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Wind noise test for full scale automobile in aero-acoustical wind tunnel - The measurement method of leakage noise

汽车整车气动声学风洞风噪试验泄漏噪声测量方法

(English Translation)

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1 Scope

This standard specifies the method for vehicle leakage noise measurement in the vehicle aero-acoustic wind tunnel, including basic test conditions, measurement and confidentiality Sealing method, working condition formulation, measurement process, evaluation parameter, record, data processing and measurement report. This standard can evaluate the leakage noise in the car it can also diagnose wind noise sources and transmission path problems.

This standard applies to cars with a complete body sealing system. The maximum size must meet the vehicle weight and external dimensions specified in the wind tunnel.

begging.

2 Normative references

The following documents are indispensable for the application of this document. For dated reference documents, only the dated version applies to this article Pieces. For undated reference documents, the latest version (including all amendments) is applicable to this document.

GB/T 15485 Acoustic speech intelligibility index calculation method T/CSAE 113-2019 Automobile aeroacoustics wind tunnel wind noise test-car interior wind noise measurement method ISO 532-1-2017 Acoustic Loudness Calculation Method Part 1 Zwicker Method (Acoustics-Methods for calculating loudness-Part 1: Zwicker method) DIN 45692 Sharpness measurement technique for the simulation of auditory effects (Measurement technique for the simulation of the simulation of the auditory sensation of sharpness)

3 Terms and definitions

Interior wind noise

The aerodynamic noise part of the noise in the car, that is, generated by the interaction

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between the external airflow of the car and the car body, radiated by the car body, and leaked into the car noise.

Leakage noise

Generalized leakage noise refers to the increase in wind noise generated by the sealing system in the car, including air suction noise, sealing system transmission noise and cavity noise Acoustic, leakage noise in a narrow sense refers only to air suction noise.

3.2.1

Aspiration noise

The aerodynamic noise increase in the car caused by the sealing gap of the car body includes the aerodynamic noise emitted by the airflow at the gap and the aerodynamic noise outside the car.

The gap is directly transmitted to the interior of the car.

3.2.2

Sealing system sound transmission noise the aerodynamic noise outside the car is introduced into the car through the body sealing system, causing an increase in the aerodynamic noise inside the car.

3.2.3

Cavity noise

The aerodynamic noise generated by the airflow at the opening of the sealed cavity of the vehicle body only includes the increased noise in the vehicle in the leakage noise.

Vehicle test status

The state of the vehicle at the time of measuring the leakage noise, mainly refers to the situation of the tape reinforced seal, including the original state, the best sealing state and the part Sub-sealed state, etc.

3.3.1

Inspection status

The measurement state of the vehicle under investigation as a target is also called the target state.

3.3.2

Reference status

Compared with the survey state, the vehicle measurement state that obtains the relative contribution of wind noise is also called the reference state.

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3.3.3

Baseline status

After the abnormal noise caused by the non-design problem is eliminated, the vehicle is in the state without additional sealing treatment. In this state, the vehicle interior noise energy measured in the wind tunnel Enough to represent the normal wind noise level of the vehicle.

3.3.4

Best sealing status quicktest status all the seals of the vehicle are in a state of enhanced sealing treatment, which represents the ideal state with the least leakage noise in the vehicle. It is also called a fully sealed state.

state.

Operating conditions of wind tunnel Refers to a series of external conditions such as the wind speed of the wind tunnel and the yaw angle of the balance during the measurement.

Measuring condition

It is composed of vehicle measurement status and wind tunnel operating conditions. It is a basic work unit that obtains one test data at a time. Such as original state, wind speed 140 km/h and 0° yaw angle constitute a wind noise measurement working condition. When comparing multiple operating conditions of the same wind tunnel with different vehicle conditions, the vehicle measurement state can be used to indicate working conditions, such as original working conditions, fully sealed working conditions, etc., but it should be noted that the operating conditions of the wind tunnel should not be confused.

3.5.1

Inspection condition the survey state is the measurement condition under a specific wind tunnel operating condition, also known as the target condition.

3.5.2

Reference status

The measurement condition of the reference state under a specific wind tunnel operating condition is also called the reference condition.

4.1 Overview

Leakage noise cannot be directly measured. In this standard, the leakage noise is obtained by comparing the interior wind noise of the vehicle under the inspection conditions and the reference conditions.

The indirect result of the noise difference. The leakage noise measurement method is

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