EURO NCAP CRASH TESTS

Superminis

- FIAT PUNTO
- FORD FIESTA
- NISSAN MICRA
- RENAULT CLIO
- ROVER 100
- VAUXHALL CORSA
- VW POLO

Produced in association with WHAT CAR?

Contents

In the UK in 1995 1,749 car occupants were killed and 21,710 were seriously ed in road accidents. The in terms of human misery is mous. However, from dish estimates, a half of fatal disabling road accident ies could be saved if people e the cars that gave the best ction in each weight category. ll new car models must, by pass safety tests before they e sold and manufacturers voluntarily carry out additional testing to cater for accidents not covered by these tests. New car designs are becoming safer; however manufacturers do have a choice when deciding on additional safety features they incoporate into their cars.

It is unfortunately impossible to find out how safe a car is simply by looking at it in a show room. That is why we have used the latest test methods to give you comparative safety data on new cars. We have carried out research into these test procedures and are confident that they reflect how cars will perform in car-to-car accidents.

We should of course like to be able to report on all new cars being sold, but the cost of carrying out all the necessary tests would be prohibitive. I am, therefore, delighted to be able to welcome the contributions already made by International Testing, the Swedish National Road Adminstration, the FIA (Federation Internationale De L'Automobile), the AA and the RAC. I am also glad to say that we shall all be joining together for future tests.

I believe the information provided by these tests will be welcomed by everyone thinking of buying a new car. I am certain that it will make a significant contribution towards road safety.

John Bowis
Minister for Transport in London and Road Safety

More than ever before safety sells cars. For car buyers it is a key element of their purchasing decision. It is essential, however, that the consumer can obtain reliable and accurate information about the safety performance of individual car models.

To help the consumer make an informed choice, the Department of Transport (UK), the Swedish National Road Administration, the Federation Internationale de l'Automobile, International Testing, the RAC, and the AA are co-operating together to establish the European New Car Assessment Programme (Euro NCAP).

Using test procedures based upon new European Union safety standards for front and side impact the programme provides a realistic assessment of the crashworthiness of individual cars. The first report on superminis will be followed by further reports covering larger vehicle classes.

'We hope this will encourage a market for safety and give makers an incentive to build safer cars'

We hope this information will encourage a market for safety and give manufacturers a stronger incentive to build safer products that perform above the minimum standards required by regulation. We believe that the Euro NCAP will help to reduce the 50,000 people killed each year in car accidents in Europe and make a real contribution to improving road safety.

Max Mosley
Chairman of Euro NCAP, President of the Federation Internationale de l'Automobile

How the tests were done

ital crash test information is for the first time freely available in this country – nd to new, tougher standards. Here's the background to their development

uro NCAP – the European New Car Assessment Programme – represents a r step forward in making independent, impartial mation on a car's worthiness available to who need it most – people buy and drive new cars. is the first time in this try that a series of crash has been conducted, the ts of which are available to one. It is also the first time tests have been carried out to standards that are both her and more indicative of ife accidents. he UK's Transport Research ratory (TRL) played a key n developing these tests for al impact, side impact and strian protection, with a to their becoming the new test standards for Europe. frontal test is used already onsumer information in rica and Australia. or this first phase of Euro P testing, seven superminis crash tested at the TRL's ities at Crowthorne, shire. This report details the lts and explains how and the tests were done.

y is more crash ting needed?

safety has a higher profile ever before, and it is easy to ve that all the crash tests on w model that can be done, are . This is not so. Every ufacturer crash tests new models. Some do a lot, others less. Since these tests vary in their severity and procedure, they never provide any like-for-like basis for comparison – even if the results were made public, which they are not.

Independent organisations may crash test cars from time to time, and make the findings public. But until now there hasn't been a full crash test programme, independently carried out and with the results available to all. The Department of Transport and its partners in Euro NCAP thought it was time there was.

The Euro NCAP international partnership is made up of the Department of Transport, the Federation Internationale de l'Automobile (FIA), the Swedish National Road Administration, the RAC, the AA and International Testing (on behalf of consumer organisations such as the Consumers' Association in the UK).

But doesn't the law require new cars to pass a crash test?

It does. But currently only one. As part of every new car's Type Approval (a process which ensures that new models meet minimum safety and environmental standards), an example of every model type must be crashed head-on into a concrete block at 50km/h (30mph). None of the sophisticated dummies, with recording equipment that shows what happens to driver and passengers in a crash, need be in the car for this test. Pass or fail depends on meeting two criteria: how far the steering wheel is pushed back, and how far it is pushed upwards.

In 1998, a new Type Approval crash test comes into force for new car models. Like the Euro NCAP frontal test, it uses an offset impact into a deformable barrier that more closely resembles real-life accidents. The Type Approval test uses a speed of 56km/h (35mph) whereas for Euro NCAP this has been raised to 64km/h (40mph).

Also in 1998, a side impact Type Approval test comes into force for new car models. This will use the same test as that used in Euro NCAP.

Tests for pedestrian protection have also been developed for legislation but there is no planned introduction date for them. Again these tests are the same as those used in Euro NCAP.

Who pays for the NCAP tests?

This first phase of Euro NCAP testing has been funded by the Department of Transport, and it was carried out by the Transport Research Laboratory in Berkshire.

However, future test programmes will be paid for by other NCAP members, as well as the Department of Transport.

Who provides the cars for testing?

There is a policy to buy each of the test cars for a Euro NCAP programme anonymously, ensuring each one is a normal production model.

The cars in this supermini group are: Fiat Punto, Ford Fiesta, Nissan Micra, Renault Clio, Rover 100, Vauxhall Corsa and Volkswagen Polo. All were equipped with a driver's airbag; none had a passenger's airbag.

The next phase of Euro NCAP testing is scheduled to be on family cars such as the Ford Mondeo and Vauxhall Vectra. Small family cars, such as the VW Golf and Ford Escort, and large cars will follow.

What tests are done?

Many different types of road accidents occur to a wide variety of people of different sizes, ages and abilities to survive impacts without injury. It is impossible to assess how well a car provides protection in all circumstances as no crash tests can fully reflect all accidents.

However, the tests chosen for Euro NCAP are the best researched tests available for use today. They are intended to form the basis of future legislation and to act as a guide so that car designers can provide improved protection in a large number of the most frequently-occurring serious and fatal accidents.

There are three tests: frontal impact, side impact, and pedestrian safety, each designed to represent actual accidents as closely as possible.

In the frontal impact, instead of hitting a solid block head-on, the test car impacts against a deformable structure which resembles the most important characteristics of the other car's front. The impact is across 40 per cent of the test car's front and is intended to represent a crash with a car of equivalent size and weight. Frontal car-to-car crashes are by far the most common sort of accident, and usually involve a collision across only part of the car's width. The offset test is always on the driver's side where there is more risk of injury from the steering wheel and pedals.

Other cars do not behave like solid objects when hit: they 'give' at the front, hence the aluminium honeycomb block used in the test. This, according to the TRL, is essential in ensuring that a car's front is designed to absorb the impact's energy in a realistic way.

This sort of test is actually tougher for a car to do well in than one involving a full-on collision with a solid block. The Euro NCAP test is carried out at 64km/h (40mph).

Side impacts are less frequent than frontal collisions but their consequences are often more serious. For the Euro NCAP test, a trolley with a deformable aluminium block is rammed into the stationary test car driver's door at 50km/h (30mph).

Although an assessment of head injury is made in the side impact test, it should be noted that this test is not good at assessing head injury risk since in real accidents the head may hit, for example, an object outside the car. In the test, it is unusual for the head to hit anything other than the side glass, which has often already broken. Hitting the glass in this way does not pose a significant risk of brain injury.

After car occupants, the next priority group for protection is pedestrians, most of whom are killed or seriously injured in accidents by being hit by the front of a car. Despite this, there is no current legislation and car manufacturers have done little to help protect pedestrians.

For the pedestrian test, instead of a dummy being hit by a moving car, various test devices, representing sections of the human body, are 'fired' at the front of a stationary test car. In this way, the testers can precisely control where, for example, a leg or a head hits the car and from this determine the risk of injury.

For each test, the manufacturers supplied seating position and test set-up information. They were invited to attend the tests and were able to satisfy themselves that the tests were carried out correctly. After each test, the manufacturer was supplied with the test data on its car and asked to compare it with any data it had from its own tests. Meetings were also held with each manufacturer where there was the opportunity to discuss any problems.

How are the results measured?

For the frontal impact, two dummies, packed with sensors, are strapped into the front seats. These complex models boast a human-type structure — including 'bones' — which is designed to simulate a real person's injuries in an accident.

The dummy's instrumentation is used to help assess the risk of injury to the head, neck, chest, knees/upper legs/pelvis, and lower legs. Key information provided includes the accelerations or forces each part of the dummy experiences.

The results aren't entirely electronically generated. Assessing injuries to feet and ankles, say, depends on the extent of intrusion into the footwell, at present measured by movement of the brake pedal. No dummy instrumentation is yet available to assess feet and ankle injury.

In addition, physical examination of the car and analysis of the high-speed film taken of every impact also play an important role in determining the protection rating for the driver in the frontal impact test. This additional information is used to assess how well the protection, as measured by the dummy, would apply to differently-sized drivers in

DEPARTMENT OF TRANSPORT

The Secretary of State's principal aims are

- To promote an efficient market, with prices reflecting the true costs of transport.
- To enable the market to provide greater choice by substantially increasing opportunities for private sector involvement.
- To assist economic growth and to provide greater choice in good quality, safe and accessible services for all transport uses.
- To promote safety, security and mobility across all modes of transport.
- To reduce the adverse impact of transport on the environment.
- To promote UK transport policies and interests internationally.
- To conduct high quality licensing and regulatory services effectively and economically.

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AUTOMOBILE ASSOCIATION

The Automobile Association was founded in 1905 as a club to champion the needs of motorists

- Today the Automobile Association has nine million members, operates the world's largest patrol force and attends five million breakdowns a year.
- The AA is Britain's largest insurance intermediary, with 1.5 million vehicle and home policyholders. Among other motoring-related activities, the Automobile Association runs a successful driving school and publishes more maps, guides and atlases than anyone else.

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FEDERATION INTERNATIONALE DE L'AUTOMOBILE

The Federation Internationale de l'Automobile (FIA) is the worldwide, non-profit federation of motoring organisations

It brings together 143 motoring clubs worldwide in 113 countries with a combined membership of 100 million individual members. As such the FIA has a unique role as the representative of the ordinary motorist and is involved in a range of automotive, consumer, environmental and safety issues. The FIA is also the governing body of international motor sport.

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INTERNATIONAL TESTING

International Testing (IT) is an association of 24 independent non-profit making consumer organisations from 21 countries, mostly in Europe

The aim of International Testing is to provide consumers with impartial and objective information about goods and services.

The IT joint comparative test programme includes regular tests on cars and member organisations have a long-standing interest in car safety; since 1983, an assessment of safety has been part of IT's standard car test.

IT was one of the first organisations to participate in these Euro NCAP crash tests and made a significant contribution to the drawing up of the testing and evaluation protocols.

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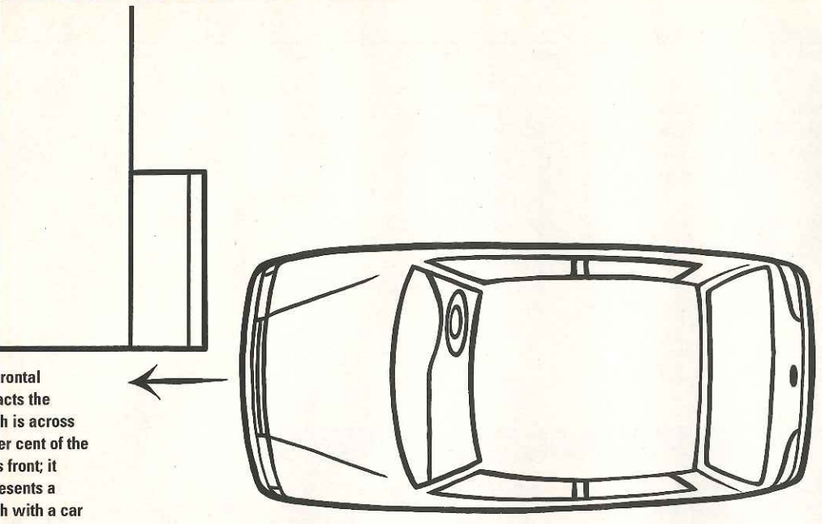
Crashtest



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this assessment is not used as part of the overall rating.

How a child restraint fits in a car affects the protection it gives in a crash. The performance of the child restraint is affected by both the car's seat and seat belt. Identical child restraints in different cars may well give different performances.

No assumptions should be made about how the crashworthiness of these cars may compare with that of cars not tested. It is also important that comparisons are not made between the crashworthiness of cars in different size categories.

What can cause a car to be 'downrated'?

A number of factors can cause a car's performance as recorded by the dummies to be modified – for

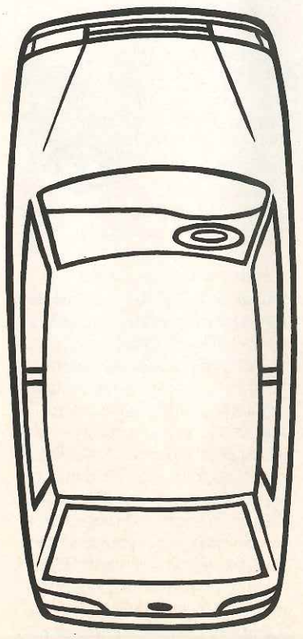
tal impact crash tests take place at 64kph into an aluminium honeycomb block

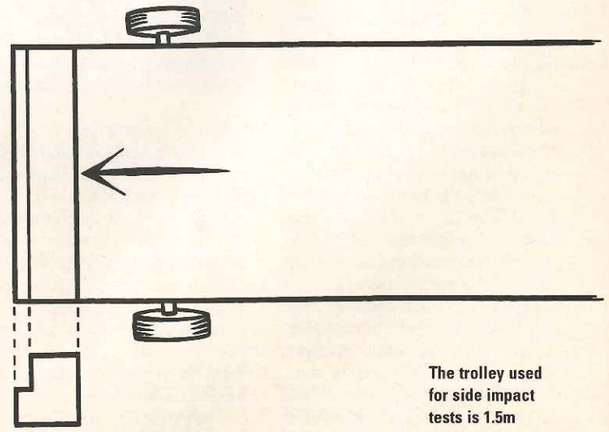
A side impact trolley with a deformable front impacts the test car at 50kph

erent seating positions. This affect a car's rating, which is in the test reports a car's formance is said sometimes to e been downrated.

This frontal test is not a severe act for the passenger. hough the passenger data is vided, it is only used in the rall assessment for protection ront and side impacts if part he passenger's body was less protected than the driver.

Another type of dummy is d in the side impact test. This esses the risk of injury to the d, chest, abdomen and pelvis. e ratings for each car are ed solely on electronic data, as are for the pedestrian test. n frontal and side impacts, a mmy of a three-year-old child rapped into a manufacturer-ommended child restraint on rear seat. This dummy does contain instruments, but ws an assessment of the raint's ability to control the vement of the child. However,





The trolley used for side impact tests is 1.5m wide and is aimed at the driver's door

example from 'marginal' to 'weak'. This may be because of a potentially greater risk of injury to differently-sized drivers, or the likely consequences of an impact at a different speed or angle.

These factors, which are normally only relevant to the driver in the frontal impact test, are based on:

Structural performance

The extent to which the passenger compartment survives the impact. Excessive deformation can create greater risks for larger occupants or drivers with their seats nearer the steering wheel.

Unstable passenger compartment

Where a structural failure occurs – for example of the facia's attachment to the side of the car, or of the door latches – meaning that a small increase in impact severity could result in much more intrusion.

Steering wheel movement / airbag stability

The protection rating for the driver's head is adjusted if the steering wheel moves back or up further than the proposed limits for legislation.

It is also adjusted if the head doesn't make proper contact with the airbag. Maintaining the position of the steering wheel (and thus airbag) is necessary to provide good protection for a wide range of occupant sizes and seat positions.

Facia design

The protection rating for the driver's upper legs is adjusted if the area of the facia where the knees hit is 'aggressive', that is, if there are stiff structures behind the facia that could concentrate forces on part of the knee or cause sharply increased loads if the knees penetrated further into the facia. As not every car driver has his knees in the same position, a wider area is considered than that hit by the dummy's knees.

What's the difference between 'limited' and 'excessive'?

In the tests, a car's performance in key ways is described by adjectives all of which are based on actual measurements. Some of these are:

A-pillar movement
Limited: up to 100mm (4ins)
Moderate: 100-200mm (4-8ins)
Excessive: more than 200mm (8ins)

Steering wheel displacement
Good: less than 100mm (4ins) horizontal, 80mm (3ins) vertical
Limited: 100-150mm (4-6ins) horizontal, 80-130mm (3-5ins) vertical
Moderate: 150-200mm (6-8ins) horizontal, 130-180mm (5-7ins) vertical
Excessive: more than 200mm (8ins) horizontal, 180mm (7ins) vertical

Footwell deformation
Limited: less than 100mm (4ins)
Moderate: 100-200mm (4-8ins)
Excessive: more than 200mm (8ins)

(Inch equivalents are approximate only)

ROYAL AUTOMOBILE CLUB

The Royal Automobile Club is a modern and progressive motoring organisation. It was founded 100 years ago to encourage motoring and protect the interests of the motorist

Today, the Royal Automobile Club is a pioneering high technology organisation which provides motoring assistance to nearly six million members, champions responsible developments in motoring, anticipates the needs of all motorists and provides an independent voice for them. The RAC is also the governing body of British motor sports.

Edmund King, RAC Public Affairs, 14 Cockspur St, London SW1Y 5BL
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SWEDISH NATIONAL ROAD ADMINISTRATION

Swedish National Road Administration (SRNA) is responsible for all infrastructure targets. In road safety, its political target is to reduce the number of fatalities and injuries

More recently, this target has been explicitly sharpened by the 'Zero Vision', where it is stated that the long term target is zero fatalities and serious injuries. The strategy for acheiving this is to build a road system that is more forgiving to human errors. Increased passive safety is one of the areas that fits into this strategy, so SRNA has actively promoted the development of Euro NCAP.

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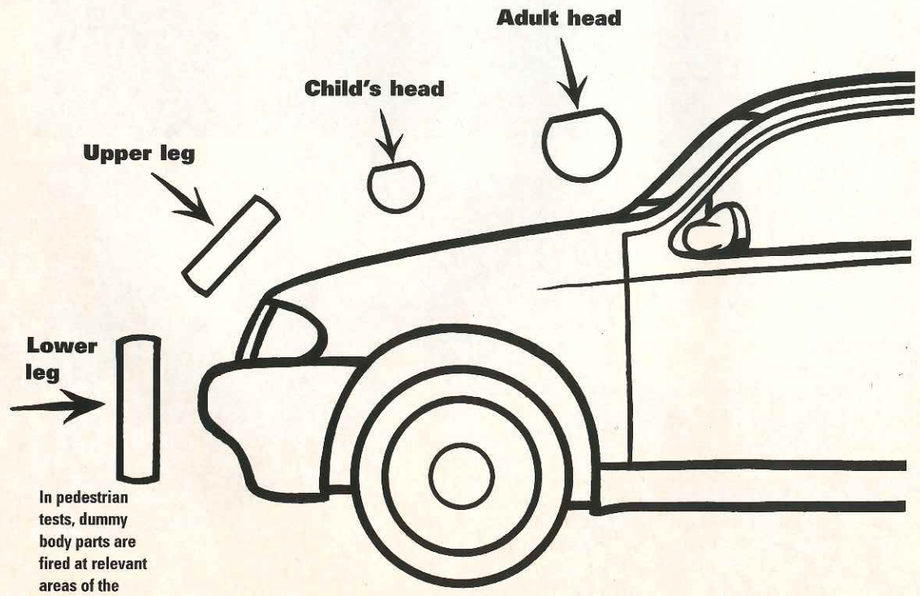


In pedestrian tests, dummy body parts are fired at relevant areas of the car's front

GLOSSARY

Crashworthiness
Describes a car's ability to provide protection in a crash.

Intrusion
Deformation of the passenger compartment or the amount items such as the facia or steering wheel are forced back towards the driver.

Offset
A frontal crash test where the impact is on one side only.

A-pillar
The pillar at the front of the door which also forms the windscreen side support.

Footwell
The area where the pedals are located.

Meet the drivers

Steel-skeletoned, rubber-skinned dummies are strapped into the front seats in place of human passengers during crash testing. Here's what they do

order to provide a picture of kely injuries in a crash, each st relies on having a driver assenger aboard. No ary driver and passenger, these are steel-skeletoned, r-skinned dummies d inside with sophisticated ng equipment.
r the frontal impact, a ny called Hybrid III is belted he car behind the steering l. A 50th percentile male ny – in size and weight, he is verage – was used for the rminis test, with key mation adjusted to make it ant to drivers of different with their seats in ent positions.
he version of Hybrid III used e Transport Research ratory is the latest available, f the type that is mming the standard crash ummy worldwide.
e was originally developed in S for airbag research, but volved to provide a huge ty of information about happens in a crash test.
ybrid III's cousin, EUROSID, pecial European-developed ny used for side impact All of his instrumentation ot for the head is different, as OSID is designed to measure erations and forces from the during tests.
side each dummy is a steel ton which represents parts e human bone structure. In the dummy's rubber flesh is ed in order to reduce friction. he sensing devices are wired computer recording oment which is carried in the f the car during the impact. ccasionally a dummy will ge from a crash with cuts, nore extensive damage is They are designed not to – which is just as well, each dummy can cost ,000. After every few tests, ummies are recertified. This, is the anatomy of a crash dummy...

Head
The dummy's head is made of aluminium and covered in rubber for flesh. Inside, you'll find three accelerometers set at right angles, each providing information about the forces and accelerations to which the brain would be subjected in a crash.

Neck
Features a variety of measuring devices detect the bending, shearing and tension forces on the neck as the head is thrown forwards and backwards during the impact.

Arms
Neither arm carries any instrumentation. In a crash test, arms flail around in an uncontrolled way, and although serious injuries are uncommon, it is difficult to provide worthwhile protection against them.

Chest (frontal impact)
The Hybrid III dummy's steel ribs are fitted with sensing equipment that records the deflection of the rib cage in the frontal impact. It is important that the loading on the chest area from the seat belt is not too high.

Chest (side impact)
The side impact dummy, EUROSID, has a completely different chest area, with just three ribs which are instrumented to record the compression of the chest and velocity of this compression.

Abdomen
EUROSID, the side impact dummy, is equipped with sensors to record penetrating forces into the abdomen area.

Pelvis
The EUROSID side impact dummy has instruments fitted in its pelvic girdle. They record lateral loads on the pelvis that may cause fractures or hip joint dislocations.

Upper leg
In Hybrid III, this area is made up of the pelvis, femur (thigh) and knee. Load cells in the femur provide information in frontal impact tests on likely injury to all sections, including the hip joint which can suffer from fractures and dislocations.

To detect forces which actually go through the knee joint if the impact with the facia is just below the knee, instrumentation called a 'knee slider' is used to measure the forces transmitted through the dummy's knee joint.

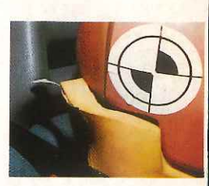
Lower leg
Instruments fitted inside the dummy's leg measure bending, shear, compression and tension at the top and bottom of the lower leg, allowing the risk of injury to the tibia (shinbone) and fibula to be assessed.

Feet and ankles
Injury assessment to the feet and ankles is based on physical deformation of the car.

Top Hybrid III is strapped into the driver's seat of the car for the test **Above** No instrumentation is fitted into the dummy's arms

Head
Made from aluminium with rubber flesh. Three accelerometers provide information for assessing the risk of brain injury

Neck
Has measuring devices to detect bending, shearing and tension forces



Chest
Hybrid III has steel ribs with sensing equipment that records deflection and deflection velocity of the rib cage

Knee
A knee slider is used to measure forces transmitted through the knee joint

Ankle
Injury to the feet and ankles is assessed from the physical deformation of the car

Sensing devices within the dummy are linked to a computer in the rear of the car

Crashtest

Fiat Punto

EURO NCAP RATING

l impact: head contact on the airbag was unstable and the passenger compartment became unstable due to weld failure of the A pillar and facia attachment

he Punto was awarded two stars for protection in frontal and side impact. All the rontal impact criteria were part from rearward ment of the steering wheel. the frontal impact, the major ems related to intrusion and stability of the passenger artment. There were ems for the lower limbs and tion is required to the knee ct areas. The unstable head ct on the airbag suggests tial problems for ent-sized drivers and those ferent seating positions. side impact, the greatest ovements could be expected reducing rib loading while olling the pelvis loading.

ucture

e frontal impact, the Punto's nger compartment became ble owing to failure of the welds on the front door pillar he partial detachment of the Structural deformation was rate. The driver's door buckled, allowing moderate collapse of the door aperture and intrusion of the facia. The driver's door required moderate force to open, and the passenger door needed limited force.

The steering wheel was forced backwards by 213mm, which is judged excessive, and the front of the driver's seat base tilted down, allowing the dummy to have a low forward trajectory. There was moderate intrusion of the footwell.

All the new side impact criteria were met but chest protection was weak

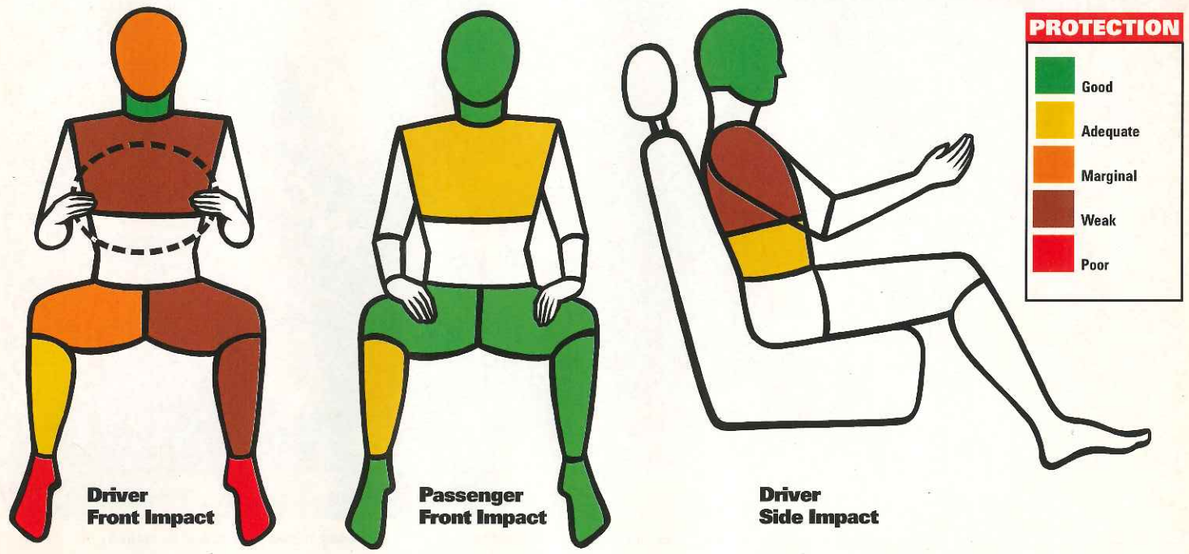
Driver

The driver's head protection would have been good on the basis of the instrumentation, but was downrated to marginal because the head contact on the airbag was unstable and because of the excessive rearward intrusion of the steering wheel. Unstable airbag contact means the head of differently-sized drivers can slide off the bag. Neck protection was good.

Seat belt loading on the chest was recorded as adequate but this was downrated to weak because of the intrusion of the facia and the instability of the passenger compartment.

The driver's left knee struck and fractured the steering column cover and distorted the cover's support bracket. The knee then deformed the facia, to the left of the steering column, which was supported by a stiff steering column mount. The right knee hit the oddments bin. For both knees, there were stiff structures which could concentrate loads on part of the knee and further penetration into the facia would have resulted in sharply increased loads. Because of this, the results were downrated to weak for the left side, marginal for the right.

The steering wheel moved rearwards excessively and the knees hit the column mount and the oddments bin



Solely on the basis of the dummy instrumentation, protection of the left lower leg was found to be weak, the right lower leg adequate. In addition, intrusion of the footwell caused foot and ankle protection to be rated as poor.

Front passenger

Protection of the head, neck, knee/femur/pelvis and left lower leg was good. Seat belt loading resulted in the chest protection being rated as adequate, as was protection of the right lower leg.

Side impact

Head protection was good. Chest protection was weak owing to the loading on the dummy's middle rib. Protection of the abdomen was found to be adequate.

An instrumentation failure resulted in no data being available to assess pelvis protection. However, information supplied by the manufacturer indicated that the ratings would have been within the range adequate to weak. Within this range, the overall performance rating for the car would not vary.

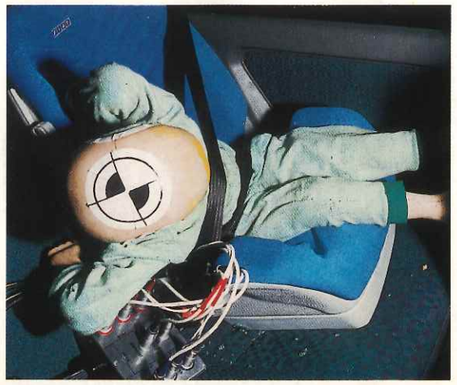
Child restraint

A forward-facing Britax Supercruiser child seat identified with Fiat logos was fitted.

In a frontal impact, forward movement of the child restraint was well controlled but it moved down into the rear seat as the child dummy moved forwards, and the dummy then rebounded in an upward direction.

In addition, there was insufficient restraint of the child's upper body which allowed a large forward movement of the dummy's head to occur. The head rebounded to hit the car's rear seat backrest outside the area of the child restraint.

The lateral movement of the child restraint under side impact was poor with the upper part of the restraint moving as far as the mid line of the car. The child's head then moved well beyond the sides of the child restraint.



Child seat was well restrained in frontal impact but poorly in side impact. In both, the head was allowed to move too much

FIAT PUNTO FACT FILE

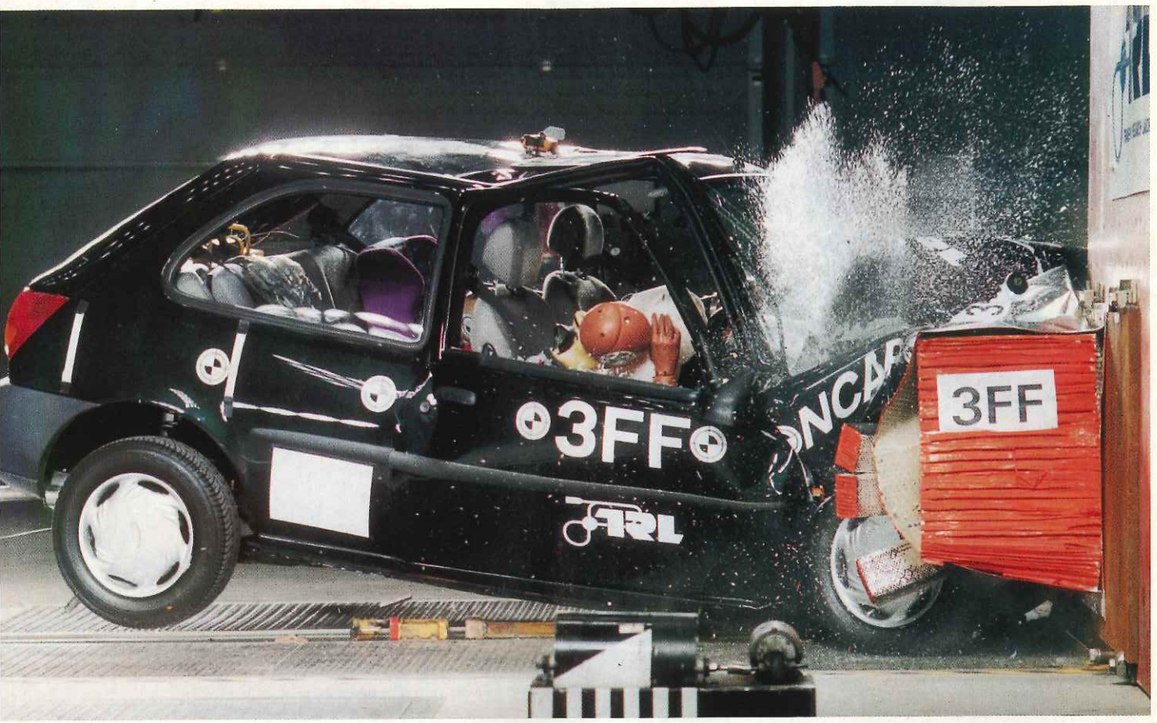
Model	Fiat Punto 55S
Body	Three-door hatchback
Car tested	1996 model year
Build date	November and December 1995
Kerb weight	866kg
UK on the road price	£7436 (with driver's airbag)

Model history

The Punto was introduced in late 1993 and launched in the UK in March 1994. The 1996 model year Punto 55 has door beams and front safety belt pre-tensioners as standard. Driver and passenger airbags are available as options. A driver's airbag was fitted to the test car.

Ford Fiesta

EURO NCAP RATING



e was stable head contact on the airbag in the frontal impact crash test, during which the Ford Fiesta's passenger compartment maintained its stability

he Fiesta was awarded three stars for protection in the frontal and side impact s. All the new frontal impact ria were met with the ption of the rearward ement of the steering wheel. n the frontal impact crash test, major problems were found to e to intrusion, although the senger compartment did ain stable. There were blems for the lower limbs and ntion is required to the knee act areas.
n the side impact test, the test improvements could be ected from reducing the rib ing while controlling the ing on the pelvis.

ucture

he frontal impact crash test, Ford Fiesta's passenger partment remained stable n moderate deformation and usion of the facia. Rearward ement of the steering wheel 125mm. The driver's door kled slightly, and needed moderate force in order to open it, but the passenger door could be opened normally following the impact. Deformation of the footwell was excessive.

Driver

The Fiesta driver's head protection would have been rated as good on the basis of the dummy instrumentation. However, the performance was downrated to adequate because of the degree of rearward intrusion of the steering wheel. Neck protection, however, was found to be good.

Seat belt loading of the chest was measured as adequate but this score was downrated to a result of marginal because of the intrusion of the car's facia during the crash test.

Protection of the upper leg area of knee/femur/pelvis would have been rated as adequate but was downrated to marginal because of the close proximity of hard components positioned behind the facia.

During frontal impact crash test, the dummy's left knee hit the steering column cover and also a stiff mounting bracket which was situated behind it. Further penetration into the passenger compartment of the car could have resulted in greater injury being sustained.

The right knee glanced off the steering column cover and hit the fuse box cover, passing just below a stiff tube which supports the steering column. The right knee of a taller driver could well have hit this tube.

Protection of the left lower leg was judged to be good, and that of the right lower leg was found to be adequate.

All the new side impact criteria were met but chest protection was weak

The steering wheel moved rearwards by 125mm. The knees hit the column mount and the fuse box cover

The excessive intrusion of the footwell caused the Ford Fiesta's protection of feet and ankles to be rated as weak.

Front passenger

Protection of the head, neck, left knee/femur/pelvis, lower legs and feet and ankles was good.

Seat belt loading resulted in the chest protection being rated as adequate, and so was the degree of protection offered to the right knee/femur/pelvis.

Side impact

The Fiesta was assessed as offering good protection for both the driver's head and abdomen.

Chest protection in side impact tests was found to be weak, reflecting the loading on the dummy's top and middle ribs that the impact caused.

An instrumentation failure resulted in no data being available to assess the degree of pelvis protection under side impact crash tests. However, information supplied by the manufacturer indicated that the ratings would have been within the range adequate to weak. Within this range, the overall rating for the car would not vary.

Child restraint

A forward-facing Romer Peggy child seat was the child restraint recommended by Ford.

During frontal impact crash tests, the forward movement of the Fiesta's child restraint was found to be well controlled. However, there was insufficient restraint offered to the child's upper body and this, in turn, allowed a large forward movement of the dummy's head to take place.

During the side impact tests, the lateral movement of the child restraint was recorded as being poor, with the upper part of the restraint being allowed to move as far as the mid line of the car.

The result of this was that the child's head was then allowed to move beyond the sides of the child restraint.

Child seat was well restrained in frontal impact but poorly in side impact. In both, the head was allowed to move too much

FORD FIESTA FACT FILE

Model	Ford Fiesta 1.25 LX 16 Valve
Body	Three-door hatchback
Car tested	1996 model year
Build date	January 1996
Kerb weight	929kg
UK on the road price	£9945

Model history

The 1996 Fiesta was introduced in September 1995. For the 1996 model year the Fiesta features door beams, driver's airbag, front safety belt pre-tensioners and webbing grabbers as standard. A passenger airbag and ABS are available as options but were not fitted.

Nissan Micra

EURO NCAP RATING

was stable head contact on the driver's airbag and the Nissan Micra's passenger compartment maintained its stability during the frontal impact crash test

The Nissan Micra was awarded two stars for protection in the frontal he side impact tests. ever, with just a little ovement in performance, the ould have been moved up he three-star category. the frontal impact crash test, licra failed to meet the new ria for the left knee impact or protection of the right r leg. Under side impact itions, it failed to meet the men requirements. n the other hand, the car did the requirements which e to the degree of steering l displacement. the frontal impact crash test, issan Micra's major ems related to intrusion, cularly at knee and footwell although the passenger artment did remain stable. ovements in safety rmance are also needed in nee impact area. or the side impact, improved ction is required for the abdomen while care is taken not to transmit too much loading to the chest or pelvis.

Structure

In the frontal impact, the Micra suffered moderate structural deformation, and the passenger compartment maintained its stability. There was good control of steering wheel intrusion – the wheel moved back into the cabin by 60mm – but the test results showed there to be an excessive intrusion of the footwell.

The driver's door failed to transmit loads effectively, allowing a moderate collapse of the door aperture and also intrusion of the facia.

The Micra failed the new criteria for abdomen protection under side impact

After the test, the driver's door could not be opened – even with extreme hand force – and tools had to be used. The passenger door opened normally.

Driver

The driver's head protection was good and the head's contact on the airbag was stable. Neck protection was also found to be good. Seat belt loading of the chest was measured as adequate but this was downrated to a score of marginal because of the intrusion of the facia.

The left knee impacted on the steering column cover, bent the column adjuster and then hit the rigid steering column and its mounting bracket. The dummy's right knee hit the car's facia and pushed it on to a tube supporting the steering column, distorting a bracket which was mounted to it.

For both knees, there were stiff structures which could concentrate loads on part of the knee and further penetration into the facia would have resulted in sharply increased loads. The right knee would also have received greater loading if it had impacted the facia in a slightly different position horizontally. The left knee protection was poor on the basis of dummy instrumentation and could not be downrated, but the right knee was downrated to weak to account for these points.

The excessive footwell intrusion led to poor protection ratings for the right lower leg and for feet and ankles. Protection of the left lower leg was rated as marginal.

Front passenger

On the front passenger side of the car, the Micra's protection of the head, neck, upper and lower legs and feet was good. Seat belt loading resulted in the chest protection being adequate.

Side impact

Protection from injury in the abdomen area was poor under side impact conditions because of excessive loads which were put on the body. The degree of head protection afforded by the Nissan Micra was found to be good, while the protection offered to the chest and pelvis areas was rated as adequate.

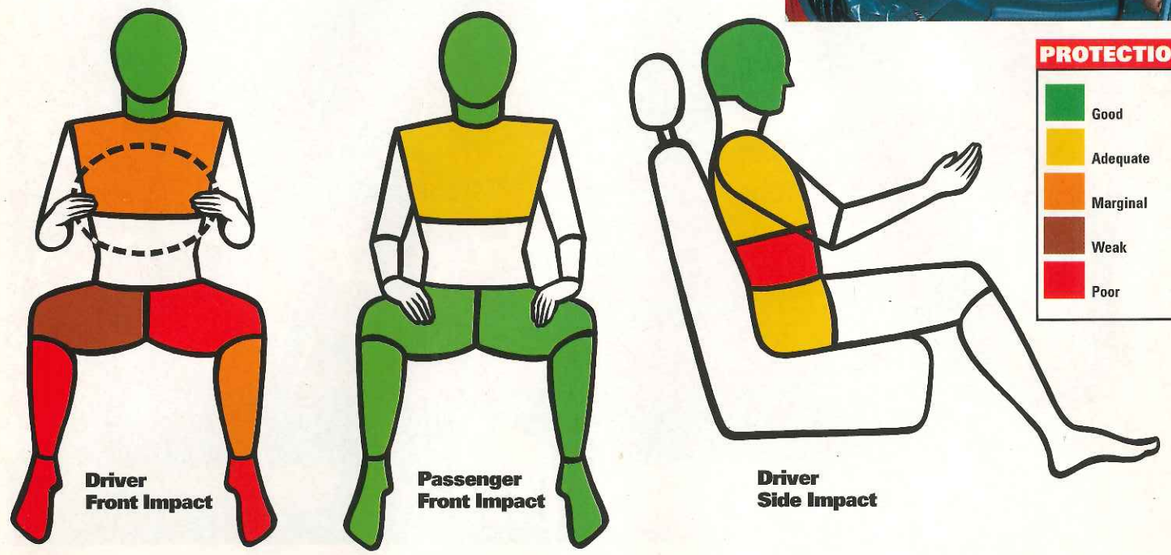
Child restraint

There was a warning label on the Micra which advised against the use of a rearward-facing child restraint in the front seat, even though the car was not fitted with a passenger airbag. A forward-facing Romer King child seat was fitted, as recommended by Nissan for use in the rear seat of the car.

The forward movement of the child seat during the frontal impact test was poorly controlled and there was found to be insufficient restraint of the child's upper body, allowing a large forward movement of the head.

During the side impact tests, the lateral movement of the child restraint was found to be poor, with the upper part of the restraint moving nearly to the mid line of the car. Under these conditions he child's head then moved well beyond the sides of the child restraint.

The driver's door failed to transmit loads effectively. Both knees hit supports for the steering column



The child seat was poorly restrained in the frontal and side impacts. In both, the head was allowed to move too much

NISSAN MICRA FACT FILE

Model	Nissan Micra 1.0L
Body	Three-door hatchback
Car tested	1996 model year
Build date	July and September 1995
Kerb weight	842kg
UK on the road price	£8450

Model history

First introduced in 1992, the 1996 model year Micra 1.0 has door beams, driver's airbag, front safety belt pre-tensioners and height adjustable features as standard. To aid installation of child restraints, automatic/emergency locking retractors (A/ELR) are fitted to the rear outboard safety belts. ABS is an option but was not fitted.

Crashtest

Renault Clio

EURO NCAP RATING

Clio driver's head slid off the airbag and scuffed the windscreen pillar. The passenger compartment became unstable because of failure of welds attaching the facia

The Renault Clio was awarded two stars for protection in frontal and impact. All the new criteria met with the exception of protection in side impact rearward and upward ement of the steering wheel ontal impact.

frontal impact, the major lems related to intrusion and nstability of the passenger partment. There were lems for the lower limbs and tion is required in the knee ct areas. The unstable head act on the airbag suggests ntial problems for different- drivers and those in different ng positions.

side impact, improved ction is required for the chest e also controlling the loading e pelvis.

ucture

instability of the passenger partment was caused by the al detachment of the facia the side of the car. Actual structural deformation was judged moderate – the A-pillar moved back by 195mm at waist level – intrusion of the footwell and the facia was also moderate.

There was moderate collapse of the door aperture. After the test, the driver's door could only be opened using tools. The passenger's door opened normally.

In side impact the Renault Clio failed to meet the new criteria for chest protection

The Clio's steering wheel was pushed back by a limited 105mm. It had also been forced upwards by 133mm under frontal impact, which is judged to be moderate.

Driver

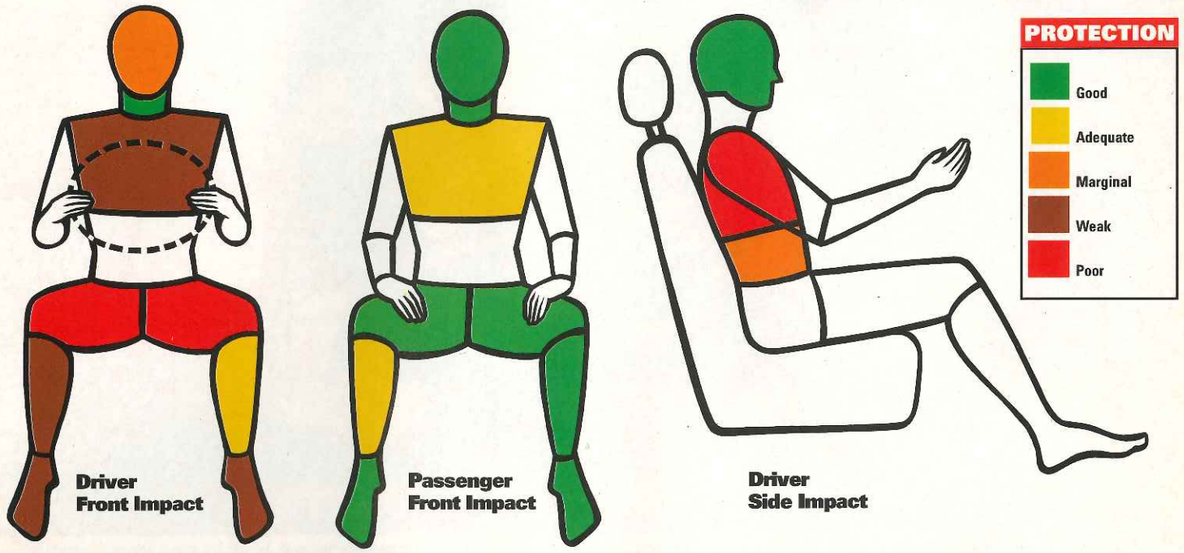
Because of this rearward and vertical intrusion of the steering wheel and an unstable head contact with the airbag – the dummy's head slid off the bag and scuffed the windscreen pillar – head protection was downrated to marginal. However, the neck protection was good.

The facia intrusion and structural instability meant that the driver's chest protection, otherwise assessed as adequate, was downrated to weak.

Protection of both upper legs was downrated to poor because of the number of stiff structures which could concentrate loads on the knees in an impact. In the frontal crash, the dummy's left knee hit the bonnet release lever, rigidly mounted on the steering column. The right knee impacted against the headlight adjuster knob, displacing it so that loads strutted through to the engine compartment bulkhead. For both knees, further penetration into the facia would have resulted in sharply increased loads.

Protection of the lower legs was assessed as adequate on the left side and weak on the right side. Intrusion of the footwell during the frontal impact caused feet and ankle protection to be rated as weak.

The steering wheel moved both rearward and upward, while the knees hit the bonnet release lever and the headlight adjuster



Front passenger

Data from the passenger-side dummy showed protection for the head, neck, knee/femur/pelvis, left lower leg and feet and ankles was good. Adequate protection was provided for the chest and right lower leg.

Side impact

High loading on all the dummy's ribs in the side impact crash test resulted in a chest protection rating of poor, with only marginal protection being provided for the abdomen. However, the head protection was judged to be good.

An instrumentation failure resulted in no data being available to assess pelvis protection. But information supplied by the manufacturer indicated that the ratings would have been within the range adequate to weak. Within this range, the overall rating for the car would not vary.

Child restraint

Renault recommended a Renault Argonaut rearward-facing child seat for the Clio. However, the restraint was too large to fit on the rear seat with the front seats in their standard position for the test. Renault's second recommendation of a Britax Freeway forward-facing child seat was therefore used

The forward movement of the child restraint under frontal impact was well controlled. However, there was insufficient restraint provided for the child's upper body which allowed a large degree of forward movement of the head to occur.

The lateral movement of the child restraint under side impact was poor, with the upper part of the restraint moving nearly to the mid line of the car. The child's head then moved well beyond the sides of the child restraint.

The child seat was well restrained in frontal impact but poorly in side impact. In both, the head was able to move too much

RENAULT CLIO FACT FILE

Model	Renault Clio 1.2RL
Body	Three-door hatchback
Car tested	1996 model year
Build date	March 1996
Kerb weight	846kg
UK on the road price	£8375 (with driver's airbag)

Model history

The Clio was introduced in April 1991. For the 1996 model year the Clio RL is fitted with door beams, front safety belt pre-tensioners and height adjustable features as standard. Driver's and passenger's airbags are optional, with a driver's airbag being fitted to the test car.

Crashtest

Rover 100

EURO NCAP RATING

d contact with the airbag was unstable and the head struck the windscreen pillar. Passenger compartment deformation was excessive and it became unstable

he Rover 100 was awarded only one star for protection in frontal and side impact. ever, with a little ovement it would move into wo-star category. the frontal impact test, the and loadings on both knees d to meet the new criteria. hermore, the rearward and ard displacement of the ing wheel also failed to ly. Under side impact crash conditions, loadings to the t and abdomen were greater those which are to be itted by the future irements. frontal impact, the major lems related to excessive sion and instability of the enger compartment. Better ol of steering wheel acement would be needed to come the Rover 100's head ction problems. or protection of the lower s, reducing intrusion and oving the knee impact area d be most beneficial.

In side impact, reduced loading of the chest and abdomen is needed, while at the same time controlling the loading on the pelvis.

Structure

The Rover suffered excessive deformation of the passenger compartment in the frontal impact – the A-pillar on the driver's side was pushed back by 488mm – and the structure became unstable. This was because the driver's door split apart, allowing excessive collapse of the door aperture and intrusion of the facia, which had partially come away from the car's side.

The new side impact criteria were not met by the Rover 100 for chest or abdomen

Following frontal impact, the driver's door could only be opened by using tools. However, the passenger's door could be opened normally.

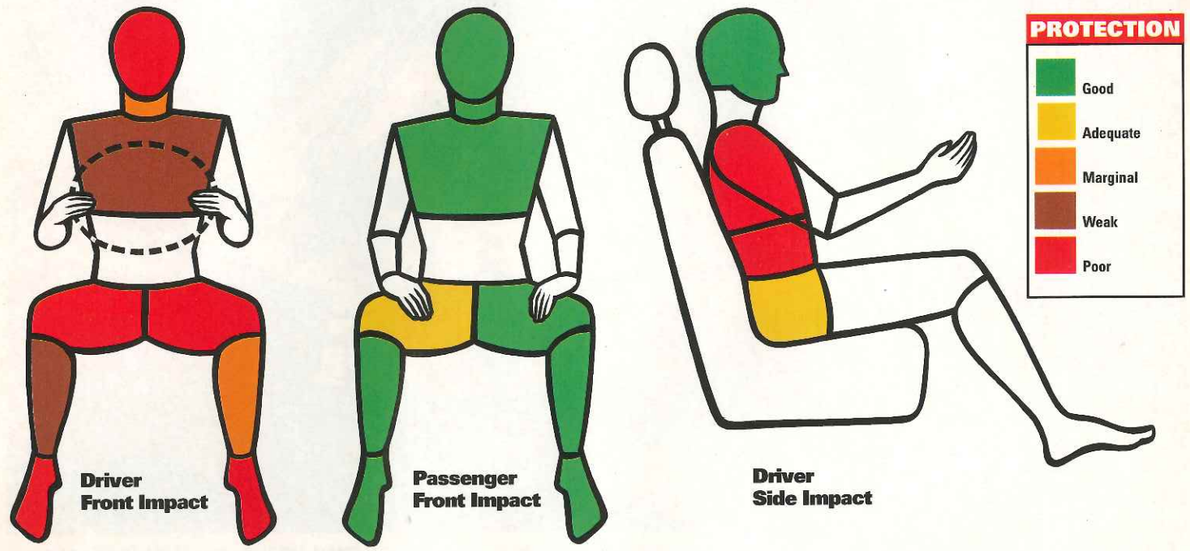
The steering wheel was pushed back by an excessive 312mm. There was excessive intrusion of the footwell.

Driver

The dummy head's contact on the airbag was unstable. The head moved past the airbag and struck the A-pillar, with the instruments showing protection available to be poor. Neck protection was judged to be marginal, and the structural instability meant that the chest protection was downrated to weak.

Solely on the basis of dummy instrumentation, the protection of both the driver's upper legs was poor and could not be downrated. The dummy's left knee fractured the steering column cover before going on to hit the ignition switch and also breaking off the electrical connections.

The steering wheel moved rearwards excessively. The knees hit the ignition switch and plastic trim over a steel beam



The right knee hit plastic trim and pushed it against a steel beam. For both knees, there were stiff structures that could concentrate loads on part of the knee and further penetration of the facia would have resulted in sharply increased loads.

Excessive intrusion of the footwell area meant that the Rover 100's protection of feet and ankles was rated as poor. Solely on the basis of dummy instrumentation, protection of the left lower leg was marginal and the right lower leg weak.

Front passenger

Protection of the passenger's head, neck, chest, left knee/femur/pelvis, lower legs and feet and ankles was good. Protection of the right knee/femur/pelvis was judged to be adequate.

Side impact

Head protection offered by the Rover 100 in side impact was good, pelvis protection adequate. Owing to loading on the dummy's top rib, the protection from injury of the chest was poor, and so was the rating given to protection of the abdomen.

Child restraint

A forward-facing Klippan Superdream child seat was fitted, as recommended by Rover.

Under frontal impact crash conditions, the forward movement of the child restraint was found to be well controlled. However, there was considered to be insufficient restraint afforded to the child's upper body which, in turn, allowed a large forward movement of the child's head to take place.

The lateral movement of the child restraint under side impact crash testing was rated as poor. In this case, the upper part of the restraint was allowed to move across as far as the mid line of the car. The child's head was then able to move well beyond the protective sides of the child restraint.

Child seat was well restrained in frontal impact but poorly in side impact. In both, the head was allowed to move too much

ROVER 100 FACT FILE

Model	Rover 111i
Body	Three-door hatchback
Car tested	1996 model year
Build date	October 1995
Kerb weight	815kg
UK on the road price	£7436 (with driver's airbag)

Model history

Introduced as the Metro in 1980, in 1991 a major rework of the frontal structure took place, plus the fitment of the K-series engine, an energy absorbing steering column and face-friendly steering wheel. A driver's airbag (fitted to the test car) was introduced in early '95 as an option.

Vauxhall Corsa

EURO NCAP RATING

e was stable head contact on the Corsa's airbag and the passenger compartment maintained its stability in frontal impact. The passenger's head hit the facia top

he Vauxhall Corsa was awarded two stars for protection in frontal and mpact. The car might have awarded three stars if the enger head had not struck the f the facia.

he new frontal impact criteria all met, with the exception of assenger head protection and earward and upward ement of the steering wheel. frontal impact, the major lems related to intrusion. ever, the passenger partment retained its stability. ection from the left knee ct area was good but on the there was scope for ovement. Protection in the vell could also be improved. here were no major iencies in side impact ction but general ovement would be desirable.

ucture

e was moderate deformation e passenger compartment, h maintained its structural stability. Rearward and upward intrusion of the steering wheel was limited – the wheel moved 127mm horizontally and 129mm vertically – but intrusion of the footwell was excessive.

The driver's door provided support sufficient to ensure there was only limited collapse of the door aperture – after the impact, both doors opened normally. However, the loading through the door moved the centre pillar rearwards, allowing moderate intrusion of the facia.

All the new side impact criteria were met but abdomen protection was weak

Driver

On the basis of the dummy's recordings, head protection was good although the limited rearward and vertical movement of the steering wheel meant this assessment had to be downrated to adequate. Neck protection was recorded as good.

Because of the moderate facia intrusion in frontal impact, the adequate rating recorded for the seat belt loading on the driver's chest provided by the dummy's instruments was downrated to a protection level of marginal.

Protection of the driver's left upper leg was good – the dummy's knee lightly impacted on the steering column cover.

On the right side, however, the knee hit the fuse box cover which was supported by a strut and tubular bar. Protection was downrated to poor since further penetration on this side would have resulted in sharply increased loads.

Despite excessive intrusion of the footwell into the passenger compartment, protection of both lower legs was assessed as adequate. For feet and ankles, the Corsa gave marginal protection.

There was limited rearward and upward movement of the steering wheel. The left knee was well protected but the right knee hit the fuse box cover

Front passenger

The passenger's head impacted on the top of the facia and the protection level was assessed as poor. Since this result was worse than that for the driver, it was used in calculating the overall protection rating in frontal and side impact.

Protection of the passenger's right upper leg was found to be weak. Protection of the chest and lower legs was assessed as adequate. There was good protection of the passenger's neck, left upper leg and also the feet and ankles.

Side impact

Head protection was good. Loading on the dummy's top rib meant chest protection was adequate, while protection from injury in the abdomen area was assessed as weak.

An instrumentation failure resulted in no data being available to assess pelvis protection. However, information supplied by the manufacturer indicated that the ratings would have been within the range adequate to weak. Within this range, the overall rating for the car would not vary.

Child restraint

A forward-facing Britax Supercruiser child seat was recommended by Vauxhall.

The forward movement of the child restraint under frontal impact was well controlled. However, there was insufficient restraint of the child's upper body which allowed a large forward movement of the head. The head rebounded to hit the rear seat backrest outside the child restraint.

In the side impact crash test, the lateral movement of the child restraint was found to be poor, with the upper part of the restraint being able to move across as far as the mid line of the car. The child's head was then allowed to move just beyond the protective sides of the child restraint.

Child seat was well restrained in frontal impact but poorly in side impact. In both, the head was allowed to move too much

VAUXHALL CORSA FACT FILE

Model	Vauxhall Corsa 1.2LS
Body	Three-door hatchback
Car tested	1996 model year
Build date	November 1995
Kerb weight	874kg
UK on the road price	£9100

Model history

The Corsa was introduced in April 1993. For the 1996 model year the Corsa features door beams, driver's airbag, front safety belt pre-tensioners and height adjustment to the front and rear safety belts as standard. A passenger airbag and ABS are available as options but were not fitted.

VW Polo

EURO NCAP RATING ★★★☆

e was stable head contact on the airbag in frontal impact and the VW Polo's passenger compartment maintained its stability with only limited intrusion

he Volkswagen Polo was awarded three stars for protection in frontal and impact. All the new frontal ct criteria were met with the ption of the upward ement of the steering wheel ntal impact, and the chest ng in side impact.

the frontal impact crash test, e was limited intrusion of the enger compartment which ned its stability. There were rticular problems with the impact areas. Reducing the ee of intrusion in the footwell ld improve protection of the nd ankles.

side impact, reduced loading e chest is needed, while, at ame time, controlling the ng on the pelvis.

ucture

passenger compartment tained its stability and rmed only by a limited nt in the frontal impact. sion of the steering column imited – 71mm back, and 87mm upwards. Collapse of the door aperture and intrusion of the facia were also found to be of limited extent.

The driver's door, however, did require moderate hand force to open after the impact. The passenger door opened normally. Intrusion of the footwell was judged to be excessive.

The new side impact criteria for chest protection were not met by the VW Polo

Driver

The dummy's instruments recorded head protection of the Volkswagen Polo as good but the vertical intrusion of the steering wheel meant that this result was downrated to a rating of adequate. Head contact on the airbag was stable and neck protection was good.

Seat belt loading on the driver's chest meant that protection here was marginal on the basis of the dummy's instruments alone.

With only limited intrusion of the facia, the rating for the chest did not justify any downrating for different sized drivers or for other drivers using different seating positions.

In the frontal impact crash test, the driver's left knee impacted below the steering column adjuster which was supported by a stiff column mounting bracket.

The right knee hit and deformed the foam-covered facia panel to the right of the steering column and deformed it by about 90mm in the process.

Although no particularly aggressive items were impacted by the right knee, there was rather more load transmitted through the knee joint than would be desirable. Protection of both the driver's knees was adequate on the basis of dummy instrumentation alone. There was no need to downrate this assessment for different sized drivers or those with a different seat adjustment.

Where the knees might have hit a different part of the facia or penetrated further into it, the instruments showed that protection of the left lower leg was good, and that of the right lower leg was weak.

Excessive footwell intrusion into the passenger compartment meant that the protection of the driver's feet and ankles was rated as poor.

Front passenger

Protection of the passenger's head, neck, knee/femur/pelvis, lower legs and feet and ankles was good. Seat belt loading resulted in chest protection being judged as adequate.

Side impact

Seat belt loading on the dummy's top rib in the side impact test meant poor protection.

The Polo's protection of the driver's head was good, with ratings of adequate being awarded for protection of the pelvis and abdomen.

Child restraint

A forward-facing Bobsy 18 child seat was recommended by Volkswagen for use in the Polo.

The forward movement of the child restraint in the frontal impact crash test was moderately well controlled.

However, there was found to be insufficient restraint of the child's upper body which, in turn, allowed a large forward movement of the dummy's head during impact.

In the case of the side impact crash test, the lateral movement of the child restraint on the back seat was poor, with the upper part of the restraint being allowed to move as far as the mid line of the car. The child's head was, however, restrained within the sides of the child restraint during the test.

Child seat was moderately restrained in frontal impact, poorly in side impact. In both, the head was able to move too much

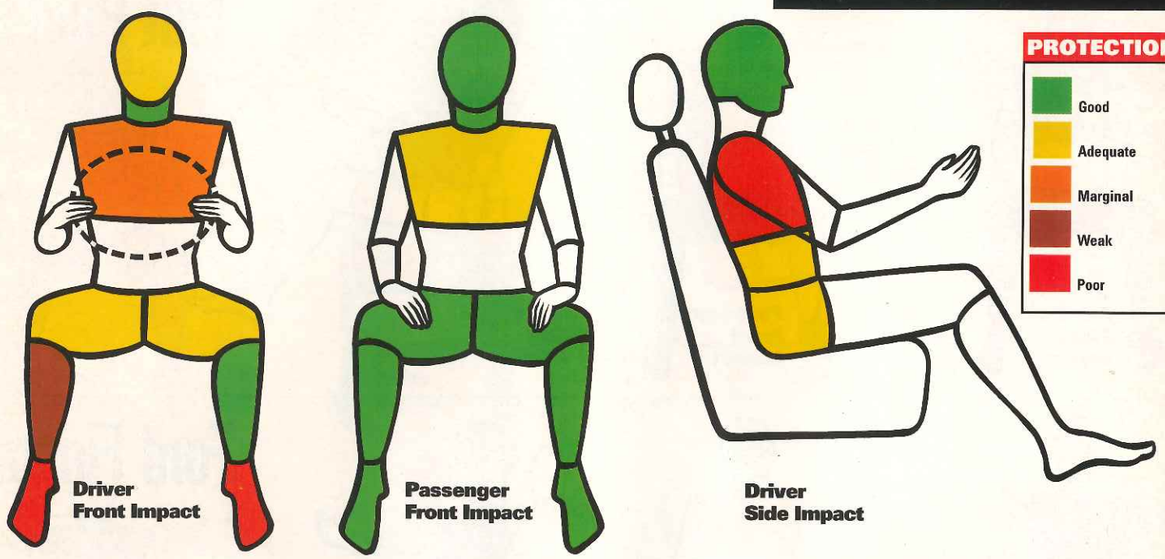
VW POLO FACT FILE

Model	Volkswagen Polo 1.4L
Body	Three-door hatchback
Car tested	1996 model year
Build date	September1995
Kerb weight	890kg
UK on the road price	£8845

Model history

The Polo was introduced in August 1994 and launched in the UK in October 1994. The 1996 model year Polo features front safety belt pre-tensioners and a driver's airbag as standard. A passenger's airbag and ABS are available as options but were not fitted.

The steering wheel moved upwards. The knees hit below the column adjuster and on the facia panel



OTECTION

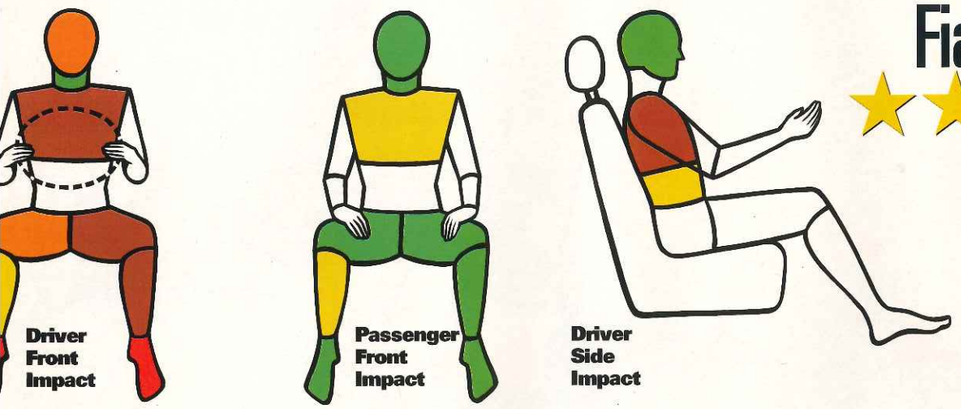
- Good
- Adequate
- Marginal
- Weak
- Poor

How the crash test cars compare

Fiat Punto

★★☆☆

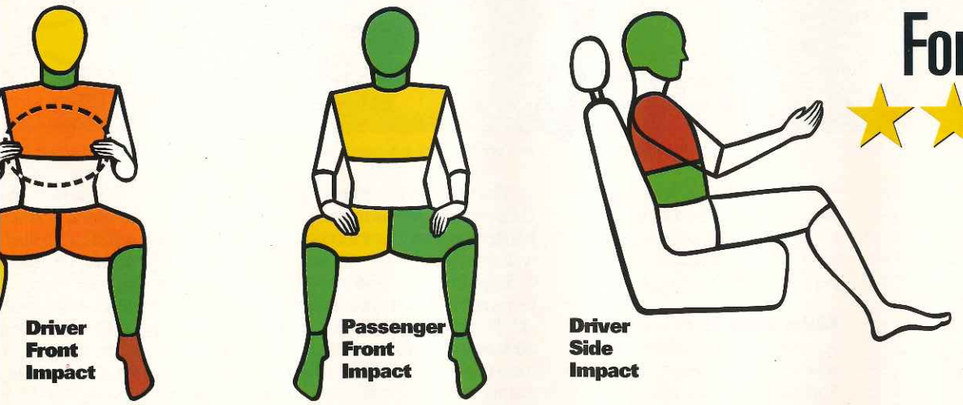
EURO NCAP RATING



Ford Fiesta

★★★☆

EURO NCAP RATING



Nissan Micra

★★☆☆

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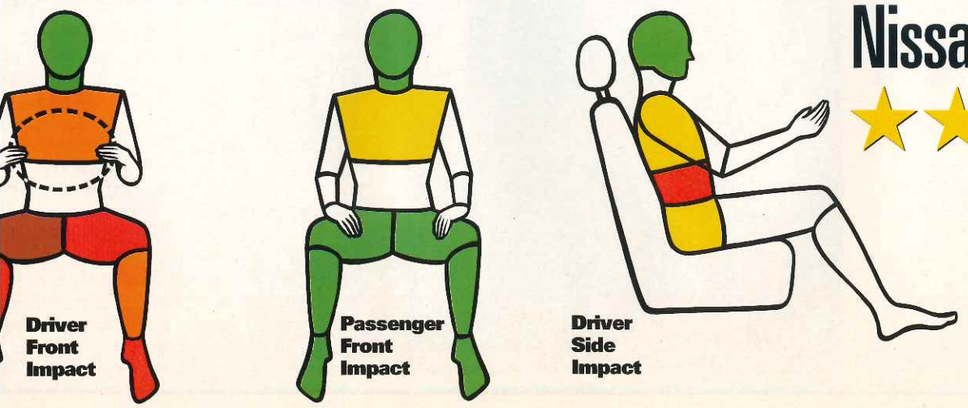
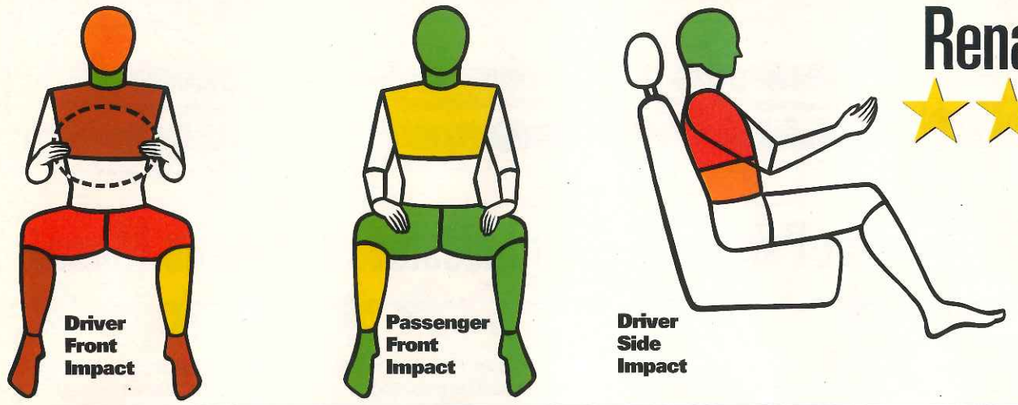


Renault Clio

★★☆☆

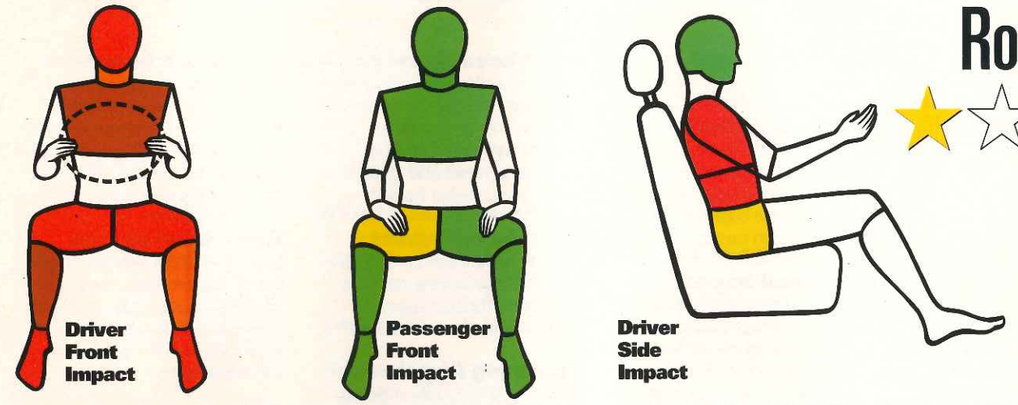
EURO NCAP RATING



Rover 100

★☆☆☆

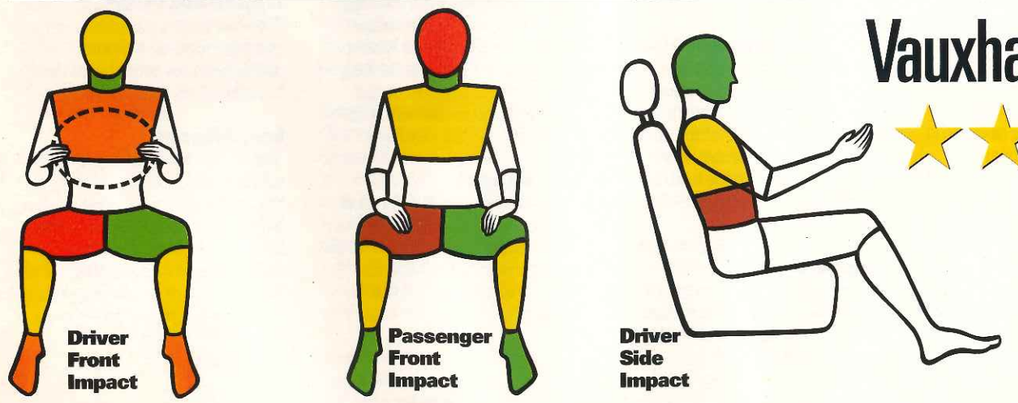
EURO NCAP RATING



Vauxhall Corsa

★★☆☆

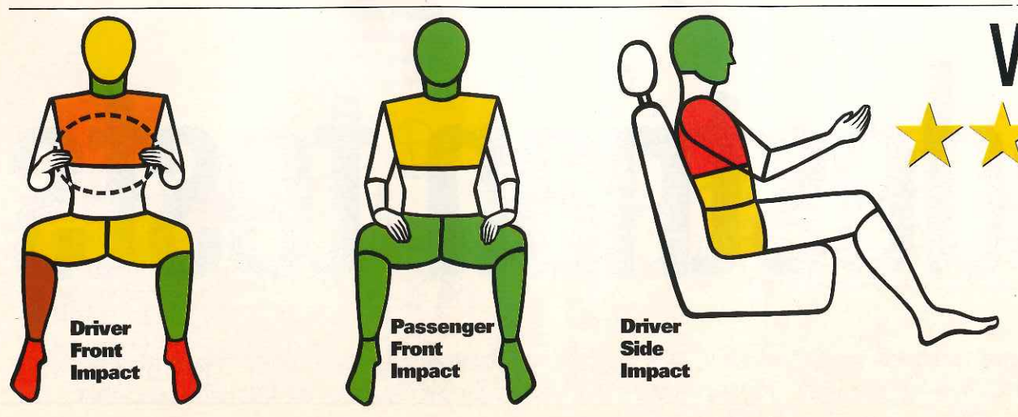
EURO NCAP RATING



VW Polo

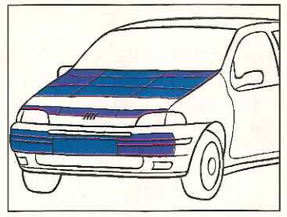
★★★☆

EURO NCAP RATING



Crashtest

ost pedestrians involved in road accidents are killed riously injured by being hit e front of a car. The NCAP pedestrian uation assesses the risks ved by testing the most rdous areas of each model. his is done by firing various my parts at the high-risk s, simulating the way in h a pedestrian would o around' the front of a car. legform is impacted against umper, an upper legform at ront edge of the bonnet, and my heads, in both child and t sizes, at various points on onnet. In each test, ronics inside the dummy s record the impact severity hich each car's protection g is based (see Key). lthough some of the cars some individual protection irements, overall none of the n provides pedestrian ction levels sufficient to proposed legislation. order to separate the cars, a an is taken allowing each performance to be described tter or worse than 'average'. better than average' is still uarantee of good protection. esearch into how pedestrians njured by cars started at back in the '70s. This looked al accidents, and then elled how people are injured g dummy and computer lations. One result of this was the building of a onstration 'pedestrian y car' in 1985. he information from this and European research was put a draft European Directive in and very little has happened then. But this Directive is g worked on again this year, Euro NCAP will provide an ntive to manufacturers to seriously with pedestrian ection.



Fiat Punto

★☆☆☆

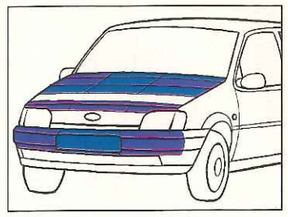
Number of test points at which protection meets proposed requirements **None**
However, the Punto needed only a little improvement to move it into the two-star category.

Child head impact
Five of the six test points gave better than average protection. The worse than average test point was on the bonnet above a front suspension turret.

Adult head impact
One out of three test points gave better than average protection. The two poorer areas were on the scuttle panel in front of the windscreen and on the bonnet above the hinge.

Upper leg impact
All three test points on the bonnet leading edge provided worse than average protection. The test points were at the centre of the car at the bonnet latch, above the centre of the headlight and in line with the inside edge of the headlight.

Leg impact
Two of three test points gave better than average protection. The poorer result was ahead of the towing eye mount.



Ford Fiesta

★☆☆☆

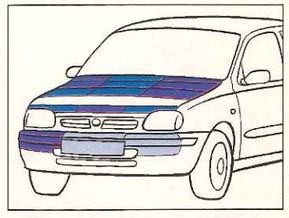
Number of test points at which protection meets proposed requirements **None**

Child head impact
Four of the six test points gave better than average protection. The two poorer results on the bonnet were above the front suspension turret and above the windscreen washer bottle.

Adult head impact
Two of the three test points gave better than average protection. The area of bonnet above the hinge provided poorer protection.

Upper leg impact
All three test impacts at points along the bonnet's leading edge provided worse than average results. The test points were at the centre of the car at the bonnet latch, above the centre of the headlight and in line with the inside edge of the headlight.

Leg impact
One test point gave better than average protection. The two poorer areas were in line with the towing eye mount and in line with the inside edge of the headlight.



Nissan Micra

★★☆☆

Number of test points at which protection protection meets proposed requirements **Two**

Child head impact
Three of the six test points gave better than average protection. Poorer areas on the bonnet were above the battery, a metal bracket on the air intake and a suspension turret.

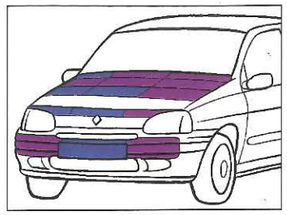
Adult head impact
One out of three test points gave better than average protection. The two poorer areas were on the scuttle panel ahead of the windscreen and on the bonnet above the hinge.

Upper leg impact
Two test points gave better than average protection. Poorer protection was provided at the location of the bonnet latch.

Leg impact
Two of the test points provided protection better than that required for proposed legislation. These were at the centre of the bumper and in line with the inside edge of the headlight. The third test point which gave worse than average protection was on the bumper in line with the towing eye.

Pedestrian tests

The third part of the Euro NCAP testing involves assessing the risk to pedestrians — after car occupants, the next priority group for protection.



Renault Clio

★☆☆☆

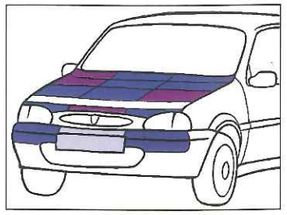
Number of test points at which protection meets proposed requirements **None**

Child head impact
Two of the six test points gave better then average protection. The four bonnet areas which gave a worse than average result were above a battery terminal, electrical connector block, bonnet latch and suspension turret.

Adult head impact
One of the test points gave better than average protection. The poorer two test points were on the scuttle in front of the windscreen and above the wiper spindle.

Upper leg impact
Two of the test points gave better then average protection. An area in line with the inside edge of the headlight provided worse than average protection.

Leg impact
One test point gave better then average protection. The two poorer areas were in line with the towing eye and the inside edge of the headlight.



Rover 100

★★☆☆

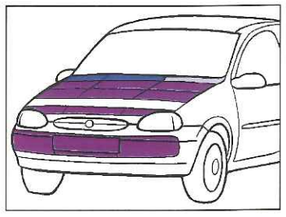
Number of test points at which protection meets proposed requirements **One**

Child head impact
Four of the six test points gave better then average protection. Areas of the bonnet above a battery terminal and suspension turret provided poorer protection.

Adult head impact
Two of the three test points gave better then average protection. Worse than average protection was provided on the bonnet above the hinge.

Upper leg impact
Two of the three test points gave better then average protection. Less protection was available in the centre of the car near the bonnet latch and badge.

Leg impact
One of the test points — at the centre of the bumper — provided protection better than that required to meet proposed legislation. Areas of the bumper ahead of the mount and in line with the inside edge of the headlight gave better than average protection.



Vauxhall Corsa

★☆☆☆

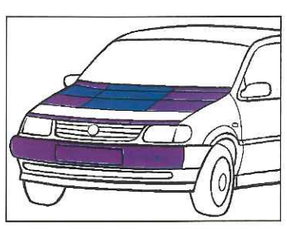
Number of test points at which protection meets proposed requirements **One**

Child head impact
All of the test points gave worse than average protection. These points corresponded to areas of the bonnet above the battery, suspension turret, oil filler cap, air cleaner, a hose clip and brake fluid reservoir.

Adult head impact
One of the test points provided protection better than that required for proposed legislation. This point was on the scuttle ahead of the windscreen. The other two test sites gave better than average protection.

Upper leg impact
All three test points provided worse than average protection. These were at the centre of the car by the bonnet latch, above the centre of the headlight and in line with the inside edge of the headlight.

Leg impact
Worse than average protection was provided at all three test points on the bumper: at its centre, in line with the towing eye and in line with the inside edge of the headlight.



VW Polo

★☆☆☆

Number of test points at which protection meets proposed requirements **None**

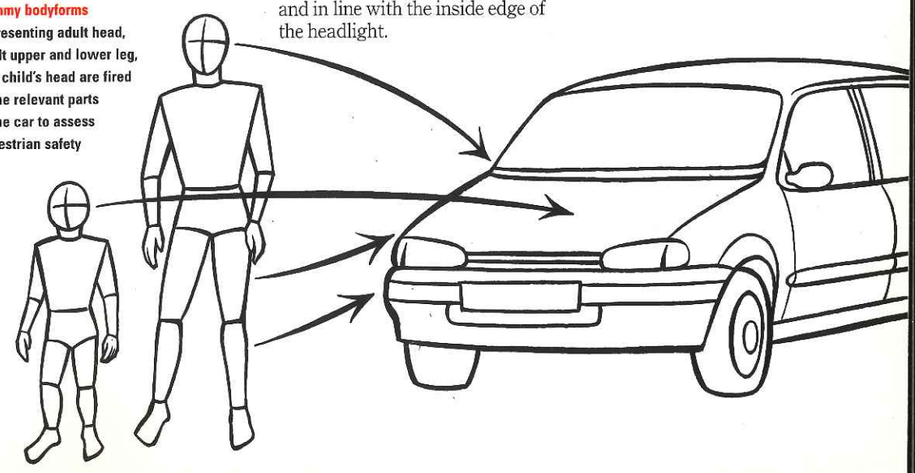
Child head impact
Three of the six test points gave better than average protection. Worse than average protection was provided on the bonnet above the screen washer bottle, the timing belt cover, and the suspension turret.

Adult head impact
One of the three test points gave better than average protection. Areas on the scuttle and on the bonnet above the hinge provided worse than average protection.

Upper leg impact
The three test points at the bonnet latch, in line with the inside edge of the headlight and above the centre of the headlight all provided worse than average protection.

Leg impact
All three test points provided worse than average protection. The test points were at the centre of the bumper, in line with the towing eye mount and the inside edge of the headlight.

Dummy bodyforms representing adult head, adult upper and lower leg, and child's head are fired at the relevant parts of the car to assess pedestrian safety



KEY

- **Meets** new criteria
- **Fails** new criteria, but better than average
- **Fails** new criteria, and worse than average

EURO NCAP

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