

	SURFACE VEHICLE RECOMMENDED PRACTICE		J1175 MAY2012
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Bystander Sound Level Measurement Procedure for Small Engine Powered Equipment			

RATIONALE

This pass-by noise procedure was developed in the 1970's. It has never been widely accepted. With the development of stationary sound power procedures used in EU countries there is no longer a need for this document.

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Foreword—This Reaffirmed Document has been changed only to reflect the new SAE Technical Standards Board Format.

1. **Scope**—This SAE Recommended Practice establishes the instrumentation and procedure to be used in measuring the bystander sound level of engine powered equipment under 15 kW (20 bhp) typical of their normal operation. 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 and 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 chain saws.

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

2. References

- 2.1 **Applicable Publications**—The following publications form a part of the specification to the extent specified herein.

- 2.1.1 ANSI PUBLICATIONS—Available from ANSI, 11 West 42nd Street, New York, NY 10036-8002.

ANSI S1.1-1960—Acoustical Terminology

ANSI S1.4-1971—Specification for Sound Level Meters

ANSI S1.13-1971—Methods of Measurement of Sound Pressure Levels

- 2.1.2 ASTM PUBLICATION—Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM C423-66—Method of Test for Sound Absorption of Acoustical Materials in Reverberation Rooms

3. **Instrumentation**—The following instrumentation shall be used for the measurement required:

- 3.1 A precision sound level meter which meets the Type 1 requirements of American National Standard, Specification for Sound Level Meters, S1.4-1971.

- 3.2 A sound level calibrator (see paragraph 5.2.3).
- 3.3 The microphone shall be used with a foam windscreen. The windscreen shall not affect the overall reading by more than ± 0.5 dB(A) for the sound source that is being measured (see paragraph 5.3).
- 3.4 An anemometer or other device for measurement of ambient wind speed.
- 3.5 An engine speed indicator (accuracy $\pm 1\%$ of full range).
- 3.6 A thermometer for measurement of ambient temperature.

4. Procedure

- 4.1 **Test Site**—The test area shall consist of a flat open space free from the effects of any large reflecting surfaces such as signboards, buildings, or hillsides located for at least 30 m (98.4 ft) from the measurement zone (see Figure 1).

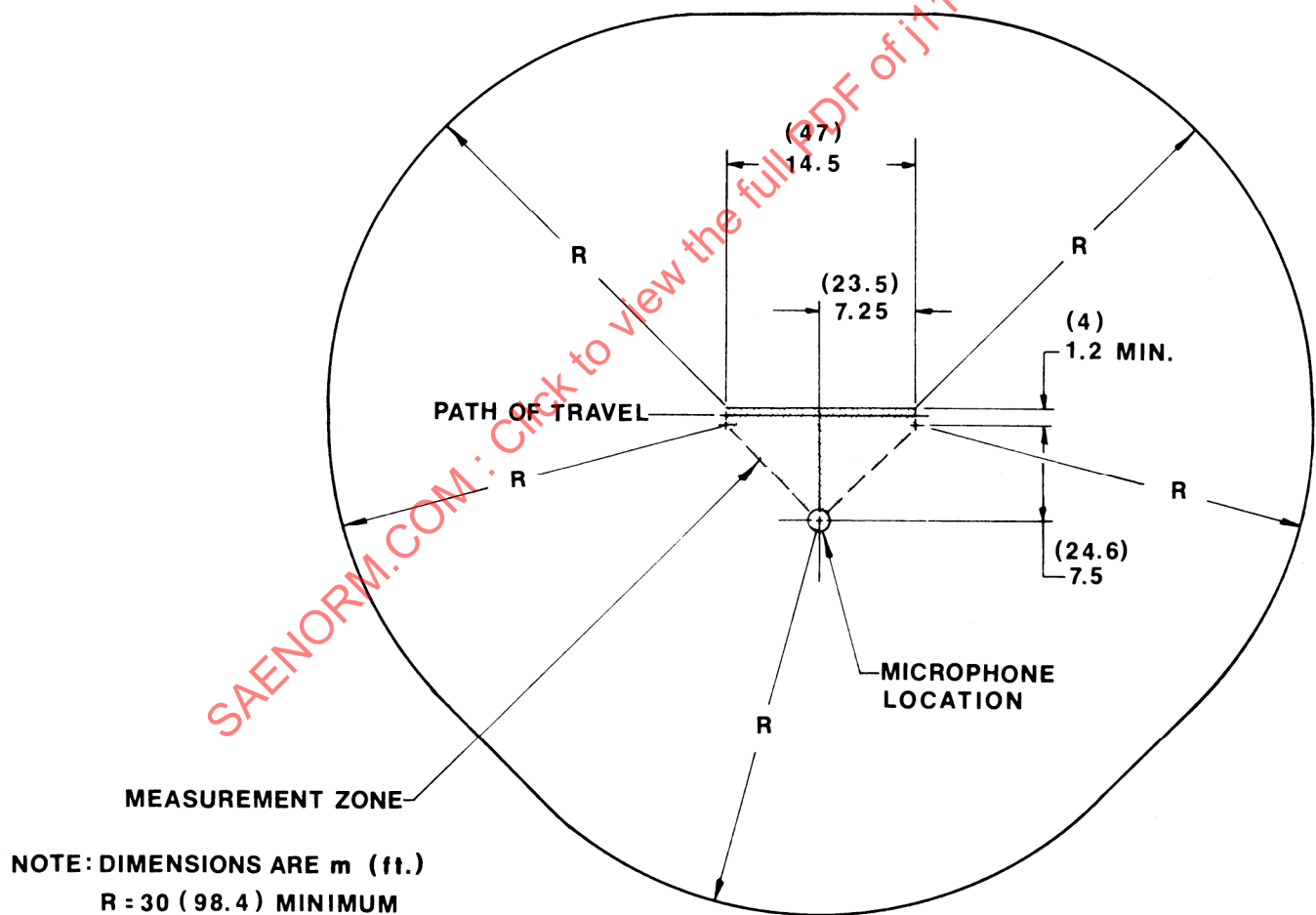


FIGURE 1—TEST SITE

- 4.1.1 The minimum dimensions of the measurement zone are defined as a path of travel 1.2 m (4 ft) wide by 14.5 m (47 ft) long plus an adjacent triangular area having a base along the edge of the path of travel and the apex 7.5 m (24.6 ft) from the midpoint of the base.
- 4.1.2 The entire surface of the measurement zone shall be synthetic surface mounted to 19 mm ($\frac{3}{4}$ in) exterior plywood or 13 mm ($\frac{1}{2}$ in) marine plywood with a suitable adhesive.

Acoustical properties tested per ASTM C423-66 after mounting on plywood shall be:

TABLE 1

Hz	Sound Absorption Coefficients
125	0.00–0.06
250	0.07–0.12
500	0.15–0.28
1000	0.28–0.34
2000	0.38–0.47
4000	0.40–0.62

- 4.1.3 The observer reading the sound level meter shall be at least 2 m (6.6 ft) directly behind the microphone. One other person may be directly behind the observer reading the meter. All others, except the operator of the equipment being tested, shall be at least 15 m (50 ft) from the equipment path or instrumentation.
- 4.1.4 The A-weighted sound level (including wind effects), due to sources other than the equipment being measured, shall be at least 10 dB lower than the level of the equipment being measured.

4.2 Equipment Operation

- 4.2.1 All equipment shall be tested in either a traveling or stationary mode as specified in paragraphs 4.2.2–4.2.6. Tests in the traveling mode shall be made with the equipment operated along the path of travel at the closest operating speed to 5 km/h (3 mph). Tests in the stationary mode shall be made with the equipment directly in front of the microphone at the center of the path of travel. The engine(s) or motor(s) shall be set at the equipment manufacturer's maximum specified rpm. Then all mechanisms necessary for the equipment to perform its intended function shall be engaged.
- 4.2.2 **MOWING EQUIPMENT**—Test in a traveling mode. The cutting height of the blade shall be set at the closest available position to 50 mm (2 in).
- 4.2.3 **WALK-BEHIND TILLERS**—Test in a stationary mode those units that are intended to be propelled by the tines. Units propelled by other means shall be tested in the traveling mode.
- 4.2.4 **WALK-BEHIND SNOW BLOWERS**—Test in a traveling mode.
- 4.2.5 **GARDEN TRACTORS WITH ATTACHMENTS OTHER THAN MOWERS**—Test in the traveling mode except those units with attachments that are intended for stationary use. These shall be tested in the stationary mode as stationary equipment.
- 4.2.6 **MISCELLANEOUS EQUIPMENT**—Test either in a traveling or stationary mode according to its intended use.