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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 18697-2002

**Acoustics -- Measurement of noise inside motor vehicles
(English Translation)**

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Foreword

This standard is equivalent to ISO 5128.1980 "Acoustics - Measurement of noise inside motor vehicles". The technical content is consistent. Appendix A (informative) is added, for reference only.

This standard was proposed by the Chinese Academy of Sciences.

This standard shall be under the jurisdiction of the National Acoustics Standardization Technical Committee.

Drafting organizations of this standard. FAW Technology Center, Shanghai Volkswagen Co., Ltd., Shenlong Automobile Co., Ltd.

1 Scope

This standard specifies the method for measuring the noise inside motor vehicles.

This standard applies to category M and category N automobiles (category M. passenger vehicles, including cars; category N. goods vehicles, including

tractors, cranes, etc.).

2 Normative references

The provisions in following documents become the provisions of this Standard through reference in this Standard. The versions indicated at the time of publication of this standard are valid. All standards are subjected to revision, AND parties who reach an agreement based on this Standard are encouraged to study if the latest versions of these documents are applicable.

GB/T 3241-1998 Octave-band and fractional-octave-band filters (eqv IEC 61260.1995)

GB/T 3730.2-1996 Road vehicle - Masses - Vocabulary and codes (idt ISO 1176.1990)

GB/T 3785-1983 Electric, sonic properties and measuring methods for sound level meters

3.1 Confirmatory test

The measurements performed are used to verify, whether the motor vehicles provided by the manufacturer meet the noise requirements.

3.2 Check test

The measurements performed are to check whether the noise of the motor vehicle is within the specified limits AND whether there has been a significant change, since the motor vehicle is submitted, or between motor vehicles which are submitted in different batches.

4.1 The reading of the sound level meter used shall use the "F" time-weighting characteristic.

4.2 The measured value of all measuring points, in the confirmatory test and the check test, shall be A sound level LpA, in unit of dB.

5.1 The sound level meter shall meet the requirements of Type 1, which is specified in GB/T 3785.

5.2 If other measurement systems are used, such as tape drives or level recorders, their electroacoustic performance shall meet the requirements of Type 1 in the relevant clauses of GB/T 3785.

5.3 In order to measure the noise spectrum, the filter shall meet the requirements of GB/T 3241.

5.4 At the beginning and end of each measurement, the acoustic performance of the measuring device must be checked, in accordance with the manufacturer's instructions. It is best to use an acoustic calibrator (such as a piston sounder) for calibration. The sound level meter shall meet the requirements of Type 1, which is specified in GB/T 3785, within the effective calibration period.

5.5 For automobile acceleration tests, it is particularly recommended to use a dual-channel recording device, which can record noise and vehicle speed signals at the same time. It can obtain a graph of the relationship between vehicle noise and vehicle speed.

5.7 The accuracy of measuring instruments for vehicle speed and engine speed shall be 3% or better.

6 Acoustic environment, meteorological conditions, background noise

6.1 The measurement location must meet the following conditions, that is, the sound radiated from the motor vehicle can only become a part of the noise inside the motor vehicle, through the reflection of the road surface; it cannot become the noise inside the motor vehicle, through the reflection of buildings, walls or similar large objects outside the motor vehicle.

6.2 The air temperature outside the motor vehicle must be in the range of -5°C

to +35°C. The wind speed, at a height of about 1.2 m, along the measurement route, shall not exceed 5 m/s. Other meteorological conditions shall not affect the measurement results. The wind speed and wind direction, for the direction of motor vehicle, shall be stated in the test report.

7 Test road conditions

The interior noise of a motor vehicle is generally greatly affected by the roughness of the road pavement structure. A smooth road pavement can produce smooth interior noise.

8.1 Engine and tire conditions

During the measurement process, all operating conditions of the engine, such as fuel, lubricating oil, ignition timing or fuel injection time, shall comply with the manufacturer's requirements. Before the start of the measurement, the engine shall stabilize, within the normal operating temperature range; OR drive a distance, at a moderate speed.

8.2 Vehicle load

The basic conditions of vehicle load shall comply with the provisions of 4.4 or

4.6 in GB/T 3730.2-1996, which are the same as those, as required by motor

vehicle manufacturers. The motor vehicle must be unloaded, when testing noise (except for the driver, measurement personnel, test equipment, no other loads are allowed).

8.3 Openings, windows, auxiliary devices, adjustable seats

Openings, such as sunroofs, all windows, air inlets, air outlets, must be closed if possible. They shall be opened, only when it is necessary to study their influence on the internal noise of the motor vehicle.