



SURFACE VEHICLE STANDARD	J994	SEP2014
	Issued	1967-07
	Reaffirmed	2014-09
Superseding J994 MAR2009		
Alarm—Backup—Electric Laboratory Performance Testing		

RATIONALE

J994 has been reaffirmed to comply with the SAE five-year review policy.

FOREWORD

This document has been modified to include additional system voltages and reduce the upper limit of the acceptable frequency range. Additional modifications have been made to clarify ambiguous sections of the Standard. Rationale for the modifications is included at the end of this document.

1. SCOPE

The scope of this SAE Standard is the definition of the functional, environmental, and life cycle test requirements for electrically operated backup alarm devices primarily intended for use on off-road, self-propelled work machines as defined by SAE J1116 (limited to categories of (1) construction, and (2) general purpose industrial).

1.1 Purpose

The purpose of this document is to define a set of performance requirements for backup alarms, independent of machine usage. The laboratory tests defined in this document are intended to provide a uniform and repeatable means of verifying that a test alarm meets the stated requirements. For on machine requirements and test procedures, refer to SAE J1446.

2. REFERENCES

2.1 Applicable Publications

The following publications form a part of the specification to the extent specified herein. Unless otherwise indicated, the latest revision of SAE publications shall apply.

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2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

- SAE J184 Qualifying a Sound Data Acquisition System
- SAE J1116 Categories of Off-Road Self-Propelled Work Machines
- SAE J1446 On-Machine Alarm Test and Evaluation Procedure for Construction and General Purpose Industrial Machinery

2.1.2 ANSI Publications

Available from ANSI, 25 West 43rd Street, New York, NY 10036-8002, Tel: 212-642-4900, www.ansi.org.

- ANSI S1.4 Specification for Sound Level Meters
- ANSI S1.40 Specification for Acoustical Calibrators

2.1.3 ASTM Publication

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

- ASTM B 117 Method of Salt Spray (Fog) Testing

2.1.4 Mil Specification

Available from Defense Printing Service, Detachment Office, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.

- MIL-STD-810B Environmental Test Methods 510 and 514.1

2.2 Related Publications

The following publications are provided for information purposes only and are not a required part of this document.

2.2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

- SAE J1105 Horn—Forward Warning—Electric—Performance, Test and Application
- SAE J1211 Recommended Environmental Practices for Electronic Equipment Design
- SAE J1455 Recommended Environmental Practices for Electronic Equipment Design in Heavy-Duty Vehicle Applications
- SAE J1849 Emergency Vehicle Sirens

2.2.2 ANSI Publications

Available from ANSI, 25 West 43rd Street, New York, NY 10036-8002, Tel: 212-642-4900, www.ansi.org.

ANSI S1.1 Acoustical Terminology

ANSI S1.13 Methods for the Measurement of Sound Pressure Level

3. DEFINITIONS

3.1 Free Field

A free field, for the purposes of this document, is defined as a space with no reflecting surface within 15 m of the sound source in any direction.

3.2 Horizontal Reflecting Plane

A horizontal reflecting plane is defined as flat ground with a surface no rougher than an asphalt road. A paved parking lot with no reflecting surfaces within 15 m would be an acceptable horizontal reflecting plane for the tests outlined in this document.

3.3 Zero Degree Axis

A line known as the “zero degree axis” is defined to correspond to the centerline of the sound producer, perpendicular to and extending outward from the output face of the alarm.

3.4 Sample Alarm

A sample alarm shall consist of an alarm randomly drawn from the production population.

3.5 Predominant Sound Frequency

The predominant sound frequency of the alarm shall be defined as the frequency that produces the highest A-weighted sound pressure level. This frequency may or may not correspond to the fundamental frequency produced by the alarm.

3.6 Test Voltages

The nominal, extreme low and extreme high system test voltages are defined for each system voltage in Table 1. All voltages are ± 0.2 V, measured at the input terminals of the alarm when the alarm is operating.

3.6.1 Test Voltage Table

NOTE: On multi-voltage alarms, use the extreme low system voltage from the lowest system voltage included in the multi-voltage range, and the extreme high system voltage from the highest included voltage range, and all included nominal voltages, unless otherwise specified.