SAE International™

SURFACE VEHICLE RECOMMENDED PRACTICE

SAE J192

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(R) Maximum Exterior Sound Level for Snowmobiles

***Foreword*—**This SAE Recommended Practice is intended as a guide toward standard practice, but may be subject to frequent change to keep pace with experience and technical advances.

***1. Scope*—**This SAE Recommended Practice establishes the instrumentation, test site, and test procedure for determining the maximum exterior sound level for snowmobiles.

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 SAE PUBLICATION—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J184— Qualifying a Sound Data Acquisition System

2.1.2 ANSI PUBLICATION—Available from ANSI, 25 West 43rd Street, New York, NY 10036-8002.

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 ANSI PUBLICATIONS—Available from ANSI, 25 West 43rd Street, New York, NY 10036-8002.

ANSI S1.1—Acoustical Terminology
ANSI S1.13—Methods of Measurements of Sound Pressure Levels

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

3.1 A sound level meter which meets the Type 1 requirements of ANSI 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 an audio recorder and/or a graphic level recorder or other indicating instrument provided the system meets the requirements of SAE J184.

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3.1.2 The microphone shall be used with an acceptable windscreen. To be acceptable, the screen must not affect the microphone response by more than ±1 dB for frequencies of 20 to 4000 Hz or ±1 1/2 dB for frequencies of 4000 to 10 000 Hz.

3.2 A sound level calibrator with an accuracy of ±0.1 dB.

3.3 An engine speed tachometer or other means of determining engine speed with a steady-state accuracy of ±3% at the prescribed test speed.

3.4 Thermometer.

3.5 Barometer.

3.6 Sling psychrometer, or dew point apparatus.

3.7 Windvane.

3.8 Anemometer.

4. Test Site

4.1 A suitable test site shall be a level, open space free from the effects of large sound reflecting surfaces. Parked vehicles, signboards, or other obstacles must not be located within 30 m (100 ft) of either the vehicle path or the microphone. (See Figure 1.)

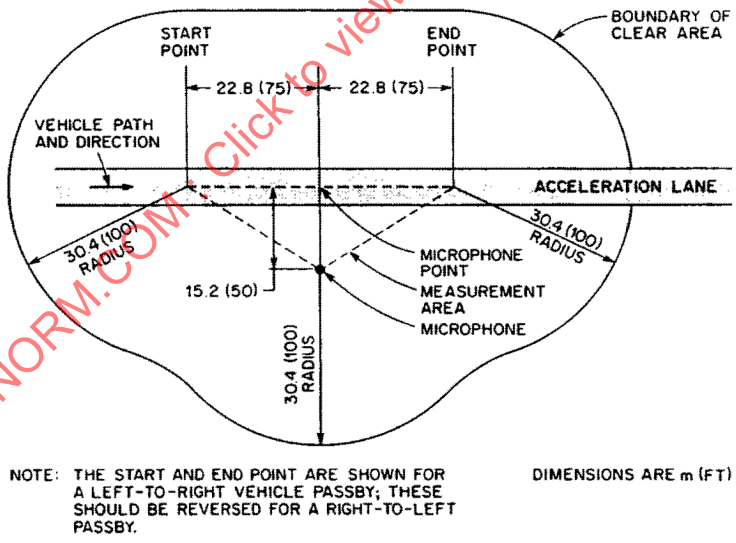

FIGURE 1—UNIDIRECTIONAL TEST SITE LAYOUT

4.2 The microphone shall be located 15 m (50 ft) from the centerline of the snowmobile path and 1.2 m (4 ft) above the snow or turf. The normal to the vehicle path from the microphone shall establish the microphone point on the snowmobile path.

4.3 The measurement area shall be the triangular area formed by the start point, the end point, and the microphone location.

4.4 The surface of the ground within the measurement area, including the snowmobile path, shall be covered with a maximum of 75 mm (3 in) loose snow over a base consisting of at least 50 mm (2 in) of snow sufficiently compacted to support the snowmobile without significant penetration. An alternate surface of turf, primarily grass, up to a maximum of 75 mm (3 in) in height may be used, which, except for the snowmobile path, shall be free of visible droplets of water.

4.5 The reference point of the snowmobile, to indicate where the snowmobile is on the snowmobile path, shall be the front of the ski(s).

4.6 While making sound level measurements, not more than one person, other than the observer reading the meter, shall be within 15 m (50 ft) of the snowmobile or microphone, and that person shall be directly behind the observer reading the meter, on a line through the microphone and the observer.

4.7 The ambient A-weighted sound level (including wind effects), coming from sources other than the snowmobile being measured, shall be at least 10 dB lower than the level of the test snowmobile.

5. Procedure

5.1 **Snowmobile Operation—**A full-throttle acceleration test as specified as follows, is the basis for establishing maximum noise capabilities of the snowmobile.

5.1.1 For the test, approach the starting point at a steady speed of 24 km/h (15 mph). When the starting point is reached, smoothly and rapidly open the throttle fully. Maintain wide open throttle until the end point is reached. The centerline of the snowmobile must not deviate more than 1 m (3 ft) from either side of the centerline of the snowmobile path. Record the maximum engine speed reached.

If the snowmobile is unable to attain a speed of 24 km/h (15 mph) on approach to the start point, pass the start point at wide open throttle, and maintain wide open throttle until the end point is passed.

5.2 The sound level meter shall be set for slow response and A-weighting network.

5.2.1 The applicable reading shall be the highest sound level indicated for the run, between the start point and the end point, ignoring unrelated peaks due to extraneous noises.

5.2.2 Test runs shall be repeated until three readings within a 2 dB range per snowmobile side have been obtained. The sound level for each side of the snowmobile shall be the average of all three readings, rounded to the nearest integer. The sound level reported shall be that for the side of the snowmobile with the highest readings.

5.3 During the test period, the atmospheric temperature, barometric pressure, humidity, wind speed, and wind direction shall be recorded at intervals not exceeding 1 h.

6. General Comments

6.1 It is recommended that persons technically trained and experienced in the current techniques of sound measurements select the equipment and conduct the tests.

6.2 The operation of recording and measuring equipment is likely to be affected by temperature near or below 0 °C (32 °F); hence, special precautions must be taken to ensure the reliability of sound level meter readings and/or recordings.

6.3 Proper acoustical calibration procedure shall account for the influence of extension cables, etc. Field calibration shall be made immediately before and after each test sequence. Internal calibration means are acceptable for field use, provided that external calibration is accomplished immediately before and after field use.

6.4 Instrument manufacturer's specifications for the proper use of the test equipment shall be adhered to.

6.5 Measurements shall be made only when the wind speed is below 19 km/h (12 mph) and the barometric pressure is between 93 and 103 kPa (27.5 and 30.5 in Hg).

6.6 The vehicle manufacturer's recommendations governing the proper operation of the vehicle shall be followed.

6.7 The method has been found to have a measurement uncertainty of ±2 dB.

7. Notes

7.1 **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.

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