STRUCTURE OF VEHICLE BUMPERS AND THEIR DURABILITY TESTS

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Car bumper is a part that absorbs and reduces external impact and protects the front and rear ends of the car. Many years ago, the front and rear bumpers of cars were stamped with steel plates to the channel steel, riveted or welded to the longitudinal beams of the frame and had a large gap with the body, they looked very ugly. With the development of the automotive industry and the widespread use of engineering plastics in the automotive industry, the car bumper is also on the way to innovation as an important tool for car safety. The front and rear bumpers of today's cars not only retain the original protective function, but also strive for harmony and unity with the body shape and strive for their light weight. Front and rear bumpers of cars are made of plastic. People call them plastic bumpers.

Plastic bumpers of cars consist of 3 parts: cushioning material, outer panel and cross beam. The outer panel and cushioning material is made of plastic and cross-beam cold rolled to form U-shaped grooves; the outer plate and cushioning material are attached to the cross beam.

There are two types of separation for car bumper plastic parts: outer and inner. Exterior or interior types can be used for all large areas on both sides of car bumpers. The choice of these two separation methods mainly depends on the bumper requirement for the base engine plant for the final vehicles. European and American cars mainly use internal separation technology, while Japanese cars mainly use external separation.

There are 2 types of divorce, each with its own advantages and disadvantages. External separation bumpers have to deal with parting lines and increase the processing procedure, but the cost and technical difficulty of external separation bumpers are lower than those of internal separation bumpers. The internal buffer can be perfectly inserted into the buffer by the dual rail variable control technology, which ensures the appearance of the buffer and saves the processing process and cost of plastic parts. But the disadvantage is that the price of the mold is high and the technical requirement of the mold is high, because its appearance is high quality, it is widely used in middle and high-end cars.

Testing car bumpers for durability generally does not require restoration and changes in technical characteristics of the car. Bumpers are designed as a piece of car armor and aim to minimize damage caused by burning or stopping vehicles.

Bumpers are designed to reduce damage to the front or rear of the vehicle during application and parking. They absorb the damage and protect the car even if the car gets a defect. Bumpers are simple and specialized replacements for the body of the car, but must maintain compliance with generally accepted test standards.

Since the bumper is an important element of car safety, before each modification is put on sale, its design is subjected to a series of tests, as a result, the quality of the shape is determined and whether the specific materials are suitable.

There are several tests to see if the part can be put into the machine:

• The element attached to the stand is hit by a heavy structure (pendulum) with a certain force. The mass of the moving structure corresponds to the mass of the intended vehicle. In this case, if the car is moving at a speed of 4 km / h, the impact force should be equal to the impact.

• The strength of the bumper is tested directly on the test vehicle. The car hits a fixed barrier at the same speed.

This check is done with the front and rear bumpers. A part is considered safe if it is not deformed or damaged by impact. This test is carried out by European companies. As for the American standards, the test is taking place under stricter conditions. Thus, the mass of the pendulum does not change (it is the same as the weight of the tested car), but its speed is twice as high and is 8 km / h. Therefore, bumpers on European car models look aesthetically pleasing, and the American counterpart is more massive.

There are the following ways to test car bumpers for durability:

1. Testing laboratories: Many countries have testing laboratories for automotive products. Car bumpers are tested in these laboratories. Through the tests, bumpers are checked against specified damage levels and given a rating based on the test procedure. Tests are also used to evaluate the bumper's value, construction materials and interconnect system.

2. Certification and standards: Bumpers specified for cars in each country must comply with certified standards. These standards ensure that bumpers are designed with the correct dimensions, design and damage reduction properties. Bumpers with certified standards help achieve durability when tested.

3. Virtual Testing: With the advancement of technology, virtual testing has been incorporated in evaluating the design and durability of vehicles. This is done using computer graphics and simulation models. Virtual tests allow you to study the burning and stopping processes of cars, the level of damage and the treatment

4. External tests: Bumpers are strictly tested during the use and parking of cars. These tests are conducted by car manufacturers. During the test, the vehicle's durability, level of bumper damage, and any restoration work required are frequently checked.

Durability testing of car bumpers depends on the overall durability of the cars, the level of damage and the structures installed during the stop. These tests are carried out by car manufacturers and are of great importance in ensuring the safety of cars and lives of bumpers.

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