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California
Environmental
Protection
Agency

Air Resources Board

HAAGEN-SMIT
LABORATORY
P.O. Box 8001
9528 Telstar Avenue
El Monte, CA
91734-8001

Pete Wilson
Governor

James M. Strock
Secretary for Environmental Protection

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MAC No. 96-06

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

SUBJECT: Modified Test Procedures for Integrated Generator Sets (Gensets)

The utility and lawn and garden equipment engine (ULGE) regulations and incorporated test procedures were adopted by the Air Resources Board (ARB) on March 20, 1992. However, portions of the test procedures did not account for the unique characteristics of certain equipment, specifically gensets. Gensets cannot be separated from the engine for testing purposes. Additionally, gensets are not designed to idle or operate at 85 percent of rated speed as does most lawn and garden equipment. Hence, the test procedures did not allow satisfactory testing of such equipment engines. Pursuant to Section 20(d) of the ULGE test procedures, the ARB approved per letter C-93-319, dated April 19, 1993, an alternative test procedure submitted by the Engine Manufacturers Association (EMA) that permitted manufacturers to test genset engines at rated speed and delete the idle mode from the test cycle. The weighting factor for the idle mode was proportionately redistributed over the remaining five test modes. All other aspects of the previous test procedures were maintained. The 1993-approved alternative test procedure for genset engines was as follows: (load factor/weighting factor) Mode 3: full/9 percent, Mode 4: 75 percent/21 percent, Mode 5: 50 percent/31 percent, Mode 6: 25 percent/32 percent, Mode 7: minimum/7 percent.

On May 26, 1995, the ULGE regulations and test procedures were amended for clarification and uniformity with federal provisions. The amended test procedures, as detailed in ARB Mail-out 95-29, provide an additional test cycle for rated-speed applications. Except for engine speed (rated speed compared to 85 percent of rated speed), the rated-speed test cycle is the same in terms of load factors and weighting factors as the 85-percent rated-speed test cycle, and both test cycles include an idle mode. However, the "minimum load" mode in both test cycles was amended to specify a 10 percent load instead. Additionally, the Raw Gas Method and Constant Volume Sampling test procedures were amended among other things to specify that a pre- and post-test procedure be performed (as applicable).

The amendments, however, did not address the specific requirements for the testing of gensets. Thus, EMA has again requested that ARB modify its prior approval of the alternative test procedure for gensets.

In this regard, ARB will allow manufacturers of ULGE gensets to use the following modified alternative test procedure for emission testing.

MODIFIED OPERATING MODES AND WEIGHTING FACTORS FOR GENSET ENGINES

MODE POINTS	1	2	3	4	5
SPEED	RATED	RATED	RATED	RATED	RATED
LOAD PERCENT	100	75	50	25	10
WEIGHTING [%]	9	21	31	32	7

Because of the 1995 amendments to the test procedures, specifically the addition of the test cycle for rated-speed applications, ARB will not accept new emission testing of genset engines using the 1993-approved alternative test procedure. It will, however, accept carryover of existing emission data generated using the 1993-approved alternative test procedure if the manufacturer makes a satisfactory showing that the certified engines comply with the emission standards under the new procedure. For example, an analysis of the changes in the total emissions (numerator) and the engine power (denominator) due to a change in the new Test Mode 5 (compared to the previous Test Mode 7) may be made to show that the certified engine will comply with the emission standards under the new procedure. Manufacturers may continue to use generator output and efficiency to determine the engine power output for purposes of determining the brake horsepower-hour emissions.

If you have further questions, please telephone Mr. Duc Nguyen, Manager, Certification Section, or Mr. Dean Hermano, Staff Engineer, at (818) 450-6103.

Sincerely,

R. B. Summerfield
Assistant Division Chief
Mobile Source Division