555	0	639	0	723	10.0
472	57.3	556	0	640	0	724	7.3

RULES AND REGULATIONS

Time	Speed (kilo- metres per second): hour	Time	Speed (kilo- metres per second): hour	Time	Speed (kilo- metres per second): hour	Time	Speed (kilo- metres per second): hour
725	4.8	809	55.2	893	45.1	976	45.9
726	3.4	810	55.0	894	44.7	977	45.9
727	0.8	811	54.7	895	45.1	978	45.9
728	0.8	812	54.7	896	45.1	979	44.6
729	5.1	813	54.6	897	45.1	980	44.3
730	10.5	814	54.1	898	44.6	981	43.8
731	18.4	815	53.3	899	44.1	982	43.1
732	20.1	816	53.1	900	43.3	983	42.6
733	22.5	817	52.3	901	42.8	984	41.8
734	25.7	818	51.5	902	42.6	985	41.4
735	29.0	819	51.3	903	42.6	986	40.6
736	31.5	820	50.9	904	42.6	987	39.6
737	34.0	821	50.7	905	42.3	988	38.4
738	37.2	822	49.3	906	42.2	989	34.6
739	39.4	823	48.3	907	42.2	990	34.6
740	41.0	824	48.1	908	41.7	991	35.1
741	42.6	825	48.1	909	41.2	992	36.2
742	43.6	826	48.1	910	41.2	993	37.0
743	44.4	827	48.1	911	41.7	994	36.7
744	44.9	828	47.6	912	41.5	995	37.0
745	45.5	829	47.5	913	41.0	996	36.5
746	46.0	830	47.5	914	39.6	997	36.5
747	46.0	831	47.2	915	37.8	998	36.5
748	45.5	832	46.5	916	35.7	999	37.8
749	45.4	833	45.4	917	34.8	1,000	38.6
750	45.1	834	41.0	918	34.0	1,001	39.0
751	44.3	835	43.5	919	34.0	1,002	39.2
752	43.1	836	41.0	920	37.7	1,003	40.4
753	41.0	837	38.1	921	38.6	1,004	41.0
754	37.8	838	35.4	922	38.9	1,005	41.2
755	34.6	839	33.0	923	39.3	1,006	40.2
756	30.6	840	32.3	924	40.4	1,007	38.8
757	26.6	841	33.6	925	40.7	1,008	38.1
758	24.0	842	35.4	926	41.0	1,009	37.9
759	20.1	843	36.4	927	40.2	1,010	36.9
760	15.1	844	37.3	928	40.2	1,011	36.2
761	10.0	845	38.6	929	40.2	1,012	35.4
762	4.8	846	40.2	930	40.2	1,013	34.6
763	2.4	847	41.8	931	39.6	1,014	33.0
764	2.4	848	42.8	932	39.4	1,015	28.2
765	0.8	849	42.8	933	39.1	1,016	22.9
766	0	850	43.1	934	39.1	1,017	17.5
767	4.8	851	43.6	935	39.4	1,018	12.2
768	10.1	852	43.8	936	39.4	1,019	6.9
769	15.4	853	43.8	937	40.2	1,020	1.6
770	20.8	854	44.7	938	40.2	1,021	0
771	25.4	855	45.2	939	40.2	1,022	0
772	28.2	856	45.2	940	39.6	1,023	0
773	29.6	857	45.3	941	39.6	1,024	0
774	31.4	858	46.5	942	38.8	1,025	0
775	33.3	859	46.7	943	39.4	1,026	0
776	35.4	860	46.7	944	40.4	1,027	0
777	37.3	861	46.7	945	41.2	1,028	0
778	40.2	862	45.2	946	40.4	1,029	0
779	42.6	863	44.3	947	38.6	1,030	0
780	44.3	864	43.5	948	35.4	1,031	0
781	45.1	865	41.5	949	32.3	1,032	0
782	45.5	866	40.2	950	27.2	1,033	0
783	46.5	867	39.4	951	21.9	1,034	0
784	46.5	868	40.4	952	16.0	1,035	0
785	46.3	869	41.0	953	11.3	1,036	0
786	46.3	870	41.4	954	6.0	1,037	0
787	45.9	871	42.2	955	0.6	1,038	0
788	45.5	872	43.3	956	0	1,039	0
789	45.5	873	44.3	957	0	1,040	0
790	45.5	874	44.7	958	0	1,041	0
791	44.4	875	45.7	959	3.2	1,042	0
792	44.3	876	46.7	960	8.5	1,043	0
793	44.3	877	47.0	961	13.8	1,044	0
794	44.3	878	46.8	962	19.2	1,045	0
795	44.3	879	46.7	963	24.5	1,046	0
796	44.3	880	46.5	964	28.2	1,047	0
797	44.3	881	45.9	965	29.9	1,048	0
798	44.3	882	45.2	966	32.2	1,049	0
799	44.3	883	45.1	967	34.0	1,050	0
800	45.1	884	44.4	968	35.4	1,051	0
801	45.9	885	43.8	969	37.0	1,052	0
802	48.3	886	42.8	970	39.4	1,053	1.9
803	49.9	887	42.6	971	42.3	1,054	6.4
804	51.5	888	44.3	972	44.3	1,055	11.7
805	53.1	889	44.7	973	45.2	1,056	17.1
806	53.1	890	45.7	974	45.7	1,057	22.4
807	54.1	891	46.7	975	45.7	1,058	27.4
808	54.7	892	46.7				

Time	Speed (kilo- metres per hour)	Time	Speed (kilo- metres per hour)	Time	Speed (kilo- metres per hour)	Time	Speed (kilo- metres per hour)
1.059	29.8	1.141	41.9	1.224	34.9	1.306	43.5
1.060	32.2	1.142	39.6	1.225	34.0	1.309	44.7
1.061	35.1	1.143	37.8	1.226	34.0	1.300	45.5
1.062	37.0	1.144	34.8	1.227	34.4	1.301	46.7
1.063	38.6	1.145	32.2	1.228	32.3	1.302	46.8
1.064	39.9	1.146	28.2	1.229	31.4	1.303	45.7
1.065	41.2	1.147	25.7	1.230	30.0	1.304	45.1
1.066	42.8	1.148	23.5	1.231	31.5	1.305	39.8
1.067	43.1	1.149	17.2	1.232	31.0	1.306	34.4
1.068	44.1	1.150	11.9	1.233	32.2	1.307	29.1
1.069	44.9	1.151	6.6	1.234	31.4	1.308	33.6
1.070	45.5	1.152	1.2	1.235	28.2	1.309	18.5
1.071	45.1	1.153	0	1.236	24.9	1.310	13.2
1.072	44.3	1.154	0	1.237	20.9	1.311	7.9
1.073	43.5	1.155	0	1.238	16.1	1.312	2.6
1.074	43.5	1.156	0	1.239	12.0	1.313	0
1.075	42.3	1.157	0	1.240	0.7	1.314	0
1.076	39.4	1.158	0	1.241	6.4	1.315	0
1.077	36.2	1.159	0	1.242	4.0	1.316	0
1.078	34.0	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	9	1.245	0	1.319	0
1.081	24.1	1.163	9	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	15.2	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	13.0	1.171	14.0	1.254	1.6	1.328	0
1.090	14.2	1.172	10.2	1.255	1.6	1.329	0
1.091	14.6	1.173	24.0	1.256	1.6	1.330	0
1.092	14.0	1.174	29.0	1.257	2.6	1.331	0
1.093	13.8	1.175	34.0	1.258	4.8	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	8.8	1.179	35.2	1.262	12.0	1.336	0
1.098	4.2	1.180	32.2	1.263	16.1	1.337	0
1.099	1.0	1.181	26.9	1.264	16.9	1.338	2.4
1.100	0.9	1.182	21.6	1.265	16.3	1.339	7.7
1.101	0.2	1.183	16.3	1.266	13.7	1.340	13.0
1.102	1.0	1.184	10.9	1.267	13.2	1.341	18.3
1.103	2.6	1.185	5.6	1.268	14.2	1.342	21.2
1.104	5.6	1.186	0.3	1.269	17.7	1.343	24.3
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	38.6	1.347	32.7
1.109	23.3	1.011	0	1.274	36.1	1.348	34.2
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	33.2	1.195	0.0	1.278	38.8	1.352	35.4
1.114	33.8	1.196	0.0	1.279	39.4	1.353	34.8
1.115	34.1	1.197	0.3	1.280	39.4	1.354	34.0
1.116	34.3	1.198	2.4	1.281	38.6	1.355	33.0
1.117	34.4	1.199	5.6	1.282	37.8	1.356	32.2
1.118	34.9	1.200	10.5	1.283	37.8	1.357	31.5
1.119	35.2	1.201	15.8	1.284	37.8	1.358	29.8
1.120	37.0	1.202	19.3	1.285	37.6	1.359	28.2
1.121	38.3	1.203	20.0	1.286	37.8	1.360	26.6
1.122	39.4	1.204	20.9	1.287	37.8	1.361	24.9
1.123	40.2	1.205	20.2	1.288	38.6	1.362	22.6
1.124	40.1	1.206	20.6	1.289	38.8	1.363	17.7
1.125	39.9	1.207	21.1	1.290	39.4	1.364	12.0
1.126	40.2	1.208	21.1	1.291	39.8	1.365	8.4
1.127	40.0	1.209	22.5	1.292	40.2	1.366	4.0
1.128	41.5	1.210	24.9	1.293	40.9	1.367	0
1.129	41.8	1.211	27.4	1.294	41.2	1.368	0
1.130	42.5	1.212	29.9	1.295	41.4	1.369	0
1.131	42.8	1.213	31.7	1.296	41.6	1.370	0
1.132	43.3	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	43.2	1.217	34.6				
1.136	43.1	1.218	34.1				
1.137	43.1	1.219	34.6				
1.138	42.6	1.220	35.1				
1.139	42.5	1.221	35.4				
1.140	41.8	1.222	35.2				

RULES AND REGULATIONS

2. Appendix IV is revised to read as follows:

APPENDIX IV—DURABILITY DRIVING SCHEDULES

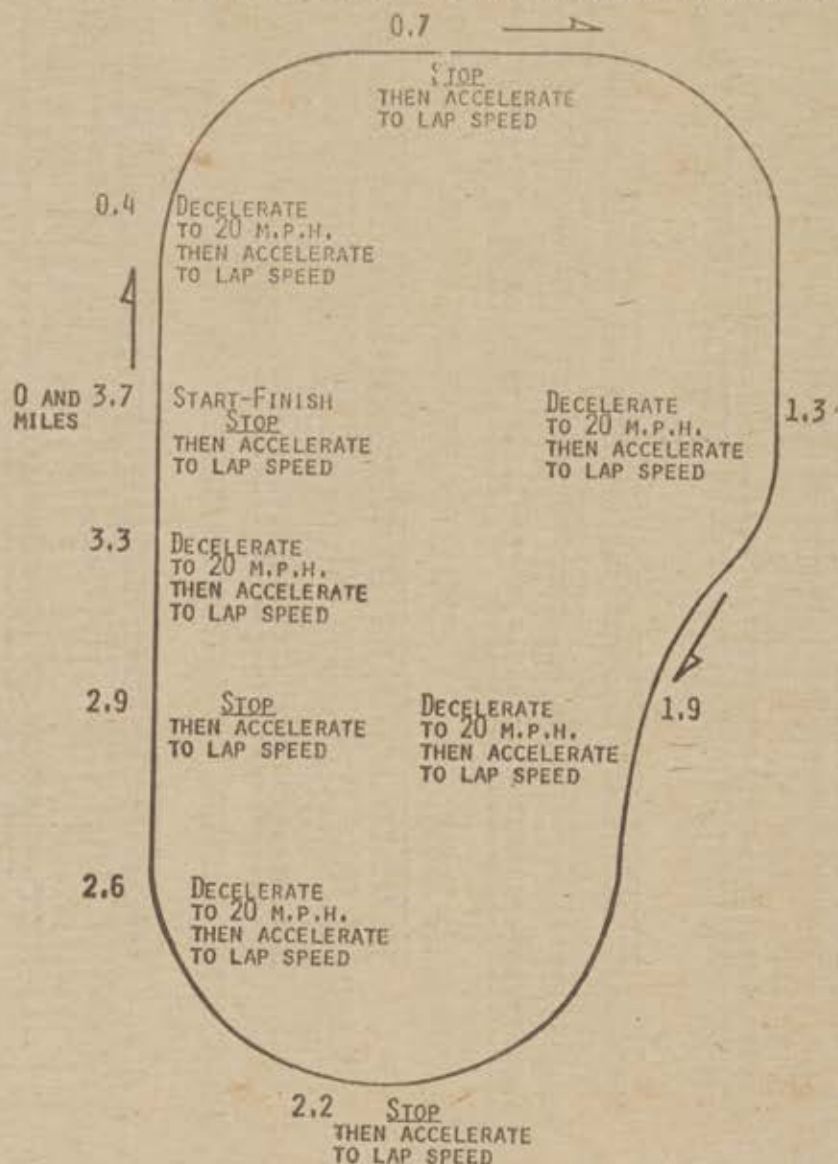
(a) Durability Driving Schedule for Light Duty Vehicles and Light Duty Trucks.

The schedule consists basically of 11 laps of a 3.7 mile course. The base vehicle speed for each lap is listed below:

Lap:	Speed miles per hour
1	40
2	30
3	40
4	40

Lap:	Speed miles per hour
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

The 10th lap is run at a constant speed of 80 m.p.h.

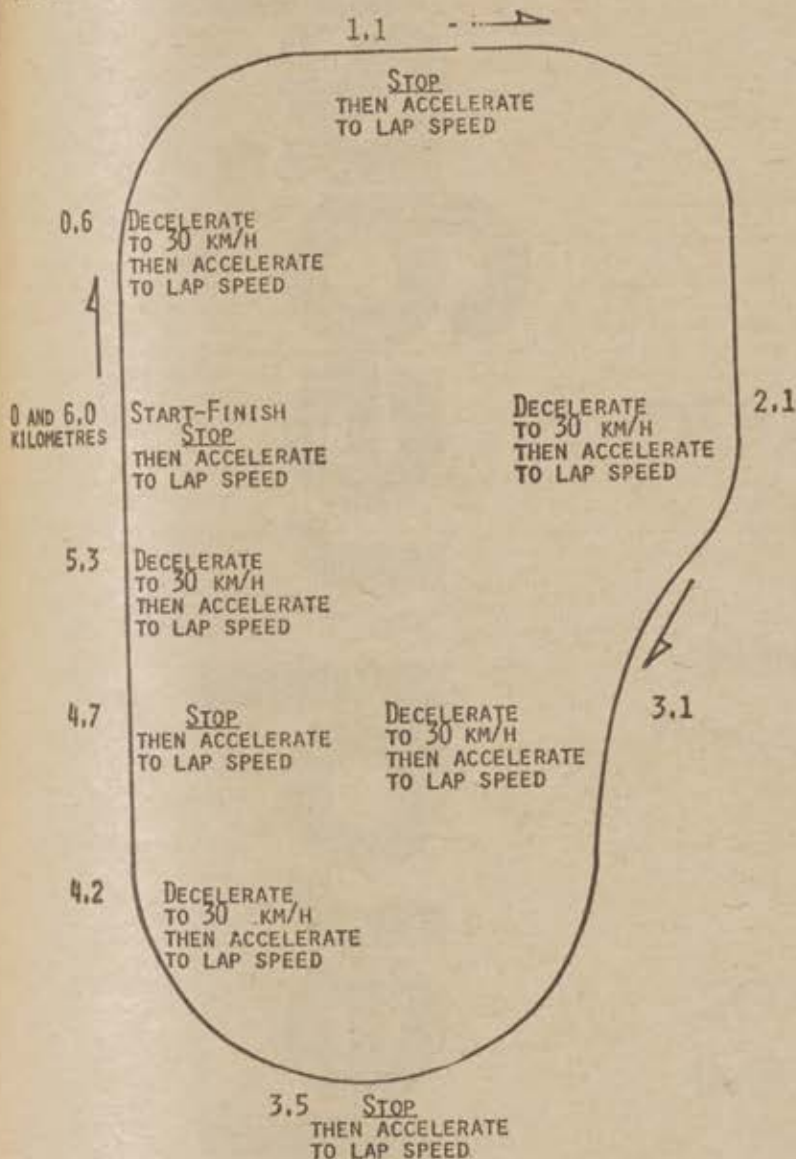
The 11th lap is begun with a wide open throttle acceleration from stop to 70 m.p.h. A normal deceleration to idle followed by a second wide open throttle acceleration occurs at the midpoint of the lap.

(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:

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



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 midpoint of the lap.

This schedule may be modified with the advance approval of the Administrator if it results in unsafe operation of the vehicle.

3. Appendix VI is revised to read as follows:

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.

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