

(2) The manufacturers may develop a service accumulation methods based upon whole-vehicle full-mileage accumulation, whole vehicle accelerated mileage accumulation (e.g., where 40,000 miles on a severe mileage accumulation cycle is equivalent to 100,000 miles of normal in-use driving), bench aging of individual components or systems, or other approaches approved by the Administrator.

(i) For whole vehicle mileage accumulation programs, all emission control components and systems (including both hardware and software) must be installed and operating for the entire mileage accumulation period.

(ii) Bench procedures shall simulate the aging of components or systems over the applicable useful life and shall simulate driving patterns and vehicle operational environments found in actual use. For this purpose, manufacturers may remove the emission-related components (and other components), in whole or in part, from the durability vehicle itself and deteriorate them independently. Vehicle testing for the purpose of determining deterioration factors may include the testing of durability vehicles that incorporate such bench-aged components.

(b) *Vehicle/component selection method.* The manufacturer shall determine a vehicle and component selection procedure which results in representative test vehicles and reflects good engineering judgment.

(c) The manufacturer shall calculate a deterioration factor which is applied to the refueling emission results of the emission data vehicles. The deterioration factor shall be based on a linear regression, or an other regression technique approved in advance by the Administrator. The DF will be calculated to be the difference between the full life mileage refueling loss emission level minus the stabilized mileage (e.g., 4000-mile) refueling loss emission level from the regression analysis. The DF and the full and stabilized mileage emission levels shall be rounded to two decimal places of accuracy in accordance with the Rounding-Off Method specified in ASTM E29-93a, Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications (incorporated by

reference, see § 86.1(b)(1). Calculated DF values of less than zero shall be changed to zero for the purposes of this paragraph.

(d) The durability process described in paragraph (a) of this section must be described in the application for certification under the provisions of § 86.1844-01.

(e) *Emission component durability.* The manufacturer shall use good engineering judgment to determine that all emission-related components are designed to operate properly for the full useful life of the vehicles in actual use.

(f) *In-use verification.* The durability program must meet the requirements of § 86.1845-01.

(g) Information obtained under §§ 86.1845-01, 86.1846-01, 86.1847-01 or from other sources shall be used by the manufacturer in developing new durability processes and/or updating existing durability processes using good engineering judgment.

[64 FR 23925, May 4, 1999, as amended at 65 FR 59974, Oct. 6, 2000]

**§ 86.1826-01 Assigned deterioration factors for small volume manufacturers and small volume test groups.**

(a) *Applicability.* This program is an option available to small volume manufacturers certified under the small volume manufacturer provisions of § 86.1838-01(b)(1) and small volume test groups certified under the small volume test group provisions of § 86.1838-01(b)(2). Manufacturers may elect to use these procedures in lieu of the requirements of §§ 86.1823-01, 86.1824-01, and 86.1825-01 of this subpart.

(b) *Determination of deterioration factors.* No service accumulation method or vehicle/component selection method is required. Deterioration factors for all types of regulated emissions are determined using the provisions in this paragraph. A separate assigned deterioration factor is required for each durability group. Manufacturers shall use good engineering judgment in determining deterioration factors.

(1) Manufacturers with aggregated sales of less than 301 motor vehicles and motor vehicle engines per year (determined under the provisions of

§ 86.1838-01(b)) may use assigned deterioration factors that the Administrator determines and prescribes.

(i) The deterioration factors will be the Administrator's estimate, periodically updated and published in a guidance document or advisory circular, of the 70th percentile deterioration factors calculated using the industry-wide data base of previously completed durability data vehicles or engines used for certification.

(ii) If there is insufficient deterioration information to calculate an appropriate industry-wide deterioration factor (for example: a new engine technology coupled with a proven emission control system), the Administrator may, at his/her discretion, use alternative methods to develop a deterioration factor.

(2) Manufacturers with aggregated sales from and including 301 through 14,999 motor vehicles and motor vehicle engines per year (determined under the provisions of § 86.1838-01(b)) certifying vehicles equipped with proven emission control systems shall conform to the following provisions:

(i) Manufacturers shall use assigned deterioration factors that the manufacturer determines based on its good engineering judgment.

(A) The manufacturer may not use deterioration factors less than either the average or 70th percentile of all of that manufacturer's deterioration factor data, whichever is less. These minimum deterioration factors shall be calculated according to procedures in paragraph (b)(2)(ii), of this section.

(B) If the manufacturer does not have at least two data points to calculate these manufacturer specific average deterioration factors, then the deterioration factors shall be no less than the EPA supplied industry-wide deterioration factors.

(C) If there is insufficient deterioration information to calculate an appropriate industry-wide deterioration factor (for example, a new engine technology coupled with a proven emission control system), the Administrator may, at his/her discretion, use alternative methods to develop a deterioration factor.

(ii) The manufacturer's minimum deterioration factors shall be calculated

using the deterioration factors from all durability groups, within the same vehicle/engine-fuel usage category (e.g., gasoline-fueled light-duty vehicle, etc.) previously certified to the same emission standards.

(A) The manufacturer shall use only deterioration factors from durability groups whose test groups were previously certified by the manufacturer and the deterioration factors shall not be included in the calculation more than once.

(B) The deterioration factors for each pollutant shall be calculated separately.

(C) The manufacturer may, at its option, limit the deterioration factors used in the calculation of the manufacturer's minimum deterioration factors to those from all similar emission control systems to the system being certified if sufficient data (i.e., from at least two certified systems) exists.

(D) All data eligible to be grouped as similar emission control system data shall be used in calculating similar system deterioration factors.

(E) Any deterioration factors used in calculating similar system deterioration factors shall not be included in calculating the manufacturer's minimum deterioration factors used to certify any of the manufacturer's remaining vehicle systems.

(3) Manufacturers with aggregated sales from 301 through 14,999 motor vehicles and motor vehicle engines per year (determined under the provisions of § 86.1838-01(b)) certifying vehicles equipped with unproven emission control systems shall conform to the following provisions:

(i) The manufacturer shall use deterioration factors that the manufacturer determines from official certification durability data generated by vehicles from durability groups representing a minimum of 25 percent of the manufacturer's sales equipped with unproven emission control systems.

(ii) The sales projections are to be based on total sales projected for each test group.

(iii) The durability data vehicle mileage accumulation and emission tests are to be conducted in accordance with § 86.1831-01.

**§ 86.1827-01**

**40 CFR Ch. I (7-1-04 Edition)**

(iv) The manufacturer must develop either deterioration factors or aged components to use on EDV testing by generating durability data in accordance with § 86.1823-01, 86.1824-01, and/or 86.1825-01 on a minimum of 25 percent of the manufacturer's projected sales (based on durability groups) that is equipped with unproven emission control systems.

(v) The manufacturer must complete the 25 percent durability requirement before the remainder of the manufacturer's sales equipped with unproven emission control systems is certified using manufacturer-determined assigned deterioration factors.

(c) *Emission component durability.* The manufacturer shall use good engineering judgment to determine that all emission-related components are designed to operate properly for the useful life of the vehicles in actual use (or alternative intervals as permitted in § 86.1805-01).

[64 FR 23925, May 4, 1999, as amended at 65 FR 59974, Oct. 6, 2000]

**§ 86.1827-01 Test group determination.**

This section applies to the grouping of vehicles into test groups within a durability group. The vehicles covered by an application within a durability group shall be divided into test groups based on the following criteria. The manufacturer shall use good engineering judgment in grouping vehicles into test groups.

(a) To be included in the same test group, vehicles must be identical in all following respects:

- (1) Durability group;
- (2) Engine displacement (within a total band width of 15 percent of the largest displacement or 50 CID, whichever is larger);
- (3) Number of cylinders or combustion chambers;
- (4) Arrangement of cylinders or combustion chambers (e.g. in-line, v-shaped);
- (5) Subject to the same emission standards, except that a manufacturer may request to group vehicles into the same test group as vehicles subject to more stringent standards, so long as all the vehicles within the test group are certified to the most stringent standards applicable to any vehicle within

that test group. Light-duty trucks which are subject to the same emission standards as light-duty vehicles with the exception of the light-duty truck idle CO standard and/or total HC standard may be included in the same test group.

(b) Where vehicles are of a type which cannot be divided into test groups based on the criteria listed above (such as non-cylinder engines), the Administrator will establish test groups for those vehicles based upon the features most related to their exhaust emission characteristics.

(c) Manufacturers may further divide groups determined under paragraph (a) of this section providing the Administrator is notified in advance of any such changes in writing.

(d) Manufacturers may request the Administrator's approval to combine vehicles into a single test group which would normally not be eligible to be in a single test group. The petition should provide:

- (1) Substantial evidence that all the vehicles in the larger grouping will have the similar levels of emissions;
- (2) Evidence of equivalent component durability over the vehicle's useful life;
- (3) Evidence that the groups will result in sufficient in-use verification program data, appropriate tracking in use, and clear liability for the Agency's recall program; and
- (4) A statement that all vehicles within a test group are certified to the most stringent standards applicable to any vehicle within that test group.

(e) Unless otherwise approved by the Administrator, a manufacturer of hybrid electric vehicles must create separate test groups based on both the type of battery technology employed by the HEV and upon features most related to their exhaust emission characteristics.

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**§ 86.1828-01 Emission data vehicle selection.**

(a) *FTP and SFTP testing.* Within each test group, the vehicle configuration shall be selected which is expected to be worst-case for exhaust emission compliance on candidate in-use vehicles, considering all exhaust emission