

Press Release

Sep 03, 2010 | ID: 34840

VOLVO XC70

OVERVIEW

- Ultimate all-road capability
- Ideal for those who lead an adventurous lifestyle
- Innovative safety technology includes world's first integrated, dual-stage child booster seat
- DRIVe variant features new five cylinder 2.0-litre D3 engine available with front-wheel-drive
- Updated D5 engine offers 11 percent improvement in performance over previous D5 and 8 percent reduction in CO₂
- All-Wheel Drive (AWD) and Hill Descent Control (HDC) are standard on D5 and T6 engines

Volvo's boldly styled and intelligently configured Volvo XC70 estate offers significantly improved levels of all-road-all-weather ability and an engaging driving experience combined with class-leading safety features, load-carrying versatility and refined passenger comfort.

It's eye-catching design, headlined by its raked windscreen and tailgate angles, blacked-out side pillars and C30-inspired taillights, are complemented by its tough and practical off-road styling.

Externally, the Volvo XC70 is higher than the V70 estate by 57mm and longer by 15mm and the car features hard-wearing scratchproof cladding which runs along the XC70's flanks and around the wheelarches. Other external features include chunkier redesigned bumpers and chromed front and rear scuff plates that shield the cars nose and tail during more arduous off-road work.

The Volvo XC70 is designed to be the perfect motoring accompaniment to an outdoor lifestyle. It offers great comfort and luxury for five adults yet has more than enough carrying space for items such as mountain bikes, skis and other sporting equipment.

This unique blend of abilities has made the XC70 range a great success since it was first introduced in 1996, pioneering a whole new type of car.

The latest version gets stronger performance, better handling, greater carrying capacity and versatility, more cabin space and comfort, and greater off-road ability. It is also the first XC70 available with a six-cylinder engine, boosting performance and mechanical refinement. The most elegant and upmarket XC70 yet, it has improved styling, cabin luxury and equipment.

For negotiating muddy forest tracks, wading rivers or powering up icy roads to ski chalets, the XC70 gets electronically controlled All-Wheel Drive (AWD) as standard on D5 and T6 engines. Volvo's unique Active Four-C chassis, which automatically adjusts dampers to provide flatter and more secure behaviour, is optional, improving handling and stability both on and off-road. Hill Descent Control (HDC) - which limits speed down steep, slippery descents to 6mph going forward and 4mph in reverse and greatly improves low-speed control - further boosts off-road credentials and is standard on T6 AWD and D5 AWD models.

'The XC70 is our main off-road adventure vehicle,' says Gerry Keaney, Senior Vice President Marketing Sales and Customer Service. 'More than the XC90, this is the vehicle chosen by those who genuinely lead an active and sporty lifestyle and really do go off-road regularly. It might be into a forest before unloading the mountain bikes, up a snowy road to the ski slope, or towing a boat down a steep and mossy slipway. No matter what the challenge, the XC70 is designed to

perform.'

While most crossovers - like SUVs - are rarely used in the rough stuff, XC70 owners do exploit their cars' capabilities. 'The XC70 has primarily been created to get you to the end of the road. But it has also shown its ability to take you further if you want to and dare to,' says Keaney.

'We had a winning concept from the very outset with the XC70 and we have refined it continuously. This model maintains its tough, capable attitude while at the same time growing more comfortable. What is more, our design team has given the car a more elegant, more luxurious look.'

The latest version has fewer plastic protection panels, favouring body-colour panels instead. The chunky protection panels are used only where necessary. They include noticeable corner pads that give the car a chunky and rugged feel. Other tough touches include lower side body cladding and front and rear alloy skid plates underneath the car. But the whole vehicle does look more elegant.

The XC70 is available with front-wheel-drive only with the new 2.0-litre D3 engine. This combination with a manual transmission reduces CO₂ emissions to 154 g/km and is badged DRIVE. In addition to the lower CO₂ emissions, fuel economy is also dramatically improved to 47.9 mpg. The D5 205 PS engine is also available in the XC70 offering CO₂ emissions of 182 g/km.

Safety innovations include a new design of child car seat with two-stage height-adjustable booster cushions that ensures optimal seatbelt geometry for maximum safety and protection but also offers good visibility out of the windows - making children (and parents) happier. 'When children complain less, parents drive more safely,' says Ahlborg. Small children would use the higher booster setting, which allows them to see out of the windows. Larger children, who still need a boost, now ride in unmatched safety.

Primary safety is also improved thanks to an innovative new Adaptive Cruise Control with Distance Alert and the new Collision Warning with Auto Brake, which warns drivers when they are getting dangerously close to the car in front and then primes the strong disc brakes for maximum braking force.

Other safety features include numerous electronically controlled braking systems such as HBA (Hydraulic Brake Assist), RAB (Ready Alert Brakes), FBS (Fading Brake Support) and OHB (Optimised Hydraulic Brakes). These all ensure that the all-new Volvo XC70 stops in the shortest possible distance. DSTC (Dynamic Stability and Traction Control) prevents skids and slides (especially useful on slippery surfaces). Improved SIPS side protection now uses superior twin-chamber airbags (the lower chambers inflate with much more pressure than the uppers, because the hips are tougher than the torso) and larger side curtain airbags. 'We're convinced this is absolutely the safest car in the premium estate class, along with the all-new Volvo V70,' says Ahlborg.

The Volvo XC70 is roomier and more comfortable than the outgoing model. Rear carrying capacity has grown by 55 litres and entry to the load area is improved by a new larger tailgate design that incorporates the tail-lights.

Volvo is renowned for superb seats that allow for hours of pampered motoring. The seats are further improved by the availability of internal ventilation, in which fans and perforated leather boost seating comfort on hot days. For more typically Swedish weather, the Volvo XC70 is also available with heated front and rear seats.

The Volvo XC70 comes in three luxury trim levels - ES, SE and SE Lux.

DESIGN CONCEPT

- All-new, rugged, sporty design
- Tough - but more elegant than outgoing XC70, with more body-colour panelling
- Designed to be equally appropriate for the café or the campsite
- Body protection in all the right places
- Tailgate design enables easy loading

The Volvo XC70 is the sportiest of all the XC models and the most capable off-road, so it has to

look the part. Its design is tough, rugged and sporty without losing the elegant or premium feel.

It's a car with two characters - sporty and adventurous on the one hand, refined and premium on the other.

Background to the design

Volvo invented the premium estate when the PV445 was launched in 1953 - a conventional saloon that could double as a capacious van.

Volvo also pioneered the crossover estate concept when the first V70 Cross Country was launched in 1996. Here was a car that had all the comfort and load-carrying ability of a Volvo estate together with real off-road credibility. The Cross Country - which became known as the XC - was not just a toughened wagon; it had more genuine off-road ability than many SUVs. The second-generation XC70, launched in 1999, refined the concept. Today, the Volvo XC70 sits in a market by itself. No other estate offers the same blend of premium features, comfort and rugged off-road skills. It is now Volvo's most off-road-orientated vehicle, despite the arrival of the XC90. Although the Volvo XC90 has clear mud-and-rocks ability, it is used almost exclusively on-road. Drivers of the Volvo XC70, by comparison, genuinely spend a good deal of their time off the beaten track, often pursuing sporting hobbies such as skiing, mountain biking, surfing, fishing or sailing.

'It's not an SUV'

The XC70 looks rugged. But it does not look like an SUV. 'The fact that it's not an SUV - yet can offer SUV-like skills - makes it very attractive to many people,' says Tomas Ahlberg, project director. 'Many people just don't want the bulk or stigma of an SUV. They want a conventional car. But one that can do the unconventional.'

'The Volvo XC70 is seen as more environmentally friendly, more fun to drive. Lots of our XC70 customers say they would never buy an SUV. But they want all the features of an SUV - such as go-anywhere ability and versatility - that make it possible for them to carry out their hobbies and interests.'

'Like a rally car'

'When we started work we came up with a vision for the car,' says Stefan Jansson, responsible for exterior design. 'Imagine a normal car driving on the road. Behind, in your rear-view mirror, you see a trail of dust. Beside you, off the road, you are being overtaken by an XC70. That was the image we created.'

Jansson said he was inspired by rally cars. 'Rally cars are like normal cars but tougher and sportier. That sums up the XC70 too. It's a car that's meant to go on all types of roads and tracks but can drive at normal speed. It's a smaller, lower, faster SUV but with at least as much practicality and versatility.'

Elegant yet rugged design

The XC70 has less hard plastic protective cladding than the outgoing model. At the front, the characteristic tough plastic nose has been abandoned and replaced with a new, unique, softer nose, mostly body-coloured. The headlamps and grille have grown and now have the same trapezoidal shape that was first seen on the XC60 Concept in Detroit in early 2007.

The dark-coloured plastic panels at the bottom are less obvious than on the previous model. But as with exclusive outdoor clothing, the protection is placed exactly where it needs to be to withstand the rough stuff.

In order to retain the rugged stance, the plastic cladding at the corners has been emphasised around the front fog lamps, which are now more clearly pronounced. 'Those corner pads - nicknamed the boxing gloves - are distinctive and practical,' says Stefan Jansson. 'The protection is exactly where you need it - on the front corners.'

At the rear, the corners are also clad in tough plastic, protecting against rocks and trees. The wheel arches are also finished in tough plastic.

The shape of the front air intakes is inspired by a jet engine's front profile. These lines are echoed around the red reflectors at the rear, which look like the extractors on a jet engine.

The chromed protective skid-plate at the front has been widened and integrated to take on a spoiler-like shape. 'It looks like a rally car sump guard and fulfils exactly the same role - to protect

the engine and underside of the front of the car,' says Jansson. A chromed skid-plate also protects the tail.

The large and distinctive dark-coloured protective plastic panels on the previous XC70 have mostly been replaced with painted surfaces. In combination with the all-new, 'nose down' stance, this gives the XC70 a more elegant and luxurious appearance.

'The result is a more premium-looking vehicle but one that has just as much practical body protection as the previous XC70,' says designer Jansson.

A sportier design

'We worked hard on getting the stance of the car just right. This is a sports estate - fun to drive and aimed at a sports-minded customer base - so we wanted to give the car more of a sporty wedge, that feeling of movement even when it's stationary. We lifted the rear of the car a little. That climbing waistline gives a forward-leaning, dynamic stance.'

A more reclined windscreen adds to the sporty feel, and so do the blacked-out roof pillars and the more steeply raked upper tailgate. The previous XC70 had a flat tailgate but the current model has a distinctive kink. 'It looks sportier but does not compromise load-carrying or load access one single bit,' says Stefan Jansson. Load-carrying space is actually bigger, by 55 litres, and boot access is better than on the outgoing XC70. This is partly because the upright tail-lights have moved from the rear pillars to the tailgate, so the opening is bigger than ever. The tailgate glass is also deeper at the sides, improving rearward visibility. A powered tailgate - for both lift and closing - is standard for extra convenience on the SE Lux and an option on the SE. The extended XC roof rails are standard, further improving potential carrying capacity.

At the rear, the Volvo name on the tailgate has more pronounced lettering, with wider spacing than before - a new feature shown on the XC60 Concept in Detroit in January 2007.

All the rear lights above the waistline - including the high-mounted third brake light - are LED lights, which are brighter and react faster than conventional tail-lights. If the load is so large that the driver is forced to drive with the tailgate slightly open, the lower lights on the body sides become supplementary brake lights.

Externally, the Volvo XC70 is higher than the V70 (by 57mm), longer (by 15mm) and has a different grille, special fog lamps and comprehensive protective cladding. The steel body panels, however, are the same, except for the front wings, and the glazing is also shared.

INTERIOR DESIGN

- Sporty, luxurious cabin
- Roomier than the previous XC70, with a high-quality feel
- Great versatility including rear seats that fold in a single easy motion
- Front passenger seat also folds, for greater carrying capacity
- Highly functional luggage area includes under-floor storage space, side rails to secure items and adjustable fasteners
- Perfect for carrying mountain bikes, skis or other sporting equipment
- Superbly comfortable seats offer internal ventilation as well as front and rear heating - so the seats are comfortable no matter what the weather
- Innovative two-stage booster seat improves child safety

The Volvo XC70 is designed to be the perfect motoring accompaniment to an outdoor lifestyle. It offers great comfort and luxury for five adults yet has more than enough carrying space for items such as mountain bikes, skis and other sporting equipment.

Despite the enormous rear load area and the versatility of the cabin, the XC70 is also a supremely comfortable luxury car, able to transport five people across continents in great refinement.

'The XC70 has a dual personality,' says Jonathan Disley, who designed the interior. 'On weekdays it's a sophisticated and elegant car for an active urban life. Come the weekend, it transforms into a rugged partner for all kinds of exciting adventures.'

Improved carrying capacity and even greater functionality

The previous Volvo XC70 was recognised for its legendary spaciousness and versatility. Yet the current XC70 is even better. Rear load area is increased by 55 litres to a vast 575 litres. Rear

access is improved by a bigger aperture, thanks partly to locating the rear tail-lights on the tailgate rather than the rear pillars. Total load length, with rear seats folded, is 1878mm (up 30mm).

The ingenious 40:20:40 split rear seat offers unrivalled versatility. Unlike conventional 60:40 or 50:50 split rear seats, the new set-up means that long items such as skis can be accommodated while two adults sit in comfort in the rear. When all three seats are folded, the load area is completely flat. The backrest of the front passenger seat can also be folded, further improving carrying capacity.

'The innovative 40:20:40 split rear seat is one of the cleverest features of the XC70,' says Tomas Ahlberg, project director. 'With normal folding rear seats, a long load such as a pair of skis reduces your car to a three-seater. With the XC70 you still get two good full-size seats in the rear.'

The rear seats fold easily. In one movement they fold flat into the floor without the need to remove headrests or separately fold the seat squabs.

The rear load bay itself is also extremely versatile. There is a large, 46-litre, lockable storage area under the floor for valuable goods. Aluminium rails are fitted to the floor and their adjustable anchorage points make it easy to secure items. The anchorage points can be tucked down into the rails when not in use. The boot's side panels also have built-in load anchorage eyelets, further to help fasten goods. In addition, the side panels can be fitted with multifunctional rails to attach hooks, load-anchoring nets and cargo space dividers, to name just a few of Volvo's many loading accessories. In effect, the Volvo XC70 offers a 3D load-securing system.

Cabin has great length, shoulder-room and legroom

'One of the goals was to ensure that all five occupants travel first-class, not just the two people in the front,' says Tomas Ahlberg.

Volvo has an excellent reputation for seating comfort. The seats on the Volvo XC70 are even better than the previous model's and the electrically operated front seats can be upholstered in perforated and ventilated leather. Front seat ventilation is supplied by the car's air-conditioning system: the air flows through the upholstery and seat cushion, reducing any stickiness caused by warm weather. The system also comes with heated front seats for chilly days, while heated rear seats are now available.

The brilliantly versatile cabin allows you to have a five, four, three, two or even single-seater as the seats fold and carrying space increases. The standard roof racks further increase carrying capacity.

Integrated two-stage child booster cushions

Another major seating innovation is Volvo's integrated, two-stage child booster cushions.

'Modern cars tend to have higher belt lines [where the bottom of the windows meets the body] so younger children tend not to be able to see out of the window in the back these days,' says Karl-Johan Ekman, technical project leader. 'It's a big problem because if they're bored and causing trouble then you won't drive so well.' The two-stage booster allows small children to sit higher and larger children still to receive a height boost. In both cases seatbelt angles are optimised, so safety is improved. The booster can be fitted to either of the outer rear seats.

Luxury cabin befitting a premium saloon

Though the Volvo XC70 has been designed as an adventurous go-anywhere vehicle, it is also a consummate long-distance luxury car. It epitomises Scandinavian luxury. The cabin is simple, elegant and functional, and seamlessly combines beauty and technology. The special stitching and trim of the seats, plus new colours, give the cabin a sportier and more outdoor feel. It is also a less complex and warmer environment than that typically found in German premium cars, as befits its Swedish design heritage.

Premium materials are used extensively, including different grades of leather, two different types of wood and two different styles of aluminium, one unique to the XC70. Leather-faced upholstery is standard on SE and SE Lux models, typical of the generous equipment levels.

One of the most elegant pieces of interior design is the sleek, ultra-slim centre console, which contains most of the important switches and controls. It contributes to the understated simplicity of the interior, avoiding a plethora of confusing switchgear.

There are three interior colours: soft beige, off black and espresso brown. 'There is more contrast on the XC70's interior than in most premium estates as a reflection of its more youthful customer base,' says Boel Hermansson, head of colour and material design for the Volvo XC70.

An unusual and distinctively Swedish touch is the 'Virrvarr' ('chaos' or 'confusion' in Swedish) detailing used for the stitching of the seats, the cross-brushed aluminium panels and the rear mesh pockets. It is inspired by the busy, almost tangled patterns of the well-known Swedish designer (and prince) Sigvard Bernadotte.

DRIVING DYNAMICS: ENGINE

- Two five-cylinder turbo diesel engines give an excellent balance of performance and economy
- A Turbo six cylinder petrol engine develops 304 PS and gives the T6 scintillating performance
- All engines located transversely for improved safety
- Front wheel drive is available with the new D3 engine and is badged DRIVe

The Volvo XC70 comes with a choice of three state-of-the-art engines. The big sellers in the UK will be the two five-cylinder diesel units - the 2.0-litre D3 and 2.4-litre D5 units. The high performance version is the turbocharged petrol T6, which delivers 304 PS, 0-60mph acceleration in 6.9 seconds and a top speed of 130mph.

	T6 AWD Geartronic	D3 FWD	D5 AWD
Type	2953cc, 24v, 6 cyl	1984cc, 20v, 5cyl	2400cc, 20v, 5 cyl
Power	304 PS	163 PS	205 PS
Torque	440/2100-4200	400/1400-2850	420/1500-3250
0-60 mph (seconds)	6.9	9.6 (DRIVe) 9.6 (G'tronic)	7.9 (manual) 8.4 (G'tronic)
Top speed (mph)	130	127 (DRIVe) 124 (G'tronic)	134 (manual) 127 (G'tronic)
CO ₂ (g/km)	248	154 (DRIVe) 179 (G'tronic)	182 (manual) 189 (G'tronic)
Fuel tank	70	70	70
Mpg: urban	18.7	36.7 (DRIVe) 31.4 (G'tronic)	30.1 (manual) 29.7 (G'tronic)
Extra-urban	34.9	58.9 (DRIVe) 51.4 (G'tronic)	51.4 (manual) 48.7 (G'tronic)
Combined	26.7	47.9 (DRIVe) 41.5 (G'tronic)	40.9 (manual) 39.2 (G'tronic)
Min kerb weight (kg)	1912	1764 (DRIVe) 1780 (G'tronic)	1843 (manual) 1859 (G'tronic)
Towing limit braked (kg)	2000	1600 (DRIVe) 1600 (G'tronic)	2100 (manual) 2100 (G'tronic)

Turbocharged T6

Designed by Volvo in Sweden but built in Bridgend, Wales, the SI6 (short in-line 6) is powerful and extremely compact. It is also very clean, easily meeting the latest Euro 4 exhaust emission standards.

In 3.0-litre T6 turbocharged form, as used in the XC70, it produces 304 PS and 440Nm of torque over a wide rev band (2100rpm-4200rpm) so the car can be driven at low revs, economically, and the T6 will still deliver enormous urge.

The turbocharger is an unusual twin-scroll device that allows for excellent low-rev pick-up, eliminating traditional turbo 'lag', and yet also delivers enormous thrust when maximum performance is desired. The twin-scroll technology allows the turbo to operate in two stages. The inflow is divided into two lots of three cylinders, allowing for swifter response and a smaller turbo unit. Ever after 4200rpm, there is only a small drop-off in torque.

There are twin overhead camshafts and 24 valves (four per cylinder) to provide optimal engine breathing. A Variable Intake System (VIS) - which varies both intake tract length and, more

unusually, plenum volume, through two throttle flap valves - boosts low-end torque and high-end power, further helping the breathing capability of this astonishing engine. For instance, in normally aspirated guise, 80 per cent of the vehicle's maximum torque is available across the entire rev range.

Unusually in this sector, the six-cylinder engine is a straight-six not a V6, which is usually cheaper to build and easier to package. A straight-six engine, as used on the T6, is intrinsically the smoothest and most refined of all engine configurations.

The biggest problem with a straight-six is that they're long and difficult to package transversely. 'Transversely mounted engines are safer - that's why we use them,' says project director Lars Blenwall. 'They reduce the risk of an engine penetrating the passenger load space and also can be designed with more crumple space in front and behind, allowing the safety systems to work more effectively.'

Most straight-six engines would not fit into a car's engine bay crossways; they're too long. Volvo engineers overcame this problem by making the new SI6 engine extremely compact and much shorter than the straight-six norm.

The key was a new and innovative drive system known as READ - Rear End Ancillary Drive. All ancillaries, such as the power-steering pump and air-conditioning compressor, are driven by gears at the rear end of the crankshaft in the space above the gearbox. The alternator is direct-driven and fitted on the engine block. The flywheel damper, which compensates for vibrations in the six-cylinder engine's relatively long crankshaft, is inside the engine block.

The result is an extremely short engine, of just 625mm - only 3mm longer than Volvo's five-cylinder engine. This substantially increases engine bay space, so the straight-six can be fitted crossways and the excellent crash structure can be configured around it. The SI6 has an aluminium block and head, and both are structurally optimised to balance low weight and stiffness. Even the camshaft cover is structural, allowing it to incorporate the camshaft bearing caps for further weight reduction.

Five-cylinder diesel engine - D5

Revised to deliver more power and torque to increase driveability, this engine offers 205 PS, 420Nm of torque from 1500-3250rpm and 0-60mph in 7.9 seconds (8.4 sec Geartronic).

The 2.4-litre diesel delivers excellent fuel economy with up to 51.4mpg and 40.9mpg on the extra-urban and combined cycles respectively and emits 182g/km of CO₂.

The performance and drivability requirements in the high-performance D5-engine were solved with twin turbochargers of different sizes that operate in sequence to provide added power over a broader rev range. The result is an engine that delivers an immediate response from the lowest engine revs without any perceptible turbo lag. It also offers rapid acceleration at all speeds, with smooth power delivery between the power bands of both turbo-charger ranges.

This twin-turbo technology in the D5 has also made it possible to introduce higher levels of exhaust gas recirculation (EGR) across a wider rev range. This harnesses the two turbochargers' different properties to deliver a combination of high performance and low fuel consumption.

The advanced fuel injection technology uses piezoelectric fuel injectors. This provides precise distribution of the atomised fuel in the combustion chamber, resulting in efficient combustion and lower emissions.

New five-cylinder, two-litre D3 engine

The main focus for the new D3 engine is reduced fuel consumption and consequent emissions. The injection system features a different type of piezoelectric fuel injectors to the D5, which aims to cut fuel consumption through extremely rapid and precise injection sequences. The high injection pressure results in an effective combustion. To promote the drivability, the single turbocharger has been optimised to produce high torque from low revs.

The new D3 163 PS engine is only available with front-wheel-drive only. This combination together with a manual transmission reduces CO₂ emissions to 154 g/km and is badged DRIVE. In addition to the lower CO₂ emissions, fuel economy is also dramatically improved to 47.9 mpg.

This CO₂ figure means the XC70 falls below the all-important 160 g/km Writing Down Allowance threshold for company cars, introduced on 1 April 2009, making the XC70 an attractive choice for the Fleet Manager. Company car drivers will also benefit significantly from lower Benefit-in-Kind taxation bills.

The new five-cylinder 2.0D diesel is, in principle, the same engine as the well-established 2.4-litre diesel, but its displacement has been reduced with a shorter stroke to optimise fuel consumption. The injection system also has a different type of piezoelectric fuel injector compared with the D5 engine. These injectors minimize fuel consumption with their exceptionally rapid and precise injection pulses under high pressure to promote extremely efficient combustion.

"More buyers than ever are focusing on fuel economy and it's important to give them more choice," says David Metherell, Product Manager at Volvo Car UK. "The DRIVE model enables customers to enjoy the benefits of a large estate with the reduced fuel consumption and lower emissions, and therefore lower running costs, which have been made possible with the DRIVE technology."

The D3 engine is also available with Geartronic transmission, however, this won't be badged DRIVE.

DRIVING DYNAMICS: CHASSIS

- Torsional rigidity of new body increased by 15 per cent
- Active Four-C chassis available as an option
- 74mm more ground clearance than V70 for better cross-country ability
- Impressive 300mm wading depth
- Hill Descent Control for safe driving on steep descents
- All-new chassis architecture with fully independent suspension for a compliant ride and good handling
- DSTC (Dynamic Stability and Traction Control) is standard to prevent slides and skids

The Volvo XC70 is equally adept at powering down muddy slopes, towing a boat up a slippery ramp or cruising on the motorway. 'Here is a cross-country vehicle that is extremely capable off-road yet drives just like a car on the tarmac,' says Tomas Ahlborg, project director. 'No SUV can offer this balance of abilities. As with any Volvo, it is also predictable, stable and safe, no matter what the surface or weather.'

Greater torsional rigidity aids ride and handling

The most important single factor in good dynamics is a rigid body platform. If the chassis twists and bends, then the handling will become unpredictable, the ride quality will deteriorate and the car will lose primary safety. Rigidity is also very important in punishing off-road conditions, when uneven roads can induce 'chassis twisting', which destabilises the vehicle.

The Volvo XC70 has a chassis architecture that offers a very high degree of structural integrity. Thanks to its careful, computer-aided design and the use of different grades of high-strength steel, the Volvo XC70 has 15 per cent greater torsional rigidity than the previous model, itself an immensely strong and stiff car.

The suspension uses coil springs all round. The front uses MacPherson struts while the rear has a multi-link arrangement. Anti-roll bars are fitted front and rear.

Specially designed for off-road

To improve driving performance on rough roads, or when off-road, the Volvo XC70 has excellent ground clearance. Its minimal overhangs mean it can also cope with very steep ascents or descents.

Helped by the generous ground clearance - it's 74mm higher than the Volvo V70 with two occupants on board - the XC70 has an effective clearance from the track beneath of 210mm. Wading depth is 300mm, so it can stride easily across shallow rivers or fords.

Although longer than the previous XC70, the vehicle is still more compact than the premium estate norm. This contributes to its ability to clamber up or down steep slopes. With ramp angles of 19.2 degrees approach, 19.8 degrees break over and 24 degrees departure, the XC70 betters its predecessor (16, 18 and 20 respectively) in all three areas.

Active Four-C chassis

Volvo's innovative active Four-C chassis is an advanced, self-adjusting chassis where electronic sensors continually monitor the car's behaviour and the dampers readjust in a fraction of a second. This technology reduces the car's tendency to squat, dip or roll under firm acceleration, hard braking or fast steering manoeuvres.

The advanced multiplex control systems update the suspension settings an almost unbelievable 500 times every second. The system is especially useful when the car's handling balance is naturally upset - for example, during fast take-off (with Four-C, the rear dampers are set to maximum stiffness to reduce squat and optimise front-end traction), during hard braking (the front dampers are stiffened to reduce nose dive) and when cornering (outside dampers are stiffened to reduce roll and improve road holding).

Dampers are also automatically stiffened as speed increases. During quick steering manoeuvres, the XC70 takes on an agility and composure that belie its size and carrying capacity. 'With an active chassis, the car's driving behaviour improves in all situations,' says project director Tomas Ahlborg. 'It is both safer and more entertaining to drive.'

Though dampers are adjusted automatically, drivers can also programme in their desired road behaviour. Three chassis settings, all at the touch of a button, alter the car's responses. Available settings are:

- Comfort - which provides the most comfortable ride with calm, harmonious body movements
- Sport - for more tightly controlled body movements and a firmer, 'hunkered down to the road' feel. Steering response is sharpened, body roll is reduced
- Advanced - the maximum sports choice that noticeably firms up dampers and would be the desired setting for brisk drives on smooth, winding roads

In an emergency situation - when the driver needs maximum control - the ingenious Four-C system overrides the personal settings to deliver maximum stability and tyre grip. Equally, as speed builds, the dampers automatically become firmer to improve handling, response and safety.

The Active Four-C chassis is especially useful on uneven or gravel roads where the unpredictable nature of the surface may catch out unwary drivers.

Hill Descent Control for safer downhill driving

Slippery downhill tracks are among the most dangerous of all off-road situations. The Volvo XC70's Hill Descent Control (HDC) allows drivers to descend slippery slopes with complete peace of mind. Speed is modulated irrespective of conditions. The electronic one-touch system, standard on T6 and D5 engines, utilises the ABS anti-lock brakes to control speed and maintain stability, ensuring a steady and safe 6mph throughout the descent. Touching the brake will slow the car but won't disengage the HDC. The HDC also works in reverse maintaining a steady 4mph, making it ideal for tricky manoeuvres such as launching a boat on a steep slipway.

'Some off-road cars have an extra-low gear for crawling or an extra-low range,' says Tomas Ahlborg. 'We believe that Hill Descent Control is a more sophisticated solution that better suits the XC70. Combined with our All-Wheel Drive system it gives great control at very low speeds, helped by the torque and throttle response of both the six-cylinder and turbocharged five-cylinder engines.'

DSTC (Dynamic Stability and Traction Control)

This is standard on all Volvo models. An electronic stability and traction system that stops skids and slides, it uses sensors to detect if any of the wheels is losing traction or grip. If so, power is cut to the relevant wheel. If the sensors detect early signs of a skid, the system automatically brakes the relevant wheel to reduce speed and regain control. It's an important primary safety aid, especially on the loose-surfaced tracks on which the XC70 may frequently be used.

DRIVING DYNAMICS: STEERING, BRAKES AND TRANSMISSION

- All-Wheel Drive (AWD) standard on T6 and D5 models for greater grip and stability
- Front-wheel-drive available only on D3 engine.
- Speed-dependent power steering is offered, ensuring good high-speed feel and easy parking
- Easy-to-use Power Parking Brake

- Highly advanced braking system includes HBA (Hydraulic Brake Assist), RAB (Ready Alert Brakes), FBS (Fading Brake Support) and OHB (Optimised Hydraulic Brakes) - all to ensure shortest possible stopping time and maximum control
- Collision Warning with Auto Brake reduces risk of rear-end collisions
- Choice of Geartronic automatic or six-speed manual for D5 and D3

All D5 and T6 XC70 models get Volvo's innovative AWD (All-Wheel Drive) transmission as standard. This advanced system, which automatically apportions torque front-to-rear depending on need, improves the XC70's handling and stability on the road. But it also improves traction and handling when the road runs out.

The D3 with front-wheel-drive retains the sporty driving properties. More horsepower, higher torque and a sporty chassis setting all help give the front-wheel drive version of the XC70 the right driving dynamics. It is the perfect choice for the customer who wants to focus on CO₂ emissions and fuel consumption without compromising on driving pleasure.

The Volvo XC70 has sharp and agile handling irrespective of conditions. The strong, large disc brakes are supplemented by a host of advanced electronic features to ensure that the XC70 always stops in the shortest possible distance, whether you're driving on the motorway or in the mud. A number of new primary safety technologies are available on the XC70, including Volvo's innovative Collision Warning with Auto Brake, which monitors the distance to the car in front and then optimises braking strength to help you avoid accidents.

All-Wheel Drive

The Volvo XC70 is a rugged car aimed at people who really do use their cars off-road. 'It's an all-road car, good on the road and good off the road,' says Tomas Ahlberg. 'Far more than most SUVs, customers genuinely use their XC70s to go into the wild. But as we say at Volvo, you use an XC70 to drive to nature not to drive over nature.'

The XC70's AWD system improves handling and road holding by apportioning torque to all four wheels. The computer-controlled BorgWarner Coupling automatically sends torque to the wheels with most grip, ensuring maximum possible traction and primary safety. The front-to-rear torque split changes constantly, as the sophisticated electronics control a hydraulic clutch that determines the most effective distribution of torque.

Sensors monitor the road (or off-road) surface and the positions of the steering, brake and accelerator. In normal conditions on a dry tarmac road, almost all the power is distributed to the front wheels. However, as soon as slippage occurs, such as in muddy off-road conditions, torque is diverted to the rear wheels to boost grip.

This unique system also features Volvo-patented Instant Traction, which detects loose or slippery surfaces and switches drive from front to rear (or vice versa) to help with standing starts.

AWD improves traction on all slippery surfaces, such as gravel, mud, snow, sand or ice, and it allows the car to go anywhere, since all four wheels provide grip. But it also improves the handling balance of the car on the road. Unlike many mechanical systems fitted to SUVs, Volvo's electronic AWD system is light - reducing unsprung weight and improving both fuel consumption and on-road handling balance.

Six-speed automatic or manual gearbox

The D3 and D5 get a choice of six-speed manual or six-speed Geartronic automatic transmission. The T6 is only offered with Geartronic. The modern Geartronic transmission can be used either as a full automatic or as a clutchless manual. In automatic mode, gear changes are so smooth as to be almost imperceptible.

The six-speed manual improves both performance and fuel economy, and is a smooth-shifting clutch-and-stick shift aimed at those who prefer changing gear themselves.

Highly advanced interactive braking system

The Volvo XC70 has ABS anti-lock brakes to stop skids and aquaplaning on- and off-road, and big disc brakes - ventilated at the front - all round. The brakes are 316mm in diameter at the front and 302mm at the rear. The new model also has a suite of advanced, interconnected braking features to deliver the best possible stopping performance. They include:

- HBA (Hydraulic Brake Assist). This is an update of Volvo's previous EBD (Electronic

Brakeforce Distribution) and EBA (Emergency Brake Assist). This new-generation system, first shown on the latest S80, helps the driver to stop in the shortest possible distance in emergency situations. Unlike the previous system, which only used vacuum assistance to boost braking strength, HBA reinforces brake pressure hydraulically. In an emergency, when the driver does not press the pedal sufficiently firmly or quickly, HBA ensures that maximum braking pressure is applied, always giving the driver the greatest chance to reduce the likelihood, or seriousness, of an accident.

- OHB (Optimised Hydraulic Brakes). In heavy braking, vacuum pressure in the brake servo can become low, reducing braking effort. OHB compensates by using hydraulic pressure to boost braking effort.
- RAB (Ready Alert Brakes). If the accelerator is released suddenly or the adaptive cruise control registers an obstacle in front of the car, RAB is deployed. The brake pads are instantly positioned very close to the discs, reducing braking response time and braking distance.
- FBS (Fading Brake Support). In long, hard braking, such as on a lengthy, mountainous descent, there is a risk of brake fade. FBS uses the hydraulics to gradually build brake pressure, maintaining pedal feel.

Collision Warning with Auto Brake

This clever technology, first shown on the latest Volvo S80 and now also available on the Volvo XC70 and V70, reduces the risk of rear-end accidents; where an impact is inevitable, it should reduce its severity.

A radar sensor, fitted behind the grille, continually monitors the area in front of the vehicle. If the sensor detects that the car in front has braked suddenly, that you are too close to the vehicle in front, or that there is an obstacle in your path, a red warning lamp flashes on the windscreen and a warning buzzer sounds. In many situations, this will be sufficient to alert the driver and the danger will pass. However, if the risk of collision increases, the brake support system is activated. The pads move very close to the brake discs and the hydraulic brake pressure is increased. Thus the brakes are fully prepared for a panic stop. Even if weak pressure is applied to the brake pedal, maximum brake pressure will be automatically used to cut stopping distance. The driver's reactions remain crucial, however - the car will never apply the brakes automatically.

To warn traffic behind, the brake lights will start to flash when the brakes have been applied in this way. Once the speed drops below 30km/h (19mph), the hazard warning flashers are also automatically activated.

The sensitivity of the collision warning system can be adjusted via the car's settings menu. There are three different positions that can be set according to driving style or road conditions.

Adjustable, speed-dependent power steering

All Volvo XC70s get sharp, power-assisted rack and pinion steering as standard. This provides extra power assistance at low speeds, for example to make parking easier. The power assistance gradually declines as road speed increases, disappearing entirely at high cruising speeds. To give all drivers their own optimum road feel, the level of steering servo assistance can now be adjusted via the car's set-up system. Power steering assistance can be set at one of three levels, depending on personal taste.

Power Parking Brake

This smart parking brake is released automatically once the accelerator is pressed (and the driver's seatbelt is fastened), making hill starts easier, especially for cars fitted with manual gearboxes. The parking brake is engaged by pushing a lever to the left of the steering wheel and can be manually disengaged by pulling the same lever.

QUALITY AND EQUIPMENT

- High level of standard equipment
- Unique trim on XC70 including tougher, more colourful fabrics
- High-quality cabin materials and trim, all of which are emissions- and allergen-free
- ES, SE and SE Lux trim levels
- Superb in-car entertainment offers some of the best sound on the road
- Three-year/60,000-mile warranty

Scandinavia is renowned for its great interior design and Volvo is no exception. Volvos manage to combine high-quality functionality, easy-to-use design simplicity and premium materials. Volvos

come much better equipped than rival German premium cars and they last, too. Independent studies invariably conclude that Volvos are among the longest-lived and most durable of all cars.

XC70 ES

The ES is extremely well equipped, featuring electronic climate control (ECC), passenger airbag cut-off switch, aluminium trim, a six-speaker Performance audio system with 80W output, cruise control, power-adjustable and heated door mirrors, 16" alloy wheels, roof rails and tough SC body cladding. The ES also uses a unique XC70 cross brushed aluminium dash and door trim for a sporty yet tough finish and includes the full suite of Volvo safety features, including dual-chamber SIPS side airbags and inflatable side curtains.

All Volvo's state-of-the-art electronic traction and braking controls, such as DSTC (Dynamic Stability and Traction Control), ABS (Anti-lock Brakes) and HBA (Hydraulic Brake Assist) are standard, as is remote-control central locking.

Further examples of the extremely high standard of equipment include load-adaptive front and rear lights, the 3D cargo load system for tethering all sorts of different objects in the cargo area and a 12V power output in the rear (perfect for camping or outdoor pursuits).

XC70 SE

Standard features on SE models include all the ES specification and adds leather-faced upholstery, an eight-speaker High Performance audio system with 160-watt output and automatic rain-sensing wipers, 17" alloys, power tailgate, Bluetooth, Rear Park Assist and autofolding power door mirrors with ground lights

XC70 SE Lux

The SE Lux is the most luxurious model in the XC70 range. Standard features include all the above plus satellite navigation, powered driver seat and power folding rear headrests. Active bending headlamps and highlight cleaning system are also standard, alongside 18" alloy wheels.

Audio systems

The Volvo XC70 has been designed to offer a superb sound experience. The standard audio is Volvo's acclaimed 'Performance' sound audio system featuring six speakers and 80-watt output. The top-of-the-range Premium Sound audio system - optional on all models - is one of the very best in the automotive world. It uses an Alpine digital 5x130-watt amplifier, Dolby Pro-Logic II Surround and 12 speakers. It's a 5.1 channel system that provides a true stereo effect. Thanks to the digital amplifier, the system automatically adjusts both volume and tone to compensate for outside noise. The amplifier has a very high damping factor, thanks to the ICEPower technology from Danish hi-fi expert Bang & Olufsen. This system contributes to the powerful sound, which remains clear all the way down to the deepest bass notes.

The normal High Performance audio system, standard on the SE and SE Lux, also offers exceptional sound quality. It gets a single CD player, a 4x40 watt amplifier and eight speakers.

For even richer and deeper bass notes, both the Premium Sound and High Performance systems can be enhanced by a 12-litre, dual-chamber sub-woofer under the luggage floor, close to the rear seat backrest. This Alpine-developed sub-woofer includes two 6.5-inch bass elements and an integrated 2x130-watt amplifier. Designed to offer the best possible bass performance, it is a £205 option on all models.

All sound systems feature an extra input for connection to portable MP3 players, such as iPods, enabling them to be mated to the car's audio system.

Bluetooth compatibility plus improved satellite navigation

Bluetooth, the advanced wireless system, enables your mobile phone to be connected to the car's loudspeaker system. This allows for perfect sound and minimises the interference often experienced when a mobile is used while driving.

Volvo's Satellite Navigation System (RTI) - available as an option on all models and standard on SE Lux models - has a faster processor, which means alternative routes are plotted more quickly than before, and there is more detailed information, including local speed limits when a national border is crossed. A number of new countries have been added, mostly in Eastern Europe. This new sat-nav system features RDS-TMC (traffic message channel) which displays up-to-date information on traffic problems. The large colour screen display rises from the top of the

dashboard, safely positioned in the driver's view. When not in use it retracts, helping to keep the car's interior design less cluttered and more Swedish minimalist.

Personal comfort settings

The XC70 driver can adjust the car's comfort functions to suit his or her personal needs. These settings are altered in the car's information system. The menu includes the seats, rear view mirrors, climate unit, audio unit, navigation system and, to a certain extent, the car's driving properties.

One of the selectable functions is automatic operation of the rear defroster. When this setting is chosen, the defroster is automatically activated when the outside temperature reaches 9 degrees C or below.

Rear seat DVD

The XC70 can be fitted with an advanced RSE (rear seat entertainment) system. An integrated DVD player, eight-inch flat-screen monitors built into the front seat headrests, wireless headphones and remote control are all included. An extra socket means it is possible to connect an additional DVD player or video game. The two screens can then be used independently. Introduced in May 2008, a Digital TV option is also available to supplement the RSE system. This option enables passengers to watch Freeview channels.

Extensive options list

The XC70 includes hundreds of options to allow owners to personalise their cars. For better value, some of these options are grouped in packs:

- Winter pack: heated front seats, headlamp cleaning system and heated washer nozzles (also available - Winter Pack with Active Bending Lights and headlamp cleaning system)
- Family pack: two, two-stage, integrated booster cushions, power child locks (rear doors only) and passenger airbag cut off switch.
- Driver Support pack: BLIS (Blind Spot Information System), ACC (Adaptive Cruise Control) with Distance Alert and Collision Warning with Auto Brake and LDW (Lane Departure Warning) and DAC (Driver Alert Control).
- Security Pack: PCC (Personal Car Communicator) and Keyless Drive and Laminated Windows including cargo area

Warranty

The Volvo XC70 is backed by a three-year/60,000-mile warranty. There's a three-year, unlimited-mileage warranty on the paintwork and either 8 or 12 years against rust perforation. All Volvos have free Mondial cover for one year, including breakdown assistance anywhere in Europe, 24 hours a day.

SAFETY

- Engineered to be the safest car in the segment
- Advanced electronic traction, stability and braking systems deliver superb primary safety - crucial on a car that will spend much time off-road or in slippery conditions
- Improved child safety with dual-stage booster cushions and extended inflatable curtain
- New, stronger side structure
- Second-generation WHIPS system avoids neck injuries
- Better pedestrian and cyclist protection
- Active bending headlamps 'see around corners'

Safety is the key quality of any Volvo. Ever since the first Volvo was built in 1927, the overriding priority has been to develop cars that help prevent accidents and, if the accident does happen, to offer maximum protection. 'Cars are driven by people. Therefore the guiding principle behind everything at Volvo is, and must remain, safety,' declared co-founders Assar Gabrielsson and Gustaf Larson.

'When we developed the Volvo XC70, our goal was that it should be the safest car in the segment,' says Hans Nyth, director of Volvo Cars Safety Centre. 'The XC70 model shares the same sophisticated network of interacting safety systems as the Volvo S80. The patented body structure absorbs energy in a highly efficient way. And the interior safety system includes the latest generation of side airbags and whiplash protection.'

'The best way to stay safe is to avoid accidents'

The Volvo XC70 has the most comprehensive and sophisticated array of safety protection devices in its class, and its suite of accident avoidance and stability devices is no less impressive.

These include numerous advanced braking functions (see 'Driving Dynamics: Steering, Brakes and Transmission'), Volvo's DSTC (Dynamic Stability and Traction Control - see 'Driving Dynamics: Chassis') and Collision Warning with Auto Brake (see 'Driving Dynamics: Steering, Brakes and Transmission') - Volvo's clever new technology that reduces the risk of rear-end accidents.

Active bending headlamps

Good headlamps are essential for safe night driving, especially in a car that is designed to go to out-of-the-way locations, miles from any public lighting. The standard halogen headlamps give an excellent light spread on low or high beam and are automatically height-adjusted to avoid dazzling oncoming cars, irrespective of load.

For even better illumination, the Volvo XC70 can be equipped with Active bending headlamps - swivelling headlamps that follow the sweeps and bends of the road. The headlamps can be swivelled up to 15 degrees in either direction, totalling 30 degrees, and can light up a longer stretch of road as it twists and turns. In order to save wear and tear on the system, it is automatically deactivated in daylight.

Like the standard halogen headlamps, the Active bending headlamps are automatically adjusted depending on how heavily the car is loaded and also on whether the car is accelerating or braking. So the headlamps always point at optimal 'level' height.

The headlamps are cleaned using an electromagnetic, high-pressure system that washes one headlamp at a time - another ingenious Volvo safety feature - so as to always provide the best possible illumination under all conditions.

Advanced driver information systems boost safety

The Volvo XC70 can be equipped with BLIS (Blind Spot Information System) and LDW (Lane departure warning) with DAC (Driver Alert Control).

Using cameras integrated into the door mirrors, BLIS registers whether another vehicle is in the blind spot offset to the rear of the car. If there is a vehicle there, a lamp lights up at the relevant mirror to alert the driver.

Rather than monitoring human behaviour (which varies from one person to another) DAC monitors the progress of the car on the road. Monitoring driving behaviour is more reliable as it assesses the impact that fatigue or distraction has on the car's movements and assesses whether it's being driven in a controlled, consistent manner. This system consists of a camera located between the windscreen and the interior rear view mirror, a number of sensors and a control unit. The camera measures the distance between the car and the road lane markings, while the sensors register the car's movements. This information is sent to the control unit which then calculates whether the driver is at risk of losing control of the car. If the risk is assessed as high, the driver is alerted via an audible signal, while a text message and coffee cup symbol appear in the cars information display to urge the driver to take a break. The driver has the opportunity to access driving information throughout a journey, the starting point is five bars and the less consistent the driving, the fewer bars remain.

Both the Driver Alert Control and Lane Departure Warning are activated when the car reaches 40mph and they will stay active as long as the speed exceeds 37mph. The availability of these systems depends on the number and quality of visible road markings. The lane markings must be clearly visible and poor light, fog, snow and extreme weather conditions can make the system unavailable.

IDIS (Intelligent Driver Information System) is standard on all Volvo XC70 models. IDIS is an electronic information system that helps prevent the driver from becoming distracted by irrelevant information in busy situations. By continuously monitoring certain functions in the car, such as brake application and movements of the steering wheel, accelerator pedal and turn indicators, IDIS can assess the complexity of the driving situation. The information is processed and at a certain level of complexity, any information that is not essential to safety is delayed, for instance incoming phone calls or SMS text messages.

ACC (Adaptive Cruise Control) with Distance Alert and Collision Warning with Auto Brake

To help the driver maintain a safe distance from the car in front, Volvo has developed Adaptive Cruise Control or ACC. It uses a radar sensor to measure continuously the distance to the vehicles in front and automatically adapts the speed of the car to help ensure the distance is not too short. This technology also forms the basis of several of Volvo's advanced driving and support systems, including Collision Warning with Auto Brake.

The driver activates the cruise control, setting the desired maximum speed at between 18 and 125mph, and chooses the minimum time interval to the cars in front. There are five different time intervals to choose from.

Distance Alert is another feature included in this option. The system helps the driver maintain a safe distance to the vehicle in front even when Adaptive Cruise Control is not in use. Activated via a button on the centre console, the driver can choose between five settings, similar to that of the ACC. If the time gap to the car in front gets shorter than the selected speed, the driver gets visual information in the head-up display on the lower section of the windscreen.

ACC with Distance Alert forms an option along with Collision Warning with Auto Brake.

Child safety improved with two-stage booster cushion

Volvo has also been a pioneer in child safety - an area of car design that is frequently overlooked. A world first for the Volvo V70 and XC70 is a height-adjustable booster cushion. Integrated into the rear seat, it can be set at two heights, allowing children of different sizes to see out of the car while also getting optimal seatbelt support. The lower setting is intended for children between 115 and 140cm in height and weighing between 22kg and 36kg. The upper setting is designed for children measuring 95-120cm and weighing between 15kg and 25kg. The integrated child booster cushions can be used on both outer rear seats.

The seats are specially designed so that the seatbelt geometry is optimum irrespective of the child's height. The safety belts also have specially adjusted force limiters so they restrain the child with just the right amount of tensioning force in a collision.

'It's a sad fact that the least well protected occupants in many cars are children,' says XC70 project director Tomas Ahlberg. 'This is because the child seats don't fit them properly, the seat is not properly secured or the belt does not fit them correctly. This new Volvo innovation optimises safety for children who have grown out of rear-facing baby chairs but who are too small to sit in a normal adult seat.'

SIPS side impact protection offers even greater safety

Volvo has also further developed its SIPS (side impact protection system) thanks to a stronger side body structure. The body's entire side structure is both stronger and lighter thanks to a well balanced combination of high-tensile steel of different grades (High Strength Steel, Extra High Strength Steel and the extremely strong Ultra High Strength Steel). The various components and grades of steel interact to reduce penetration into the passenger compartment.

The inflatable roof curtains in the Volvo XC70 have been extended by 60mm, offering greater head protection for children and adults alike.

The Volvo XC70 also gets a new type of side airbag. These new side impact airbags have two separate chambers - one for the hip section and one for the chest. The hips can withstand greater force than the chest, so the lower chamber inflates with up to five times more pressure than the upper section. The side impact airbags interact with the inflatable curtains and the car's network of safety beams to provide the most effective possible protection.

Crumple zones made using different grades of steel

The patented front body structure in the Volvo XC70 is divided into zones, each of which has a different task during the crash sequence. The outer zones are responsible for most of the deformation. The closer the collision forces get to the passenger compartment, the less the material deforms. In order to give each zone the right properties, different grades of steel are used in different structures. In all, there are four different grades. Apart from regular body steel, three different grades of high-tensile steel are used: High Strength Steel, Extra High Strength Steel and Ultra High Strength Steel.

These crumple zones are:

- Zone for deformation at low speeds: The front bumper is attached to a cross-member made of aluminium. The attachment points at the body's longitudinal beams are designed as collapsible 'crash boxes'. They absorb low-speed collision forces without damaging the rest of the body's beam structure.
- Zone for deformation at high speeds: The straight sections of the longitudinal beams are made of High Strength Steel, a very tough grade of steel optimised for high energy absorption. This zone accounts for most of the deformation.
- Back-up zone: The beam section that curves out towards the A-posts serves as a barrier protecting the passenger compartment and also as a back-up to reduce deformation. Its shape also helps minimise the risk of the front wheel penetrating the passenger compartment. Instead, the wheel helps absorb the collision forces. This section is very rigid and is made of Extra High Strength Steel.
- Three-point attachment: A rigid cross-member links the two A-posts and the lower side-members so that they form a particularly sturdy three-point attachment on each side. This design is particularly effective at protecting the passenger compartment in a severe impact.

Compact transverse engines improve safety

Like all other models in the Volvo range, the Volvo XC70 has a transverse driveline. A transverse installation gives the engine more space inside the engine compartment to allow the crumple zones and other safety systems to work more effectively. It also reduces the risk of the engine penetrating the passenger compartment in a frontal impact.

Second-generation WHIPS system

WHIPS (Whiplash Protection System) reduces the risk of neck injuries in a rear-end collision. The front seat backrest accompanies the passenger's initial body movement and dampens the incoming force rather like one's hand does when catching a ball.

The Volvo XC70 features the same generation of WHIPS mechanism as was launched on the S80 model and the V70. This generation was further developed to ensure that the damping motion is gentle and to provide good contact between the head and head restraint throughout the impact sequence.

Protection for pedestrians and cyclists

The rounder front end of the Volvo XC70 has a large, energy-absorbing soft structure in front of the bumper that helps reduce leg injuries to other road users in the event of a crash. The spoiler's lower edge has also been reinforced and moved forward, almost on a level with the bumper. The area of contact on a pedestrian's or cyclist's leg should be distributed across a larger area, reducing their risk of injury.

The bonnet is raised on impact to help cushion any blow and its underside has a honeycomb structure that absorbs crash energy and reduces injury.

Protection for other motorists

With its high ground clearance, the Volvo XC70 has relatively high bumpers. This creates a greater potential risk of damage to an oncoming 'normal' passenger car. To reduce the risk of injury in a collision, the front suspension subframe in the Volvo XC70 is supplemented by a lower cross-member, positioned at the height of a conventional car's bumper. This lower beam is integrated into the XC70's structure and is neatly concealed behind the spoiler. In a collision, the lower cross-member should strike the oncoming car's protective structure, activating its crumple zone as intended so the occupants can be given the maximum level of protection.

Other protective safety solutions

- Collapsing steering column that moves horizontally upon deformation for the best possible interaction with the airbag
- Pedals that limit the risk of penetration into the passenger compartment
- Driver and passenger airbags with two-stage function for superior cushioning and ultimate protection
- Seatbelt pre-tensioners for all five seats
- Seatbelt reminders for all five seats
- Force-limiters for the seatbelts
- Reinforced, transversely fitted tubular beam between the A-posts
- Strong SIPS tubes in the seats and a sturdy magnesium bracket in the middle of the car
- Diagonally fitted beams of Ultra High Strength Steel in the doors

SECURITY

- Volvo On Call rings for help automatically
- PCC (Personal Car Communicator) enhances security
- Electronic immobiliser
- Remote key fob activates alarm and deadlocks
- 360° Laminated windows available
- Home Safe and Approach lighting is standard

Volvo has an unmatched reputation for car safety. But personal protection is also of growing importance, which is why the Volvo XC70 has numerous features to give owners extra peace of mind.

Volvo On Call

In a car that can take you to places that normal cars can't, it's good to know that help is at hand in an emergency. Volvo On Call, available as an option, uses advanced telematics to call for help. The system uses the integrated GSM telephone and GPS satellite navigation to automatically call the emergency services when an airbag or seatbelt pre-tensioner is triggered during an accident. Alternatively, you can ring the emergency services by pushing a red SOS button on the GSM phone.

If the car breaks down or you need help, pressing the Volvo On Call button will put you straight through to a Volvo On Call operator who can offer roadside assistance.

PCC (Personal Car Communicator)

This looks remarkably like a regular remote control but it can do a lot more than just activate the locks and alarm. A simple push of a button can, within a few seconds, tell the car owner if:

- the car is locked or unlocked
- the alarm has been triggered

The information is available and up-to-date as long as the distance between the PCC and the car is 100 metres or less. In addition, the most recent data is logged so the owner can at any time and any place check whether the car really was locked when it was parked.

Home Safe and Approach lighting

By pressing a button on the remote controller when approaching the car, the driver can turn on the inside lights, the side marker lights and the lights in the rear-view mirror. On leaving the car, a tweak of the headlamp stalk activates the dipped beam headlamps for 30, 60 or 90 seconds (programmable), lighting the path to the door.

Laminated glass all round

To make break-ins more difficult, the Volvo XC70 can be specified with laminated glass in all the windows, including the rear side windows and the tailgate, giving the whole car, including the luggage compartment, effective protection.

The storage system under the luggage compartment floor has a capacity of 46 litres if the car does not have a spare wheel. It is locked automatically when the tailgate is locked.

Deadlocks, immobiliser and alarm

Standard features include a remote control key fob that activates an alarm and strong deadlocks. Even if a thief does break into the car, for instance through breaking the glass, the deadlocks make it impossible to open the doors from the inside. The key fob also activates an electronic immobiliser that makes starting the car impossible without the correct key.

ENVIRONMENT

- Particulate filter on diesel engines cut 95 per cent of exhaust particulates
- The new D3 DRIVE engine with front-wheel-drive and manual gearbox offers excellent 47.9 mpg economy and a 154 g/km CO₂ performance
- CZIP (Clean Zone Interior Package) gives extraordinarily clean air inside car and reduces risks of allergy
- Interior trim materials are allergen-free
- All new Volvos are 85% recyclable and 95% recoverable

- Cabin air filter removes dust, pollen and exhaust particle

Volvo Cars' commitment to environmental activities and continuous investment to help reduce its carbon footprint goes far beyond lowering CO₂ emissions. Volvo's 'Clean inside and out' programme represents a holistic approach to the environmental impact of the car. It focuses on health, resource utilisation and the ecological consequences of the production, use and disposal of the vehicle.

Volvo Cars' focus on other energy sources than oil has been going on for more than 25 years. Back in 1982 the company took the first step by using residual heat from the nearby refineries to heat the factory in Torslanda, Sweden. In 1988 Volvo started using natural gas, which was the main fuel for heating its European factories (Sweden and Belgium) and, from 1 January 2008, Volvo's European manufacturing units now only use green electricity - hydropower. This is Volvo's latest step in making its production climate neutral and future plans may also extend to other energy sources such as biogas and wind-power.

The XC70 offers more off-road performance than most SUVs yet is far more economical. Its lower, car-like shape also means it's lighter and more manoeuvrable yet it is also roomier than most 4x4s.

Clean, efficient engines

The engines in the Volvo XC70 are all pleasingly economical, given the extraordinary abilities of the versatile and sporty XC70. A particulate filter, which traps 95 percent of soot particles, requires no servicing and is fitted as standard in both Euro 5 compliant diesel engines.

The T6 engine also meets Euro 5 emissions regulations. It produces 26.7mpg on the combined cycle and emits 248 g/km of CO₂ - a very reasonable figure considering the high performance and overall vehicle versatility (carrying capacity, strength and all-road potential).

The D3 diesel DRIVe engine and front-wheel drive is the CO₂ emitting XC70 of all, emitting only 154 g/km of CO₂.

Reducing fuel consumption and CO₂ emission level offers a range of benefits, both for the environment and the buyer's pocket. The full DRIVe range now includes the XC60 crossover, V70 and XC70 premium estates and S80 executive saloon. The introduction of an intelligent Start/Stop system has reduced CO₂ emissions to just 99g/km on C30, making it exempt from annual road tax under current regulations. The same technology also cuts CO₂ emissions to 104g/km on S40 saloon and V50 Sportswagon models.

Clean cabin environment

Environmental protection also extends to ensuring that XC70 occupants breathe the purest air possible.

Volvo's Air Quality System monitors the cabin, minimising odours and pollutants entering from outside. The air-conditioning system always ensures that the air is cleaner inside the car than outside. A cabin air filter prevents dust, pollen and exhaust gas particles from entering the car.

Furthermore, Volvo's new CZIP (Clean Zone Interior Package) features an automatic air-purging system. When the car is unlocked by the remote control, the passenger compartment is automatically ventilated for about one minute if the outside air temperature is above 10 degrees C. Carefully selected trim materials, which minimise emissions of harmful substances, further help to provide cabin air of a cleanliness approved by the Swedish Asthma and Allergy Association.

Corporate Citizenship

The Volvo XC70 is built in one of the automotive world's cleanest factories: emissions of solvents from the Volvo Torslanda plant in Sweden have been reduced by over 90 per cent since 1972. Volvo's annual Corporate Citizenship report is available at www.volvocars.com/citizenship.

Ends

Keywords:

XC70 (2007), Press Releases, 2011, XC70 (2008-2016)

Descriptions and facts in this press material relate to Volvo Car UK's car range. Described features might be optional. All information is correct at time of going to press and may be altered without prior notification.

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