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Leisure accommodation vehicle - Safety ventilation requirements

旅居车辆 安全通风要求

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Leisure accommodation vehicle - Safety ventilation requirements

1 Scope

This document specifies the vehicle requirements, effective ventilation area requirements, and effective ventilation test methods for the safe ventilation of leisure accommodation vehicles.

This document is applicable to the leisure accommodation vehicles specified in GB/T 22550.

2 Normative references

The following documents contain the provisions which, through normative reference in this document, constitute the essential provisions of this document. For the dated referenced documents, only the versions with the indicated dates are applicable to this document; for the undated referenced documents, only the latest version (including all the amendments) is applicable to this document.

GB/T 2893.2-2020 Graphical symbols - Safety colours and safety signs - Part 2: Design principles for product safety labels

GB/T 3730.3 Motor vehicles and towed vehicles - Dimensions of vehicles - Terms and definitions

GB/T 22550 Leisure accommodation vehicles - Vocabulary

3 Terms and definitions

The terms and definitions defined in GB/T 3730.3 and GB/T 22550 and the following terms and definitions apply to this document.

3.1 leisure accommodation vehicle

Units for temporary or seasonal occupancy and meeting building requirements and road vehicle use requirements.

Note: leisure accommodation vehicles include motor caravans and caravans.

4.1.2 If the vehicle has been tested for safe and effective ventilation in accordance with the provisions of Chapter 6 and the test results meet the requirements for determining the results, and a permanent label is posted next to the fired equipment, it is considered that the requirements of 4.1.1 have been met. The content of the label shall comply with the provisions of Appendix A.

4.1.3 The ventilator shall meet the following requirements:

a) Renew the air for the occupants;

b) Provide combustion air for non-space enclosed equipment in the vehicle;

c) Evacuate the combustion products of the equipment having no flue in the vehicle;

d) Provide necessary ventilation for installed electrical equipment.

4.1.4 If the effective ventilation area is reduced during the running of the vehicle, when the vehicle is stopped and the engine is turned off, the ventilator shall be automatically restored to meet the requirements of Chapter 5 or Chapter 6.

4.1.5 In order to ensure the safety of living, the following points shall be emphasized in the vehicle instruction manual:

a) Under no circumstances shall the vents be blocked or partially blocked;

b) It is necessary to keep the ventilation openings unobstructed and keep the ventilation mesh panels or ventilation protection devices for the ventilation openings (such as gratings) clean;

c) Cooking equipment such as cookers working with naked fire shall not be used for indoor heating;

d) If the leisure accommodation vehicle has been tested and approved in accordance with the provisions of Chapter 6, the warning sign specified in Appendix A shall be reproduced in the vehicle instruction manual;

e) During the living, all lift roofs shall be raised for leisure accommodation vehicles with lift roofs.

4.2 Design requirements for flue discharge ports

4.2.1 The flue discharge port shall be installed according to the requirements of the equipment description, and it should be installed on the roof or side wall of the vehicle.

4.2.2 When the flue discharge port is installed under the floor, its position shall be close to the sides or rear of the vehicle, and protective measures shall be taken to prevent combustion products from entering the living area through the floor.

Description of the indexing numbers:

1 --- Window;

2 --- Forbidden area;

3 --- Bottom of the vehicle.

Note: If the flue discharge port is installed directly below the window opening due to structural or layout restrictions, the gas equipment shall stop working automatically when the window is opened.

Figure 2 -- Schematic diagram of the window surrounding area where the installation of the flue discharge port is forbidden

4.3 Design requirements for ventilation openings

4.3.1 The ventilation openings of the ventilator shall include high-level ventilation openings and low-level ventilation openings.

4.3.2 The high-level ventilation openings can be on the car roof or at a high position on the wall. The high-level ventilation openings on the wall shall be installed at a position that is no less than 1750 mm above the interior floor of the vehicle or no more than 150 mm from the interior roof of the vehicle, and in any case, the position shall be at least 300 mm higher than the top surface of the mattress of the highest berth.

4.3.3 The low-level ventilation opening shall not exceed 100 mm above the floor of the vehicle.

4.3.4 The installation of the ventilation openings shall ensure that the ventilation function of the ventilation openings will not be affected due to decorative parts, curtains, or other obstacles.

4.3.5 If ventilation is provided to the interior of the vehicle through cupboards, bed boxes, or similar spaces, it shall be ensured that the airflow is not blocked (e.g., blocked by items stored in such spaces).

4.3.6 Ventilation openings shall be protected with protective devices (e.g., gratings). The protective device shall be easy to clean, and it shall be possible to remove the protective device by using simple tools (such as screwdrivers).

5 Requirements for the free area of ventilation

5.1 Basic requirements

5.1.1 When calculating the free area of ventilation, the area of all protective devices (such as gratings) of the ventilation openings shall be subtracted.

5.1.2 The free area of ventilation of the vehicle shall be reasonably allocated according

6 Effective ventilation test method and result judgment

6.1 Test conditions

6.1.1 The external ambient temperature shall be controlled at 20 ℃±5 ℃, and the wind force shall be less than or equal to 0.3 m/s.

6.1.2 Turn off the engine, close all doors and windows, and turn off manually closable ventilation equipment; keep the above devices and equipment closed during the test period. When the ventilation equipment cannot be completely closed, the ventilation equipment shall be adjusted to the minimum gear.

6.1.3 Expand the partition curtain, set the bed in the sleeping position and the expansion compartment in the closed position.

6.1.4 Space-enclosed equipment (such as gas refrigerators) and other non-space-enclosed equipment in the vehicle (except grills, cookers, and ovens) shall run together at maximum power.

6.1.5 Seal the passages between all pipelines of instruments (equipment) and the test vehicle.

6.2 Test process

6.2.1 Under the conditions of 6.1.1, measure the carbon dioxide concentration of the external environment at a distance of 1000 mm from the test vehicle.

6.2.2 Use a carbon dioxide tester to measure the concentration of carbon dioxide in each habitable compartment of the leisure accommodation vehicle; the measurement work in all habitable compartments shall be carried out at the same time; the carbon dioxide tester shall be placed in the center of the habitable compartment and about 200 mm below the roof of the vehicle to collect the atmosphere sample, and shall not be in the direct blowing areas of ventilation openings.

6.2.3 Use burners that consume liquefied petroleum gas containing at least 95% propane as fuel and generate carbon dioxide; simulate and calculate the number of passengers in each habitable compartment and the use of unattended kitchen equipment. In this case, the following requirements shall be met.

a) The output power (W_p) of the burner shall be determined according to formula (1):

$$W_p = Z \times [(0.1 \times P) + (0.1 \times N)] \quad (1)$$

Where:

If the test is interrupted for any reason (such as the opening of the door or the accidental extinguishment of the burner), the test shall be abandoned; a new round of testing shall be started after the carbon dioxide concentration in the vehicle is consistent with the carbon dioxide concentration in the external environment.

6.3 Result judgment

During the 3 h test, if the measured result does not rise more than 1% of the carbon dioxide concentration in the external environment, it is deemed to meet the safety ventilation requirements; within the 3 h test, if any measured result rises more than 1% of the carbon dioxide concentration in the external environment, it is deemed that the safety ventilation requirements are not met.

6.4 Test report

The test report shall include at least the following content:

a) The model and/or version of the tested vehicle;

b) The number of habitable compartments and their areas in the tested vehicle;

c) The number of standard beds in each habitable compartment;

d) The number of burners for all grills, cookers, and ovens in each compartment;

e) Description of ventilation openings and/or ventilators, and their location (distinguishing the low/high level);

f) Test results, including a list of all collected CO_2 concentration values or a curve graph of CO_2 concentration values corresponding to time stamps;

g) The contents such as the conclusion of whether the leisure accommodation vehicle meets the ventilation requirements.

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