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PEOPLE'S REPUBLIC OF CHINA

GB/T 14365-93

Acoustics - Measurement of noise emitted by stationary road vehicles

声学 机动车辆定置噪声测量方法

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Acoustics - Measurement of noise emitted by stationary road vehicles

GB/T 14365-93

This Standard references-adopts the international standard ISO 5130-1982 “Acoustics - Measurement of noise emitted by stationary road vehicles - Survey method”.

1 Subject content and application scope

This Standard applies to the measurement of noise emitted by all kinds of stationary road vehicles. Stationary means that the vehicle is not running, the engine is in unladen operation state. The measurement data obtained by the method specified in this Standard can be used to evaluate and inspect the main noise source of motor vehicles - exhaust noise and engine noise level. The date directly obtained by this method can not characterize the maximum noise level of vehicles when running.

2 References

GB 3785-83 Electric, sonic properties and measuring methods for sound level meters

3 Measurement environment

3.1 Measurement site

3.1.1 Measurement site shall be open, flat ground constituted with concrete, asphalt and other hard materials. The outer edge shall be at least 3 m away from the outer contour of the vehicle (see Figure 1, Figure 2). Large obstacles outside the measurement site, such as: parked vehicles, buildings, billboards, trees, paralleled walls, etc. shall be at a distance of not less than 3 m from microphones.

3.1.2 Except the measuring personnel and the driver, there shall be no other personnel on the measurement site that may affect the measurement.

3.2 Background noise

3.2.1 In measurement process, the background noise at the microphone positions (including the effect of wind) shall be 10 dB(A) lower than the measured noise. The

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neutral position, the rear wheels shall be overhead.

5.1.2 The engine hood, windows and doors shall be closed, the air conditioner and other auxiliary apparatus of vehicles shall be switched off.

5.1.3 During measurements, the water temperature and oil temperature of engines shall comply with the specifications of the manufacturing plants.

5.2 Measurement times

REPEAT each type of test at each measurement site until there are 3 consecutive readings of which the change-range is within 2 dB, and take the arithmetic mean as the measurement result.

5.3 Exhaust noise measurement (see Figure 1)

5.3.1 Microphone positions

5.3.1.1 The microphone shares the same height with the exhaust vent end, it shall not be less than 0.2 m above the ground, in any case.

5.3.1.2 The reference axis of microphone shall be in parallel to the ground, and form a 45° ± 10° angle with the plane that passes through the airflow direction of exhaust vent end, and is perpendicular to the ground. The microphone faces toward the exhaust vent. It is 0.5 m away from the exhaust vent end and is placed on the outer side of the vehicle.

5.3.1.3 The vehicle is equipped with two or more exhaust pipes, and the interval between the exhaust pipes is not more than 0.3 m. And when coupled to a muffler, it is only needed to take one measurement position. The microphone shall choose the exhaust pipe that is the closest to the outer of the vehicle. If two or more exhaust pipes locating on a line perpendicular to the ground, then select one exhaust pipe that is the farthest away from the ground.

5.3.1.4 If the vehicle is equipped with several exhaust pipes, and the interval between every two exhaust pipes is greater than 0.3 m, then each exhaust pipe shall be measured, and the highest sound level shall be recorded.

5.3.1.5 For vehicles with vertically upward exhaust pipes, the height of where microphone placed shall be the same as that of exhaust pipe; the microphone faces upwardly, its reference axis shall be perpendicular to the ground. The microphone shall be placed closer to the exhaust pipe on one side of the vehicle, and 0.5 m away from the exhaust vent end.

5.3.1.6 If the vehicle can not meet the placement of 5.3.1.1 and 5.3.1.2 due to design

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reasons (such as spare tire, fuel tank, storage battery, etc.), it shall draw a measuring point figure, and mark the position of the microphone. The microphone faces toward the exhaust vent end and is placed on places that satisfy the above conditions as far as possible, and at least 0.2 m away from the nearest obstacle.

5.3.2 Engine operating conditions

5.3.2.1 Measurement of engine rotating speed:

Gasoline engine vehicles (except motorcycles), take 3/4 n_r ± 50 r/min;

Diesel engine vehicles (except motorcycles), take 3/4 n_r ± 50 r/min;

Motorcycles, when n_r>5000 r/min, take 1/2 n_r ± 50 r/min

when n_r≤5000 r/min, take 1/2 n_r ± 50 r/min.

n_r - refers to the rated speed specified by the manufacturer.

5.3.2.2 When measuring, after the engine is stable at the above rotating speed, measure the noise during the process of slowing down from the steady speed as soon as possible to the idling speed, then record the maximum sound level.

5.4 Engine noise measurement (see Figure 2)

5.4.1 Microphone position

5.4.1.1 The microphone is 0.5 m above the ground, and faces toward the vehicle. It is placed on the side of the vehicle where has no driver's position. At where 0.5 m away from the vehicle’s outer contours, the microphone’s reference axis is in parallel to the ground, located in a vertical plane; the position of the vertical plane depends on the position of the engine.

Front-engine: perpendicular to the plane and passing through the front axis.

Rear engine: perpendicular to the plane and passing through the rear axis.

Mid-engine and motorcycle: perpendicular to the plane and passing through the midpoint of the front and rear axis.

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Additional information:

This Standard shall be under the jurisdiction of the National Standardization Technical Committee on Acoustic.

This Standard was responsibly drafted by the Beijing Municipal Institute of Labor Protection. The Ministry of Communications Highway Research Institute and the Changchun Automobile Research Institute participated in the drafting.

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