



SURFACE VEHICLE RECOMMENDED PRACTICE

J986™

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Sound Level for Passenger Cars and Light Trucks

RATIONALE

This document is cancelled as the vehicle operating conditions and specifications contained in the document are obsolete for current motor vehicles and the test mode is incompatible with in-use driving.

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1. **Scope**—This SAE Standard establishes the test procedure, environment, and instrumentation for determining the exterior sound level for passenger cars, multipurpose vehicles, and light trucks having a gross vehicle mass rating of 4540 kg or less. The test procedure is characterized by having fixed initial conditions, i.e., an as-specified initial vehicle speed and gear selection at a fixed start point on the test site. Full-throttle acceleration and closed-throttle deceleration of the vehicle are included in this procedure.

Sound levels determined in accordance with this document are dependent on the performance capability of the test vehicle, as influenced by power-to-mass ratio and overall powertrain gear ratio.

2. References

- 2.1 **Applicable Publications**—The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply.

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

SAE J184—Qualifying a Sound Data Acquisition System

SAE J1349—Engine Power Test Code—Spark Ignition and Diesel

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

ANSI S1.4-1983—Specification for Sound Level Meters

ANSI S14A-1985—Sound Level Meters

- 2.1.3 U.S. Environmental Protection Agency Noise Advisory Circular: A/C No. 3, January 27, 1978

3. Definitions

- 3.1 **Curb Mass**—The mass of the vehicle with standard equipment, optional equipment, and fluids filled to capacity.
- 3.2 **Multi-fuel Vehicle**—A vehicle, such as a dual- or bi-fuel vehicle, equipped to operate on more than one type of fuel, e.g., either compressed natural gas or gasoline.

- 3.3 Variable Fuel Vehicle**—A vehicle equipped to operate on a variety of fuel blends, e.g., a mixture of gasoline and methanol.
- 3.4 Rated Engine Speed**—The engine speed at which the engine delivers rated power output as defined in SAE J1349, as determined by the manufacturer.
- 3.5 Throttle Control**—The driver operated pedal (or other control) which connects through some mechanism to the engine fuel metering device (carburetor, fuel injectors, fuel distributor, or equivalent device) and thereby controls the engine power output.

NOTE—For the purpose of this document, depression of the throttle control acts to increase engine speed and release of the throttle control acts to reduce engine speed.

4. Vehicle Operation

- 4.1** The test mass of the vehicle, including the driver and equipment, shall not exceed 125 kg over the curb mass (fuel level may be reduced as needed to ensure that this requirement is met).
- 4.2** The powertrain and exhaust system temperatures shall be within the normal operating range throughout each test run. A 1 min stabilizing period with the engine at idle speed and the transmission in neutral is required prior to each test run.

NOTE—Usually a vehicle brought to normal engine coolant temperature through moderate driving operations is adequately conditioned for testing.

- 4.3** Vehicle tires shall be inflated to the proper pressure in accordance with the manufacturer's recommendations.
- 4.4** Preliminary runs to familiarize the driver and to establish the vehicle operating conditions should be made before taking sound level measurements.
- 4.5 Acceleration Test**—The acceleration test is the primary test mode and must be conducted first to obtain information necessary to conduct the deceleration test.
- 4.5.1** For this test, the vehicle shall approach the measurement area along the vehicle path with the vehicle speed stabilized at 48 km/h $\pm$ 1.2 km/h. The highest-numerical-ratio transmission gear shall be used that will result in the front of the vehicle reaching or passing the entry point of the end zone before rated engine speed is attained. It is recommended that the approach speed be held constant for a distance of at least 7.5 m prior to reaching the start point.

When the front of the vehicle reaches the start point $\pm$ 1.5 m, the throttle control shall be fully depressed as rapidly as possible and the vehicle allowed to accelerate until the engine reaches rated engine speed. The test run is then terminated and the throttle control may be released.

Should rated engine speed not be attained in the end zone, the test run is nonetheless terminated when the front of the vehicle reaches the end of the end zone. The maximum engine speed attained should be noted. (See 4.5.1).