

## **How Are Cars Tested for Safety?**

In the United Kingdom, as in many countries across the globe, new vehicles must undergo various government safety tests before going on sale. However, most motorists are more interested in the tests that form the basis of the safety ratings awarded by Euro NCAP, a safety assessment programme that originated in the UK but is now based in Brussels.

Backed by the European Commission, 7 EU governments, and motoring organisations representing every EU member country, Euro NCAP publishes safety ratings for a variety of popular motor vehicles every year. These ratings are calculated from the results of a series of crash tests, which although based on the same test procedures used by government authorities, are more rigorous and therefore more widely respected by consumers.

## **What Exactly Do the Tests Involve?**

The main tests that Euro NCAP has historically performed are frontal and side impact tests, as well as side pole impact and pedestrian tests. These are carried out as follows:

### **1. Frontal Impact Test**

The frontal impact test is performed by driving the vehicle into a deformable barrier. The barrier is offset so that it overlaps 40% of the width of the car being tested, rather than forming a solid barrier right across its path. The car is propelled into the barrier at a speed of 64 km/h, which, taking into account the structural properties of the barrier, should accurately replicate the forces at work in a collision involving two cars travelling in opposite directions at 50 km/h. During the test, two adult-sized dummies are strapped into the front seats and child-sized dummies are strapped into the rear seats.

### **2. Side Impact Test**

In the side impact test, it is the deformable barrier that moves rather than the vehicle being tested. Mounted on a trolley, it is propelled into the side of the car at a speed of 50 km/h. During this test, there is an adult dummy in the driver's seat (of the same size as an average male) and child dummies in the rear seats.

### **3. Side Pole Impact Test**

This test is intended to replicate what happens when a driver loses control on the road and skids sideways into a solid object – such as a tree or lamppost – located at the side of the road. The car is propelled into the pole at a speed of 32 km/h. It is placed at an oblique angle of 15 degrees to the direction of travel, so that it is not quite perpendicular to the pole at the point of impact. During the test, a male adult dummy is placed in the driver's seat.

### **4. Pedestrian Tests**

The pedestrian protection score is derived from three different tests involving head, upper leg and lower leg impacts. Both adult and child-sized head form impactors are used in the head tests, and just adult leg form impactors in the leg tests.

### **What Are the Tests Designed to Show?**

1. Frontal Impact Test – This is designed to test the structure of the car as a whole and ensure that in the event of a frontal impact, energy is directed to wherever it can be safely absorbed. It is also designed to ensure that the front crumple zone crumples in such a way as to minimise any deformations of, or intrusions into, the passenger compartment.
2. Side Impact Test – The side impact test is designed to ensure that the side of the vehicle being tested provides adequate protection to vital body areas.
3. Side Pole Impact Test – This test is intended to discover whether the vehicle can protect the driver's head sufficiently well in the event of such an impact. Because the force of the impact is concentrated in a small area, without adequate protection the pole could penetrate well into the passenger compartment and hit the driver's head.
4. Pedestrian tests – These are designed to ensure that the vehicle manufacturer has done everything possible to minimise the injuries that would be sustained by a pedestrian in the event that he or she was struck by the car being tested.

### **Other Tests Performed by Euro NCAP:**

#### **Child Occupant Protection.**

Euro NCAP also performs tests involving small child dummies placed in child restraint systems that are recommended by the manufacturer of the car being tested. Both frontal and side impact tests are carried out to establish how well these systems work. Additionally, a selection of currently available child restraint systems other than those recommended by the manufacturer are tested to see how easy they are to install without mistakes being made that would compromise their effectiveness.

#### **Whiplash Tests**

The whiplash tests are a more recent addition to Euro NCAP's programme and they are intended to test the effectiveness of seats and head restraints in protecting occupants from whiplash in the event of a rear impact. They consist of three dynamic tests as well as an assessment of the design of the head restraints for both the front and rear seats.

#### **Full Width Rigid Barrier Test**

Introduced this year, this test involves the car being driven at 50 km/h into a rigid barrier that spans the entire width of the car. During the test, a female-sized dummy is placed in the driver's seat, and another one is placed in the passenger-side rear seat.

### **AEB City Test**

To test the effectiveness of autonomous emergency braking systems designed to prevent or lessen the impact of low speed rear-end collisions, cars are driven towards a target vehicle at a speed of between 10-50 km/h. The test was introduced last year because this type of collision often results in whiplash injuries to the passengers in the car in front.

### **Protecting Yourself and Your Family**

You can make sure that you are doing everything possible to protect yourself and your family when on the road by checking the Euro NCAP ratings for any car that you are thinking of buying. From 2016, only vehicles that feature state-of-the-art crash avoidance systems - such as AEB, lane departure warning and pedestrian detection - will stand a chance of being awarded a 5-star rating.