

PRESS INFORMATION

The new Volvo V50

Compact sportswagon with enhanced safety levels

- **New, patented frontal structure with several crumple zones**
- **Four steel grades interact for optimal deformation**
- **Side-impact protection system design is similar to the Volvo S80**
- **Frontal design with integrated protection for other road users**
- **Strong seats help to reduce the risk of injury in rear-end collisions**
- **34% increase in torsional rigidity compared with the Volvo V40**
- **Unique intelligent driver information system – IDIS**
- **Keyless Drive – a key-less locking/unlocking system**
- **Volvo On Call and Emergency Service System**

The Volvo V50 is a compact sportswagon which is both enjoyable to drive and flexible to use. What is more, it offers an enhanced level of safety – both protective and preventive.

Like the new S40, the Volvo V50 has very stiff body, a patented frontal structure and a comprehensive interior safety system, creating a vehicle with excellent safety characteristics.

The Volvo V50 also sees the introduction of Keyless Drive, a key-less locking/unlocking system with well-planned functions to help create a convenient car ownership experience.

PROTECTIVE SAFETY

Crumple zones with different grades of steel

“Our new compact models, the V50 and S40, have been developed to comply with rigorous safety targets,” says Ingrid Skogsmo, head of the Volvo Cars Safety Centre.

In a compact car body, the preconditions for efficient deformation are different from those of a large body. As the necessary deformation is absorbed within a shorter total distance, the properties of the various materials must be exploited to the maximum in order to absorb as much of the energy as possible.

The frontal body structure of the Volvo V50 was divided into several zones, each with a different task in the deformation process. The outer zones are responsible for most of the deformation. The closer the collision forces get to the passenger compartment, the less the materials deform.

“The objective is that the passenger compartment act in a predictable manner in most types of collision,” explains Ingrid Skogsmo.

In order to give each zone the relevant properties, the quality of the steel varies. Four different steel grades are used. In addition to conventional bodywork steel, three different grades of high-strength steel are employed: High Strength Steel, Extra High Strength Steel and Ultra High Strength Steel.

The zonal system enables the collision forces to be absorbed in a highly ingenious and effective manner:

Low-speed deformation zone

The front bumper incorporates a rigid cross-member made of Ultra High Strength Steel. The attachments to the longitudinal members of the body are designed in the form of ‘crash boxes’. They help to absorb the forces generated by a low-speed collision without damage to the rest of the body structure. These crash boxes can be replaced easily at a reasonable cost.

High-speed deformation zone

The straight sections of the side members are made of High Strength Steel, a very ductile grade of material, which is optimised for high energy absorption. This is the zone that accounts for most of the deformation in a collision.

In addition, Volvo has opted to include upper side members in the compact Volvo V50, as they help provide significant occupant protection if the vehicle should collide with a truck platform or a loading pier, for example.

Back-up zone

The section of the member that turns outward toward the A-pillar is designed to act as a barrier for the cabin space and as a back-up to help reduce deformation. The design also helps minimise the risk of the front wheel penetrating the interior. The wheel instead helps to absorb the collision forces. This section is extremely rigid and is made of Extra High Strength Steel.

Three-way attachment

A rigid cross-member connects the A- pillars and lower side members so that they form an extremely rigid three-way attachment on each side. This design plays a vital part in helping to maintain the cabin space in a severe crash.

The new front structure is one of Volvo's many patented safety designs.

Compact engines contribute to crash safety

Efficient packaging has enabled the engines in the Volvo V50 to be made 200 mm slimmer and 25 mm shorter. As these engines are installed transversely, the reduced width creates more space between engine and passenger compartment. In a collision, the engine can be pushed 150 mm to the rear before the crankshaft comes into contact with the cross-member near the bulkhead.

The Volvo V50 also has an interior safety system design that is patterned after the Volvo S80.

The steering column can be deformed up to 140 mm. When deformed, the steering column moves horizontally, to provide the optimal airbag position for this vehicle.

Other safety features that are shared with the Volvo S80:

- Collapsible pedals
- Dual-stage airbags
- Seat belt pretensioners for the front seats and rear outboard seats
- Force limiter for the front seat belts
- Belt reminder for the front seats (for European markets also on all seats at the rear)

Side Impact Protection System

The Volvo V50 is 54 mm wider than its predecessor, the V40. This creates added space for deformation in a collision. In other respects, the Volvo V50 has the same type of side impact protection as the Volvo S80, with SIPS (Side Impact Protection System), side-impact airbags and inflatable curtains. These curtains are also designed to provide enhanced protection in roll-over accidents, by deflating more slowly (approximately three seconds) than the front airbags.

The side airbags are larger than those in the V40 model, to provide additional protection at hip and chest height.

Several features help to make the body stiffer and reduce side penetration:

- The reinforced, transversely-installed tubular beam between the A-pillars
- The strong, rigid SIPS-tubes in the seats and the deformable steel box in the centre
- The diagonally-installed beams made of Ultra High Strength Steel in the doors
- The B-pillars which have been significantly reinforced and are dimensioned to help provide enhanced protection

Rear-end collisions

The Volvo V50 is also designed to provide enhanced occupant protection in a rear-end collision.

Volvo's system for avoiding neck injuries – WHIPS (Whiplash Protection System) – is one of the most effective on the market. In the event of a severe impact from the rear, the seat backrest and head restraint accompany the movements of the seat occupant's body.

The seats and backrests have a particularly robust design. They are designed to withstand loads from items such as unsecured luggage. At the same time, they are designed to yield in severe collisions in which a balance between strength and flexibility is important for occupant safety.

“Our seats are far sturdier than those that are usually found in most of the compact segment,” says Ingrid Skogsmo. “This is particularly important in a five-door model with its additional load capacity.”

Protection for other road users

The Volvo V50 has a frontal design with clean, smooth surfaces and rounded corners. The aim here is to help reduce the risk of injury to pedestrians and other road users in the event of an accident. Furthermore, the front has energy-absorbing characteristics, including a soft structure ahead of the bumper, to help reduce the risk of leg injuries.

The bonnet and front wings are designed to absorb energy. This helps to reduce the risk of head injuries. In addition, the new, compact petrol engines leave a generous 70 mm of free deformation space between the cylinder head and bonnet.

Built for children too

Like the other Volvo models, the Volvo V50 has been developed with children in mind. The safety structure of the body and the interior safety systems are designed and dimensioned to help protect the youngest occupants as well.

Both rear outer seats can be fitted with integrated child booster cushions for children above three years of age.

The front passenger airbag can be switched off and disabled with a key (available from spring 2004) (not in the USA or Canada).

The front passenger seat is prepared to fit a rearward-facing child seat. It has special anchorage loops for attachment using the safety belt. (Warning: Never place a child seat of any type in the front seat of a vehicle equipped with a passenger side airbag)

PREVENTIVE SAFETY

Stable driving properties

The body of the Volvo V50 is 34 per cent stiffer than that of its predecessor, the Volvo V40, thanks to advanced body design. This torsional rigidity helps to produce stable, predictable behaviour on the road. What is more, the chassis design, with its wide track and long wheelbase, also has a positive effect on driving stability.

- The front track is 1,535 mm (63 mm wider than the V40)
- The rear track is 1,531 mm (57 mm wider)
- The wheelbase is 2,640 mm (78 mm longer)

The suspension is independent, with spring struts at the front and a multilink system at the rear. The rear suspension helps to counteract any tendency to skid.

The Volvo V50 can be specified with:

- The STC (Stability and Traction Control) anti-spin system
- DSTC (Dynamic Stability and Traction Control), which corrects the progress of the car if it displays any sign of starting to skid

The Volvo V50 T5 will also be available in combination with All Wheel Drive. Volvo's electronically controlled AWD system distributes the torque automatically to help match the road conditions and driving style and is designed to provide more stable, predictable driving characteristics.

Effective brakes

The Volvo V50 has extremely effective ABS brakes – with electronic brake-force distribution to the rear wheels and automatic panic-braking assistance – EBA (Emergency Brake Assistance). The front wheels feature ventilated discs. The disc size is adapted to match engine power (diameter up to 16.5").

Projector-type headlamps

The headlamps feature projector-type low beams. The concentrated beam of light is surrounded by a "halo" which helps oncoming drivers judge the distance to the car.

Bi-Xenon gas discharge lamps (GDL) for high and low beam are available as an option.

Additional turn indicators in the door mirrors and integrated side-marker lights in the front and rear lamps make the Volvo V50 easy to see from the side as well.

Ergonomic driver's environment

A driving position with the correct ergonomic design, with all the instruments and controls in just the right position, makes for safer driving. In this respect, the Volvo V50 continues a renowned Volvo tradition. It has a comfortable, ergonomically-designed driver's seat, an adjustable steering wheel and a logically laid-out instrument panel.

Steering-wheel-mounted controls for the audio system, cruise control, telephone and RTI (Road and Traffic Information) navigation system further enhance driving safety.

Intelligent Driver Information System

The Intelligent Driver Information System – IDIS – is a new feature in the automotive industry, which has been inspired by fighter aircraft technology. The system helps the driver to avoid being distracted while driving.

When overtaking or braking, for example, signals from the integrated GSM telephone and certain peripheral information are under certain conditions delayed until the situation is calmer.

The IDIS function continuously registers the driver's activity by monitoring steering wheel angles, acceleration, turn signal function and so on. This information is processed and, at a given activity level, information that is not essential for safety is held back.

IDIS is standard on all versions of the Volvo V50, irrespective of whether or not the car is fitted with an integrated phone.

IDIS is factory-prepared for forthcoming on-board systems for information and communication. The more of these functions the car has, the greater the benefit of IDIS.

SECURITY

Volvo's holistic view of safety encompasses not just protective and preventive safety, but also personal security. The Volvo V50 is designed to provide enhanced protection for the occupants of the car and their property, both while on the move and when the car is parked.

The Volvo V50 can, for example, be equipped with laminated side windows, an unusual feature in a compact car. Laminated glass is extremely difficult to smash and provides enhanced protection from break-ins.

Keyless Drive – key-less locking system

The Volvo V50 can be specified with a key-less locking/unlocking system. This makes it possible to unlock (and lock) the car and turn on the engine without using a key. In order to do this, the driver needs to have what is known as a PAD (Passive Authorisation Device) within reach, in his pocket, for example. It is also possible to activate all normal remote functions such as follow-me-home lighting and the panic alarm from a distance. As a result, the system offers complete freedom of action and swift access to the car in a threatening situation.

QUESTIONS AND ANSWERS ABOUT KEYLESS DRIVE

How do you lock and unlock the car?

You use either a PAD in the same way as the standard remote control (by pressing the buttons), or the door handles to unlock and door buttons to lock the car.

Is it possible only to open the driver's door?

It is easy to adjust the settings to enable you to open all the doors and compartments/hatches at the same time or just one specific door (or the tailgate).

What happens if you leave the pad in the car?

It becomes inactive when the car is locked. It is then impossible to unlock the car, unless you have another PAD in your pocket. Without an authorized PAD, no one can open the car in any case. The PAD inside the car can be reactivated in a number of ways. The easiest way is to use another authorized PAD to unlock the car.

How is the engine turned on?

The engine is turned on using a knob on the instrument panel (press and turn). For safety reasons, the clutch (manual transmission) or brake pedal (automatic) must be depressed at the same time.

Does the engine stop if the pad is dropped from the car?

Should this happen while driving, you can still continue to drive. However, if the engine is turned off, it is not possible to restart without a PAD.

Volvo On Call with an emergency signal

Volvo On Call is an option in the Volvo V50 with an integrated GSM telephone. In an accident in which an airbag or belt pretensioner has been activated, a signal is transmitted automatically to the CSC (Customer Service Centre), which can immediately locate the car and call for help. In situations in which the alarm has been activated, the CSC also receives a signal and can then inform the police – who can be guided to the scene.

(Volvo On Call is not available in North America and Japan)

Emergency Service System

This is a function in Volvo On Call which ensures that the information that is sent to the CSC is supplemented with information about the type of accident, the severity of the accident, whether the airbags have been activated and so on. This helps the rescue services to plan and design their action in the appropriate way.

Other security functions

The Volvo V50 is also equipped with a number of theft-protection functions, such as

- Electronic immobiliser
- Electronic “anti-theft marking”
- Uniquely identified control modules
- Audio system which is integrated in the on-board electrical system

The locking system (the key-based standard system) is extremely sophisticated and offers a wide range of personal settings:

- Unlocking of doors – all the doors or only the driver’s door
- Automatic locking of the doors after moving off
- Indicator blink when unlocking or locking – with an option to cancel

Variable timing for follow-me-home and approach lighting – 30, 60 or 90 seconds

KH

2004-01-04