

**TECHNICAL REPORT****J952a**

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**SOUND LEVELS FOR ENGINE POWERED EQUIPMENT - SAE J952a****SAE Standard**

Report of Construction and Industrial Machinery Technical Committee approved May 1966 and last revised by Vehicle Sound Level Committee January 1969.

**1. INTRODUCTION**

This SAE Standard establishes maximum sound levels for engine powered equipment and describes the test procedure, environment, and instrumentation for determining these sound levels. It does not include machinery designed for operation on highways or within factories and building areas.

**2. MAXIMUM SOUND LEVELS**

See paragraph 5.2 and Table 1.

**3. INSTRUMENTATION**

3.1 A sound level meter which meets the requirements of International Electrotechnical Commission Publication 179, Precision Sound Level Meters.

3.2 A sound level calibrator (see paragraph 5.5).

3.3 A calibrated windscreen (see paragraph 5.4).

**4. PROCEDURE**

4.1 TEST SITE - The test area shall consist of a flat open space free of any large reflecting surfaces such as a sign-board, building, or hillside located within 100 ft of either the microphone or the equipment being recorded.

4.1.1 Bystanders may have an appreciable influence on meter response if such persons are in the vicinity of the equipment or the microphone. No person other than the observer reading the meter shall be near the microphone.

4.1.2 The ambient sound level (including wind effects) due to sources other than the equipment being measured shall be at least 10 dbA lower than the level of the tested equipment.

4.1.3 The path of equipment travel shall be over a surface which is typical of the particular machine application.

4.2 EQUIPMENT OPERATIONS - Operate the equipment at the combination of load and speed which produces the maximum sound level without violating the manufacturer's operation specifications.

**4.3 MEASUREMENTS**

4.3.1 The microphone shall be located at a height of 4 ft above the ground plane.

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

4.3.3 For equipment which is not traveling, record the highest sound level obtained at 50 ft from the nearest surface of the equipment.

4.3.4 For traveling equipment, take measurements at

50 ft normal from the centerline of the path of straight line travel.

The applicable reading will be the highest sound level obtained from the loudest side as the equipment moves along the line of travel.

4.3.5 The sound level which is reported shall be the average of the two highest applicable readings which are within 2 db of each other.

**5. GENERAL COMMENTS**

5.1 It is strongly recommended that technically trained personnel select equipment and that tests be conducted only by qualified persons trained in the current techniques of sound measurement.

5.2 An additional 2 db allowance over the sound level limits is recommended to provide for variations in test site, vehicle operation, temperature gradients, wind velocity gradients, test equipment, and inherent differences in nominally identical vehicles.

5.3 Instrument manufacturer's specifications for orientation of the microphone relative to the source of sound and the location of the observer relative to the meter should be adhered to.

5.4 When a windscreen is required, a previously calibrated windscreen should be used. It is recommended that measurements be made only when wind velocity is below 12 mph.

5.5 Manufacturer's recommended calibration practice of the instruments should be followed. Field calibration should be made immediately before and after each test sequence. Either an external calibrator or internal calibration means is acceptable for field use, providing that external calibrating is accomplished before or after field use.

5.6 Horsepower sizes utilized in determining equipment categories in paragraph 2 shall be in accordance with SAE J816, or J607.

**6. REFERENCE MATERIAL**

Suggested reference material is as follows:

USASI S1.1-1960, Acoustical Terminology.

USASI S1.2-1962, Physical Measurement of Sound.

International Electrotechnical Commission Publication 179, Precision Sound Level Meters (available from USASI).

(Applications for copies of these documents should be addressed to U.S.A. Standards Institute, 10 East 40th Street, New York, N. Y. 10016)

**Documents**

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Table 1

| <u>Type of Equipment</u>                                                                                                                                                                                                                                                                                                                        | <u>Max Sound Level<br/>dB(A at 50 ft<br/>(A-Weighting Network)</u> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|
| 1. Construction and industrial machinery encompassing only mobile equipment, powered by internal combustion engines, such as crawler tractors, dozers, loaders, power shovels, and cranes, motor graders, paving machines, off-highway trucks, ditchers, trenchers, compactors, scrapers, and wagons                                            | 88                                                                 |
| 2. Engine powered equipment of 5 hp or less intended for use in residential areas at frequent intervals. Typical pieces of such equipment are lawn mowers, small garden tools, riding tractors, and snow removal equipment. This specifically excludes commercial equipment not intended for frequent use in residential areas                  | 70                                                                 |
| 3. Engine powered equipment exceeding 5 hp but not greater than 20 hp intended for use in residential areas at frequent intervals. Typical pieces of such equipment are lawn mowers, small garden tools, riding tractors, and snow removal equipment. This specifically excludes commercial equipment not intended for use in residential areas | 78                                                                 |
| 4. Engine powered commercial equipment of 20 hp or less intended for infrequent use in a residential area                                                                                                                                                                                                                                       | 88                                                                 |
| 5. Farm and light industrial tractors                                                                                                                                                                                                                                                                                                           | 88                                                                 |

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