SAE International™

SURFACE VEHICLE RECOMMENDED PRACTICE

SAE J1970

REV. SEP2003

Issued 1991-12
Revised 2003-09

Superseding J1970 DEC1991

Shoreline Sound Level Measurement Procedure for Recreational Motorboats

1. ***Scope***—This SAE Recommended Practice establishes the procedure for measuring the sound level of recreational motorboats at a position on the shore under conditions other than stationary mode operation. It is intended as a guide toward standard practice and is subject to change to keep pace with experience and technical advances.

1.1 Purpose—This document specifies guidelines for sound level measurements made from the shoreline of recreational boating areas and is intended for recreational motorboats only.

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.

2.1.1 ASA PUBLICATIONS—Available from Acoustical Society of America, http://asa.aip.org, or from ANSI, 25 West 43rd Street, New York, NY 10036-8002, http://www.ansi.org.

ANSI S1.4—Specification for Sound Level Meters

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, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J34—Exterior Sound Level Measurement Procedure for Pleasure Motorboats
SAE J2005—Stationary Sound Level Measurement Procedure for Recreational Motorboats

2.2.2 ASA PUBLICATIONS—Available from Acoustical Society of America, http://asa.aip.org, or from ANSI, 25 West 43rd Street, New York, NY 10036-8002, http://www.ansi.org.

ANSI S1.1—Acoustical Terminology
ANSI S1.13—Measurement of Sound Pressure Levels in Air

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

3.1 A sound level meter which meets ANSI Standard S1.4 Type 1 or Type 2 specification for Sound Level Meters.

3.2 A microphone windscreen that does not affect the overall reading by more than ± 0.5 dB(A).

3.3 A sound level calibrator.

4. Procedure

4.1 Measurement Site—A suitable site is the shore of a body of water or dock projecting out from the shore into the body of water, or a raft or a boat moored to a dock or anchored so that the sound level meter or microphone is not more than 6 m (20 ft) from shore. If the measurement is made from a dock, care should be taken to minimize the effect of sound waves reflected from the dock. The area around the microphone and boat being measured shall be free of large obstructions or reflective surfaces, such as buildings, high embankments, sea walls, hills, large piers, or large tree trunks >0.3 m (1 ft) in diameter breakwaters, etc., for a minimum distance of 3 m (10 ft).

4.2 Boat Operation

4.2.1 The applicable reading does not require that the boat be at any specific distance from the shoreline or microphone.

4.2.2 This measurement procedure shall not be used during the 30 s time period following engine start-up and/or preceding engine shutdown.

4.3 Measurements

4.3.1 The microphone shall be placed 1.2 to 1.5 m (4 to 5 ft) above the water, and no less than 0.6 m (2 ft) above the surface of the shore, dock, or platform. If on a dock or platform, the microphone shall be placed near or beyond the end of the dock or platform. If the measurement is made from a boat, the microphone shall be held at a height of not less than 0.6 m (2 ft) above the surface of the water. A suitable boat for this purpose is of open hull construction.

4.3.2 The meter shall be set for slow response and the A-weighting network.

4.3.3 The observer reading the meter shall not be closer than arm's length from the microphone. Only one other person may be within 15 m (50 ft) of the microphone when measuring from the dock or shoreline, and that person shall be directly behind the observer reading the meter.

4.3.4 The applicable reading shall be the highest sound level measured during a period when the background sound level is at least 10 dB lower than the maximum allowable sound level. Background sound level includes wind effects, noise from boats other than the one being measured, wave action, boat wakes, and other extraneous noises. Readings due to hull slaps which create intermittent sound levels shall be disregarded.

4.3.5 The observer shall record the applicable reading and the background sound levels taken immediately before and immediately after the applicable reading.

4.3.6 When sound level readings are taken from inside a boat, 3 dB shall be subtracted from the reading to better correlate with shoreline readings.

5. General Requirements

5.1 The measurements shall be conducted only by persons qualified by training to perform these measurements.

5.2 Proper use of all test instrumentation is essential to obtain valid measurements. Operating manuals or other literature furnished by the instrument manufacturer should be consulted for both recommended operation of the instrument, and precautions to be observed.

5.3 Proper acoustical calibration shall comprise the complete measurement system including extension cables, etc. Field calibration shall be performed immediately before and after each test sequence.

5.4 A measurement shall be invalid if changes in the background sound level affect the applicable reading.

5.5 The use of the word “shall” in the procedure is to be understood to be mandatory. The use of the word “should” is to be understood as advisory. The use of the word “may” is to be understood as permissive.

6. Notes

6.1 **Marginal Indicia—**The change bar (l) located in the left margin is for the convenience of the user in locating areas where revisions have been made to the previous issue of the report. An (R) symbol to the left of the document title indicates a complete revision of the report.

PREPARED BY THE SAE MARINE TECHNICAL COMMITTEE

APPENDIX A

A.1 This procedure may be used for the measurement of sound emitted by recreational motorboats in use on waterways where sound level restrictions apply. Sound level is a function of the exhaust system, the boat hull, the manner of boat operation, e.g., distance from shore, engine speed and trim angle, and other factors. Background information is included in the SAE J1970 Rationale Statement.