State of California
AIR RESOURCES BOARD

Staff Report: Initial Statement of Reasons for Proposed Rulemaking

NOTICE OF PUBLIC HEARING TO CONSIDER AMENDMENTS TO THE EMISSION CONTROL REGULATIONS FOR 1995 AND LATER MODEL UTILITY AND LAWN AND GARDEN EQUIPMENT ENGINES

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I. INTRODUCTION

Emission regulations for utility and lawn and garden equipment engines (utility engines) were approved by the Air Resources ARB (ARB) on December 14, 1990, and became effective on May 31, 1992. These regulations were adopted and implemented under the authority of the California Clean Air Act of 1988 (CCAA) as codified in Health and Safety Code Sections 43013 and 43018. The utility engine regulations include exhaust emission standards and test procedures, provisions for emission control system labels, an emission-related component defect warranty, and quality-audit and compliance test procedures. The utility engine regulations were originally applicable to engines produced on or after January 1, 1994. However, a one-year delay in the implementation was approved by the ARB on April 8, 1993. The regulations are currently applicable to new engines produced on or after January 1, 1995.

The implementation of the utility engine regulations has required the ARB staff to develop new operational procedures for engine certification, quality-audit and compliance activities. As experience was gained implementing these procedures, the need to incorporate improvements and clarify provisions became apparent. Also, modifications are necessary to be as consistent as possible with the United States Environmental Protection Agency's (USEPA's) proposed nonroad small engine Phase I test procedures. Additionally, utility engine manufacturers have requested that the regulations be modified to reflect contemporary utility engine test practices recently adopted by two international standards organizations. In response to these concerns, the staff is proposing that the utility engine regulations be amended.

II. BACKGROUND

A. Utility Engine Emission Regulation Applicability

The utility equipment category includes a variety of equipment powered by gasoline-, diesel- and alternative-fueled, two- and four-stroke engines. Any engine that is used to power utility and lawn and garden

equipment is subject to the regulations if the engine produces a maximum power less than 25 brake horsepower (bhp)[1], or the engine is governed (i.e., controlled engine speed), or calibrated (e.g., fuel feed, value timing, etc.), to produce less than 25 bhp. For a given engine that has models under 25 bhp, and models at 25 bhp or over, only the models under 25 bhp are subject to the regulations. Included in the category are engines that power handheld and non-handheld equipment. Engines may be used in multiple equipment applications because of similar performance characteristics. Table 2-1 provides examples of typical applications of utility engines that are subject to the regulations.

Table 2-1. Utility Equipment

Handheld Equipment	Non-handheld Equipment
Chainsaws	Walk Behind Mowers
String Trimmers	Riding Mowers
Leaf Blowers	Generators

Some of the equipment originally considered to be subject to the utility engine regulations is expected to be preempted from ARB regulation in accordance with the federal Clean Air Act Amendments (CAA Amendments) of 1990. The federal CAA Amendments established a federal preemption that prohibits any state or political subdivision thereof from the regulation of emissions from new farm and construction equipment powered by an engine less than 175 horsepower[2]. To date, USEPA has not promulgated a final rule defining the scope of federal preemption. However, ARB staff has reached agreement with engine manufacturers with respect to which equipment should be preempted and has so informed USEPA. The existing California regulations accept any additional guidance that USEPA provides on preemption in its

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1. The power output is determined when an engine is equipped with only the accessories required for engine operation (e.g., cooling water pump for a water-cooled engine, etc.).

2. The CAA Amendments did not define precisely which equipment applications belong to the farm and construction equipment classification. In an effort to define the scope of the preemption, the United States Environmental Protection Agency (USEPA) issued a "Notice of Proposed Rulmaking for the Waiver to California for Nonroad Engine and Vehicle Pollution Control Standards; proposed Decision of the Administrator; Opportunity for Public Hearing". The definition of a utility engine, as defined in Title 13, CCR, Section 2401, specifically excludes any engine or engine used to power equipment that is included within the scope of the federal preemption. Ref.: CAA, Sections 209(e)(1) and (e)(2).

final rule. Without a final decision from USEPA, engine manufacturers have proceeded to develop and certify engines for the 1995 calendar year based on the ARB/engine manufacturers' agreement.

B. Utility Engine Emission Control Regulations

The utility engine regulations establish emission standards and engine test procedures. They specify requirements for emission control labels, defects warranties, and engine compliance test programs. Utility engines must demonstrate compliance with the exhaust emission standards shown in Table 2-2.

Table 2-2. Exhaust Emission Standards (grams per brake horsepower-hour)

Calendar Year	Engine Class	Hydro-carbon	Oxides of Nitrogen	Carbon Monoxide	Particulate Matter[3]
1995 to 1998	Non-handheld				
(Tier I)	< 225 cc	- 12.0	Combined -	300	0.9
	≥ 225 cc	- 10.0	Combined -	300	0.9
	Handheld[4]				
	< 20 cc	220	4.0	600	-
	20 - 50 cc	180	4.0	600	-
	≥ 50 cc	120	4.0	300	-
1999 and subsequent (Tier II)	Non-handheld	- 3.2	Combined -	100	0.25
	Handheld	50	4.0	130	0.25

The Tier I standards provide feasible, short-term reductions in utility engine emissions by the use of simple engine modifications (e.g.,

3. Applicable to all 1995 and later diesel-cycle engines, and all 1999 and later two-stroke engines.

4. To be classified as a handheld piece of equipment, the equipment must require that the operator support its full weight while in operation; and, the engine must be capable of being operated in any position to perform its designed function properly.

calibrations, component tolerances, etc.). The Tier II standards will provide greater long-term emission reductions through the use of advanced control technologies (e.g., catalytic converters, etc.). By 2010 these standards are expected to result in a statewide reduction of approximately 58 tons per day (tpd) of hydrocarbon emissions and 375 tpd of carbon monoxide emissions.[5]

The emission test procedures and enforcement procedures provide the protocol to accurately evaluate the utility engine emissions and ensure compliance with the emission standards. These procedures are similar to existing on-road motor vehicle regulations with amendments to reflect the inherent differences between such vehicles and utility engines. For example, to reduce the cost burden on manufacturers, at the time of initial adoption of the procedures, certain requirements applicable to on-road motor vehicles were either modified or eliminated for utility engines (e.g., elimination of any emission control system durability demonstration, reductions in the quantities of engines required to be quality-audit tested, and reduction in warranty coverage period).

Since the ARB's adoption of these regulations, staff has begun to apply the regulations for engine manufacturers submitting certification applications for engines to be produced during the 1995 calendar year. To date, Executive Orders have been issued for over 40 1995 calendar year production two- and four-stroke, spark-ignition, and four-stroke diesel-cycle engine families. Through this process, staff and industry have identified areas in the procedures that would benefit from additional clarification or modification. Incorporation of these changes is the subject of this proposal.

III. SUMMARY OF RECOMMENDED ACTION

Staff recommends modifications to the emission test procedures, and the requirements regarding emission control labels, defects warranty, assembly-line quality-audit testing (quality-audit) and new engine compliance test testing (See Attachments A and B). If adopted, the amendments would clarify and update the regulations and procedures, helping to ensure greater compliance. The proposed amendments do not change the previously adopted utility engine emission standards, and, accordingly, do not impact the per-engine emission reductions that should be achieved. A summary of the staff's proposal follows below, and a more detailed discussion is provided in Section IV -- DISCUSSION.

A. Alternative Fuel Test Method -- Gaseous Fuels

The exhaust emissions from engines that use gaseous fuels (e.g., natural gas, etc.) contain large quantities of methane gas. Unlike other hydrocarbon exhaust gases, methane does not contribute to the formation of

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5. The estimated tonnage reduction does not reflect the impact of the federal preemption.

smog (i.e. ozone). Although gaseous-fueled utility engines do not emit large quantities of smog producing emissions, they are currently required to certify to the same total hydrocarbon (including methane) standard as engines using gasoline or diesel fuels. Since the emission characteristics of these engines have not yet been adequately determined, the staff proposes that these engines be allowed the option of using an alternative test procedure that subtracts the methane from the rest of the hydrocarbons in the exhaust. These engines could, as an option, certify to the hydrocarbon standard on the basis of only the non-methane hydrocarbon (NMHC) content of the total hydrocarbon emissions. Similar allowances are made for methane emissions from on-road vehicles.

B. Utility Engine Regulations -- Test Procedures

Portions of the ARB's current utility engine Test Procedures[6] are based on the Society of Automotive Engineers' (SAE's) utility engine test procedure that was issued in June 1983[7]. The SAE's procedure has been updated and improved since the adoption of the ARB's procedures. The staff proposes to incorporate the improvements associated with the updated version of the emission test procedures and add the new diesel-cycle test cycle.

C. Test Procedures -- Certification Test Fuels

The specifications for the utility engine certification test fuels were adopted with the intent that they be consistent with the on-road motor vehicle fuel specifications that were contained in the "California Exhaust Emission Standards and Test Procedures for 1988 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles", amended July 12, 1991. The on-road motor vehicle fuel specifications have since been revised to include Phase II gasoline. However, utility engines can be certified with only the fuels specified in the July 12, 1991 version of the on-road motor vehicle test procedures. The staff proposes that the utility engine regulations be revised to incorporate the most recent on-road motor vehicle fuel specification, which includes Phase II gasoline.

D. Utility Engine Regulations -- Emission Control Labels

The regulations were adopted with the intent that emission control labels provide specific engine-related information to facilitate the identification and maintenance of an engine's emission control system and provide an aid in compliance activities. The current regulations contain provisions for three types of emission control labels: the engine label, the

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6. Ref.: "California Exhaust Emission Standards and Test Procedures For 1995 and Later Utility and Lawn and Garden Equipment Engines", amended April 8, 1993 ("Test Procedures").

7. Ref.: Society of Automotive Engineers' document J1088, "Test Procedures For The Measurment Of Gaseous Exhaust Emissions From Small Utility Engines".

supplemental engine label, and the fuel label. Engine manufacturers are required to attach an engine label to every engine. Equipment manufacturers are required to attach a supplemental engine label whenever the visibility of the initial engine label is eliminated after the installation of an engine into an equipment assembly. Engine manufacturers are also required to attach a fuel label to minimize the possibility that an engine is misfueled.

The staff proposes revisions to the engine and supplemental engine label regulations to allow names and trademarks other than the engine manufacturer's to appear on the labels. Amendments are also proposed to ensure that all labels remain durable for the useful life of the engine, and to make clear that equipment manufacturers are responsible for attaching supplemental engine labels. The staff also proposes to clarify the requirements regarding labeling the proper fuel to use in an engine. New requirements would clarify the responsibilities of the engine and equipment manufacturers in ensuring that the fuel labels are visible to the ultimate purchasers.

E. Utility Engine Regulations -- Defects Warranty and Emission Control Warranty Statement

Compliance with the defects warranty and the emission control system warranty statement regulations is the responsibility of the engine manufacturer. Staff proposes minor changes to the warranty language in Sections 2405 and 2406, Title 13, California Code of Regulations (CCR), in order to emphasize that the responsibility of warranty compliance remains with the engine manufacturer, even when an equipment manufacturer uses a name and trademark different than the engine manufacturer's on its engine and/or supplemental engine label.

F. New Engine Compliance and Quality-Audit Test Regulations

(1) Assembly-Line Quality-Audit Tests

Assembly-line quality-audit test procedures are applicable to utility engines produced on or after January 1, 1996. Engine manufacturers are required to emission test one percent of an engine family's production. An engine manufacturer may propose an alternative quality-audit test procedure that uses less than one percent of the engine family's production if the alternative procedure provides an equivalent assurance of compliance.

The current utility engine quality-audit procedures were based on existing on-road motor vehicle quality-audit procedures, and modified to be applicable to utility engines. However, portions of the current procedures are still not totally reflective of utility engine production practices.

Staff proposes revisions to the quality-audit procedures that clarify the methods for determining compliance of an engine family, establishing a procedure to use production quantities from multiple production quarters when the volume of production is low, establishing quality-audit sample rates for low-volume production quarters (i.e., less

than 5,000 units), and clarifying other provisions. Furthermore, the staff proposes that, in addition to using an engine dynamometer, other types of power loading devices may be used to test handheld equipment engines that are integrated with the equipment. This will reduce the cost associated with the quality-audit tests.

(2) Compliance Tests

New engine compliance procedures are applicable to utility engines produced on or after January 1, 1995. These procedures are initiated at the ARB's option and provide additional assurance that a manufacturer's product satisfies the regulations. The compliance procedures allow the ARB to perform emission tests and/or inspections of engines and the facilities where the engines are developed, tested and assembled. These procedures may be conducted on completed engines that are selected randomly at any point in the manufacturer's (engine or equipment, as applicable) product distribution process (e.g., at a retail dealer's store, etc.).

The current new engine compliance procedures were adapted from existing on-road new motor vehicle compliance procedures. However, some portions of the current procedures were not changed sufficiently to address situations particular to utility engines, such as adjustable engine parameters. To ensure compliance of engines with adjustable engine parameters, the staff proposes that such engines be compliance tested with the engine parameters adjusted to any position within the range of the allowable adjustments available to the ultimate purchasers. Other amendments that clarify the compliance requirements are also proposed.

G. Manufacturer Penalties

The current regulations provide for the enjoinment of further sales in California of a manufacturer's products when an engine family is not in compliance with the regulations. However, the current regulations do not identify specifically the manufacturer (i.e., engine or equipment) or product (i.e., engine family or equipment model) that is subject to such enjoinment. The regulations are also not clear regarding a manufacturer's responsibility for emission compliance of incomplete engine assemblies. Engine manufacturers have expressed concerns that they could be responsible under the present regulations for noncompliance of engines that were sold as incomplete engine assemblies to third parties that used inappropriate components in assembling the finished engine.

Therefore, the staff proposes that the regulations be revised to clarify that when the engine manufacturer is determined to be responsible for the noncompliance, the entire noncompliant engine family is subject to being enjoined from further sales, and when the equipment manufacturer is determined to be responsible for the noncompliance, the applicable equipment product line of the equipment manufacturer is subject to injunction. The staff also proposes that the regulations be revised to require that any seller of an engine assembly (complete or incomplete) provide all necessary information about the engine's emission requirements to the party that purchases the engine assembly.

H. Other Amendments

The staff proposes additional amendments that are explained in Section IV -- DISCUSSION. These amendments include:

-Diesel-Cycle Engine Family Groupings

-Tamper Resistance of Adjustable Engine Parameters

-Utility Definitions

-Production Engines

The staff has also proposed various clarifications, corrections and modifications throughout the regulations that are not substantive in order to maintain continuity throughout the regulations with respect to the proposed amendments.

IV. DISCUSSION

This section provides additional information about each of the regulatory amendments described above. The reader can proceed to Section V -- REGULATORY ALTERNATIVES if no additional details are needed, or refer to individual discussions in this section as necessary.

A. Alternative Fuel Test Method -- Gaseous Fuels

The utility engine hydrocarbon emission standards reflect total hydrocarbon emissions. Some engine manufacturers currently market utility engines that are fueled by gaseous fuels (i.e., natural gas and propane) that emit large amounts of methane. Methane gas is less of a concern than other hydrocarbons because it does not contribute to the formation of ozone. Engine manufacturers believe that gaseous-fueled engines are penalized unfairly in certification because, while their total hydrocarbon emissions are high, most of their exhaust is methane. Thus, they produce less reactive hydrocarbons.

At the present time, the ARB has not sufficiently evaluated the emission characteristics of gaseous-fueled utility engines. Consequently, the staff cannot propose a separate hydrocarbon standard (i.e., a non-methane hydrocarbon (NMHC) standard) for these engines. Since gaseous-fueled engines are likely to be less polluting than other types of engines, the staff believes they should not be prevented from certifying.

Accordingly, the staff proposes that manufacturers of gaseous-fueled engines have the option to certify their engines to the total hydrocarbon (THC) standard on the basis of only the NMHC portion of the total hydrocarbons. Engine manufacturers certifying these engines will need to propose an alternative testing procedure for determining the NMHC portion of the THC emissions. The ARB will monitor the emission characteristics and sales volumes of these engines so that a reasonable NMHC standard can be developed and implemented if necessary.

B. Test Procedures

(1) Incorporation of the SAE and ISO Test Procedures

The current ARB Test Procedures use either a raw gas method or a constant volume sampling test procedure to produce emission test results. The current ARB raw gas method test procedure was based on the SAE's J1088, "Test Procedure For The Measurement of Gaseous Exhaust Emissions From Small Utility Engines", issued in June 1983. The current ARB constant volume sampling procedure was based on an existing on-road motor vehicle procedure and modified to reflect utility engine test requirements and conditions. Both the current raw gas method and constant volume sampling procedures use the same test cycles (i.e., steady-state modal engine operation).

Since adoption of the ARB's utility test procedure, engine manufacturers have improved the raw gas method test procedures that are used for their internal testing by incorporating current test practices and equipment specifications. In February 1993, the SAE issued a revised J1088 procedure that reflects the latest industry practices. The USEPA's proposed non-road small engine Phase I test procedure has incorporated the updated J1088 as part of its emission test procedures.

The ARB's current test procedures allow integrated generator engines to be tested at conditions that reflect actual equipment operation (i.e., rated speed) and in the final equipment form (i.e., the engine and generator are assembled together)[8]. This provision was allowed because these engines operate only at a rated speed, and they cannot operate when disassembled from the generator equipment. The SAE's latest J1088 test procedures recognizes that other engines (i.e., not only integrated generator engines) must operate at a rated engine speed. Engine manufacturers have requested that the ARB procedures be amended accordingly.

The current constant volume sampling procedures do not provide sufficient information (i.e., flow measurement, dilution ratio, and sampling procedure)[9] necessary to measure PM appropriately. Also, this test procedure does not include test methods (e.g., multiple filters, effective weighting factors, etc.) that are currently used by industry. A more complete PM test procedure is contained in the International Organization for Standardization's (ISO's) document 8178-1[10].

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8. Ref.: Test Procedures, Part I, Section (20)(c).

9. Ref.: Ibid., Part III, Sections (14), (15), (16), (23) and (24).

10. Ref.: ISO document 8178-1, "Reciprocating Internal Combustion (RIC) Engines -- Exhaust Emission Measurement", Part 1, "Test Bed Measurement of Gaseous and Particulate Exhaust Emissions From RIC Engines", November 11, 1992.

Therefore, the staff proposes that the SAE J1088 (Feb 1993) and portions of ISO 8178-1 PM test procedures be incorporated into the regulations. Only those portions of the ISO 8178-1 procedure that are applicable to PM measurement and data reduction would be incorporated because the current constant volume sampling procedure of the utility test procedures is deficient in only the procedures required for PM determination. Additionally, to maintain consistency with the USEPA nonroad small engine test procedures, the staff proposes to incorporate much of the USEPA's proposed non-road small engine Phase I test procedure. In addition to the above, the staff proposes some nonsubstantive amendments to the current constant volume sampling procedure to eliminate confusing references to on-road motor vehicle-type tests (e.g., references to "cold soak" areas, etc.).

(2) Certification Test Fuel Specifications

At the time of adoption of the utility test procedures, it was the staff's intent to allow utility engine manufacturers to certify engines with fuel specifications that are consistent with the on-road motor vehicle fuel specifications[11] since utility engines use the same commercial fuels as on-road motor vehicles. Staff recognized that cleaner gasoline and diesel fuels were to enter the market at the same time as the controlled utility engines, and that the utility engines should be allowed to use the cleaner fuels for certification. Thus, the utility engine test procedures referenced the July 12, 1991 version of the "California Exhaust Emission Standards and Test Procedures for 1988 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles" (the on-road motor vehicle test procedures). These provisions permitted the use of Indolene Clear and Phase 1 gasolines for certification test fuels with the specifications for the cleaner fuels to be incorporated. However, the on-road motor vehicle test procedures were superseded by more recent versions. Hence, the utility engine fuel specifications are no longer consistent with the current 1995 and later on-road motor vehicle fuel specifications. In the latest motor vehicle test procedure (amended September 22, 1993), the fuel specifications allow the use of Phase II and Indolene Clear gasolines, USEPA low- and high-sulfur diesel, California clean diesel, gaseous fuels, and alcohol-based (i.e., methanol, ethanol) fuels.

Therefore, the staff proposes that the utility engine fuel specifications be revised, with several noted exceptions, to be consistent with the latest on-road motor vehicle fuel specifications. The staff proposes that methanol and ethanol fuels would not be allowed for engine certification because the utility engine emission standards do not include a formaldehyde standard. The utility engine industry would need to propose a

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11. Ref.: Test Procedures, Part II, Section (12)(a)(1), and Part III, Section (4)(a) and (4)(b)(1).

reasonable and acceptable formaldehyde emission standard for such engine certification purposes if there is interest in certifying using methanol and ethanol fuels.

(3) Diesel-Cycle Engine Family Groups

Currently, manufacturers of diesel-cycle engines are required to separately certify each engine model that has a different total engine displacement or a different number of cylinders. When total engine displacements are within fifteen percent of the largest engine displacement, models can be grouped as one "engine family" to reduce the certification burden.

Diesel-cycle utility engine manufacturers believe that their engines should be given an allowance that will further reduce their certification burden. Specifically, these engine manufacturers have requested an amendment to the engine family criteria used to define engine families which would allow the engine manufacturer to group engines with similar individual cylinder displacements regardless of the number of cylinders. A similar allowance is contained in the Heavy-Duty Off-Road Diesel-Cycle Engine regulations[12]. This allowance reduces the number of engine families that must be certified without any compromise in compliance assurance; hence, it results in a reduction in the certification costs/administrative burden for both engine manufacturers and the ARB.

Accordingly, staff proposes that the utility engine test procedures be revised to allow diesel-cycle engines with similar engine cylinder designs (except for the number of cylinders) to be combined into engine family groups for the purpose of certification. Such engines must have individual cylinder displacements that are within fifteen percent of the largest cylinder displacement to be included in the engine family group. Diesel-cycle engine families should continue to be formed on the basis of engine parameters that are specified by the Executive Officer; however, these parameters would not include the number of cylinders.

(4) Tamper Resistance of Adjustable Engine Parameters

To ensure that production engines maintain their emission characteristics throughout their useful life, certain engine parameters must be resistant to tampering by the ultimate purchaser. Provisions related to tamper resistance of adjustable engine parameters (e.g., idle fuel mixture screws, etc.) are not contained in the current regulations. On-road motor vehicle regulations include provisions about tamper resistance criteria of adjustable engine parameters, and these provisions have been consulted on a

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12. Ref.: Mail-out #93-42, "California Exhaust Emission Standards and test Procedures For New 1996 and Later Heavy-Duty Off-Road Engines and Equipment Engines".

case-by-case basis for utility engines. Accordingly, staff proposes that tamper resistance provisions be incorporated into the off-road utility engine regulations. These include determining which adjustable engine parameters are subject to adjustment, evaluating the adequacy of limits, stops, seals, or other methods used to control, restrict or inhibit adjustments, evaluating the emissions impact of such adjustments, and notifying the engine manufacturer of these determinations.

(5) Engine Family Certification

The current regulations require engine manufacturers to submit specific emission information, and allow the ARB to verify the accuracy of the information (i.e., confirmatory testing)[13]. However, the current regulations do not delineate how or when such information is submitted and evaluated. Accordingly, staff proposes that the current regulations be amended to clarify the submission, review and approval process of required certification information. The amendments would clarify these processes with respect to specific items, such as letters of intent, certification application submissions, test engine selections, revisions to the certification application, emissions testing, test waiver request submissions and approvals, confirmatory testing, warranty statements, and Executive Order approvals.

(6) Production Engines

The current utility engine test procedures include provisions that require an engine manufacturer to furnish the Executive Officer with a reasonable number of production engines for test purposes, and to notify the Executive Officer annually of the number of each engine family-engine displacement-emission control system-fuel system combination produced for sale in California during the preceding year[14]. These provisions are, in effect, similar to the compliance test procedures as set forth in Title 13, CCR, Sections 2407(a)(1), (b)(4)(b), and (8)(a) and (8)(B). Therefore, the reference in the utility test procedures is duplicative, and staff proposes that these provisions be deleted from the test procedures.

C. Utility Definitions

The staff proposes revisions and additions to definition sections of the regulations and test procedures. The proposed changes clarify the engine certification protocol.

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13. Ref.: Test Procedures, Part I, Sections (14)(a)(1), (18)(a), and (26).

14. Ref.: Ibid., Part I, Sections (13)(a) and (b).

The intent of the regulations is to require engine manufacturers to emission test the engine configuration that is expected to have the greatest probability to exceed the emission standards (worst-case engine), and thereby determine emission values that can be considered as truly representative of all engines within the engine family. The regulations, however, currently do not provide clear definitions of engine configurations or assemblies. The staff proposes that the ARB amend the existing engine family definition, and adopt the following definitions that define engine family names and the various engine configurations and assemblies, to clarify the engine family designations and the certification process.

-A "basic engine" is an engine manufacturer's unique combination of engine displacement, number of cylinders, fuel system, emission control system and other engine and emission control system characteristics specified by the Executive Officer.

-An "engine family" is a subclass of a basic engine based on similar emission characteristics. The engine family is the grouping of engines that is used for the purposes of certification.

-An "engine-displacement-emission control system combination" or "engine-displacement-system combination" is a subclass of an engine family based on engine displacement and specific emission control system components.

-An "engine model" is a subclass of an engine-displacement-system combination based on the engine power output (i.e., the engine calibration), and other parameters.

-An "engine configuration" is a subclassification of an engine model based on specific emission-related components (e.g., air inlet, fuel, and exhaust systems, etc.).

-An "engine family name" is a multi-character alphanumeric sequence that represents certain specific and general information about an engine family.

-A "complete engine assembly" is an assembly of a basic engine and all of the specific applicable components (e.g., air inlet, fuel and exhaust systems, etc.) and calibrations (e.g., carburetor jet size, valve timing, etc.) in order that the assembly can be installed into a new unit of equipment.

-An "incomplete engine assembly" is a basic engine assembly that does not include all of the components necessary for designation as a complete engine assembly, and is marketed in order to be a part of, and assembled into, a new unit of equipment that is marketed to ultimate purchasers. An original equipment manufacturer purchaser then procures the remainder of the necessary components and completes the engine assembly for installation into a new unit of equipment. This type of

arrangement allows an original equipment manufacturer purchaser to tailor the completed engine assembly to its own particular requirements.

-A "third-party distributor" is a party that is not an engine or equipment manufacturer, and that engages in wholesale and/or retail sales of complete and/or incomplete utility and lawn and garden equipment engine assemblies.

D. Emission Control Labels

(1) Engine Label -- Location

The emission control label regulations are set forth in Title 13, CCR, Section 2404. The intent of the regulation is that all certified engines can be readily identified by ultimate purchasers and service technicians. However, compliance with the current regulations is difficult because the regulations do not consider the actual engine assembly process. Presently, under the regulations, the engine manufacturer is responsible for the attachment of engine labels which are allowed to be attached only upon the engine block or crankcase. This requirement is too limited in practice. Many engines require that engine air-flow devices (e.g., shrouds, covers, etc.) be fastened to the engines or functionally integrated into the equipment housings. These ancillary engine components may obscure any engine labels attached directly to the engine block or crankcase. Thus, the engine manufacturer's block or crankcase label may not be readily visible. Since the label obscuring shrouds and covers are necessary for engine operation they are not likely to be removed by the end-use operators; therefore, the placement of engine labels on these components by the engine manufacturer should be acceptable.

Compliance with the present regulations is also difficult because the regulations do not consider the marketing structure that exists in the utility engine industry. There are three arrangements through which utility engines are marketed. The first arrangement is when an engine manufacturer is also the original equipment manufacturer (i.e., builds and assembles both the engine and equipment), and sells the complete engine installed in a new unit of equipment to a retail customer. The second arrangement is when an engine manufacturer sells an engine (i.e., complete or incomplete engine assembly) directly to an original equipment manufacturer. The third arrangement is when an engine manufacturer sells an engine (i.e., complete or incomplete engine assembly) to a third-party distributor. The engine is subsequently sold to an original equipment manufacturer, another distributor or a retail customer, and the engine manufacturer may not be aware of the ultimate user or equipment application.

Accordingly, the staff proposes that the regulations be revised to reflect actual industry market arrangements and to clarify that the responsibility for compliance lies with the manufacturer that adds on components that conceal the original engine labels, as well as with the engine manufacturer. Staff proposes that, in the first instance, the engine manufacturer has the responsibility to attach the engine label upon the

engine block or crankcase. However, if the engine label is subsequently obscured by ancillary engine components, the manufacturer responsible for the ancillary components attachment shall attach the engine label upon an engine component that is not easily removed and is not expected to be replaced within the equipment's useful life.

(2) Engine Label Content -- Engine Family Name

The current utility regulations do not require inclusion of the engine family name on the engine label. However, an engine family name is an important aid in the engine certification and compliance activities. The staff proposes that the engine label content provisions be amended to include the engine family name.

(3) Engine Label Content -- Names and Trademarks

The current regulations require that the corporate name and trademark of the engine manufacturer appear on the engine label. However, practice has been that equipment manufacturers and retail distributors often portray themselves to the retail buyers as the manufacturer of the entire product (i.e., engine and equipment) even when the engine has been procured from another manufacturer. This is accomplished by marketing the equipment with only the markings (i.e., identification) of an equipment manufacturer on the equipment that is offered for retail sale. In such instances, there is not any indication of the engine manufacturer's identity.

The current requirement that the engine manufacturer's name and trademark appear on the engine label does not allow equipment manufacturers to portray themselves as the "sole" manufacturer. Industry has requested that the ARB modify this requirement because it impacts the existing marketing arrangements.

Accordingly, the staff proposes that the emission label regulations be modified to permit an engine manufacturer to display the name and trademark of an equipment manufacturer, or retail distributor, in addition to, or in place of, the engine manufacturer's name and trademark on the engine label that is required to be attached before an engine is shipped from the engine manufacturer's production facility. This allowance is acceptable because the identity of the engine manufacturer is coded within the engine family name and the engine family name is required to be displayed on the engine label (See Engine Label Content -- Engine Family Name discussion above). The engine manufacturer must provide samples of all engine labels (including those of an original equipment manufacturer or retail distributor) to the Executive Officer in the engine family's certification application.

(4) Supplemental Engine Label Content -- Names and Trademarks

As was discussed previously with respect to the name and trademarks that are allowed to appear upon the engine label, staff proposes to revise the current regulations to specifically allow the original equipment manufacturer's name and trademark to be displayed on the supplemental engine

label instead of those of the engine manufacturer. Therefore, either an original equipment manufacturer's or an engine manufacturer's name and trademark would be displayed upon a supplemental engine label. The engine manufacturer can always be identified via the engine family name. Engine manufacturers must provide the Executive Officer with an indication of original equipment manufacturer models that utilize a particular engine family.

(5) Supplemental Engine Label -- Specifications

The current regulations do not state that the supplemental engine label is required to satisfy the same specification requirements (i.e., durability, content, etc.) as the engine label even though that was the intent of the regulations. Accordingly, the staff proposes that the regulations specify that supplemental engine labels satisfy all of the engine label specifications.

(6) Engine Label -- Engine Build Date

The current engine label content provisions require that the month and year of engine manufacture (build date) appear on the engine label, or that the build date be stamped elsewhere on the engine if sufficient space is not available on the engine label. At the time of adoption of the present regulations, it was intended that the engine build date also appear on a supplemental engine label whenever such a label is necessary and that the build date be readily visible whenever attached. The responsibility for the engine build date to appear (and be readily visible) on the supplemental engine label (or stamped elsewhere on the engine or equipment) should be assigned to the original equipment manufacturer that is responsible for the supplemental engine label. Therefore, staff proposes that the label regulations be revised accordingly. As an option, staff proposes that the engine manufacturer may chose to encode the build date in some manner (e.g., within the engine's serial number, etc.) so that it would always be readily visible regardless of installation within the original equipment. If this option is elected, the engine manufacturer would be required to provide an explanation of the build date code to the Executive Officer.

(7) Fuel Label Content

The current regulations require that if an engine has an emission control device that the Executive Officer has determined would be significantly impaired by the use of leaded gasoline, the engine manufacturer shall attach a label that specifies the proper fuel(s) for engine operation. The intent of the regulation is to notify the ultimate purchaser of the proper fuel(s) required for proper engine operation and to avoid imparing the emission control system. Such notification helps assure that production engines are, and remain, truly representative of the certification engines.

Staff proposes that the fuel label provisions be clarified to protect further the emission control system from misfueling. Additionally, staff proposes that the fuel label content requirements for gasoline-fueled

engines delete the requirement to specify "unleaded gasoline only", since the only gasolines that are available commercially in California are unleaded. Such labels would need to specify "GASOLINE ONLY". Fuel labels for other types of fuels would indicate the proper operating fuels, for example, a diesel-fueled engine's label will indicate "DIESEL ONLY", a propane-fueled engine' label will indicate "PROPANE ONLY", etc.

(8) Fuel Label -- Location

The current regulations require an engine manufacturer to attach a fuel label at an engine's fuel tank filler inlet, or when an engine is manufactured separately from the equipment, to attach a readily visible fuel label to the engine. Engines are manufactured separately from the equipment in the cases when either an engine manufacturer sells an engine (i.e., complete or incomplete engine assembly) directly to an original equipment manufacturer, or when an engine manufacturer sells an engine (i.e., complete or incomplete engine assembly) to a third-party distributor, and the engine assembly is subsequently sold to an original equipment manufacturer, another distributor or a retail customer. An incomplete engine assembly may or may not have a fuel tank. The current regulations, which require that the fuel label be readily visible on the engine, do not properly consider the fact that the engine manufacturer may not know how the engine assembly will be installed into a piece of equipment.

The staff proposes that the regulations be amended to clarify the responsibilities of the engine and equipment manufacturers with respect to fuel labels in the situation when the engine is manufactured separately from the equipment. In the situation when an engine is manufactured separately from the equipment and the engine assembly includes a fuel tank, the engine manufacturer would be responsible for the attachment of a readily visible fuel label. In the situation when an engine is manufactured separately from the equipment and the engine assembly does not include a fuel tank, the engine manufacturer is responsible for the attachment of a readily visible fuel label on the engine (i.e., existing requirement) and the equipment manufacturer shall be responsible for the attachment of a readily visible fuel label at the fuel tank filler inlet. Also in this situation, the engine manufacturer would be required to inform the original equipment manufacturer, or a third-party distributor, that purchases the engine about the fuel label requirements. Accordingly, an engine manufacturer would be required to include a statement in the certification application describing how it will comply with this requirement.

(9) Fuel Label -- Specifications

The current engine label regulations require that particular specifications be included in the label (e,g., durability, visibility, etc.)[15]. Although it was intended that the fuel label also satisfy these same label requirements, the regulations do not expressly state this

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15. Ref.: Title 13, CCR, Section 2404(e), (f), (g), (h) and (i).

intention. Therefore, staff proposes that a requirement that the fuel labels satisfy the same durability, visibility, etc. requirements as the engine label be included in the regulations.

(10) Emission Control Label Regulations -- Engine Identification System

The current emission control system label regulations require an engine manufacturer to submit information about an engine identification coding system[16]. An engine identification coding system is used to verify implementation of production engine changes that are required for already certified engines. This provision has no applicability to the emission control system label, and furthermore, a requirement is already included within the Test Procedures as part of certification. Therefore, staff proposes that this provision be deleted from Title 13, CCR, Sections 2404.

E. Utility Engine Regulations -- Defects Warranty and Emission Control Warranty Statement

Section 2405, Title 13, CCR, currently delineates the defects warranty coverage of emission-related utility engine components. Section 2406, Title 13, CCR, outlines the defects warranty statement that is provided to each retail engine or equipment purchaser. In conjunction with the certification of an engine family, the party that is certifying the engine family is required to obtain ARB approval of the proposed warranty statement.

Currently, engine labels are required to display the corporate name and trademark of the manufacturer that certifies an engine family. In consideration of existing marketing arrangements, staff has proposed that engine labels be allowed to display corporate names and trademarks of original equipment manufacturers instead of the names and trademarks of the engine manufacturers. (See Discussion Item (D)(3) Engine Label Content -- Names and Trademarks above). This allowance does not relieve engine manufacturers of the responsibility for compliance with emission regulations, including the defects warranty requirements.

Accordingly, staff proposes minor changes to the warranty language in Sections 2405 and 2406, Title 13, CCR, in order to emphasize clearly that the responsibility of warranty compliance remains with the engine manufacturer.

F. Assembly-Line Quality-Audit Regulations

(1) Assembly-Line Test Result Evaluations

In Section 2407(b)(7)(F) of the present regulation, engine manufacturers are required to evaluate the quarterly quality-audit test

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16. Ref.: Ibid., Section 2404(j).

emission data in order to determine engine family emission compliance[17]. However, the regulations do not address the situation when a low volume of quarterly engine production results in an insufficient sample size (i.e., less than ten engines), which raises questions of the validity of the test results. Therefore, staff proposes that the regulations be revised to address the situation when fewer than ten engines have been tested. Under the proposal engine manufacturers would include past quarter production results until data from ten engines are included.

(2) Assembly-Line Quality-Audit Test Compliance Determinations

The initial staff report indicated that quality-audit compliance is determined on the basis of a comparison between the average of production engine emission levels and the emission standards. However, the regulations do not provide procedures or methodology to determine compliance. Accordingly, staff proposes that a method for compliance be incorporated into the regulations. Specifically, the staff proposes that an engine family would be considered noncompliant when the average of any pollutant (rounded off to the same number of significant digits as the standard) exceeds the applicable calendar-year exhaust emission standard.

(3) Assembly-Line Quality-Audit Tests -- Engine Speed and Power

The current assembly-line quality-audit regulations require that each engine be tested in accordance with the same procedures utilized for certification[18] (i.e., the Test Procedures). This requires a modal power measurement of each engine that is quality-audit tested.

A determination of a certification test engine's power output is required because the emission standards are specific to power output (i.e., horsepower). This determination requires measurements of the test engine's power output at various loads. Each non-handheld equipment test engine would have six power measurements (i.e., six separate test modes); each handheld equipment engine would have two power measurements (i.e., two separate test modes). Such measurement requirements are not burdensome because they are expected to be conducted for only a few certification test engines.

Some equipment is designed and built to eliminate redundancy of structures or systems that are common for both the engine and the equipment. For example, in order to operate, an engine may require an air cooling system as well as structures that direct the cooling air flow around the engine. Such air flow structures could be formed from the equipment housing. A more efficient product results when a singular component or

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17. Ref.: Ibid., Section 2407(b)(7)(F).

18. Ref.: Ibid., Section 2407(b)(2).

system can be designed to perform two or more functions (functionally integrated). Many types of handheld equipment engines are functionally integrated with the equipment (e.g., the fan of a leaf blower produces both the "blower" air flow and the "engine cooling" air flow). However, these types of equipment engines are difficult to emission test because the engine and equipment must be separated to gain access to the engine's crankshaft to measure the power, and this disassembly renders the engine inoperable. The current regulations recognize this difficulty only with respect to integrated generators (i.e., gen sets), and allow the engine manufacturers of these equipment engines to propose an alternative test procedure in order to obtain power measurements.

The cost burden to perform this modal power measurement on handheld equipment for quality-audit tests can be significantly higher than for certification tests because the quantity of engines required to be tested is higher (i.e., one or two for certification tests vs. one percent of production for quality-audit tests).

Consequently, handheld equipment engine manufacturers have requested that the ARB revise the regulations to allow the use of certification test power values of handheld equipment engines as "nominal" power values for the quality-audit tests. Handheld equipment engine manufacturers have argued that this nominal power usage is valid because the handheld equipment engine test procedure requires operation at only two modes: idle and full load at rated engine speed. The use of a nominal power value for quality-audit tests would eliminate the need for an engine dynamometer in the tests for power measurements. Therefore, any power absorption device (e.g., load cell, water brake, etc.) could be used to load the engine in the quality-audit tests.

Accordingly, staff proposes that amendments be incorporated that address differences in the exhaust emission tests with respect to the certification and quality-audit procedures of handheld equipment engines. Specifically, the revision should allow the values of engine power and speed determined in the engine family certification to be used in lieu of the determination of the engine power and speed of a quality-audit production engine. Such a request should include a specification of the particular power absorption device (e.g., dynamometer, water brake, etc.) used to apply the test load to the production engines. The engine manufacturer should establish an equivalent assurance of compliance by a comparison of emission data produced from a statistically valid quantity of engines that uses both the proposed method and the required procedures.

(4) Quality-Audit Tests -- Sample Rate

The current regulations do not address the situation when the quantity of an engine manufacturer's estimated quarterly engine production is 5,000 or less[19]. The regulations specify the sample rate only when the

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19. Ref.: Ibid., Section 2407(b)(7)(I).

engine manufacturer's estimated quarterly engine production is greater than 5,000 units, and the statistical evaluation required by the procedures is satisfied. Staff proposes that the sample rate criteria be revised to reflect that the sample rate for the next month of production should be five (5) engines per month when the engine manufacturer's estimated quantity of quarterly engine family production is equal to or less than 5,000.

G. Compliance Regulations

New engine compliance procedures are applicable to utility engines produced on or after January 1, 1995. These procedures are executed upon ARB's option and provide additional assurance that engines distributed and marketed in California are in compliance with the emission regulations. These procedures allow the ARB to perform emission tests and/or inspections of engines and the facilities where the engines are developed, tested and assembled. These procedures may be conducted on completed engines that are selected randomly at any point in the engine or equipment manufacturer's product distribution process (e.g., at a retail dealer's store, etc.).

The current new engine compliance procedures were adapted from existing on-road new motor vehicle compliance procedures. However, some portions of the current procedures were not changed sufficiently to address the situation involving emission testing of engine that are equipped with adjustable engine parameters. The current compliance test regulations require that all tests be conducted in accordance with the applicable calendar year certification emission test procedures[20]. However, this requirement does not address the practical differences that exist between certification and compliance test methods. For example, the certification testing requires testing at the allowable extremes of adjustment. Compliance (and quality-audit) tests should be allowed to be conducted at any position that is within the range of the allowable endpoints of the adjustment (i.e., not at only the endpoints) because this is more realistic to actual usage. This approach is consistent with on-road motor vehicle compliance tests. Therefore, staff proposes that any adjustable engine parameters can be set to positions that are within the range available to the end-use operators (e.g., an engine carburetor with an adjustable idle fuel mixture may be compliance and quality-audit tested at any mixture position that is within the range of adjustment available to the end-use operator).

H. Manufacturer Penalties

(1) Emissions Noncompliance Responsibilities - Extent of Liability

Under the present regulations, the engine manufacturer has the responsibility of certifying all engines produced after January 1, 1995 for the California market. In conjunction with the engine family certification, an engine manufacturer is responsible for assessing all expected engine

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20. Ref.: Ibid., Section 2407(a)(4).

configurations (e.g., air filter, muffler, calibration, etc.). It is also responsible for identifying and emission testing the engine assembly with the greatest probability to exceed the emission standards. Equipment manufacturers are not required to certify their equipment (i.e., engine) if the equipment utilizes an engine that was certified by the engine manufacturer.

Under the current regulations engine manufacturers are also responsible for new engine emission compliance testing, and being in compliance with the applicable emission standards related to such tests. Accordingly, the engine manufacturer would clearly be subject to being enjoined from selling noncompliant engines when discovered. However, the compliance responsibility is currently unclear when an engine manufacturer has not completed the final engine assembly (i.e., an engine manufacturer has sold an incomplete engine assembly to an original equipment manufacturer, and the original equipment manufacturer completes the assembly of the engine), or when an incomplete engine assembly is sold to a third-party distributor and then sold to a retail buyer that completes the engine assembly. Engines assembled by an original equipment manufacturer, or a third-party distributor, are required to satisfy the same emission regulations as the engine manufacturer's certification engine. Accordingly, it is necessary that the responsibility for compliance be shared. First, the engine manufacturer has the responsibility and duty to advise and make the original equipment manufacturer and third parties aware of individual component specifications (e.g., allowable muffler or air cleaner restrictions, etc.). Once satisfied, the original equipment manufacturers and third parties have the responsibility to properly meet the specifications as set for the engine by the engine manufacturer.

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. The staff proposes that the regulations be amended to clarify that the engine manufacturer shall be subject to having its entire noncompliant engine family enjoined from further sales in California if noncompliance is the fault of the engine manufacturer not properly notifying and advising original equipment manufacturers and third-party distributors of their responsibilities. A third-party distributor would have the responsibility of conveying the information regarding individual component specifications to subsequent purchasers of the engines. The third-party distributor, or equipment manufacturer, would be subject to having their applicable equipment product line enjoined if the cause for noncompliance is found to be the failure to meet either the requirements of notice or assembling the engine to proper specifications.

(2) Emission Label Noncompliance Responsibilities - Extent of Liability

The current emission label regulations assign responsibility for the attachment of a supplemental engine label to the equipment

manufacturer[21]. The equipment manufacturer must also ensure that such a supplemental engine label is readily visible to the average person. These supplemental engine label requirements are reasonable because the original equipment manufacturer is the party responsible for assembling the engine in the equipment and is the party with knowledge of whether the original engine label is obscured by the equipment.

Currently, the regulations do not specifically subject an equipment manufacturer to penalties for noncompliance with the supplemental engine label requirement. Accordingly, staff proposes that the regulations be amended to clarify the penalties for noncompliance with the supplemental engine label requirements (i.e., being enjoined from further sales and distribution in California of the affected original equipment manufacturer's equipment products).

V. REGULATORY ALTERNATIVES

The objective of these proposed amendments is to correct current regulatory deficiencies and enhance the efficiencies of the engine family certification, quality-audit and compliance activities conducted by industry and the ARB. The majority of the proposed amendments are a result of continuous dialogue and cooperation between industry and the ARB. Many of the proposed amendments have been implemented on a case-by-case basis during the certification process. Industry and the ARB agree that the modifications are beneficial because they have general applicability. Over the past several months, industry has received draft copies of these regulatory clarifications and has commented upon them. The ARB has considered industry's comments and has revised its proposal where warranted. Industry has not, to date, submitted any alternatives to the proposed amendments. Staff believes that there are not any viable regulatory alternatives to the proposed amendments.

VI. AIR QUALITY, ENVIRONMENTAL AND ECONOMIC IMPACTS

A. Air Quality and Environmental Impacts

The proposed amendments are intended to clarify and enhance the processes through which utility engines are certified, assembly-line quality-audit and compliance tested. The proposals do not change the emission standards, or relieve engine manufacturers of the other requirements associated with engine family certification. Consequently, the air quality and environmental impacts of the proposed action should be unchanged from previous assessments.

B. Cost, Cost-Effectiveness and Economic Impacts

The proposed amendments include clarifications and modifications that should result in an overall improvement in the efficiency of the

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21. Ref.: Ibid., Section 2404(c)(1).

certification and compliance processes. Thus, the industry and ARB costs associated with these processes should be reduced accordingly. Consequently, staff believes that the economic impact of this proposed action will be positive.

C. IMPACT ON THE ECONOMY OF THE STATE

The staff believes that the proposed amendments should not adversely affect the economy of the State. As stated above, the proposed amendments are expected to provide an economic benefit for both industry and the ARB. Therefore, the impact on the State's economy should be positive.

VII. REFERENCES

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