

kW, the useful life is 150 hours of operation or 3 years, whichever comes first.

(2) For conventional sterndrive/inboard engines, the minimum useful life is 480 hours of operation or ten years, whichever comes first. However, you may request in your application for certification that we approve a shorter useful life for an engine family. We may approve a shorter useful life, in hours of engine operation but not in years, if we determine that these engines will rarely operate longer than the shorter useful life. If engines identical to those in the engine family have already been produced and are in use, your demonstration must include documentation from such in-use engines. In other cases, your demonstration must include an engineering analysis of information equivalent to such in-use data, such as data from research engines or similar engine models that are already in production. Your demonstration must also include any overhaul interval that you recommend, any mechanical warranty that you offer for the engine or its components, and any relevant customer design specifications. Your demonstration may include any other relevant information. The useful life value may not be shorter than any of the following:

- (i) 150 hours of operation.
- (ii) Your recommended overhaul interval.
- (iii) Your mechanical warranty for the engine.

(3) You must specify a longer useful life for conventional sterndrive/inboard engines in terms of hours if the average service life of engines from the engine family is longer than the minimum useful life value, as follows:

(i) Except as allowed by paragraph (e)(3)(ii) of this section, your useful life (in hours) may not be less than either of the following:

(A) Your projected operating life from advertisements or other marketing materials for any engines in the engine family.

(B) Your basic mechanical warranty for any engines in the engine family.

(ii) Your useful life may be based on the average service life of engines in the engine family if you show that the average service life is less than the useful life required by paragraph (e)(3)(i)

of this section, but more than the minimum useful life (480 hours of engine operation). In determining the actual average service life of engines in an engine family, we will consider all available information and analyses. Survey data is allowed but not required to make this showing.

(f) *Applicability for testing.* The duty-cycle emission standards in this section apply to all testing performed according to the procedures in §1045.505, including certification, production-line, and in-use testing. The not-to-exceed standards apply for all testing performed according to the procedures of subpart F of this part.

**§1045.107 What are the not-to-exceed emission standards?**

Not-to-exceed emission standards apply as follows:

(a) Measure emissions using the not-to-exceed procedures in subpart F of this part:

(b) Determine the not-to-exceed standard, rounded to the same number of decimal places as the emission standard in Table 1 to this section from the following equation:

$$\text{Not-to-exceed standard} = (\text{STD}) \times (\text{M})$$

Where:

STD = The standard specified in paragraph (a) of this section if you certify without using ABT for that pollutant; or the FEL for that pollutant if you certify using ABT.  
M = The NTE multiplier for that pollutant, as defined in paragraphs (c) through (e) of this section.

(c) For engines equipped with a catalyst, use NTE multipliers from the following table across the applicable zone specified in §1045.515:

TABLE 1 TO § 1045.107—NTE MULTIPLIERS FOR CATALYST-EQUIPPED ENGINES

| Pollutant                | Subzone 1 | Subzone 2 |
|--------------------------|-----------|-----------|
| HC+NO <sub>x</sub> ..... | 1.50      | 1.00      |
| CO .....                 | N/A       | 1.00      |

(d) For two-stroke engines not equipped with a catalyst, use an NTE multiplier of 1.2 for HC+NO<sub>x</sub> and CO. Compare the weighted value specified in §1045.515(c)(5) to the NTE standards specified in paragraph (b) of this section.

(e) For engines not covered by paragraphs (c) and (d) of this section, use

§ 1045.110

the NTE multipliers from the following table across the applicable zone specified in § 1045.515:

TABLE 2 TO § 1045.107—NTE MULTIPLIERS FOR FOUR-STROKE ENGINES WITHOUT CATALYSTS

| Pollutant                | Subzone 1 | Subzone 2 |
|--------------------------|-----------|-----------|
| HC+NO <sub>x</sub> ..... | 1.40      | 1.60      |
| CO .....                 | 1.50      | 1.50      |

**§ 1045.110 How must my engines diagnose malfunctions?**

The following engine-diagnostic requirements apply for engines equipped with three-way catalysts and closed-loop control of air-fuel ratios:

(a) *Equip your engines with a diagnostic system.* Equip each engine with a diagnostic system that will detect significant malfunctions in its emission control system using one of the following protocols:

(1) If your emission control strategy depends on maintaining air-fuel ratios at stoichiometry, an acceptable diagnostic design would identify a malfunction whenever the air-fuel ratio does not cross stoichiometry for one minute of intended closed-loop operation. You may use other diagnostic strategies if we approve them in advance.

(2) If the protocol described in paragraph (a)(1) of this section does not apply to your engine, you must use an alternative approach that we approve in advance. Your alternative approach must generally detect when the emission control system is not functioning properly.

(3) Diagnostic systems approved by the California Air Resources Board for use with sterndrive/inboard engines fully satisfy the requirements of this section.

(b) *Use a malfunction indicator.* The malfunction indicator must be designed such that the operator can readily see or hear it; visible signals may be any color except red. Visible malfunction indicators must display “Check Engine,” “Service Engine Soon,” or a similar message that we approve. The malfunction indicator must go on under each of the following circumstances:

(1) When a malfunction occurs, as described in paragraph (a) of this section.

(2) When the diagnostic system cannot send signals to meet the requirement of paragraph (b)(1) of this section.

(3) When the engine’s ignition is in the “key-on” position before starting or cranking. The malfunction indicator should turn off after engine starting if the system detects no malfunction.

(c) *Control when the malfunction can turn off.* If the malfunction indicator goes on to show a malfunction, it must remain on during all later engine operation until servicing corrects the malfunction. If the engine is not serviced, but the malfunction does not recur for three consecutive engine starts during which the malfunctioning system is evaluated and found to be working properly, the malfunction indicator may stay off during later engine operation.

(d) *Store trouble codes in computer memory.* Record and store in computer memory any diagnostic trouble codes showing a malfunction that should activate the malfunction indicator. The stored codes must identify the malfunctioning system or component as uniquely as possible. Make these codes available through the data link connector as described in paragraph (g) of this section. You may store codes for conditions that do not activate the malfunction indicator. The system must store a separate code to show when the diagnostic system is disabled (from malfunction or tampering).

(e) *Make data, access codes, and devices accessible.* Make all required data accessible to us without any access codes or devices that only you can supply. Ensure that anyone servicing your engine can read and understand the diagnostic trouble codes stored in the on-board computer with generic tools and information.

(f) *Consider exceptions for certain conditions.* Your diagnostic systems may disregard trouble codes for the first three minutes after engine starting. You may ask us to approve diagnostic-system designs that disregard trouble codes under other conditions that would produce an unreliable reading, damage systems or components, or cause other safety risks.

(g) *Follow standard references for formats, codes, and connections.* Follow conventions defined in SAE J1939-05