Maximum Sound Level Potential for Motorcycles—SAE J47

SAE Recommended Practice
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LAND SEA AIR SPACE

PREPRINT

MAXIMUM SOUND LEVEL POTENTIAL FOR MOTORCYCLES—SAE J47

SAE Recommended Practice

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1. Scope—This SAE Recommended Practice establishes the test procedure, environment and instrumentation for determining maximum sound level potential for motorcycles.

2. Instrumentation

2.1 The following instrumentation shall be used, where applicable:

2.1.1 A sound level meter which meets the Type 1 or S1A requirements of American National Standard Specification for Sound Level Meters, S1.4–1971 (R 1976). As an alternative to making direct measurements using a sound level meter, a microphone or sound level meter may be used with a magnetic tape recorder and/or a graphic level recorder or indicating instrument provided that the system meets the requirements of SAE Recommended Practice, J184, Qualifying a Sound Data Acquisition System.

2.1.2 An acoustic calibrator with an accuracy of ±0.5 dB (see paragraph 6.4.4).

2.1.3 A calibrated engine speed tachometer having the following characteristics:

(a) Steady-state accuracy of better than 1%.

(b) Transient response: Response to a step input will be such that within 10 engine revolutions the indicated rpm will be within 2% of the actual rpm.

2.1.4 An anemometer with steady-state accuracy within ±10% at 19 km/h (12 mph).

2.1.5 An acceptable wind screen may be used with the microphone. To be acceptable, the screen must not affect the microphone response more than ±1 dB for frequencies of 20–4000 Hz or ±1½ dB for frequencies of 4000–10 000 Hz.

3. Test Site

3.1 The test site shall be a flat open space free of large sound-reflecting surfaces (other than the ground) such as parked vehicles, signboards, buildings, or hillsides, located within 30 m (100 ft) radius of the microphone location and the following points on the vehicle path:

(a) The microphone point.

(b) A point 15 m (50 ft) before the microphone point.

(c) A point 15 m (50 ft) beyond the microphone point.

3.2 The measurement area within the test site shall meet the following requirements and be laid out as described:

3.2.1 The surface of the ground within at least the triangular area formed by the microphone location and the points 15 m (50 ft) prior to and 15 m (50 ft) beyond the microphone point shall be dry concrete or asphalt, free from snow, soil or other extraneous material.

3.2.2 The vehicle path shall be of relatively smooth, dry concrete or asphalt, free of extraneous materials such as gravel, and of sufficient length for safe acceleration, deceleration, and stopping of the vehicle.

3.2.3 The microphone shall be located 15 m (50 ft) from the centerline of the vehicle path and 1.2 m (4 ft) above the ground plane.

3.2.4 The following points shall be established on the vehicle path:

(a) Microphone point—a point on the centerline of the vehicle path where a normal through the microphone location intersects the vehicle path.

(b) End point—a point on the vehicle path 7.5 m (25 ft) beyond the microphone point.

(c) Acceleration point—a point on the vehicle path at least 7.5 m (25 ft) prior to the microphone point established by the method described in paragraph 4.1.

3.2.5 The test area layout in Fig. 1 shows a directional approach from left to right with one microphone location for purposes of clarity. Sound level measurements are to be made on both sides of the vehicle; therefore, it will be necessary to establish either a second microphone location on the opposite side of the vehicle path with a corresponding clear area or end points, and acceleration points for approaches from both directions.

4. Procedure

4.1 To establish the acceleration point, the end point shall be approached in low gear from the reverse direction at a constant road speed obtained from 60% of the engine speed at maximum rated net power. When the front of the vehicle reaches the end point, the throttle shall be rapidly and fully opened to accelerate past the microphone point under wide-open throttle. By trial, the lowest transmission gear shall be selected that will result in the vehicle traveling the shortest distance from the end point to the place where the engine speed at maximum rated net power is reached, but which is not less than 7.5 m (25 ft) past the microphone point.

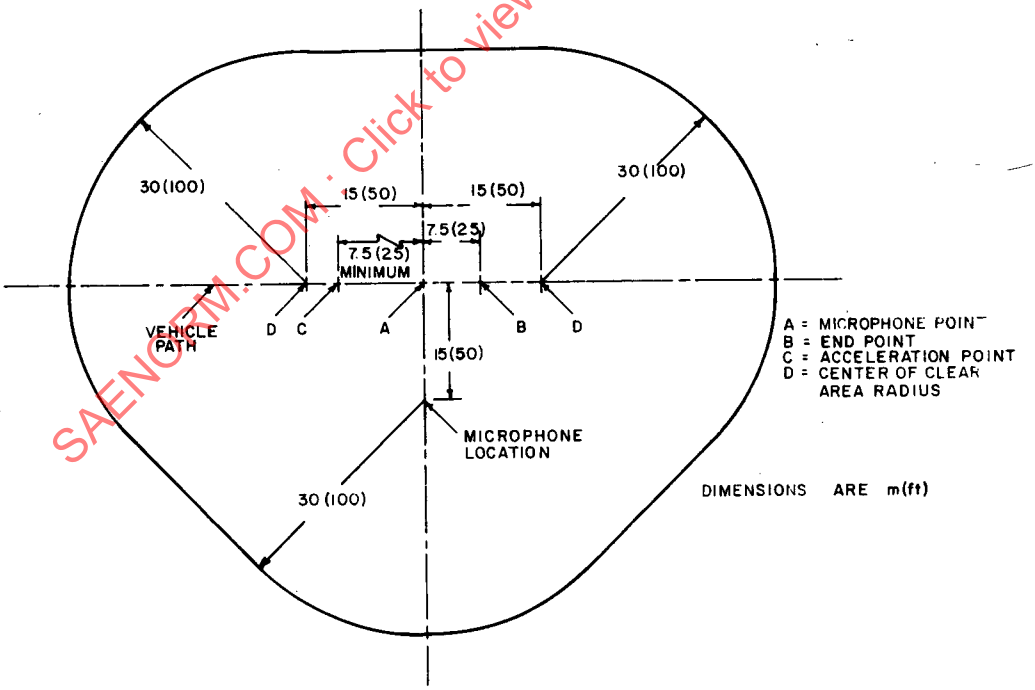

FIG. 1

The ϕ symbol is for the convenience of the user in locating areas where technical revisions have been made to the previous issue of the report. If the symbol is next to the report title, it indicates a complete revision of the report.