

VOLVO S80

MARKET POSITIONING

The S80 is the flagship of Volvo's 'S' range of stylish saloons, offering a natural progression from its S40 and S60 siblings, with the ultimate in space, comfort and prestige.

Its eye-catching, bold styling easily distinguishes the S80 from its other premium brand rivals in the executive saloon sector and helped it maintain steady sales figures while the market for large executive saloons has shown a gradual decline.

At its launch in 1998 the S80 heralded a new era of bolder designs to the Volvo range. As a consequence the S80 still looks fresh and modern today, and only required subtle, detailed interior, exterior and technical refinements in 2003 for the new S80 models. This also included the introduction of Volvo's advanced, active 'Four-C' chassis option, offering a choice of 'Comfort' and 'Sport' settings at the touch of a button.

The S80 is surprisingly affordable with a choice of S, SE and Executive trim levels with high standard specifications, which includes a minimum of: Electronic Climate Control; premium audio system with CD; alloy wheels; cruise control; electric windows; information centre and DSTC (Dynamic Stability and Traction Control), plus the usual abundance of Volvo's advanced safety features.

For performance and economy, the S80 offers one of Volvo's widest range of engines. This includes both five and six cylinder normally aspirated and turbo petrol units, environmentally friendly Bi-Fuel models that run on petrol as well as gas (LPG or CNG), plus the most popular engine in the range, an advanced common rail turbo diesel.

The S80 is the flagship of Volvo's 'S' range of stylish saloons, offering a natural upward progression from its S40 and S60 siblings and the ultimate in space, comfort and prestige.

Its eye-catching, bold exterior styling and typically Scandinavian simple, clean interior design easily distinguish the S80 from its other premium brand rivals in an executive saloon sector dominated by the German marques.

With the help of Volvo's then design director, Peter Horbury, the S80 heralded a new era of bold design in the Volvo range when it was launched in 1998, and has only required subtle, detailed interior and exterior refinements to improve its elegance and driving dynamics for the new S80 range in 2003.

Competitive prices and high levels of luxury and refinement make the S80 range surprisingly good value with a choice of S, SE and Executive trim levels.

A high standard specification includes a minimum of Electronic Climate Control, premium audio system with CD, alloy wheels, cruise control, information centre and DSTC (Dynamic Stability and Traction Control), plus the usual abundance of Volvo's advanced safety features, while SE models are enhanced with luxuries such as leather upholstery, an upgraded audio system and larger 17in alloy wheels.

For the ultimate in luxury, the Executive model tops the S80 range and comes complete with a DVD player and twin TV screens in the back of the front head restraints, a built-in fridge and unique soft leather upholstery with contrast piping.

The S80 range features one of Volvo's widest range of engines, including both five and six cylinder normally aspirated and turbo petrol units, environmentally friendly Bi-Fuel models that run on petrol as well as (cheaper) gas (LPG or CNG), but the most popular is now the advanced and refined, common rail turbo diesel unit.

In addition to the range of powerful engines, there is also the option of a 'Sports Pack' for most S80 models, including lowered sports chassis, load compensating suspension and larger 18in alloy wheels, or Volvo's advanced, active 'Four-C' chassis, introduced for the 2004 model year, which offers the driver the choice of 'Comfort' and 'Sport' settings at the touch of a button.

EXTERIOR DESIGN

The S80's shapely and contemporary Scandinavian style boldly introduced a new era of Volvo design architecture at its launch in 1998.

A strong V-shape flows from the front grille up the bonnet, along the distinctive side shoulders and ends at the vertical rear boot line to give the S80 a strong visual presence, and make it instantly recognisable as a Volvo.

The S80's distinctive original design still looks as fresh and modern, so in 2003, five years after its launch, Volvo only needed to make detail enhancements to the S80's exterior design for added elegance and prestige. These include:

- **A dynamic dark silver square-mesh grille**
- **Chrome door handles**
- **Chrome highlights under the side windows**
- **Smaller rear light clusters with brighter LED brake lights and lower chrome strip, plus reprofiled one-piece boot lid with chrome strip above the number plate and redesigned, colour-coded bumpers**
- **New smoother front section around grille, bumper and spoiler with chrome strip across lower air intake, and larger apertures for the fog lamps**
- **Redesigned, more aerodynamic door mirrors for improved air flow to keep side windows cleaner**

The S80 is not a saloon derivative of a Volvo estate, but was designed specifically for its target market – the large, executive saloon sector.

Its contemporary Scandinavian style boldly introduced the start of a new era of bolder Volvo design language and architecture.

A strong V-shape flows from the front grille up the bonnet, along the distinctive side shoulders and ends at the vertical rear boot line to give the S80 a strong visual presence, and makes it instantly recognisable as a Volvo.

The S80 design, overseen by Volvo's British designer, Peter Horbury, now Executive Design Director at the Premier Automotive Group overseeing Volvo, Jaguar, Land Rover and Aston Martin designs, uses, "a very Swedish design simplicity," which Horbury believes is crucial to Volvo's success.

"A Volvo buyer displays terrific self confidence," he says. "Nobody shows-off in Swedish culture, and a Volvo's not a show-off's car. People buy Volvos because they know what they want and they're happy if nobody, apart from other Volvo drivers, notices them," he continued.

Cleverly, the S80's design still looks as fresh and modern as it did at its launch in 1998, so by 2003, five years after its launch, Volvo only needed to make detail enhancements to the S80's exterior design to make it more elegant and exclusive. These include:

- A dynamic dark silver square-mesh grille
- Chrome door handles
- Chrome highlights under the side windows
- Smaller rear light clusters with brighter LED brake lights and lower chrome strip, plus reprofiled one-piece boot lid with chrome strip above the number plate and redesigned, colour-coded bumpers
- New smoother front section around grille, bumper and spoiler with chrome strip across lower air intake, and larger apertures for the fog lamps
- Redesigned, more aerodynamic door mirrors for improved air flow to keep side windows cleaner

Another British designer at Volvo, Steve Harper, was responsible for the enhancements to the new S80 that help it create an overall impression of a more prestigious car in Volvo's model range.

Harper explains: "All the S80's new parts are like cut diamonds or precious gems. Correctly designed and placed in the appropriate setting, they forge a powerful image of subtle elegance and prestige."

DRIVING DYNAMICS

ENGINE

With powerful five and six-cylinder petrol engines, Volvo's modern and refined diesel, plus Bi-Fuel engines capable of running on petrol or gas (LPG or CNG) underlining Volvo's commitment to helping the environment, the S80 has a wide choice of power sources available.

The petrol engines include turbo-powered as well as normally aspirated versions.

The extra economy, flexibility and refinement of Volvo's modern turbo diesel engine is now proving the most popular choice in the range, while the recent steady growth in the number of petrol stations selling LPG is fuelling an increased awareness of the benefits of Bi-Fuel engines that offer cleaner emissions and, with LPG usually around half the price of unleaded petrol, useful savings in fuel costs, too.

With normally aspirated and turbo variants of its five and six-cylinder petrol engines, a modern and refined 'D5' turbo-diesel, plus Bi-Fuel engines that run on both petrol or gas (LPG or CNG) available, the S80 offers one of the biggest and most powerful choice of engines in the Volvo range.

Engine	CC/ Cylinders	BHP	Torque (Nm @ rpm)	0-62 mph (sec)	Co2 (g/km)	MPG Combin ed
2.4 (140)	2435/5	140	220 @ 3750	10.5	215	31.4
2.4 (170)	2435/5	170	230 @ 4500	9.0	217	31.0
2.0T	1984/5	180	240 @ 2200	9.1	223	30.1
2.5T	2521/5	210	320 @ 1500	7.3	222	30.4
D5	2401/5	163	340 @	9.8	172	43.5

			1750			
2.9 *	2922/6	196	280 @ 3900	8.9	259	26.2
T6 *	2922/6	272	380 @ 1800	7.2	272	25.0
Bi-Fuel:	2435/5	140	214 @	10.6	187	24.4
LPG	2435/5	140	4500	10.5	213	31.7
Petrol			220 @ 3750			
Bi-Fuel:	2435/5	140	192 @	11.0	164	30.7
CNG	2435/5	140	4500	10.5	219	30.7
Petrol			220 @ 3750			

* Geartronic transmission standard

All engines are transverse with four valves per cylinder and multipoint fuel injection (multipoint direct fuel injection on D5 and T6). High torque figures at low engine speeds provide plenty of smooth flexibility, and the S80 engine line-up provides a range of power outputs from 140bhp to 272bhp to suit all customers.

With a choice of 140bhp or 170bhp, the normally aspirated 2.4-litre engine starts the S80 range with a comfortable and refined power delivery and some of the lowest CO2 emissions of the range.

The 2.0T, 2.5T and T6 engines are all turbocharged petrol engines using variable valve timing – on the inlet side on normally aspirated 2.4 engines, the exhaust side for the 2.0T, and both inlet and exhaust sides for the 2.5T and T6.

The 180bhp 2.0T engine joined the new S80 range for the 2004 model year at the same time as the 210bhp 2.5T replaced the former 200bhp 2.4T. Both engines offer surprisingly quick (low pressure) turbo power with generous torque figures at low engine speeds making them capable of reaching 62mph 9.1 and 7.3 seconds, respectively, yet still deliver good fuel economy of just over 30mpg on the Combined cycle.

The T6, clearly the most powerful engine in the S80 range, delivers outstanding, smooth performance using responsive dual turbochargers and variable inlet and exhaust valve timing to deliver maximum torque of 380 Nm from as low as 1800rpm, as well as meeting the strict European 2005 emission requirements.

The D5 is the first diesel car engine Volvo has produced in-house. It is available in the S80 range in S, SE and Executive models and offers refined performance with low fuel consumption of up to 43.5mpg on the Combined cycle. It has 163bhp of power with 340 Nm of torque from just 1,750rpm more than the 320Nm of torque offered by the 210bhp, 2.5T petrol engine. It has instantly proved extremely popular and represents over 56 per cent of S80 sales in the UK.

Volvo's D5 engine is a turbocharged diesel made of lightweight aluminium using the latest variable nozzle turbine with movable guide vanes for optimum flow conditions for high turbine efficiency at all engines speeds. A fast-acting Exhaust Gas Recirculation system increases engine efficiency and reduces Nox emissions while retaining high fuel efficiency, all combined with second generation common rail direct fuel injection technology that electronically controls fuel and injection timing. Fuel is injected directly into the cylinders under high pressure – up to 1600bar. The result is extremely finely atomised fuel, ensuring efficient combustion while minimising emissions of nitrogen oxides (Nox) and particulates.

All five-cylinder engines (petrol, diesel and Bi-Fuel) are available as S and SE models, while the six-cylinder units along with the D5 are exclusively reserved for SE and Executive models only and fitted with Geartronic transmission as standard.

Finally, as part of Volvo's commitment to the environment, the S80 Bi-Fuel engines run on gas with petrol in a reserve tank to offer the double benefits of reducing harmful emissions in the atmosphere as well as lower fuel costs as LPG is approximately half the price of unleaded petrol – or more if a company 'bunkers' LPG fuel for its own fleets.

Rest assured that all Volvo Bi-Fuel models are fully crash tested for optimum safety and designed with under-floor gas tanks without any intrusion to luggage space. Unlike rivals from other manufacturers, Volvo Bi-Fuel models are fully integrated into the car's design

and built on the same production lines as the rest of the range - rather than converted elsewhere - and come complete with a full Volvo warranty. What's more, grants are available from the Energy Savings Trust 'Powershift' programme towards the additional cost of these models, and which once registered are also exempt from Congestion Charging.

CHASSIS

The Volvo S80 has been designed for a harmonious balance between response and comfort. A comfort chassis is standard on the D5 and both 2.4-litre normally aspirated engines, while a dynamic chassis setting is standard on all other models, while an optional lowered sports chassis is also available.

Better still, Volvo's advanced active 'Four-C' (Continuously Controlled Chassis Concept) chassis was introduced as one of the dynamic enhancements available for the new S80 from mid-2003. This is the same chassis concept used in Volvo's high-performance, AWD S60 R and V70 R, and has now been adapted for the front-wheel drive S80 offering the driver the choice of 'Comfort' and 'Sport' chassis settings.

The Volvo S80 has been designed for a harmonious balance between response and comfort.

A long (2791mm) wheelbase, highly torsionally stiff body and an advanced chassis ensure the S80's stable road behaviour. Front wheel drive and independent suspension are combined with multi-link rear suspension for first class ride comfort.

A comfort chassis is standard on the D5 and both 2.4-litre normally aspirated engines, while a dynamic chassis setting is standard on all other models, while an optional lowered sports chassis is also available.

Volvo's DSTC (Dynamic Stability and Traction Control) is standard on all models and detects and counteracts any tendency to skid by braking the wheels necessary to retain control. Its anti-spin system ensures that the driven wheels get the right amount of power to retain a firm grip on the road.

An optional 'Four-C' (Continuously Controlled Chassis Concept) active chassis was introduced as one of the dynamic enhancements available for the new S80 in mid-2003. This borrows the same advanced technology and chassis concept as Volvo's high-performance S60 R and V70 R, but adapts it for the S80's front-wheel drive and offers the driver the choice of 'Comfort' and 'Sport' chassis settings.

Dampers and suspension settings are monitored about 500 times a second and instantly and constantly adjusted to provide the driver with the appropriate choice of ride and handling combination. The sensors constantly monitor the following parameters:

- The car's speed and acceleration
- Lateral acceleration during cornering
- Suspension movements
- The steering wheel's position and how fast it's being turned
- The engine's current (calculated) torque
- The degree of braking

When in 'Comfort' setting, the Four-C chassis makes for an extremely comfortable ride, particularly on poor surfaces. Damping settings are continuously adjusted in response to the quality of the road surface to provide as comfortable a ride as possible, and make the S80 an ideal car for travelling long distances.

Alternatively, at the touch of the 'Four-C' button on the dashboard the S80 can instantly change to 'Sports' setting and the dampers become firmer, together with quicker steering responses, to provide better body control.

For example, when driving round a bend damping is adjusted so the pressure on the road surface is distributed optimally between all four wheels, while at higher speeds and during lateral acceleration, or if the car is heavily laden, damping is also increased automatically for more controlled roadholding and stability.

In addition, the Four-C system will automatically strive to keep the car's body level during braking and acceleration without excessive dipping at the nose or squatting at the rear, and no matter which setting is chosen the car is always ready for the worst. For

instance, in a sudden emergency avoidance manoeuvre the Four-C system takes control and adjusts the dampers to provide the safest possible driving characteristics for the situation – ie. minimum roll, effective road grip and the shortest possible stopping distance.

STEERING, BRAKES, TRANSMISSION

The Volvo S80 has always been a rewarding and comfortable car to drive and travel in. Dynamic enhancements for the new S80 in 2003 included new ZF steering for more direct and sharper steering responses with better handling. ZF also supply a new, optional speed-dependent steering available on the new S80, which is designed to give more assistance at very low speeds, when parking for instance, and less at higher speeds.

In addition, the greater and constant control provided by Volvo's optional 'Four-C' active chassis concept also benefits the S80's steering responses and braking.

A four-speed Geartronic transmission is standard with the six-cylinder 2.9 and T6 engines, which allows sequential manual changes for added control, while a standard five-speed automatic transmission is available on all other models. Both transmissions adapt their shift points to suit individual driving styles.

DSTC (Dynamic Stability and Traction Control) and a powerful anti-lock braking system with EBD (Electronic Brake Distribution) mean braking power is automatically distributed between the front and rear wheels for quick, sure stops regardless of the car's load. EBA (Electronic Brake Assistance) helps shorten braking distances in emergency situations.

With front-wheel drive, independent suspension combined with sophisticated multi-link rear suspension the Volvo S80 has always been a rewarding and comfortable car to drive and travel in.

The standard DSTC (Dynamic Stability and Traction Control) anti-spin system ensures the driven wheels retain a firm grip on the road and also detects and counteracts any tendency to skid by braking the wheels necessary to retain control.

One of the dynamic enhancements for the new S80 includes the introduction of ZF rack and pinion steering for more direct, sharper steering responses and better roadholding. At the same time, a speed sensitive power steering option was also introduced as an option for the new S80 (not available for D5 or Bi-Fuel), and is designed to match the amount of power assistance to the driving circumstances. It will maximise assistance at low speeds and gently reduce the level of assistance as speed rises to improve steering precision and enhancing road feedback.

INTERIOR DESIGN

'Space, style and great design' sum up the S80's cool and modern interior. It's spacious, well equipped and everyone travels in first class luxury and safety in the S80.

The cabin epitomises clean and simple, stylish Swedish design, with great ergonomics, and plenty of space for five adults, all with head restraints, seat belts with pre-tensioners, and even air vents in the middle 'B' pillar to keep rear passengers as comfortable as possible.

Volvo only had to make detail refinements to the interior of the new S80 in 2003, such as new folding key with integrated remote locking control, revised front door panels for better quality feel and more user convenience, darker 'charcoal' colour instrument surrounds, an upgraded premium audio system with 'Dynaudio' speakers, new textiles for headlining, pillars and sunvisors, and smarter instrument dials with chrome rings on five-cylinder engine models and chronograph style surrounds on six-cylinder models.

All Volvo interiors conform to its 'Clean inside and Out' programme which ensures that no emissions occur inside the car from plastics, textiles, leather or metals. State of the art filters and sensors in the S80's ECC (Electronic Climate Control) ensure no harmful emissions, pollen or dust enter the interior from outside.

'Space, style and great design' sum up the S80's cool, modern interior. It's spacious, well equipped and everyone in the S80 travels in first class luxury and safety.

The S80's cabin epitomises clean and simple, stylish Swedish design, with great ergonomics and easy to use dashboard controls. There's plenty of space for five adults, all of who travel safely thanks to head restraints all round, three-point seat belts with pre-tensioners and additional protection from the S80's IC (Inflatable Curtain) along the side of the car, as well as Volvo's SIPS (Side Impact Protection System) and SIPS side airbags.

With the original excellence of the S80's interior design, Volvo only had to make relatively subtle detail refinements for the new S80 in 2003, which included:

- Darker 'charcoal' colour for dashboard and instrument surrounds
- Folding key with integrated remote control and panic function
- Upgraded premium sound system with Dynaudio speakers
- Revised front door panels with greater quality and improved, more convenient handle locations for shorter or taller occupants
- Chronograph style instrument dials on six-cylinder models (like S60 R)
- Chrome rings for instrument dials on five-cylinder models (like XC90)
- Chrome inlays for air vent controls
- New textile for headlining, sunvisors and rear parcel shelf
- New 'walnut' inlay option

Surprise and delight features inside the S80 that help take the burden out of contemporary motoring include separate air vents in the middle 'B' pillar to keep rear passengers as comfortable as possible as well as helping to clear ice and mist from side windows in poor weather conditions.

Being a large saloon, it's no surprise it offers a substantial amount of luggage space - 407 litres (14.4 cu ft) to be precise, or with the flexibility of split folding rear seats for long loads, a maximum of 902 litres (31.9 cu ft) with the rear seats down.

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art filters and sensors in the S80's ECC (Electronic Climate Control) ensure no harmful emissions, pollen or dust enter the interior from outside.

But for the ultimate in luxury interiors, the S80 Executive offer the maximum levels of S80 luxury and refinement with specially designed seats upholstered in Executive Soft Leather with contrasting seams and piping and hand-finished cultivated Italian walnut wood trim. Rear seat entertainment includes a DVD player with twin screens in the rear of the front head restraints and infra red cordless headphones, remote control and games console socket. But, that's not all. The S80 Executive also offers heated front and rear seats, plus a fridge and glasses compartment.

QUALITY AND EQUIPMENT

A passion for high quality lies at the heart of the Volvo brand, which is reflected in the choice and design of trim materials and the excellent build quality. The new S80 enhanced its aesthetic appeal with detail refinements to the interior and exterior, such as chrome surrounds for the instruments, improved materials for rooflining and sunvisors, and redesigned interior front door panels with better ergonomics.

The S80 offers owners a choice of interior upholsteries and colours, as well as optional upgrades, including soft leather and Bergen Alcantara/Leather sports upholstery.

Standard specifications are equally impressive, with a minimum of Electronic Climate Control with Volvo's Air Quality System (AQS) and pollen filter, alloy wheels, cruise control and a premium audio system with CD player fitted to every S80. Customers can upgrade from the standard S specification to the plusher SE or the range-topping Executive model with fridge in rear armrest and DVD with twin rear TV screens. There's also a host of accessories and options, including upgraded audio systems, sun curtains for side and rear windows, an integrated GSM telephone, and even armour protection, if required.

Peace of mind is provided by a comprehensive warranty package that includes one year's free RAC cover and a full three year/60,000 mileage mechanical warranty.

- High standard of trim materials and build quality
- Standard specification includes: Electronic Climate Control with Volvo's Air Quality System (AQS) and pollen filter; premium audio system with CD player; alloy wheels and cruise control
- DVD-based Road and Traffic Information System (RTI) available as an option (with or without TV tuner)
- Vast range of options and accessories to meet lifestyle requirements – including armour protection
- 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 crafted door handles, solid, chunky feel of the switchgear to the leather-wrapped gearknob, the Volvo S80 exudes a feeling of quality, well-being and good Swedish design.

Subtle detailed enhancements were introduced for the new S80 in 2003, including chrome surrounds for the instruments, improved materials for rooflining and sunvisors, chrome detailing under the side windows, rear lights and above the rear number plate, plus redesigned interior front door panels with better ergonomics for all sizes of occupants.

Customers also expect a high level of standard equipment in a premium saloon, and the Volvo S80 does not disappoint. The luxury specification of every model includes Electronic Climate Control with Volvo's Air Quality System, all-round electric windows, cruise control, electric/heated door mirrors, alloy wheels and a premium audio system with CD.

A wide range of optional extras can give each S80 a personal touch. Hi-fi enthusiasts, for example, can upgrade the standard audio system to a Dolby Pro Logic Surround

Sound system with a 4 x 75W amplifier and no fewer than 8 Dynaudio speakers and one centre surround speaker. The list goes on to include the likes of Bi-Xenon headlights, laminated side windows, reverse warning sensors, towbars... and more.

Volvo's RTI (Road and Traffic Information System) is proving increasingly popular and useful, and is available with a large, remote-controlled colour screen that gracefully slides up out of the dashboard when required. It's linked to a DVD system and displays route information for the whole of Europe. It retracts into the top of the fascia when not in use and can be controlled using a joystick-style switch on the steering wheel or a separate remote control unit. The screen can also be specified to double as a TV monitor.

Volvo groups some options together in packs for better value:

- 'Winter Pack' includes heated front seats, headlamp wash/wipe and luxury floor mats
- 'Family Pack' includes integrated child seat (rear centre armrest) and manual sun curtains for rear shelf and side doors
- 'Premium Pack' includes electric passenger seat, electric folding rear headrests, Bergen leather/Alcantara sports upholstery and walnut wood trim
- 'Communications Pack' includes dual band integrated GSM telephone, RTI navigation system with remote control and Europe DVD map, and with or without TV monitor
- 'Sports Pack' includes larger 18in BBS alloy wheels, lowered sports chassis, load compensating suspension and speed dependent steering (not D5)

There is a vast range of accessories designed to accommodate the varying lifestyles of Volvo S80 owners – even full armour protection can be arranged by special order, if required. There's also dedicated mobile phone kits and child booster cushions and seats can accompany ski, surfboard, or bicycle carriers. Each item is designed and built with the same attention to detail as the rest of the car and integrates beautifully into the overall package.

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 target of becoming the 'Customer satisfaction no. 1' in the premium sector by 2004. To fulfil this 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

Volvo's commitment to safety is legendary, and the Volvo S80 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 to protect both front and rear occupants. In a frontal collision, 'intelligent' airbags work in unison with the safety belts and pretensioners, while the WHIPS (Whiplash Protection System) reduces the risk of back and neck injuries by 50 per cent in the event of a rear impact. All three passengers in the rear seats benefit from three-point seatbelts with pretensioners.

The success of these systems is reflected in a top score (when tested) four star EuroNCAP rating and the Volvo S80 achieved a maximum 100% score in the side impact test.

- Top score (when tested) four star EuroNCAP crash test rating, 100% score for side impact
- 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

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 philosophy that has been demonstrated to fine effect in the Volvo S80, which features a comprehensive safety package designed to protect occupants in a wide range of accidents. The success of these measures was recognised in the EuroNCAP crash tests where the Volvo S80 achieved a maximum four star rating (when tested) and a maximum 100% score in the side impact tests. EuroNCAP's testers concluded: "This large Volvo is very safe and gave a good all round performance, especially in side impact where the driver's head is well protected by a drop-down curtain airbag."

The key to this impressive performance is 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. They 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 both front and rear occupants. 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 throughout complex collision sequences.

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 three-point safety belts with tensioners, which are fitted for all five occupants. 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.

Volvo's WHIPS (Whiplash Protection System) made its debut in the S80 in 1998 and is now fitted across the Volvo range to help prevent neck and back injuries in a rear impact. In the event of an accident, 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 inclines backwards in order to reduce the force that would otherwise throw their head forwards. WHIPS reduces acceleration forces on the neck by about a half.

ENVIRONMENT

A commitment to the environment is one of Volvo's core values. For example, this 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.

In addition, the S80 is fitted with Volvo's 'PremAir' system which features a catalytic coating on the radiator that converts 75 per cent of the ground level ozone passing through it into oxygen. This reduces harmful pollutants in the environment and makes a major contribution to local air quality.

- '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 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 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 S80. PremAir features a catalytic coating on the radiator that converts 75 per cent of the ground level ozone passing through it into oxygen. This reduces harmful pollutants in the environment and makes a major contribution to local air quality.

Every Volvo S80 also benefits from Volvo's Air Quality System. This 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 air-conditioning system also incorporates a cabin air filter that prevents dust, pollen and exhaust gas particles entering the car.

The interior of the Volvo S80 complies with 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 S80 meets Öko-Tex standards. The components on the Volvo S80 that most frequently come into contact with the skin – the door handle, ignition key and safety belt locks – are also compliant with Öko-Tex and allergen-free.

The Volvo S80's slippery shape and sophisticated catalyst and engine management systems help to keep fuel consumption and emissions to a minimum. The Bi-Fuel models, in particular, make a major contribution to improving environmental standards. Natural gas (CNG) powered cars cut the emissions of carbon dioxide – which contributes to the greenhouse effect – by about 20% compared with the same car running on petrol fuel. An LPG-powered Volvo S80 reduces carbon dioxide emissions by around 10%.

Volvo's commitment to the environment 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) in London.

SECURITY

Volvo is committed to protecting the car, its occupants, and their possessions. Every model is fitted as standard with a sophisticated alarm and immobiliser system that can be switched on and off using the remote control unit integrated into the key fob. The combination of deadlocks plus optional laminated side windows makes the Volvo S80 a difficult car to break in to.

The key fob 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
- Visible VIN

Volvo's passion for safety also extends to issues of personal security. The Volvo S80 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 correct 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 introduction of optional laminated side windows also makes it harder for thieves to gain access.

The remote control key fob, allowing the driver to open the car when approaching it, activates the deadlock system. This system can also be used to open the boot 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 standard in every Volvo S80. 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.

The Approach and Home Safe lighting system provide an important contribution to personal security. 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.

VITAL STATISTICS

- | | | |
|----|-----------------------------------|------|
| A. | Overall length | 4822 |
| B. | Overall width (exc. wing mirrors) | 1832 |

C.	Unladen height	1452
D.	Wheelbase length	2791
E.	Front track width	1570
F.	Rear track width	1548
G.	Rear load height (672 Bi-Fuel)	661
H.	Front seat max headroom (no sunroof)	988
I.	Front seats width	1472
J.	Front seats max legroom	1072
K.	Front seats max headroom	988
L.	Rear seats width	1446
M.	Rear seats max legroom	911
N.	Load length luggage 2 seat mode	1924
O.	Load length luggage 5 seat mode	1108

DID YOU KNOW?

1. The S80 is produced at Volvo's Torslanda plant in Gothenburg, Sweden
2. The D5 engine accounts for 56 per cent of S80s sold in the UK
3. S80 sales:
 - Year – S80's sold (total large saloons sold)
 - 2000 – 3,884 (54,295)*
 - 2001 – 3,865 (50,631)*
 - 2002 – 3,942 (49,651)*
4. 35 per cent of S80 owners have their own business †
5. Favourite hobbies of S80 owners:
 - Golf 38 % †
 - Football/rugby 25 % †
 - Hiking/climbing 18 % †
 - Travel/touring 15 % †
 - Sailing 5 % †

The S80 has won many awards, including:

Prince Michael Road Safety Awards - Best New Safety Feature (Inflatable Curtain) 1998

Auto Express Used Car Honours 2003 – Best Executive Car

US-NCAP – World's Safest Car, 2000

The European Automotive Design Award, 1998

† Source: New Car Buyers Survey 2003

* Source: SMMT