

State of California
AIR RESOURCES BOARD

Notice of Public Availability of Modified Text

PUBLIC HEARING TO CONSIDER AMENDMENTS TO THE SMALL OFF-ROAD ENGINE REGULATIONS

Public Hearing Date: March 26, 1998
Public Availability Date: December 21, 1998
Deadline for Public Comment: January 5, 1999

At a public hearing held March 26, 1998, the Air Resources Board (the "Board") considered amendments to sections 2400 through 2414, Title 13, California Code of Regulations ("CCR") and the "California Exhaust Emission Standards and Test Procedures for 1995 and Later Utility and Lawn and Garden Equipment" ("Test Procedures"). The purpose of those amendments is to control emissions deterioration and to add to industry's flexibility in meeting the standards for engines below 25 horsepower (hp). The proposed regulatory action is described in detail in the small off-road engine (SORE) initial statement of reasons (staff report), released February 6, 1998, as part of Mail-Out MSC 98-02.

At the hearing, the Board approved the proposed amendments to sections 2400 through 2414, Title 13, CCR, and the associated test procedures, with some modifications to the originally proposed regulatory language. Resolutions 98-15-A, for engines less than or equal to 65 cubic centimeters ("cc") in displacement, and 98-15-B, for engines greater than 65 cc in displacement, are included as Enclosure 1. The regulatory sections, with the modifications noted, are contained in Enclosure 2, while the test procedures, also with modifications noted, are in Enclosure 3. The following is a description of the modifications, by Section number.

§ 2401 - "Sales," "horizontal-shaft engine," "vertical shaft engine," and "extreme non-attainment area" were added and some other definitions were modified to provide further clarification. The definition of "sales" was included to provide greater specificity regarding the information that would be deemed acceptable by the Executive Officer. The definition of "Certification Emission Reduction Credits" was modified for consistency with the definition of "sales."

"Horizontal-shaft engine," "vertical shaft engine," and "extreme non-attainment area" were added to explain the terms used in the modifications to section 2403 that involve emissions standards and other requirements for spark-ignition engines greater than 65 cc.

"Small off-road engines" was modified to clarify that the regulation does not apply to snowmobiles, model airplanes, model boats, or model cars.

§ 2403 -The Board approved several modifications to the originally proposed amendments of section 2403:

1. Handheld/Nonhandheld Distinction - As noted in the staff report, the staff's intent in substituting the 60 cc division for the handheld/nonhandheld distinction was to simplify the certification process without throwing any currently-certified engines out of compliance. Following publication of the staff report, one manufacturer identified a 62 cc engine certified for handheld uses. Therefore, the staff recommended, and the Board approved, placing the division at 65 cc rather than 60 cc.

Additionally, one manufacturer requested that the transition from handheld/nonhandheld to displacement-based standards be made immediately. As noted at the Public Hearing, this change would not cause any certified engine to fall out of compliance and the benefits of the change, such as the simplification of the certification process, would be available immediately. Therefore, the staff has modified § 2403 to remove the handheld/nonhandheld distinction entirely. This change has also been reflected throughout the test procedures and the remainder of the regulations.

2. Durability Periods - One manufacturer requested that the staff institute an intermediate durability period for engines 0-65 cc, as is being considered by the U.S. EPA. Staff agrees that an intermediate durability period between 50 and 300 hours would be appropriate, as the 50 hour and 300 hour durability periods were originally chosen to reflect the durability of a basic two-stroke engine. Manufacturers will utilize other technologies in addition to the basic two-stroke technology, which may not be adequately described by the durability periods proposed in the staff report. Therefore, the option of a 125-hour durability period has been added for engines 0-65 cc.

3. Emissions Standards for Spark-Ignition Engines Greater Than 65 cc - At the hearing, the staff proposed, and the Board approved, an alternative to the standards proposed in the staff report. The alternative is projected to attain the same emissions reductions from these engines as the original staff proposal, but would provide manufacturers greater flexibility to attain those reductions. The alternative would delay the implementation of the Tier 2 standards until 2002 for engines equal to or greater than 225 cc and horizontal-shaft engines below 225 cc, and until 2006 for vertical-shaft engines less than 225 cc. The modified standards are shown in Table 1, below.

Table 1
Exhaust Emission Standards
grams per brake horsepower-hour
[grams per kilowatt-hour]

| Calendar Year | Engine Class ⁽¹⁾ | Hydrocarbon plus oxides of nitrogen ⁽²⁾ | Hydrocarbon ⁽²⁾ | Carbon Monoxide | Oxides of Nitrogen | Particulate |
|---------------|-----------------------------|--|----------------------------|-----------------|--------------------|--------------------|
| 1995 | I | 12.0 | -- | 300 | -- | 0.9 ⁽³⁾ |
| | II | 10.0 | -- | 300 | -- | 0.9 ⁽³⁾ |
| | III ⁽⁴⁾ | -- | 220 | 600 | 4.0 | -- |
| | IV ⁽⁴⁾ | -- | 180 | 600 | 4.0 | -- |
| | V ⁽⁴⁾ | -- | 120 | 300 | 4.0 | -- |
| 1996 to 1999 | I | 12.0 ⁽⁵⁾ | -- | 350 | -- | 0.9 ⁽³⁾ |
| | II | 10.0 ⁽⁵⁾ | -- | 350 | -- | 0.9 ⁽³⁾ |
| | III ⁽⁴⁾ | -- | 220 ⁽⁵⁾ | 600 | 4.0 ⁽⁵⁾ | -- |
| | IV ⁽⁴⁾ | -- | 180 ⁽⁵⁾ | 600 | 4.0 ⁽⁵⁾ | -- |
| | V ⁽⁴⁾ | -- | 120 ⁽⁵⁾ | 300 | 4.0 ⁽⁵⁾ | -- |

| <u>Model Year</u> | <u>Engine Class</u> ⁽¹⁾ | <u>Durability</u> <u>Periods (hours)</u> | <u>Hydrocarbon</u> <u>plus oxides of</u> <u>nitrogen</u> ⁽²⁾ | <u>Carbon</u> <u>Monoxide</u> | <u>Particulate</u> |
|--------------------------|------------------------------------|---|---|----------------------------------|-----------------------------|
| 2000-2001 ⁽⁵⁾ | SI 0-65 cc, inclusive | 50/125/300 | 54 [72] | 400 [536] | 1.5 ⁽⁴⁾ [2.0] |
| | SI >65 cc - <225 cc | N/A | 12.0 [16.1] | 350 [467] | |
| | SI ≥225 cc | N/A | 10.0 [12.0] | 350 [467] | |

| <u>Model Year</u> | <u>Engine Class</u> ⁽¹⁾ | <u>Durability</u> <u>Periods (hours)</u> | <u>Hydrocarbon</u> <u>plus oxides of</u> <u>nitrogen</u> ⁽²⁾ | <u>Carbon</u> <u>Monoxide</u> | <u>Particulate</u> |
|---------------------------------------|---|---|---|----------------------------------|-----------------------------|
| 2002-2005 ⁽⁵⁾ | Spark-Ignition (SI) Engines 0-65 cc, inclusive | 50/125/300 | 54 [72] | 400 [536] | 1.5 ⁽⁴⁾ [2.0] |
| | SI >65 cc - <225 cc Horizontal | 125/250/500 | 12.0 [16.1] | 410 [549] | |
| | SI >65 cc - <225 cc Vertical | NA | 12.0 [16.1] | 350 [467] | |
| | SI ≥225 cc | 125/250/500 | 9.0 [12.0] | 410 [549] | |
| | SI 0-65 cc, inclusive | 50/125/300 | 54 [72] | 400 [536] | 1.5 ⁽⁴⁾ [2.0] |
| 2006 and subsequent ⁽⁵⁾ | SI >65 cc - <225 cc | 125/250/500 | 12.0 [16.1] | 410 [549] | |
| | SI ≥225 cc | 125/250/500 | 9.0 [12.0] | 410 [549] | |
| | CI <11 hp | 3000 hours or 5 years | 7.8 [10.4] | 6.0 [8.0] | 0.75 [1.0] |
| 2000-2004 ⁽⁵⁾ | CI ≥11-<25 hp | 3000 hours or 5 years | 7.1 [9.5] | 4.9 [6.6] | 0.6 [0.8] |
| | CI <11 hp | 3000 hours or 5 years | 5.6 [7.5] | 6.0 [8.0] | 0.6 [0.8] |
| 2005 and subsequent ⁽⁵⁾ | CI ≥11-<25 hp | 3000 hours or 5 years | 5.6 [7.5] | 4.9 [6.6] | 0.6 [0.8] |
| | CI ≥11-<25 hp | 3000 hours or 5 years | 5.6 [7.5] | 4.9 [6.6] | 0.6 [0.8] |
| | CI ≥11-<25 hp | 3000 hours or 5 years | 5.6 [7.5] | 4.9 [6.6] | 0.6 [0.8] |

- (1) "Class I" means small off-road engines greater than 65 cc but less than 225 cc in displacement.
 "Class II" means small off-road engines equal to or greater than 225 cc in displacement.
 "Class III" means small off-road engines less than 20 cc in displacement.
 "Class IV" means small off-road engines 20 cc or greater but less than 50 cc in displacement.
 "Class V" means small off-road engines equal to or greater than 50 cc, but less than or equal to 65 cc in displacement.

- (2) The Executive Officer may allow gaseous-fueled (i.e., propane, natural gas) engine families that satisfy the requirements of the regulations to certify to either the hydrocarbon plus oxides of nitrogen or hydrocarbon emission standard, as applicable, on the basis of the non-methane hydrocarbon (NMHC) portion of the total hydrocarbon emissions.
- (3) Applicable to all diesel-cycle engines.
- (4) Applicable to all two-stroke engines.
- (5) Engines used exclusively in snowthrowers and ice augers need not certify to or comply with the HC and NOx standards at the option of the manufacturer.

Manufacturers who produce more than 40,000 spark-ignited engines per year between 65 and 225 cc for sale in extreme nonattainment areas (based on data for engines produced for sale in such areas in model year 1998) will be responsible for additional emission reductions to attain the emissions reductions equivalent to the proposal in MSC 98-02. Each affected manufacturer must submit a plan to achieve its share of the additional emission reductions. The Executive Officer shall evaluate the plans based on the estimated model year 1998 sales in the extreme nonattainment areas, and will allocate responsibility proportionally based upon those estimates. The plans submitted must in the aggregate provide for emissions reductions that are equal to or greater than the difference between: 1) the reductions that would have been achieved in the extreme nonattainment areas in calendar years 2000, 2001, 2005 and 2010 by all engines greater than 65 cc displacement that would have met the emissions reduction requirements proposed in MSC 98-02; and 2) those same engines meeting the standards shown in Table 1.

The additional reductions are to be obtained mainly through engine improvements, such as early introduction of clean engines, evaporative emissions controls, the voluntary certification of construction and farm equipment engines not subject to ARB requirements (a manufacturer choosing voluntarily to certify an engine must also certify that it will honor all compliance and warranty requirements set forth for small off-road engines) and/or other measures approved in advance by the Executive Officer.

Affected manufacturers must also demonstrate that at least 60 percent of engines greater than 65 cc sold in extreme nonattainment areas comply in model years 2000 and 2001 with the standards applicable to the 2006 model year. The percentage will be based on the total projected sales by all manufacturers of engines greater than 65 cc in the extreme nonattainment areas in those model years, and will be allocated proportionally between the manufacturers subject to this requirement.

The extent to which manufacturers have met these obligations will be evaluated on the basis of statewide implementation of the plans' provisions, since manufacturers have indicated that they cannot track the destination of their engines more specifically than statewide.

4. Averaging - Staff has clarified the description of the averaging program to ensure consistency with §2408 and the Test Procedures, specifically with regards to the averaging of pollutants other than HC+NOx. Averaging of other pollutants is allowed; however, there are no provisions for emissions credits for pollutants other than HC+NOx and particulates, so

banking and trading is allowed only for HC+NO_x and particulates. The staff has also clarified that the final accounting process for credits allows manufacturers one model year to make up any end-of-model-year credit deficit before credits are discounted.

5. Replacement Engines - The requirements for replacement engines greater than 225 cc have been aligned with the U.S. EPA's requirements, which allow for the continued production of older-model engines, provided the engine manufacturer has ascertained that no certified engine is available with the appropriate physical or performance characteristics to repower the equipment, the engine manufacturer or its agent takes ownership and possession of the engine being replaced (or the Executive Officer has approved an alternative), and the replacement engine is clearly labeled as such.

§2404 Engine Label and Air Index - At the hearing, the Board directed the staff to include incentive programs to encourage the production and purchase of clean engines. These programs are to provide additional emissions information to the potential purchaser.

Accordingly, the staff has added language to require an Air Index label, similar to that used for on-road vehicles, on each piece of new equipment. The engine manufacturer must arrange for a label with the engine family's Air Index to be attached to the equipment, where a potential consumer can view the information prior to purchase. For engines 0-65 cc, inclusive, the engine manufacturer must also arrange for a label with the engine family's Air Index to be attached to the equipment packaging. The manufacturer would direct the consumer to the owner's manual for a detailed explanation of the information. If the Air Index is not part of a label permanently attached to the equipment, it must be designed for removal only by the ultimate purchaser.

The Air Index will provide a relative comparison between the emissions expected from various engines. The SORE Air Index is based on comparing the engine family's family emission level to the applicable HC+NO_x standard. The Air Index for each engine will be determined by the following formula:

$$\text{Air Index} = \frac{\text{FEL} * 3}{\text{Standard}}$$

where

FEL= the Family Emission Limit for the engine

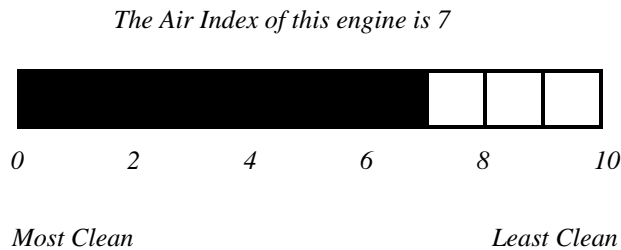
Standard = The applicable HC+NO_x emissions standard, as given in § 2403 (b); and

The Air Index label must include a graphical representation of the Air Index, information regarding the significance of the Air Index, and an indication of the emissions durability period of the engine. The emissions durability period must be indicated by the actual hours, by the descriptive terms shown in the table below, or by both.

Table 3
Descriptive Terms for Emissions Durability Periods

| Descriptive term | Applicable to Emissions Durability Period |
|------------------|--|
| Moderate | 50 hours (0-65 cc) 125 hours (65 cc and greater) |
| Intermediate | 125 hours (0-65 cc) 250 hours (65 cc and greater) |
| Extended | 300 hours (0-65 cc) 500 hours (65 cc and greater) |

The Air Index information must take the form of the following example, which has been adapted from the on-road Smog Index program:



Note: The lower the Air Index, the less pollution emitted during typical operation.

This engine is certified to be emissions compliant for the following use:

- Moderate* [or appropriate hours, or both]
- Intermediate* [or appropriate hours, or both]
- Extended* [or appropriate hours, or both]

Check the owner's manual for further details.

Additionally, the engine label requirements have been modified to provide greater flexibility. If there is insufficient space on the engine to accommodate a label that contains all of the specified information, the Executive Officer could allow the engine manufacturer to exclude some items, placing them instead in the owner's manual.

§2407 - Staff made numerous minor changes to provide further clarification of the Cumulative Sum procedure, to correct references, and to align the program more completely with the proposed United States Environmental Protection Agency (U.S. EPA) program.

§2408 - The staff has modified some of the language involving emissions reductions credits and the averaging, banking and trading programs in order to clarify the provisions and improve consistency with § 2403 and the test procedures. Additionally, at industry request, the staff has added language to explicitly state that the reporting requirements can be met by use of a spreadsheet containing the various information. A sample spreadsheet is enclosed (see Enclosure 4).

§2409 - Staff has made some modifications to this section to remove an incorrect reference to averaging of production credits. Although production credits may be used to modify a manufacturer's corporate average, they are not in themselves averaged.

Test Procedures - In addition to making the test procedures consistent with the above modifications of the regulatory language, staff has made other modifications to clarify and simplify the test procedures. These modifications include provisions allowing electronic submission of certification applications, allowing the manufacturers to recommend high-altitude adjustments that would not increase emissions beyond those of the unadjusted engine at high altitude, allowing service accumulation for natural gas engines to use fuel available near the test site, and aligning with the U.S. EPA specifications for determining engine displacement.

The staff has made several other modifications throughout the regulations and test procedures to correct grammatical and typographical errors, correct references and citations, increase alignment with the U.S. EPA, and improve the clarity of the regulations and test procedures.

As noted above, Enclosure 1 contains copies of Board Resolutions 98-15-A (engines less than or equal to 65 cc) and 98-15-B (engines greater than 65 cc), approving the above described regulatory action. Enclosures 2 and 3 contain the text of the modified regulatory language and associated test procedures, respectively, with modifications to the originally proposed text shown by **bold double underline** and deletions shown by ~~**bold strikeout**~~. Enclosure 4 is a sample of the sort of information that would satisfy the reporting requirements of the averaging program.

In accordance with section 11346.8 of the Government Code, the Board directed the Executive Officer to adopt sections 2400 through 2414, as approved, after making the modified regulatory language available to the public for comment for a period of at least 15 days, provided that the Executive Officer shall consider such written comments as may be submitted during this period, shall make such modifications as may be appropriate in light of the comments received, and shall present the regulations to the Board for further consideration if he determines that this is warranted.

Written comments must be submitted to Mr. Michael W. Carter, Chief, Emission Research and Off-Road Controls Branch, Air Resources Board, 9580 Telstar Avenue, Suite # 4, El Monte, California 91731-2988, no later than January 5, 1999 for consideration by the Executive Officer prior to final action. Only comments relating to the modifications described in this notice will be considered by the Executive Officer.

Sincerely,

Robert H. Cross, Chief
Mobile Source Control Division

Enclosures