

**AIR RESOURCES BOARD**

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MAIL-OUT #95-30



September 14, 1995

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

**SUBJECT: Clarification of Certification Procedures for Utility and Lawn and Garden Equipment Engines (ULGEs)**

On May 31, 1995, the Certification staff of the Air Resources Board (ARB) met with ULGE manufacturers for a clarification of certification issues concerning 1995 and later ULGEs to be sold in California. This meeting was held in response to the May 1, 1995, request by the Engine Manufacturers Association (EMA). Since the issues addressed at the meeting affect the ULGE industry, this Mail-out is being issued to all manufacturers. The issues and the ARB's responses at the meeting are detailed below.

### **1 Labeling - Part Number Identification of Emission Components**

**ISSUE:** EMA believes there is no need for part numbers for emission components that were required in ARB's Manufacturers Advisory Correspondence (MAC) 94-05. In lieu of part numbers, EMA would like to use engineering drawings for identifying emission components. At the most, EMA can agree to a short list of emission components for part numbering purposes.

**RESPONSE:** Per MAC 94-05, the ARB has determined that the use of part numbers is the most efficient method for configuration control. For example, part numbers can be used to easily ascertain that production engines are represented by the certified test engines, and to readily identify misbuilds. Other methods are also allowed if they can provide the same degree of configuration control for field identification of misbuilds and verification that production test engines (e.g., new engine compliance ("Title 13") testing, and quality audit (QA) testing) are the same as the certified test engines. To assist manufacturers during the initial certification, the ARB delayed implementation of MAC 94-05 requirements until the 1996 certification year.

During the course of the May 31 meeting, EMA was unable to provide a detailed explanation of the procedures necessary to assure configuration control for the use of engineering drawings in lieu of part numbers. Thus, the ARB and EMA agreed that the following list of emission components should be provided with part numbers. If an emission component is not used on a specific engine configuration, a part number for such component is not required. New components may be added to this list in the future with prior notice to manufacturers.

Fuel System: gasoline carburetor and injector; diesel injection pump; compressed natural gas/liquid petroleum gas (CNG/LPG) regulator, carburetor and injector. The ARB agreed to delete the requirement for a separate part number for the fuel system's tamper resistance method provided the fuel system's part number is unique in respect to the tamper

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- resistance method employed; that is, identical fuel systems with different adjustable tamper resistance methods must have different part numbers.
- Ignition System: ignition module; spark plug
  - Oxygen sensor
  - Electronic control module
  - EGR valve body
  - Injection air pump
  - Auxiliary emission control device (e.g., temperature or pressure sensors, timer)
  - Air and fuel filter, if the element is enclosed by a housing or seal.
  - Exhaust aftertreatment: catalyst; particulate trap

## 2. Certification Engine Power Rating

ISSUE: The EMA requests the ARB to delete the requirement of Mail-out 93-44, which specifies that the actual rated power of the certification test engine be within  $\pm 5$  percent of its nominal rated power. The EMA stated that the test engine's measured power cannot meet this tolerance because the test engines are not broken-in completely and/or are pre-production or prototype engines. The EMA further represented that manufacturers do not intentionally attempt to compromise emissions compliance by testing certification engines that are either too high or low in power. Lastly, the EMA requested the ARB to clarify a number of seemingly varying references to power output in the certification application format.

RESPONSE: The requirement in Mail-out 93-44 is intended to assure, for certification purposes, the representativeness of the test engine's emissions to the engine family's emissions. That is, a test engine is suitable for certification purposes if its actual rated power is within  $\pm 5$  percent of its nominal rated power. For the reasons outlined by the EMA, the ARB will not require ULGE manufacturers to comply with the requirement at this time; however, manufacturers will be required to continue to report the actual rated power of the certification test engine in the application for certification. It was agreed that the representativeness of the certification emission values will ultimately be assured by QA or Title 13 testing on actual production engines.

As for clarification of various references to the power output in the application for certification, the "Rated Power @ RPM" referred to in Mail-out 92-57, Section 10.02.00.00, is the power output of the subject engine model determined per either SAE J1349 (net) or J1995 (gross). The "Recommended Maximum Power" in Section 10.09.02.00 is the power that the manufacturer suggests for extended or continuous use of the engine. As this term is deemed confusing to the industry, the ARB will not require the reporting of this value due to its irrelevance to the certification of the engine family. The "Rated HP @ RPM" and "Maximum Rated Power" listed in the Supplemental Data Sheet are the power of the individual models in the engine family as described in Section 10.02.00.00 above and the highest of these models, respectively; the latter is for administrative purposes only.

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### 3. Altitude Adjustment

ISSUE: The EMA requests that the proposed MAC for demonstrating altitude adjustment compliance provide for, but not be limited to, manufacturer-supplied engineering documentation of the air-to-fuel (A/F) ratio that results from the use of an altitude kit and specification of the actual jet dimensions contained in the altitude kit. The EMA suggests that the MAC allow the use of the fuel jet dimensions based on the generic effect of high altitude on the A/F ratio.

RESPONSE: To assist manufacturers during the initial certification, the ARB delayed, until the 1996 certification year, compliance with the ARB's requirements for altitude adjustments. Generally, the ARB will require manufacturers to confirm that the engine's A/F ratio with the high-altitude jet at elevation will be no richer than that with the standard jet at low altitude. This can be done by a number of methods, including bench flowing and high-altitude chamber testing. Near the completion of the 1995 certification year, the ARB plans to issue a MAC on altitude compensation. The EMA's suggested options will be considered for this MAC. One concern regarding the EMA's suggested generic, industry-wide application of fuel jet sizes for altitude adjustment is that many factors besides a jet's diameter can influence the A/F characteristics of a carburetor. As a result, it was agreed at the meeting that such demonstration of altitude adjustment compliance will be best achieved based on individual manufacturer's data.

### 4. Certification Fuel Specification for Alternative Fuels

ISSUE: The EMA is concerned that the ARB has not properly defined the LPG or CNG certification test fuel specifications. It believes the requirement to use the light-duty vehicle (LDV) test fuel as referenced in the ULGE regulations places excessive costs on ULGE manufacturers; instead, commercially available alternate fuels, e.g., HD-5 propane, should be allowed.

RESPONSE: The ULGE test procedures require the use of the same gaseous test fuels as specified in the LDV procedures. These LDV test fuel specifications are intended to represent actual in-use fuels and at the same time minimize variations in the emission test results due to test fuel effects. This requires manufacturers to blend the test fuel, at high costs, to the specifications. Thus, as applied to ULGE certification testing, the LDV gaseous test fuel is not practical as its cost is high compared to the engine's unit price. In view of this, the ARB has accepted manufacturer representations that the high test fuel costs constitute an unsatisfactory test condition under the prescribed test procedures. Section 20(d) of the test procedures allows the ARB to permit an alternative procedure if it determines that the prescribed procedure is not susceptible to satisfactory testing. Accordingly, the ARB has allowed, and will continue to allow, manufacturers on a case-by-case basis to use commercially available CNG or LPG fuels for certification and QA testing if any significant emission differences between the best-case commercial fuel and the worst-case specified test fuel can be accounted for by an additive correction factor not less than zero. A manufacturer will have to propose such a test program for ARB's approval to determine the correction factors that can be applied to other CNG or LPG product lines of the manufacturer. Such proposed test programs should identify the worst-case test engine, the specifications of the reference fuel and the best-case commercial fuel (i.e.,

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very close to pure methane or propane), and the number of tests. It should be noted that the ARB will have the option to conduct confirmatory tests and Title-13 tests using either fuel and the results will be enforceable.

#### **5. Labeling - Harmonization with EPA**

**ISSUE:** The EMA urges the ARB to permit use of a single emission label format which would meet the labeling requirements of both the ARB and the United States Environmental Protection Agency (U.S. EPA). This would effectively reduce the cost and labor involved in producing and applying labels for both ARB and EPA certified engines, and would also allow 50-state distribution of such engines.

**RESPONSE:** The ARB agreed to consider a 50-state label but a final decision could not be made until the U.S. EPA's nonroad small engine regulations were released. Based on the U.S. EPA's nonroad small engine regulations released on May 31, 1995, the ARB has determined that there are significant differences in comparison to the ARB's regulations. These differences include: (1) the certification standards are not equivalent (e.g., carbon monoxide standard in grams per brake horsepower-hour is 300 for the ARB but is 350 and 450 for the U.S. EPA) and (2) the U.S. EPA's different definition of hand-held equipment. Also, under U.S. EPA's regulations, a manufacturer is allowed, as an option to the indolene-clear test fuel, to use the Clean Air Act baseline fuel for certification purposes, whereas California regulations do not allow such fuel. For these reasons, a 50-state label is not practical.

#### **6 Engine Family Name Carryover**

**ISSUE:** Mail-out 92-57 permits engine manufacturers to carry over their engine emission labels for subsequent-year certification if no running changes (R/C) have occurred. The EMA requests the ARB to confirm that the ARB still allows carry-over of engine labels when no R/C occurred.

**RESPONSE:** As provided for in Mail-out 92-57, the ARB will allow the carry-over of engine labels where there are no R/C for the certified engine family. The label carry-over for engines certified to Tier 1 standards will be allowed through the 1998 certification year. Engine labels for Tier 1 standards are not allowed for carry-over to engines that are certified to Tier 2 standards commencing in the 1999 certification year.

#### **7 Labeling - Running Changes**

**ISSUE:** Mail-out 92-57 permits carry-over of engine emission labels except when a R/C has occurred. Typically, a running change results in only a minor change to the engine label, i.e., a change in the first character of the engine family name and the year in the statement of compliance. It is unlikely that the remaining information on the label will change. The EMA does not believe that all R/Cs should require revision to the emission label and requests that carry-over of unchanged engine labels be permitted for R/C which do not affect the emissions output of the subject engine family.

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**RESPONSE:** The emission label carry-over policy outlined in Mail-out 92-57 (issue 6. above) is necessary to track R/C for enforcement purposes. However, based on EMA's presentation that R/C can be tracked by a properly documented application for certification in combination with the build date indicated on each engine unit, the ARB agreed to require a new engine label only when a R/C affects an engine family's determinators. Cosmetic or non-emission related modifications to the engine will not require the engine label to be revised.

## **8 Conditional Executive Officer Approvals of Certificate**

**ISSUE:** In July 1994 a Board hearing was held to update the ULGE regulations. Mail-outs 94-24 and 94-35 provide the new updated ULGE regulatory language, however, these changes are not effective until the Office of Administrative Laws (OAL) approves the Board package. Because some manufacturers have been anxious to implement the new procedures, the ARB is permitting use of the new procedures through conditional executive orders. These executive orders state that the certification will be rescinded if the new updated regulations are not approved by OAL and if the manufacturer does not retest for compliance with the applicable regulations within 30 days of notification. EMA requests that the OAL should approve changes proposed in Mail-outs 94-24 and 94-35 so that conditional executive orders need not be issued.

**RESPONSE:** The Board package was approved by the OAL on July 24, 1995, with an immediate effective date. As a result, the ARB will now grant full executive orders, not conditional ones, for engine families that were tested using the amended test procedures. For engine families that were granted conditional executive orders, new executive orders granting full certification are not necessary as the conditional clause has been fulfilled by the OAL approval.

## **9. ARB Response Mechanism for Running Changes**

**ISSUE:** Although the ULGE regulations outline the R/C process, the ARB response mechanism to R/C requests is not detailed. The R/C policy for on-road certification is currently employed for ULGE certification, i.e., if manufacturers do not receive notification of ARB's disapproval of a R/C within 30 days of submittal to the ARB, then the R/C is considered to have been approved. The EMA requests that manufacturers receive ARB's definitive responses within 30 days of submittal regarding the R/C review status. The EMA requests that the ARB formalize its R/C approval mechanism through a MAC.

**RESPONSE:** Formal notice of R/C approval is resource-intensive and can adversely affect the timely certification of engine families. The ARB and the EMA have agreed that the present protocol for on-road certification of R/Cs described above is also acceptable for the ULGE certification program.

## **10. Labeling - Sample Certification Label Submission Deadlines**

**ISSUE:** Title 13, California Code of Regulations (CCR), Section 2404(i) requires manufacturers to submit actual samples of all production labels within 30 days after the start of production. EMA recommends a period of 90 days from

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the start of engine production to submit actual sample labels to ease logistics concerns, particularly for off-shore manufacturers.

RESPONSE: Because the label layouts are described in the applications for certification, the ARB has been given the opportunity to review and approve the label format prior to production. The submission of actual samples of the production labels would serve as a final verification. When actual production labels are identical to the layouts that have been provided in the application, the ARB will allow manufacturers up to 90 days after the start of production to submit actual samples of the emission labels. However, if the actual label differs from the approved format described in the application, the manufacturer is required to submit the modified label within 30 days of the start of production and to apply the modified label to all previously produced engines.

#### 11. Continued Use of Air for Calibration, Span, and Zero Analyzer Gases

ISSUE: The EMA does not believe a technical necessity exists for the requirement in Mail-out 94-35 that nitrogen be used as the calibration, span, and zero gas for the heated flame ionization detector (HFID). It believes that the use of air gives results as accurate as nitrogen and will standardize all analyzers to a common calibration gas, thereby eliminating the need for extensive plumbing modifications and obsoleting manufacturers' existing stocks of zero grade air. The EMA requests the ARB's approval for the continued use of air for these purposes as had been allowed by the regulations prior to the July 1994 amendments.

RESPONSE: The change to nitrogen for calibration, span and zero gases was made at the July 1994 hearing to harmonize with the U.S. EPA (or so at that time). The U.S. EPA's final approved regulations allow the use of either zero grade air or nitrogen for the HFID. As a result, for consistency the ARB will permit continued use of air for such purposes. However, the ARB will have the option to use either gas during its own enforcement testing (e.g., certification confirmatory testing, Title 13 testing) and the results shall be enforceable.

#### 12 Tamper-Resistant LPG and Natural Gas Regulators

ISSUE: The EMA requests the ARB to not require tamper resistance measures for adjustable parameters on CNG and LPG regulators. The EMA recognizes the ARB's concerns for unauthorized field adjustments, however, the EMA believes these concerns are satisfactorily addressed through Underwriters Laboratories, Inc. (UL) approval of such regulators (and, additionally, Canadian Gas Association (CGA) approval for CNG regulators). The EMA believes the inability to make field adjustment to suit the prevailing low-pressure gas supply can result in incorrect gas flows.

RESPONSE: Many tamper resistance methods have been developed and certified for gasoline and diesel engines that allow for limited field adjustments. The ARB expects similar efforts from manufacturers of LPG and CNG regulators to provide emission compliance and satisfactory in-use performance. It is not required that a tamper resistance method renders the regulator unadjustable; however, adjustable parameters on such regulators should incorporate adequate tamper resistance measures approved by the ARB to prevent adjustments outside the

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certified ranges. Regarding UL and CGA approvals of CNG and LPG regulators; emphasis of such approvals appears to be safety and mechanical performance concerns. The ARB does not have any information regarding UL and CGA assurance that such regulators would comply with the emission standards at all possible settings of the regulators when no tamper resistance measure is used. In summary, tamper resistance is required for adjustable CNG/LPG regulators. However, the ARB recognizes the difficulties experienced by ULGE manufacturers with the CNG/LPG regulator suppliers due to the small volumes involved. The staff will work with the individual manufacturers and regulator suppliers to achieve the most practicable tamper resistance measures.

### **13. Replacement Parts**

**ISSUE:** A November 18, 1994, fax issued from the ARB to a ULGE manufacturer clarified guidelines regarding replacement parts for in-use ULGEs. The EMA agrees with the contents of this fax and encourages ARB to release this information industry-wide.

**RESPONSE:** The ARB's ULGE replacement-part policy is adopted from similar requirements applicable to on-road motor vehicles (Title 13, CCR, Sections 1900 and 2220 et seq.). Aftermarket parts are produced for use on post production engines. There are four different categories of aftermarket parts. A replacement part is a part intended to replace an original equipment emissions related part and is functionally identical to the original equipment part in all respects as it affects emissions (including durability). A consolidated part is a type of replacement part which is designed to replace a group of original equipment emission related parts and which is functionally identical to the parts that it is replacing in all respects as it affects emissions (including durability). The use of these aftermarket parts does not invalidate the engine family certification.

A modified part is an aftermarket part which is intended to replace an original equipment emissions related part but which is not functionally identical to the part that it is replacing in all respects as it affects emissions. An add-on part is an aftermarket part which is not a modified part or a replacement part (i.e., it is not intended to replace an emissions related part). Because add-on and modified parts may affect emissions, the use of add-on or modified parts would invalidate the engine family certification.

### **14. Procedure for Carry-Over of an Engine Family into the Next Model Year**

**ISSUE:** The EMA would like the ARB to provide guidelines for carry-over of ULGE certification in time for the 1996 certification year.

**RESPONSE:** This issue will be addressed in a Mail-out to be released later this year. It is anticipated that the process will be abbreviated and very simple for direct carry-over of an engine family certification.

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Information to be Supplied on the Supplemental Label

ISSUE: In the event that an engine emission label is obscured by an original equipment manufacturer's (OEM's) equipment, a supplemental label must be attached on a visible location with all the information listed on the original label. Of specific concern to the EMA is the requirement to include the engine build date on the supplemental label (or on another visible location on the engine or equipment) which would cause logistical problems, especially in the tracking of the engines. Accordingly, the EMA suggests that the requirement to include build dates on supplemental labels be deleted.

RESPONSE: The ARB accepted the EMA's presentation that it is difficult for ULGE manufacturers to ascertain the final destination of their engines, and that the engine's build date, although obscured by the equipment, will be sufficient for any enforcement testing conducted since it will be necessary to disassemble the equipment for such tests, thereby providing access to the engine's label and build date. Rather than allowing manufacturers to pack loose supplemental labels with the engine assemblies which would then increase the possibility of mislabeling, the ARB will not require the inclusion of the engine's build date on the supplementary label based on Title 13, California Code of Regulations, Section 2404(i) which specifies that the Executive Officer may, upon request, waive or modify the label content requirements provided that the intent of the specifications is met.

16. Regulation of Aftermarket Gaseous Fuel Converters

ISSUE: The EMA inquired if aftermarket entities that supply aftermarket conversions of certified gasoline and diesel ULGEs for operation on CNG or LPG fuel have to obtain an Executive Officer's approval like an OEM application.

RESPONSE: The ARB believes that aftermarket conversions must be certified by the ARB for CNG/LPG operation. If not, the ARB will consider the engines not to be covered by the original gasoline or diesel ULGE certification. Since these aftermarket CNG/LPG conversions of ULGEs are typically low-volume operations for special applications, it would seem logical that the ULGE manufacturers obtain such ARB approval on behalf of the aftermarket converters

If you have further questions on these issues, please telephone Mr. Duc Nguyen Manager, Certification Section, at (818) 575-6844.

Sincerely,



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