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# Air Resources Board

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Gray Davis  
Governor

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TO: ALL SPARK-IGNITION (SI) MARINE ENGINE MANUFACTURERS  
ALL OTHER INTERESTED PARTIES

SUBJECT: CERTIFICATION GUIDELINES FOR 2001 MODEL-YEAR (MY) AND  
LATER SI MARINE ENGINES

Enclosed are the guidelines for preparing and submitting applications for certification of 2001 MY and later SI marine engines. Applications prepared following these guidelines will permit an expedited review and certification approval by the Air Resources Board's (ARB's) staff. New SI marine engines are not legal for sale and use in California until they are certified by the ARB. Violations of the certification requirement will subject the engine manufacturer and selling dealers to enforcement actions by the State. These guidelines include the following parts.

- Chapter I: Certification Overview
- Chapter II: General Instructions
- Attachment 1: Certification Summary Sheet and Supplemental Information Formats
- Attachment 2: Certification Database

For an engine family to be certified by the ARB, the manufacturer's application package must include the following that have been properly prepared.

1. Cover Letter
2. Certification Summary Sheet
3. Supplemental Information
4. Certification Database. This can be transmitted electronically to the manufacturer's assigned ARB Certification Section staff.
5. The federal application for certification for the subject engine family that has been or is to be submitted to the U. S. Environmental Protection Agency.

Should you have further questions on this matter, please contact Mr. Dean Hermano, Staff Engineer, Certification Section, at (626) 450-6103, or by e-mail at [dhermano@arb.ca.gov](mailto:dhermano@arb.ca.gov).

Sincerely,

/s/

R. B. Summerfield, Chief  
Mobile Source Operations Division

Enclosure

California Environmental Protection Agency

**REFERENCES**

References 1 through 13 below are accessible through the ARB's internet website at <http://www.arb.ca.gov/regact/marine/marine.htm>. Reference 14 may be accessed at <http://arbis.arb.ca.gov/msprog/levprog/cleandoc/ldvtp01.pdf>.

1. Title 13, California Code of Regulations (13 CCR), section 2440. (Applicability)
2. 13 CCR, section 2441. (Definitions)
3. 13 CCR, section 2442. (Emission Standards)
4. 13 CCR, section 2443.1. (Emission Control Labels)
5. 13 CCR, section 2443.2. (Environmental Labels)
6. 13 CCR, section 2443.3. (Consumer Labels)
7. 13 CCR, section 2444. (In-Use Compliance Testing and Recall)
8. 13 CCR, section 2445.1. (Defects Warranty Statement)
9. 13 CCR, section 2445.2. (Emission Control Warranty Statement)
10. 13 CCR, section 2446. (Production-Line Testing and Selective Enforcement Auditing)
11. 13 CCR, section 2447. (Emission Standards and Test Procedures)
12. 13 CCR, section 2448. (Sunset Review of Regulations)
13. California Exhaust Emission Standards and Test Procedures for 2001 Model Year and Later Spark-Ignition Marine Engines (Test Procedures), adopted December 10, 1998. (Emission Test Procedures and Certification Procedures)
14. California Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles, adopted August 5, 1999. (for Test Fuel Purposes)

## CHAPTER I

## CERTIFICATION OVERVIEW

Starting from the **2001** model-year, new SI marine engines for propelling **outboard and personal watercraft** must be certified for emission compliance by the Air Resources Board (ARB) before these engines are legal for sale and use in California. The **Executive Orders** certifying these engines are valid for only **one model-year** of production. **New Executive Orders for continued production in each succeeding model year** must be obtained from ARB. Selling an engine before the engine receives ARB certification will subject the engine manufacturer and the selling dealers to ARB **enforcement actions** as authorized by state laws.

SI marine engines are grouped into **engine families** for certification and all related implementation purposes (e.g., quality audit, recall). An engine family includes engine models that share similar engine design and emission control features such that these engine models can be expected to exhibit similar emission performance. The ARB's emission control program for SI marine engines can be roughly divided into **three phases**: Pre-Production with certification, running changes and field fixes; In-Production with quality audit testing; and Post-Production with in-use testing.

## 1. CERTIFICATION

- Certification Process
- Determining the Applicable Emission Standard
- Durability Testing and Determining DFs
- Certification Testing
- Data Carryover and Carryacross
- Running Changes and Field Fixes

a. Certification Process

To obtain ARB certification for each engine family, the manufacturer must determine the useful-life emission deterioration factor (**DF**) for the family. This DF is applied to the emission result from the family's official certification engine to demonstrate that the deteriorated (i.e., projected useful-life) emission rate complies with the applicable emission standard. The ARB may direct the manufacturer to conduct a **retest** if the original test result indicates marginal compliance. Any **anti-tampering device** that will be installed on production engines for protection against unauthorized adjustments of emission-related adjustable parameters must be approved by ARB. The manufacturer's format for the **certification label**, consumer label ("**hang tag**" label) and environmental label ("**stars**" label), and the locations where the labels are affixed to each production engine must be approved by the ARB. The manufacturer's **emission warranty statement** provided with each production engine must also be approved by ARB.

The manufacturer must submit to ARB an **application for certification** containing all the required information and test data in the **ARB-specified format**. The ARB is required to approve or disapprove an application within **90 days** after receipt of the **complete**

**application**; the normal processing time is about **4 to 6 weeks**. To **expedite the certification approval**, requests for ARB approval of anti-tampering devices, labels, the emission warranty statement, and any **modification to the test procedures** may be submitted in advance of the application.

b. Determining the Applicable Emission Standard

For each engine family, the manufacturer must decide the **applicable emission standard** in one of two ways. For **direct compliance**, the applicable emission standard is specified by regulation based on the sales-weighted average rated power of all engines produced for the engine family. At the time of certification, an estimated standard is determined based on the engine family's manufacturer-projected production volume and engine-model mix. At the end of the model-year production, the final, applicable emission standard will be determined based on the actual production number and product mix.

For **corporate average compliance**, the manufacturer will specify, subject to certain specified limitations, a family emission limit (**FEL**) for each engine family. The FEL is the applicable emission standard for all engines in the family. The **corporate-average emission value**, which is weighted by the FEL, production volume and sales-weighted average rated power of each engine family that participates in the corporate compliance method, must not exceed the applicable **corporate-average standard** which is determined by regulation based on the sales-weighted average rated power of all participant engine families. Engines for **outboard** and **personal watercraft** must be in **separate corporate average compliance plans**.

c. Durability Testing and Determining DFs

The DF is a measure of the emission deterioration over the family's useful life. DFs are determined through the manufacturer's **durability testing**. A manufacturer should submit its durability test plan for ARB approval prior to conducting the testing to avoid rejection of the resulting DF.

The following is a summary of the elements of an acceptable durability test program. A prototype **durability data engine** in the configuration expected to exhibit a **high deterioration rate** (e.g., the hottest engine conditions and catalyst temperature) is run on an **operating schedule** and **commercially available fuels** to accumulate service hours that age the engine and its emission controls up to the equivalent of its useful life. Emission-related **scheduled maintenance** as permitted in regulations may be performed. **Unscheduled maintenance** may be performed only with prior ARB approval. During service accumulation, engine emissions are **periodically measured** using the regulation-specified test fuel and test procedure to establish the trend line that will be used to determine the DF. Depending on the type of anti-tampering device used, the ARB may specify the **settings of the adjustable parameters** for the purpose of conducting the durability test. **Whole-engine aging** (normal or accelerated) and **component bench aging** are acceptable methods for service accumulation.

#### d. Certification Testing

Close to production time, an **emission data engine** (a prototype engine with **production-intent calibrations**) which is expected to exhibit the **worst emissions** (e.g., highest specific fuel rate, coolest catalyst temperature) is run according to the manufacturer's **break-in** procedure to stabilize the engine's emissions. An emission test is then conducted using the specified test fuel and test procedure. Depending on the type of anti-tampering device used, the ARB may specify the **settings of the adjustable parameters** for the purpose of conducting the certification test. For the engine family to be certified, its **certification emission level**, which is the emission data engine's test result adjusted (i.e., added or multiplied) by the DF, must not exceed the applicable emission standard or FEL.

#### e. Data Carryover and Carryacross

Subject to ARB approval, the durability data and/or certification emission data may be **carried over**, in lieu of new tests, to subsequent engine families in the following model years, provided there have been no changes that would have resulted in the new selection of the durability engine or emission data engine. Also, subject to ARB approval, the durability data and/or certification emission data may be **carried across**, in lieu of new tests, to a different engine family in the same model year if it is adequately demonstrated that the DF and/or emission data is representative of the new engine family.

#### f. Running Changes and Field Fixes

Any factory change to the engines during the model-year production must be approved by ARB via a **running change** request. Any change to the engines where the change is implemented after the engines left the assembly line (e.g., at factory warehouses, distribution centers, dealers) must be approved by ARB via a **field fix** request. A field fix request typically occurs after the model-year production has ended. Running changes and field fixes not approved by ARB will render affected engines uncertified and subject the manufacturer to ARB enforcement actions.

For questions regarding certification, please **contact** your **assigned Certification Section staff person** or Mr. Duc Nguyen, Manager, Certification Section, at (626) 575-6844, or by e-mail at [dnguyen@arb.ca.gov](mailto:dnguyen@arb.ca.gov).

## 2. QUALITY AUDIT

During the model-year production, the manufacturer is required to conduct quality audit (QA) tests of production engines to show the engine family's compliance with the emission standard. A manufacturer must use one of two QA options, the Cumulative Sum (**CumSum**) or **QA (1%)** method. Once selected, the applicable QA method must be applied to **all** of the manufacturer's engine families during the model year; a mid-year change to the other QA method is not allowed. A manufacturer's QA **sampling plan** and

**test procedure** must be approved by ARB. **Quarterly reports** of the QA test results must be submitted to ARB in a specified format and within specified time limits.

For more information on QA testing, please **contact** Ms. Maggie Wilkinson, Manager, New Vehicle and Engine Audit Section, at (626) 575-7040, or by e-mail at [mwilkins@arb.ca.gov](mailto:mwilkins@arb.ca.gov).

### 3. IN-USE TESTING

Manufacturers are subject to in-use testing to demonstrate the continued compliance of its engines. The **ARB will select** certain engine families for in-use testing. Upon ARB notification, the **manufacturer** shall **procure and test** in-use engines in accordance with the test procedures (Reference #7). To avoid rejection of the gathered in-use data, a manufacturer should submit its **in-use test plan** for ARB approval prior to conducting the in-use testing. If the in-use test results exceed the applicable emission standard, the manufacturer will be required to implement **remedial actions** that are accepted and approved by ARB.

For more information on in-use testing, please **contact** Mr. John Urkov, Chief, In-Use Programs Branch, at (626) 575-6814, or by e-mail at [jurkov@arb.ca.gov](mailto:jurkov@arb.ca.gov).

## CHAPTER II

## GENERAL INSTRUCTIONS

These instructions provide guidance regarding the preparation, submission and revision of certification applications for 2001 and subsequent model year SI marine engines. Only essential information for certification is required in this format. Other information required by the test procedures (e.g., test engine build records, test and maintenance records, etc.) must be maintained by the manufacturer and made available to the ARB within 30 days upon request. An application submitted in accordance with these instructions will enable an expedited review and certification by the ARB. All revisions to the application must be submitted to the ARB for approval.

### 1. WHERE TO SUBMIT APPLICATION FOR CERTIFICATION

All certification-related applications and correspondence should be forwarded to:

Mr. R. B. Summerfield, Chief  
Mobile Source Operations Division  
Air Resources Board  
9480 Telstar Avenue, Suite 4  
El Monte, California 91734-2301

### 2. LETTER OF INTENT

A letter of intent should be submitted to the ARB in advance of submission of the first application for certification for the model year. The letter of intent should list planned engine families, the projected dates when the applications will be submitted, and the dates by which the Executive Orders are needed. Any certification or testing issues that may delay the certification process of any engine family may be included in the letter of intent. Updates to the manufacturer's certification plan should be submitted in a timely manner. ARB staff uses the information provided in the letter of intent to plan ahead for the certification year and to resolve issues in advance so that the manufacturer's certification schedule can be met.

### 3. COVER LETTER

A cover letter, signed by the manufacturer's authorized representative, must accompany each engine family application. The cover letter should recap highlights about the engine family, such as the applicable standard or FEL, the number of eligible stars, the use of a modified test procedure and anticipated start date of production.

The following statements of compliance must be provided in the letter:

- a) Conformance with the general standards regarding no increase in emissions or unsafe conditions as stated in section 5 of the "California Exhaust Emission

Standards and Test Procedures for 2001 Model Year and Later Spark-Ignition Marine Engines”, adopted December 10, 1998.

- b) Conformance with the specifications for the emission control label, and consumer/environmental and hang tag labels as stated in 13 CCR, Sections 2443.1 through 2443.3.
- c) The test engine for which data have been submitted has been tested in accordance with the applicable test procedures, that it meets the requirements of such tests, and that, on the basis of such tests, it conforms to the requirements of this Part (i.e., Reference #13).

#### 4. LABELING

The engine manufacturer is required to submit three different labels for each engine to the ARB for review and approval of their format, content and location. The proposed locations must be shown by either a drawing or photograph. Detailed written explanations of the label locations are also acceptable. Manufacturers may submit samples for approval in advance of the actual certification application to prevent any certification delay.

The first label is the emission control label, or engine label. The label must contain all the information enumerated in 13 CCR, section 2443.1(c)(4). If the engine label will be obscured by the OEM's equipment or housing, a supplemental label must be provided for affixing on the exterior of the equipment. It must contain the same information as the engine label except for manufacture-date, which may be omitted. However, if the manufacture-date is not included on the supplemental label, it must be stamped or indicated elsewhere on the exterior of the equipment.

The second label is the consumer/environmental label. This label is required for all SI marine engines that meet the Tier 1, 2 or 3 standards. These labels may be used by parks and waterway agencies to control access of these marine watercraft based on environmental concerns. Engines are denoted as one-, two- or three-star, with three-star being the lowest emitting; the specific requirements of this label are provided in 13 CCR, section 2443. This label may also be affixed to engines produced before the 2001 model year if the manufacturer can satisfactorily demonstrate that the engine complies with the ARB's emission standards.

The third label is a nonpermanent label (e.g., hang tag) that explains the cleanliness of the one-, two-, and three-star ratings on the environmental label. The suggested language for this label is provided in 13 CCR, section 2443.3 (b). For all personal watercraft and outboard engines greater than 130 horsepower (about 97 kW), the hang tag label may omit references to the three-star rating until (1) the 2004 model year or (2) the model year following the initial certification of a personal watercraft or outboard engines (over 130 horsepower) to the Tier 3 standard, whichever occurs first.



## 5. WARRANTY

A copy of the engine manufacturer's emission warranty statement that will be provided to the end-users must be submitted for ARB review and approval. The warranty statement must be completed as specified in 13 CCR, sections 2445.1 and 2445.2. Manufacturers may submit their proposed warranty statement for approval in advance of the actual certification application to prevent any certification delay.

## 6. TEST PROCEDURES

The test equipment provisions and emission test procedures are identical between the ARB and the United States Environmental Protection Agency (U.S. EPA).

## 7. MODIFIED TEST PROCEDURES

Any modifications to the prescribed test equipment and/or test procedures due to unique engine designs, laboratory equipment arrangements, facility limitations, etc. must be approved by the Executive Officer and described in the application. The use of unapproved test equipment or procedures can result in rejection of generated test data.

## 8. ADJUSTABLE PARAMETERS AND ANTI-TAMPERING DEVICES

If a test engine has a parameter that can be adjusted in a way that can significantly affect emissions, it will be tested at the possible extremes of the adjustment (i.e., maximum rich and lean settings). Samples of a manufacturer's proposed anti-tampering measure, preferably as implemented on the carburetor or engine as applicable, to prevent unauthorized adjustments should be submitted in advance of the application to the ARB for approval. All adjustable parameters, sealed and unsealed, and the corresponding ARB approval number must be reported in the application. If the parameter or method of tamper-resistance is subsequently modified, a new ARB approval will be required.

## 9. CERTIFICATION EMISSION-TEST FUEL

The fuel for emission testing must meet the specifications in the test procedures to reduce emission variations due to fuel effects. Testing with unauthorized fuel will result in rejection of the test results.

a. Gasoline. Three test fuels are allowed.

i. Indolene Clear. This certification gasoline is specified in the Code of Federal Regulations, Title 40, Part 86, section 113-91(a)(1). [40 CFR 86.113-94(a)(1)].

- ii. California Phase 2 Gasoline (Cleaner Burning Gasoline). The specifications of this certification gasoline are provided in the on-road test procedures (Reference #14, Section 9(a)(1)(ii)). This gasoline may be used as an option to Indolene Clear.
  - iii. Clean Air Act Baseline. This is the default fuel allowed by the U.S. EPA. The specifications for this fuel can be found in Table 8-1 of the Test Procedures (Reference #13).
- b. Gaseous Fuels (LPG, Propane, CNG, LNG): The gaseous certification emission-test fuels are referenced in the on-road test procedures (Reference #14). They are listed here for manufacturers' convenience.
- i. Liquefied Petroleum Gas. All certification emission testing must use the following specifications.
    - a) propane content of 93.5 volume percent +/- 1.0%;
    - b) propene content of 3.8 volume percent +/- 0.5%; and
    - c) butane and heavier components of 1.9 volume percent +/- 0.3%.
  - ii. Natural Gas. All certification emission testing must use the following specifications:
    - a) methane content of 90.0 mole percent +/- 1.0%;
    - b) ethane content of 4.0 mole percent +/- 0.5%;
    - c) C<sub>3</sub>-and-higher hydrocarbon content of 2.0 mole percent +/- 0.3%;
    - d) oxygen content of 0.5 mole percent maximum;
    - e) inert gas (sum of CO<sub>2</sub> and N<sub>2</sub>) content of 3.5 mole percent +/- 0.5%.

## 10. AMENDMENTS TO THE APPLICATION

Any revisions to the application due to typographical errors, corrections, running changes or field fixes, or new test data and information must be submitted to the ARB. If the change affects the Certification Summary form and/or the Model Summary form, the revised forms will have to be completely filled and submitted. For the other parts of the application package, only the revised information on the affected application pages needs to be submitted, together with the following for identification purposes:

- Manufacturer Name
- Model Year
- Engine Family
- Process Code
- Engine Displacement
- Comments Fields (describing the update or change)
- The field that has been changed or corrected.

## 11. RUNNING CHANGES AND FIELD-FIXES

Any factory change to the engines during the model-year production must be approved by ARB via a manufacturer's submitted running change request. Any change to the engines where the change is implemented after the engines leave the assembly line (e.g., at factory warehouses, distribution centers, dealers) must be approved by ARB via a manufacturer's submitted field fix request; a field fix request typically occurs after the model-year production has ended. Running changes and field fixes not approved by ARB will render affected engines uncertified and subject the manufacturer to ARB enforcement actions. If the change affects an emission-related part or results in a new "worst-case" test engine, new test data or engineering evaluations will be required to demonstrate that the engine family will remain in compliance. Only the affected pages and information fields of the application need to be submitted.

## 12. FAMILY EMISSION LIMIT (FEL) CHANGES

Subject to ARB approval, an engine manufacturer may recertify an engine family during the model year to change the affected FEL. The new FEL will be applied to all engines in the family. "Gaming" with the FEL changes will not be permitted.

## 13. CONFIDENTIALITY

The ARB will deem the engine manufacturer's projected California sales, production periods and catalytic converter composition (precious metal ratio and loading) confidential. Any other information that is designated by the manufacturer as confidential may not receive automatic treatment for confidentiality unless the manufacturer can justify that the information is truly privileged, confidential business information.

## **Attachment 1:**

### **Certification Summary Sheet: (2 pages)**

- Blank Form in Word 97 format
- Sample as printed (and can be used in lieu of the Word 97 form) from entries that were entered for the Access 97 Certification Database Form (see Attachment 2).

### **Supplemental Information Formats (8 pages)**

1. **Engine Family (EF) Name:** a. EPA-Standardized: \_\_\_\_\_  
b. EF Name on Engine Label: \_\_\_\_\_ c. Trade Name (e.g., Optimax): \_\_\_\_\_
2. **Major Equipment Applications:** (check all applicable)  
Personal Watercraft (PWC) \_\_\_\_\_ Jet Boat \_\_\_\_\_ Jet Board \_\_\_\_\_ Outboard \_\_\_\_\_ Other (specify) \_\_\_\_\_
3. **All Engine Sales Codes within EF:** (check all applicable) California-Only \_\_\_\_\_ 50-State \_\_\_\_\_ 49-State Only \_\_\_\_\_
4. **All Engine Displacement in EF:** (check one) in cubic centimeters (CC) \_\_\_\_\_ liters (L) \_\_\_\_\_ cubic inches \_\_\_\_\_  
1) \_\_\_\_\_ 2) \_\_\_\_\_ 3) \_\_\_\_\_ 4) \_\_\_\_\_
5. **EF Rated Power** (in kW): Highest Model: \_\_\_\_\_ Lowest Model: \_\_\_\_\_ Sales-Weighted Avg.: \_\_\_\_\_
6. **HC+NOx Certification Standard** (in g/kW-hr): \_\_\_\_\_ (check one) Direct Standard \_\_\_\_\_ FEL (Corp.Avg.) \_\_\_\_\_
7. **Environmental Cleanliness / Number of Stars Rating:** (check one) 0 \_\_\_\_\_ 1 \_\_\_\_\_ 2 \_\_\_\_\_ 3 \_\_\_\_\_  
Corresponding (check one) Tier \_\_\_\_\_ 1 \_\_\_\_\_ 2 \_\_\_\_\_ 3 Star Label's HC+NOx Standard (in g/kW-hr) \_\_\_\_\_
8. **Engine Design:** a. Combustion Cycle: (check one) 4-stroke \_\_\_\_\_ 2-stroke \_\_\_\_\_ @ Oil/Fuel Ratio \_\_\_\_\_  
b. Engine Type: (check one) Reciprocating \_\_\_\_\_ Rotary \_\_\_\_\_ Other (e.g., turbine, etc.) (specify) \_\_\_\_\_  
c. Valvetrain: (check one) Overhead \_\_\_\_\_ Side \_\_\_\_\_ Reed Valve \_\_\_\_\_ Piston Ported \_\_\_\_\_ Other (specify) \_\_\_\_\_  
d. Total Number of Intake and Exhaust Valves (Ports) per Cylinder: 2 \_\_\_\_\_ 3 \_\_\_\_\_ 4 \_\_\_\_\_ 5 \_\_\_\_\_ Other (specify) \_\_\_\_\_  
e. Type of Engine Cooling: (check one) Air \_\_\_\_\_ Water \_\_\_\_\_ Oil \_\_\_\_\_ Other (specify) \_\_\_\_\_  
f. Number of Cylinders: (check one) 1 \_\_\_\_\_ 2 \_\_\_\_\_ 3 \_\_\_\_\_ 4 \_\_\_\_\_ 5 \_\_\_\_\_ 6 \_\_\_\_\_ 8 \_\_\_\_\_ 10 \_\_\_\_\_ 12 \_\_\_\_\_ 16 \_\_\_\_\_ Other (specify) \_\_\_\_\_  
g. Cylinder Arrangement: (check one) Inline \_\_\_\_\_ Vee \_\_\_\_\_ Hori.Opposed (Flat) \_\_\_\_\_ Other (specify) \_\_\_\_\_  
h. Operating Fuel: (i) Type: (check one) Dedicated \_\_\_\_\_ Flexible Fuel \_\_\_\_\_ Dual Fuel \_\_\_\_\_ Bi Fuel \_\_\_\_\_  
(ii) Fuel: (specify Gasoline, Liquefied Petroleum Gas (LPG), Propane), Natural Gas (CNG, LNG)) \_\_\_\_\_
9. **Intake, Fuel and Emission Control Systems**<sup>1</sup>: \_\_\_\_\_
10. **Deterioration Factors (DFs):** a. New Dura.Testing: Yes \_\_\_\_\_ No \_\_\_\_\_ Carryover from EF: \_\_\_\_\_  
b. Dura. Eng. Model: \_\_\_\_\_ ID: \_\_\_\_\_ Service Accumulation Hours: \_\_\_\_\_  
c. DF Type: (check one) Multiplicative (no less than 1.000; no units) \_\_\_\_\_ Additive (no less than 0.000; in g/kW-hr) \_\_\_\_\_  
d. DF Values: HC: \_\_\_\_\_ NOx: \_\_\_\_\_ HC+NOx: (optional) (for additive DF only) \_\_\_\_\_ CO: \_\_\_\_\_
11. **Certification Test Engine Information:** New Test \_\_\_\_\_ Carryover from Engine Family \_\_\_\_\_  
a. Test Engine: Model \_\_\_\_\_ ID: \_\_\_\_\_ Rated Power, kW: \_\_\_\_\_ @ \_\_\_\_\_ rpm.  
Break-in/Stabilization Hours: \_\_\_\_\_ Test Dates: \_\_\_\_\_  
b. Test Fuel: (i) Gasoline: Indolene Clear \_\_\_\_\_ CAA Baseline \_\_\_\_\_ Calif. Ph2 \_\_\_\_\_ Other (specify) \_\_\_\_\_  
(ii) LPG, Propane, CNG or LNG: Test Procedure Specs. \_\_\_\_\_ Approved Alternative Specs. \_\_\_\_\_  
c. Test Procedure (TP): (i) Sampling: Raw Gas Method (RGM) \_\_\_\_\_ Constant Volume Sampling (CVS) \_\_\_\_\_  
(ii) Test Cycle: 5-Mode: \_\_\_\_\_ Approved Modified 5-Mode: \_\_\_\_\_ Approved Alternative Cycle: \_\_\_\_\_ Approved  
Special Cycle: \_\_\_\_\_ Testing per 91.118(g): \_\_\_\_\_ N/A: \_\_\_\_\_. (iii) Special Test Equipment (e.g., cooling fans,  
special couplings, etc.): No \_\_\_\_\_ Yes/Describe: \_\_\_\_\_
12. **HC+NOx Certification Emission Levels** (in g/kW-hr): \_\_\_\_\_ (Enter level from confirmatory test, if any. If none, enter the highest value from all tests below.)

Test No. And Type <sup>2</sup>	Official Test Results, g/kW-hr				Deteriorated Certification Emissions, g/kW-hr (i.e., with DFs applied)			
	HC	NOx	HC+NOx	CO	HC	NOx	HC+NOx	CO
1								
2								
3								
4								

**Quality Audit Procedure:** CumSum \_\_\_\_\_ 1% QA \_\_\_\_\_ **Issue Date:** \_\_\_\_\_ **Revision Date:** \_\_\_\_\_  
**Remarks:** \_\_\_\_\_

**ARB USE ONLY**

Processed by: _____ Date: _____ Reviewed by: _____ Date: _____
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<sup>1</sup> Use SAE J1930 abbreviations. Examples: NA for natural aspiration; TC turbocharging; SC supercharging; CAC charge air cooling; CARB carburetion; TBI throttle body fuel injection; MPI multiport fuel injection; SMPI sequential MPI; DGI direct gasoline injection; AIR secondary air injection; PAIR pulsed AIR; EGR exhaust gas recirculation; O2S oxygen sensor; HO2S heated O2S; OC for oxidation catalyst; TWC three-way catalyst; OC+TWC for OC plus TWC in one container; EM for Engine Modification (use if only NA and/or CARB are the only other selections in the field).  
Use **prefix** "2" or "3" etc. in front of O2S, TWC, etc. to designate **parallel** arrangement, e.g., 2TWC for two TWC in parallel. Use **suffix** "2" or "3" etc. to designate **series** arrangement, e.g., TWC-3 for three TWC in three separate containers, one after the other.





Model Year: \_\_\_\_\_  
Manufacturer Name: \_\_\_\_\_  
Engine Family: \_\_\_\_\_  
**SI MARINE ENGINE SUPPLEMENTAL INFORMATION**

Page: \_\_\_\_\_  
Issued: \_\_\_\_\_  
Revised: \_\_\_\_\_  
E.O.#: \_\_\_\_\_

S08. CATALYTIC CONVERTER: Yes \_\_\_\_\_ No \_\_\_\_\_

- a. Type/Number/Arrangement (e.g., TWC, OC, 2TWC for 2 parallel, TWC-2 for 2 in series): \_\_\_\_\_
- b. Location (e.g., close coupled, exhaust manifold, muffler): \_\_\_\_\_
- c. Catalyst Manufacturer.: \_\_\_\_\_
- d. Substrate: (i) Volume: \_\_\_\_\_ cc (ii) Construction: Pellet \_\_\_\_\_ Honeycomb \_\_\_\_\_  
Number of cells: \_\_\_\_\_ (per cm<sup>2</sup>)  
(iii) Composition: Ceramic \_\_\_\_\_ Metallic \_\_\_\_\_ (iv) Containment Method: Wire mesh \_\_\_\_\_ Other (specify) \_\_\_\_\_
- e. Active Material:

Composition (Pt, Pd, Rh): _____ Ratio: _____ Loading (g/L) _____
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**CONFIDENTIAL**

S09. PROJECTED SALES AND PRODUCTION PERIOD

**CONFIDENTIAL**

- a. Projected California Annual Sales (units): \_\_\_\_\_ Projected 50 State Sales (units): \_\_\_\_\_
- b. Estimated Production Period: Start Date: \_\_\_\_\_ End Date: \_\_\_\_\_
- c. Estimated Introduction into Commerce Date: \_\_\_\_\_





**Model Year:** \_\_\_\_\_  
**Manufacturer Name:** \_\_\_\_\_  
**Engine Family:** \_\_\_\_\_  
**SI MARINE ENGINE SUPPLEMENTAL INFORMATION**

**Page:** \_\_\_\_\_  
**Issued:** \_\_\_\_\_  
**Revised:** \_\_\_\_\_  
**E.O.#:** \_\_\_\_\_

S19. EMISSION-RELATED PART NUMBERS (Part numbers as stamped on the component, not the stock or inventory numbers, should be listed here.)

	S11. Engine Model				
<b>Fuel System:</b>					
Carb/Mixer Assy.					
Fuel Injector					
Fuel Pump					
ECM					
Pressure Regulator					
Oxygen Sensor					
Other (specify)					
<b>Intake System:</b>					
Air Cleaner Element					
Intake Manifold					
Turbocharger					
Supercharger					
Charge Air Cooler					
Other (specify)					
<b>Ignition System:</b>					
Spark Plug					
Ignition Coil					
Ignition Control Valve Module					
Distributor					
Other (specify)					
<b>EGR:</b>					
EGR Valve Assembly					
Vacuum Control Valve					
<b>Air Injection</b>					
Control Valve					
Check Valve					
Solenoid Valve					
<b>Aftertreatment System:</b>					
Catalyst					
Exhaust Manifold					
<b>Crankcase System:</b>					
PCV Valve					

**Model Year:** \_\_\_\_\_  
**Manufacturer Name:** \_\_\_\_\_  
**Engine Family:** \_\_\_\_\_  
**SI MARINE ENGINE SUPPLEMENTAL INFORMATION**

**Page:** \_\_\_\_\_  
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**E.O.#:** \_\_\_\_\_

**S20. LABELING:**

- a. Emission label format approved? No \_\_\_ Yes \_\_\_ If yes, reference approval: \_\_\_\_\_  
Sample label attached? No \_\_\_ Yes (put label in #S22) \_\_\_\_\_
  
- b. Environmental label format approved? No \_\_\_ Yes \_\_\_ If yes, reference approval(s): \_\_\_\_\_  
Sample label attached? No \_\_\_ Yes (put label in #S22) \_\_\_\_\_
  
- c. Environmental hangtag format approved? No \_\_\_ Yes \_\_\_ If yes, reference approval(s): \_\_\_\_\_  
Sample hangtag attached? No \_\_\_ Yes (put hangtag in #S22) \_\_\_\_\_

**S21. WARRANTY:** Emission warranty approved? No \_\_\_ (Provide full warranty statement in #S22)

Yes \_\_\_ (Reference approval: \_\_\_\_\_ )

Have any changes been made since the last approval? No \_\_\_ Yes \_\_\_ If yes, provide an explanation of the changes:

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**Model Year:** \_\_\_\_\_  
**Manufacturer Name:** \_\_\_\_\_  
**Engine Family:** \_\_\_\_\_  
**SI MARINE ENGINE SUPPLEMENTAL INFORMATION**

**Page:** \_\_\_\_\_  
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**Revised:** \_\_\_\_\_  
**E.O.#:** \_\_\_\_\_

S22. ADDITIONAL INFORMATION AND COMMENTS

Model Year: \_\_\_\_\_  
 Manufacturer Name: \_\_\_\_\_  
 Engine Family: \_\_\_\_\_  
**SI MARINE ENGINE SUPPLEMENTAL INFORMATION**

Page: \_\_\_\_\_  
 Issued: \_\_\_\_\_  
 Revised: \_\_\_\_\_  
 E.O.#: \_\_\_\_\_

S23. CORPORATE AVERAGE PLAN  
 SAMPLE FORMAT

Equipment Type (check one): **Outboard**  **Personal Watercraft** \_\_\_\_\_

**CONFIDENTIAL**

ABC Marine Co.  
 Certification Plan and Estimated Production Volumes  
 2001 Model Year SI Marine Engines

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Engine Family	Models	Rated Power (kW)	Estimated Production Volume (Units)		HC+NOx Family Emission Limit (g/kW-hr)	Family Sales-Weighted Power (kW) $\sum [(3) \times (5)] / \sum (5)$	(4) x (7)	(4) x (6) x (7)
			Family	Model				
YXZM.123ABC			30		140.00	9.9	297.0	41580
	711K	4.3		10				
	723B	10.1		10				
	747A	15.4		10				
YXZM.234DEF			58		125.00	25.7	1490.6	186325
	850B	16.7		13				
	850C	28.3		45				
YXZM.345GHJ			39		35.00	36.2	1411.8	49413
	345X	30.0		23				
	450W	45.2		16				
YXZM2.00KLM			54		15.00	96.9	5232.6	78489
	200J	96.9		54				
<b>TOTALS:</b>			<b>181</b>				<b>8432.0</b>	<b>355807</b>

- SALES-WEIGHTED AVERAGE POWER (P) OF ALL ENGINE FAMILIES =  $\sum [(4) \times (7)] / \sum (4) = 8432.0/181 = 46.6$  Kw
- ESTIMATED CORPORATE AVERAGE EMISSION VALUE =  $\sum [(4) \times (6) \times (7)] / \sum [(4) \times (7)] = 355807/8432.0 = 42.20$  g/kW-hr
- ESTIMATED CORPORATE AVERAGE STANDARD =  $(0.25 \times (151+557/P^{0.9}))+6.0 = (0.25 \times (151+557/(46.6)^{0.9}))+6.0 = 48.14$  g/kW-hr

Model Year: \_\_\_\_\_  
 Manufacturer Name: \_\_\_\_\_  
 Engine Family: \_\_\_\_\_  
**SI MARINE ENGINE SUPPLEMENTAL INFORMATION**

Page: \_\_\_\_\_  
 Issued: \_\_\_\_\_  
 Revised: \_\_\_\_\_  
 E.O.#: \_\_\_\_\_

S23. CORPORATE AVERAGE PLAN

Equipment Type (check one): **Outboard**\_\_\_\_ **Personal Watercraft**\_\_\_\_\_

**CONFIDENTIAL**

Certification Plan and Estimated Production Volumes

(1)	(2)	(3)	(4)		(5)	(6)	(7)	(8)	(9)
Engine Family	Models	Rated Power (kW)	Estimated Production Volume (Units)		HC+NOx Family Emission Limit (g/kW-hr)	Family Sales-Weighted Power (kW)	(4) x (7)	(4) x (6) x (7)	
			Family	Model					$\sum [(3) \times (5)] / \sum (5)$

1. SALES-WEIGHTED AVERAGE POWER (P) OF ALL ENGINE FAMILIES =  $\sum [(4) \times (7)] / \sum (4) =$
2. ESTIMATED CORPORATE AVERAGE EMISSION VALUE =  $\sum [(4) \times (6) \times (7)] / \sum [(4) \times (7)] =$
3. ESTIMATED CORPORATE AVERAGE STANDARD =  $(0.25 \times (151+557/P^{0.9}))+6.0 =$

**Attachment 2:**

**Certification Database**

### CERTIFICATION DATABASE FORM

The certification database form closely follows the Certification Summary described in Attachment 1. The database form is an **Access 97** file; the **electronic version** of this form can be **obtained by contacting your assigned ARB Certification Section staff person**. An imprint of this database form is enclosed for information purposes (only for hard copy mailings of this guidance). In the Access 97 file, the light blue fields indicate fill-in boxes, dark blue fields indicate pull-down menus and red fields indicate they are “reserved for ARB use only.”

After **completing** and **verifying** this database form for each engine family, the manufacturer should (1) print a **hard copy** and submit it in lieu of the Certification Summary form described in Attachment 1 (which is a Word 97 document) as part of the engine family’s certification application package, and (2) **electronically send** the certification database information to its assigned Certification staff person.

Below is a list of the information fields that manufacturers must provide in order to complete an application for certification. **Incorrect or missing information will render the application incomplete and result in a certification delay.** The fields below are numbered corresponding to the filled-in numbers that are indicated on the enclosed sample (only for hard copy mailings of this guidance).

Field	Reserved for ARB Use Only	Pull- Down Menu	Fill-In/Describe
1. Model Year		<input checked="" type="checkbox"/>	
2. Application Type		<input checked="" type="checkbox"/>	
3. Manufacturer		<input checked="" type="checkbox"/>	
4. EO No.	<input checked="" type="checkbox"/>		
5. Engine Family Name			12 alphanumeric characters
6. EF Name on Engine Label			12 alphanumeric characters
7. Trade Name			Up to 32 alphanumeric characters
8. Equipment Applications		<input checked="" type="checkbox"/>	
9. Sales_Code		<input checked="" type="checkbox"/>	
10. EF CA Projected Sales			Up to 10 numbers
11. Engine_Displace_x			xxxx.xxx (in cc)
12. Highest Power (in kW)			xxx.xxx (in kW)
13. Lowest Power (in kW)			xxx.xxx (in kW)
14. Sales-Weighted Average			xxx.xxx (in kW)
15. HC+NOx_Std_CERT			xxx.xxx (Must be equal to or lower than the Star Label’s standard.)
16. HC+NOx Standard Type		<input checked="" type="checkbox"/>	
17. Engine Models			Up to 200 alphanumeric characters



Field	Reserved for ARB Use Only	Pull-Down Menu	Fill-In/Describe
18. Star Label Rating		<input checked="" type="checkbox"/>	"0-star" if Tier1<Cert Std.; "1-star" if Tier2<Cert Std.≤Tier1; "2-star" if Tier3<Cert Std.≤Tier2; "3-star" if Cert Std.≤Tier3
19. Certification Standard		<input checked="" type="checkbox"/>	
20. HC+NO <sub>x</sub> _Std_STAR			xxx.xxx (in g/kW-hr)
21. Combustion Cycle		<input checked="" type="checkbox"/>	
22. Oil/Fuel Ratio			Up to 10 numerals; enter "N/A" for 4-strokes
23. Engine Type		<input checked="" type="checkbox"/>	
24. Valvetrain		<input checked="" type="checkbox"/>	
25. Valve (Ports)/Cylinder		<input checked="" type="checkbox"/>	
26. Cooling Medium		<input checked="" type="checkbox"/>	
27. # of Cylinders		<input checked="" type="checkbox"/>	
28. Cylinder Arrangement		<input checked="" type="checkbox"/>	
29. Fuel System Configuration		<input checked="" type="checkbox"/>	
30. Operating Fuel		<input checked="" type="checkbox"/>	
31. ECS_Cat		<input checked="" type="checkbox"/>	
32. ECS_o2s		<input checked="" type="checkbox"/>	
33. ECS_fuelsys		<input checked="" type="checkbox"/>	
34. ECS_egr		<input checked="" type="checkbox"/>	
35. ECS_asp		<input checked="" type="checkbox"/>	
36. ECS_air		<input checked="" type="checkbox"/>	
37. ECS_em:		<input checked="" type="checkbox"/>	Use "EM" only when CARB (carburetor) fuel system and NA (natural aspiration) are the only other information. Use "*" otherwise.
38. New Durability Testing?		<input checked="" type="checkbox"/>	
39. Durability Carryover EF Name			12 alphanumeric characters; enter "N/A" if #36 is "Yes"
40. Durability Engine Model			Up to 32 characters
41. Durability Engine ID Number			Up to 32 characters
42. Service Accumulation Hours			xxx.xxx (in hours)
43. DF_Type		<input checked="" type="checkbox"/>	
44. xxHC_DF			xx.xxx
45. NO <sub>x</sub> _DF			xx.xxx
46. xxHC+NO <sub>x</sub> _DF			xx.xxx (This is optional and for additive DF type only.)
47. CO_DF			xx.xxx
48. CERT_EDE_type		<input checked="" type="checkbox"/>	

Field	Reserved for ARB Use Only	Pull-Down Menu	Fill-In/Describe
49. Emission Carryover Engine Family Name			12 alphanumeric characters; enter "N/A" if #46 is "NEW"
50. Cert_engine model			Up to 32 characters
51. Cert_engine_id			Up to 32 characters
52. Rated Power (kW)			xxx.xxx (in kW)
53. @ Rated_rpm			Up to 5 numerals; no decimals
54. Cert_engine_stabilization_hours			Up to 3 numerals
55. cert_test_date			month/date/year (e.g., 06/19/00 for June 19, 2000)
56. Certification Test Fuel		<input checked="" type="checkbox"/>	
57. Certification Test Procedure		<input checked="" type="checkbox"/>	
58. Certification Test Cycle		<input checked="" type="checkbox"/>	
59. Cert_TP: List all special...			Up to 200 alphanumeric characters
60. HC+NOx: Certification Level			xxx.xx (in g/kW-hr)(Enter level from confirmatory test, if any. If none, enter highest value from all tests.)
61. TEST_SET_x		<input checked="" type="checkbox"/>	
62. HC			xxx.xxx (in g/kW-hr)
63. NOx			xxx.xxx (in g/kW-hr)
64. HC+NOx			xxx.xxx (This is optional and for additive DF only.)
65. CO			xxx.xxx (in g/kW-hr)
66. HC (Deteriorated)			xxx.xxx (in g/kW-hr)
67. NOx (Deteriorated)			xxx.xxx (in g/kW-hr)
68. HC+NOx (Deteriorated)			xxx.xxx (in g/kW-hr)
69. CO (Deteriorated)			xxx.xxx (in g/kW-hr)
70. QA_Procedure		<input checked="" type="checkbox"/>	
71. Remarks			Up to 200 alphanumeric characters
72. Date_issued			month/date/year (e.g., 06/19/00 for June 19, 2000)
73. Date_revision			month/date/year (e.g., 06/19/00 for June 19, 2000)
74. Processed By:	<input checked="" type="checkbox"/>		
75. DATE_PROC	<input checked="" type="checkbox"/>		
76. Review By:	<input checked="" type="checkbox"/>		
77. Review_date	<input checked="" type="checkbox"/>		