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June 22, 2000

Manufacturer's Advisory Correspondence    MAC #2000-04

**TO:**                    ALL SPARK-IGNITION MARINE ENGINE MANUFACTURERS

**Subject:**            Format for Submitting Electronically Based and Written  
                              Submissions of Manufacturer Quarterly Production Line Testing  
                              Reports, and Guidance on Meeting Production Line Engine  
                              Sampling Requirements for 2001 and Later Model Year Spark-  
                              Ignition Marine Engines.

This letter transmits the enclosed Manufacturers' Advisory Correspondence (MAC) which clarifies the Air Resources Board's (ARB) policy regarding the requirements for filing production line test sampling procedures and production line audit reporting. Title 13, California Code of Regulations, Section 2446 requires manufacturers to submit quarterly production line testing reports electronically and in hard copy, in a format specified by the ARB. The attachments to this MAC transmit the ARB specified format and provide guidance to manufacturers regarding the preparation and submittal of quarterly production line testing reports.

If you have questions regarding this matter, please contact Mr. Keith Macias, Air Resources Engineer, at (626) 575-7068 or Dr. Paul Adnnani, Air Resources Engineer, at (626) 459-4476.

Sincerely,

R. B. Summerfield, Chief  
Mobile Source Operations Division

Attachments

Manufacturers' Advisory Correspondence #2000 -04

Subject: Production line testing engine selection and reporting formats for 2001 and subsequent model year (MY) spark-ignition marine engines certified for sale in California.

Applicability: Manufacturers of California certified 2001 and subsequent MY spark-ignition marine engines used to propel marine watercraft, excepting manufacturers of those categories of engines and/or equipment specified in Title 13, California Code of Regulations, Sections 2440 (a)(2) and (c)(1) - (3).

Reference: Title 13, California Code of Regulations (CCR), Section 2446 (a) through (d).

Background: Title 13, CCR, Section 2446 requires a manufacturer of 2001 and later MY spark-ignition marine engines certified for sale in California to conduct Production Line Testing (PLT) using the quality-audit one percent (1%) method or the cumulative sum method, unless the manufacturer has been approved to use an alternate method that shows an equivalent assurance of compliance to that of the 1% method. The engine manufacturer must select one method for each model year, and must submit its method of PLT for ARB Executive Officer approval not later than 90 days prior to the start of production for each MY.

Engine manufacturers electing to proceed under the cumulative sum PLT method must submit their procedures for randomly selecting engines or units of equipment to the Chief, Mobile Source Operations Division, P. O. Box 8001, 9528 Telstar Ave., El Monte, CA. 91734-8001, before the start of production for the first year of production. Title 13, CCR Section 2446 (c)(1)(A)(iii).

These engine manufacturers must also provide, for the 2001 and later MYs, actual California sales data, or other information acceptable to the Executive Officer, including, estimates based on market analyses and federal production or sales. Title 13, CCR Section 2446 (c)(1)(A)(iv)(b).

Engine manufacturers utilizing either the quality-audit or the cumulative sum PLT procedures must submit quarterly reports in an ARB specified format, and in both electronic and hard copy formats within 45 days after the end of each calendar quarter. Title 13, CCR Sections 2446 (b)(4)(A) and (C), and 2446 (c)(3)(E) and (F). Manufacturers must also notify the ARB in writing and by telephone within 10 working days of an engine family failure. Title 13, CCR Sections 2446 (b)(3)(A) and 2446 (c)(2)(A)(viii).

Discussion: ARB's regulations applicable to 2001 and subsequent model year spark-ignition marine engines took effect on January 7, 2000. On October 27, 1999, ARB conducted a workshop to discuss these regulations with spark-ignition marine engine manufacturers. At that workshop, ARB staff provided guidelines on selecting a production line testing method and discussed the requirement for submitting a sampling plan for randomly selecting engines for production line testing. ARB staff also provided manufacturers with a draft version of the ARB specifications for submitting electronically based quarterly production line test reports.

Policy: **Reporting Format**

Title 13, CCR Sections 2446 (b)(4) and (c)(3) specify that manufacturers of 2001 and later MY spark-ignition marine engines must report to ARB each quarter the production volumes and production line emission test results for each California-certified engine family. The attachments to this MAC provide the format that manufacturers should use to submit the quarterly electronic and hard copy reports. This electronic format is an update to the draft format provided at the October workshop and should be followed precisely. All electronic fields must be included in a manufacturer's submittal and any field that does not apply should be left blank.

Attachment 1 describes the database structure required for the electronic submittal, provides details of the data field identification system, defines the file names, and specifies the software most readily accepted by the ARB. Attachments 2, 3, 5, and 7 provide the data file structure for each of the ARB-specified files and the regulatory basis for requiring the reporting of information. The ARB format for the hard copy printout of these files is provided in Attachments 4, 6 and 8. Attachment 9 shows an example of a Code Key File, which describes manufacturer-designated codes used primarily in the Individual Engine Test Data file. Attachment 10 lists the three-letter manufacturer identification code as defined by the United States Environmental Protection Agency for use in engine family names.

The quarterly production-line test reports are due within 45 calendar days after the end of each calendar quarter. Flexibility exists regarding the software a manufacturer may use to prepare the electronic forms (see Attachment 1). The hard copy format presented in Attachment 6 was prepared with Microsoft's Access database program. A manufacturer may elect to prepare the hard copy information using another program so long as the required information is provided.

The ARB recommends that manufacturers submit their electronic data on 3.5 inch floppy disks. Alternate means of transmitting electronic reports are also acceptable (e.g., via the Internet); however, ARB prefers that manufacturers submit the reports on floppy disks to ensure accuracy and confidentiality of the reports. A 3.5 inch floppy disk containing the templates for the four electronic file formats and the Microsoft Access hard copy formats is available on request. The files will also be made available on the ARB website.

### **Submittal of Random Sampling Procedures**

A manufacturer of 2001 and later MY spark-ignition marine engines must submit the random sampling procedure it will use for production line testing to the ARB prior to the start of production for the 2001 model year. This procedure will remain on file with the ARB for subsequent model years as long as the sampling selection method remains unchanged.

At a minimum, a manufacturer's random sampling procedure should describe how engines will be randomly selected throughout the production year, how the sample size for an engine family will be determined for the quarter, and the procedures to prevent production-line workers from identifying engines selected for testing during the assembly process. Test engines must be selected from the end of the assembly line and must be representative of the engines manufactured for sale in California. All engine models within the engine family must be included in the random selection process.

### **California Sales Estimates**

Manufacturers of engine families certified for sale in all 50 states using the 1% PLT sample selection method may provide ARB with estimates of California sales only if actual California sales data cannot be provided. Prior to the beginning of the 2001 model year, manufacturers must provide their total production figures and an estimate of California sales at the end of the model year. Engine manufacturers must also provide supporting material for their estimates.

For the 2001 and later model years, engine manufacturers must provide actual California sales, or other information acceptable to the ARB Executive Officer, including, but not limited to, an estimate based on market analysis and federal production or sales.

## Attachment 1

### California Air Resources Board Reporting Format for Production-Line Testing Results For Spark-Ignition Marine Engines

Title 13, California Code of Regulations (CCR) Sections 2446 (b)(4) and (c)(3), require manufacturers of spark-ignition marine engines to submit quarterly reports in electronic and hard copy format. The electronic format for each file is described in Attachments 2, 3, 5, and 7. The formats for the hard copy reports are shown in Attachments 4, 6 and 8.

#### Spark-Ignition Marine Engine Production-Line Testing (PLT) Database Description

The PLT database is a relational database consisting of four data files. The following files and hard copy formats are used with the PLT database.

#### **1) Engine Family Information File (Attachment 2)**

This file contains certification-related data for each California-certified engine family and includes certification information such as engine type and class, the standard or Family Emission Level (FEL) the family is certified to, the applicable Deterioration Factors (DFs), and whether the FEL has been changed. Attachment 2 defines the content of each field in this file to be reported electronically. The hard copy format for this file is included in the top section of Attachment 6.

#### **2) Engine Family Data Per Quarter File (Attachment 3)**

This file contains emission and production data for each engine family in production. The data fields include quarterly production numbers, the statistical summary of the emission test results (with and without the applicable deterioration factors), the cumulative sum calculations at the end of the quarter, the actual and required sample size, whether the engine family complies with standards or the action limits, and other engine family specific information. Attachment 3 defines the field contents for this file. Several fields from this file are included in the hard copy summary file shown in Attachment 4 and the Engine Family Quarterly Data information portion of the hard copy report in Attachment 6.

#### **3) Hard Copy Format for the Manufacturer Quarterly Production and Testing Summary File (Attachment 4)**

The hard copy format presented in Attachment 4 includes information from the Engine Family Data Per Quarter File (Attachment 3) to provide a listing of the engine families produced during the quarter and the statistical analysis of the test data for each engine

family. The file sequence numbers that identify each data field are shown in parentheses.

#### **4) Individual Engine Test Data Per Quarter File (Attachment 5)**

This file consists of the emission data record for each engine/application tested. In addition, each record provides engine specific test parameters, engine identification codes, individual test results and the cumulative sum calculations for the regulated pollutants at the conclusion of each engine test. This file also allows manufacturers to report multiple tests on the same engine and the final average results for multiple tests on the same engine. Attachment 5 defines the fields used in this file and Attachment 6 includes the hard copy format for this file as the Individual Engine Test Data per Quarter portion of the report.

#### **5) Hard Copy Format For Quarterly Engine Family Test Summary (Attachment 6)**

This hard copy format is divided into three separate areas to summarize the data for each engine family from the Engine Family Information File, the Engine Family Data per Quarter File, and the Individual Engine Test Data per Quarter File. The top section entitled "Engine Family Information Data" summarizes data from the Engine Family Information File and provides the certification-related information for an engine family. The second section entitled "Engine Family Quarterly Data" summarizes data from the Engine Family Data per Quarter File and includes quarterly testing and production information for an engine family. The final section summarizes data from the Individual Engine Test Data per Quarter File and provides individual engine test results and cumulative sum calculations for each engine tested in an engine family. The file sequence numbers shown in parentheses identify each corresponding field from the electronic data file.

#### **6) Combined Quarters Engine Family File (Attachment 7)**

This file is for engine families using 1% quality audit testing and does not apply to manufacturers that use the cumulative sum sampling option. This file contains the combined quarter summaries for engine families with less than ten engines tested in a quarter. Each record provides the summary for any engine family with less than ten tests by combining the current quarter's data with all of the data from the preceding quarter(s). Quarters are combined throughout the engine family model year starting with the most current quarter and adding less current quarters until the sample size contains at least ten engines per family. Attachment 7 defines the content of each field in this file.

## 7) Hard Copy Format For Combined Quarters Engine Family File

(Attachment 8)

Attachment 8 provides the hard copy report format for the Combined Quarters Engine Family File, along with identifying file sequence numbers in parentheses from the electronic data file.

## 8) Code Key File (Attachment 9)

This file describes the manufacturer-designated codes for all engine families and consists of a Key for Engine Identification Codes and a Key for Plant and Test Location Codes. The engine identification codes need only be reported during the first quarter of production or as changes occur. Manufacturers may also choose to use codes to explain engine failure and/or other reasons for test failures.

Attachment 9 provides an example of a Code Key File by describing the codes used in the Individual Engine Test Data Per Quarter File (Attachment 5). The format for electronic and hard copy submittal of the Code Key File is left to the discretion of the manufacturer.

## 9) Spark-Ignition Marine Engine Manufacturer Code for Quarterly Report

(Attachment 10)

This table provides the three-character manufacturer identification code as defined by the United States Environmental Protection Agency in their standardized engine family name format.

### Identification of Each Field in the Tables

Each record field in a table is identified by:

**Sequence** – Order of the data in the table

**Data Name** – Name of the data field

**Type** – Three types of data: C= Characters (i.e. alpha-numeric)  
N= Numeric  
D= Date (format: year/month/day)

**Length** – Specifies the maximum number of characters for each field. For numeric data, the number before and after the decimal point indicates the digits to be reported (example: 2.2 specifies that up to two digits are to be reported before the decimal point and 2 digits must be reported after the decimal point).

**Range or Domain** – Defines the possible inputs or provides the range and format of the input data.

**Description** – Explanation of the information to be reported in the specified field of the record.

The first row of each file should contain the field headings using the given data name. The data for each record are entered in the rows below the corresponding field heading (i.e. columnar report format). For the hard copy, the column width may be adjusted to best fit the reported data; however, the specified length of the data field must not be exceeded. All characters should be entered in uppercase. Fields that do not apply to an engine family or a test engine, should be left blank (i.e., no spaces).

### **Guidance for Electronic Submittal of QA data files**

Each file should be named as follows: QYYMMMZF.XXX (ex. 200XYX1S.XLS)

- Q = 1 for January through March quarter  
2 for April through June quarter  
3 for July through September quarter  
4 for October through December quarter
  
- YY = Last two digits of the calendar year
  
- MMM = Manufacturer code as specified in the second to fourth digits of the engine family name
  
- Z = Last digit of the model year
  
- F = I for Engine Family Information File  
S for Engine Family Data Per Quarter File  
V for Individual Engine Test Data Per Quarter File  
T for Combined Quarters Engine Family File  
C for Code Key File
  
- XXX = file extension: XLS for Excel (97 or earlier version) file  
MDB for Access (97 or earlier version) file  
WK? for Lotus 1-2-3 file  
WQ1 for Quattro Pro/DOS file  
TXT for comma delimited ASCII Text file