SAE The Engineering Resource For Advancing Mobility®

A Product of the
Cooperative Engineering Program

SAE J1169 SEP85

SAENORM.COM : Click to view the full PDF of j1169_198509

Measurement of Light Vehicle Exhaust Sound Level Under Stationary Conditions

SAE Standard
Revised September 1985

S.A.E.
LIBRARY

Submitted for Recognition as an American National Standard

RATIONALE:

This Standard is technically the same as the original version, approved in January 1977 as a Recommended Practice. Minor editorial changes (grammar, word choice, and updating of references) and minor corrections to Fig. 2 were made prior to approval as an SAE Standard. This upgrading is based on the widespread acceptance and use of the procedure by governmental agencies and industry and also on its essential conformance with ISO 5130-1982, Acoustics - Measurement of Noise Emitted by Stationary Road Vehicles - Survey Method.

RELATIONSHIP OF SAE STANDARD TO ISO STANDARD:

Conforms to ISO 5130-1982, Acoustics - Measurement of Noise Emitted by Stationary Road Vehicles - Survey Method.

REFERENCE SECTION:

American National Standard Specification for Sound Level Meters, S1.4-1983. (Available from American National Standards Institute, 1430 Broadway, New York, NY 10018.)

ISO 5130-1982, Acoustics - Measurement of Noise Emitted by Stationary Road Vehicles - Survey Method

SAE J184a, Qualifying a Sound Data Acquisition System (June 1978)

APPLICATION:

This SAE Standard establishes the test procedure, environment, and instrumentation to be used for measuring the exhaust sound level of passenger cars, multipurpose vehicles, and light trucks under stationary conditions.

This sound level measurement procedure has been developed as a guide for governmental agencies establishing in-service sound level limitations and enforcement measurement procedures. It is directed at the assessment of vehicle noise and is not intended to determine maximum vehicle sound levels.

SAENORM.COM : Click to view the full PDF of j1169_198509

COMMITTEE COMPOSITION:

DEVELOPED BY THE SAE LIGHT VEHICLE EXTERIOR SOUND LEVEL SUBCOMMITTEE:

T. M. Howell, Ford Motor Co., Dearborn, MI - Chairman
K. D. Cherne, Rochester, MI
W. J. Haley, Jr., Ford Motor Co., Dearborn, MI
R. H. Paddy, Ford Motor Co., Dearborn, MI
R. F. Schumacher, General Motors Corporation, Milford, MI
R. H. Sweigard, Ann Arbor, MI
E. A. Zylik, Amer. Motors Corp., Detroit, MI

COMMITTEE COMPOSITION (Continued):

SPONSORED BY THE SAE VEHICLE SOUND LEVEL COMMITTEE:

R. F. Schumacher, General Motors Corporation, Milford, MI - Chairman
W. S. Coleman, Eaton Corp., Southfield, MI - Sponsor
K. S. Bagga, American Motors Corporation, Detroit, MI
L. J. Eriksson, Nelson Industries, Inc., Stoughton, WI
J. A. Hayes, Cummins Engine Co., Columbus, IN
G. Hazem, Ontario Ministry of the Environment, Toronto, Ontario, Canada
T. J. Henry, International Harvester, Ft. Wayne, IN
R. K. Hillquist, Michigan Acoustical Consultants, Milford, MI
T. M. Howell, Ford Motor Co., Dearborn, MI
F. R. Kishline, Redford, MI
M. D. Lamparelli, Detroit, MI

SAENORM.COM : Click to view the full PDF of j1169_198509

SAE The Engineering Resource For Advancing Mobility®

400 COMMONWEALTH DRIVE, WARRENDALE, PA 15096

HIGHWAY VEHICLE STANDARD

Submitted for recognition as an American National Standard

SAE J1169

Issued Jan. 1977
Revised Sept. 1985

Supersedes J1169 MAR85

Ø

MEASUREMENT OF LIGHT VEHICLE EXHAUST SOUND LEVEL UNDER STATIONARY CONDITIONS

1. INTRODUCTION:

1.1 Scope: This SAE Standard establishes the test procedure, environment, and instrumentation to be used for measuring the exhaust sound level of passenger cars, multipurpose vehicles, and light trucks under stationary conditions.

This sound level measurement procedure has been developed as a guide for governmental agencies establishing in-service sound level limitations and enforcement measurement procedures. It is directed at the assessment of vehicle exhaust noise and is not intended to determine maximum vehicle sound levels.

2. INSTRUMENTATION:

2.1 The instrumentation necessary to conduct this test shall meet the minimum performance requirements specified below.

2.2 The sound level meter shall meet the Type 1, S1A, 2, or S2A requirements of American National Standard Specification for Sound Level Meters, S1.4-1983. (See paragraph 7.4.)

2.2.1 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 other indicating instrument, providing that the system is in conformance with SAE Recommended Practice J184a, Qualifying a Sound Data Acquisition System (June 1978).

2.3 The sound level calibrator shall be accurate to ±0.5 dB.

2.4 A microphone windscreen may be used, and shall be of a type recommended by the sound level meter manufacturer.

SAENORM.COM : Click to view the full PDF of j1169_198509

SAE Technical Board Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

SAE reviews each technical report at least every five years at which time it may be reaffirmed, revised, or cancelled. SAE invites your written comments and suggestions.

Copyright 1985 Society of Automotive Engineers, Inc.
All rights reserved.

Printed in U.S.A.

2.5 The engine speed measuring device shall be accurate to ±100 rpm at 3000 rpm.

3. TEST ENVIRONMENT:

3.1 The test site shall be out-of-doors and shall consist of a flat surface of concrete, asphalt, or similar hard material, free of snow, grass, loose soil, ashes, or other sound absorbing material. It shall be in an open space free from large reflecting surfaces, such as parked vehicles, buildings, billboards, trees, shrubbery, parallel walls, people, etc., within a 3 m (10 ft) radius from the microphone location and any point on the vehicle.

3.1.1 As an alternative to outside testing, a large hemi-anechoic chamber may be used.

3.2 The ambient sound level (including wind effects) from sources other than the vehicle being tested shall be at least 10 dB below that produced by the test vehicle.

4. MICROPHONE LOCATION:

4.1 The microphone of the sound level meter shall be located at a distance of 0.5 m (20 in) from the reference point on the exhaust gas outlet pipe (refer to Fig. 1) and at an angle of 45 deg (+0, -10 deg) to the flow axis of the pipe termination (refer to Fig. 2). The microphone shall be at the height of the reference point, but not less than 0.2 m (8 in) from the ground surface. The reference axis of the microphone shall lie in a plane parallel to the ground surface and shall be directed toward the reference point on the exhaust gas outlet. (See also paragraphs 4.2, 4.3, and 7.6.)

SAENORM.COM : Click to view the full PDF of j1169_196509

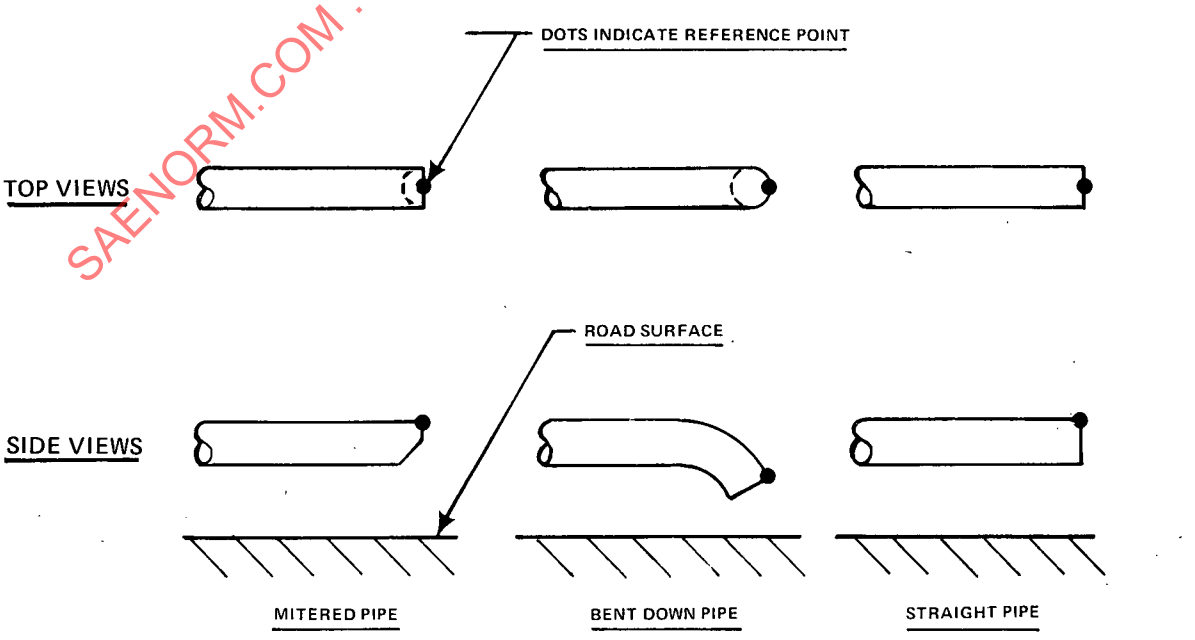

Fig. 1 - Outlet Pipe Details

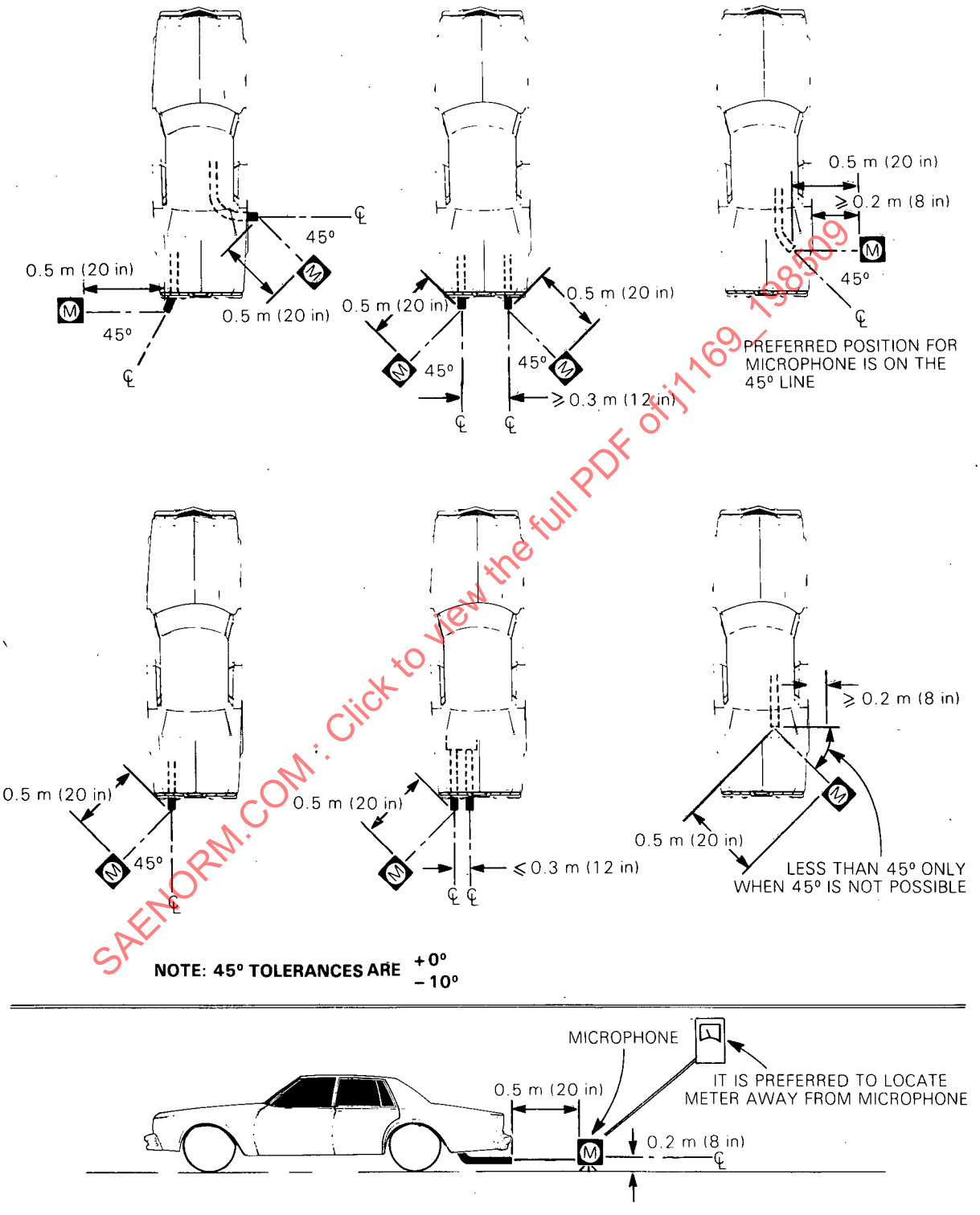

Fig. 2 - Microphone Location Sketch

SAENORM.COM : Click to view the full PDF of j1169_198509