

VOLVO XC70

MARKET POSITIONING

Now known simply as the Volvo XC70, it perfectly complements Volvo's new XC90 by offering SUV standards of all-wheel drive, all-road abilities in an estate car.

The XC70's styling asserts its own identity with a rugged look that suits its purpose, while a standard specification including leather upholstery, alloy wheels and a superior audio system with Dolby Surround Sound, proves its premium status.

The engine line-up was revised for the 2003 model year to include Volvo's new 2.5T petrol engine and D5 turbodiesel.

When Volvo launched the original V70 XC ('Cross Country') in 1997, it was a new breed of car. Here was a vehicle that combined the luxury and dynamics of an estate car with the versatility of a chassis and extra ground clearance that could handle rough terrain. Volvo had developed an understanding of how people actually use their vehicles and developed a genuinely new alternative to a traditional SUV (Sports Utility Vehicle).

The concept proved a great success and found favour with customers across the world – in the US market the 'XC' variant rapidly accounted for 45 per cent of all V70's sold. The success of the concept led to the development of a second generation model, but whereas the original was a derivative of the Volvo V70, its successor was engineered as a stand alone car. This explains why it is now known simply as the Volvo XC70 and complements the new Volvo XC90 in the company's XC ('cross country') range.

The styling, while based on the Volvo V70, asserts its own identity with a rugged look that suits its purpose. The front and rear feature unique colour co-ordinated mouldings which are united by flared wheel arches and extensive body-side mouldings. To complete the effect, an aluminium skid plate is fitted

to the front end and complemented by the bespoke alloy wheels and chunkier, standard fit roof rails. But these additions are not simply aesthetic, they also protect the bodywork on rough terrain.

The increased ride height also enhances the Volvo XC70's stance and rugged appeal. It has a ground clearance of 209mm, which is 69mm more than a Volvo V70 and comparable with many SUVs. Now coupled with a new, electronic Haldex All Wheel Drive (AWD) system and chunky Pirelli Scorpion tyres, it provides the Volvo with all-terrain ability. The Volvo XC70 was never intended to rival the mud-plugging ability of dedicated off-roaders such as the Land Rover Discovery, but it's more than capable of traversing muddy fields or dirt tracks.

And it combines this with on-road dynamics derived from the critically acclaimed Volvo V70. The MacPherson strut front suspension and Delta-link rear end provide a cushioning ride with entertaining, failsafe handling.

There are two engines to choose from, both of which were introduced for the 2003 model year – a 2.5T petrol and the D5 turbodiesel.

The new 2.5T petrol engine replaces Volvo's 2.4T and uses a light pressure turbo to provide stirring performance – 0-62mph takes just 7.6sec – with good mid-range torque of 320Nm from 1500-4500rpm.

Strong mid-range urge and refinement are also some of the characteristics of Volvo's D5 common rail turbodiesel, which generates 163bhp but, even with automatic transmission achieves an average of 33.2mpg on the Combined cycle.

The interior of the Volvo XC70 builds on the success of the Volvo V70. The handsome, ergonomically efficient fascia is familiar and so is the vast load bay and spacious passenger compartment. But the Volvo XC70 introduces some tricks of its own. The rear seat splits 40/20/40, allowing long loads to be carried alongside passengers, or the centre section can be swapped for an

optional cooler or storage box. There's a passenger grab handle on the centre console for when the going gets rough, and the standard leather trim has 'sail seam' stitching, which underlines Volvo's tough yet luxurious stylish approach to the interior design.

As you'd expect, the Volvo XC70 is also packed with the latest safety features, which it shares with the Volvo S60 and the Volvo S80. Volvo's acclaimed SIPS and WHIPS systems are complemented by an Inflatable Curtain (IC), twin front 'intelligent' airbags and three-point safety belts with tensioners for all five occupants.

Volvo's 'clean inside and out' programme reflects the company's commitment to improving the environment. Volvo's Air Quality System (AQS) ensures that the air quality inside the car is always better than that outside, and every new Volvo is backed by an Environmental Product Declaration examined and verified by Lloyd's Register Quality Assurance Limited (LRQA) of London.

DESIGN CONCEPT

The Volvo XC70 combines the elegance of the Volvo V70 with the ruggedness of an SUV (Sports Utility Vehicle). It complements the new Volvo XC90 and provides a perfect alternative for customers wanting the added versatility of an SUV in a car-like body.

Although the design is based on the Volvo V70, it asserts its own style and identity. The chunkier bumpers and wrap-around body mouldings are both practical and attractive, while the frontend also benefits from a stylish, aluminium skid plate.

In the side elevation, the Volvo XC70 is distinguished by plastic cladding and wheel arch extensions, which frame the six-spoke alloy wheels and chunky Pirelli Scorpion tyres. Standard fit roof rails complete the look.

- **Styled by Swede Stefan Jansson, under the guidance of British Design Director, Peter Horbury (now Director of Design for the whole of PAG)**

- Contrasting, unique bumpers and side mouldings add special look, practicality and rugged appeal
- Traditional Volvo V-shaped bonnet with sporty black, egg-crate grille
- Wheel arch extensions and plastic side cladding
- Unique 16in alloy wheels with chunky Pirelli Scorpion tyres
- Increased ground clearance enhances all-terrain aesthetics

The design of the Volvo XC70 is a brilliant synthesis of the elegant sophistication of the Volvo V70 and the ruggedness of an SUV (Sports Utility Vehicle). It perfectly complements the new Volvo XC90 and provides an alternative for customers who want added versatility in a car-like body.

Unlike the original Volvo V70XC or 'Cross Country', which was a derivative of the V70 estate, the current Volvo XC70 was developed as a stand alone model. This is reflected in the distinctive styling, which was developed by the Swedish designer Stefan Jansson, under the guidance of Volvo's British Design Director Peter Horbury – who is now Design Director for the entire Premier Automotive Group.

The most obvious changes to the shape of the Volvo V70 are to be found at the front and rear. Colour co-ordinated, contrasting dark blue or brown bumpers and body-side mouldings add some rugged appeal and they're also extremely practical. The bonnet retains the characteristic Volvo 'V', and at its leading edge it meets a distinctive, black, egg-crate grille. Another stylish yet practical feature is the aluminium front skid plate neatly integrated between the front foglights.

The theme continues at the rear with a robust rear valance and bumper moulding. A rear skid plate is available to match the front one. These differentiate the XC70 from the Volvo V70 and also protects the body on difficult terrain and around town. Identically coloured flared wheel arch extensions and plastic body cladding complete the special effect.

These wheel arches frame the bespoke 16in alloy wheels, which are mated to chunky Pirelli Scorpion STR road tyres. The standard fit roof rails are chunkier than those on a regular V70, and are as attractive as they are practical.

The visual impact of these design touches is enhanced by the increase in ground clearance. The Volvo XC70 sits 69mm higher to the ground than the Volvo V70, with a total ground clearance of 209mm – equal to many off-roaders. This makes a major contribution to the car's off-road ability and the rugged, stylish and practical appeal of the design.

DRIVING DYNAMICS

ENGINES

There are two powerful, five-cylinder engines available, both of which were introduced into the XC70 for the 2003 model year – a 2.5T petrol and the D5 turbodiesel.

The new 210bhp, 2.5T petrol engine replaces Volvo's 2.4T and uses a light pressure turbo to provide stirring performance from its 2521cc engine – 0-62mph takes just 7.6sec – with excellent mid-range torque of 320Nm from 1500-4500rpm.

Strong mid-range urge and refinement are also some of the characteristics of Volvo's D5 common rail turbodiesel, which generates 163bhp but, even with 'Geartronic' transmission, achieves an average of 33.2mpg on the Combined cycle.

- New 2.5T petrol and D5 turbodiesel engines introduced for 2003 model year
- 2.5T engine boasts four valves per cylinder, continuously variable valve timing and a light pressure turbo
- Petrol engine develops 210bhp and powers the manual Volvo XC70 from 0-62mph in 7.6 seconds and on to 140mph

- D5 employs direct injection common rail diesel technology for effortless surge and refinement

At the heart of the Volvo XC70 are two new engines that deliver an impressive combination of performance and flexibility with low fuel consumption and exhaust emissions. For the 2003 model year, a 2.5-litre, low-pressure petrol turbo engine replaced the 2.4T, and was joined by Volvo's frugal and refined D5 turbodiesel.

The 2.5T belongs to the RN range of five-cylinder, all-aluminium, in-line petrol engines. It features four valves per cylinder, a twin cam head, centrally mounted spark plugs and continuously variable valve timing (CVVT). The latter operates on the exhaust cam and helps to minimise emissions, especially when the engine is cold.

Boasting a capacity of 2521cc, the 2.5T develops 210bhp and 320Nm of torque. The latter is available from 1500-4500rpm and provides impressive mid-range flexibility. Against the stopwatch, the manual Volvo XC70 records 0-62mph in 7.6sec and 140mph. The figures for the auto are 8.0sec and 137mph respectively.

The D5 turbodiesel variant was also introduced to the Volvo XC70 range for the 2003 model year, making it one of a minority of diesel, AWD estates on the market. A common rail system enables the fuel to be distributed under very high pressure via a single 'common' fuel line or 'rail'. The combustion can be controlled very precisely, reducing emissions and maximising performance and refinement.

The engine develops 163bhp at 4000rpm and 340Nm of torque from 1750-3000rpm. This helps the Volvo V70 D5 (with 'Geartronic' transmission) combine strong performance – 0-62mph takes 11.5 seconds and it can reach 121mph – with excellent mid-range pull thanks to torque of 340Nm from 1750-3000rpm.

CHASSIS

The Volvo XC70 combines the ability to traverse mixed terrain with the on-road dynamics of the critically acclaimed Volvo V70.

The sophisticated suspension set-up and high torsional rigidity are shared with the Volvo V70, but the geometry has been revised and the front track widened to enhance stability in all conditions.

An increase in the ride height by 69mm when compared with the Volvo V70, an electronic Haldex all-wheel drive system and chunky Pirelli Scorpion tyres mean the Volvo XC70 is surprisingly capable over rough ground and poor surfaces.

- Mixed-terrain ability combined with impressive on-road performance
- High torsional rigidity benefits safety and chassis dynamics
- Wider front track than Volvo V70 for improved stability in all conditions
- Sophisticated Delta multi-link rear suspension
- Ground clearance of 209mm, 69mm more than Volvo V70
- Load compensating suspension fitted as standard
- Electronic Haldex all-wheel drive system maximises traction in all conditions
- DSTC (Dynamic Stability and Traction Control) fitted to 2.5T
- Lower centre of gravity than an SUV

The strength of the Volvo XC70 concept is its ability to combine the on-road dynamics of the critically acclaimed Volvo V70 with the mixed-terrain ability of an SUV. The sophisticated suspension set-up and high torsional rigidity are shared with the Volvo V70, but the front track is wider for enhanced stability in all conditions.

A high level of torsional rigidity is crucial to providing a consistent ride and handling balance, and it also enhances a vehicle's crash performance. Volvo's engineers met their rigidity targets through the extensive use of High Strength

Steel (HSS) and the application of bonding techniques in place of the more usual spot welding. Bonding, unlike spot-welding, produces a continuous joint that increases the rigidity of the structure and also steals less space in, for example, the luggage area. The technique clearly works, as the latest Volvo XC70 is 50 per cent stiffer than its predecessor.

The Volvo XC70 shares its basic suspension set-up with the Volvo V70, but with modified geometry and an extra-wide track. The MacPherson strut front suspension employs dampers and coil springs that are combined in a single unit and are positioned asymmetrically in relation to the strut. Beneath the spring struts are triangular lower links, with an anti-roll bar attached directly to the bottom of the struts themselves. Anti-lift and anti-dive technology also enhances the car's stability in all conditions.

At the rear, the Volvo XC70 employs a sophisticated Delta multi-link system, mounted in a chill-cast aluminium subframe. This is attached to the body at four points via insulating rubber bushes to keep noise and vibration to a minimum. The use of aluminium helps keep the weight down, while the compact design ensures that there's no encroachment on passenger or luggage space.

Four links on each side – hence multi-link – comprised of two trailing arms, upper and lower links, a track rod and an anti-roll bar, control the movement of the wheels. As with the front suspension, the coil springs and dampers form a single unit. This system permits a small degree of passive rear wheel steer when cornering, to aid stability. In recognition of its role as a load carrying estate, the Volvo XC70 features load compensating suspension as standard.

The revised suspension geometry and the introduction of chunky 215/65 R16 Pirelli Scorpion STR tyres have resulted in a change in the track widths when compared with the Volvo V70. The Volvo XC70 has a front track of 1611mm, compared with 1560mm for the Volvo V70, which promotes extra stability in rough conditions.

These changes also incorporate an increase in ride height, to help the Volvo XC70 cope with rough terrain. It has a total ground clearance of 209mm, which is 69mm more than a Volvo V70 and compares well with rivals such as the Audi Allroad and even some SUVs, such as the Jeep Grand Cherokee.

For the 2003 model year, the Volvo XC70's all-wheel drive system was revised with the introduction of a new electronic system developed in conjunction with the Swedish specialist, Haldex. It operates independently of driver input, distributing torque automatically between the front and rear wheels for the best possible grip in all conditions.

The intelligent AWD system uses a variety of sensors to monitor the road surface and the steering wheel, brake and accelerator pedal positions. In normal driving conditions on dry roads, almost all the power is distributed to the front wheels. However, for off-road work, or if the sensors detect slippage, torque is proportionately diverted to the rear wheels to maximise traction. The system responds in just one-seventh of a wheel turn, making an outstanding contribution to the Volvo XC70's versatility, responsiveness and active safety.

The 2.5T model further benefits from DSTC (Dynamic Stability and Traction Control). The system uses sensors to detect the onset of a skid and then automatically slows the appropriate wheel to restore control.

STEERING, BRAKES AND TRANSMISSIONS

The Volvo XC70's steering and braking systems have been tuned to maximise driver enjoyment and safety, both on and off-road. The rack and pinion steering provides a linear response and plenty of feedback, while the anti-lock brakes are boosted by Electronic Brakeforce Distribution (EBD).

A five-speed manual gearbox is standard on the 2.5T, but for those who prefer to let a computer take the strain, Volvo offers a Geartronic automatic transmission (standard on D5 models). This system adapts its

shift points to individual driving styles and also benefits from a manual shift facility for added control.

- Power-assisted rack and pinion steering tuned to optimise feedback and response
- Anti-lock brakes with Electronic Brakeforce Distribution (EBD) fitted as standard
- Emergency Brake Assist (EBA) standard on 2.5T
- Five-speed manual gearbox fitted as standard
- Optional Geartronic automatic transmission adapts its shift patterns to suit individual driving styles and includes a sequential, manual shift facility for added control

The Volvo XC70 uses a power-assisted rack and pinion steering system that has been developed to optimise driver feedback and response, both on and off road. The steering feel has been improved through careful tuning of the torque build-up during cornering, which helps the driver to place the car accurately on the road.

Large disc brakes, which are ventilated at the front, deliver a firm and consistent response, whatever the payload. As you'd expect from Volvo, an anti-lock braking system is fitted as standard and is joined by Electronic Brake Force Distribution (EBD). EBD constantly distributes braking power between the front and rear wheels to ensure maximum retardation regardless of the road conditions. The 2.5T model also benefits from EBA (Emergency Brake Assist). This senses when an emergency stop is required and automatically applies maximum braking performance.

Every model is supplied as standard with the 'M56' five-speed manual gearbox. This compact unit uses a three shaft (one input/two layshaft) system in place of the more traditional two shaft design, which contributes to the smooth, positive shift quality.

For drivers who prefer to let a computer take the strain, Volvo offers the Geartronic automatic transmission (standard on D5 models). This five-speed unit automatically adjusts its shift points to reflect the driver's style and also offers a manual, sequential-shift facility. The driver is able to choose gears individually by tipping the lever forwards to change up and backwards to change down.

INTERIOR DESIGN CONCEPT

The interior design concept for the Volvo XC70 borrows heavily from the Volvo V70, but it's been revised and upgraded to reflect its role as a rugged, lifestyle alternative.

There's a passenger grab handle on the centre console for rough terrain, and the standard leather trim features 'sail seam stitching,' which underlines Volvo's tough yet luxurious approach to the interior design.

The cabin has ample room for five adults and, with the seats folded flat, there's 1641 litres of load capacity. Unique to the Volvo XC70 is a 40/20/40 split rear seat, which allows long items to be accommodated next to passengers. The centre section can also be removed and replaced with accessories, such as an electric cooler box.

- Builds on critically-acclaimed design of Volvo V70
- Front seat occupants benefit from standard 'sail seam' leather trim and passenger grab handle on centre console
- Ample space for five adults, with three-point safety belts and head restraints for each occupant
- Angle of rear seat backrest can be adjusted through 30 degrees
- Unique 40/20/40 split rear seat adds versatility
- Front passenger seat folds forwards to accommodate loads up to 3.09m long
- Luggage volume of 1641 litres with seats folded
- Unique shopping bag holder fitted as standard

The interior design concept for the Volvo XC70 borrows heavily from the Volvo V70, but it's been revised and upgraded to reflect its role as the rugged, lifestyle alternative.

Durable fabrics and materials have been chosen for the carpets and trim panels. The Select leather upholstery, which is standard across the range, also features unique 'sail seam' stitching, which underlines Volvo's tough yet luxurious approach to the interior design. The sturdy passenger grab handle on the centre console also looks the part and proves extremely useful when crossing rough terrain.

The rest of the fascia is borrowed from the Volvo V70 and is a handsome design tuned for ergonomic efficiency. The large, easy to use buttons are spread logically across the fascia in a typically simple Swedish design, and the controls for the audio system, climate-control and dynamic systems are sensibly grouped together and fall naturally to hand.

Additional controls for the stereo, cruise control and the Road and Traffic Information (RTI) system (standard on the SE) have also been cleverly integrated into the steering wheel and can be operated without the driver taking their hands off the wheel. All the car's primary functions are therefore grouped sensibly around the driver, helping to make the XC70 an easy and satisfying car to use.

The front seats were orthopaedically designed and combine a high level of comfort and support – especially over a long journey. The driver's seat is electrically adjustable (as is the passenger's on SE-spec cars) and this, coupled with a steering wheel that adjusts for reach as well as rake, provides an ideal driving position for people of all shapes and sizes.

Volvo has always been committed to providing exceptional comfort for all the car's occupants. Peter Horbury explains:

“Nobody rides tourist class in a Volvo; everybody rides at least business class. All five seats are a priority.”

By opting for a transverse engine layout, Volvo’s engineers have helped maximise the available passenger space. There’s ample room in the rear for a triplet of adults and every occupant benefits from a proper head restraint and a three-point safety belt with tensioners. The angle of rear-seat backrest can also be adjusted through 30 degrees to maximise either rear passenger comfort or load space

In the design of the rear seat, the Volvo XC70 differs dramatically from the Volvo V70. It features an innovative, three way, 40/20/40 split designed to make the car as flexible as possible. By folding down the centre section, for example, the XC70 is able to accommodate two passengers in extreme comfort alongside a long object, such as a snowboard. The centre section can be removed altogether and replaced with an array of options including a 30 litre storage box and a 17 litre cool box. The seat back can also be converted into a luxurious armrest. The conventional two part (60/40) rear seat is available as an alternative.

Such versatility helps the Volvo XC70 stand out against some talented opposition, and it’s accompanied by all the luggage space and practicality expected of a Volvo estate car. The near-vertical rear end and square rear windows liberate a vast, well-shaped load area. With the rear seats in place, there’s 485 litres of space to the glass line, which, with the seats folded down, can be increased to a maximum of 1641 litres. To accommodate items of up to 3.09m in length, the front passenger seat also folds forwards.

This space is made more useful by a number of neat storage solutions. Volvo’s unique shopping bag holder keeps objects upright and secure and folds away neatly into the boot floor when it’s not in use. A standard steel safety grille protects occupants against loose luggage under heavy braking, and it can be folded up against the headliner when it’s not in use. Other

thoughtful touches include a hook in the passenger seat headrest for hanging a jacket. This keeps it within easy reach without it obscuring rear vision.

For drivers who require occasional seven-seater versatility, Volvo also offers a pair of rearward facing seats for children. Both of these seats benefit from a three-point safety belt and head restraints. And when they're not in use, the seats fold away beneath the luggage compartment floor.

QUALITY AND EQUIPMENT

A passion for high quality lies at the heart of the Volvo brand. In the Volvo XC70, this is reflected not only in the choice of trim materials, but also in the outstanding build quality.

The standard specification is equally impressive, with electronic climate control, a premium audio system with CD player and Dolby Surround Sound, leather trim, an electric drivers seat and a rear waste bin fitted to every model. There's also a wide range of options and accessories, reflecting the active lifestyles of Volvo XC70 owners.

Additional peace of mind is provided by a comprehensive warranty package that includes a full three year/60,000 mileage mechanical warranty.

- High standard of trim materials and build quality
- Standard specification includes electronic climate control, alloy wheels, leather upholstery, electric driver's seat, and premium audio system with CD player and Dolby Surround Sound
- DVD-based Road and Traffic Information System (RTI) and TV standard on SE models
- Vast range of accessories to meet lifestyle requirements, including electric cooler box, towbars and roof carriers for bikes, skis and snowboards
- Full array of Volvo safety equipment (ABS, WHIPS, SIPS, IC, etc)

- Three year/60,000 mileage warranty package

A passion for high quality lies at the heart of the Volvo brand. It's inherent not only in the build quality that reflects the ruggedness, durability and reliability for which the marque is renowned, but also in the choice of body and trim materials. From the exquisitely crafted door handles to the leather-wrapped gearstick, the Volvo XC70 exudes a feeling of quality and well being. The switchgear has a solid, chunky feel and the fascia is designed with typical Swedish simplicity, reminding occupants that they are enjoying a premium product.

The Volvo XC70 also offers an outstanding array of standard equipment. The luxury specification of every model includes Electronic Climate Control (ECC) with Volvo's Air Quality System (AQS), leather trim, all-round electric windows, electric/heated door mirrors, cruise control, alloy wheels, a rear waste bin and an electric driver's seat with memory. Also standard is a premium audio system with CD player, a separate amplifier and Dolby Surround Sound, delivering exceptional sound quality.

Upgrading to the SE version adds an electric passenger's seat, heated front seats, a headlamp wash/wipe, a rain sensor for the windscreen wipers and Volvo's Road and Traffic Information System (RTI). The RTI is comprised of a large colour screen, that can be used either by the driver using controls on the steering wheel or by passengers using a separate remote control, and which is linked to a DVD system that can display route information for the whole of Europe. When the car's stationary, the screen also doubles as a TV monitor, turning the Volvo XC70 into a mobile multi-media centre.

There's also a vast range of accessories to accommodate the needs of every Volvo XC70 owner. An elastic net, for example, secures items to the luggage compartment floor and an integrated storage bag can be specified to take the place of the centre section of the rear seat, providing 30 litres of extra in-car storage.

As an alternative, this space can be filled with an electric cooler box, which is sure to prove a hit with families on a long journey. Easy to fit and remove, it occupies the centre section of the rear seat and connects to the power supply in the boot. It has a 17 litre capacity and can chill two, 2.0-litre bottles of soft drink or a mixture of bottles and cans.

The technicians and interior designers were anxious to look after every member of the family and have developed a bespoke cage/gate that provides a dedicated compartment within the load area for a pet. All of these features help to confirm the Volvo XC70's reputation for versatility and great design.

Volvo's employees are justifiably proud of the quality of their products, but they're equally determined to offer the best customer service. In 2001, Volvo's management set a goal of becoming the 'Customer satisfaction no. 1' in the premium sector by 2004. To fulfil this ambitious target, the company has initiated a series of Quality Forums, which scrutinise information from a combination of internal and external sources, including independent rankings by companies such as JD Power. Having analysed the data, the Forums initiate action plans to improve performance in specific areas.

This quality assurance package is backed up by a comprehensive warranty. The standard mechanical warranty is three years/60,000 miles, there's a three year unlimited mileage warranty on the paintwork and eight years cover against rust perforation. In addition, all Volvos are covered by one year's free RAC cover, which provides full breakdown and recovery assistance, anywhere in Europe, 24 hours a day.

SAFETY

The Volvo XC70 features a comprehensive safety package designed to protect occupants in a wide variety of accidents.

The SIPS (Side Impact Protection System) includes side and Inflatable Curtain (IC) airbags that protect both front and rear occupants. In frontal impacts, 'intelligent' front airbags work in unison with the safety belts,

while the WHIPS (Whiplash Protection System) helps reduce the risk of back and neck injuries in a rear impact.

In the rear of the car, all three passengers benefit from three-point safety belts with tensioners, and there are ISOFIX fittings for child seats.

- SIPS (Side Impact Protection System) with side airbags and IC (Inflatable Curtain) airbags for front and rear passengers
- Twin front 'intelligent' airbags
- Five three-point seatbelts with pre-tensioners. Load limiters for front occupants
- WHIPS (Whiplash Protection System) fitted as standard
- ISOFIX fittings in rear and range of bespoke child safety seats protect new generation

Volvo's commitment to safety is as old as the company itself. As, Assar Gabrielsson, one of the founders of Volvo declared: "Cars are driven by people. The guiding principle behind everything we make at Volvo therefore, is – and must remain – safety." It's a commitment that's more than fulfilled with the Volvo XC70, which features an extensive safety package designed to protect occupants in a wide range of accidents.

A quarter of all impacts are from the side, which is why Volvo developed the Side Impact Protection System (SIPS). A large part of the force of a collision that would otherwise penetrate through the side of the car is dissipated by SIPS via beams, pillars, the floor, the roof and other parts of the car body.

The side impact airbags then play an important role in protecting the chests of the occupants. These airbags are fitted in the outer edge of the front seats, not in the door, which ensures that they're always securely positioned next to the occupant's side, whatever the position or angle of the seat.

Further protection is provided by the IC (Inflatable Curtain) airbag, which sits in the headlining and protects occupants in the front and rear. In the event of a side impact, IC inflates in a few thousandths of a second and then remains inflated for about three seconds in order to provide maximum protection for the head and upper body throughout complex collision sequences. The Inflatable Curtain is effective whether the window is open or shut and it absorbs up to 75 per cent of the energy developed if the head is thrown sideways in a crash.

The two front airbags are 'intelligent' and deploy in two stages according to the severity of the accident, alleviating the risk of facial injuries caused by the occupant's faces impacting with the airbag. They are complemented by full three-point safety belts with tensioners, which are fitted for all passengers. The tensioners activate within a few thousandths of a second in the event of a collision and tighten the belt for maximum protection. The front seat safety belts then release a little so that the driver and passenger are cushioned by the airbags in a controlled manner.

The Volvo XC70 also features the WHIPS (Whiplash Protection System), which helps prevent neck and back injuries in a rear impact. In the event of a collision, the entire backrest moves rearwards to reduce the strain on the occupant's back and neck. Then, when their back has been safely restrained by the backrest, it reclines in order to reduce the force that would otherwise throw their head forwards. WHIPS reduces acceleration forces on the neck by about a half.

Volvo's engineers have also made special provision for protecting the next generation. Every Volvo XC70 comes fitted as standard with the provision for the fitment of ISOFIX child safety equipment and a bespoke rearward-facing child safety seat can be supplied as an option. An integrated booster cushion built into the rear centre armrest is available, which has been specially designed for children aged between 4 and 10. A standard booster cushion with an adjustable backrest is also offered.

ENVIRONMENT

Volvo's commitment to the environment is reflected in its 'clean inside and out' programme. An air filter prevents dust, pollen and exhaust particles reaching the interior, while the Air Quality System ensures that the air inside the cabin is always cleaner than outside. All the trim materials comply with Öko-Tex standards, helping to reduce the risk of an allergic reaction.

Another pioneering feature is the PremAir system, which converts 75% of the ground level ozone passing through the radiator into oxygen. Little wonder that each new Volvo is backed by an Environmental Product Declaration from Lloyd's Register Quality Assurance Limited (LRQA).

- 'Clean inside and out' programme
- Cabin air filter removes dust, pollen and exhaust particles
- PremAir ozone system converts 75% of ground level ozone to oxygen
- Air Quality System (AQS) ensures cleaner air inside than out
- Interior trim materials conform to Öko-Tex standards and are allergen-free
- Several of the engines already meet stringent EU 2005 and ULEV (Ultra Low Emission Vehicle) emission requirements
- Each new Volvo is backed by an Environmental Product Declaration examined and verified by Lloyd's Register Quality Assurance Limited (LRQA)

According to the 2001 RAC Report on Motoring, the typical private motorist drives for over 250 hours each year, while in the same period, a company car driver spends an average of 425 hours inside their vehicle.

Yet, while most of us are aware of vehicle emissions and air quality issues, how many drivers know that the air inside their cars may also be harmful? Or

that the metals, textiles and leathers used in car interiors can emit volatile substances, which activate allergies and skin conditions?

Many motorists don't realise their car could be increasing their risks of asthma, eczema, headaches, eye irritation or even a heart attack. In recent years, the number of people suffering from allergies and other forms of hypersensitivity has been growing rapidly.

Volvo's 'clean inside and out' programme to create emission-free cars is a healthy solution to the problem.

The Volvo PremAir system makes a major contribution to air quality. It's an industry first and is fitted as standard to every Volvo XC70. PremAir features a catalytic coating on the radiator that converts 75% of the ground level ozone passing through it into oxygen. It therefore reduces harmful pollutants in the local environment.

The Volvo XC70 also comes fitted with a cabin air filter, which prevents dust, pollen and exhaust gas particles from entering the car via the ventilation system. This works in conjunction with the Air Quality System (AQS), which constantly monitors the cabin environment to minimise odours and pollutants entering from the outside. It ensures that the air inside the car is always cleaner than that outside.

The interior of the Volvo XC70 complies to a strict standard called Öko-Tex, which sets maximum levels for dangerous substances contained in textiles and trim materials. All the leather upholstery and the trim fitted to the Volvo XC70 meets Öko-Tex standards. The components on the Volvo XC70 that most frequently come into contact with the skin – the door handle, ignition key and seat belt locks - are also compliant with Öko-Tex and allergen-free.

The Volvo XC70's impressive aerodynamics (Cd 0.30) and sophisticated catalyst and engine management systems help to keep fuel consumption and emissions to a minimum.

Volvo's commitment also extends beyond the car's immediate environment. It was one of the first manufacturers to use tools to evaluate the life-cycle environmental impact of its products. The system, known as EPS (Environmental Priority Strategies in product design) enables Volvo to evaluate the impact of its products and processes on natural resources, ecosystems and human health. This information is available to the public at www.volvocars.co.uk.

It's a strategy that's clearly paid dividends - emissions of solvents from Volvo's Torslanda plant in Sweden have been reduced by over 90% since 1972 and virtually the entire car can be recycled at the end of its life. Little wonder that each new Volvo is backed by an Environmental Product Declaration examined and verified by Lloyd's Register Quality Assurance Limited (LRQA) of London.

SECURITY

Volvo is committed to protecting the car, its occupants, and their possessions. The Volvo XC70 is fitted as standard with a sophisticated alarm and immobiliser system that can be switched on and off using the remote controller on the key fob. The combination of deadlocks and the option of laminated side windows can make the Volvo XC70 a difficult car to break in to.

The remote control also operates the Approach lighting system, which illuminates the car and the surrounding area as the driver approaches. Likewise, a tweak of the headlight stalk activates the Home Safe system, switching on the headlamps for thirty seconds after the occupants have left the vehicle.

- Electronic immobiliser fitted as standard
- Alarm and deadlock system operated from remote control key fob
- Approach and Home Safe Lighting system fitted to every model

Volvo's passion for safety also extends to issues of personal security. The Volvo XC70 is fitted as standard with a wide range of features designed to protect occupants from burglary, theft and assault.

An electronic immobiliser makes it impossible to start the car without the right key, while the outer lock cylinder rotates, making it difficult to break in to. If the thief does manage to get in, via a window, for example, the deadlock system makes it impossible to open a door from the inside. The availability of laminated side windows can also make it harder for thieves to gain access to an XC70.

The deadlock system is activated by the remote control key fob, allowing the driver to open the car as they approach. This system can also be used to access the tailgate independently of the doors, which is a useful deterrent to opportunist thieves.

The same remote control system also switches on the alarm system, which is fitted as standard to the Volvo XC70. The alarm is triggered if anyone attempts to open the doors, the bonnet or the boot lid. It also reacts to movement inside the car or if a window is broken. As an option, this system can be upgraded to include a level sensor that activates the alarm if the car is jacked up in any way.

An important contribution to personal security is provided by the Approach and Home Safe lighting system. By pressing a button on the remote controller as they approach the car, the driver is able to turn on the inside lights, the side marker lights and the lights in the rear-view mirrors. On leaving the car, a tweak of the headlight stalk activates the dipped beam headlamps for 30 seconds, lighting a path to the door. It's a simple system that offers considerable peace of mind.

DID YOU KNOW?

- 1 The majority of XC70 owners are aged between 35-44 - younger than on some other Volvo models *

- 2 The typical XC70 owner is university educated, with a mean household income of about £65,000, and either the owner of a small or large business, a company director, a professional partner/freelance occupation, or retired*
- 3 The XC70 is built in Gothenburg, Sweden and sold throughout the world – as far afield as Australia, the Far East and South America.
- 4 The top hobbies of XC70 owners are:
 - Walking/hiking/hill climbing (25.76%)*
 - Gardening (22.73%)*
 - Watching football or rugby (15.23%)*
 - Touring/travel/holidays (15.12%)*

*Source: New Car Buyers Survey 2002