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Safety property requirements and test methods for fuel tanks of motorcycles and mopeds

摩托车和轻便摩托车燃油箱安全性能 要求和试验方法

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Safety property requirements and test methods for fuel tanks of motorcycles and mopeds

1 Scope

This document specifies the safety property requirements and test methods for fuel tanks of motorcycles and mopeds, as well as the requirements for installing the fuel tank on a motorcycle.

This document applies to metal fuel tanks and non-metallic fuel tanks for motorcycles and mopeds (hereinafter referred to as "motorcycles").

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

fuel tank

An independent tank assembly fixed to a motorcycle for storing fuel.

3.2

leakage of fuel

Fuel drops from the fuel tank in lines or drops.

3.3

rated capacity

The fuel capacity specified in the fuel tank design parameters.

3.4

fuel weight loss

The change in weight of fuel stored in the fuel tank due to diffusion during the prescribed fuel tank safety property test.

3.5

dump stop valve

A device that prevents fuel from spilling when a motorcycle falls over.

3.6

fuel tank attachment

Parts and assemblies installed on the fuel tank principal.

Note: Such as fuel tank cap, fuel level sensor, fuel pump, dump stop valve, oil-gas separator or oil pipe, but excluding charcoal canister.

3.7

fuel supply system

A system consisting of a fuel tank and the fuel tank attachment.

3.8

automatic compensating pressure device

A device that automatically compensates for the working pressure or safety pressure of the fuel tank.

Note: Such as vent valve, safety valve, etc.

3.9

working pressure of the fuel tank

The pressure above the liquid level in the fuel tank under normal vehicle operating conditions.

4 Safety property requirements for fuel tanks

4.1 Fuel tanks shall be made of metal or non-metallic materials. The fuel tank and its adjacent parts shall be designed so as not to generate any electrostatic charge that could cause sparks between the fuel tank and the vehicle frame.

4.2 Fuel tanks shall be corrosion-resistant.

4.3 The fuel tank is to be subjected to an anti-pressure testing in accordance with 5.1. The test pressure shall be twice the relative working pressure of the fuel tank or a relative pressure of 30 kPa, whichever is higher. The fuel tank and its fuel tank attachment shall not show any rupture or leakage. However, permanent deformation of the fuel tank is permitted.

4.4 The fuel tank shall be equipped with an automatic compensating pressure device to automatically release any excess pressure or pressure exceeding the working pressure of the fuel tank. The automatic compensating pressure device shall be designed to eliminate any ignition hazard.

4.5 Fuel must not flow out of the fuel tank cap or any device installed to release excessive pressure. Carry out the test in accordance with 5.2. The average value of the total fuel leakage at each angle shall not exceed 30 g/min. The amount of fuel dripping during the overturning process shall not be taken into account.

5 Safety property test methods for fuel tanks

5.1 Anti pressure testing

5.1.1 Unless otherwise specified, the anti-pressure testing shall be carried out at an ambient temperature of 20 ℃ ~ 30 ℃.

5.1.2 The fuel tank shall be installed with all accessories as per normal use and filled with the rated capacity of non-flammable liquid (such as tap water). Seal all openings between the fuel tank and the outside. If there is an automatic compensating pressure device, the ventilation channel shall also be sealed. Gradually increase the air pressure inside the fuel tank through the fuel tank filling port, fuel tank vent or fuel supply pipe until it reaches the pressure value specified in 4.3; maintain this pressure for not less than 60 seconds. Check and record any leakage from the fuel tank and its accessories, as well as any deformation of the fuel tank.

5.1.3 If the anti-pressure testing in 5.1.1 is carried out at the fuel tank filler port, the fuel tank cap shall be subjected to a separate pressure test at the pressure value specified in 4.3, and this pressure shall be maintained for not less than 60 seconds. Check and record any leakage from the fuel tank cap.

5.2 Rollover test

5.2.1 Unless otherwise specified, the rollover test shall be carried out at an ambient temperature of 25 °C ± 5 °C.

5.2.2 Fix the fuel supply system in simulated vehicle loading form on the test fixture.

5.2.3 The test fixture shall rotate along an axis parallel to the longitudinal axis of the vehicle.

5.2.4 The rollover test shall be carried out twice, once with the fuel tank filled to 90% of the rated capacity with the test liquid, and once with the fuel tank filled to 30% of

the rated capacity with the test liquid. The test liquid is a non-flammable liquid or tap water with a viscosity and density similar to that of normally used fuel.

5.2.5 Rotate the installed test device 90° to the left. Remain the fuel tank in this position for not less than 5 minutes. Rotate the fuel tank another 90° in the same direction. Maintain at this fully inverted position for at least 5 minutes. Restore the fuel tank to its normal position and discharge the test liquid that cannot flow back into the fuel tank from the vent valve, which can be replenished. Rotate the fuel tank 90° to the right from its installed position. Remain the fuel tank in this position for not less than 5 minutes. Then, rotate the fuel tank another 90° in the same direction. Maintain at this fully inverted position for at least 5 minutes. Each 90° turn shall be completed within 3 minutes. The amount of fuel leakage shall be recorded after the fuel tank is turned over at each angle.

5.3 Test methods for non-metallic fuel tanks

5.3.1 Permeability test

The permeability test shall be carried out on a brand new fuel tank.

Fill the fuel tank with 50% of the rated capacity of the test fuel; close the tank; place it in an environment with an air temperature of 40 ℃ ± 2 ℃ until there is a stable mass loss. The pre-storage period shall be no less than 28 days. Empty the fuel tank and then refill it with 50% of the rated capacity of the test fuel. Place the fuel tank in a stable environment at a temperature of 40 ℃ ± 2 ℃ until the fuel temperature reaches the test temperature. Close the tank and measure the fuel mass loss due to diffusion after 56 days. The results of each fuel tank permeability test shall be recorded, and the maximum value shall be taken as the final result.

Note: The test fuel refers to the motor vehicle gasoline (V) with a research octane number of 92 or 95 that complies with the provisions of GB 17930.

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