Press Release

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Volvo XC90, Model Year 2009

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Model Year 2009

Overview

- High quality, flexible and innovative 7-seat as standard interior, with 64 seating configurations
- Two high-performance petrol engines - Volvo's first V8 (315PS) and a 3.2-litre in-line six-cylinder (238PS) - join the D5 turbodiesel (185PS)
- Premium 7-seat SUV which achieves a sub 225g/km of CO₂ in the D5 manual and Geartronic
- Sporty R-DESIGN package introduced in May 2008
- Car-like driveability with AWD (All Wheel Drive) with Instant Traction™ and 218mm of ground clearance for all-terrain ability
- S, SE, R-DESIGN, SE Lux, and the Executive trim levels available
- R-DESIGN features dynamic chassis settings, stiffer anti-roll bars, firmer shock absorbers and sport tuned speed-dependent steering
- Innovative safety, including Roll-Over Protection System (ROPS), Roll Stability Control (RSC), BLIS, WHIPS, SIPS, IC, DSTC, EBD etc.
- Fully crash-tested at the Volvo Safety Centre - including compatibility with smaller cars
- Higher standard specifications than rival SUVs from other premium brands
- High Performance and Dynaudio Premium Sound audio systems with Dolby Pro Logic II Surround Sound™ and MP3/WMA compatibility
- 25mm shorter than the all-new Volvo V70 estate
- Oeko-tex standard compliant, emissions-free interior

The Volvo XC90 revolutionised the premium SUV market when it was launched in 2003. With its modern design, powerful engines, Roll-Over Protection System (ROPS) and seven-seat capability with up to 64 seating configurations, it rapidly became Volvo’s best-selling model: almost 81,000 Volvo XC90s were sold globally in 2007, of which over 4,000 came to British customers. It is produced at Volvo's Torslanda plant in Gothenburg, Sweden.

With increased refinement, desirability and performance, the Volvo XC90 features elegant exterior styling, a more luxurious and highly-specified interior, and two high-performance petrol engines - Volvo's V8 (315PS) and a new 3.2-litre, in-line six-cylinder - the Volvo XC90 has moved further upmarket in the premium SUV sector.

The elegant rear exterior of the new Volvo XC90 features lights which emphasise the curves of the Volvo XC90's shoulders, plus a wide, chrome detailing above the number-plate, full-width rear
At the front there's a grille with more chrome and a large Volvo 'iron mark' badge, plus bumpers with a greater degree of colour-coding. The Volvo XC90 is also distinguished by striking 18in alloy wheels (standard on SE and SE Lux) and colour-coded side mouldings and door handles. In line with the rest of the Volvo range, the new Volvo XC90 also features larger, body-coloured door mirrors, which now incorporate the side indicator lights.

Inside, to achieve a high quality feel, there are a number of materials and upholsteries to choose from including Sovereign Hide soft leather with contrasting seam stitching and panels in perforated leather. A choice of interior inlays includes Sapeli wood and cross brushed aluminium.

In typically simple Scandinavian style, the interior design is characterised by airiness, space and quality, with a dashboard set low for a car-like driving experience. Typical of the Volvo XC90's ingenuity and flexibility is the removable armrest between the front seats to offer more legroom for the passenger in the centre seat in the second row of seats. But there's more: that centre seat also has an integrated booster cushion and slides forward to bring a child closer to the passengers in the front seats.

In fact, all seven seats are individual with head restraints and seat belt pre-tensioners, while, unlike some rivals, the Volvo XC90's sixth and seventh seats don't take up valuable load space or have to be clumsily removed; instead, they simply and cleverly fold away individually under the boot floor when not required. There are 64 different seating configurations. Yet, despite all these features and ingenuity, the Volvo XC90 is 25mm shorter than the all-new Volvo V70 estate.

The Volvo XC90's tailgate is gently sloping rather than vertical to clearly state that this is not a regular Volvo estate car. The resulting shorter roofline also helps the vehicle appear smaller and gives it a modern, sporty stance.

For added convenience, the tailgate is split so the lower section can be used as a seat for two adults or table yet is still low enough to load bags without the need to open it; it is strong enough to be stood upon when loading items onto the roof, and the upper section is not too large, heavy or high when opened.

Two high-performance petrol engines - Volvo's first V8 and a 3.2-litre six-cylinder - join the 185PS D5 turbodiesel for the Volvo XC90.

Volvo's V8 engine offers 315PS and 440Nm of torque - with a rousing V8 'burble'. It sprints from 0-60mph in just 6.9 seconds and has an electronically limited top speed of 130mph. The V8 engine is refined with extremely compact dimensions to enable it to be fitted transversely - like all Volvos - to help maintain good front crumple zones and leave more space for the passenger compartment. It is also one of the cleanest V8 engines on the market with emissions of 322 g/km and meets the American ULEV II (Ultra-Low Emissions Vehicle, stage II) standard.

The 3.2-litre petrol engine develops 238PS and 320Nm of torque, which translates into a 0-60mph time of 8.9 seconds, a top speed of 130mph and emissions of 289 g/km. Similar to the V8 engine, the 3.2-litre also comes as standard with Volvo's six-speed Geartronic transmission. The new engine is mostly made of aluminium with an efficient design that is more compact than Volvo's five-cylinder engines, and it combines its high performance with good fuel economy - 23.3mpg on the official combined cycle.

Volvo's D5 turbodiesel, which develops 185PS and 400Nm of torque, offers both strong mid-range urge and refinement. It is fitted with a diesel particulate filter as standard and comes with a six-speed manual transmission or (optionally) Volvo's six-speed Geartronic, plus the latest common-rail direct-injection technology. The manual Volvo XC90 D5 gets from 0-60mph in 10.3 seconds, has a top speed of 121mph, emissions of 219 g/km and achieves 34.0mpg on the combined cycle.

The D5 Geartronic engine was re-homologated for MY09 resulting in the CO2 figure dropping from 239g/km to 224g/km (S, SE and SE Lux models only) and so both the D5 manual and Geartronic fall below the key threshold for VED and London Congestion Charging. This also means that the Volvo XC90 is one of only two premium 7-seat SUVs to achieve a sub-225g/km figure.
The new Volvo XC90 features AWD (All Wheel Drive) with Instant Traction™, with an electronic BorgWarner coupling system to maximise traction between front and rear axles, yet despite its substantial off-road abilities, it is as easy, responsive and rewarding to drive as any regular Volvo saloon or estate model.

The new Volvo XC90 is available in S (D5 only), SE, SE Lux, R-DESIGN and Executive trim levels, all offering a high standard specification compared with most other premium brand rivals.

The standard specification of the ‘S’ model includes: Alarm with immobiliser, rear park assist, Electronic Climate Control (ECC) with Air Quality System (AQS) and pollen filter, information centre, leather gear knob, load cover, steering wheel remote audio controls, High Performance Sound audio system with CD, 4x40w amplifier, 8 speakers, MP3/WMA compatibility and auxiliary input for MP3/iPod connection, key-integrated remote control central locking with deadlocking system, 17in alloy wheels, front fog lights, DSTC (Dynamic Stability and Traction Control) with EBA (Emergency Brake Assist), RSC (Roll Stability Control), Marstrand textile/vinyl upholstery, Manganese trim, electronic All Wheel Drive with Instant Traction™, load-compensating suspension.

Upgrading to the ‘SE’ specification adds: body-coloured wheelarches, body-coloured mirrors, door handles and side rubbing strips, rear skid plate, electric driver's seat (with memory) and door mirror memory, leather-faced upholstery, 18in alloy wheels, rain sensor - automatic windscreen wiper activation, autodimming rear-view mirror, dark wood trim.

The ‘SE Lux’ offers the same specification as the SE but adds: chronograph-style instrument dials, brushed aluminium roof rails, power folding door mirrors with ground lights and water-repellent glass, Sovereign Hide soft leather upholstery, 18in Camulus alloy wheels, Bi-Xenon headlights and cleaning system, power driver and passenger seats, heated front seats, Sapeli wood trim, luxury floor mats.

The ‘Executive’ represents the ultimate Volvo XC90 with the following additional specification: active Bending headlights, Dynaudio Premium Sound audio system with 6xCD autochanger and Dolby Pro Logic II with digital Surround Sound™, 5x130w amplifier and 12 speakers, extended body-coloured wheelarches, 19in Galateia alloy wheels, silver-coloured front skidplate, chromed wide tailpipe cover, satin chrome door mirror caps, chromed C-pillar with ‘Executive’ badge, Executive Ventilated Soft Leather upholstery with massage function and door inserts with contrast piping, Executive soft leather extra padded front door armrests, RTI satellite navigation system with RDS-TMC and Europe data on hard disk, integrated GSM telephone, rear seat headphone sockets, refrigerator in front centre armrest, Executive Nubuck trimmed floor mats, metallic paint, unique matt silver grille, walnut wood trim in door panels, centre console and gear lever knob.

New for May 2008 is the sporty R-DESIGN package, already popular on the Volvo C30, S40 and V50. The R-Design package for the Volvo XC90 is an extension of the XC90 Sport model that was introduced in late 2006 and maintains many of the same prominent features such as the Sport chassis, details in silk matt finish, sill mouldings in brushed stainless steel and instrument dials with metal chronograph watch-style faces and blue lighting.

However, R-Design brings a whole new expressive dimension with 19-inch alloy wheels as standard with an option to upgrade to 20-inch, dual exhaust pipes, skid-plate, the R-Design badge in the grille and rear view mirror caps in silk matt finish. To further accentuate the sporty nature and to create a sleeker appearance, the car is not fitted with roof rails, although these are still available as an option.

SE models and above can be upgraded with Volvo Inscription™, which opens a whole new colourful world of interior sophistication with a collection of bespoke, exclusively designed interiors. Soft ‘semi aniline’ leather upholstery, with ribbed inserts on the seats, comes from the finest hides and is available in a kaleidoscope of exciting colour combinations for all three rows of seats, and door panels. It also includes a soft leather sports steering wheel and Nubuck trimmed floor mats with contrasting piping.

A comprehensive range of optional items includes a choice of DVD-based rear-seat entertainment systems and dark tinted rear windows, as well as many of the features from the top-of-the-range Executive model, such as Active Bending headlights, which move 15 degrees either way to give the driver a better view of the road ahead, integrated telephone, an upgraded, hard disk-based RTI satellite navigation system with TMC (Traffic Message Channel), rear headphone sockets and the awesome Dynaudio Premium Sound audio system.
In order to optimise safety in the new Volvo XC90 and, in particular, reduce the risk of a roll-over, Volvo has fitted as standard a Roll-Over Protection System (ROPS) with Roll Stability Control (RSC) technology. This uses a gyro-sensor to register the car's roll speed and roll angle to instantly calculate the terminal angle and risk of a roll-over, and automatically activate the DSTC (Dynamic Stability and Traction Control) anti-skid system, if required, to help the driver maintain control.

For added protection, Volvo has also reinforced the new XC90's roof structure with extremely tough Boron steel, which is four to five times stronger than normal steel. In addition, the side Inflatable Curtain (IC) protects all three rows of seats and has been designed to stay inflated longer in case of multiple roll-overs, and to help keep occupants inside the vehicle. As you would expect, the Volvo XC90 scores highly in a variety of international safety ratings, including pedestrian protection test ratings.

Volvo has also considered the new XC90’s crash compatibility with other, smaller cars, and designed a lower cross-member - concealed behind the front spoiler - at the height of a bumper in a conventional car to impact with and activate its crumple zones as intended.

Volvo’s 'Clean inside and out' environmental programme reflects its continuing commitment to the environment. Its plants are some of the automotive world’s cleanest factories, and 85 per cent of each car can be recycled, plus every new Volvo is backed by an EPI (Environmental Product Information) which is available at www.volvocars.com/epi. In addition, Volvo produces an annual Corporate Citizenship report, which is available at www.volvocars.com/citizenship.

Like all Volvos, the new XC90’s interior is Oeko-tex standard compliant and free from allergy-inducing emissions. In addition, an active carbon filter ensures dust and exhaust particles do not enter the cabin, while Volvo’s superior Air Quality System (AQS) shuts down the air input if outside air is too dirty.

**Design Concept**

- Designed to reflect customers' AWD/all-terrain requirements in a premium package
- Complements Volvo XC70 in Volvo's XC (Cross Country) Range
- Elegant exterior moves new Volvo XC90 further upmarket
- Traditional Volvo V-shaped bonnet with new chrome grille
- Broad, rounded shoulders emphasised by redesigned tail-lights
- Larger door mirrors incorporate side indicators
- Five trim levels available: S, SE, new R-DESIGN and SE Lux, plus Executive
- Ground clearance of 218mm

The elegant exterior of the new Volvo XC90 has been achieved by a number of enhancements. These are most noticeable at the rear where redesigned lights that incorporate two brake lights on each side emphasise the strong curves of the Volvo XC90’s shoulders. There’s also a wide, chrome detailing above the rear number-plate, a full-width rear skidplate and a new bumper with more body colouring. Flush-mounted Rear Park Assist sensors are also fitted as standard.

At the front, the traditional Volvo V-shaped bonnet incorporates a new grille with a wider chrome surround and more three-dimensional mesh inserts, plus a larger Volvo 'iron mark' badge. The front bumper has a greater degree of colour-coding and a new, extended skidplate built into it. The Volvo XC90 is also distinguished by new 18in alloy wheels (standard on SE and SE Lux) and colour-coded side mouldings, door handles and wheelarch mouldings with black stone protectors. In line with the rest of the Volvo range, the Volvo XC90 also features larger, body-coloured door mirrors, which now incorporate the side indicator lights.

The musculature of the Volvo XC90 is matched by rounded corners front and rear, a gently sloping
Heated front seats, headlamp cleaning system, luxury floor

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Overview
High quality, safety and performance are Volvo's strengths. The new XC90 incorporates the latest in technology, and also features the new generation of the old Volvo - a production car with a high safety level since the 1950s.

Extraordinary safety - Swedish principles. The XC90's five best-selling countries in 2007 were: Sweden (111,000 units), the UK (16,268 units), Germany (15,036 units), Canada (13,920 units) and the USA (12,886 units). Together, the Volvo XC90's five best-selling countries accounted for a total of 458,323 Volvo cars sold.

A comprehensive range of optional items includes a DVD-based rear-seat entertainment systems (split) tailgate and shorter roof section to promote a smoother, non-aggressive impression and help the vehicle to look more compact and desirable.

The Volvo XC90's 'cockpit forward design' enables the passenger compartment to be as far forward as possible with a more steeply raked windsreen than in most other SUVs. This has allowed Volvo to make a seven-seat SUV yet still within modest overall body dimensions: the new Volvo XC90 is 4.8 metres long, 25mm shorter than the all-new Volvo V70.

The Volvo XC90's tailgate is gently sloping rather than vertical to clearly state that this is not a regular Volvo estate car. The resulting shorter roofline also helps the vehicle appear smaller and gives it a modern, sporty stance.

For added convenience, the tailgate is split so the lower section can be used as a seat or table; it is strong enough to be stood upon when loading items onto the roof, and the upper section is not too large, heavy or high when opened.

Five trim levels are offered for the Volvo XC90 - S, SE, R-DESIGN and SE Lux and Executive - each with its own subtle variations.

For customers wishing to personalise their Volvo XC90, there are some specific options which may be of interest, such as dark-tinted rear windows, Active Bending headlights (standard on Executive), aluminium running boards and roof protection ribs (seven rubber ribs mounted lengthwise on the roof).

Driving Dynamics: Engines

The Volvo XC90 is available with a choice of three high-performance engines - one diesel and two petrol - all of which produce plenty of power and, especially, torque from low engine speeds and through the mid-range for maximum flexibility and driving pleasure.

V8

Volvo's first V8 engine offers 315PS and 440Nm of torque (370Nm of which is available from 2000rpm) - enough to provide the new Volvo XC90 with stirring performance, as well as a rousing V8 'burble'. The V8 Volvo XC90 has as standard Volvo's six-speed Geartronic automatic transmission, as well as the latest All Wheel Drive (AWD) system with Instant Traction™, and sprints from 0-60mph in just 6.9 seconds, has emissions of 322 g/km and an electronically limited top speed of 130mph.

It is an extremely refined engine, with compact dimensions to enable it to be fitted transversely in the new Volvo XC90 - like all Volvos - to help maintain good front crumple zones and leave more space for the passenger compartment.

Its compact design was achieved by positioning the cylinders at 60 degrees with a counter-rotating balancer shaft, rather than the conventional 90 degrees. The left-hand bank of cylinders is also offset slightly relative to the right bank - the opposite of normal V8 design. This has enabled the unit to be designed exactly to match the front-end collision protection structure.

In addition, all the ancillaries, such as the alternator, are fitted directly onto the engine itself without any space-stealing brackets. The starter motor is fitted above the transmission to save space; similarly, the exhaust camshafts are driven by secondary chains running off the inlet camshafts. The result is a V8 engine that is just 754mm long and 635mm wide and weighs just 190kg thanks to the block and cylinder head being cast in aluminium.

The counter-rotating balancer shaft between the banks makes this engine one of the world's smoothest running V8s.

The 4.4-litre V8 engine is immensely powerful, with a maximum of 315PS and no less than 440 Nm of torque. They jointly satisfy the needs of particularly enthusiastic driving or effortless motorway cruising. There's a massive 370 Nm of torque available around 2000 rpm - the most
common rev range in everyday driving.

'This powerful V8 means we can reach out to the most discerning of customers,' says Derek Crabb, Vice President of Powertrain at Volvo Cars. 'In the premium SUV class, there are many buyers who would never consider any other engine alternative.'

It is also one of the cleanest V8 engines on the market and meets the American ULEV II (Ultra Low Emissions Vehicle, stage II) standard, which has been possible with the help of:

- Four catalytic converters. Two of these are of close-coupled catalyst type and fitted to one exhaust manifold each. The other two are installed under the car floor.
- Lean air/fuel mixture for lower emissions at cold start.
- Higher idling speed at cold start (about 1250rpm) and optimised ignition for faster warming of the engine and catalytic converters.

The result is extremely low emissions before the catalytic converters are activated - which takes place just 15-20 seconds after the engine is started.

"It is during these 15-20 seconds that the majority of the emissions of harmful substances takes place," says Jögen Sjensson, Volvo's Chief Programme Engineer.

The sound of a V8 engine is also important to customers and is something Volvo has paid special attention to during the development of the engine. The resulting off-beat V8 'burble' speaks for itself.

3.2

The new six-cylinder 3.2-litre (3192cc) engine develops 238PS and 320Nm of torque, which translates into a 0-60mph time of 8.9 seconds with emissions of 281 g/km and a top speed of 130mph. It also comes as standard with Volvo's six-speed Geartronic transmission and the latest All Wheel Drive (AWD) system with Instant Traction™.

Built at Bridgend in Wales, the 3.2 is a modern unit, mostly made of aluminium with an efficient design. A straight-six engine is, intrinsically, the most refined and smoothest of all engine configurations. But their length makes them difficult to package transversely. 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 in-line six-cylinder (SI6) engine extremely compact, much shorter than the straight-six norm. In fact, it is more compact than Volvo's five-cylinder engines as its ancillary components are neatly positioned behind the engine in the space above the transmission.

The key was a new, unique and highly innovative drive system known as READ - Rear End Ancillary Drive. All ancillaries, such as power steering pump and air conditioning compressor, are driven by gears at the rear end of the crankshaft. The alternator is direct driven and installed on the engine block. The flywheel damper is now inside the engine.

The result is an extremely short engine, of just 625 mm, or 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 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.

There are twin overhead camshafts and 24-valves (four per cylinder) to provide optimal engine breathing. Engine breathing is further improved by Volvo's patented Cam Profile Switching (CPS) system that features two completely different intake cam profiles machined onto the same camshaft. The engine management system decides which cam profile to use, depending on the engine's running conditions and driver's torque demands. One profile is ideal for low speed/low load driving and offers good torque and excellent fuel economy. The other, which gives longer valve lift, is ideal for enthusiastic driving, at higher speeds. An ingenious two-piece hydraulic valve tappet arrangement alters the cam profiles.
'In principle, Cam Profile Switching creates two engines in one,' says Derek Crabb. 'We can unite widely differing demands on one and the same engine and easily meet the requirements of customers with entirely different wishes. Our focus is just as much on satisfying customers who prioritise performance as those who are more interested in driving comfort and fuel economy.'

The SI6 engine also features a continuously Variable Cam Timing (VCT) system, to constantly alter valve overlap to achieve optimum power, efficiency and emissions. The combination of CPS and VCT gives the new straight-six engine an astonishingly broad power and torque band, and improves both outright performance and the vehicle’s driveability.

In addition, the 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, 80 percent of the vehicle’s maximum torque is available across the entire rev range, and 256 Nm is on tap all the way from 1400rpm to 6400rpm.

'VIS enables us to exploit the engine's capacity to the maximum and extract the maximum possible power throughout the entire rev range,' says Derek Crabb.

The SI6 engine is also amazingly clean, complying with Euro5 emission control standards, and ULEV (Ultra Low Emissions Vehicle) II standards in the US.

It achieves high performance with good fuel economy thanks to its valve train, with both Variable Cam Timing (VCT) and Cam Profile Switching (CPS) on the intake side. With CPS, the intake valves can be lifted to different heights depending on engine revs and load - a lower lift for economical driving and a higher one for more power, almost creating two engines in one.

**D5**

Volvo's 2400cc, D5 turbodiesel, which develops 185PS and 400Nm of torque, offers both strong mid-range urge and refinement. It is fitted with a diesel particulate filter as standard, a six-speed manual transmission or (optionally) Volvo's six-speed Geartronic, plus the latest common-rail direct-injection technology. The manual Volvo XC90 D5 gets from 0-60mph in 10.3 seconds and has a top speed of 121mph, whilst achieving an average of 34.0mpg on the combined cycle.

The D5 turbodiesel engine was substantially revised and enhanced in 2005 following technological developments and extensive changes to the performance characteristics. For example, these included:

- New electronic glow plug system for faster starting
- More advanced injection process with 7 spray holes instead of 5 in each injector for complete fuel atomization and more efficient combustion and enhanced performance
- New, larger and more efficient turbocharger with electronic control for faster/more precise control of charge pressure; plus larger compressor wheel, new cambered vanes for improved response at all speeds and reduced turbo lag
- Turbo centre housing now water cooled to provide continued cooling after engine stops
- Improved flow of air/exhaust gases for optimal flow and reduced drop of pressure
- More powerful engine management system with more sensors to improve regulation
- EGR (Exhaust Gas Recirculation) system modified for improved flow/regulation
- New, more effective cooling system for EGR
- Faster, electronically controlled throttle moves EGR gases/regulates temperature better
- Air swirl in combustion chamber is now infinitely variable for more efficient combustion
- Increased volume for combustion chambers and consequently a lower compression ratio
- Larger catalytic converter with oxygen sensor for more precise emissions control
With CO₂ emissions being a hot topic, Volvo are pleased to report that after several updates for MY09 the D5 Geartronic now boasts a figure of 224g/km down from 239g/km (excluding R-DESIGN and Executive which remain at 239g/km). Together with the 219g/km figure for the D5 manual the engine falls into VED band F and will avoid the proposed £25 London Congestion Charge. This also means that the Volvo XC90 is one of only two premium 7-seat SUVs to achieve a sub 225g/km figure.

**Driving Dynamics: Chassis**

- AWD with Instant Traction™ for impressive all-terrain and on-road performance
- Electronic BorgWarner coupling system maximises traction between front and rear axles
- Volvo’s TRACS anti-spin system also distributes power across the axle
- New SE Sport model: dynamic chassis settings, stiffer anti-roll bars, firmer shock absorbers and sport tuned speed-dependent steering. Developed on UK roads
- 218mm ground clearance
- Car-like driving experience
- Wide track and long wheelbase for maximum stability
- Dynamic Stability and Traction Control (DSTC) fitted as standard
- Sophisticated multi-link rear suspension
- R-DESIGN features dynamic chassis settings, stiffer anti-roll bars, firmer shock absorbers and sport tuned speed-dependent steering
- Load-compensating suspension fitted as standard

The new Volvo XC90 is designed for all types of roads, irrespective of the surface beneath the tyres or the weather conditions. Even though it was never designed to be a serious off-roader, the Volvo XC90 has the versatile combination of electronically controlled BorgWarner All Wheel Drive (AWD) with Instant Traction™ and a generous 218mm of ground clearance for when the going gets tough.

A high seating position gives the Volvo XC90 driver a feeling of safety and greater awareness of the road ahead, with the knowledge that he or she can control the car with the help of instant, well-weighted response from the chassis, engine and brakes.

The chassis in the Volvo XC90 is designed to give the vehicle the same ride and roadholding characteristics as a passenger car. The suspension is more substantial, however, to handle heavier loads, as well as the higher ground clearance and all-terrain possibilities.

The rear multi-link suspension is well isolated, with the dampers and springs attached directly to the subframe. This results in a quieter ride as road and transmission noise is largely filtered out before it reaches the bodywork.

A wide track (1634mm front, 1624mm rear) and a long wheelbase (2857mm between the front and rear axles) make for exceptional stability, so the new Volvo XC90 behaves consistently and dependably, even on curving, twisting and uneven roads.

The XC90 R-DESIGN model features dynamic chassis settings, stiffer anti-roll bars, firmer shock absorbers and sport tuned speed-dependent steering.
The chassis settings for the Volvo XC90 R-DESIGN have been refined and specifically developed on UK roads to increase genuine driving pleasure. The shock absorbers have stiffer rebound rates and the anti-roll bars are stiffer (front +0.5mm; rear +1.0mm) to offer a high level of stability when cornering. The speed dependent steering has also been adapted to offer a quicker steering response. Furthermore, Volvo’s self-levelling system, Nivomat, has been fine-tuned to offer great stability and driving control.

**AWD with Instant Traction™**

The new Volvo XC90’s AWD (All Wheel Drive) system has the latest electronic system developed in conjunction with the Swedish specialist, BorgWarner. It operates independently of driver input, distributing torque automatically between the front and rear wheels for the best possible grip in all conditions.

A ‘pre-charged’ function uses a non-return valve within the coupling, making 80Nm of torque instantly available to the rear wheels if the sensors detect any slippage. It feeds more power to the rear wheels as the car pulls away to improve acceleration. Once moving, power is balanced between front and rear, reducing drive to the rear wheels when not needed, and helping to reduce fuel consumption.

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, 95 per cent of the power is distributed to the front wheels. However, for off-road work, or if the sensors detect slippage, between 5 and 65 per cent of the power/torque is diverted to the rear wheels to maximise traction, if required.

The XC90 further benefits from Volvo’s TRACS anti-spin system and Dynamic Stability and Traction Control (DSTC). TRACS prevents wheel spin by transferring power across the axle if it detects a wheel is losing grip on one side. This means power is automatically and smoothly distributed to the wheels with the best traction at any given time. TRACS is deactivated during braking so the brake and ABS systems can function effectively, for high stability and shorter braking distances.

In addition, the DSTC system increases driving safety on twisty roads and in slippery conditions by using sensors to detect if one of the driven wheels shows any sign of losing traction and cutting the power to it at lightning speed so it can quickly regain grip. And if the car shows any tendency to skid, the system automatically brakes the relevant wheels to help maintain smooth control.

All Volvo XC90 models benefit from ABS brakes with Electronic Brake Distribution (EBD) and Emergency Brake Assist (EBA) which senses an emergency stop and automatically brings the car to a halt in as short a distance as possible.

**Driving Dynamics: Steering, Brakes and Transmission**

- Power-assisted ZF rack and pinion steering optimised for feedback/response
- Speed-dependent steering (standard on V8)
- Anti-lock brakes (ABS) with Electronic Brakeforce Distribution (EBD)
- Dynamic Stability and Traction Control (DSTC) with Emergency Brake Assist (EBA)
- AWD with Instant Traction™ and BorgWarner coupling, plus TRACS traction control
- Six-speed manual transmission for D5 turbodiesel; six-speed Geartronic optional
- Six-speed Geartronic transmission standard on V8 and 3.2-litre petrol
- Geartronic automatic transmission adapts its shift patterns to suit individual driving styles and includes a sequential, manual-shift facility for added control

The new Volvo XC90 is as easy, responsive and rewarding to drive as a regular Volvo saloon or estate model. Its torsionally rigid body, transverse engines and All Wheel Drive combine to create
almost even weight distribution (53 per cent front, 47 per cent rear).

The front MacPherson suspension, together with the ZF steering gear, promotes increased precision and sharp response. Speed-sensitive steering is standard on V8 petrol models and optional on the rest of the range.

**DSTC, EBD and EBA**

The Volvo XC90's braking system is designed and tested to help stop the vehicle safely, even when it is fully loaded with seven people and luggage, and is backed by sophisticated traction and stability control systems.

Dynamic Stability and Traction Control (DSTC) is standard on every model and prevents wheelspin by either braking the wheel that has lost traction (up to 25mph) or, at speeds above 25mph, by reducing engine power and using extra sensors to detect the onset of a skid. The system then automatically slows the appropriate wheel to restore control. It ensures that the driven wheels get exactly as much power as they can transfer to the road.

All Volvo XC90s benefit from ABS brakes with EBD (Electronic Brake Distribution) and EBA (Emergency Brake Assist) which monitors how quickly the brake pedal is pressed, and determines if the driver is panic-braking. When this occurs, the brake pressure is boosted to maximum in the shortest possible time, to reduce the stopping distance.

**AWD with Instant Traction™**

The Volvo XC90's All Wheel Drive system has the latest electronic features developed in conjunction with the Swedish specialist, BorgWarner. It operates independently of driver input, distributing torque automatically between the front and rear wheels for the best possible grip in all conditions.

A 'pre-charged' function uses a non-return valve within the coupling, making 80Nm of torque instantly available to the rear wheels if the sensors detect any slippage. It feeds more power to the rear wheels as the car pulls away to improve acceleration. Once moving, power is balanced between front and rear, reducing drive to the rear wheels when not needed, and reducing fuel consumption.

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 diverted to the rear wheels to maximise traction.

The XC90 further benefits from Volvo's TRACS anti-spin system and Dynamic Stability and Traction Control (DSTC). TRACS prevents wheel spin by transferring power across the axle if it detects a wheel is losing grip on one side.

**Geartronic**

Volvo's Geartronic transmission - standard on V8 and 3.2-litre petrol models, optional on the D5 - gives the driver the best of both worlds. Geartronic automatically adjusts its shift points to reflect the driver's style and also offers a manual, sequential-shift facility where the driver is able to choose gears individually by tipping the lever forwards to change up and backwards to change down. It also features a 'W' setting for winter driving on slippery surfaces when it will start in a higher gear to avoid wheelspin and loss of control.

**Interior Design**

- Innovative and flexible interior
- Seven individual, forward-facing seats in three rows with 64 seating configurations
- Centre seat of middle row features integrated child booster cushion and moves forward nearer adults in front of car
- Higher-quality feel with new materials, upholsteries and luxury detailing
Heated front seats, headlamp cleaning system, luxury floor

The interior of the new Volvo XC90 endorses the car's move further upmarket with an enhanced premium feel. The airiness, space and quality of the old model remain - as, of course, does the innovative and flexible design - but new materials and a higher standard of detailing impart an air of luxury and craftsmanship.

Key to the transformation is the use of new materials and upholsteries, including Sovereign Hide soft leather with contrasting seam stitching and panels in perforated leather for the new SE Lux model (optional on others) as well as Inscription™ interior upgrades available.

The centre console has been upgraded with aluminium-effect trim and a new display for the audio and telephone systems. The dials and switchgear feature satin chrome inlays and a new choice of Sapeli wood has been introduced. For extra convenience when overtaking, a quick push of the indicator stalk automatically flashes the indicators three times. The door handles are also new and feature an improved design with a more tactile, black centre area.

"The changes we have made to the new Volvo XC90 can be regarded as precision tuning designed to increase the car's appeal still further," says Hans Wikman, Volvo's Vice President Vehicle Line Large Cars. "Volvo wants to give the discerning XC90 customers a more luxurious, premium experience."

The driver will appreciate one of the clearest and most ergonomically designed instrument panels, which has a typically Scandinavian simplicity of line and functionality: plenty of information from a small number of meticulously designed instruments.

Compared with those found in a normal saloon, the instruments and controls are angled slightly up towards the driver's eyes. Together with the high seating position, this enhances the feeling of control - the single quality that SUV buyers generally prize most highly.

Despite being 25mm shorter than the all-new Volvo V70 premium estate, the Volvo XC90 offers the greatest flexibility in the premium SUV class, with generous interior space housing seven individual, forward-facing seats - all with head restraints and seat belt pre-tensioners.

"Everyone rides business class in the Volvo XC90; nobody travels economy class," says Peter Horbury, Volvo's former Vice President and Chief Designer.

The middle seat in the centre row has an integrated child booster cushion and also slides forwards independently so it can be positioned directly between the two front seats, thus improving contact between a child and the front seat occupants. What's more, the armrest between the front seats is removable to create more leg room for the passenger in this centre seat. In total, there are 64 different seating configurations.

The third row features two separate seats, offering full comfort for children or for adults of modest build. Unlike some rivals, these do not take up valuable space or have to be clumsily removed, but instead they neatly and simply fold away individually out of sight into the boot floor when not in use, so are always on hand.

Both the second and third rows of seats can be folded down to create an entirely flat luggage compartment floor no less than 3845mm long and 1127mm wide, with a volume of 1837 litres. In addition, the front passenger seat also folds forwards to accommodate extra-long loads. Even with all seven seats in use, there is still a useful amount of load space for the family - 249 litres, to be precise.

**Quality and Equipment**

- Higher standard specification than many other premium brand rivals
In the new Volvo XC90, considerable importance has been attached to providing a comprehensive standard specification to reflect the upmarket ambience of the car itself.

Luxurious touches such as the use of high-quality materials and upholsteries, and satin chrome inlays for the controls are matched by a high level of standard equipment on all models.

Hi-fi enthusiasts can upgrade to the Executive model's Dynaudio Premium Sound system with Dolby Pro Logic II Surround Sound™ and 12 Dynaudio speakers. It includes a 6xCD, FM and AM radio, 5 x 130w amplifiers, as well as MP3/WMA compatibility and an auxiliary jack input to enable customers to connect personal iPod players.

Volvo employs its own audio development team, rather than relying on an outside supplier, to ensure the audio systems are tailored to suit the acoustic properties of each model. As a result, all components have been tuned to produce the best possible surround sound everywhere in the car. Even rear passengers are able to hear the sensation of surround sound over the entire music frequency range.

The Dolby Pro Logic II system produces five unique sound channels. Listening to Surround Sound from the Premium Sound audio system is designed to be like sitting in the best seat in front of a live orchestra - you feel you are actually there.

The new Volvo XC90 is available in S (D5 only), SE, new R-DESIGN and SE Lux variants, plus Executive trim levels.

The standard specification of the 'S' model includes:

- Alarm with immobiliser
- Rear Park Assist
- Electronic Climate Control (ECC) with Air Quality System (AQS) and pollen filter
- Information centre
- Leather gear knob
- Load cover
- Steering wheel remote audio controls
- High Performance Sound audio system with CD, 4x40w amplifier and 8 speakers
- MP3/WMA compatibility
- Auxiliary input for MP3/iPod connection
- Key-integrated remote control central locking with deadlocking system
- 17in alloy wheels
- Front fog lights
- DSTC (Dynamic Stability and Traction Control) with EBA (Emergency Brake Assist)
- RSC (Roll Stability Control)
- Marstrand textile/vinyl upholstery
- Manganite trim
- Electronic All Wheel Drive with Instant Traction™
- Load-compensating suspension

**Upgrading to the ‘SE’ specification adds:**
- Body-coloured wheelarches
- Body-coloured mirrors, door handles and side rubbing strips
- Rear skid plate
- Electric driver’s seat (with memory) and door mirror memory
- Leather-faced upholstery
- 18in alloy wheels
- Rain sensor - automatic windscreen wiper activation
- Autodimming rear-view mirror
- Dark Wood trim
- Autodimming Rear View Mirror with Compass

**The new R-DESIGN offers the SE specification, plus:**
- Larger 19in alloy wheels
- Front and rear skid plate
- Extended body coloured wheel arch extenders
- Exterior trim with a satin silver finish, rather than the standard chrome
- Unique sill mouldings in brushed stainless steel
- Roof rails are not fitted - for a sleeker appearance, although available
- Active Bending lights
- Headlamp cleaning system
- R-DESIGN badge in front grille and branding on steering wheel
- Unique quad exhaust endpipes
- Silver-matt finish to door mirror caps
- Unique leather-faced upholsteries embossed with R-DESIGN logo: Off Black with Cream inlay or Calcite with Off-Black inlay
The new 'SE Lux' offers the same specification as the SE but adds:

- Chronograph instrument dials
- Brushed aluminium roof rails
- Power folding door mirrors with ground lights and water-repellent glass
- Sovereign Hide soft leather upholstery
- 18in Camulus alloy wheels
- Bi-Xenon headlamps and cleaning system
- Power driver and passenger seats
- Heated front seats
- Sapeli wood trim
- Luxury floor mats

The 'Executive' represents the ultimate Volvo XC90 with the following additional specification:

- Active Bending headlamps
- Dynaudio Premium Sound audio system with 6xCD autochanger and Dolby Pro Logic II with digital Surround Sound™, 5x130w amplifier and 12 speakers
- Extended body-coloured wheelarches
- 19in alloy wheels
- Silver front skidplate
- Chromed wide tailpipe cover
- Satin chrome door mirror caps
- Chromed C-pillar with ‘Executive’ badge
- Executive ventilated soft leather upholstery with massage function and door inserts with contrast piping
- Executive soft leather extra padded front door armrests
- RTI satellite navigation system with RDS-TMC and Europe data on hard disk
- Integrated GSM telephone
- Rear seat headphone sockets
- Refrigerator in front centre armrest
- Executive Nubuck trimmed floor mats
- Metallic paint
- Unique matt silver grille
- Walnut wood trim in door panels, centre console and gear lever knob
- Volvo On Call
SE models and above can be upgraded with Volvo Inscription™, which opens a whole new colourful world of interior sophistication with a collection of bespoke, exclusively designed interiors. Soft ‘semi aniline’ leather upholstery, with ribbed inserts on the seats, comes from the finest hides and is available in a kaleidoscope of exciting colour combinations for all three rows of seats, and door panels. It also includes a soft leather sports steering wheel and Nubuck trimmed floor mats with contrasting piping.

A comprehensive range of optional items includes a DVD-based rear-seat entertainment systems with the ability to watch Freeview and subscription channels, as well as many of the features from the top-of-the-range Executive model, such as Active Bi-Xenon headlights, which feature a unique design and a facility to change the headlamp beam pattern for driving in mainland Europe, integrated telephone, an upgraded, hard disk-based RTI satellite navigation system with TMC (Traffic Message Channel), rear headphone sockets and the Dynaudio Premium Sound audio system.

Volvo owners can also personalise their car by choosing options such as dark-tinted rear windows, third-row seating air conditioning, or a rear entertainment system. Many are conveniently grouped together, such as the Winter, Communications and Entertainment Support Packs:

<table>
<thead>
<tr>
<th>Winter Pack:</th>
<th>Heated front seats, headlamp cleaning system, luxury floor mats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communications Pack:</td>
<td>Dual-band integrated GSM telephone with handset, RTI navigation system with RDS-TMC, remote control and Europe data on hard disk, Volvo On Call</td>
</tr>
<tr>
<td>Entertainment Support Pack:</td>
<td>RTI navigation System with RDS-TMC Remote Control and Map Data on Hard Disk, BLIS (Blind Spot Information System) and Rear Seat Entertainment with 1 x DVD Player in front centre armrest, 2 x 8in Screens, 2 x IR Headphones. Remote Control and Dark tinted windows (Rear windows and Rear screen)</td>
</tr>
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**Rear-seat entertainment**

Rear-seat passengers have access to their own headphone socket and control unit for the audio system, located conveniently in the C-post. There they can plug in their headphones and simultaneously listen to either a CD or the radio, so they are not limited to what's coming through the speakers. This means that parents and children can each enjoy their different tastes in music at the same time – making long trips in a Volvo XC90 much more enjoyable.

Rear-seat entertainment options include a choice of DVD-based twin screen systems. The factory option offers a DVD player in the front armrest with two seven-inch screens in the head restraints of the front seats. Alternatively, there are two other options offered as an accessory fit: a twin-screen system with a DVD fitted in the boot that can take 10 DVDs at a time, or a roof-mounted single screen that is lowered on powered hinges. They can be remote-controlled and used with wireless headphones to avoid disturbing other passengers. The DVD players play ordinary CDs as well. A Digital TV option us also available to supplement the RSE system, this enables passengers to watch Freeview channels as well as providing a cardslot than can be used for subscription services.

**RTI with RDS-TMC**

Volvo's RTI (Road and Traffic Information) satellite navigation system has been upgraded for the new Volvo XC90 and now works from a hard disk-based system (instead of DVD) which is easier to use, calculates routes more quickly and provides additional information. Including data for most of Europe, the system offers a choice of 'Easy' or 'Advanced' modes, according to the driver's needs.
The system also features RDS-TMC (Traffic Message Channel) which displays up-to-date information on traffic problems. It has a large colour screen that rises from the top of the dashboard to be safely positioned in the driver's view. Controls on the rear side of the steering wheel make it easy for the driver to use the system while driving, or there’s a remote control unit for passengers to use.

**Volvo On Call - advanced telematics**

Volvo On Call is a valuable personal safety feature using advanced telematics. The system uses an integrated GSM telephone with a built-in GPS unit for satellite positioning, and ensures help is always close at hand.

**Volvo On Call - safety package**

Volvo On Call comes with a standard safety package. If an airbag or seat belt pre-tensioner is triggered in the event of an accident, Volvo On Call automatically calls the Emergency Services via BT999 and can also provide data of your location.

Alternatively, pressing the red ‘SOS’ button on the integrated GSM telephone will put you straight through to the Emergency Services.

Also, 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 is only a call away at any time of day to offer personal services such as route guidance, or to guide roadside assistance to you.

**Volvo On Call - security package**

An optional Volvo On Call security package offers the added benefits of a remote door unlock facility, theft notification and vehicle tracking.

In the future, Volvo On Call’s services could include automatically contacting your local dealer when a service is required.

**Accessories**

There’s also a vast range of accessories to accommodate the needs of every Volvo XC90 owner.

A new Park Assist Camera uses the car’s RTI navigation screen to display what’s going on behind when reversing, as well as showing ‘help lines’ of the car’s planned path, which could be especially useful to customers reversing to hitch up to a trailer. The wide range of load-carrying systems includes ski and roof boxes, bike racks and surf board holders, roof protection ribs and towbars - all designed to ensure the car can accommodate the hobbies, interests and busy lives of Volvo owners.

**Quality and customer satisfaction**

Volvo’s employees are justifiably proud of the quality of their products, but they’re equally determined to offer the best customer service. Volvo’s management has set a goal of achieving ‘Customer satisfaction no. 1’ in the premium sector. 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.

**Warranty**

This quality assurance package is backed up by a comprehensive warranty. The standard mechanical warranty is three years/60,000 miles (whichever is soonest), 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**
Like all Volvo models, the new XC90 features a comprehensive safety package designed to protect occupants in a wide variety of accidents. Given the higher centre of gravity of an SUV, however, there has been a greater focus on the increased potential for roll-over accidents.

Roll-Over Protection System

Volvo's Roll-Over Protection System (ROPS) tackles the problem from two directions:

- A stability-enhancing system, Roll Stability Control (RSC), minimises the risk of the new Volvo XC90 rolling over in the first place.
- Increased protection is provided for occupants if the vehicle does roll over.

Owing to its higher centre of gravity, an SUV may have a higher risk of rolling over in certain critical situations compared with a conventional car. That is why the centre of gravity in the Volvo XC90 has been kept as low as possible compared with most SUVs. In fact, it is just 89mm higher than that of the Volvo XC70.

However, this does not mean that Volvo has compromised on one of the properties that SUV buyers value so highly: a commanding seating position. The front seats are no less than 165mm higher than in the Volvo XC70.

Roll Stability Control

In order to help reduce the risk of a roll-over situation, Volvo has developed an active stability-enhancing system known as Roll Stability Control (RSC). The system uses a gyro-sensor to register the car's roll speed and roll angle and instantly calculates the terminal angle and roll-over risk.

If there is an obvious risk of rolling over, the DSTC (Dynamic Stability and Traction Control) anti-skid system is activated and responds by reducing the engine's power and braking one or more wheels as necessary until the car understeers and stability is regained.

This significantly helps reduce the risk of a roll-over accident initiated by extreme manoeuvres and is the only active stability-enhancement system to measure the car's roll angle.

Special Boron steel in a reinforced roof structure

If the new Volvo XC90 experiences a roll-over, the passive safety systems kick in.

The goal is to reduce the risk of occupants' heads coming into contact with the car's interior roof panel or sides. So, Volvo has reinforced parts of the roof structure in the Volvo XC90 with...
extremely tough Boron steel, which is four or five times stronger than normal steel.

All seven seats are equipped with seat belt pre-tensioners to hold the occupants securely in place. In an accident, the pre-tensioner pulls the seat belt firmly across the occupant's body in order to help provide maximum protection.

To help prevent the head from striking the car's sides, the new Volvo XC90 is equipped with Volvo's Inflatable Curtain (IC). IC also helps prevent the occupants or any limbs from being thrown from the car in an accident. In the Volvo XC90, the IC protects all three rows of seats.

The Volvo XC90's IC is specially adapted to stay fully inflated for longer to offer maximum protection in a roll-over scenario. If the occupant's head is resting against the window at the moment of inflation, the curtain will slip between the glass and the occupant's head.

Compatibility

The problem of compatibility - when an SUV collides with a car that sits closer to the road surface - was another important focus throughout the development of the Volvo XC90.

A typical SUV has a high ground clearance and thus often comes with high-positioned bumpers. This may create a greater risk of damage to the oncoming car and more serious injuries to its passengers as the lower car's protective beams and crumple zones simply slip below the front of the SUV without being activated.

In order to reduce the risk of this type of injury, the Volvo XC90's front suspension subframe is supplemented with a lower cross-member neatly concealed behind the front spoiler and positioned at the height of the beam in a conventional car.

The lower cross-member strikes the oncoming car's protective structure, activating its crumple zone as intended so the occupants can be given the maximum level of protection.

Considerable attention has also been given to the safety of pedestrians, cyclists and other relatively unprotected road-users. The entire front of the car features clean, gentle and smooth lines, and there are no protruding parts that may cause injuries.

The engine in the new Volvo XC90 is installed low in the vehicle. As a result, the bonnet has no less than 80mm of deformation space before there is any contact with the engine below it. It thus serves as a soft, impact-absorbing 'bumper', reducing the risk of serious injury if a pedestrian is thrown onto the bonnet.

High safety level in the third row of seats

The Volvo XC90's third row of seats provides a high level of passenger safety. There is generous space behind it, so collision force in a rear-end impact can be effectively absorbed and dissipated.

The occupants of the rearmost seats sit just above the rear axle, which is the optimum position in terms of side-impact safety. These seats also feature seat belt pre-tensioners, head restraints and protection from the Inflatable Curtain.

WHIPS, Volvo's award-winning Whiplash Protection System, is fitted in the two front seats of the new Volvo XC90. WHIPS is activated in the event of a rear-end collision from speeds as low as 9mph, helping to reduce trauma on the spine and neck and thus reducing the risk of injury.

Child safety

An integrated booster seat is standard in the centre seat of the middle row, as are ISOFIX mounting points, and Volvo also offers a passenger airbag cut-off switch to enable child seats to be carried in the front of the car.

Water-repellent glass

Another aid to improve driver visibility and help prevent accidents is water-repellent glass (WRG) for door mirrors (standard on the SE Lux and Executive). This glass is also available for (laminated) side windows.
On the side windows, the WRG gathers water together as pearls of moisture that are easily blown away by the wind, leaving a dry glass panel with unobstructed visibility. Since it is more difficult for dirt to fasten onto dry surfaces, it is also easier to keep the windows cleaner. The WRG treatment requires that the windows be laminated.

On the WRG door mirrors, a different method is used. Here, the water is distributed evenly across the entire glass surface so that it is possible to see through the water. In certain weather conditions, the function can be speeded up if the mirror heater elements are activated.

**Whiplash protection**

Volvo was the first car manufacturer to improve driver comfort by studying ergonomics and introducing adjustable lumbar support seat backs in 1964. After nearly 40 years of continuous research, crash-testing and innovation, it can also claim that its seats can reduce whiplash injuries by 50 per cent.

Seventy per cent of personal injuries in car accidents include whiplash, but Volvo's research shows this risk can be reduced by half with 'WHIPS' - the Volvo Whiplash Protection System, first introduced at the launch of the S80 in 1998, and now standard in all Volvo front seats. Volvo's WHIPS seats significantly reduce the force on the spine and head by absorbing energy from the impact and offering superior support thanks to the combination of an innovative moving support mechanism in the seat back and a fixed head restraint design permanently at the right height and position.

In practice, the WHIPS seat mechanism bends backwards with the occupant's body - first in parallel and then in a short reclining movement.

Volvo's traffic accident research team compared real-life whiplash injuries from Volvos with and without WHIPS, and the results point to a clear conclusion: WHIPS reduced short-term and long-term (of more than a year) injuries by 33 per cent and 54 per cent respectively, while whiplash injuries in women were reduced by as much as 50 per cent and 75 per cent, respectively.

All Volvo car head restraints were placed in the highest category in the 'New Car Whiplash Rating' published by the Thatcham Motor Insurance Repair Research Centre. Static tests were carried out to measure the design and position of head restraints in 500 car models.

"We are very proud of coming out so well," says Volvo Car Corporation's safety engineer and whiplash specialist, Lotta Jakobsson. "Volvo has long understood how important head restraints are, and led the industry in introducing them.

Like Volvo, the Swedish insurance company, Folksam, also compared real-life accidents, and showed that WHIPS seats reduced whiplash injury by 40 per cent. In 2003, Folksam crash-tested seats from a number of different manufacturers’ cars, and Volvo seats were considered the best. An overall whiplash injury reduction in the region of 50 per cent was thought possible, if all cars had seats as good as Volvo’s.

**Security**

- Electronic immobiliser fitted as standard
- Alarm and deadlock system operated from remote control key fob
- Home Safe and Approach lighting system fitted to every model
- Volvo 'Best Manufacturer' in British Insurance Car Security Awards, 2004 and 2005
- Laminated and dark-tinted side windows available
- Level sensor available
- Volvo On Call telematics
Volvo's passion for safety also extends to issues of personal security. It came out as overall 'Best Manufacturer' in the British Insurance Car Security Awards in 2004 and 2005. The BISCA aim is to raise consumer awareness of vehicle security and recognise manufacturers' efforts to make cars more secure.

The new Volvo XC90 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 a Volvo XC90, while dark-tinted rear windows protect the car's contents and aid personal security.

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 new Volvo XC90. The alarm is triggered if anyone attempts to open the doors, the bonnet or the tailgate. 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 Home Safe and Approach lighting system. By pressing a button on the remote controller when approaching 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, 60 or 90 seconds (programmable by a Volvo dealer), lighting a path to the door. It's a simple system that offers considerable peace of mind.

**Volvo On Call - advanced telematics**

Volvo On Call is a valuable optional safety and security feature using advanced telematics. The system uses an integrated GSM telephone with a built-in GPS unit for satellite positioning, and ensures help is always close at hand. If an airbag or seat belt pre-tensioner is triggered in the event of an accident, Volvo On Call automatically calls the Emergency Services via BT999 and can also provide data of your location.

Alternatively, pressing the red 'SOS' button on the integrated GSM telephone will put you straight through to the Emergency Services.

Also, 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 is only a call away at any time of day to offer personal services such as route guidance, or to guide roadside assistance to you.

An optional Volvo On Call security package offers the added benefits of a remote door unlock facility, theft notification and vehicle tracking.

**Environment**

- 'Clean inside and out' environmental commitment
- Interior trim materials conform to Oeko-Tex standards and are allergen-free
- Air Quality System (AQS) ensures cleaner air inside than out
- 85 per cent of the car can be recycled
- Each new Volvo is backed by an Environmental Product Information (EPI) analysis, available at [www.volvocars.com/epi](http://www.volvocars.com/epi)
- Volvo produces an annual Corporate Citizenship report, which is available at [www.volvocars.com/citizenship](http://www.volvocars.com/citizenship)
Environmental care is one of Volvo's core values so, when developing its SUV, Volvo paid particular attention to emissions and fuel economy.

"We know that some people are uncomfortable about the fact that SUVs produce higher emissions and consume more fuel than most passenger cars," says Hans Wikman, the Volvo XC90 Project Director.

**Healthy inside**

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 emissions-free cars is a healthy solution to the problem.

The interior of the new Volvo XC90 complies with a strict standard called Oeko-Tex, which sets maximum levels for dangerous substances contained in textiles and trim materials. All the leather upholstery and trim fitted to the Volvo XC90 meets strict Oeko-Tex standards.

Furthermore, the leather is tanned using natural plant substances and the components on the Volvo XC90 that most frequently come into contact with the skin - the door handles, ignition key and safety belt locks - are also compliant with Oeko-Tex and allergen-free.

**Clean air**

The new Volvo XC90 takes further care of the environment inside the passenger compartment and reduces the risk of allergy-related problems with its Electronic Climate Control (ECC) with automatic Air Quality System (AQS).

AQS consists of a filter featuring a particle trap and an active carbon filter, removing particles such as pollen and unpleasant odours from the incoming air, and has a sensor that automatically activates the air recirculation function if the concentrations of substances such as nitrogen oxide, carbon monoxide and hydrocarbons in the air entering the cabin are too high.

**Corporate Citizenship**

Volvo's commitment to the environment extends beyond the car itself. It was one of the first manufacturers to use tools to evaluate the life-cycle environmental impact of its products. The system, known as EPI (Environmental Product Information), 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.com/epl](http://www.volvocars.com/epl).

It's a strategy that has clearly paid dividends. The new Volvo XC90 is built in one of the automotive world's cleanest factories, with emissions of solvents from the Volvo Torslanda plant in Sweden reduced by over 90 per cent since 1972. Plus, 85 per cent of each car can be recycled and every new Volvo is backed by an EPI. Volvo's annual Corporate Citizenship report is available at [www.volvocars.com/citizenship](http://www.volvocars.com/citizenship).

**Did You Know?**
- 1. The new Volvo XC90 is built at the company’s Torslanda plant in Gothenburg, Sweden.
- 2. The XC90 was Volvo’s best-selling model. In 2007, global Volvo XC90 sales totalled 79,140 - out of a total of 458,323 Volvo cars sold.
- 3. The XC90 was Volvo UK's 3rd best-selling model in 2007 (1st V50, 2nd S40).
- 4. The XC90's five best-selling countries in 2007 were: USA (31,301), Russia (6,159), Germany (5,412), UK (4,258) and Spain (3,176).
- 5. The XC90 won many awards around the world, including in the UK: What Car? Car of the Year Awards, 'Best 4x4', 2003 TheSun, 'SUV of the Year' BBC Top Gear magazine, 'Best 4x4'
- 6. 53 per cent of XC90 customers are aged 35-44, while 74 per cent have a family, with an average gross annual household income of £79,150*, noticeably higher than rest of the Volvo range.
- 7. The top three reasons given for buying a Volvo XC90 were: number of seats (48 per cent), style (34 per cent), and safety features (34 per cent)*.
- 8. Volvo used a female focus group in USA while developing the XC90 to understand any specific needs from their extensive SUV experience in the USA.


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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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