

AIR RESOURCES BOARD

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Manufacturers Advisory Correspondence #95-02



February 22, 1995

TO: ALL MANUFACTURERS OF UTILITY AND LAWN AND GARDEN EQUIPMENT ENGINES
ALL OTHER INTERESTED PARTIES

SUBJECT: Utility and Lawn and Garden Equipment Engine (ULGE) Streamlined
Certification Procedures

Enclosed is an Air Resources Board's (ARB's) Manufacturers Advisory Correspondence (MAC) that provides some streamlining measures for ULGE certification procedures related to both test engine selection and confirmatory testing, and that were discussed at an industry and ARB meeting on October 31, 1994. The ARB will allow engine manufacturers to select test engines and proceed with emission testing without an ARB pre-test approval of the selection. Also, the ARB will allow engine manufacturers to decide at the time of the initial emission testing if confirmatory testing is necessary.

If you have further questions on this matter, please contact Mr. Duc Nguyen, Manager, Certification Section, or Mr. Ronald Haste, Staff Engineer, at (818) 575-7067.

Sincerely,

A handwritten signature in black ink, appearing to read "K. D. Drachand".

K. D. Drachand, Chief
Mobile Source Division

Enclosure

State of California
AIR RESOURCES BOARD

SUBJECT: Utility and Lawn and Garden Equipment Engine (ULGE)
Streamlined Certification Procedures.

APPLICABILITY: All California-Certified ULGEs.

- REFERENCES:**
1. Title 13, California Code of Regulations (CCR)
 2. Mail-out #94-24, Notice of Public Hearing to Consider Amendments to the Emission Control Regulations For 1995 and Later Model Utility and Lawn and Garden Equipment Engines (Clean-up Amendments).
 3. California Exhaust Emission Standards and Test Procedures For 1995 and Later Utility and Lawn and Garden Equipment Engines (Test Procedures), amended April 8, 1993.
 4. MAC #92-06, Small-Engine Certification Procedures
 5. Mail-out #92-57, Small-Engine Certification (Guidelines for Certification).

[References to the above document are indicated by brackets]

DISCUSSION: The ULGE regulations were approved by the Air Resources Board (ARB or the Board) in December 1990. These regulations are applicable to ULGEs produced on or after January 1, 1995 [Ref.: 1, Section 2400(a)(1)]. The regulations include exhaust emission standards and test procedures, an emission-related component defect warranty, assembly-line quality-audit and new engine compliance test procedures, and provisions for emission control system (ECS) labels. In July 1994, the Board approved amendments that clarified and improved (i.e., cleaned-up) the ULGE regulations [Ref.: 2].

The regulations provide that the Executive Officer will select test engines to represent each engine-displacement-emission control system combination (i.e., each engine-displacement-system combination), and the engine configuration (e.g., calibration, etc.) of each engine-displacement-system combination that has the highest probability of exceeding the emission standards [Ref. 3, Part I, Section (18)(a)]. In order to relieve engine manufacturers of emission testing each engine-displacement-system combination, the ARB accepts the testing of only the

"worst-case" engine configuration of the worst-case engine-displacement-system combination. The worst-case engine configurations are identified using sound engineering judgment. The ARB's MAC #92-06 includes information about identifying and selecting worst-case engine configurations on the basis of specific engine parameters (e.g., bore-to-stroke ratio, etc.) [Ref.: 4, Policy No. 1]. The information in this MAC is provided in order to facilitate engine manufacturers' efforts in selecting the proper test engines.

Engine manufacturers are required to recommend suitable test engines and provide the supporting engineering rationale (e.g., the criteria outlined in MAC #92-06) in conjunction with the initial submission of engine family certification applications [Ref.: 5, Chapter 2.11, Paragraph 3]. Presently, the ARB reviews the recommendations and either concurs, or re-evaluates the information provided by the engine manufacturer and designates alternative test engines. This process has been lengthy and cumbersome. Accordingly, the ARB will immediately allow engine manufacturers the option to select and test worst-case engine configurations without receiving prior ARB approval. This allowance is authorized under the provisions for implementing abbreviated certification procedures [Ref.: 3, Part I, Section 27(b)]. The test engine selections, supporting information, and emission test results must be included with the initial certification application submissions. This option reduces the amount of time required to complete engine family certification without compromising the effectiveness of the certification program.

However, the possibility that the ARB may not agree with an engine manufacturer's particular selection will exist. In this situation, the engine manufacturer may elect one of three options.

One option would be for the ARB to issue an Executive Order covering only that portion of the engine family that is determined by the ARB to be truly represented by the particular engine configuration that was emission tested. Engine configurations will be considered nonrepresentative if the ARB determines that such engines will have a higher probability of exceeding the emission standards than the selected emission test engines. Only engines covered by the Executive Order could be legally offered for sale in California.

A second option would be for an engine manufacturer to re-designate and test a new worst-case engine configuration to represent the entire engine family. An Executive Order will be issued upon the ARB's receipt of satisfactory test results for the new test engine. However, such action may adversely impact the engine family's expected certification schedule.

A third option would be a combination of the first two actions. The ARB could issue an engine family Executive Order to cover only that portion of the engine family that is represented by the emission-tested engine configuration. The engine manufacturer could then select and test a second engine configuration to represent the remainder of the engine family. The engines covered by the initial Executive Order could be legally offered for sale in California immediately after the issuance of the Executive Order. The engine manufacturer will need to submit the emission test results of the second selected test engine configuration in order for the ARB to determine if the remainder of the engine family could be legally offered for sale. The ARB will review these test results and decide if the results demonstrate that the remainder of the engine family could be covered by the initial Executive Order, or if the initial Executive Order should be amended to reflect the results of the second test engine.

Under all three options, the ARB will notify an affected engine manufacturer about the ARB's disallowance of the engine manufacturer's initial test engine selection as the engine family's worst-case configuration. This notice will set forth the reasons for the disallowance and request the engine manufacturer to identify the option it will select.

Upon the initial completion of an engine manufacturer's certification testing, the Executive Officer may require that the engine manufacturer conduct confirmatory testing [Ref.: 3, Part I, Section (26)(a)]. The purpose of confirmatory testing is to demonstrate that the emission results of a certification test engine are repeatable and can be expected to represent the emissions of the production engines. Factors that cause doubt about the true representativeness of a certification test engine include a marginal test result (i.e., a test result that is less than 15 percent below the applicable emission standard), a demonstration capacity by the engine manufacturer to perform the certification function properly, testing of a new engine design or ECS technology, and the reasonableness of a test result when compared to similar engines or ECS technologies. Confirmatory testing may also be conducted on a random basis in order to maintain the assurance of the validity of the engine manufacturer's entire test program. Confirmatory tests are essentially a second test of the certification test engine.

Engine manufacturers can request that the ARB waive the right to conduct such confirmatory tests. Engine manufacturers are encouraged to submit "test-waiver" requests as soon as possible after the engine manufacturer-conducted testing on the selected test engines is completed. The procedure for submitting test waiver requests is set forth in the clean-up amendments to the regulations that were approved for adoption by the ARB in July 1994 [Ref.: 2,

Section 26]: The procedure for submitting these requests is discussed in Mail-out #92-57 [Ref.: 5, Chapter 2.11, Paragraph 5(a)]. The criteria used to evaluate test-waiver requests are set forth in the clean-up amendments [Ref.: 2, Section 26(c)] and presented in Mail-out #92-57 [Ref.: 5, Chapter 2.11, Paragraph 5(b)].

Test-waiver requests are usually evaluated expeditiously by the ARB. Nevertheless, the ARB is interested in reducing the certification processing time as much as possible. Therefore, the ARB will allow engine manufacturers the option to determine when engine family test results could be considered marginally compliant (i.e., they are less than 15 percent below the applicable standard), and then proceed with a second emission test without first submitting a test-waiver request. Under this option, an engine manufacturer will be required to submit information about the initial and second tests in the engine family certification application. This allowance will not compromise the expected ULGE emission reductions, and is authorized under the provisions for implementing abbreviated certification procedures [Ref.: 3, Part I, Section 27(b)]. Occasionally, the ARB may still require confirmatory tests in situations when the test results are unreasonable, the engine uses new technology, or on a random basis to maintain assurance of the validity of the engine manufacturer's entire test program. In such instances, the ARB will provide the engine manufacturer with the specific reasons for such testing.

POLICY:

Test Engine Selection

- a. The Executive Officer hereby allows engine manufacturers the option to identify engine configurations that are expected to have the highest probabilities to exceed the applicable emission standards (i.e., the worst-case configurations), and proceed to test such engines for engine family certification purposes, without first receiving prior concurrence from the ARB of the selected engine configurations. Under this option, the engine manufacturer's test engine selection, and supporting information for such a selection, must be clearly described in the engine family certification application.
- b. In the event that the Executive Officer determines that a manufacturer-selected test engine configuration is not indicative of the engine family's worst-case engine configuration, the ARB will contact the affected engine manufacturer and inform the manufacturer of the reasons for the ARB's disallowance of the manufacturer-selected test engine as the engine family's worst-case configuration. The engine manufacturer will then elect one of the following options.

- (i) The Executive Officer should issue an Executive Order to cover only the production configurations that are determined to be represented by the engine manufacturer's test engine configuration. Engines configurations that are determined to have higher probabilities of exceeding the emission standards than the engine manufacturer's test engines will not be included in the Executive Order, and will not be legal for sale in California.
- (ii) The engine manufacturer should re-select and test a new worst-case engine configuration that will represent the entire engine family. Upon concurrence by the Executive Officer and receipt of the compliant test results of the new worst-case test engine selection, an Executive Order would be issued to cover the entire engine family.
- (iii) The Executive Officer should issue an Executive Order to cover only the production configurations that are determined to be represented by the engine manufacturer's test engine configuration, and allow the engine manufacturer to re-select and test a second engine configuration that will represent the remainder of the engine family. Engines covered by the initial Executive Order could be legally offered for sale in California. The initial Executive Order could subsequently be amended as necessary to include the applicable engine information and test results of the newer engine configuration.

2. Confirmatory Testing

- a. The Executive Officer hereby allows engine manufacturers the option to determine when engine family test results could be considered marginally compliant, and proceed with a second emission test (i.e., conduct confirmatory testing) without notifying the ARB of the initial test results. Marginal compliance is typically indicated by a test result that is less than 15 percent below the applicable standard. Under this option, information on both the initial and second tests must be submitted in the engine family certification application.
- b. Occasionally, the Executive Officer may still require confirmatory testing even if the initial test results are not considered to be marginally compliant, yet are determined to be unreasonable, the engine uses

new technology, or on a random basis to maintain assurance of the validity of the engine manufacturer's entire test program. The ARB will provide the engine manufacturer with the specific reasons for such testing.