

(b) [Reserved]

**§ 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.

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

(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.

**§ 86.419–2006 Engine displacement, motorcycle classes.**

(a)(1) Engine displacement shall be calculated using nominal engine values and rounded to the nearest whole cubic centimeter, in accordance with ASTM E 29–93a (incorporated by reference in § 86.1).

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

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

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

(1) Class I—0 to 169 cc (0 to 10.4 cu. in.).

(i) Class I motorcycles with engine displacement less than 50 cc comprise the Class I-A subclass.

(ii) Class I motorcycles with engine displacement 50 cc or higher comprise the Class I-B subclass.

(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 and compliance with emission standards will be determined on the basis of engine displacement.

[69 FR 2437, Jan. 15, 2004]

**§ 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.

(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

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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.
- (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 fea-

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tures most related to their emission characteristics.

[42 FR 1126, Jan. 5, 1977, as amended at 44 FR 48205, Aug. 17, 1979]

**§ 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 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.