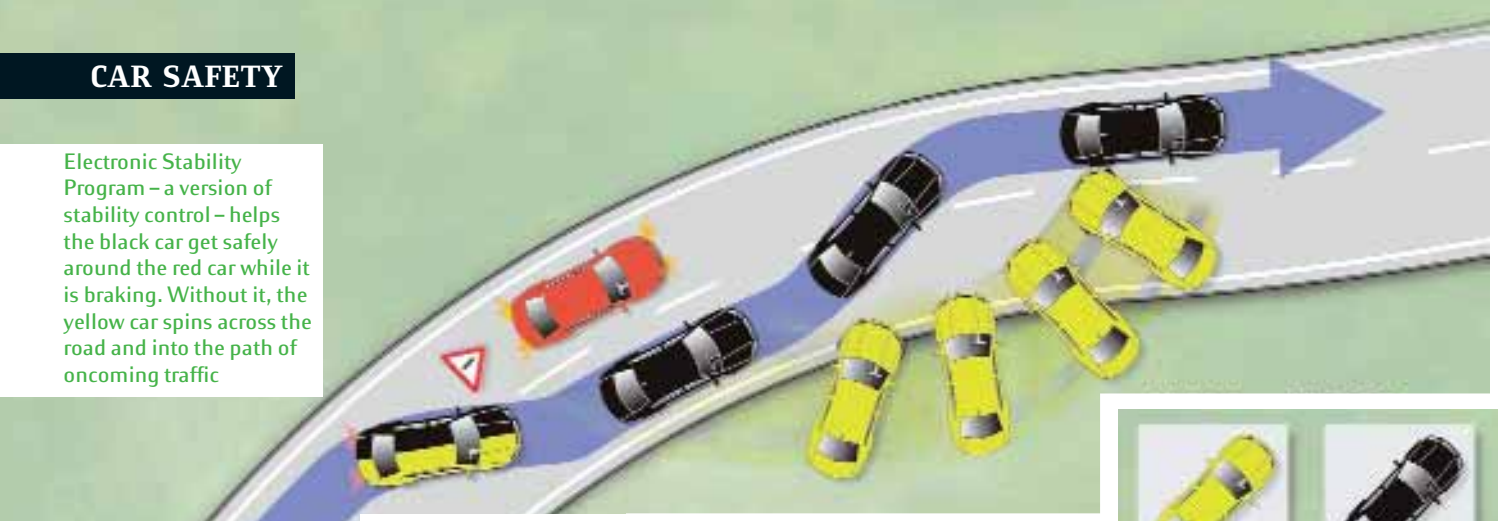


Electronic Stability Program – a version of stability control – helps the black car get safely around the red car while it is braking. Without it, the yellow car spins across the road and into the path of oncoming traffic

Cars in control

We examine the technology that could save your life, and find out which cars offer the best protection in a crash

STABILITY CONTROL (SC)

Depending on the car, SC may be standard, optional at extra cost (prices range from £100 to £1,000) or not available. There's a confusing array of names for SC systems, but all of these trade acronyms operate on the same principle: Electronic Stability Program (**ESP**), Electronic Stability Program Plus (**ESP+**), Vehicle Dynamic Control (**VDC**), Electronic Stability Control (**ESC**), Dynamic Stability Control (**DSC**), Vehicle Stability Control (**VSC**), Vehicle Stability Assist (**VSA**), Active Stability Control (**ASC**), and Dynamic Stability and Traction Control (**DSTC**).

'I was travelling at about 70mph when a wheel rolled out of a lorry and came to a stop in the middle of my lane,' says Kevin Delaney, Head of Traffic and Road Safety at the RAC Foundation. The advanced driver felt confident of dealing with any situation until his near-miss on the M11.

'I hit the brakes very hard, turned the wheel hard left and expected the worst. The car felt almost as if the back were being "pushed" from the right. I missed the wheel and was travelling towards the hard shoulder *and* the lorry, so I steered hard right. Then I was pointing straight at the central crash barrier, so I steered hard left. Again, I felt the back of the car was being "pushed" from the right. I passed the lorry, checked my mirror and saw the wheel still in the middle of the outside lane.'

That's a typical emergency situation in which a stability control (SC) system can help – and it's now available in many new cars. The 'pushing' is the SC preventing a severe skid or loss of control.

Stability Control came to the rescue of advanced driver Kevin Delaney

Crash safety group EuroNCAP is so convinced of the effectiveness of SC systems that it urges car buyers to choose one of the many vehicles now equipped with SC. Mr Delaney backs this: 'My Volkswagen Passat is fitted with ESP [VW's brand of stability control]. When skill alone is not enough, I want to know these systems are there as back-up.'

AVOIDING ACCIDENTS

Stability control uses a computer to monitor variables such as individual wheel speed and steering, and it also measures changes in direction. This helps it decide whether the vehicle is likely to skid, by comparing the driver's desired course with the actual one. It can brake individual wheels to counteract a severe skid or spin if it decides the driver is in danger of losing control.

Research by Volkswagen shows that traffic fatalities could be cut by 35 per cent if all cars were fitted with SC. Another study by the Swedish Road Administration concluded that SC systems 'reduce the number of crashes with personal injuries' and recommended that 'the automotive industry should only market cars with [it]'.

Matthew Avery, Crash Research Manager at motor insurance researchers Thatcham, agrees: 'SC is an absolute lifesaver. Research from Japan, USA and Sweden shows accident rates involving cars with it fitted fall by more than 30 per cent.'

The number of new cars fitted with SC in the UK rose from 29 per cent in 2004 to 33 per cent last year. There's been no independent research in Britain, but we think it's high time the Department for Transport (DfT) investigated the benefits of this potentially life-saving technology.

The police view on such technological sentinels is guarded. 'All of these features can benefit the motorist as long as we don't start to rely on them,' said Suffolk Roads Police Sergeant Christopher

PHOTOGRAPHY ROBIN BECKHAM ILLUSTRATION BOSCH

Keeping in lane

To keep you firmly on the straight and narrow, Citroën's Lane Departure Warning System (LDWS) uses infrared 'eyes' positioned on the bumper to monitor lane changes at speeds above 50mph.

If you change lanes without indicating, the car seat vibrates on the side corresponding to the lane change. It's the equivalent of 'virtual rumble strips', and has the added benefit of actively encouraging drivers to signal before changing lanes. However, it has to be switched on by the driver – we'd prefer an automatic system.

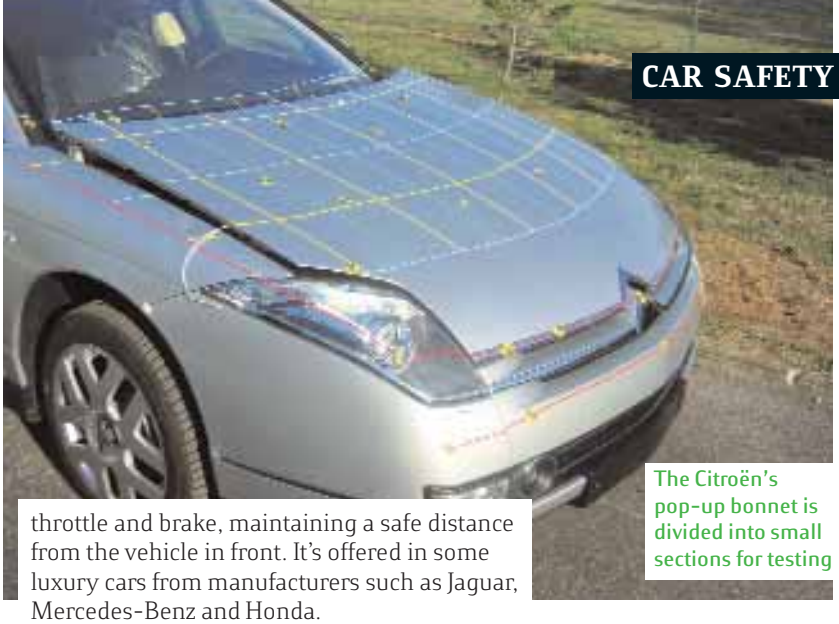
LDWS is optional on Citroën's C4 and C5 family cars and standard on the C6 saloon model.

Rodda. 'As long as people are the main controllers of vehicles, we should only view these as aids.'

For further information about SC, look at www.euroncap.com and follow the links.

THE LATEST SAFETY DEVICES

- The latest pedestrian-protection devices have been introduced on Citroën's C6 and Jaguar's XK. The bonnet on these cars pops up if bumper-mounted sensors detect a collision. The raised bonnet is designed to cushion the pedestrian's head and body, and keep the vulnerable head away from the 'hard points' underneath the bonnet. Honda plans to introduce it on its new Legend model.
- Other designs rely on the car crumpling at the point of impact and gradually absorbing the energy of a collision, in order to minimise the effect of the accident on the pedestrian.
- Anti-lock brake systems (ABS) use wheel speed sensors to ensure the wheels don't lock during heavy braking, so the driver can retain steering control and, hopefully, avoid an accident. Electronic ABS is fitted to nearly every new car sold in the EU as part of a voluntary agreement between car manufacturers. We'd like to see a similar policy adopted for SC systems.
- Brake Assist is a common accompaniment to ABS in most new cars. It detects rapid application of the brakes and can reduce stopping distances by applying them quicker than most drivers would.
- Heavy braking on roads where the grip differs on each side of the car is another hazard. The natural tendency is for the car to 'turn' towards the side that offers more grip, but Electronic Brake-force Distribution, available on most family cars, counteracts this effect and makes sure your car pulls up in a predictable fashion.
- Some systems (such as Mercedes-Benz's Sensotronic Brake Control) exploit the car's on-board computer even further: they detect when the driver rapidly releases the throttle pedal and push the brake pads close to the disc ready for braking, which removes any 'slack' in the brake pedal.
- Comfort systems such as cruise control are still evolving. Active Cruise Control moderates the throttle and brake, maintaining a safe distance from the vehicle in front. It's offered in some luxury cars from manufacturers such as Jaguar, Mercedes-Benz and Honda.



The Citroën's pop-up bonnet is divided into small sections for testing

CUTTING ROAD DEATHS

It's not just manufacturers who are trying to make our roads safer. The government has set high targets for reducing road accidents by 2010:

- 40 per cent fewer people killed or seriously injured (KSI) in road accidents
- 50 per cent fewer children KSI
- 10 per cent fewer minor casualties.

The annual KSI rate fell to 34,351 in 2004, from an average rate between 1994 and 1998 of 47,656. But fatalities themselves dropped just 10 per cent in 2004 from the 1994 to 1998 average of 3,578. While it's difficult to know why the rates have fallen, the government says that 'improvements in vehicle design [are] helping to reduce the severity of injuries' but that 'driver behaviour is contributing to [fatal] accidents'.

Ultimately, safety is still the driver's responsibility. But if you're buying a new car, insist on having the technological innovations that enhance the vehicle's safety. Overleaf, we show which cars are fitted with SC and how well they did in our safety tests.

The four-wheel drive debate

The new Jeep Grand Cherokee performed poorly in EuroNCAP's pedestrian protection tests, where it scored no stars.

Logic suggests that high-riding vehicles would cause more harm when they hit pedestrians. And, in fact, no large off-roader scores more than two stars for pedestrian safety – including the Volvo XC90, despite Volvo's 'safety-first' approach.

Public pressure and legislation have combined to ensure that 'bull bars' (stylised chrome bumper additions) have virtually disappeared from four-wheel-drive vehicles in the UK. But what lies behind them still leaves much to be desired, and EuroNCAP's pedestrian protection test results won't do anything for large off-roader cars.

Despite big strides in this area from affordable superminis such the Fiat Grande Punto and Honda Jazz, the off-roader brigade has yet to catch up.

Poor pedestrian safety: 2005 Jeep Grand Cherokee

CAR SAFETY RESULTS

Most of our newly-tested cars have side curtain airbags fitted. Our testers feel these offer much improved side-impact protection and should be fitted as standard. Wherever possible you should insist on having them, even if it means spending a few hundred pounds extra to get the option.

The Peugeot 1007 was the safest supermini in our test

OUR TESTS

SAFETY

Which? safety experts consider extra types of accident, such as rear-end shunts and rollovers, which aren't covered in EuroNCAP tests (see below). From their analyses we can give a more detailed picture of safety levels for each car. Each score is directly comparable to every other score, regardless of size or class of car – unlike EuroNCAP testing, where scores can be compared only to cars in the same category – supermini, say.

CRASH TESTS

The star ratings reflect EuroNCAP's crash safety scores. EuroNCAP was formed in 1995 by organisations including the Swedish government, the DfT and Which?. The group has standardised several crash tests, which simulate a typical head-on accident at 40mph and side-impact crash at 30mph. Pedestrian safety simulates a 25mph crash.

But manufacturers are now starting to exploit the predictable test setup. For instance, it's common to find 'pelvis pushers' in new car doors which, in side-impact crash tests, push the dummy into a part of the car where there are no sensors to measure impact force, giving a better test score. But developments such as these are unlikely to present any real benefit to human occupants, and we'd like to see designs improved to genuinely increase occupant safety rather than simply boost test scores.

Superminis

Peugeot's new 1007 tops our safety table but we have some concerns about its unusual electric sliding doors, which could be accidentally opened in certain kinds of 'sideswipe' collisions, such as scraping against a tree.

We think Peugeot should redesign the vulnerable exterior door handle to prevent this happening.

Safety scores

MODEL	Stability control: Availability	Safety: Score (no limit)	Crash tests: Occupant (max 5)	Crash tests: Pedestrian (max 4)
Peugeot 1007	Fitted as standard	10.5	★★★★★	★★
Renault Modus	Optional at extra cost	10	★★★★★	★
Ford Fiesta	Not available	9.5	★★★★	★★
Seat Ibiza	Certain models only	9.5	★★★★	★★
Citroën C3 Pluriel	Not available	9.5	★★★★	★★
Skoda Fabia	Certain models only	9.5	★★★★	★★
Volkswagen Polo	Optional at extra cost	9.5	★★★★	★
Mazda 2	Optional at extra cost	9	★★★★	★★
Smart ForFour	Fitted as standard	9	★★★★	★
Fiat Idea	Optional at extra cost	9	not tested	not tested
Honda Jazz	Not available	8.5	★★★★	★★★
Citroën C2	Certain models only	8.5	★★★★	★★
Citroën C3	Optional at extra cost	8.5	★★★★	★★
Nissan Micra	Certain models only	8.5	★★★★	★★
Mini Cooper	Optional at extra cost	8.5	★★★★	★
Citroën C1[a]	Not available	8	★★★★	★★
Fiat Punto	Certain models only	8	★★★★	★★
Mitsubishi Colt	Certain models only	8	★★★★	★
Hyundai Getz	Not available	8	★★★★	★
Vauxhall Corsa	Not available	8	★★★★	★
Fiat Panda	Not available	8	★★★	★
Peugeot 107[a]	Not available	8	not tested	not tested
Vauxhall Agila	Not available	8	not tested	not tested
Chevrolet Kalos	Not available	8	not tested	not tested
Suzuki Ignis	Not available	8	not tested	not tested
Peugeot 206	Certain models only	7.5	★★★★	★★
Smart ForTwo	Fitted as standard	7.5	not tested	not tested
Ford Ka	Not available	7.5	★★★	★
Kia Picanto	Not available	7.5	★★★	★
Toyota Aygo	Not available	7.5	not tested	not tested
Chevrolet Matiz	Not available	7	★★½	★★

a Fitted with cornering stability control, which acts only on the front wheels

Small MPVs

The Vauxhall Zafira's safety score was disappointing considering it's a brand new design, and too many safety features, such as side curtain airbags and active head restraints, are optional on it.

Honda's FR-V uses the same 3+3 seating arrangement as the Fiat Multipla. It scores quite well in the EuroNCAP tests but our own testers weren't convinced that the single airbag for both front-seat passengers is able to provide adequate protection for two differently-sized occupants.

Vauxhall's Zafira disappoints

Safety scores

MODEL	Stability control: Availability	Safety: Score (no limit)	Crash tests: Occupant (max 5)	Crash tests: Pedestrian (max 4)
Volkswagen Touran	Fitted as standard	12	★★★★★	★★★
Seat Altea	Certain models only	11.5	★★★★★	★★★
Vauxhall Zafira	Certain models only	11.5	★★★★★	★★
Toyota Corolla Verso	Certain models only	11.5	★★★★★	★★
Ford Focus C-Max	Optional at extra cost	11.5	★★★★	★★
Renault Scénic	Optional at extra cost	11	★★★★★	★★
Mazda 5	Certain models only	11	★★★★★	★★
Honda FR-V	Certain models only	10.5	★★★★	★★★
Chrysler PT Cruiser	Not available	10.5	★★★	★
Volkswagen Golf Plus	Fitted as standard	10.5	not tested	not tested
Ford Fusion	Optional at extra cost	10	★★★★	★★
Vauxhall Meriva	Optional at extra cost	10	★★★★	★
Mercedes-Benz Vaneo	Fitted as standard	9.5	★★★★	★★
Hyundai Matrix	Not available	9.5	not tested	not tested
Citroën Xsara Picasso	Certain models only	9	★★★★	★★
Fiat Multipla	Not available	9	★★★	★★
Fiat Doblo	Not available	9	★★★	★
Mitsubishi Space Star	Not available	8.5	★★★	★★
Kia Carens	Not available	8.5	not tested	not tested
Citroën Berlingo Multispace	Optional at extra cost	7.5	★★★★	★★

Executive cars

Audi's A8 still tops the *Which?* test but the smaller A6 needs some work on pedestrian protection. Lexus' new GS gets similar scores to the A8 – we liked the automatically-adjusting head restraint, which goes to the correct position as the seat moves for maximum protection.

The Audi A8 stays in front

Safety scores

MODEL	Stability control: Availability	Safety: Score (no limit)	Crash tests: Occupant (max 5)	Crash tests: Pedestrian (max 4)
Audi A8	Fitted as standard	14	not tested	not tested
Lexus LS430	Fitted as standard	13.5	not tested	not tested
Lexus GS	Fitted as standard	13	★★★★★	★★
Volvo S80	Fitted as standard	13	★★★★	★★
Jaguar XJ8	Fitted as standard	13	not tested	not tested
Audi A6	Fitted as standard	12.5	★★★★★	★
Jaguar S-type	Fitted as standard	12.5	not tested	not tested
Mercedes-Benz E-Class	Fitted as standard	12	★★★★★	★
BMW 5 series	Fitted as standard	12	★★★★	★

Small family cars

Safety scores

MODEL	Stability control: Availability	Safety: Score (no limit)	Crash tests: Occupant (max 5)	Crash tests: Pedestrian (max 4)
Mercedes-Benz B-Class	Fitted as standard	11.5	not tested	not tested
Volkswagen Golf	Fitted as standard	11	★★★★★	★★★
Ford Focus	Certain models only	11	★★★★★	★★
Mercedes-Benz A-Class	Fitted as standard	11	★★★★★	★★
Vauxhall Astra	Certain models only	11	★★★★★	★
Audi A3	Fitted as standard	11	★★★★	★
Renault Mégane	Certain models only	10.5	★★★★★	★★
BMW 1 series	Fitted as standard	10.5	★★★★★	★
Volkswagen Beetle	Fitted as standard	10.5	★★★★	★★
Citroën C4	Certain models only	10	★★★★★	★★★
Fiat Stilo	Certain models only	10	★★★★	★
Mazda 3	Certain models only	10	not tested	not tested
Subaru Impreza	Not available	10	not tested	not tested
Seat Leon (outgoing model)	Certain models only	9.5	not tested	not tested
Toyota Corolla	Certain models only	9.5	★★★★	★★
Peugeot 307	Certain models only	9.5	★★★★	★★
Alfa Romeo 147	Certain models only	9.5	★★★	★★
Suzuki Liana	Not available	9.5	not tested	not tested
Chevrolet Lacetti	Not available	9	not tested	not tested
Kia Cerato	Not available	9	not tested	not tested

The Mercedes-Benz B-Class is another premium badged entrant into our tests – it looks a bit like a scaled-up A-Class and it's quite roomy inside. We like the optional integral booster seat, suitable for children who are too big for a separate child seat but too small to benefit from an adult seat belt. But we found the B-Class suffers from the same 'sliding-seat syndrome' as the A-Class and VW Group cars (see 'Recalls needed', p15). So far we've only tested the seats on the new Seat Leon, which is part of the VW Group and has the problem too.

'Sliding-seat syndrome' spoils the B-Class

Sports and coupés

Vauxhall's Tigra is the only newcomer we've tested in this sector. Our testers found issues with the front head restraints, which don't give enough protection to taller passengers during a rear-impact collision.

Newcomer Tigra has safety issues

Safety scores

MODEL	Stability control: Availability	Safety: Score (no limit)	Crash tests: Occupant (max 5)	Crash tests: Pedestrian (max 4)
BMW Z4	Fitted as standard	10.5	★★★★	★★
Vauxhall Tigra	Optional at extra cost	9.5	★★★★	★★

Large family cars

Safety scores

MODEL
Volvo S40
Fiat Croma
Volvo S60
Saab 9-3
Peugeot 407
Mercedes-Benz C-Class
Jaguar X-type
Vauxhall Signum
Volkswagen Passat
Renault Laguna
Toyota Prius
BMW 3 series
Toyota Avensis
Honda Accord
Vauxhall Vectra
Audi A4
Seat Toledo
Ford Mondeo
Nissan Primera
Skoda Superb
Hyundai Sonata
Citroën C5
Skoda Octavia
Mazda 6
Alfa Romeo 156
Hyundai Elantra

PHOTOGRAPHY JOHN TRENHOLM

Not all Fiat Cromas have Stability Control fitted

Fiat's new Croma scored highly in our inspections, just missing out on the top spot to Volvo's impressive S40. But some low-spec models don't come with stability control – which we think should be standard.

Stability control	Safety	Crash tests	
Availability	Score (no limit)	Occupant (max 5)	Pedestrian (max 4)
Fitted as standard	13.5	★★★★★	★★
Certain models only	13	★★★★★	★
Fitted as standard	12.5	★★★★	★★
Certain models only	12	★★★★★	★
Fitted as standard	11.5	★★★★★	★★
Fitted as standard	11.5	★★★★★	★★
Certain models only	11.5	★★★★	★
Certain models only	11.5	★★★★	★
Fitted as standard	11	★★★★★	★★
Certain models only	11	★★★★★	★★
Fitted as standard	11	★★★★★	★★
Fitted as standard	11	★★★★★	★
Certain models only	11	★★★★★	★
Certain models only	11	★★★★	★★
Certain models only	11	★★★★	★
Fitted as standard	11	★★★★	★
Certain models only	11	not tested	not tested
Certain models only	10.5	★★★★	★★
Certain models only	10.5	★★★★	★
Certain models only	10.5	★★★★	
Fitted as standard	10.5	not tested	not tested
Fitted as standard	10	★★★★★	★
Certain models only	10	★★★★	★★
Certain models only	10	★★★★	★
Fitted as standard	9.5	not tested	not tested
Not available	9	★★★	★★

Recalls needed

Worryingly, we've found several more instances of a problem we first discovered in some VW Group cars (*Which?*, February 2006, p9).

In the Mercedes-Benz A- and B-Class, it's possible for rear-seat occupants to release the front-seat slider catch with their feet, allowing the seat to slide freely backwards and forwards. As the seat-belt buckle is integral to the seat, this could stop the front-seat restraint working properly in an accident.

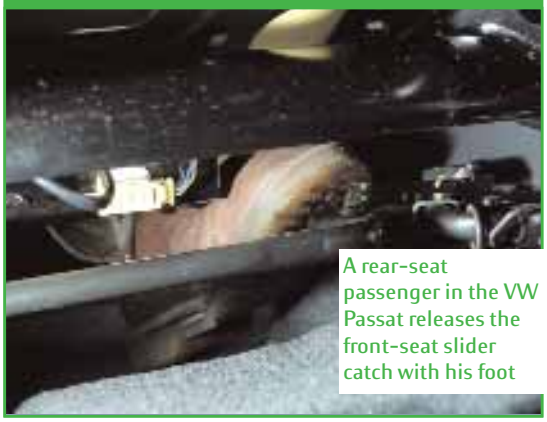
Mercedes-Benz says: 'To date not a single case is known where [this] unlocking occurred – neither in our own accident research data nor in data from third parties.'

This may be true, but we think that if there is a possibility, no matter how small, of the seating design causing unnecessary injury, it should be eliminated.

When we first alerted the VW Group to this problem, it responded by changing the design. But it's still possible to release the catch from the rear seat. As with the Mercedes-Benz, we feel that the risk of injury is unacceptable.

The VW Group told us: 'The vehicles that [you] tested significantly exceed the relevant legal requirements. This still applies even when the seat is able to slide back and forth on its rails.'

When we uncovered a similar problem in the Vauxhall Signum (*Which?*, March 2004, p33), Vauxhall took action quickly to change the design. If Vauxhall managed to respond so swiftly, there's no reason why Mercedes-Benz and the VW Group can't do the same.



A rear-seat passenger in the VW Passat releases the front-seat slider catch with his foot

USING THE TABLES

Ranking is based first on our safety rating and then on each of the two sets of crash test scores (see p12 for explanation of scores).

Stability control

Availability Whether SC is offered as a standard fit across a range, as a standard fit on certain models only, is an optional extra or is unavailable.

Safety

Score How well a car did in crash tests conducted by *Which?* experts. Scores have no upper or lower limit and are comparable between car categories.

Crash tests

Occupant How well cars protected their occupants during crash tests conducted by EuroNCAP. ★★★★★= safest, no stars = least safe, ✶ = an unacceptably high risk of life-threatening chest injuries during a side-impact crash.

Pedestrian How well cars protected pedestrians during collision tests conducted by EuroNCAP. ★★★ = best pedestrian protection , no stars = worst pedestrian protection. **Blue** stars denote tests carried out before 31 December 2001and **green** stars denote tests carried out after that date; the two cannot be compared because of changes in the testing and rating procedures.