

VOLVO CARS 2004

# PRESS INFORMATION

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## PRESS INFORMATION

### Short version

# The all-new Volvo S40

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More people are considering smaller cars. But when it comes to premium car buyers there is one important catch.

They don't compromise. Meaning that they might go smaller, but they don't want less.

The package must still include large-car properties; design, driving pleasure, comfort, technology, and of course in a Volvo, large-car safety.

So the designers and engineers behind the all-new Volvo S40 faced a tough challenge:

Take the core properties from the 4.82 metre Volvo S80 and squeeze them into the 4.47 metre all-new S40 – a car that actually is 48 millimetres shorter than the current S40!

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This is the story about what they came up with.

*Hans-Olov Olsson  
President and CEO, Volvo Car Corporation*

### The ultimate design icon of the all-new Volvo S40

The exterior of the all-new Volvo S40 is an evolution of Volvo's modern body design, while the interior is something of a revolution. The most distinctive new feature is the unique, super-slim free-floating centre stack that elegantly links together the tunnel console with the instrument panel.

This is an entirely new solution in the car industry, specially developed for the new Volvo S40 and previewed recently in the Volvo VCC (Versatility Concept Car).

The controls in the new centre stack have an ergonomic and functional design. Most are used for several functions, in a logical and convenient way. The top half of the control

panel is used to operate the audio system and the integrated phone, while the lower half controls the climate system.

Behind the centre stack there is a practical storage compartment for personal items, easily accessible from both sides.

### **Shorter, wider and taller**

The new Volvo S40 is shorter, but at the same time wider and taller, than its predecessor, creating more interior space. The bonnet is short and there is a pronounced cab-forward profile.

Viewed from above, the body resembles the shape of a boat hull, with a rounded prow, a broad midship section and a narrowing stern. Together with the broad shoulders, this hull shape forges a compact and athletic stance, and it also contributes to the car's excellent aerodynamics.

The track and wheelbase have been extended, virtually putting a wheel at each corner. This contributes to the sporty appearance and gives the car stable on-the-road behaviour. The long wheelbase also makes it possible to fit conveniently wide rear doors.

The doors of the Volvo S40 are convex in profile, unlike the concave shape of the doors on the larger Volvo models. This convex curvature reinforces the compact appearance and enhances the cabin's width.

### **New, patented frontal structure with several crumple zones**

The all-new Volvo S40 is a compact car with extremely high safety levels – both protective and preventive. Volvo's intention was to reach the same high safety level as in the large Volvo models.

The frontal body structure of the Volvo S40 is 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 used deform. The intention is that the passenger compartment should remain intact in most collisions.

In order to give each zone the relevant properties, different grades of steel are used in different areas. 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.

### **Compact engines contribute to crash safety**

Owing to efficient packaging, the engines in the all-new Volvo S40 have been able to be made 200 mm slimmer. Since the engines are installed transversely, the reduced width creates greater space between engine and passenger compartment. In a collision, the engine can be pushed no less than 150 mm rearwards before the engine block comes into contact with the cross-member near the bulkhead.

The all-new Volvo S40 also shares the same type of interior safety system as found on the larger Volvo models, including WHIPS (Whiplash Protection System), SIPS (Side Impact Protection System), side-impact airbags and inflatable curtains. The all-new Volvo S40 is 54 mm wider than its predecessor. This creates added space for deformation in a side impact.

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

### **Protection for other road users**

The design of the all-new Volvo S40 has a front characterised by clean, smooth surfaces and rounded corners. The curves and panels are shaped to help reduce the risk of injury to pedestrians and cyclists in the event of an accident. Furthermore, the front has an energy-absorbing structure ahead of the bumper so as to help reduce the risk of leg injuries.

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

### **Stable driving properties**

The body of the all-new Volvo S40 is 68 percent stiffer than that of its predecessor, thanks to advanced body design. This torsional rigidity contributes to stable, predictable and consistent behaviour on the road. The car's chassis design, with its broad track and long wheelbase, also has a positive effect on stability.

The suspension is independent all round, with spring struts at the front and a multilink system at the rear. The rear suspension provides a certain degree of passive steering to counteract any tendency to skid.

The all-new Volvo S40 can be specified with:

- STC (Stability and Traction Control) anti-spin system.
- DSTC (Dynamic Stability and Traction Control), which corrects the car's progress and poise if there is any sign of starting to skid.

The all-new Volvo S40 has extremely powerful 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. Disc size varies with engine power (diameter up to 16.5").

### **Unique Intelligent Driver Information System (IDIS)**

The all-new Volvo S40 introduces IDIS – the Intelligent Driver Information System.

IDIS is a car industry world novelty, influenced by fighter aircraft technology.

The system helps the driver avoid being distracted while driving.

When the traffic situation requires the driver's full attention and concentration, for example when overtaking or braking, signals from the integrated GSM telephone and certain peripheral information are delayed until the situation is calmer.

IDIS is standard in all versions of the all-new Volvo S40, irrespective of whether or not the car is fitted with an integrated phone.

### **Powerful engines for silky-smooth progress**

Despite its compact dimensions, the all-new Volvo S40 gets a transverse five-cylinder in-line engine – a unique feature in the compact class.

Most of the engine's external components have been designed and packaged so that the engine installation takes exceptionally little space.

The result is an engine that is 200 mm slimmer and 25 mm shorter than that found in the large Volvo models. This compact format makes the engine lighter. Combined with Volvo's architecture – transverse engine installation – it also contributes to high crash safety since there is added space for deformation in the engine compartment.

The new five-cylinder in-line engines have a displacement of 2.4 and 2.5 litres respectively. The five cylinders and large displacement provide high torque from low engine revs – along with swift acceleration.

The most powerful engine, the T5, offers a maximum of 220 hp and 320 Nm of torque. The Volvo S40 T5 will later become available in combination with All Wheel Drive. The AWD version will be launched in 2004.

The all-new Volvo S40 will also be available with a choice of two five-cylinder normally aspirated engines (170 hp and 140 hp) – and an entirely new four-cylinder diesel engine (136 hp).

### **Transmission from the R models**

The six-speed manual gearbox developed for the Volvo S60 R and V70 R now makes its entry in the Volvo S40 T5.

The normally aspirated engines are mated to a new generation of Volvo's five-speed manual gearbox.

The automatic transmission for the Volvo S40 is the same as that used in the larger Volvo models. It is a five-speed unit with an adaptive gearchanging pattern; in other words, it adapts to the current driving style.

The turbodiesel comes as standard with a six-speed manual gearbox. This contributes to swift acceleration owing to excellent pulling power in every ratio.

### **Chassis with large-car properties**

The all-new Volvo S40 has been developed in the same spirit as the Volvo S60 and Volvo S80. The experience gained from the advanced Volvo S60 R formed the basis for the new compact model.

The five-cylinder powertrain laid the foundation for the large-car properties. The chassis technology was also obtained from the larger Volvo models. Independent suspension with a multilink system at the rear provides a superb combination of comfort and consistent response. The wider track and longer wheelbase, compared to the current Volvo S40 model, also contribute to the car's stable behaviour on the road.

The steering is electro-hydraulic, with light, distinct and controlled steering feedback.

### **Careful selection of materials and technologies**

The all-new Volvo S40 is built in some of the most up-to-date production plants in the world. The manufacturing methods, as well as the materials and substances used in production, are selected so as to minimise the risk to health, both to production personnel and to people outside the plant.

The on-board technologies are designed for the minimum possible effect on the surrounding environment in the form of low exhaust emission levels.

Like all Volvo cars, the all-new Volvo S40 is designed for a high recycling rate.

- The all-new Volvo S40 will be built in Volvo Car Corporation's Ghent factory in Belgium, where 340 million Euros have been invested in a high-tech production process.
- The all-new Volvo S40 will start leaving the factory towards the end of 2003.
- The annual sales target is 70,000 cars.

For more information • <http://media.volvocars.com>

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2004-01-04



## PRESS INFORMATION

The all-new Volvo S40:

### **Smaller – but a grown-up competitor**

- **The large car's properties in compact format**
- **Increasingly younger buyers, particularly in the USA**
- **Annual target 70,000 cars**
- **USA the largest market**

The all-new Volvo S40 is 50 millimetres shorter than its predecessor – yet it has grown in terms of product content and competitiveness.

“We have a long history in this sedan segment. We have upgraded our cars continuously; from the Volvo 340, via the Volvo 440/460 and then the present Volvo S40/V40. Now, we are convinced that the all-new Volvo S40 will make us grow even stronger over the next few years,” says Volvo Cars President and CEO Hans-Olov Olsson.

“We can offer our customers the large car's properties in a compact format. This, combined with an exciting design and exceptional road manners, makes the new S40 a highly potent challenger in this segment,” adds Hans-Olov Olsson.

Expanding the brand further down the age spectrum is an important part of Volvo Cars' strategy – and it is naturally particularly important that the entry-level model appeals to young buyers.

“We want to attract customers into the Volvo family as early as possible, and the all-new Volvo S40 will definitely attract younger buyers,” comments Hans-Olov Olsson.

#### **Average age of 40 in the USA**

The accelerating rejuvenation process is most noticeable in the USA, where Volvo expects one-third of purchasers to be men or women without children. The average age of S40 buyers is expected to be 40, which is low compared to the competitors.

“For a European car, this is a very low figure. It emphasises our conviction that our new, exciting sedan has a healthy youthful appeal,” says Hans-Olov Olsson.

In Europe, the customer group will have a somewhat older average age, with a quarter of sales going to pre-family buyers. In Europe, more men than women will buy the S40 compared with the USA, where the proportion of male and female buyers is expected to be more or less equal.

### **Annual target 70,000 cars**

The all-new Volvo S40 will leave the factory towards the end of this year, and the annual sales target for 2004 is 70,000 cars.

By far the largest single market will be the USA, whose target for 2004 is 20,000 cars in the Volvo S40 series. This will be followed by Sweden (5,000), Britain (4,000), Germany (4,000) and Spain (3,000).

### **More for your money in the base version**

The new car will be priced slightly higher than the current Volvo S40, but this is more than compensated by the fact that the successor has an upgraded base specification. For example, air conditioning and power windows are now fitted as standard.

Most of the options that can be specified on the larger Volvo S80 and S60 are also available to buyers of the new Volvo S40. This applies, for instance, to a built-in telephone, navigation system and the DSTC (Dynamic Stability and Traction Control) anti-skid system.

### **Built in Belgium**

The all-new Volvo S40 will be built at the Volvo Cars factory in Ghent, Belgium. Volvo's production operations in Born in the Netherlands cease with the phasing out of the previous Volvo S40 and V40 models.

Volvo Cars has invested 340 million Euro in the Ghent factory, which when fully extended will be the company's largest production plant with an annual capacity of 270,000 cars.

The new Volvo S40 is the first in a range of new Volvo models sharing common technology. Next in line is the Volvo V50, a sports wagon that will reach the showrooms in the first half of 2004.

In addition to the new Volvo S40 and Volvo V50 , the Ghent factory will also build the Volvo S60, while the production of the Volvo V70 will be moved to the Torslanda factory in Göteborg, Sweden.

The Volvo XC70, Volvo S80 and Volvo XC90 are also built in Torslanda.

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2004-01-04

## PRESS INFORMATION

The all-new Volvo S40:

### **Minimalistic centre stack – the ultimate design icon**

- **Sources of inspiration outside the car world**
- **Minimalist product design**
- **Extremely slim free-floating centre stack with functional design**
- **The ultimate design icon of the all-new Volvo S40**
- **Decorative aluminium panels gives a product-orientated impression**
- **Discreet theatre lighting promotes a cosy interior**

The all-new Volvo S40 introduces an entirely new approach to interior design – with a unique stand-alone free-floating centre stack.

This is an entirely new solution in the car industry, specially developed for the new Volvo S40 and previewed recently in the Volvo VCC (Versatility Concept Car).

When the time had come to fashion the interior of the Volvo S40, one of the challenges was that the occupants should enjoy a perception of space and airiness despite the compact body. This required new approaches and a decision was taken to tackle the design work from an entirely fresh angle. The design team turned their attention to other sources of inspiration than the car world.

“If you want to be innovative, there is little point in looking at what the competition is doing. It is far more valuable to look at what they’re not doing,” says the head of design at Volvo Cars, Henrik Otto.

### **Influence from outside**

One natural influence was the Scandinavian design tradition of clean surfaces and uncluttered lines – along with a natural lightness of material and structure. A couple of excellent examples are the world-famous designer Arne Jacobsen’s classic compression-moulded chairs Series 7 and the Ant chair, along with Alvar Aalto’s typically Nordic functional architecture and furniture design.

Trends in high-tech quality products such as audio systems, cameras and computers were also a rich source of inspiration. Not just in terms of form and function but also for ways of using and combining new materials – and of making them part of the overall experience.

These ventures into parallel environments not only provided inspiration, they also formed the very foundation for how the interior of the new Volvo S40 would be designed.

### **Minimalist expression**

In order to best utilise the various materials available and link them together in a natural way, the interior was built up in layers, with the centre stack as the topmost, free-standing feature. With its prominent position, it constitutes the car’s foremost control panel, like the remote control in the modern home entertainment system.

Behind the centre stack there is a practical storage compartment for personal items, easily accessible from both sides. This space is discreetly illuminated, further enhancing the impression of a free-standing stacked panel – and the feeling of well thought-out functionality.

Since a modern audio system with a CD player does not require as much lateral space as the older cassette player units, width too could be minimised. The result is a very slim panel with a minimalist appearance, further contributing to a particularly noticeable sense of interior space.

“The panel is the ultimate icon of the car and a revolution in itself. It required considerable ingenuity and hard work to find a technical solution for this super-slim format,” says the designer behind the unit, Guy Burgoyne.

### **Three décor levels**

Like the other panels in the car, the centre stack can be customised with a variety of décor panels. The choice allows the buyer to tailor the car’s interior to suit his or her individual tastes:

- At base level, the centre stack has a grey, glossy finish.
- The dark “Wood Effect” panel gives a more elegant and sober impression.

- The “Aluminium” panel (made of genuine aluminium) gives the most product-oriented and high-quality impression.
- Additional décor versions may be introduced later.

### **Multi-function controls**

The controls in the new centre stack have an ergonomic and functional design. Most are used for several functions, in a logical and convenient way. The top half of the control panel is used to operate the audio system and the integrated phone, while the lower half controls the climate system.

The main system functions are regulated via the four large rotary controls. All the minor function buttons are collected together in a panel that resembles a remote control, all the push-buttons have a marked profile to avoid the risk of pressing two buttons at the same time. The design language continues throughout the various parts of the interior.

The audio system in the all-new Volvo S40 can be specified with the Dolby Surround Pro Logic II, the same level of high-class car audio technology that was introduced in the Volvo XC90.

### **Theatre lighting**

The interior of the new Volvo S40 has a number of discreet lighting points. The overall effect is of theatre lighting, with soft illumination of various parts of the interior. The centre stack, for instance, is constantly illuminated from the roof, so softly and gently that the light does not distract the driver.

The light is only noticed when the driver moves his or her hand towards a control, thus assisting in operation in the dark. This is yet another sign of the consideration and creativity that characterises the design of the new Volvo S40.

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2004-01-04

## PRESS INFORMATION

The all-new Volvo S40:

### **Innovative interior with large-car feel**

- **Crisp, fast lines**
- **Revolutionary interior design based on several layers**
- **Innovative upholstery inspired by sportswear accessories**
- **Shorter, but wider and taller than its predecessor**
- **Short bonnet and marked cab-forward design**
- **Boat profile creates a compact and athletic impression**

“Ready for take-off! The new Volvo S40 is designed to express power and performance!”

These are the words of Henrik Otto, Volvo Car’s Design Director. He emphasises the crisp, sporty lines of Volvo’s new medium-size car. It is a compact four-door sedan with a dynamic design and premium-car feel.

Henrik Otto and his team obtained their inspiration from classic Scandinavian design with its clean shapes and open surfaces, airiness and intimate interplay between form and function.

#### **Exterior evolution – interior revolution**

The exterior is an evolution of Volvo Car’s modern body design, while the interior is something of a revolution. Minimalism maximises the large-car impression despite the compact exterior dimensions.

The interior is built up of several visual layers. The first layer shows as an edge trimming around the entire interior, along the side windows and the windscreen. The impression is of being safely ensconced in a cocoon.

The next layer is the instrument panel. It has a clean, uncluttered layout, with air vents and other details positioned as islands in an otherwise free area. The instrument panel has a new type of surface, a texture conveying a feel of cutting-edge technical innovation

rather than classic leather-trimmed furniture. This special surface texture separates the instrument panel visually from the cabin's outer edge trim.

The main instrument features two round gauges, surrounded by contrasting metal bezels. This design gives a sporty and three-dimensional vision.

### **Elegant and spacious**

The most distinctive new feature in the passenger compartment is the unique, super-slim free-floating centre stack that elegantly links together the tunnel console with the instrument panel. The centre stack constitutes the interior's topmost layer. It is further described in a separate press release.

There is another console in the roof, echoing the centre stack and continuing the theme of the car's central nerve system.

### **T-Tec upholstery**

The interior is available in a choice of three shades: dark grey, lava grey and dark beige. Each interior colour is available together with a range of matching upholstery colours.

Leather is one of four upholstery alternatives. The most innovative upholstery is Dala, a ribbed textile with T-Tec elements and visible light-coloured seams.

T-Tec is a material specially developed for Volvo Cars and inspired by sportswear and modern travel accessories. The contrast between T-Tec and textile – along with seams in a different but matching colour – reinforces the car's dynamic appeal.

### **Fold-down backrests**

The cab-forward design, the long wheelbase and Volvo's architecture of transverse engine installation combine to give the new Volvo S40 a spacious cabin.

The cabin can be rearranged in the same flexible manner as in the larger Volvo models. The rear seat splits into two sections and the backrests fold down. The front passenger seat can also be specified in a version with a fold-flat backrest. With the seats folded down, the load floor is entirely flat.

### **A comet on the move**

The new Volvo S40 is shorter, but at the same time wider and taller, than its predecessor, creating more interior space. The bonnet is short and there is a pronounced cab-forward profile. This eager stance, as though the car is constantly urging ahead, creates a sensation of speed even when at a standstill and at the same time creates additional space for a long passenger cabin and generous rear-seat legroom.



“Anyone looking at the Volvo S40 from the side gets the impression of a comet on the move. The gently rounded nose, the sweeping lines and the abrupt tail generate a vibrant sensation of speed,” comments Henrik Otto.

The track and wheelbase have been extended, virtually putting a wheel at each corner. This contributes to the sporty appearance and gives the car stable on-the-road behaviour. The long wheelbase also makes it possible to fit conveniently wide rear doors.

### **Boat shape**

Viewed from above, the body resembles the shape of a boat hull, with a rounded prow, a broad midship section and a narrowing stern. Together with the broad shoulders, this hull shape forges a compact and athletic impression, and it also contributes to the car’s excellent aerodynamics.

The doors of the Volvo S40 are convex in profile, unlike the concave shape of the doors on the larger Volvo models. This convex curvature reinforces the compact appearance and enhances the cabin’s width.

The windscreen wipers are of an entirely new type, concealed under the trailing edge of the bonnet. There are turn indicator repeaters integrated into the door mirrors, easily visible from the sides.

In order to further emphasise the sporty nature of the Volvo S40, the car can be equipped with a design package consisting of more pronounced sill mouldings and spoilers.

A number of newly designed aluminium wheels are available on the options list. The sportiest wheels are 18 inches in diameter and are shod with ultra-low profile 215/45 tyres.

### **Exterior Sport Styling**

The all-new Volvo S40 will also be available with an Exterior Sport Styling concept – special styling accessories that further accentuates the sedan model’s sporting prowess and dynamic image.

The Exterior Sport Styling concept includes spoilers front and rear, side-skirts and a bootlid spoiler – all painted the same colour as the rest of the body. A lowering kit, that reduces the height of the car with 20 mm, and contributes to the driving experience, is also included.

### **Genuine Volvo identity**

The new Volvo S40 has a profile of its own – yet maintains a clear Volvo identity.

The grille with its familiar diagonal has a horizontal mesh pattern in a dark-grey metallic colour, echoing the Volvo S60 and S80. The bonnet has the traditional V-shape. The

body's contour lines – the classic Volvo “shoulders” along either side of the body – are also inherited from the rest of the Volvo family.

Those broad shoulders are a modern Volvo feature that signal power and safety. From the rear, the distinctive tail lamps show with the utmost clarity that what lies ahead is a Volvo.

### **A brief comparison**

The new Volvo S40 is shorter than its predecessor, but it is larger in every other respect:

Length	4468 mm (48 mm shorter than the previous S40 model)
Width	1770 mm (54 mm wider)
Height	1452 mm (44 mm taller)
Wheelbase	2640 mm (78 mm longer)
Track front	1535 mm (63 mm wider)
Track rear	1531 mm (57 mm wider)

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2004-01-04

## PRESS INFORMATION

The all-new Volvo S40:

# Built according to Volvo's consistent environmental philosophy

- **Materials and technologies selected to minimise risk to health**
- **New engine technology gives environmental benefits**
- **Premair<sup>®</sup>**
- **Pollen filter is standard**
- **Interior Air Quality System a new option in the compact Volvo**
- **Environmental Product Declaration available from start**

### Careful selection of materials and technologies

The all-new Volvo S40 is built in one of the most up-to-date production plants in the world. The manufacturing methods, as well as the materials and substances used in production, are selected so as to minimise the risk to health, both to production personnel and to people outside the plant.

Examples: Chromium-free body material pretreatment, water-borne exterior paints, CFC-free materials.

The on-board technologies are designed for the minimum possible effect on the surrounding environment in the form of low exhaust emission levels.

Examples: Aluminium low-friction engines, catalytic converters with three-way technology – located close to engine, oxygen sensor (Lambdasond) both upstream and downstream of catalytic converter, system for recovery of evaporated fuel vapour (EVAP).

As all Volvo cars, the all-new Volvo S40 is designed for a high recycling rate.

Examples: 85% by weight of the materials in the car can be recycled; plastic components are marked to facilitate recycling; recycled felt and wood-fibre materials are used in certain interior trim components.

### **Lower fuel consumption and lower emission levels**

The new petrol engines are a further development of Volvo's low-friction engines. The manifold and turbo unit in the T5 engine have been cast together in high-alloy cast steel that is particularly heat resistant (1050°). It therefore needs less cooling in the conventional way with petrol.

As a result, the engine can be run on a leaner fuel mixture, promoting lower fuel consumption and exhaust emissions, especially when driving at high speeds and at a higher load.

The new plastic inlet manifold also provides positive environmental effects. The plastic material's minimal heat conducting ability leads to cooler inlet air and thus more efficient combustion.

The lambda probes are of improved design, heating up faster and activating more quickly in cold starts. This promotes lower emissions.

The radiators for the Volvo S40's five-cylinder engines feature Volvo's PremAir<sup>®</sup> system, developed in cooperation with Engelhard Corporation.

PremAir<sup>®</sup> is a system that uses a catalytic coating on the radiator. It converts up to 75% of the ozone passing through the radiator into harmless oxygen.

The plans include a range of Bi-Fuel engines, that is to say engines that can be run on natural gas, biogas and petrol.

### **Will meet the next generation of emission regulations**

The five-cylinder engines have been upgraded to meet the next generation of US and California emission regulations for this decade.

Those regulations are the toughest emission standards in the world and have led to new steps within emission development to handle the stringent HC, NOx and durability requirements. Volvo offers this enhanced technology for tailpipe emissions worldwide on the new five-cylinder engines.

### **Cleaner inside than out**

Like other Volvo cars, the all-new Volvo S40 has been developed to offer its passengers a clean and healthy cabin. A pollen filter is standard. In addition, Volvo's Interior Air

Quality System (IAQS) is now available as an option in the compact model too. IAQS includes a sensor for the incoming air and an activated carbon filter. It is an advanced air quality system, which automatically purifies the incoming air of impurities and odours. IAQS makes the interior air cleaner than the air outside the car.

All materials used in the interior have been selected and tested to prevent allergies and other ailments.

Examples: Low PVC content in interior trim materials, chromium-free leather, an interior that does not cause problems for a nickel-allergic person, ÖKO-TEX-certified fabrics (the ÖKO-TEX Label is an international registered mark for testing of textiles and leather. The certification ensures that textiles and leather are hypoallergenic and free from hazardous substances).

### **Environmental Product Declaration available from start**

Like all Volvo models, the all-new Volvo S40 comes with an environmental product declaration (EPD), something that Volvo was the first car manufacturer in the world to introduce. Volvo Car's EPD is based on a holistic approach with focus on health, resource utilisation and ecological consequences. It gives the car buyer an overview of the car's environmental impact throughout its lifetime and thus makes it easier to compare the eco-performance of Volvo's various models and engine alternatives.

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2004-01-04

## **PRESS INFORMATION**

The all-new Volvo S40:

# **A broad powertrain programme with seven engine options**

- **New generation of compact low-friction engines**
- **Compact format boosts collision safety**
- **Five cylinders and large displacement**
- **Four-cylinder turbodiesel**
- **Six-speed manual gearbox from the R models**
- **Meticulously balanced chassis with AWD option**

Despite its compact dimensions, the all-new Volvo S40 gets a transverse five-cylinder in-line engine – a unique feature in the compact class.

This has been made possible by new methods of shrinking the engine's outer dimensions. The result is a compact car offering high performance and excellent driveability. The engine's compact dimensions also contribute to the car's excellent crash safety.

The chassis has been developed in parallel with the new engines so as to provide driving properties on a par with those of Volvo's larger sedan models.

### **New engine generation of extremely compact dimensions**

The new petrol engines are a further development of the low-friction engines that power the large Volvo models. The new generation is named RNC, with C indicating Compact. Most of the engine's external components have been designed and packaged so that the engine installation takes exceptionally little space:

- The exhaust manifold outlets are angled down towards the engine block.
- The manifolds on the turbo engines are cast together with the turbo unit housing for added compactness.

- The inlet manifold is compact-cast in fibreglass-reinforced plastic and is routed up over the engine. The fuel injectors are installed in an aluminium section for safety reasons.
- The alternator, water pump and air conditioning compressor are of compact design and are very efficiently packaged.
- The air conditioning compressor has been moved to be well protected in case of a collision.

### **More space between engine and passenger compartment**

The result is an engine that is 200 mm slimmer and 25 mm shorter than that found in the large Volvo models. This compact format makes the engine lighter. Combined with Volvo's architecture – transverse engine installation – it also contributes to high crash safety since there is added space for deformation in the engine compartment. In a collision, the engine can be shunted no less than 150 mm to the rear before the engine block comes into contact with the cross-member near the bulkhead.

There is no less than 70 mm of free space above the engine between the cylinder head and bonnet. This allows the bonnet to crumple gently, thus reducing the risk of head injuries if a pedestrian or cyclist should collide with the car.

### **Powerful engines for silky-smooth progress**

The new five-cylinder in-line engines have a displacement of 2.4 and 2.5 litres respectively. The five cylinders and large displacement provide high torque from low engine revs – along with swift acceleration.

What is more, a five-cylinder engine with a long stroke has a more relaxed, more pleasant character owing to its low vibration level and smooth operation.

The engines in the all-new Volvo S40 share the same technology as the units that power the larger Volvo cars:

- Four valves per cylinder and dual overhead camshafts – for high power and alert response.
- Variable camshaft timing (CVVT) – for high power and high torque in combination with lower consumption and reduced emissions.
- Electronic engine management system with precise and adaptive control – for efficient combustion and good performance.

### **T5 turbo – later also with AWD**

The Volvo S40 T5 is the sportiest model in the range. It has a 2.5 litre petrol engine mated to a light-pressure turbocharger. The turbo system is tuned to provide exceptional torque from low to high revs. The high and flat torque curve ensures excellent acceleration.

The manifold and turbo unit in the T5 engine have been cast together in high-alloy cast steel that is particularly heat resistant. It therefore needs less conventional cooling with petrol. As a result, the engine can be run on a leaner fuel mixture, promoting lower fuel consumption and exhaust emissions, especially when driving at high speeds and at a higher load.

The T5 engine offers a maximum of 220 hp and 320 Nm of torque.

The Volvo S40 T5 will later become available in combination with All Wheel Drive. The AWD version will be launched in 2004. It will have the same type of electronically controlled hydraulic coupling as found on Volvo's larger AWD models.

"Four-wheel drive gives the car increased commercial prestige. An AWD model in the compact segment gives customers a wider choice and boosts our competitiveness," explains Peter Ewerstrand, the project manager for the all-new Volvo S40.

### **Broad range of engines**

At its launch, the all-new Volvo S40 will also be available with a choice of two five-cylinder normally aspirated engines, the 2.4i and 2.4 with 170 hp and 140 hp respectively. Both engines have a displacement of 2.4 litres.

In addition, there is an entirely new four-cylinder diesel engine, the 2.0 D. It is turbocharged and has second-generation common rail technology featuring moving rails.

The injection system operates under immense pressure, ensuring extremely fine distribution of the fuel particles. This helps promote both good performance and low emission levels. During 2004 a particulate filter will be offered.

With the help of piezo-electrical injectors, the fuel can be portioned out in several small injectors during each combustion cycle, helping cut noise levels as a result. With these piezo-electrical injectors, the engine is prepared for forthcoming emissions requirements.

The diesel engine is a result of Ford Motor Company's and Peugeot's joint engine development programme.

The diesel engine has a displacement of 2.0 litres. In 2004, a smaller 1.6 litre diesel engine will also be launched.

The range of engines will be successively broadened.



<b>Engine</b>	<b>Configuration</b>	<b>Output</b>	<b>Torque</b>	<b>Introduction</b>
<b>2.4</b>	<b>5 cyl in-line</b>	<b>140 hp</b>	<b>220 Nm</b>	<b>Volvo S40 launch</b>
<b>2.4i</b>	<b>5 cyl in-line</b>	<b>170 hp</b>	<b>230 Nm</b>	<b>Volvo S40 launch</b>
<b>T5</b>	<b>5 cyl in-line</b>	<b>220 hp</b>	<b>320 Nm</b>	<b>Volvo S40 launch</b>
<b>2.0 D (turbodiesel)</b>	<b>4 cyl in-line</b>	<b>136 hp</b>	<b>340 Nm</b>	<b>Spring 2004</b>
<b>1.8</b>	<b>4 cyl in-line</b>	<b>120 hp</b>	<b>160 Nm</b>	<b>Spring 2004</b>
<b>1.6</b>	<b>4 cyl in-line</b>	<b>100 hp</b>	<b>145 Nm</b>	<b>Autumn 2004</b>
<b>1.6 D (turbodiesel)</b>	<b>4 cyl in-line</b>	<b>110 hp</b>	<b>240 Nm</b>	<b>Autumn 2004</b>

For performance and consumption figures see separate specification document.

The plans also include Bi-Fuel engines, that is to say engines that can be run on both natural gas and petrol.

“When the model range is fully in place, we will have a remarkably complete span of engines to choose between,” says Peter Ewerstrand. “We will be able to meet just about any need and wish.”

### **Transmissions from the R models**

The six-speed manual gearbox developed for the Volvo S60 R and V70 R now makes its entry in the Volvo S40 T5. The six forward ratios are spread out to combine swift acceleration with high top speed. The gearbox has triple synchromesh and a reassuringly distinct change pattern with a precise gate.

The normally aspirated engines are mated to a new generation of Volvo’s five-speed manual gearbox. It has been further developed with triple synchromesh for faster changes and distinct feel.

### **Adaptive automatic transmission**

The automatic transmission for the Volvo S40 is the same as that used in the larger Volvo models. It is a five-speed unit with an adaptive gearchanging pattern; in other words, it adapts to the current driving style.

Much effort has been invested in matching driveshafts and universal joints to the high engine power outputs and in ensuring smooth, snatch-free power transmission under acceleration.

### **Six gears for the diesel too**

The turbodiesel comes as standard with a six-speed manual gearbox (not the same as in the T5 model). This contributes to swift acceleration owing to excellent pulling power in every ratio.

### **Chassis with large-car properties**

The all-new Volvo S40 has been developed in the same spirit as the Volvo S60 and Volvo S80. The experience gained from the advanced Volvo S60 R formed the basis for the new compact model.

“A modern Volvo should obey the driver’s slightest command – immediately and without fuss,” emphasises Peter Ewerstrand. “It should be as enjoyable to drive as it is safe. When it comes to the all-new Volvo S40, we had particularly high ambitions when the project got under way. And we’re more than pleased with the result.”

The five-cylinder powertrain laid the foundation for the large-car properties. The chassis technology is developed to meet particularly stringent demands. Independent suspension with a multilink system at the rear provides a superb combination of comfort and consistent response. The wider track and longer wheelbase, compared to the current Volvo S40 model, also contribute to the car’s stable behaviour on the road.

Front suspension geometry has been carefully calculated to provide quick and precise steering response, enhancing the sporty appeal.

The steering is electro-hydraulic, with light, distinct and controlled steering feedback. “The new powertrain and the carefully matched chassis in combination with the body’s exceptional torsional rigidity, make for a particularly pleasant driving experience. This is a car you’ll truly look forward to driving whenever you get the chance,” promises Peter Ewerstrand.

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2004-01-04

## **PRESS INFORMATION**

**The all-new Volvo S40**

### **Compact car with high safety levels**

- **Developed and tested in the world's most advanced safety centre**
- **New, patented frontal structure with several crumple zones**
- **Four steel grades interact for optimal deformation**
- **The same side-impact protection system as in larger Volvo models**
- **Frontal design with integrated protection for other road users**
- **68% greater torsional rigidity compared to the current Volvo S40**
- **Unique intelligent driver information system – IDIS**
- **High level of theft protection**

The all-new Volvo S40 is a compact car with extremely high safety levels – both protective and preventive. Volvo's objective has been reached: the same high safety level in the new S40 as in the current S80 model.

This is possible thanks to several interacting units, including a very stiff body, a new frontal structure and a new intelligent system for driver information.

The safety systems have been developed and tested in The Volvo Cars Safety Centre, the most advanced facility of its kind in the world. About forty full-scale tests have been performed to help ensure that all the on-board components interact.

## **PROTECTIVE SAFETY**

### **Crumple zones that employ different grades of steel**

During the development of the all-new Volvo S40, the designers started off by using the crash safety levels of the Volvo S80 as a model – with the aim of reaching the same high level with the new compact body.

“While we cannot change the laws of physics, our aim of building cars that are the safest in their class applies to all models, irrespective of size,” says Ingrid Skogsmo, head of the Volvo Cars Safety Centre.

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

“A tough challenge, one that we approached in an entirely new way,” confirms Ingrid Skogsmo.

The frontal body structure of the Volvo S40 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 used deform. The objective is that the passenger compartment should remain intact in most collisions.

In order to give each zone the relevant properties, different grades of steel are used in different areas. 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 an extremely rigid crossmember of Boron steel (Ultra High-Strength Steel). The attachments to the longitudinal members of the body are designed in the form of ‘crash boxes’, which help absorb the forces generated by a low-speed collision without damage to the rest of the body structure. The crash boxes can be replaced easily at 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 also in the compact Volvo S40 since they provide significant occupant protection if the vehicle should collide, for example, with a truck platform or a loading pier.

### **Back-up zone**

The section of member that turns outward toward the A-post is designed to act as a barrier for the cabin space and as a back-up reducing deformation. The design also helps minimize the risk of the front wheel penetrating the interior. The wheel instead helps 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-posts and lower side members. On each side they form an extremely rigid three-way attachment, which very strongly helps to maintain the 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**

Owing to efficient packaging, the engines in the all-new Volvo S40 have been able to be made 200 mm slimmer. Since the engines are installed transversely, the reduced width creates greater space between engine and passenger compartment. In a collision, the engine can be pushed no less than 150 mm rearwards before the engine block comes into contact with the cross-member near the bulkhead.

The all-new Volvo S40 also shares the same type of interior safety systems as found on the S60 and S80 models.

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.

In cars for the North American market the collapse function adapts to the use of the seat belt.

More safety features in common with the S80 model:

- 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 in all places in the rear)

## **Side Impact Protection System**

The all-new Volvo S40 is 50 mm wider than its predecessor. This creates added space for deformation in a collision. In other respects, the Volvo S40 has the same type of side impact protection as found on the S80 Volvo model, with SIPS (Side Impact Protection System), side-impact airbags and inflatable curtains. These curtains are designed to provide enhanced occupant protection in rollover accidents, by deflating more slowly (approximately 3 seconds) than the front airbags.

The side airbags are larger than in the previous S40 model so as to help provide more effective protection at hip and chest height.

Several features contribute to the stiffer body and help reduce side intrusion:

- The reinforced, transversely installed tubular beam between the A-pillars
- The diagonally installed beams of Ultra High Strength Steel in the doors
- The B-pillars, which have been significantly reinforced and are dimensioned to help provide enhanced protection

The Volvo S40 has been designed to help provide the highest level of occupant protection in a rear-end collision too.

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 are of a particularly robust design. They are dimensioned to withstand high loads from items such as unsecured luggage, while at the same time they are designed to yield in severe crashes where a balance of strength and flexibility is important for occupant safety.

“Our seats are far sturdier than those usually found in the compact segment,” says Ingrid Skogsmo.

## **Protection for other road users**

The design of the all-new Volvo S40 has a front characterised by clean, smooth surfaces and rounded corners. The curves and panels are shaped to help reduce the risk of injury to pedestrians and cyclists in the event of an accident. Furthermore, the front has an energy-absorbing structure ahead of the bumper so as to help reduce the risk of leg injuries.

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

## **Built for children too**

Just like the rest of the Volvo range, the all-new Volvo S40 is developed with a keen focus on children. The body's safety structure and interior safety systems are designed and dimensioned to help protect the youngest occupants too.

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 US or Canada).

The front passenger seat is factory-prepared for fitting a rearward-facing child seat. It has special anchorage loops for attachment using the seat belt.

## **PREVENTIVE SAFETY**

### **Stable driving properties**

The body of the all-new Volvo S40 is 68 percent stiffer than that of its predecessor, thanks to advanced body design. This torsional rigidity contributes to stable, predictable and consistent behaviour on the road. The car's chassis design, with its broad track and long wheelbase, also has a positive effect on stability.

- The front track is 1535 mm (63 mm wider than the previous S40 model).
- The rear track is 1531 mm (57 mm wider)
- The wheelbase is 2640 mm (78 mm longer)

The suspension is independent all round, with spring struts at the front and a multilink system at the rear. The rear suspension provides a certain degree of passive steering to counteract any tendency to skid.

The all-new Volvo S40 can be specified with:

- STC (Stability and Traction Control) anti-spin system.
- DSTC (Dynamic Stability and Traction Control), which corrects the car's progress and poise if there is any sign of starting to skid.

In 2004 the Volvo S40 T5 will become available in combination with All Wheel Drive. Volvo's electronically controlled AWD system distributes the torque automatically to match the road and driving style and providing stable, consistent driving characteristics.

### **Excellent braking**

The all-new Volvo S40 has extremely powerful 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 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 side-mounted turn indicators in the door mirrors and integrated side-marker lights in the front and rear lamps make the Volvo S40 easy to see from the side too.

### **Ergonomic driver’s environment**

An ergonomically designed seating position with all the instruments and controls in just the right position makes for safer progress. In this respect, the Volvo S40 continues a renowned Volvo tradition. It has a comfortable and conveniently operated 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 add further to driving safety.

### **Intelligent Driver Information System**

The all-new Volvo S40 introduces IDIS – the Intelligent Driver Information System.

IDIS is a car industry world novelty, influenced by fighter aircraft technology. The system helps the driver avoid being distracted while driving.

When the traffic requires the driver’s full attention and concentration, for example when overtaking or braking, signals from the integrated GSM telephone and certain peripheral information are delayed until the situation is calmer.

The IDIS function continuously registers the driver’s activity by monitoring steering wheel movements, the accelerator pedal, turn signal function, braking and so on. This information is processed and at a given activity level, information that is not essential to safety is held back.

In normal conditions, the driver can at any time answer phone calls and text messages and receive traffic information.

IDIS is standard in all versions of the all-new Volvo S40, 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 such 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 S40 is designed to provide effective protection for the car's occupants and their property, both while on the move and when the car is parked.

The level of theft protection is very high, as a result of close co-operation with Thatcham, the world-leading automotive research and technology centre. The Volvo S40 is equipped with a number of protective functions, such as:

- Electronic immobiliser
- Electronic anti-theft "marking"
- Uniquely identified control modules
- Audio system as an integral part of the on-board electrical system

In addition to this, the S40 has a sophisticated locking system with a wide range of scope for personal settings:

- Unlocking of doors – all 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 Light – 30, 60 or 90 seconds

The remote can also open all windows, i.e. to cool down the interior on a hot day. It can also close the sunroof and all the windows.

The all-new Volvo S40 can also be equipped with laminated door windows, an unusual feature in a compact car. Laminated glass is extremely difficult to smash and provides enhanced protection against break-ins.

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2004-01-04

## PRESS INFORMATION

The all-new Volvo S40:

### Safety in a frontal collision

**Occupant protection in the compact S40 is on a par with that in the Volvo S80 thanks to:**

- **Patented new front architecture**
- **Four different grades of steel**
- **Intelligent engine compartment packaging**
- **Re-engineered collapsible steering column**

“When we designed the all-new Volvo S40, we needed to answer two questions,” says Volvo Cars’ safety engineer Ragnar Crona:

- How do we handle the high impact forces from larger vehicles?
- Where do we find the crumple zone necessary to provide a “soft” stop for the occupants in the Volvo S40?

The problem is that the front structure has to deform under high impact force. However, this force must be lower than the maximum force that the safety cage surrounding the occupants can handle. This means that collision performance is highly dependent on just how strong the safety cage can be made.

In a traditional front structure, incoming impact forces are transferred from the side members down to the sill and the floor. This transfer of the impact force gives rise to considerable bending moment. This bending moment limits the maximum force that the side member can be engineered to withstand. In order to avoid crushing the back-up structure, the force in the side members has to be kept relatively low.

The energy that the side member can absorb is a function of how long it is and the amount of force for which it is dimensioned.

Low resistance requires a long side member and thus a long front, which creates an additional challenge when engineering a smaller car.

### **Patented new front architecture**

The new Volvo S40 has a new front architecture for which Volvo has secured the patent.

In the Volvo S40, the incoming impact forces from the deformable side members are transferred into a web of longitudinal and transverse members that form the front part of the safety cage.

This web can be compared to an old-fashioned railroad bridge, whose zigzag members absorb multidirectional forces in the most optimum way.

With this architecture, we can allow the side members to deform at a higher load. This means that the same amount of energy can be absorbed with shorter side members. The entire front can accordingly be made shorter.

We have used High-Strength Steel in those parts of the body that absorb the incoming collision energy. This grade of steel is optimal for deformation under very high loads.

In the areas surrounding the occupants, where we do not want any deformation at all, we have used Extra-High-Strength Steel. This steel grade is very strong but still pliant enough to ensure that the safety cage deforms in a controlled manner in the event of a particularly severe collision.

### **Each part has its own predetermined path in a collision**

The Volvo S40 is thus designed to absorb incoming collision energy and to allow the front to deform in a controlled manner. The only problem is that there is a five-cylinder engine in the way.

“Normally when you design an engine, you make sure that it fits into the car. When we designed the engine for the Volvo S40, however, we made sure it was compact enough to stay in the engine compartment even after a collision,” explains Ragnar Crona.

The five-cylinder engine in the Volvo S40 is new and it is been designed to be as compact as possible so as to permit the largest possible crumple zone. The new engine in the Volvo S40 thus gives the occupants more of a survival zone compared to previous Volvo engines.

Everything under the bonnet of the Volvo S40 has a predetermined position after a frontal impact, stacking up in an organised way in front of the safety cage.

### **More space inside**

We have also increased the post-collision survival space inside the car. In an impact, the re-engineered steering column concertinas more than in previous models. This allows the driver to move further forward inside the car during the collision sequence without compromising safety. As a result, the safety belt and airbag are better able to help limit the forces imposed on the driver, thus bringing his or her body to a “softer” stop.

### **Safety in a compact car**

The patented front structure, the way the engine is packaged in the engine bay, the combination of different-grade steel and the re-engineered collapsible steering column give the Volvo S40 a remarkably generous front crumple zone despite the compact nose. In fact, in terms of frontal collision protection, this intelligent engineering puts the new compact Volvo S40 on a par with the current Volvo S80, recognised worldwide as one of the safest cars on the market. It is not possible to change the laws of physics, but new technologies can certainly be harnessed to further improve safety in smaller cars.

2004-01-04

The descriptions and data contained in this press material (release) apply to the international model range of Volvo Car Corporation. Specifications may vary from country to country and change without notice.

## ENGINES

Type
Configuration
Displacement, cm <sup>3</sup>
Bore (mm)
Stroke (mm)
Engine cylinder block material
Cylinderhead material
Combustion chamber type
Compression ratio
Valves, no/cylinder
Camshafts
Engine management system
Ignition sequence
Engine idling speed, rpm
Fuel, rec. octane
Max output, kW (hp)/rpm.
Max torque, Nm/rpm.

## POWER AND TORQUE →

### TRANSMISSIONS

5- or 6-speed manual gearbox.  
5-speed adaptive automatic transmissions with Geartronic, electronically controlled, with lock-up and winter mode selection.

Ratio	MMT6	M66W	M56L	M56H	AW55-51
First	3.07	3.39	3.39	3.07	4.66
Second	1.86	1.91	1.90	1.77	3.03
Third	1.24	1.27	1.19	1.19	1.98
Fourth	0.84	0.95	0.87	0.87	1.34
Fifth	0.89	0.78	0.70	0.70	1.02
Sixth	0.71	0.65	–	–	–
Reverse	4.19	3.20	3.30	2.99	5.11

Manual gearbox/final drive  
Automatic gearbox/final drive

## PERFORMANCE

Gearbox
Acceleration, 0–100 km/h (sec)
Top speed, km/h
Fuel consumption l/100 km (Combined)
CO <sub>2</sub> g/km

## CHASSIS

Suspension	front	Spring-strut, lower link, anti-roll bar
	rear	Individual, multilink, coil springs, anti-roll bar
Steering	Rack and pinion, power assisted	
Turning circle, curb to curb	10.6 m	
Braking system	ABS system with EBD. Ventilated discs front and rear.	
Braking distance 100–0 km/h	38 m	
Brake disc diameter		
Front/Rear	300/278 mm	

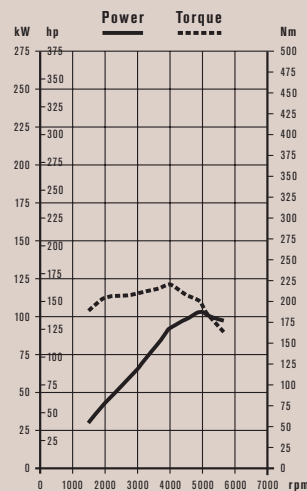
## MEASUREMENTS AND VOLUMES

Exterior measurements (cm)	
Length	446.8
Width	177.0
Height, curb	145.2
Wheelbase	264.0
Track, front	153.5
Track, rear	153.1
Ground clearance, curb	13.5
Weights/Miscellaneous	
Weight, curb, kg (B5244S4/B5254T3)	1399/1419
Fuel tank, l (Petrol/Diesel)	62/55
Max. trailer weight, kg	1500
Max load, kg	450
Max roof load, kg	75
Drag coefficient, Cd	0.31

Interior measurements (cm)	
Headroom with sunroof (front/rear)	96.8/94.5
Headroom without sunroof (front/rear)	98.8/94.5
Passenger compartment width at shoulder height (front/rear)	140.2/137.4
Leg room (front/rear)	105.7/87.4
Cargo volume, litres (ISO V210)	404
Cargo length (L211)	97.6
Cargo length with rear seat(s) folded down	174.5
Load length with rear seat(s) and front passenger seat folded down	302.0
Height of luggage compartment	47.5
Liftover height (H195)	64.2
Width of luggage compartment between wheelhouses	103.4

### Volvo S40 2.4/140 (B5244S5)

In-line 5 cyl., naturally aspirated
Transverse, front wheel drive
2435
83
90
Aluminium
Aluminium
Pent-roof
10.3
4
2
Microprocessor controlled fuel and ignition system with self diagnostics
1-2-4-5-3
720
91–98 RON
103 (140)/5000
220/4000

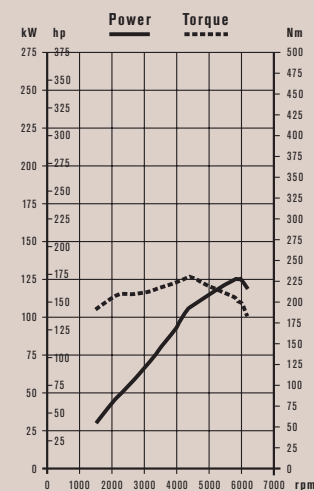


M56L/4.00  
AW55-51/2.44

Manual	Automatic
9.9	10.6
205	200
8.4	9.1
199	217

### Volvo S40 2.4i/170 (B5244S4)

In-line 5 cyl., naturally aspirated
Transverse, front wheel drive
2435
83
90
Aluminium
Aluminium
Pent-roof
10.3
4
2
Microprocessor controlled fuel and ignition system with self diagnostics
1-2-4-5-3
720
91–98 RON
125 (170)/6000
230/4400



M56H/4.25  
AW55-51/2.44

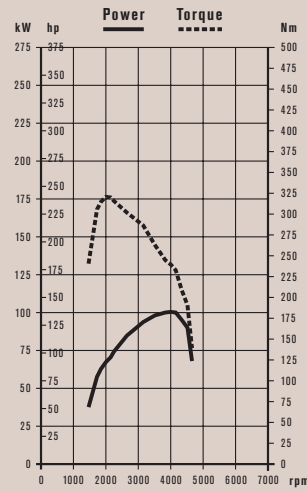
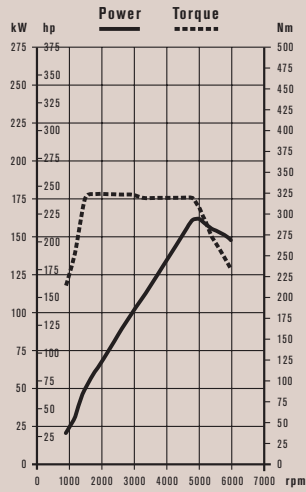
Manual	Automatic
8.2	8.9
220	215
8.5	9.1
203	217

→ Cont'd Volvo S40

Preliminary data

Volvo S40 T5 (B5254T3)
In-line 5 cyl., light press. turbo
Transverse, front wheel drive
2521
83
93,2
Aluminium
Aluminium
Pent-roof
9.0
4
2
Microprocessor controlled fuel and ignition system with self diagnostics
1-2-4-5-3
770
91-98 RON
162 (220)/5000
320/1500-4800

Volvo S40 2.0D (D4204T)
In-line 4 cyl. turbo diesel
Transverse, front wheel drive
1998
85
88
Aluminium
Aluminium
-
18,5
4
2
Common-Rail Direct Injection with self diagnostics
1-3-4-2
800
Diesel Min Cetane 48
100 (136)/4000 prel.
320/2000 prel.



M66W/3.77  
AW55-51/2.27

MMT6/2.85\*  
-

Manual	Automatic
6.8	7.2
240	235
8.7	9.4
208	224

Manual
9.5
210
5.6
148

\* Gear 5, 6 & Rev. (4.07 Gear 1, 2, 3, 4)