8.1.5 The identification of the vehicle, its engine and its transmission system;

8.1.6 The transmission gears during the test;

8.1.7 The road and engine speeds at the beginning of the period of acceleration;

8.1.8 The auxiliary equipment, where appropriate, and its operating conditions; and

8.1.9 The number of measurements and the sound pressure levels recorded, in decibels.

APPENDIX

RATIONALE STATEMENT

In 1982, the SAE Light Vehicle Exterior Sound Level Subcommittee of the Vehicle Sound Level Committee undertook the task of a thorough review of the ISO R362 motor vehicle exterior noise test procedure, its technical aspects, test philosophy, and potential impact as a manufacturer test procedure on the fleet of U.S.-built vehicles. During the review process, the ISO Standard was released as the current version, ISO 362-1981, which forms the basis for SAE J1470 OCT84. Therefore, this SAE Recommended Practice incorporates the essential elements, technical aspects, philosophy, and basic format of the ISO 362-1981 Standard and includes the addition of provisions adopted by WP29 in ECE R51 to accommodate testing of certain high-performance vehicles and vehicles with automatic transmissions that are not part of ISO 362-1981. This recommended practice does not replace any existing SAE Standards or Recommended Practices. It provides a common basis for sound level performance testing of motor vehicles that is in agreement with current practices in countries other than the United States.

This Appendix contains an explanation of the differences between ISO 362-1981 and SAE J1470 OCT84. Major differences are explained in detail. In several cases, minor differences, essentially editorial in nature, are not discussed in detail. Typically, a minor difference incorporates an element of the SAE format or provides clarification of a statement.

Differences

Section 2—The list of references includes European and U.S. documents that detail measurement equipment specifications, terminology, and measurement methodology applicable to vehicle noise testing.

When this test method is to be used for export vehicle testing, users should be aware of differences between sound level meter standards and engine power rating methods.

Section 3.3—This section has been added to establish a difference between a forced down shift from third gear to second gear, which is permissible, and a forced down shift, herein defined as kick-down, to low or first gear, which is specifically disallowed, during test vehicle operation.

Section 4.1—Paragraph 1 of this section incorporates identification of the U.S. standard for sound level meters. It is substantially equivalent to IEC Publication 651.

Section 4.1—This section is changed to include wind screen performance specifications. The ISO procedure requires the microphone manufacturer to verify performance of the wind screen. This procedure establishes quantitative values for acceptability.

Section 4.1—This section is also changed to add provisions for the use of recording or other equipment as alternatives to a Type 1 sound level meter as long as such equipment meets the Type 1 specifications according to SAE J184a.

Section 5.1—Paragraph 1 of this section has been changed to incorporate specific criteria in place of the terms "substantially level" used in the ISO procedure. Test experience with other SAE procedures supports the need for such definition.

Section 5.2—Reference to "gusts of wind" is deleted because the steady wind limits and background noise specification are adequate to provide minimum requirements for good measurement practices.

Section 6.4—This section is changed to require that other temperature-sensitive, noise-related vehicle equipment, in addition to the engine, also be brought to normal operating temperature prior to the start of testing.

Section 6.5.2.2b—The mass breakpoint is changed to incorporate the U.S. vehicle categories in accordance with federal regulations for medium and heavy trucks. European countries have somewhat different categories that affect regulated levels.

This section has also been expanded to include specific test requirements for certain high-performance vehicles in accordance with changes to ECE R51 as adopted by WP29 in 1983 that are not a part of ISO 362-1981.

Section 6.5.2.3b—This section has been expanded to include changes adopted by ECE WP29 in 1983 which recognize design features of certain U.S.-built automatic transmissions which prevent performing the test in accordance with the requirements of ISO 362-1981 without major rework of the test vehicles. The wording adopted should allow current and future vehicle configurations to meet test performance requirements.

Section 7—This section is new in its entirety. The ISO procedure does not include these provisions. Nonetheless, SAE procedures use this section to provide additional technical details and practical considerations considered essential for consistency and quality of test measurements. These details include specifics relating to such items as test personnel, test equipment and calibration, ambient conditions, test site, and test vehicles.

PERFORMANCE OF VEHICLE TRAFFIC HORNS—SAE J377 FEB87

SAE Standard

Report of the Vehicle Sound Level Committee, approved April 1969, reaffirmed February 1987. Rationale statement available.

1. Introduction—This SAE Standard establishes the minimum operational life cycles, corrosion resistance, and sound level output for traffic horns (electric) on new automotive highway vehicles. Test equipment, environment, and procedures are specified.

2. Performance Requirements—When measured in accordance with the procedures described herein, new vehicle horns shall equal or exceed the following requirements, using new horns for each of the tests:

2.1 Complete 50 000 cycles of the laboratory operation test without loss of more than 6 dB(A) output.

2.2 Complete 72 h of salt spray exposure, after which the horn must be operational with a loss of output of no more than 6 dB(A).

2.3 Produce a sound level, when mounted in the specified position(s) on a vehicle, of 82–102 dB(A) at a distance of 50 ft directly in front of the vehicle.

3. Instrumentation—The following instrumentation shall be used for the measurement required:

ϕ **3.1** A precision sound level meter which meets the requirements of International Electrotechnical Commission Publication 651.

3.2 A sound level calibrator.

3.3 A calibrated windscreen.

3.4 A d-c voltmeter.

4. Procedure

4.1 Laboratory Tests—Sound level output of the horn shall be measured according to the requirements of paragraphs 4.1.1 and 4.1.2 before and after life cycle and corrosion tests.

4.1.1 Test Conditions—Measure the sound level output in an anechoic chamber or a free field at a distance of 2.5 or 3 ft from the horn on the acoustical axis (highest output) of the horn. The horn and microphone are to be mounted at the same height within 6 in of 4 ft from the ground. The horn shall be mounted by the bracket to a rigid surface during measurement. Ambient temperature during test shall be 72–80°F.

4.1.2 Power Supply—The power source shall consist of an automotive battery of the correct rated voltage for the horn tested, with an electrical power supply connected in parallel to maintain the state of charge of the battery. The electrical power supply shall have sufficient capacity to maintain full battery charge during test and shall deliver filtered direct current with a voltage regulation of 0.1% or less. The power supply voltage and the circuit resistance from the power supply to the horn terminal shall be as specified by the horn manufacturer.

4.1.3 Life Cycle Test

(a) Operate the horn for 50 000 cycles, each cycle consisting of 0.75 s on and 3.25 s off. The horn may be adjusted to nominal settings before conducting the test, but not thereafter.

(b) After completing the life cycle test, the sound level output shall be measured under the same conditions as before the test. The horn must satisfy the condition of paragraph 2.1.

4.1.4 Corrosion Resistance Test *ed.*

(a) Subject the horn to a salt spray test in accordance with ASTM B117-85 for 72 h.

(b) After completing the salt spray test, the sound level output shall be measured under the same conditions as before the test. The horn must satisfy the conditions of paragraph 2.2.

4.2 Sound Output Test—Sound output is measured with the horn or horns, mounted on the vehicle in the specified position. The vehicle must be operated for at least 15 min to stabilize conditions before test. The engine on the vehicle shall be running at a speed at which the voltage