



SURFACE VEHICLE RECOMMENDED PRACTICE

J1174

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Superseding J1174 MAR1985

Operator Ear Sound Level Measurement Procedure for Small Engine Powered Equipment

RATIONALE

This document was revised to allow the use of sound level meters and data acquisition systems conforming to current ANSI and SAE Standards. The updated standard includes the option for testing on an artificial surface or natural turf.

1. SCOPE

This SAE Recommended Practice establishes the instrumentation and procedure to be used in measuring the operator ear sound level for engine powered equipment under 30 kW (40 bhp). The sound levels obtained by using this procedure are representative of the sound levels generated by the equipment under typical operating conditions. It is intended to include equipment such as lawn mowers, snow blowers, and tillers. It is not intended to include equipment designed primarily for operation on highways or within factories or buildings, or vehicles such as motorcycles, snowmobiles, and pleasure motorboats that are covered by other SAE Standards or Recommended Practices.

This procedure does not cover handheld equipment such as chainsaws, leaf blowers, and trimmers.

This SAE Recommended Practice may also be used when measuring the operator ear sound level of similar equipment powered by electricity or other power sources.

2. REFERENCES

2.1 Applicable Documents

The following commonly referenced publications form a part of this document as listed below.

The latest issue of SAE publications shall apply.

The applicable issue of other publications shall be the issue in effect on the date of the purchase order.

In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence.

Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

2.1.1 SAE Publication

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.

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Documents

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SAE J184 Qualifying a Sound Data Acquisition System

2.1.2 ANSI Publication

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

ANSI/ASA S1.4 American National Standard Electroacoustics - Sound Level Meters

ANSI/ASA S1.40 American National Standard Specifications and Verification Procedures for Sound Calibrators

ANSI/ASA S1.1 Acoustical Terminology

ANSI/ASA S1.13 Measurement of Sound Pressure Levels in Air

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 C423-09a Method of Test for Sound Absorption of Acoustical Materials in Reverberation Rooms

2.1.4 ISO Publication

Available from International Organization for Standardization, ISO Central Secretariat, 1, ch. de la Voie-Creuse, CP 56, CH-1211 Geneva 20, Switzerland, Tel: +41 22 749 01 11, www.iso.org.

ISO 3744 Acoustics - Determination of sound power levels and sound energy levels of noise sources using sound pressure -- Engineering methods for an essentially free field over a reflecting plane

ISO 11094 Acoustics - Test code for the measurement of airborne noise emitted by power lawn mowers, lawn tractors, lawn and garden tractors, professional mowers, and lawn and garden tractors with mowing attachments

ISO 3411 Earth-moving machinery - Physical dimensions of operators and minimum operator space envelope

2.1.5 IEC Publication

Available from IEC Central Office, 3, rue de Varembe, P.O. Box 131, CH-1211 Geneva 20, Switzerland, Tel: +41 22 919 02 11, www.iec.ch.

IEC 60942 Electroacoustics - Sound calibrators

3. INSTRUMENTATION

The following instrumentation shall be used for the measurement required.

3.1 A sound level meter meeting the Type 1 or Type S1A requirements of ANSI/ASA S1.4

3.1.1 As an alternative to making direct measurements using a sound level meter, a microphone or sound level meter may be used with a recorder or other indicating instrument, provided the system meets the requirements of SAE J184.

3.2 A sound level calibrator with an accuracy of ± 0.5 dB conforming to IEC 60942 Class 1 and/or ANSI S1.40.

3.3 If a microphone windscreen is used, it shall not affect the overall reading by more than ± 0.5 dB(A) for the sound source that is being measured (see 5.4).

3.4 An anemometer with steady-state accuracy of $\pm 10\%$ at 9 m/s (20 mph).

3.5 An engine speed indicator (accuracy $\pm 1\%$ of full range).