STATE OF CALIFORNIA
AIR RESOURCES BOARD

Amendments to Regulations for the Control of Emissions for 1995 and Later Utility and Lawn and Garden Equipment Engines.	)	**Mail-Out # 94-24**
	)	**Hearing Date: July 28, 1994**

STATEMENT OF THE
ENGINE MANUFACTURERS ASSOCIATION
AND THE
OUTDOOR POWER EQUIPMENT INSTITUTE

Good morning, my name is Jed Mandel. I am here today on behalf of the Engine Manufacturers Association and the Outdoor Power Equipment Institute. The members of EMA and OPEI manufacture the small engines and equipment covered by today's proposed amendments.

EMA and OPEI have worked and continue to work with the ARB Staff to address our concerns with the proposed "clean-up" package. EMA and OPEI support Staff's efforts to amend its rules in accord with industry's recommendations, and we will continue to work with Staff to address our remaining concerns. EMA has forwarded to Staff a list of specific technical issues that remain with Mail-Out #94-24. We would appreciate the Board's directing the Staff to make the necessary additional technical corrections.

EMA and OPEI also have been working with Staff on several key issues with respect to the effective date of the Tier I standards, the carbon monoxide ("CO") emission levels for non-handheld equipment, and provisions for small volume equipment manufacturers. EMA has filed a Petition requesting that the ARB amend the proposed regulations consistent with EMA's concerns in those three areas.

EMA is asking that the Board amend the proposed regulations by (1) extending the effective date of the Tier I exhaust emission standards to August 1, 1996; (2) revising

the proposed CO standard for non-handheld engines from 300 to 350 g/bhp-hr; and (3) providing an exemption from the requirements of the regulation for small volume equipment manufacturers.

Providing relief in these three areas of the rule is critical to the small engine and equipment industries and to the citizens of California. Without additional leadtime, a more reasonable CO standard, and relief for small volume producers, the utility and lawn and garden engine and equipment industry will be substantially harmed. While there currently are many engine families certified to CARB's Tier I standards, those engine families, on both an application and sales volume basis, do not meet the needs of the marketplace.

As more explicitly set forth in the Petition, additional leadtime is necessary for engine manufacturers to meet the Tier I standards because of the substantial development time that is necessary. Engine manufacturers have worked diligently to develop products that will meet the standards, yet more time is needed because of the difficulties and time delays faced by engine manufacturers.

- Engine manufacturers rely on suppliers and suppliers' design and development processes. Yet suppliers and engine manufacturers have limited resources for the research and development necessary to meet the new standards. And, there are only a limited number of firms in the industry. Without the ability to obtain parts integral to engine exhaust emissions systems designed to meet the new standards, engine manufacturers' ability to produce compliant engines is severely limited.

- Engine operational problems often cannot be discovered until engines are actually tested in final equipment applications. Operational and performance difficulties, which may be significant, must be resolved before certifying an engine and offering it for sale. Design modifications -- which can take substantial time -- may be necessary.

A number of engine families representing a large portion of the sales volume in the utility, lawn and garden industry have not yet been certified. Without those engines, the needs of the marketplace will not be met. Further, even if those engines had been fully redesigned and tested and were ready to be certified, the ARB Staff would not likely have the time and resources to complete certification by the end of 1994.

As an added measure of uncertainty, EPA only recently has signed its final rule on the criteria for providing authority under Section 209(e) of the Clean Air Act for California to adopt nonroad regulations. However, a hearing has yet to be scheduled on California's request for authorization to proceed with implementing and enforcing its utility, lawn and garden rules.

In any event, granting additional leadtime will not have a substantial adverse impact on California's air quality. Engine manufacturers have introduced and will continue to introduce lower-emitting products into the marketplace as they are developed. Similarly, revising the CO standard from 300 to 350 g/bhp-hr will allow small engines in non-handheld equipment to operate satisfactorily, while the environment will not be harmed, because hydrocarbon (HC) and oxides of nitrogen (NOx) emissions will not be adversely affected. Although EMA members have worked actively to develop reliable exhaust aftertreatment systems and improved carburetor material, design and dimensional controls, many engines still cannot meet the Tier I CO standard. Without a change in the standard, those engines will disappear from the California markets.

One method for reducing CO emissions is to decrease the fuel in the air-fuel mixture (run the engine "lean"). But, as the air-fuel mixture becomes leaner, the engine will experience severe operational problems. As the load on the engine varies, the engine will not be able to respond and will "stumble" or "die." The exact CO level at which an engine will perform acceptably varies depending on the

engine design and equipment application. To ensure acceptable engine performance, the mean calibration level for certain engines must be set at or above the 300 g/bhp-hr standard.

Variability in CO emissions within a given engine family also results from dimensional tolerances in engine cylinders and the carburetor which lead to a range of air-fuel and compression ratios. This variability occurs despite close dimensional tolerances. Although machinery process improvements may decrease dimensional variability slightly, the reduction will not have a significant enough effect to reduce CO while maintaining an acceptable engine performance level.

Finally, in order to avoid substantial disadvantage to small volume equipment manufacturers, a modest small volume exemption should be adopted. A number of small volume OEM customers will not have the resources to make the design changes in their products necessary to incorporate engines certified to meet the ARB's standards. Such an exemption, in conjunction with a requirement that the engine manufacturer meet the standards on average should not result in an air quality problem and will ensure that small California-based businesses are not disadvantaged.

EMA recommends that the Board direct Staff to consider these issues and to place them on the agenda for the September Board hearing. This will allow EMA to explore the issues fully with Staff and will allow Staff to present these issues to the Board based on further discussions.

If you have any questions, I will be pleased to answer them.

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COMMENTS OF THE

PORTABLE POWER EQUIPMENT MANUFACTURERS ASSOCIATION

TO THE CALIFORNIA AIR RESOURCES BOARD ON

PROPOSED AMENDMENTS TO THE CALIFORNIA EMISSION CONTROL

REGULATIONS FOR 1995 AND LATER MODEL UTILITY AND

LAWN AND GARDEN EQUIPMENT ENGINES

July 28, 1994

INTRODUCTION

The Portable Power Equipment Manufacturers Association ("PPEMA") respectfully submits these comments to the California Air Resources Board on Mail-Out 94-24, the proposed amendments to the California Emission Control Regulations for 1995 and Later Model Utility and Lawn and Garden Equipment Engines. PPEMA is the national, not-for-profit trade association representing manufacturers of chain saws, brushcutters, string trimmers, edgers hedgetrimmers, blowers, cut-off saws and similar products powered by two-stroke engines. These portable products are light weight, provide a high power-to-weight ratio, and may be operated in any position. Because of their portability and form of operation, these products are often called "handheld equipment."

PPEMA previously provided comments to CARB staff on an earlier draft of the proposed amendments.[1] In general, PPEMA notes that Mail-Out 94-24 makes few changes to those sections of the earlier draft that were the subject of PPEMA's March 18, 1994 comments.

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[1] See March 18, 1994 PPEMA comments on CARB Mail-Out 94-09, a copy of which is attached hereto and expressly made part of PPEMA's comments on the proposed amendments.

Because many of PPEMA's March 18, 1994 comments requested clarification or confirmation of PPEMA's interpretation of specific regulatory language, PPEMA views the absence of further modification to such provisions to mean that PPEMA's interpretation is correct. Other PPEMA comments suggested revision, or objected to, specific provisions. PPEMA continues to assert those positions.[2]

PPEMA also requests that CARB staff formally respond to the attached February 2, 1994 letter from Donald Purcell, President of PPEMA, to Norman Kayne, Chief of CARB's certification branch. Although some of the questions raised by PPEMA's February 2 letter appear to be addressed by the Mail-Out 94-24, PPEMA believes that a written response is appropriate.

DISCUSSION

PPEMA continues to believe that CARB's lawn and garden engine regulations should be modified in several respects. Most of PPEMA's suggested changes are technical corrections to inaccuracies in CARB's definitions and procedures. A few comments, such as those regarding CARB's handheld equipment definition and its CO limit for large handheld engines, are intended to address certain inequities and technological problems in the regulations. PPEMA requests that CARB carefully consider all of PPEMA's suggested

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[2] PPEMA does not waive its previously-stated objections to CARB's Utility and Lawn and Garden Equipment Engine Regulations. Nothing in these comments or PPEMA's March 18, 1994 comments should be interpreted as a waiver of such objections.

changes, including those made in its March 18 comments, before finalizing the proposed amendments.

A. Definition of Handheld Equipment

Although PPEMA has addressed CARB's definition of handheld equipment on several occasions, PPEMA considers EPA's recent proposal of federal emissions regulations for spark-ignited nonroad engines 25 horsepower and less to be a significant new development that warrants revisiting this issue. The definition of handheld equipment is critical to PPEMA members because their two-stroke engine products can only meet the emissions standards for handheld equipment. Unlike the CARB definition, EPA defines handheld equipment to include equipment that is fully supported by an operator or that is operated multipositionally to perform its intended functions. Additionally, EPA's definition of handheld equipment includes equipment that weighs less than 14 kg, has no more than two wheels, and meets one of the following criteria: (i) the operator provides support or carries the equipment throughout its operation; (ii) the operator provides support or attitudinal control of the equipment throughout its performance; or (iii) it is a pump or a generator.

PPEMA believes that EPA's proposed rule generally defines handheld equipment more accurately than CARB's definition. EPA's definition recognizes that light-weight equipment should be classified as handheld whenever the operator must provide significant support or control of the equipment in order for it to perform its intended function. EPA's definition does not

automatically exclude equipment because of the presence of one or two wheels, but instead establishes specific criteria to determine whether or not the equipment is truly handheld. For example, edgers, small pumps, and small generators are considered handheld equipment under EPA's definition, and thus are subject to the handheld emissions standards. This treatment recognizes that these equipment types share the operator control and portability characteristics typical of handheld equipment. Under CARB's current regulation, however, these two-stroke products are considered non-handheld equipment and will be subject to the non-handheld standards, thereby eliminating them from the California market.

Consequently, in order to permit handheld classification of edgers, small pumps and small generators, PPEMA requests that CARB adopt EPA's approach to defining handheld equipment.[3]

B. Edgers

In October 1993, PPEMA requested clarification from CARB staff that two-stroke edgers were considered handheld equipment. PPEMA's request was prompted by the fact that, although CARB's October 1990 notice of proposed rulemaking indicated that edgers were handheld equipment, a literal application of CARB's definition would exclude wheel-equipped edgers. CARB staff subsequently informed PPEMA that handheld, wheel-equipped edgers were not considered handheld equipment. This decision effectively bans the sale of two-stroke

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[3] At the same time, PPEMA requests that CARB continue to specify that two-stroke snowthrowers are subject to the handheld equipment emissions standards.

edgers in California, because two-stroke engines cannot meet the emissions standards for non-handheld equipment.

In PPEMA's view, the decision by CARB staff does not adequately account for the similarity of edgers and trimmers. Both types of equipment utilize the same type of design, combining a two-stroke engine, a shaft with two handles, and a cutting attachment. Edgers and trimmers both use a depth gauge to control the cutting plane. A trimmer's depth gauge is a bumper that ensures that grass is cut at a uniform height; an edger's depth gauge is an adjustable wheel which controls the depth of the cutting blade. Neither of these equipment types can reasonably be considered ground-supported. Operators must support and control both types of equipment in order to perform their intended function, and both types of equipment are subject to the same ergonomic considerations. Notwithstanding these handheld characteristics common to both edgers and trimmers, CARB's regulations only classify trimmers as handheld equipment.[4]

Given their similarities, different regulatory treatment of trimmers and edgers is not justified. PPEMA therefore requests, even in the event that the handheld equipment definition is not modified, that CARB specify that two-stroke edgers are considered handheld equipment.

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[4] Although both types of equipment can be used without their respective depth gauges, equipment operation would be less comfortable and possibly less safe.

C. CO Emissions Standard

CARB's CO standard for handheld equipment engines 50 cc and larger cannot be met by many handheld products. Although most handheld equipment engines over 50 cc are not subject to CARB's regulations because of federal preemption, PPEMA remains concerned that regulated two-stroke engines will not be able to meet the 300 g/hp-hr CO limit. The enleanment of the air/fuel mixture necessary to meet this standard will generate excessive temperatures and negatively affect product durability. A more reasonable standard that will avoid potential temperature and durability problems, while still ensuring significant reductions in CO emissions, is 450 g/hp-hr. Accordingly, PPEMA requests that CARB modify the existing CO emissions limit for handheld engines over 50 cc to 450 g/hp-hr.

D. Compliance Testing and Quality Audit

PPEMA understands that, for purposes of audit testing, the carburetor may be set anywhere within the adjustable parameters specified by the engine manufacturer in its application for certification. However, PPEMA requests confirmation from CARB that data must be reported from only one position.

CARB's requirements for quality audit reports call for information on "start and stop dates of batch-produced engine family production." PPEMA requests that CARB define the phrase "batch-produced engine family production." PPEMA also requests that CARB require that engine manufacturers supply either a written quality audit report, or a diskette (or electronic transmission)

containing such information, but not both. To provide reports in both forms is unduly burdensome.

CARB's compliance testing requirements provide that "engines shall be tested in groups of five until a 'Pass' or 'Fail' decision is reached for each pollutant independently for the engine family or subgroup . . .." PPEMA interprets this requirement to mean that if after testing a group of five engines, a "pass" decision is reached for two pollutants and a "no decision" is reached for a third, compliance testing must continue only with respect to the third pollutant.

Finally, the regulations permit engine manufacturers to use rated power and speed for emissions calculation in connection with quality audit tests. PPEMA requests CARB's confirmation that rated power and speed may also be used for compliance testing. As in the case of audit testing, use of rated power and speed will reduce the costs of compliance testing.

E. NOx Measurements for Quality Audit

Test data indicates that Nox emissions from two-stroke engines are considerably less than CARB's 4.0 g/hp-hr standard, often less than 25% of the limit. Test data also indicates a high correlation between Nox emissions and CO emissions. Using this correlation, CO testing results demonstrate that NOx emissions stay well below the 4.0 g/hp-hr limit even in worst-case situations. PPEMA therefore requests that CARB delete the NOx measurement for quality audit testing, as omitting this measurement will save time and money for engine manufacturers. Instead of performing NOx measurements

during audit, manufacturers could confirm low NOx emissions levels by using a NOx-CO correlation factor. Accordingly, PPEMA requests that CARB modify its audit regulation by providing engine manufacturers with this option.

F. Test Muffler for Quality Audit

To reduce the costs of quality audit testing, PPEMA requests that CARB permit use of a test muffler. Equipped with a probe, a test muffler can be used to connect the engine to the gas analyzers. The test muffler thus provides standardized probe location, which is important to obtain accurate and repeatable test results. To otherwise achieve standardized probe location for audit testing, all mufflers would have to be equipped with a probe. PPEMA believes that this requirement is unreasonable due to the additional cost and functional problems that would result, especially when only 1% or less of production engines will be subject to quality audit testing.

Based upon staff comments, PPEMA understands that CARB may accept use of a probe-equipped test muffler for quality audit testing so long as it is regularly inspected, cleaned, and replaced if necessary. PPEMA therefore requests that CARB modify the audit procedures to permit the use of a probe-equipped test muffler under these conditions.

G. Fuel Tank Label

PPEMA again requests that CARB withdraw its fuel tank labeling requirement because it imposes unwarranted costs. Staff's concern when originally proposing the fuel label requirement was to

prohibit the use of leaded fuel. This is not a problem, however, because leaded fuel is not available in California. The fuel labeling requirement does not affect engine emissions, nor does it provide otherwise unavailable information because fuel requirements are clearly provided in owner's manuals. No reasonable basis exists to duplicate this information. Given these circumstances, handheld equipment manufacturers should not be forced to assume the cost of a fuel tank label.

H. Gross Power

CARB defines "gross power" as the engine's power when equipped only with those accessories necessary for operation. As stated in PPEMA's March 18 comments, this definition may be inapplicable to certain engines when the load is a necessary accessory. For example, the fan for some power blowers is a necessary accessory because, in addition to creating an air stream, it creates pressure within the volute which is bled off through channels to provide engine cooling. In such cases, accurate power measurements cannot be obtained because of the power used by the fan. To address these situations, PPEMA requests that CARB permit manufacturers to remove the load-generating fan in order to obtain accurate power measurements and to supply auxiliary cooling during the emissions test, or to determine power requirements of the blower assembly.

I. Divider for Spanning, Testing and Calibration

PPEMA requests CARB's clarification of whether an engine manufacturer may use a divider for spanning, testing and calibration.

J. Exhaust Analytical System

PPEMA understands that the schematic diagrams of analytical systems included in CARB's test procedures are exemplary only, and do not preclude the use of different systems such as NDIR for NOx measurements. Nevertheless, to clarify this issue, PPEMA requests that CARB specify that alternate analytical systems may be used.

CARB's description of the exhaust analytical system also specifies that the analyzer be equipped with a meter to measure flow rate, and a gauge to measure pressure. These measuring systems are duplicative. Because only one measuring system is necessary, PPEMA requests that CARB modify its procedures to state that each analyzer inlet have "a valve to meter the flow rate, or gauges to measure the pressure."

K. Probe Position

CARB's requirements for positioning the emissions probe are not necessarily consistent. Based upon prior testing, the most critical aspect of positioning the probe is that it "be located in a position that yields a well-mixed, homogenous sample of exhaust gas," one of CARB's three criteria. This requirement is consistent with the SAE J1088 procedure. CARB should delete its other criteria for probe position, as they may interfere with obtaining a well-mixed, homogenous sample of exhaust gas and will have an effect on engine emissions.

L. Analyzer Calibration

CARB should not require engine manufacturers to check the linearity of each analyzer over its entire operating range.

Testing has shown that calibrating the analyzer over its entire range is unnecessarily costly and time consuming. It is sufficient for the engine manufacturer to calibrate only at the zero and span point, so long as the analyzer manufacturer confirms that this will ensure readings within 2% of full scale over the full span range. PPEMA requests that the analyzer calibration procedures be modified accordingly.

M. Engine Dynamometer Test Run

CARB's dynamometer test run procedures appear to require continuous recording of all modal emission data and of the analyzer's output of exhaust gas. This implies that incremental recording is not permitted. Notwithstanding CARB's regulatory language, PPEMA understands that incremental recording is permitted. To avoid confusion on this matter, PPEMA requests that CARB confirm that incremental testing is permitted.

N. Effective Date

PPEMA understands that CARB staff has been contacted by other organizations to delay the effective date of CARB's Tier I emissions standards. In the interests of fairness, PPEMA requests that if CARB responds to these requests by providing relief, such relief should apply to all engine manufacturers. PPEMA members face considerable obstacles in bringing many of their products into compliance and will suffer significantly reduced product offerings under the present effective date. Since the basic problem of reducing emissions in a short time across many product lines is

common to all industry members, a uniform delay in the effective date is the only reasonable solution.

CONCLUSION

As described by the foregoing comments and PPEMA's March 18, 1994 comments regarding proposed amendments to CARB's emissions regulations for lawn and garden equipment engines, several additional changes are still needed to CARB's requirements. PPEMA requests that CARB modify the regulations consistent with these comments as PPEMA continues to work with CARB staff.

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July 14, 1994

Ms. Jackie Lorenco
Manager, Off Road Controls Section
Mobile Source Division
Air Resources Board
9528 Telstar Avenue
El Monte, CA 91731

Dear Jackie:

During our telephone conversation earlier this week, we discussed the possibility that the Air Resources Board (ARB), in conjunction with various "clean-up" amendments to ARB's Utility Engine Standard, may reconsider the Tier I emission levels for CO, and an extension of the January 1, 1995 effective date. In addition, we discussed the definition of handheld engines, and specifically the interpretation of hand-held engine equipment which classifies small edgers equipped with a guide wheel as nonhand-held products. PPEMA will be submitting comments on the clean-up amendments to the standard and are particularly concerned about the three items we discussed today. Set forth below is a brief statement of PPEMA's position regarding these three matters.

1. The Tier I CO emission level for handheld engines 50cc and larger should be raised from 300 to 450 g/hp/hr. The CO emission levels for handheld engines under 50cc is 600 g/hp/hr. Many of the engines in this category simply cannot meet the 300 g/hp/hr standard without major engine modifications which were not envisioned for Tier I.

Most of the engines over 50cc are used in larger chain saws and similar equipment which are used in logging or other commercial operations. While most of this equipment is preempted from regulation by ARB a significant portion is subject to the Utility Engine Standard. During initial consideration of the standard PPEMA urged ARB to adopt a 450 g/hp/hr standard and presented test data to support our request. That data, as well as subsequent data presented to EPA, showed that even with enleaned carburetors only 20 to 30 percent of the engines tested complied with the 300 g/hp/hr standard. While PPEMA's members have worked, and will continue to work, on the engine modifications to reduce CO emissions, they have not had enough time to accomplish all the tasks necessary to bring their product

lines into compliance with the standards by the effective date. The net result is that many of the non-preempted products over 50cc will not be offered in California unless the CO standard is revised to a technologically feasible level. We believe that level should be set at 450 g/hp/hr.

2. If ARB extends the effective date of the Utility Engine Standard, the extension should be applicable to all classes of engines subject to the standard. PPEMA's members, like all engine manufacturers to which the standard applies, have had an enormous task in bringing their engines into compliance with the standard and obtaining the necessary certifications. Many of the models currently offered by PPEMA members will not be offered in California after the January 1, 1995 because there has not been enough time to solve all the technical issues for all the engine families.

Several PPEMA members have recently experienced delays in the processing time of their certification applications. The delays are apparently caused by the heavy workload on ARB staff responsible for reviewing certification requests. It is extremely difficult to reach ARB staff by phone or to obtain responses from them. One company reports that an application has been pending for over a year, notwithstanding its readiness to provide any information necessary to complete the process. Another company reports that it must make an appointment to speak by phone with the ARB staff person responsible for its application. Unless these administrative delays are resolved, it may be necessary to request that the Board extend the effective date of the standard.

3. PPEMA continues to believe that 2-stroke edgers equipped with a guide wheel should be classified as handheld equipment. We request that the earlier interpretation concluding that these products are non-handheld be reconsidered.

Please advise me as soon as possible whether the Board will consider an extension of the effective date of the standard and/or a revision of the CO limits.

Very truly yours,

DUNAWAY & CROSS

Mac S. Dunaway

COMMENTS OF THE

PORTABLE POWER EQUIPMENT MANUFACTURERS ASSOCIATION

TO THE CALIFORNIA AIR RESOURCES BOARD ON THE

PROPOSED AMENDMENTS TO THE CALIFORNIA

UTILITY AND LAWN AND GARDEN EQUIPMENT ENGINE

EMISSIONS REGULATIONS

March 18, 1994

INTRODUCTION

Pursuant to the February 16, 1994 notice provided by the California Air Resources Board ("CARB"), the Portable Power Equipment Manufacturers Association ("PPEMA") respectfully submits these comments on the proposed amendments to the California Emissions Regulations for Utility and Lawn & Garden Equipment Engines. PPEMA is the national, not-for-profit trade association representing manufacturers of gasoline powered chain saws, string trimmers, brushcutters, blowers, cut-off saws and similar equipment.

DISCUSSION

The majority of the comments herein address specific changes to the existing regulations and procedures. PPEMA understands, however, that the proposed amendments are intended to serve as a regulatory "clean-up." Consequently, PPEMA's comments include additional matters of particular importance that should be addressed by this process. Several of these issues, and others, were discussed in PPEMA's January 28, 1994 letter to Norman Kayne of CARB's Certification Branch. PPEMA requests that CARB address the issues raised by PPEMA's January 28 letter as well as the matters discussed herein.

I. Regulations

A. Section 2403 - Emissions Standards and Test Procedures

1. Hand-held Equipment Definition

CARB's definition of "hand held equipment" is confusing. PPEMA believes that some minor modifications to the language used in the definition will serve to clarify which products qualify as hand-held and which do not.

The characteristic most common to the equipment manufactured by PPEMA members is its manual portability. The equipment is

designed to be carried by hand to its place of use, manipulated by hand during use and/or repositioned by hand during use. Although the equipment's weight may not always be fully supported by the operator during use, the operator is generally required to carry, manipulate and/or reposition the equipment periodically during its use. In addition, of course, all such equipment manufactured by PPEMA members is powered by small 2-cycle engines which are capable of multi-position operation. Based upon these considerations, PPEMA suggests that CARB modify its definition as stated below.

> To qualify as hand held equipment, the following requirements must be satisfied:
>
> > (1) the equipment must require the operator to support its full weight periodically during normal use or to manually manipulate or reposition it during normal use, and
> >
> > (2) the engine must be capable of operating in any position.

2. Particulate Matter Standard

CARB has not provided any support for its 1999 particulate matter standard for two-stroke engines used in hand-held equipment. Without evidence to justify such regulation, the particulate matter standard should be limited to diesel engines. More generally, PPEMA objects to CARB's 1999 standards for reasons provided previously.

B. Section 2404 - Emission Control Labels

PPEMA supports staff's proposal to allow engine manufacturers to substitute the name and trademark of another engine or original equipment manufacturer on engine labels. While this alternative will help simplify certification, other provisions within CARB's labeling requirements require additional modification.

The proposal that engine manufacturers supply a fuel tank label is inconsistent with the option to delete fuel information from the engine label. If engine manufacturers provide the required fuel information in the owner's manual, as permitted by CARB's regulations, there is no need for a fuel tank label. In the event that CARB requires a fuel tank label, PPEMA requests that CARB give manufacturers the option of providing either a worded label or a label using an internationally-accepted symbol.

CARB should also delete its proposal to require manufacturers to ensure that labels cannot be re-used. This requirement may be interpreted to preclude use of common adhesives that manufacturers intend to employ for emissions control labeling. While it is unclear how or why emissions labels would be re-used, PPEMA notes

that the regulations already require that the "label shall be affixed in such a manner that it cannot be removed without destroying or defacing the label." Because the regulations already address the issue, the new "no re-use" requirement is unnecessary.

C. Section 2405 - Warranty

PPEMA understands that an equipment owner may not be charged for diagnostic labor for repair or replacement of a warranted part, or for diagnostic labor leading to a determination that a warranted part is defective. PPEMA requests CARB's confirmation that a manufacturer may charge an equipment owner for diagnostic labor performed pursuant to an asserted warranty claim when it is determined that the claim was unfounded.

D. Section 2407 - Compliance Testing and Quality Audit

CARB's compliance testing and quality audit procedures need clarification in several areas.

For both compliance testing and quality audit procedures, CARB staff proposes that "engine parameters shall be set to values or positions that are available to the ultimate purchaser . . .." The new language indicates that carburetor settings for quality audit and/or compliance testing must be varied from engine to engine, or possibly even that a single engine must be tested at several carburetor settings. As CARB staff previously indicated, quality audit and compliance testing should be performed at the manufacturer's suggested settings. PPEMA requests clarification of this issue.

For quality audit reports, CARB requires that emission data be rounded to one significant figure beyond the applicable standard. This requirement is not in accordance with good engineering or scientific practice and may lead to inaccuracies. All emissions data submitted in quality audit test reports should be rounded to the same number of significant figures as the applicable emission standard.

For compliance testing, CARB requires engine manufacturers to supply unique specialty hardware and personnel "within seven days of a request," or else be precluded from objecting to testing results on these grounds. CARB should clarify whether this request refers to a request for engines or a request for unique hardware and/or personnel. Additionally, when specifying compliance testing procedures, CARB should consider the fact that hardware requirements may differ between laboratories.

The regulations are unclear regarding the minimum number of engines that must be tested each month under the quality audit testing procedures. For example, must a manufacturer always complete quality audit testing on at least 10 engines each month or

each quarter? What happens if a manufacturer tests less than 10 engines in its first quarter of production? It is also unclear how many quality audit reports are required if the engine manufacturer produces all California engines in a single quarter. In such a case, it seems unreasonable to require manufacturers to supply additional reports. PPEMA requests clarification of these issues.

CARB requires manufacturers to obtain approval of the quality audit testing method and the method of engine selection. The quality audit regulations also specify that manufacturers must submit their method of engine selection to CARB prior to the start of production for the 1996 calendar year. Based on these requirements, PPEMA understands that a manufacturer must obtain approval of both the method of engine selection and of the test method for the quality audit by January 1, 1996. PPEMA requests confirmation of this interpretation.

The quality audit procedures permit manufacturers of hand-held equipment engines, after CARB approval, to use alternative load devices as well as rated power and rated speed instead of measured values. This option will significantly reduce the cost of testing emissions from hand-held equipment engines. PPEMA requests clarification, though, of whether rated power and speed must correspond to a particular setting of an adjustable carburetor. PPEMA also requests that the same option be available for compliance testing.

In some instances, the break-in time for hand-held equipment engines is unnecessarily long. The regulations should provide that break-in time may be reduced so long as engine emissions are stabilized at an earlier stage.

II. Exhaust Emissions Standards and Test Procedures

A. Definitions

The definition of "gross power" may be inapplicable to engines when the load is a necessary accessory, such as for power blowers. PPEMA also notes that it is impossible to measure the power transmitted at idle for hand-held equipment that uses a clutch. This is because proper idle speed will disengage the clutch. For testing such equipment, PPEMA recommends that the clutch remain on the equipment and that the power calculation for clutched hand-held equipment equal zero.

B. Engine Identification Number

PPEMA interprets CARB's engine identification procedures to require manufacturers to submit an explanation of the manufacturer's engine identification system at the beginning of each calendar year, but not to require a manufacturer to identify

all certified engines unless specifically requested by the Executive Officer. What remains unclear are the circumstances under which CARB would require a manufacturer to actually supply such information. In PPEMA's view, CARB should make such requests only under limited, clearly identified conditions because to supply a list of all certified engines is costly and time consuming.

C. Application for Certification

As presently structured, certain aspects of CARB's certification process appear unnecessarily burdensome. For example, it is unnecessary for a manufacturer to supply its method for estimating California sales as part of the certification application when such information can be obtained from quality audit reports.

Similarly, CARB requires engine manufacturers to provide "a description of the training program and for personnel who will perform such maintenance, and the equipment necessary to perform such maintenance." PPEMA interprets this provision to require engine manufacturers to submit information about training programs for maintenance personnel and equipment necessary for maintenance, not to require manufacturers to include the actual training programs and maintenance equipment in the certification application.

CARB should also permit manufacturers of hand-held equipment engines to certify and label their engines prior to the 1995 calendar year. Advance labeling and certification is necessary to enable manufacturers to meet seasonal peak demands. This practice has previously been used in the automotive industry, as shown by the attached circular from the U.S. Environmental Protection Agency.

D. Engine Families

CARB staff proposes to require that the displacement of an engine must be within 15 percent of the largest engine in any displacement class in order to be included in the same engine family. This proposal is overly restrictive as applied to hand-held equipment engines because of their small size and similar emissions characteristics. For example, if the largest hand-held equipment engine a manufacturer produces in the under 50 cc displacement class is 45 cc, then a 38 cc or smaller engine may not be included in the same family, even if the engines have identical emissions characteristics. PPEMA therefore requests that CARB permit all hand-held equipment engines within a displacement class that have similar emissions characteristics to be included in the same engine family.

E. Test Engines

1. Engine Accessories

As indicated previously, power blowers sometimes cannot be tested with installed cooling fans, because such fans affect power measurements. PPEMA requests CARB's guidance in such cases.

2. New Engine Types

For purposes of obtaining certification based upon the previous certification of, or emissions data submitted for, a similar engine, PPEMA requests clarification of CARB's interpretation of a "similar engine."

F. Test Procedures - General Requirements

1. Test Modes

CARB's "prescribed sequence" of engine testing is unnecessarily burdensome for hand-held equipment engines. Rather than requiring the manufacturer to test at rated speed and then at idle for each of three different carburetor settings (rich, lean, and factory set), PPEMA suggests that CARB permit manufacturers the option of testing such engines in a different sequence, so long as the proper speeds and engine loads are included. For example, manufacturers of hand-held equipment engines with adjustable carburetors should be given the option of using the following test sequence: (i) at setting A, measure at rated speed, then idle; (ii) at setting B, measure at idle, then rated speed; (iii) at setting C, measure at rated speed, then idle.

2. NMHC Standard

CARB proposes to permit manufacturers of gaseous-fueled engines to certify their engines based on their emissions of non-methane based hydrocarbon ("NMHC"). CARB should provide supporting data for this option, as well as greater detail on how it will be put into practice. For instance, will gaseous-fueled engines be certified to a separate NMHC standard?

3. Emissions Calculations

CARB should not require engine manufacturers to calculate brake-specific emissions in g/kW-hr units. The regulations specify emissions standards in g/hp-hr units.

G. Testing by the Executive Officer

CARB's procedures indicate that confirmation testing will occur automatically unless the manufacturer obtains a testing waiver. This places an unfair burden on engine manufacturers,

whose emissions data should be presumed to be reliable. Confirmation testing should be required only in those instances that CARB can articulate reasons to question a manufacturer's data.

The proposed criteria by which CARB would consider a test waiver are also unfair. One of the factors considered in a request for a confirmation test waiver is "marginal compliance" with an emissions standard. It is PPEMA's understanding that CARB defines "marginal compliance" as less than 15 percent below an applicable emissions standard due to concerns over in-use deterioration, even though the regulations were not intended to address in-use emissions.

Finally, PPEMA requests clarification from CARB whether confirmation testing must be performed on the original test engine, or whether such testing may be performed on a new engine of the same type.

H. Right of Entry

PPEMA requests confirmation that CARB will provide prior notice to original equipment manufacturers, in addition to engine manufacturers, before seeking entry to lawn and garden equipment retail outlets for compliance purposes.

III. Raw Gas Method Test Procedures

A. Engine Test Setup

The proposed amendments delete prior language specifying that mixing chambers should not be used to measure emissions from two-cycle engines. The current language refers to use of "an exhaust mixing chamber (as applicable)," but subsequently states that a mixing chamber is optional equipment for raw gas method testing. It is thus unclear under what circumstances, if any, a mixing chamber may or must be used. PPEMA requests clarification that the regulations do not require a mixing chamber for measuring emissions from two-cycle engines.

B. Analytical Gases

CARB's draft modifications require that calibration and span gases for the hydrocarbon analyzer use zero-grade nitrogen as a diluent, instead of air, when testing gasoline engines. Presumably, this modification was made because the combination of air and propane becomes explosive at air concentrations of 2.2 percent. However, good engineering practice calls for use of zero-grade air in non-explosive concentrations as the proper diluent because it more closely represents the exhaust gas that will be measured. When a higher diluent concentration is needed, nitrogen should be used.

PPEMA also suggests that both calibration and span gases be within +/- 2 percent of the NIST gas standard. Requiring calibration gases to be within +/- 1 percent will not result in measurably greater testing accuracy, but will increase testing costs significantly.

C. Calibrations, Frequency and Overview

CARB's nomenclature does not adequately distinguish between calibrating test equipment, which consists of the complete system check recommended by the testing equipment manufacturer, and zeroing and spanning test equipment, which is a less thorough procedure. For that reason, the monthly analyzer calibrations referred to in paragraph 4(c) appear inconsistent with the yearly, weekly, and monthly calibrations referred to in paragraphs 6-9. CARB should clarify these requirements.

As a general matter, the frequency of calibration, in the sense of a complete check, depends upon the type of system used. For example, analog systems require calibration more often than digital systems. PPEMA therefore recommends that analyzer calibration be performed at the frequency recommended by the testing equipment manufacturer.

D. Engine Test Procedure

CARB's requirement that manufacturers check analyzer span and zero after every test cycle is unnecessarily stringent. Manufacturers of hand-held equipment should have the option of demonstrating that analyzer zero and span can be checked less frequently without losing accuracy in emissions measurements.

Likewise, CARB's requirement that the engine test cycle begin within five minutes of completing engine preconditioning is overly strict because of difficulty in timing the completion of engine service accumulation. Once an engine has received the required service accumulation hours, CARB should allow emissions testing to begin after engine temperature stabilizes because stable engine temperatures ensure stabilized emissions characteristics. This procedure is consistent with SAE J1088.

CARB should clarify its statement that "engine service accumulation may be substituted for engine preconditioning if such accumulation was conducted for at least 40 minutes." The extent to which this statement permits manufacturers to reduce break-in time is unclear.

In the constant volume sampling procedure, CARB requires that engine speed and load be maintained to the smallest tolerance possible within the capabilities of the test equipment through the use of good engineering practice. The same requirement should apply to the raw gas procedures for all torques, not just those

less than 0.2 Nm. Tolerances should not exceed those stated by the equipment manufacturer.

Finally, CARB requires that manufacturers perform a hydrocarbon hang-up check after the last mode of each test cycle, but does not indicate how this check should be performed. Such procedures should be detailed by the regulations.

E. Records Required

CARB's record requirements call for manufacturers to maintain a continuous record of engine torque and engine speed for each mode. The test procedures, however, only require torque measurements at three specific times: before the emissions equipment is connected; after the test equipment is connected before testing; and after all testing is completed. PPEMA requests that CARB clarify that manufacturers of hand-held equipment engines need only to measure and record engine speed and torque at these three intervals.

Additionally, PPEMA requests that CARB delete "air humidity" from the environmental conditions that must be measured because this parameter normally is not needed for emissions calculations.

IV. Particulate Matter Test Procedures

CARB's draft particulate matter test procedures are based upon the International Standards Organization ("ISO") test procedure 8178-1. PPEMA could not evaluate this section within the time permitted because CARB did not provide a copy of the ISO 8178-1 procedure for review. Consequently, PPEMA requests that CARB provide additional time for engine manufacturers to evaluate CARB's particulate matter test procedures.

CONCLUSION

PPEMA's review of the proposed "clean-up amendments" to the utility and lawn and garden engine emissions regulations indicate that further revisions are necessary. These revisions should be made before the amendments are proposed to the Board.

United States Environmental Protection Agency
Office of Air and Radiation Washington, DC 20460

EPA

OMS Advisory Circular

SUBJECT: Duration of Certificates of Conformity, Annual Production Period, and Model Year

A. Purpose

The purpose of this advisory circular is to clarify EPA's definitions of model year, annual production period, and the duration of certificates of conformity. Advisory Circular No. 6A is obsolete and should be discarded.

B. Background

Under the Clean Air Act of 1970, a certificate of conformity is to be issued for a period "not in excess of one year." Advisory Circular No. 6A interpreted the phrase "one year" to mean one model year. It did not, however, define all relevant limitations governing the duration of one model year and the annual production period associated with such model year. This advisory circular clarifies the definitions of the terms "model year" and "annual production period" in relation to the coverage of certificates of conformity and to Corporate Average Fuel Economy (CAFE) calculations.

C. Applicability

The definitions provided by this advisory circular are effective immediately and apply to all light-duty vehicles and trucks, heavy-duty vehicles and engines, and motorcycles.

D. Duration of Model Year

A specific model year must always include January 1 of the calendar year for which it is designated and may not include a January 1 of any other calendar year. Thus, the maximum duration of a model year is one calendar year plus 364 days.

E. Definition of Production Period

The "annual production period" for any specific model within an engine family of light-duty vehicles or heavy-duty engines begins either: (1) when such vehicle or engine is first produced, or (2) on January 2 of the calendar year preceding the year for which the model year is designated, whichever date is later. The annual production period ends either: (1) when the last such vehicle or engine is produced, or (2) on December 31 of the calendar year for which the model year is named, whichever date is sooner.

F. Duration and Applicability of Certificates of Conformity

1. Section 206(a)(1) of the Clean Air Act of 1970 provides that certificates of conformity may be issued for a period "not in excess of one year." EPA regulations interpret "year" to mean "model year" (40 CFR 86.085-30(a)(2)). "Model year" is in turn defined by section 202(b)(3)(A)(i) of the Act to mean the manufacturer's annual production period. Therefore, except as provided in paragraph F.2, below, a certificate of conformity is deemed to be effective and covers the vehicles or engines named in such certificate and produced during the annual production period defined in paragraph E.

2. Section 203 of the Clean Air Act prohibits the sale, offering for sale, delivery for introduction into commerce, and introduction into commerce of any new vehicle or engine not covered by a certificate of conformity unless it is an imported vehicle exempted by the Administrator or otherwise authorized jointly by EPA and U.S. Customs service regulations.[1] However, the Act does not prohibit the production of vehicles or engines without a certificate of conformity. Vehicles or engines produced prior to the effective date of a certificate of conformity, as defined in paragraph F.1, may also be covered by the certificate if the following conditions are met:

a. The vehicles or engines conform in all respects to the vehicles or engines described in the application for the certificate of conformity.

b. The vehicles or engines are not sold, offered for sale, introduced into commerce, or delivered for introduction into commerce prior to the effective date of the certificate of conformity.

c. The Agency is notified prior to the beginning of production when such production will start, and the Agency is provided full opportunity to inspect and/or test the vehicles during and after their production. For example, the Agency must have the opportunity to conduct SEA production line testing as if the vehicles had been produced after the effective date of the certificate.

3. Vehicles or engines imported by an original equipment manufacturer after December 31 of the calendar year for which the model year is named are still covered by the certificate of

1. EPA has issued regulations that permit entry of certain imported nonconforming vehicles if they are modified to conform with emission standards even if they are not covered by certification.

conformity as long as the production of the vehicle or engine was completed before December 31 of that year.[2] (However, see CAFE consideration in Section G.)

4. Vehicles or engines produced after December 31 of the calendar year for which the model year is named are not covered by the certificate of conformity for that model year. A new certificate of conformity demonstrating compliance with currently applicable standards must be obtained for these vehicles or engines, even if they are identical to vehicles or engines built before December 31.

5. The extended coverage period described here for a certificate of conformity (i.e., up to one year plus 364 days) is primarily intended to allow flexibility in the introduction of new models. Under no circumstances should it be interpreted that existing models may "skip" yearly certification by pulling ahead the production of every other model year. While this situation, to our knowledge, has not occurred in the past, a practice of producing vehicles for a two year period would violate Congress's intent of annual certification based upon an annual production period. EPA is not currently setting forth rules for how to determine when abuse has occurred since this has not been a problem to date. However, manufacturers should note our concern in this area and should continue to use normal yearly production periods for existing models.

G. CAFE Considerations

The Motor Vehicle and Cost Savings Act, section 501(9), does not use the concept of "introduction into commerce." Rather, it defines "manufacture" to mean "to produce or assemble in the customs territory of the United States, or to import." The resultant definition of "model year" for CAFE purposes is equivalent to the definition for certification purposes for all vehicles except for those produced before December 31 of the calendar year for which the model year is named but not actually imported until after December 31 of that year. These vehicles, as discussed in paragraph F.3, are included in that model year for certification because they were produced before December 31 of that year. However, they must be included in the subsequent model year CAFE calculation, as they were not "manufactured" (i.e., imported) until after the expiration of that year. As an example, consider the case of a

2. This section does not apply to vehicles that may be covered by certificates held by independent commercial importers unless specifically approved by EPA.

1987 model year vehicle "produced" on December 15, 1987 but not "imported" until January 21, 1988. This vehicle would still be covered by the 1987 certificate, as it was produced before December 31 of the calendar year for which the model year is named. However, it must be included in the 1988 model year CAFE calculations, as it was imported, and thus "manufactured" for CAFE purposes, after the expiration of the 1987 calendar year.

Richard D. Wilson
Director, Office of Mobile Sources

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2 February 1994

Norman Kayne, Chief
Certification Branch
California Environmental
Protection Agency
Air Resources Board
Haagen-Smit Laboratory
9528 Telstar Avenue
El Monte, California 91731

Ref: Summary of December 9, 1993 Meeting, and
Request For Clarification of Several Issues

Dear Norm:

In the December 9, 1993 meeting between the Air Resources Board Certification Staff and PPEMA, a number of issues were raised. Set forth below is a summary of that meeting, and a request for clarification on several issues.

Certification Emission Values

During discussion of Certification Emission Values, PPEMA stated these values should be based upon actual values which are more relevant and representative. For example, requiring certification of both the maximum HC value and the maximum NOx value would violate this principle. PPEMA also noted that the use of emission data which does not reflect actual emission levels should not be used in any inventory analysis.

CARB's response was that initial certification will require the use of the highest values, i.e, CARB will mix and match values from different engines within an engine family because initial certification is intended to be a "data gathering exercise." Only limited testing is involved.

During a Quality Audit CARB will rely on "nominal" test values. Maggie Wilkinson indicated that audit testing will require the use of the "manufacturer's setting." Extreme testing will not be required.

It is PPEMA's understanding that certification data will not be used as the basis for an inventory analysis.

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Horsepower Values

PPEMA stated that the plus or minus five percent rated HP during certification is irrelevant when a product complies with emission requirements. Gathering and reporting of this information is therefore not necessary. PPEMA also noted there is no HP requirement in the standard, and requested this requirement be eliminated.

CARB responded that the intention of this requirement is to verify that HP is truly representative of production engines.

Question: Will CARB eliminate the plus or minus five percent HP requirement?

Warranted Emission Parts

PPEMA requested clarification of those components covered by the warranty provisions.

CARB responded that the components listed in the regulations are covered. In addition, some components which are clearly related to the regulations are also covered, for example, the air filter and fuel filter. CARB's intention is to cover all components which are "implied" as part of the emission system.

CARB noted that emission components scheduled for regular maintenance are warranted up to the time of maintenance.

The complete list of covered components is:

* carburetor
* spark plugs
* ignition system
* air filter
* fuel filters [if outside the carburetor]

PPEMA noted the fuel filter is generally inside the carburetor, and only a fuel strainer "pickup" is actually outside the carburetor. CARB agreed to review whether the fuel "pickup" component is covered. CARB agrees to use the carburetor when the fuel filter is a part of the carburetor, however, if the fuel filter is outside the carburetor then the fuel filter must be warranted separately.

Question: Is the fuel "pickup" component covered by the warranty?

Measurement of NOx Values During Audit

PPEMA requested that CARB eliminate NOx values during audit testing.

Maggie Wilkinson requested that PPEMA prepare an alternative test procedure supported by a test report to substantiate this concept. She may accept development of an alternative test procedure by PPEMA, but individual companies must request an exemption.

Use of Limiter Caps During Certification

PPEMA stated that if a company can meet the regulations without limiter caps, they should not be required.

Certification staff will recommend support, but Rod Summerfield has to approve this matter.

Fuel Tank Labeling ["Unleaded Gasoline Only"]

PPEMA stated this issue is not required by the standard, and equally important, only unleaded gasoline is available in California, making any such requirement unnecessary. PPEMA also noted that an owners manual informs users that only unleaded fuel should be used, and that no leaded gasoline can be sold in California, therefore the requirement serves no useful purpose and imposes an unjustified financial burden on the manufacturer.

Question: Will CARB delete this requirement?

Test Fuels

PPEMA stated its understanding that the standard will allow either Phase I or Indolene fuels.

CARB responded that either Phase I and/or Indolene fuels can be used for now, however, in the "regulatory cleanup" currently underway, CARB expects to modify these requirements to eliminate Phase I gasoline, and require Indolene and/or Phase II fuels. These changes are expected to occur at the end of 94 or early 95.

Ambient Humidity

PPEMA stated this requirement is not necessary due to not being used in any calculations.

Question: Can this item be deleted?

Definition of Engine Families

PPEMA requested clarification of this matter, and CARB requested a proposal as soon as possible. CARB Certification Staff also indicated this matter may require Air Resources Board approval.

Development of Optional Standardized Certification Format

PPEMA stated that to avoid duplication and administrative problems, an optional standardized certification format should be developed.

CARB requested a proposal as soon as possible.

Please call if you have any questions.

Very truly yours,

Donald E. Purcell

Donald E. Purcell
President

c Ron Haste, Certification Engineer

Engine Manufacturers Association
401 North Michigan Avenue
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94-7-1
7/28/94

STATE OF CALIFORNIA
AIR RESOURCES BOARD
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July 27, 1994

VIA FACSIMILE

Mr. James D. Boyd
Executive Officer
California Air Resources Board
2020 L Street
Sacramento, California 95814

Dear Jim:

As you know, the Engine Manufacturers Association (EMA) has been working with members of the ARB Staff on several issues of critical importance to the utility and lawn and garden engine industry. EMA appreciates Staff's willingness to work with us on those issues.

However, we have not yet been able to resolve our concerns with respect to the necessary leadtime and appropriate effective date for the small engine regulations, the stringency of the CO standard for non-handheld equipment, and the effects of the regulations on small volume equipment manufacturers. In order to protect industry's interests, we are planning to file a Petition tomorrow requesting that the Board amend the Emission Control Regulations for 1995 and Later Model Utility and Lawn and Garden Equipment Engines.

At the Board hearing on Thursday, July 28, 1994, we intend to ask the Board to direct Staff to continue working with us to address our concerns. We believe that resolution of these critical and complex issues is possible. Given the nature of the issues, we also intend to request that the Board direct Staff to put them on the agenda for the September Board hearing. Prompt resolution of this matter is critical.

Finally, we have provided detailed technical comments on agenda item 94-7-1 (Mail-Out #94-24). We hope the Board will allow the Staff to work with us on technical corrections through the use of the 15-day notice process.

If you have any questions or would like to discuss this matter further, please do not hesitate to call.

Very truly yours,

Jed R. Mandel

Jed R. Mandel
General Counsel
Engine Manufacturers Association

JRM/kdr

cc: Jacqueline E. Schafer
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FIRM: California Air Resources Board

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FAX NO.: 916/322-6003

FROM: Jed R. Mandel

PHONE NO.: 312/269-8042

COMMENTS:

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94-7-1
7/28/94

July 21, 1994

Mr. Michael Carter
Chief
Off-Road Control Regulations Branch
Mobile Source Division
California Air Resources Board
9528 Telstar Avenue
El Monte, CA 91731

RE: EMA Comments on Lawn & Garden and Utility Engine and Equipment Regulation Clean-Up Amendments -- CARB Mail Out #94-24

Dear Mr. Carter:

The small engine manufacturer members of the Engine Manufacturers Association (EMA) have reviewed the referenced ULGE Rule Clean-Up Package mail-out. EMA and its members are appreciative of the staff's efforts to address our previously expressed concerns submitted March 18 in this amended proposal. However, in the course of our review of Mail-Out #94-24 we have found some issues that remain with the regulation and certification procedures that we would like closure on with CARB's Rules Development and Certification Divisions.

Staff Report

Section F. (4) Quality Audit Tests -- Sample Rate

One of the referenced sample rates stated incorrectly in this section of the staff report. It should make initial reference to the fact that the normal sample rate is at $\geq$ 1% of each engine family's production. The first sentence is incorrect. The regulations do address the situation specified -- if a manufacturer chooses the normal sample rate specified in the preamble only applies to the "Alternate Quality-Audit Engine Selection Criteria".

Attachment A **Article 1. Utility and Lawn and Garden Engines**

Section 2400. Applicability

Item (a)(1) Engine manufacturers desire more explicit clarification of the point that while these regulations are applicable to utility and lawn and garden equipment and engines, the provisions of the rule become effective upon only those engines produced on or after January 1, 1995. Equipment supplemental labeling and fuel type notices, which are the responsibility of OEMs where applicable, become effective when engines produced on or after January 1, 1995 are used in such equipment.

EMA suggests the language here be revised to read as: "This article shall be applicable to utility and lawn and garden ~~equipment and~~ engines ~~used in such equipment~~ produced on or after January 1, 1995 and any utility and lawn and garden equipment at which time such complying engines are used."

Section 2401. Definitions

Item (3) "Basic Engine" EMA finds the inclusion of "fuel system" in the definition of "Basic Engine" to be inappropriate and misleading since the fuel system type is one of the main determinators of an engine family and not related to the definition of basic engine at all. We recommend that the words "fuel system" be deleted from the definition of "Basic Engine" found in this referenced section and Attachment B. Part I. Number 2. Definitions.

Section 2404. Emission Control Labels

o Engine Label Content and Location

Item (c)(1) This section clearly indicates that the label can be attached to any permanent part of the engine. Therefore, specific references to the "block and crankcase" should be deleted.

Item (c)(4)(H) Engine manufacturers have previously expressed our need for allowing a common label for *carry-over engine configurations* (i.e., engine family configurations which are not changed for the duration of the standard period from 1995 -1998). From our inquiries with CARB staff it is our understanding that staff will allow manufacturers to introduce a common labeling practice for carry-over engine configurations. Therefore, an example statement of compliance could contain the statement, "THIS ENGINE MEETS 1995 - *1998* CALIFORNIA EMISSION REGULATIONS FOR UTILITY AND LAWN AND GARDEN EQUIPMENT ENGINES". Moreover, it is our understanding that the coded characters required by CARB to denote the engine family ID on the label do not have to change from year-to-year for carry-over model years, since the family ID characters refer to the calendar year in which the engine family was originally certified [refer to Chapter 5 of CARB Mail-Out #92-57].

EMA would like to see this point resolved for allowing manufacturers to utilize common labeling for carry-over engine configurations and clearly stated in the amended regulation within Section 2404 Emission Control Labels. We cannot over emphasize the importance of this matter to engine manufacturers for allowing this simplification.

o Engine Fuel Type Label Content and Location

Item (f)(1)(ii)(4) and (5) Requires an engine manufacturer that markets an incomplete engine assembly without a fuel tank to permanently attach a plastic or metal fuel type label on the engine assembly in a readily visible location. EMA finds this requirement to be redundant and an unnecessary burden, since in addition to the engine manufacturer's fuel type label requirement item (5) requires an OEM that procures an incomplete engine assembly without a fuel tank to provide the appropriate engine fuel type notice as specified in this subsection in conjunction with the installation of a fuel tank with the engine or equipment assembly. Moreover, Item (c)(4)(C) already requires a fuel type notice to appear on the engine label supplied by the engine manufacturer.

CARB staff needs to be more sensitized to the fact that requiring duplicative fuel type notices from engine manufacturers where OEM primary responsibility for placement on or adjacent to the fuel tank is already cited is burdensome and leads to needless incremental cost and labor content for the engine manufacturer. Adding more labeling requirements is no small task in a fast-paced engine assembly line operation.

EMA requests that the engine manufacturer's responsibility to apply a duplicate fuel type notice on any incomplete engines assemblies produced without a fuel tank be deleted, leaving this responsibility to the OEM purchaser as specified in item (5). Item (4) should be modified to read:

> "(4) An engine manufacturer shall provide the appropriate fuel type notice as specified in this Subsection for all complete ~~and incomplete~~ engine assemblies that the engine manufacturer has produced."

Item (j) Requests that "Samples of all actual production labels used within an engine family shall be submitted to the Executive Officer within 30 days after the start of production." CARB is advised that the engine manufacturer will submit all regulation-specified labels required to appear on the engine for which *the engine manufacturer has control over or access.* Obviously, it must be the imposed responsibility of the OEM to submit samples of any regulation required labels for the equipment to the Executive Officer for inspection and approval. Such a regulatory requirement is not explicitly stated in the text of Section 2404, and probably should be added.

Section 2407. New Engine Compliance and Quality-Audit Testing

Item (a)(12) Compliance Test Procedures EMA wants to draw staff's attention to the first sentence in this passage where we find the language to be inconsistent with the similar enforcement provisions found in Item (a)(11) and (b)(7)(C)(i). It is our understanding that it is CARB's intent to focus its enforcement authority only on those noncompliant engines found in an engine family or which may make up a subgroup within an engine family. The corrected passage should read as:

> "(A) Notify the engine manufacturer and may seek to enjoin the engine manufacturer from any further sales or distribution of the applicable noncompliant engines ~~families~~ in the State of California pursuant to Section 43017 of the Health and Safety Code. ..... etc."

Item (b)(4) Quality Audit - Engine Sample Selection

In order to clarify this provision, EMA recommends a language revision be made to the first sentence as follows: "The engine ~~engine~~ manufacturer shall randomly select one percent of the estimated California sales volumes of engines from each family for quality-audit testing.

Item (b)(6)(C) Typographical error found at third line from bottom-- reference should be to Paragraph (D) below.

Attachment B California Exhaust Emission Standards and Test Procedures for 1995 and Later Utility and Lawn and Garden Equipment Engines

Part I, Section 2. Definitions

The use of the term "Gross Power" is inappropriate for use in utility engine emission testing and is inaccurate as listed in the proposal. EMA recommends that the definition for "Gross Power" be deleted and substituted by the following additional terms that need to be added in this section which include "Idle Speed", "Net Brake Power", and "Fully Equipped Engine". For accuracy and consistency, we suggest the insertion of the terminology and definitions found in the SAE procedure J1349 as follows:

"Idle Speed" means the engine manufacturer's recommended idle speed. If there is no recommended idle speed, the idle speed will be the lowest stable engine speed without a load.

"Net Brake Power" means the power of an engine when configured as a "fully equipped" engine as defined in SAE J1349 Section 3.4 and Table 4.

"Fully Equipped Engine" is an engine equipped with only those accessories necessary to perform its intended service. A fully equipped engine does not include components that are used to power auxiliary systems. If these components are integral with the engine or for any reason are included on the test engine the power absorbed may be determined and added to the net brake power. The commonly used accessories (taken from Table 4 of SAE J1349) that should be include in the test are: air cleaner, exhaust system, fuel pump, cooling fan for air-cooled engines, cooling water pump for water-cooled engines (as applicable). Common accessories that are not required include: radiator cooling fan, radiator and thermostat (for water-cooled engines), power steering pump, compressor for air conditioning, fuel filters, alternator (unless needed to power fuel pump or injectors), and vacuum pump. [Ref. Sec. 3.4 and Table 4 of SAE J1349]

Here it is important to note in the above description that engine manufacturers need the revision to measure net brake power without the radiator cooling fan installed for water-cooled engines to harmonize with European regulations. This item is of extreme importance to engine manufacturers that market their products in Europe as well as North America to enable them to certify the engine one time only.

Part I, Section 18. Test Engines

Item (d)(4)(iii) EMA requests a language revision to more accurately reflect the case:

"(iii) Attempts to misadjust the parameter would result in ~~in~~ breakage of the restrictive device ~~and/~~ or the parameter and thereby result in unsatisfactory engine operation."

Part I, Section 19. Draft proposal needs to be renumbered-- Section 19 was deleted.

Part I, Section 20. Test Procedures, General Requirements

Item (a)(2) EMA has found some errors and redundancy in the third sentence of this item. We suggest the third sentence be reworded as follows: "The test is designed to measure (as applicable) the concentration of hydrocarbons (HC), carbon monoxide (CO), carbon dioxide (CO_2), oxides of

nitrogen (NOx), ~~and~~ *particulate mass (PM)*, ~~and fuel consumption, exhaust volume,~~ fuel flow, and the ~~gross~~ *net brake* power output *(without cooling fan for water-cooled engines)*."

The measurement of fuel consumption and fuel flow is redundant. Measuring the exhaust volume is unnecessary when using the raw gas method emission sampling technique. Further, the term *gross power* is inappropriately used here, since the engines are emission tested by measuring their *net brake power* as specified in SAE J1349 and referenced previously in these comments.

In addition, engine manufacturers suggest the revision to measure net brake power without the radiator cooling fan installed for water-cooled engines to harmonize with European regulations (i.e., EEC directives and ECE regulation 637). This item is of extreme importance to engine manufacturers that market their products in Europe as well as North America to enable them to certify the engine one time only.

Item (c)(2) Test Cycles

If an engine family contains engine configurations which operate at different speeds, some at rated speed and some at intermediate speed the certification testing is done based on the worst case test cycle. For quality audit testing the speed used should be determined by the configuration selected rather than the certification test speed.

Part II. Raw Gas Method Test Procedures

Part II, Section 2. Engine Test Setup: Exhaust Gas Analytical System: Engine Parameters.

Item (b)(1) Exhaust Gas Analytical System.

> "Exhaust gases shall be sampled by one probe and then be split internally to the different analyzers."

We strongly suggest that the following language be added:

> "Exhaust gases may be sampled with two probes if the manufacturer submits this alternative procedure to the Executive Officer for consideration and approval."

Rationale for this requested addition is as follows:

1. There are both one probe and two probe sampling systems available today.

2. In the two probe system, one sample line is for dry exhaust sampling, and the other probe is used for wet (heated) gas sampling.

Item (b)(i) If a HCLA analyzer is utilized it must be placed in the heated sample stream with the FID rather than the cold sample stream as indicated. This is shown as a separate heated line in figure 2-2 Pg. 34.

The final sentence indicates that the analyzer flow meters are located in the analyzer exhaust. As shown in the schematic flow controls/meters are typically placed on the inlet flow to the analyzers to assure proper flow without impairing the analyzer's performance.

Item (c)(3) Fuel Flow Measurement

The requirement for +/- 1% of the full scale flow rate accuracy is not in agreement with the latest revision of SAE J1088 which specifies +/- 2% of the reading. The SAE J1088 requirements should be adopted for consistency with testing methods being proposed by the U.S. EPA and ECE DG XI.

Part II, Section 11. Engine Fuel and Lubricant Specifications

Item (a)(2)(i)(C) Engine manufacturers desire some additional consideration for the more common situation where engine service accumulation is run indoors in laboratory durability facilities, rather than outdoors. Proper engineering judgement dictates that manufacturers be allowed to run service accumulation on a fuel whose Reid Vapor Pressure is appropriate for the seasonal conditions of the test site (if outdoors) or appropriately suited to the ambient conditions of the test cell or facility (if indoors). EMA offers the following language revision as a fix:

> "(C) The Reid Vapor Pressure of a gasoline shall be characteristic of the engine fuel <u>matching the seasonal conditions of the test site (if outdoors) or appropriately suited to the ambient conditions of the test cell or facility (if indoors)."</u>

Part II, Section 12. Engine Test Procedure.

Item (a)(2)(ii) EMA finds this requirement to be unnecessary for every test engine. Engine Pre-Test Preparation as described should not be required if the emission equipment's effect on a given engine family has previously been determined.

Item (a)(3)(i) Checking the maximum allowable leakage rates for the vacuum and pressure side of the system is an additional burdensome requirement which is a concern.

Item (a)(3)(iii) To add the requirement to check zero and span after each test cycle is an unnecessary burden.

Item (b)(2)(ii) The preconditioning requirement for spark ignition engines for a minimum of 20 min. prior to the beginning of the thermal stability should be deleted.

Item (c)(2) These are the same zero and span issues in Item (a)(3) above.

Item (d)(2) The requirement to maintain speed and load within +/- 5% for all power modes which have greater than 0.2 lb-ft is not realistic. Minimum torque capability is typically +/- 0.1 lb-ft which would relate to a set point of 2.0 lb-ft which is significantly over the minimum 0.2 specification. We recommend the specification be changed to +/- 5% or +/- 0.1 lb-ft which ever is greater.

Item (e)(1) The requirement to perform an HC hang-up check within one minute of the completion of the last mode should be optional at the discretion of the testing facility.

Item (e)(4) The zero and span drift requirements of +/- 2% are additional burdens which are unnecessarily stringent. If required the requirement should be +/- 5%.

Part II, Section 13. Records Required

Engine manufacturers request a clarification regarding if there is a preferred an/or predetermined format for reporting all of the information listed?

Single point digitally averaged numerical values should be identified as an alternate means to meet the requirements for continuous records or strip chart records in:

- o **Item (f)(4)** engine torque and engine speed for each mode
- o **Item (i)(1), (2) & (3)** Zero, Span, Sample, and HC hang-up

Part II, Section 14. Data Reduction and Presentation of Results

Item (b)(4) Fuel Flow Method

The equations given for calculation of HC, CO, and NO_2 do not agree with the latest release of SAE J1088. Specifically, the SAE J1088 formulas include a term for the correct molecular weight of the fuel. Listing the accurate molecular weight of the certification fuel is absolutely required for the use of oxygenated fuels such as California's Phase II reformulated gasoline to obtain accurate results. The SAE J1088 formulas should replace those specified.

Part II, Appendix A

The formula for H_2 has an error in the denominator. The brackets should begin with the "3" term and end after the "CO_2%" term :

$$H_2 = \frac{0.5 \times y \times CO \times (C0\% + CO_2\%)}{CO\% + (3 \times CO_2\%)}$$

Part III Constant Volume Sampling Test Procedures

Most engine manufacturers do not have any experience with CVS sampling, but it would appear that an IM240 type of dilution system which introduces dilution air with the exhaust gas where collected from the engine would be much more desirable than the conventional system described.

Part III, Section 26. Calculations: Exhaust Emissions

Item (c)(l)(iv)(B): The "dilution exhaust sample" is incorrect. It should be "dilution air sample."

Item (c)(5)(vii)(B); Humidity correction factor (K_H) is specified only for gasoline engines in this subparagraph. Therefore we recommend that K_H for diesel engines should be added to this subparagraph for consistency with subparagraph 6.2.2.1 of SAE J1088.

$K_H = 1/\{1 - 0.0329(H - 10.71)\}$ (Gasoline)
$K_H = 1/\{1 - 0.0182(H - 10.71)\}$ (Diesel)

Part IV Particulate Matter Test Procedures

EMA has noted that CARB has incorporated by reference some already outdated particulate matter test procedures for diesel engine emission testing. Mail-Out #94-24 references the provisions of ISO 8178, Part 1, Version N124 dated November 11, 1992 which has been modified substantively since its issue.

We request that CARB incorporate by reference the provisions contained in the ISO 8178, Part 1 Draft International Standard ("DIS") version dated October 14, 1993 and the language included in ISO/TC 70/SC8 document "N208" that contains further update language issued from comments to the DIS. The "N208" document was issued on May 24, 1994.

Furthermore, CARB should be advised to craft some provision in the regulatory language which would allow the Executive Officer to incorporate test procedure changes as warranted without having to seek formal ARB approval each time an update occurs to a technical test procedure.

We hope these comments assist CARB Rules Development Division and Certification Division in making appropriate revisions to the rule itself and the Guidelines for Certification to enhance the accuracy and cost-effectiveness of these regulations for small engine manufacturers. Industry would also suggest that ARB publish a complete revised version of the California Regulations for 1995 and Later Utility and Lawn and Garden Equipment Engines which incorporates the latest corrections and test procedures in one document.

EMA requests the opportunity to discuss these issues with staff prior to the ARB hearing to clarify any remaining issues or questions with these comments. If you would like further information with respect to this matter, please do not hesitate to contact me.

Sincerely,

Glenn F. Keller

Glenn F. Keller
Executive Director

cc: Rod Summerfield
Robert Cross
Jackie Lourenco
ARB Secretary

gfk\gcu\arb94-24.com

94-7-1
7/28/94

STATE OF CALIFORNIA
7/27/94
XC: Board members
JQS TAC
AS Legal
JB MSD

HONDA
AMERICAN HONDA MOTOR CO., INC.
1919 Torrance Boulevard • Torrance, CA 90501-2746
(310) 783-2000

July 25, 1994

AHCERT-941038

Ms. Pat Hutchens, Secretary
California Air Resources Board
2020 L Street
Sacramento, CA 95814

Dear Ms. Hutchens:

Enclosed are the comments of Honda Motor Co., Ltd. to the proposed regulatory clean-up for the California Regulations for 1995 and Later Utility and Lawn and Garden Equipment Engines (Mail-Out #94-24).

Please contact me at (310) 783-3419 if you have any questions.

Yours truly,

AMERICAN HONDA MOTOR CO., INC.

Michael V. Tyrrell

Michael V. Tyrrell
Administrator - Certification
Certification Department

MVT/jsb

Enclosure(s)

jsb c:\wpwin/tyrrell.wp1

COMMENTS OF HONDA MOTOR CO., LTD. REGARDING CARB MAIL-OUT #94-24 "UTILITY AND LAWN AND GARDEN EQUIPMENT ENGINES PROPOSED AMENDMENTS"

We appreciate the opportunity to comment on the ARB's proposed amendments to the ULGE regulation. We understand and support ARB's efforts to improve California's air quality, and we do not oppose regulations to achieve these goals which are technically feasible and cost effective. We do, however, have some concerns about the proposed amendments as described below.

Staff Report: Initial Statement of Reasons for Proposed Rulemaking

Section IV. Discussion

Item H(1) .."The staff proposes that the regulations be revised to require that any seller of an engine assembly (complete or incomplete) provide purchasers with the appropriate information about the engine's required emission requirements".

We could not find the provisions that the ARB staff noted in the staff report. ARB should clarify this requirement.

CALIFORNIA EXHAUST EMISSION STANDARDS AND TEST PROCEDURES

Part II, Section 2. Engine Test Set-up: Exhaust Gas Analytical System: Engine Parameters.

Figure 2-1: Engine Test Set-up.

In this figure, the exhaust gas sample probe is located at the muffler/catalyst and optionally at the tail pipe (i.e., after the optional mixing chamber). HONDA believes that the exhaust gas should be measured by the probe installed in the tail pipe. Basically, the exhaust gas regulations were originally made to control the exhaust gas emitted from the engines or vehicles.

It does not make sense to locate the sample probe in the muffler since the exhaust gases in the muffler are not necessarily considered to be equivalent to the gases actually emitted from an engine's tail pipe. For these reasons, ARB should amend the regulation to indicate that the sample probe should be installed in the tail pipe regardless of whether a mixing chamber is used or not.

Item (c)(1) .."Conversion of concentration into mass may be based either on engine airflow or fuel flow; however, the fuel flow measurement is recommended for all engines".

The provision as worded is confusing and should be rewritten to clarify the meaning. ARB needs to clarify what is meant by "recommended". Is there truly an alternative that the manufacturer can choose or is the fuel flow measurement required?

Item (d)(3)(ii) .."To minimize dropout of heavy hydrocarbon fractions in the exhaust mixing chamber during part throttle, light load operation, the tank size should be kept"...

The word "tank" should be replaced with "chamber".

Section 5 Dynamometer Calibration

Item (a) .."The dynamometer shall be calibrated at least once each month or performance verified at least once each week and then calibrated as required using the dynamometer manufacturer's method of calibration".

The meaning of "performance verified" is not clear. What is "performance" and how is the performance to be verified? ARB should clarify this requirement. Additionally, the required calibration interval is unclear. ARB needs to clarify that the required interval is at least once each month and once each week is optional. The words "if necessary" should be added as follows:

.."The dynamometer shall be calibrated at least once each month and, if necessary performance verified at least once each week and then calibrated as required using the dynamometer manufacturer's method of calibration".

Section 12 Engine Test Procedure

Item (b)(2)(viii) .."The method used to determine thermal stability (e.g., variation in cylinder temperature, engine oil temperature, etc.) shall be recorded".

The measurement point of cylinder temperature is unclear. And generally, there are no points to measure temperature in an engine cylinder. Honda will measure the cylinder head temperature at the spark plug seat. The term "Cylinder temperature" should be replaced with "cylinder head temperature".

Item (b)(2)(xv) .."Idle-mode fuel and air flow measurements may be determined immediately before or after the dynamometer sequence or as dictated by good engineering practice".

KOHLER CO. KOHLER, WISCONSIN 53044 PHONE 414 457-4441 TELEX 269-558 TWX 910 264 3877

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To Pat Hutchins	From Don DeMaster
Co.	Co.
Dept.	Phone #
Fax #	Fax #

KOHLER

STATE OF CALIFORNIA
AIR RESOURCES BOARD
7/25/94

cc: Board members
JOS TAC
AS Legal
JB MSD

94-7-1
7/28/94

July 23, 1994

Mr. Michael Carter
Chief
Off-Road Control Regulations Branch
Mobile Source Division
California Air Resources Board
9528 Telstar Avenue
El Monte, CA 91731

RE: Kohler Co. Comments on Proposed Amendments to the Emission Control Regulations for 1995 and Later Model Utility and Lawn and Garden Equipment Engines - CARB Mail-Out #94-24.

Dear Mr. Carter:

Kohler has reviewed subject document. We appreciate the staffs efforts to address the concerns that the Engine Manufacturers Association expressed regarding Mail-Out #94-09 in the letter from Glenn Keller to you dated March 18, 1994.

Most of Kohler Co. concerns were addressed in the changes proposed in Mail-Out #94-24. However, there were a few requests for change that were not addressed which Kohler feels are important and should be addressed by ARB staff.

Section 2404. Emission Control Labels

Engine Label

Item (c)(4)(H) We have "This engine meets 1995-1998 California..." approved by ARB. This allows a common label for carry-over engine configurations. The amendments have the wording ... "appropriate calendar year California regulations; for example, THIS ENGINE MEETS 1995 CALIFORNIA EMISSION REGULATIONS FOR UTILITY AND LAWN AND GARDEN EQUIPMENT ENGINES".

Kohler requests that label carry-over be allowed and that this be clearly stated in the amended regulation.

Fuel Call-out Label for Incomplete Assemblies

Item (f)(4) This paragraph requires an engine manufacturer that markets an engine without a fuel tank to attach a permanent label on the engine assembly in a readily visible location that provides the appropriate fuel type notice.

CARB staff has stated in the past that the intent is to make sure the end user is reminded of the proper fuel every time the tank if filled. However, that will only happen if the label is at or near the fuel tank filler inlet.

CARB's intent for this requirement is already satisfied by the requirement that the OEM place a label on or near the fuel tank filler inlet. The engine manufacturer is required to notice the fuel recommendation on a label or in the owners manual and is also required to notify the party (Distributor or OEM) purchasing an engine without a tank of their labeling responsibility. To require an engine manufacturer to place a label on the engine when they do not supply the tank is redundant and adds additional unnecessary cost (label and time to attach).

Kohler Co. requests that ARB modify the regulatory language to remove the requirement for unnecessary label duplication.

California Exhaust Emission Standards and Test Procedures

Part I, Section 20. Test Procedures, General Requirements

Item (a)(2) This section references "gross power output". That should be changed to "net power output".

Part II, Section 13. Records Required

Item (i)(1),(2) & (3) Kohler requests clarification from CARB regarding the format of required information when a data acquisition device other than a strip chart recorder is used.

In addition to the issues raised above, Kohler supports the comments being forwarded to ARB by Glenn Keller on behalf of the Engine Manufacturers Association.

Kohler Co. appreciates this opportunity to provide comments and trusts the ARB staff will take them under consideration as they make the appropriate revisions to the California Regulations for 1995 and Later Utility and Lawn and Garden Equipment Engines.

Very truly yours,

Don M. De Master

Don M. De Master
Manager Technical Services and Emission Certification

CC: Robert Cross
Jackie Lourenco
Pat Hutchins, ARB Secretary

Kubota

KUBOTA Corporation

64, ISHIZUKITA, SAKAI
OSAKA, JAPAN

STATE OF CALIFORNIA
AIR RESOURCES BOARD
RECEIVED 8/1/94
BY BOARD SECRETARY
JQS TAC
AS Legal
JB MSD

July 26, 1994

Ms. Pat Hutchins
ARB Secretary
Air Resources Board
P.O. Box 2815
Sacramento, CA 95812

Dear Ms. Hutchins:

Please find attached KUBOTA Corporation's comments regarding CARB Mail-out #94-24 which considers amendments to the emission control regulations for 1995 and later model utility and lawn and garden equipment engines.

If any questions should arise regarding our comments, please feel free to contact me at the following numbers:

Tel: 708)884-0212
Fax: 708)884-6410

Sincerely,

Kevin R. Kokrda
Manager
Emission Standards
Kubota Tractor Corporation
Engine Division

att:krk

KUBOTA Corporation's Comments Regarding CARB Mail-out #94-24

KUBOTA Corporation is a member of the Engine Manufacturers Association (EMA). We support the EMA position and participated in the development of their comments.

KUBOTA Corporation however has individually addressed the following issues that are unique to them and of major concern.

Attachment A

2404. Emission Control Labels - 1995 and Later Utility and Lawn and Garden Equipment Engines

CARB has stated clearly in this section that a fuel type notice shall indicate the appropriate engine fuel, or fuel and lubrication mixture.

We strongly request that the diesel engines which obtain CARB Certification with low sulfur diesel certification fuel should require a fuel call out label stating "LOW SULFUR DIESEL FUEL ONLY". This is requested because if these certified engines are installed in equipment and subsequently operated on high sulfur fuel, they may be in non-compliance in terms of meeting the CARB ULGE exhaust emission
levels.

Attachment B

Part 1, Section 20. Test Procedures, General Requirements

Item (a)(2) "Gross Power Output" should be revised to "Net Brake Power Output (without cooling fan for water cooled engines)".

This is suggested to harmonize with European regulations (i.e. EEC directives and ECE regulation 637)

Part II. Raw Gas Method Test Procedures

2. Engine Test Setup: Exhaust Gas Analytical System: Engine Parameters.

(b)(1) Exhaust Gas Analytical System.

"Exhaust gases shall be sampled by one probe and then be split internally to the different analyzers".

We strongly suggest that the following language be added:

"Exhaust gases may be sampled with two probes if the manufacturer submits this alternative procedure to the Executive Officer for consideration and approval".

Rationale for this requested addition is as follows:

1. There are both one probe and two probe sampling systems available today.

2. In the two probe system, one sample line is for dry exhaust sampling, and the other probe is used for wet (heated) gas sampling.

Part III. Constant Volume Sampling Procedure

5. Analytical Gases

(b)(1)(i) ;
"C3H8 and purified nitrogen:" is not consistent with subparagraph (a)(2) which specifies "Calibration .... single blends of propane using air as the diluent". It should be "C3H8 and purified synthetic air".

15. Test Procedures, Overview
(b) ;
We need clarification and/or references for "measurement methods for tolerance determination of the specified engine speed and load " to determine and record the range for each test mode. (max./min. avg. ?)

19. Dynamometer Procedure
(a)(4) ;
The method for determining thermal stability decision is specified in this subparagraph, (i.e., combustion cylinder temperature remain within +/- 5°C [+/- 9°F] over a five (5) minutes period).

We recommend the above be revised to the below statement:

The goal is to stabilize all engine parameters effecting emissions production and performance output before recorded measurements begins. Temperatures of combustion chamber components (water and/or oil for liquid cooled engines) are good indicators of engine stability. After thermal stability is achieved, emissions measurements are initiated.

26. Calculations: Exhaust Emissions
(c)(1)(iv)(B) ;
The "dilution exhaust sample" is incorrect. It should be "dilution air sample".

(c)(5)(vii)(B) ;
Humidity correction factor(kh) is specified only for gasoline engines in this subparagraph.

Therefore we recommend that kh for diesel engines should be added to this subparagraph for consistency with subparagraph 6.2.2.1 of SAE J1088.

$$kh = 1/\{1 - 0.0329(H - 10.71)\} \text{ (Gasoline)}$$
$$= 1/\{1 - 0.0182(H - 10.71)\} \text{ (Diesel)}$$

Kubota

KUBOTA TRACTOR
CORPORATION
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Fax (310) 370-2370

July 8, 1994

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Air Resources Board
STATE OF CALIFORNIA

94-7-1
7/28/94

CERTIFIED MAIL: RETURN RECEIPT REQUESTED

xc: Board members
JQS TAC
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JB MSD

Ms. Jacqueline Schafer
Chairwoman
California Air Resources Board
2020 L Street
Sacramento, CA 95812

Dear Ms. Schafer:

I am writing to you at the request of Kubota Corporation, which has been involved with the California Air Resources Board (CARB) Utility and Lawn and Garden Equipment Engine (ULGE) regulatory process from the onset.

Kubota Corporation is a multinational industrial company headquartered in Osaka, Japan. The products manufactured in its plants are sold in over 100 countries. Kubota Corporation is a leader in ULGE certification efforts, with fourteen engine families already receiving "Executive Orders". Kubota Tractor Corporation is a California corporation affiliated with Kubota Corporation.

As you know, there is less than six months from the scheduled implementation date of January 1, 1995 of the proposed ULGE regulation currently under review. Kubota Corporation is very concerned that this regulation remains unfinalized at this time.

Kubota Corporation has invested considerable resources to date in a good faith effort to comply with the ULGE regulation as presently proposed. The current uncertainty resulting from the lack of finalization of the regulation has placed Kubota Corporation in an unfavorable position compared to those of its competitors who may not have made a similar effort in research and development of low emission engines.

At this time, Kubota Corporation is making final decisions with respect to its 1995 production models. CARB decisions with respect to the new regulation will have a significant affect on the models to be produced.

In light of the significant impact that the current uncertainty will have both on Kubota Corporation and its customers should such uncertainty continue, we strongly request rapid and reasonable resolution of the pending regulation.

Thank you for your attention to this matter.

Sincerely yours,

Richard O. Briggs

RICHARD O. BRIGGS
Legal Counsel

ROB:jsj

1217j

Onan

STATE OF CALIFORNIA
A... 7/24/94

94-7-1
7/28/94

xc: Board member
JQS TAC
AS Legal
JB MSD

July 25, 1994

ARB Secretary
Air Resources Board
P.O. Box 2815
Sacramento, CA 95812

Dear Board Secretary:

The following is a list of comments or questions concerning CARB mail-out # 94-24.

SECTION	PAGE	PARAGRAPH	COMMENTS
Staff Report plus Attachment A plus Attachment B	13 3 5&6	C. 2401.a(3)&(9) Part I.2.	Definitions of "Basic Engine" and "Engine Family" are incompatible as written. Suggest that "Basic Engine" definition be revised to eliminate the words "fuel system". The fuel system is a something used to define an engine family and not a characteristic of the basic engine.
Attachment A	2	2400.a.1	Delete the phrases "equipment and" and "used in such equipment" from the sentence (i.e. eliminate both underlined phrases). Onan has discussed this item with CARB staff and feels that this change will clarify the applicability.
Attachment A	24	2407.b.4.A	Under Engine Sample Selection, change first sentence to read as follows: "The engine manufacturer shall randomly select one percent of the estimated California engine sales volume from each engine family for quality-audit testing."
Attachment B	18	18.d.4.iii	Change "and/or the parameter and thereby result" to "and/or the parameter and result in visibly noticeable damage or unsatisfactory engine operation." Requiring manufacturers to design in poor engine performance even under "tampering" conditions is contrary to good engineering practice and could even result in an increased risk of personal injury.

Onan Corporation 1400 73rd Avenue N.E. Minneapolis, MN 55432 (612) 574-5000

TECUMSEH PRODUCTS COMPANY COMMENTS ON AMENDMENTS TO EMISSION CONTROL REGULATIONS FOR 1995 AND LATER MODEL UTILITY AND LAWN AND GARDEN EQUIPMENT ENGINES

by Lynn Sonntag Delzell
Mayer, Brown & Platt
Chicago, Illinois

Tecumseh Products Company ("Tecumseh"), a manufacturer of small engines for lawn and garden equipment, fully supports the three point position of the Equipment Manufacturers Association ("EMA"), as stated in its comments to the California Air Resources Board ("CARB"). However, Tecumseh Products Company will focus its comments on the industry request that CARB extend compliance under the rule until August of 1996.

The air will not suffer from such delay. The industry as a whole has already anticipated the rule compliance date by introducing lawn and garden equipment which substantially reduces emissions to the air. The industry as a whole on average currently emits 20% less HC and NOx as compared to average 1990 NEVES inventory levels.

In addition, since the adoption of the California rule in December 1990, Tecumseh has followed an aggressive program to meet the new standards. This program included designing engineering alterations to Tecumseh's basic engine type to reduce emissions. While Tecumseh was able to reduce emissions in prototypes of these engines, it was not able to achieve compliance with the future California emission standards. Redesigned prototypes of one engine family did meet Tier 1 standards, on the average. However, average compliance is not enough and Tecumseh would therefore not be able to implement production of this prototype without a catalytic device of some sort.

In 1992, years before the compliance deadline, Tecumseh introduced into the market the new "Vector" engine line which emits approximately 50% of the emissions emitted by its predecessors. Since Tecumseh's attempts at modifying existing basic engine lines have not fully reached the required emission reductions, Tecumseh is now attempting to more fully modify the basic engine type to apply Vector-type features to small displacement class 1 engines. Prototyping, experimentation, and retooling Tecumseh's manufacturing process to produce these engines for California will take until August 1996 model introductions.

A means does exist which will likely meet Tier 1 standards by the January 1, 1995 model year. This would require developing a reliable and safe add-on catalytic device for small non-automotive engines of this category. In contrast, Tecumseh prefers to design engineering features to meet the Tier 1 emission standards which would form a permanent part of the engine. Accordingly, the EMA has urged, and Tecumseh supports, the extension for compliance with Tier 1 standards to August of 1996.

TECUMSEH PRODUCTS COMPANY
ENGINE AND TRANSMISSION GROUP

NEW HOLSTEIN OPERATIONS
1604 MICHIGAN AVENUE
NEW HOLSTEIN, WISCONSIN 53061-1175

PHONE: 414-898-5711
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July 21, 1994

STATE OF CALIFORNIA
AIR RESOURCES BOARD
RECEIVED 7/25/94
AIR BOARD SECRETARY

94-7-1
7/28/94

cc: Board Members
JDS TAC
AS Legal
JB MSD

Air Resources Board Secretary
Air Resources Board
P.O. Box 2815
Sacramento, CA 95812

To Whom It May Concern:

Tecumseh Products would like to thank the ARB for the opportunity to comment on the latest revisions to the Emission Control Regulations for 1995 and Later Model Utility and Lawn and Garden Equipment Engines.

While the staff has done an admirable job of implementing many of the suggestions made by industry over the brief history of this regulation there are a few comments that we would like to share with the Board and the Staff in this regard.

We would also request that we be allowed to comment on those requests and comments received from other interested parties prior to their inclusion in this regulation.

Sincerely:

Gar M. Adams
Manager, Emissions and Components

xc: G. Gatecliff
J. Moorman
J. Martinco

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To Pat Hutchins	From G. M. Adams
Co. California ARB	Co. Tecumseh Prod
Dept. Board Secretary	Phone # 414-898-5711
Fax # 916-322-6003	Fax # 414-898-9019

July 21, 1994

CARB Mail Out 94-24 Comments

The following are Tecumseh Products Company comments on the Utility/ Lawn and Garden Equipment Engine Regulation "Rule Clean-Up" as identified in mail out 94-24.

Informative digest of proposed action:

Pg. 2 Summary of staff proposals:

Inclusion of the latest version of SAE J1088 Recommended Practice is inferred but is not included in it's entirety in the detail sections that follow.

Staff report:

Pg. 15 Engine Label Content- Names and Trademarks

Reference is made to the multiple ways an engine manufacturer may distribute their product in the Engine Label- Location section of page 14. This reference correctly indicates that the engine manufacturers may sell incomplete engines to third party distributors who in turn sell them to an OEM. To require the engine manufacturer to provide the Executive Officer with all potential engine labels is not possible as there may be no contractual agreement between the engine manufacturer and the OEM.

Pg. 15/16 Supplemental Engine Label Content- Names and Trademarks

As indicated above the engine manufacturer may not have a complete list of OEM models due to indirect distribution.

Attachment A:

Pg. 2: 2400 Applicability

The scope of the regulation appears to have been expanded to include equipment. This would impose substantial distribution and inventory constraints. Equipment incorporating engines produced after the effective date of the regulation should be subject to the provisions of this regulation. Equipment incorporating engines build prior to the effective data of this regulation should be exempt.

CARB Mail Out 94-24 Comments
Pg. 2

Pg. 7: 2403 Exhaust Emission Standards and Test Procedures

(b) Engines covered by these standards and procedures should only be included if they are manufactured after the effective date of the regulation.

Pg. 9: 2404 Emission Control Labels

This section clearly indicates that the label can be attached to any permanent part of the engine. Therefore, references to the block and crankcase only should be deleted.

Pg. 12: Supplemental Engine Label Content and Location

4) The allowance to delete the engine date of manufacture from the supplemental label is desirable, however, the additional requirement that this not be done unless the date of manufacture is readily visible on the engine should be deleted.

Attachment B:

Pg. 11: 9 Exhaust Emission Standards for 1995 and Later Utility and Lawn and Garden Engines

(b) Engines covered by these standards and procedures should only be included if they are manufactured after the effective date of the regulation.

Pg. 12: 12 Submission of Engine Identification Number

a) This section appears to require that engine manufacturers advise the Executive Officer of the engine numbering system which identifies that an engine is covered by an executive order. As the engine must have the engine family identification on the label this requirement is an unnecessary duplication.

Pg. 17: 18 Test Engines

3) i) Most engines in this category are designed to be easily disassembled in a reasonably short period of time using standard tools for ease of repair. The requirement to allow only disassembly with special tools is not compatible with this basic design intention and therefore should be deleted.

Pg. 19 Test Procedures, General Requirements

c) 2) If an engine family contains engine configurations which operate at different speeds, some at rated speed and some at intermediate speed the certification testing is done based on the worst case test cycle. For quality audit testing the speed used should be determined by the configuration selected rather than the certification test speed.

Pg. 23 Testing by the Executive Officer

a) If the Executive Officer determines that confirmatory testing is required, and when this testing is conducted at a location other than the engine manufacturer's, can representatives of the engine manufacturer witness the testing?

Pg. 36 Exhaust Gas Analytical System

(i) If a HCLA analyzer is utilized it must be placed in the heated sample stream with the FID rather than the cold sample stream as indicated. This is shown as a separate heated line in figure 2-2 Pg. 34.

The final sentence indicates that the analyzer flow meters are located in the analyzer exhaust. As shown in the schematic flow controls/meters are typically placed on the inlet flow to the analyzers to assure proper flow without impairing the analyzer's performance.

Pg. 37 (3) Fuel Flow Measurement

The requirement for +/- 1% of the full scale flow rate accuracy is not in agreement with the latest revision of SAE J1088 which specifies +/- 2% of the reading. The SAE 1088 requirements should be adopted.

Pg. 48-52 Engine Test Procedure

a) 2) Engine Pre-Test Preparation as described should not be required if the emission equipments effect on a given engine family has previously been determined.

a) 3) i) The maximum allowable leakage rates for the vacuum and pressure side of the system is an additional requirement which is a concern.

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Pg. 48-52 Engine Test Procedure (cont.)

a) 3) iii) To add the requirement to check zero and span after each test cycle is an unnecessary burden.

b) 2) ii) The preconditioning requirement for spark ignition engines for a minimum of 20 min. prior to the beginning of the thermal stability should be deleted.

c) 2) These are the same zero and span issues in a) 3) above.

d) 2) The requirement to maintain speed and load within +/- 5% for all power modes which have greater than 0.2 lb-ft is not realistic. Minimum torque capability is typically +/- 0.1 lb-ft which would relate to a set point of 2.0 lb-ft which is significantly over the minimum 0.2 specification. We recommend the specification be changed to +/- 5% or +/- 0.1 Lb-ft which ever is greater.

e) 1) The requirement to perform an HC hang-up check within one minute of the completion of the last mode should be optional at the discretion of the testing facility.

e) 4) The zero and span drift requirements of +/- 2% are additional burdens which are unnecessarily stringent. If required the requirement should be +/- 5%.

Pg. 52: 13 Records Required

Is there a preferred and/or predetermined format for reporting all of the information listed?

Single point digitally averaged numerical values should be identified as an alternate means to meet the requirements for continuous records or strip chart records in;

f) 4) engine torque and engine speed for each mode

i) 1), 2), & 3) Zero, Span, Sample, and HC hang-up

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Pg. 57 (4) Fuel Flow Method

The equations given for calculation of HC, CO, and NO2 do not agree with the latest release of SAE J1088. Specifically the J1088 formulas include a term for the molecular weight of the fuel. This is absolutely required for the use of oxygenated fuels such as CA Phase II to obtain accurate results. The SAE J1088 formulas should replace those specified.

Pg. 59 Appendix A

The formula for H2 has an error in the denominator. The brackets should begin with the "3" term and end after the "CO2%" term.

$$H2 = \frac{0.5 * y * CO * (CO\% + CO2\%)}{CO\% + (3 * CO2\%)}$$

Pg. 65 Part III Constant Volume Sampling Test Procedures

We do not have any experience with CVS sampling but it would appear that an IM240 type of dilution system which introduces dilution air with the exhaust gas where collected from the engine would be much more desirable than the conventional system described.