

Ground-breaking all-new Volvo S60 arrives Down Under

- World-first Pedestrian Detection with Full Auto Brake
- City Safety and Advanced Stability Control a first for segment
- Roll Over Protection System a first for segment
- All-wheel drive standard in T6 and D5
- Premium, driver-focussed cabin
- 224kW six-cylinder T6 petrol engine debuts in S60
- More space for passengers and luggage
- Coupé-style sedan with sports handling

The all-new Volvo S60 luxury sedan is set to raise the stakes in Australia's midsize premium car market with distinctive, coupé-style looks, breakthrough onroad dynamics and world-first safety innovations.

Behind the bold, confident and alluring style of Volvo's all-new S60 sedan lies a thoroughly resolved design that combines high technology with maximised efficiency - in terms of safety, mechanical function and total space utilisation.

With a host of new primary and secondary safety innovations, the all-new S60 sedan becomes the most high-tech Volvo yet seen. Class-leading dynamic safety technology, including Roll Over Protection System (ROPS), extended functionality to its Dynamic Stability and Traction Control (DSTC) system to include Advanced Stability Control (ASC) is complemented by two pioneering safety innovations: Pedestrian Detection with Full Auto Brake, and Volvo's City Safety, which was first seen on the Volvo XC60.

The new-generation S60 is also styled to attract.

Its coupé-like profile incorporates a steeply raked windscreen and a roofline that flows in one smooth sweep into the taillights. Volvo design director Peter Horbury says 'You are almost surprised to see that it has rear doors.'

On the road, the S60 is the sportiest Volvo sedan yet made. 'The ride is firmer and yet it is much better controlled. I would say comfort has actually been increased,' says Egbert Bakker, technical expert responsible for vehicle dynamics at Volvo.

The all-new Volvo S60 has one of the most advanced stability control systems part of Volvo's high-tech Dynamic Stability and Traction Control (DSTC) reducing the likelihood of wheel spin of skidding.

Corner Traction Control increases on-road agility by automatically braking the inner driven wheel as extra power is applied to the outer wheel. This 'torque vectoring' improves turn-in, thus reducing understeer.

In addition, Volvo's optional FOUR-C active suspension has been modified and improved for the S60, while all-wheel drive is standard in T6 and D5 models.

Within, its premium interior combines high quality materials with Swedish comfort, style and functionality, offering tangible increases in both passenger room and luggage space.

And while the all-new S60 embraces Volvo's already comprehensive range of passenger safety functions, it also introduces a new, world-first innovation: Pedestrian Detection with Full Auto Brake.

Via a camera and radar that scan the road ahead, the all-new S60 is able to brake itself if a pedestrian moves into the path of the car and the driver fails to respond to warnings.

Also part of the Volvo S60's safety armament is City Safety, which is fitted as standard equipment and reduces, or entirely avoids, low speed impacts up to 30 km/h, Driver Alert Control (DAC) to alert drivers who have become tired or distracted, Blind Spot Information System (BLIS) which helps detect vehicles in the rear blind spots on both sides of the car, Lane Departure Warning (which alerts drivers if the vehicle runs across the lane markers without the indicator being activated), Active Bi-Xenon lights that 'see around corners' and numerous secondary safety features including seat-mounted side airbags, pyrotechnic seatbelt pre-tensioners for all occupants, improved inflatable curtains and Volvo's patented whiplash protection system (WHIPS).

Peter Janevik, Volvo's manager of active safety functions, says 'This is the safest Volvo ever.'

According to Volvo Car Australia Managing Director, Alan Desselss, the all-new S60 is, 'The most dynamic, most emotionally involving car we've ever manufactured, a striking sports sedan that shows Volvo's passion for cars. Yet it is very much a true Volvo.'

The all-new S60 will be a vital component of the company's strategy for the Australian market. 'This is an extremely important new car for us,' he says. 'With its standout style, exceptional on-road abilities, outstanding passenger comfort and the very latest Volvo safety technology it sets new standards in Australia's premium mid-size segment."

Stressing the significance of the all-new S60 in Australia, Mr. Desselss said Volvo Car Australia is targeting around 1500 annual sales in its first full year. 'It will join the XC60 and XC90 as our biggest-selling models.'

The annual sales split is planned around 800 T5 models, 500 T6 models and 200 D5 turbodiesel models.

All-new Volvo S60 in detail

1. DESIGN CONCEPT

- Coupé style fused with four-door sedan practicality
- Larger dimensions for improved passenger and luggage space
- Striking design represents a major step forward in Volvo design language
- Confident and assertive styling; the most extrovert Volvo sedan
- 'Double wave' side profile for sleek and low appearance

'The all-new Volvo S60 has been sculpted to move you,' says Design Director Peter Horbury. 'Every single line in its design is there to transport you both physically and emotionally. Its profile radiates so much coupé feeling that the rear doors come as something of a pleasant surprise when you examine the car close-up.'

The premium sports sedan market is full of (mostly German) cars full of extrovert character - such as a hunkered-down stance, big wheels, large badges and a sporty styling character.

According to Peter Horbury, 'There's little point playing the polite Englishman or reserved Swede if you want to make a lasting impression. Translated into a car market packed with extrovert models from all the leading makers, this means that you have to sharpen your design pencil like never before if you want to be seen. That's why it's so important for the all-new Volvo S60 to be more daring than our previous models.

'The front is a good example. It was a bit too minimalist in the previous model. The grille, the large iron mark and the front position marker lights in the all-new Volvo S60 are immediately noticeable in your rear-view mirror. The attitude is proud and self-confident but without appearing too aggressive. There is no doubt which car is behind you.' Increased dimensions mean a better deal for passengers and luggage In terms of dimensions, the all-new S60 sits between the S40 and S80 sedan models.

A 61-millimetre wheelbase increase helps improve ride comfort and passenger space, while body length has been kept to just 25 mm greater than the outgoing S60, minimising front and rear overhangs and helping manoeuvrability in urban driving conditions.

Despite its low-slung, coupé profile, the all-new S60's overall height is actually greater than the previous model, maximising headroom and improving passenger comfort. Knee space in the rear seat has increased by 30 mm.

The luggage area is also well attended to, with a 107 mm wider boot opening and access from the interior available via a standard 60:40 split-fold rear seat. To further assist functionality, the all-new S60's passenger-side front seat backrest can be folded forward.

All-new Volvo S60: a great, evolutionary styling leap

The all-new Volvo S60 was designed under the directorship of Steve Mattin while Peter Horbury was working for Ford in America. Horbury, who served as Volvo design director from 1991-2002 and is responsible for the modern Volvo design language says he has 'nothing but praise' for the work done in his absence.

'I call the design of the S60 a great evolutionary step. If you look back at the previous generation S60 (which was launched in Australia in 2000), the lineage is clear: the rounded nose, the fastback rear, and the sporty proportions. That S60, and the S80 that went before, began the current Volvo styling direction, which took classic Volvo cues but made them more modern. The all-new S60 takes that styling treatment to a much higher level of sportiness. This is a big step forward.'

Sportier, more distinct than any previous Volvo

Örjan Sterner was responsible for the exterior design of the all-new Volvo S60. For him, the direction was crystal-clear from the outset: 'In overall shape, the allnew S60 is a coupé, sportier and more distinct than any previous Volvo. Virtually all the lines were penned to carve out the correct wedge profile. It carries a sporty appeal that promises great driving pleasure before you even get behind the wheel.'

With the rear pillar stretching all the way to the taillights and a slim, coupé-like roofline accompanied by a new contour on the shoulders, a gentle yet powerful double wave stretching from the headlamps to the tail lamps is created.

'The dip in the middle of the double waves visually pushes the car down and puts focus over the wheels. This enhances the stance and makes the car look sleeker and lower. The sculpted bonnet and the short overhangs front and rear also emphasise the sports car feel.'

This design dynamism is enhanced by what Volvo's design team calls the 'racetrack' design. The car's lines do not end abruptly but instead continue to flow organically, continually, echoing the smooth shapes of a racetrack.

According to Sterner, 'It's confident and assertive. We worked a lot on its stance, the way it sits on its wheels. That is the key design quality of any sporting car. It must look as though it hugs the road.'

Organic Scandinavian design

'The design is also very Scandinavian,' says Sterner. 'It is very clean with clear distinct forms and shapes. Scandinavian design is never just about aesthetics. It's also about deeper questions, such as the environment or caring for the people around you.' An example is the soft surfacing on Volvo exterior corners, which is safer for pedestrians.

Volvo's design language has undergone dramatic change over the past decade without compromising in any way the core values that have made the brand one of the strongest in the automotive world.

LED technology adds to styling character

Volvo's designers have used LED technology to create distinctive, yet fluid, light streams front and rear. The vertically positioned lights at the front, the eyebrowlike side marker lights, the turn indicators in the door mirrors and the position lights in the taillights all help give the new S60 an unmistakable profile, even at night.

Parts of the rear lamp units are also integrated into the boot lid, creating a horizontal light pattern that helps make the car look even sleeker, lower and broader.

Improvements in headlight technology and design ensure a better cut and spread of light negating the need for fog lights.

In addition, the removal of the fog lights allows more space for the Electro Hydraulic Power Steering, decreasing fuel consumption and lowering emissions.

Also assist those drivers who forget to turn off their fog lights after the fog has cleared risking a fine in all States and Territories of Australia.

Aerodynamic design shows it's not just a pretty face

Volvo's all-new S60 is not only designed to add emotion and sports appeal. Being a Volvo, there is a functional benefit. The drag co-efficient is a slippery 0.28, making the S60 one of the most aerodynamic cars in its class. Adds Peter Horbury: 'The all-new S60 is sportier and more dynamic than any previous Volvo. But it is still an unmistakable representative of Scandinavian design at its best. Flowing organic shapes go hand-in-hand with user-friendly functionality, as well as a car aiming to be the safest in the world.'

2. INTERIOR DESIGN

- Most high-tech Volvo cabin ever
- More spacious than outgoing S60, with increased rear legroom
- Simple, premium, elegant Swedish design
- Driver-focussed cockpit
- Premium materials including wood, leather and aluminium
- Intuitive controls designed for easy use

'This is the most stylish, distinctive and best-finished Volvo cabin. Of course, being a Volvo, it is also highly rational and functional. I think we have also added some playfulness to the rational simplicity of Scandinavian design tradition,' says Jonathan Disley, head of interior design.

Most high-tech Volvo cabin ever

Easy-to-use technology abounds inside the S60. An all-new infotainment system combining audio, navigation, mobile phone and other functions, is presented within a five or seven-inch colour screen in the upper part of the centre console.

Its height is designed to make it easier for the driver's eyes to be kept on the road. All functions can be controlled from the steering wheel, or by controls directly below the screen.

The human-machine interface is a crucial aspect of any Volvo. The intuitive controls are in keeping with Volvo's goal to make reading the instruction manual unnecessary.

Voice controlled navigation is available (standard in the T6) and standard Bluetooth - complete with audio streaming - can connect the driver's own mobile phone to the infotainment system.

'Every detail looks like it's in motion'

For Disley, the interior is the most important part of any car. 'It's where the owner spends his or her time.' Disley says the S60's interior grew from the S80, 'a car we are immensely proud of. It captures the Scandinavian feeling of being a home away from home. Our challenge was to take this and to give it a sportier, driver-oriented feeling. It's serene, like a spa, and at the same time it communicates a sense of being in command.'

The spa analogy is doubly relevant. While Disley was sketching spirals, a colleague commented that the drawings looked like the famous Spa racing circuit in Belgium. 'That was a eureka moment,' says Disley. 'This racetrack line ran around the cabin and held everything together. It also gave the continual expression of movement.'

Interior designer Tony Hunter adds: 'It's a trick that a lot of artists use - from Da Vinci to Kandinsky. They have a visual line that draws all the elements together, that you subconsciously follow with your eyes.'

Says Disley: 'Every detail looks like it's in motion. All these lines 'embrace' the driver's cockpit. The instruments and centre stack are angled towards the driver to create a sensation of focus and control. The new dynamic three-spoke steering wheel and the new sports seats with extra side supports are standard. You also sit lower than the Volvo norm, and lower than in the outgoing S60.'

Driver focused, yet pampers passengers

The interior of the S60 is a full five-seat configuration offering comfortable space for all occupants, yet is unashamedly driver-oriented. Knee space in the rear seat has increased by 30 mm compared with the previous-generation S60, while the sculpted outer rear seats give the passenger in the middle welcome side support. 'Sports saloons typically have a very 'me' feel,' comments Tony Hunter. 'They are designed around the driver. While the S60 is very driver focused, we are a 'we' brand. We care about all occupants. We didn't want any passenger to think we'd forgotten about them. That would have been a very un-Volvo thing to do.'

So, despite the warp-around binnacle and the centre console that is angled towards the driver, the front seat passenger has easy access to key controls.

A Volvo design initiated in the C30 Coupé, the floating centre stack, was inspired by Swedish furniture and its tendency to 'bend wood'. The thinness of the stack gives it a 'floating' effect.

Big on functionality, not gadgetry

Swedish influences are prominent in the S60 cabin. 'It's simple and uncluttered with no unnecessary gadgetry,' says Hunter. 'It's very intuitive, and very Swedish.' Peter Horbury adds: 'It's quite unlike some complicated German interiors. The impression with these cars can be that the technology is taking over the car. There's nothing worse than getting in a car and thinking it's more intelligent than you are.'

Examples of the class-leading functionality include a front passenger seat in which the backrest folds forward - helping rear seat carrying capacity - and a split folding (60:40) rear seat, ideal for carrying long loads in the boot. Again, this is an unusual quality in a sports sedan. The boot opening is 107 mm wider than the previous S60.

The S60 represents a significant step forward in quality and craftsmanship Horbury says it is the best interior Volvo has done. Fit and finish is improved, and so is the quality of materials. They look better and feel better. The wood inlay, when specified, is of course real wood, as you'd expect given Volvo's Scandinavian roots. Anders Sachs, who is responsible for colour and trim, says 'Sweden has a long tradition in high-quality fabrics. At first glance, the upholstery looks understated, classic and elegant. Take a closer look and you see an asymmetric line pattern. You may not notice it at first but when you do, it's a feel-good moment.'

Swedish design is famous for its light shades. Of course, the S60 offers black upholstery and charcoal trim but there are also some more typically Scandinavian hues such as soft beige or Beechwood upholstery and sandstone beige interior.

3. DRIVING DYNAMICS: ENGINES

- First Volvo S60 to receive the powerful 224kW T6 engine
- Revised D5 engine offers better performance and economy, lower
 emissions
- Four-cylinder petrol T5 mated to Volvo's Powershift dual-clutch transmission

The S60 goes on sale in Australia with a five-cylinder diesel engine, the powerful petrol T6 and, during the first quarter of 2011, a direct-injection turbocharged four-cylinder petrol T5.

All engines are state-of-the-art. The D5 was unveiled in the XC60 in 2009 and is further improved for the S60. The T6 engine has also been upgraded and is now more powerful, and more economical, than ever.

	T5 FWD	D5 AWD	T6 AWD
Engine	1999cc	2400cc	2953cc
	Transverse	Transverse	Transverse
	4cyl, 16V	5cyl, 20V	6cyl, 24v
Fuel	Petrol	Diesel	Petrol
Power	177kW @ 5500	151kW @ 1500-	224kW @ 5600
	rpm	3250 rpm	rpm
Torque	320Nm @ 1800-	420Nm @ 1500-	440Nm @ 2100-
	5000 rpm	3250 rpm	4200 rpm
Transmission	6-sp Powershift	6-sp adaptive	6-sp adaptive
	with Neutral	Geartronic with	Geartronic with
	Control	Neutral Control	Neutral Control
0-100km/h (sec)	7.5	8.1	6.1
Top Speed	230	230	250
(km/h)			

C02 (g/km)	193	189	243
Emissions	Euro 5	Euro 5	Euro 5
Fuel	8.3	7.1	10.2
Consumption -			
Combined			
(L/100km)			

*Please refer to technical specification sheet for more detail

D5 diesel engine

Twin turbochargers of different sizes, operating in sequence to provide added power over a broad rpm range, feature in the high-performance D5 engine. This results in immediate response from the lowest engine revs without any perceptible turbo lag. It also offers rapid acceleration at all speeds, with smooth power delivery between the power bands of both turbocharger ranges.

Advanced piezoelectric fuel injector technology is also used in the D5 engine. This provides precise distribution of the atomised fuel in the combustion chamber, resulting in efficient combustion and low emissions.

Aluminium block and head construction is employed in the five-cylinder diesel for light weight, while four valves per cylinder are used for optimal breathing and twin overhead camshafts for efficient valve actuation. A maintenance-free particulate filter traps 95 per cent of soot particles.

High-performance T6

The 3.0-litre T6 turbo-charged petrol engine has been improved for the S60. Both power and torque are better than the previous T6 engine (up 14kW to 224 kW and up 40 Nm to 440 Nm) while fuel consumption on the combined cycle is just 10.2 I/100km. This is the first time the T6 has been fitted to the S60 and is commensurate with Volvo's desire to make the all-new S60 the sportiest Volvo yet.

The T6 engine is powerful and extremely compact. It is also very clean, easily meeting the latest Euro 5 exhaust emission standards.

Ilt produces maximum torque over a very wide rpm band stretching from 2100rpm to 4200rpm. This enables the car to be driven economically at low revs while still delivering enormous urge.

An unusual twin-scroll turbocharger configuration allows for excellent low-rpm response, eliminating traditional turbo 'lag', and yet also delivers powerful thrust when maximum performance is desired. Twin-scroll technology allows the turbo to operate in two stages. The inflow is divided into two groups of three cylinders, allowing for swifter response and a smaller turbo unit. Even after 4800rpm, there is only a small drop-off in torque.

Twin overhead camshafts and 24 valves provide optimal engine breathing. A 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 the engine. An impressive 80 per cent of the vehicle's maximum torque is available across the entire rev range.

Unusually in this sector, the six-cylinder engine uses an inline configuration, rather than the more common and more easily packaged V6 layout. An inline engine is intrinsically the smoothest and most refined of all configurations.

The biggest problem with an inline six is the length, which makes for difficult transverse packaging. 'Transversely mounted engines are safer - that's why we use them,' says Derek Crabb, head of powertrain development at Volvo Car Corporation.

'They reduce the risk of an engine penetrating the passenger load space and also can be designed with more crumple space in front and behind, allowing the safety systems to work more effectively.'

Most inline six-cylinder engines would not fit into a car's engine bay crossways; they're too long. Volvo engineers overcame this problem by making the new SI6 engine (short in-line six) engine extremely compact and much shorter than the inline-six norm.

The key was a new and innovative drive system known as READ - Rear End Ancillary Drive. All ancillaries, such as the air-conditioning compressor, are driven by gears at the rear end of the crankshaft in the space above the gearbox. The alternator is direct-driven and fitted to the engine block. The flywheel damper, which compensates for vibrations in the six-cylinder engine's relatively long crankshaft, is inside the engine block.

An extremely short engine is the end result. It measures just 625mm - only three mm longer than Volvo's five-cylinder engine. This substantially increases engine bay space, so the inline six can be fitted crossways and the crash structure can be configured around it. The SI6 has an aluminium block and head, both structurally optimized to balance low weight and stiffness. Even the camshaft cover is structural, allowing it to incorporate the camshaft bearing caps for further weight reduction.

On the S60 T6 and D5, a six-speed Geartronic automatic gearbox and all-wheeldrive (AWD) are standard.

New-generation GTDi engines

An all-new 177 kW four-cylinder GTDi (gasoline turbocharged direct injection) engine will be introduced to the Australian S60 range in the T5 model early in 2011.

This new engine uses direct fuel injection to improve performance, response, economy and emissions. The choice of four, rather than five cylinders reduces friction and boosts economy, yet the engine remains smooth and refined.

Twin variable camshafts and 16-valve heads are used in the all-aluminium 2.0 GTDi. A world first is the use of sheet steel, rather than cast iron, for the turbocharger. Using sheet steel for both the exhaust manifold and the turbocharger reduces weight and improves heat control, boosting efficiency. The turbo is unusually small - the market's smallest in relation to engine output – helping boost engine response while lowering fuel consumption.

Sharp engine response is a key quality of a sporting car, and Crabb says Volvo has worked hard to give all the S60 engines - not just the new GTDi - sprightly performance. 'All the S60 engines are either new, or upgraded, and a key goal has been to give them greater response through the engine range. We have done this by reworking the bottom ends, reducing friction and improving the breathing. It's not just engines - we have also overhauled the transmissions. The highest levels of performance were an absolute priority for the all-new S60.'

The front wheel drive S60 T5 GTDi comes with Volvo's six-speed Powershift dual-clutch gearbox.

3. DRIVING DYNAMICS: CHASSIS

- Dynamic chassis standard (Touring chassis no cost option)
- Benchmarked against the BMW 3 Series and Audi A4
- Optional Active Four-C suspension
- New Advanced Stability Control, part of the Dynamic Stability and Traction Control (DSTC) system
- The all-new S60 has fully independent coil spring suspension, specially tuned for responsive, agile behaviour. Front suspension is by MacPherson struts, with a multi-link configuration at the rear.

'Our benchmark was the BMW 3 Series and the Audi A4', says Egbert Bakker, technical expert responsible for vehicle dynamics. 'But the S60 is different from those cars. It must be agile, responsive and great fun to drive. In addition, it must offer extraordinary security even in the most difficult conditions. A Volvo must be poised and predictable in Sweden on an icy winter's road, on a Californian country road at the height of summer. We have our own chassis DNA. It's fun but always with security. That's one reason why we only offer front-wheel drive or all-wheel drive. It gives greater predictability.'

The platform is similar to the latest S80, V70, XC70 and XC60. On the all-new S60, the suspension has been tuned for greater responsiveness and dynamism. 'It's not just the suspension,' says Bakker. 'We have gone right through the chassis - from steering right through to tyres - always with the goal of providing maximum driving enjoyment combined with safety.'

Ride and handling

The Volvo S60's suspension is tuned to meet demanding European requirements, with much of the development work done on narrow, winding and badly surfaced B-roads in the UK.

According to Bakker, the British roads represent a challenge for suspension designers: 'They are very demanding and were the ideal surface on which to test the S60. Get those roads right, and you get the suspension right,' he said.

Former British Touring Car champion John Cleland played an instrumental role in the development of the new dynamic chassis. His race winning motor sport experience meant he was best placed to evaluate and advise on the new dynamic performance which proved invaluable throughout the cars' development.

Sportier - but more comfortable

The suspension is firmer, and provides more communication than the outgoing S60. 'The ride quality is much more controlled,' says Bakker. 'The old S60 offered a slightly softer ride but the new S60 is much more precise and body movement is more poised. The new S60 delivers a much more compliant ride than a typical German sports sedan. Yet the S60 always feels in control. It's a different sort of comfort compared with the old S60 but, on balance, I would say that the all-new S60 is certainly more agile and responsive, and also more comfortable.'

From steering to tyres: the goal was a sportier drive

'We went through the whole car - from steering wheel to tyres and everything in between - to give a sportier drive,' says Bakker. 'We kept asking: how could we make it stiffer, sportier, and more dynamic? The steering wheel is smaller than the old S60's to make the driver feel more connected to the road. The steering column has double the torsional rigidity and is better isolated with stiffer bushes and top mounts. The steering ratio is sharper, by 10 per cent. The dampers in the suspension are firmer, and so are the springs. There is much more communication from chassis to driver and much more of a feeling of direct contact between the tyres and the road.' The front and rear subframe bushes are also twice as stiff as before.

FOUR-C as an option

Volvo's FOUR-C 'active' suspension, in which the dampers are automatically adjusted to suit the immediate driving situation, is optional on all versions of the S60. The FOUR-C system has been completely retuned for the new car. 'The settings are changed to give a clearer difference', says Egbert Bakker. 'But we still offer some sportiness in the Comfort setting and comfort in the sportiest Advanced setting'.

Electronic sensors continually monitor the car's behaviour. The dampers then readjust in a fraction of a second to offer optimal handling and ride. This technology reduces the car's tendency to squat, dip or roll under firm acceleration, hard braking or fast steering manoeuvres.

Advanced multiplex control systems update the suspension settings 500 times every second. The system is especially useful when the car's handling balance is naturally upset - for example during fast acceleration (with FOUR-C, the rear dampers are set to maximum stiffness to reduce squat and optimise front-end traction), during hard braking (the front dampers are stiffened to reduce nose dive) and when cornering (outside dampers are stiffened to reduce roll and improve road holding).

Dampers also automatically stiffen as speed increases. The driving behaviour is improved in all situations.

Though dampers are adjusted automatically, drivers can also programme their desired settings. The three chassis settings are selected by the touch of a button. They are:

Comfort - which provides the most comfortable ride with smooth and gentle body movements;

Sport - for more tightly controlled body movements and a firmer 'hunkered down' feel. Steering response is sharpened, body roll is reduced;

Advanced - the maximum sports choice that noticeably firms up dampers and the optimal setting for brisk drives on smooth, winding roads.

In an emergency situation, when the driver needs maximum control, the ingenious FOUR-C system overrides the personal settings to deliver maximum stability and traction. Equally, as the speed builds, the dampers automatically become firmer to improve handling, response and safety.

Corner Traction Control for improved turn-in

Volvo's new Corner Traction Control (CTC) further sharpens the driving experience. A refinement of the Dynamic Stability and Traction Control (DSTC) system, it uses torque vectoring to improve turn-in.

When taking a corner, the inner driven wheel is braked while extra power is fed to the outer driven wheel. This not only improves agility and precision, it also reduces the tendency to understeer - a characteristic of powerful front-wheel drive cars.

In addition, CTC makes it easier to maintain the chosen line on a winding road, in keeping with Volvo's desire to maximise the poise and predictability of the new S60. It also reduces the 'snatch' sometimes found in front-drive cars when accelerating hard from a side road to merge with traffic.

Advanced Stability Control improves driving pleasure and safety A new Advanced Stability Control, part of the Dynamic Stability and Traction Control (DSTC) system, is believed to be the world's most sophisticated. A new roll angle sensor identifies any possible loss of traction at an early stage. Dynamic Stability and Traction Control (DSTC) is standard on all Volvos and has been further refined for the S60. This electronic stability and traction system stops skids and slides using sensors to detect if any of the wheels lose traction or grip. If so, power is cut to the relevant wheel. If the sensors detect early signs of a skid, the system automatically brakes the relevant wheel to reduce speed and regain control. It's an important primary safety aid.

If the driver wants to use the vehicle in a more spirited manner, DSTC has a sports setting that disables the electronic intervention.

Engine Drag Control prevents the wheels from locking during engine braking on a slippery surface.

Another active safety technology is Trailer Stability Assist (TSA), first showcased on the Volvo XC60. TSA dampens the swaying 'snaking' motion that can occur when towing, which can sometimes lead to serious accidents. TSA operates with the DSTC system to stabilise the trailer by braking one or more wheels while at the same time restricting the engine's torque. When an accessory tow bar is ordered, the TSA software is downloaded and forms part of the cost of the tow bar.

All-Wheel Drive

All Wheel Drive (AWD) - standard on T6 and D5 - improves handling and roadholding by apportioning torque to all four wheels. The computer-controlled system automatically sends torque to the wheels with most grip, ensuring maximum possible traction and active safety. The front-to-rear torque split changes constantly - from zero to 100 per cent, front or rear. Sophisticated electronics control a hydraulic clutch that determines the most effective distribution of torque. Sensors monitor the road surface and the positions of the steering, brake and accelerator. In normal conditions on a dry bitumen road, almost all the power is distributed to the front wheels. However, as soon as slippage occurs, torque is diverted to the rear wheels to boost grip.

This system also features Volvo-patented Instant Traction that detects loose or slippery surfaces and switches drive from front to rear (or vice versa) to help with standing starts.

All Wheel Drive not only improves traction on slippery surfaces, such as gravel, mud or ice, but also improves the handling balance of the car. The powerful T6 engine, in particular, presents a problem for a front-drive chassis. Torque steer can occur as the steering has difficulty controlling the powerful driven wheels. Four-wheel drive improves steering feel, traction and handling balance.

4. DRIVING DYNAMICS: STEERING, BRAKES AND TRANSMISSION

- Quicker ratio rack-and-pinion steering for greater precision
- Emergency Brake Lights (EBL), flashing, standard
- ABS anti-lock brakes combine with Hydraulic Brake Assist (HBA) and Ready Alert Brakes(RAB) to give maximum braking ability in all conditions
- All-wheel drive (AWD) standard T6 and D5

Most sporting cars tend to be identified by powerful engines and striking style. But steering, brakes and transmission are just as important for a total dynamic experience. That's why Volvo spent a great amount of time perfecting the total driving experience.

Sharper, more agile steering

The rack-and-pinion steering ratio is 10 per cent faster than the old S60's, the steering column has greater torsional rigidity and the steering column mounts are stiffer. The chunky, leather-rimmed steering wheel is smaller than the previous S60's wheel to help the driver feel more connected to the road. The whole steering system has more response, more feel and helps give the vehicle more natural poise,' says Egbert Bakker.

Speed dependent power steering available

All S60 models get power-assisted steering, but Volvo's new sports sedan can also be ordered with speed-dependent power steering. This provides extra assistance at low speeds, making parking easier. Power assistance gradually declines as road speed increases, disappearing entirely at high cruising speeds. To suit individual requirements, the level of steering servo assistance can be set at one of three levels.

Strong, progressive brakes featuring advanced electronic controls

Powerful anti-lock (ABS) four-wheel disc brakes - ventilated at the front - give the all-new S60 outstanding, low-fade stopping power.

The disc brakes are supplemented by a host of *standard* advanced electronic controls, to maximise braking power. They include:

• Hydraulic Brake Assist (HBA)

This is an update of Volvo's previous EBD (Electronic Brake Distribution) and EBA (Emergency Brake Assist). This new generation system, first shown on the S80, helps the driver to stop in the shortest possible distance in emergency situations. Unlike the previous system, which only used vacuum assistance to boost braking strength, HBA reinforces brake pressure hydraulically. In an emergency, when the driver does not press the pedal sufficiently firmly or quickly, HBA ensures that maximum braking pressure is applied, always giving the driver the greatest chance to reduce the likelihood, or seriousness, of an accident.

• Optimised Hydraulic Brakes (OHB)

In heavy braking, vacuum pressure in the brake servo can become low, reducing braking effort. OHB compensates by using hydraulic pressure to boost braking effort.

• Ready Alert Brakes (RAB)

If the accelerator is released suddenly or the adaptive cruise control registers an obstacle in front of the car, RAB is deployed. The brake pads are instantly positioned very close to the discs, reducing braking response time and braking distance.

• Fading Brake Support (FBS)

In long, hard braking, such as on a lengthy, mountainous descent, there is a risk of brake fade. FBS uses the hydraulics to gradually build brake pressure, maintaining pedal feel.

An electronic parking brake is fitted to the all-new Volvo S60 as standard.

Transmission - Two six speed gearboxes

The T6 and D5 S60 models are mated to Volvo's six-speed Geartronic gearbox, which offers both full automatic and manual shifting as well as 'Sport' mode.

This transmission can be used either in full automatic or manual override mode. The Sports button allows higher revs before each gear change, slightly faster shifts and sharper kick-down.

The GTDi engine will come with Volvo's twin-clutch semi-automatic Powershift transmission. The Powershift uses two clutches to offer fast gearchanges. It can also be used as a full automatic but because the drive is continually engaged as in a conventional manual transmission, it offers excellent fuel economy.

5. SAFETY - THE BENCHMARK FOR THE SEGMENT

- Pedestrian Detection with Full Auto Brake is a world-first safety technology
- City Safety offered as standard for the first time on a sedan car
- Roll Over Protection System (ROPS) first for segment
- Airbags include curtain side airbags and hip and thorax side airbags
- Five three-point pyrotechnic seat belts with pre-tensioners

Ever since the first Volvo was built in 1927, the overriding priority has been to develop cars that help prevent accidents and, if an accident does happen, to offer maximum protection. 'Cars are driven by people,' declared co-founders Assar Gabrielsson and Gustaf Larson. 'Therefore the guiding principle behind everything at Volvo is, and must remain, safety.'

Volvo has been a safety pioneer ever since the company was founded. Innovations include the three-point seat belt (1959) - the greatest advance in car safety of all time, according to many safety experts. They also include the safety cage (1944), padded instrument panel (1960), rear seat belts (1966), side impact airbags (1994), whiplash protection (1998), roll stability control (2002), lower front crossmember in XC models to increase safety compatibility with lower cars (2002) and, of course, City Safety first seen on the XC60 in 2009. To this roll call of safety milestones can now be added: Pedestrian Detection with Full Auto Brake, and City Safety.

Pedestrian Detection with Full Auto Brake

This is a world first safety technology - the first time that any carmaker has offered a feature that specifically avoids a collision with a pedestrian. The radar and camera-based system can detect pedestrians in front of the car, warn the driver, and then automatically activate the brakes if the driver fails to respond in time. Unfortunately pedestrian accidents are regular occurrences. In Europe, 14 per cent of all traffic fatalities are pedestrians. In the USA it is 11 per cent while in China, it rises to 26 per cent.

'At Volvo we have always led the way when it comes to protecting the occupants in our cars,' says Thomas Broberg, senior safety advisor. 'In recent years, we have adopted groundbreaking initiatives that help the driver avoid and mitigate accidents with other vehicles. Now we are taking a giant stride forward with technology that can contribute to increased safety for unprotected road users as well.'

Pedestrian Detection with Full Auto Brake uses a newly developed radar unit integrated into the car's grille, a camera fitted in front of the interior rear-view mirror, and a central control unit. The radar detects any object in front of the car and determines its proximity. The camera determines what type of object it is.

Thanks to the newly developed dual-mode radar's much wider field of vision, pedestrians about to step into the road are detected. The system can detect pedestrians who are 80cm tall and upwards - which includes children.

If a pedestrian is detected, the driver firstly receives an audible warning combined with a flashing light in the windscreen's head-up display. At the same time, the car's brakes are pre-charged. If the driver does not react to the warning and an accident is imminent, full braking power is automatically applied.

Volvo has worked for five years on the development of Pedestrian Detection with Full Auto Brake. Test cars have been in operation all over the world to 'learn' all possible variations of traffic behaviour, road conditions and climate. 'We've driven more than half a million test kilometres in real traffic to 'train' the system to recognise pedestrians' patterns of movement and their appearance in different countries and cultures,' explains Thomas Broberg.

Avoids impacts at speeds below 35 km/h

Half of all pedestrian accidents occur at speeds below 25 km/h Pedestrian Detection with Full Auto Brake can avoid a collision with a pedestrian at speeds up to 35km/h if the driver does not react in time. At higher speeds, the focus is on reducing the car's speed as much as possible prior to the impact, reducing the likelihood of serious injury or death.

'The proportion of pedestrian fatalities is too high today and our technology will play a major role in reducing it,' says Broberg.

Collision Warning with Full Auto Brake

Pedestrian Detection is a development of Volvo's Collision Warning system, which uses the nose-mounted radar and camera to warn drivers if they're about to hit another vehicle, and apply the brakes automatically if necessary.

Unlike Pedestrian Detection, and City Safety, this automatic braking technology is designed for higher speed, such as that encountered on freeways. A radar sensor fitted behind the grille, and a digital camera behind the windscreen, automatically monitor the distance to the vehicle in front. If the vehicle in front suddenly brakes, is stationary or too close, a red warning light flashes on the windscreen and a warning buzzer sounds. The braking system is also automatically pre-charged to prepare for panic braking: the pads move very close to the discs and hydraulic brake pressure is increased. If the driver does not react to the warnings and a collision is imminent, automatic braking is applied to reduce the severity of the accident.

As with Pedestrian Detection, this system can avoid collisions up to 35 km and reduce the severity of the impact at speeds over that.

Automatic braking is only applied as a last resort. 'We give the driver ample warning,' says Broberg. 'Only when they don't respond, or it's too late, will automatic braking take over.'

City Safety prevents, or mitigates, low speed urban accidents

City Safety, a technology introduced on the Volvo XC60 and now featured as standard on the S60, avoids low speed accidents. Statistically, these are the most common types of crash, with up to 75 per cent of accidents occurring under 30 km/h. City Safety either eliminates such accidents or reduces the severity of the impact.

'The biggest safety benefit is to reduce whiplash,' says Thomas Broberg. 'We are also reducing the damage to the cars involved and probably preventing accidents further down the line of traffic.'

City Safety works at speeds below 30 km/h. A laser sensor, fitted behind the rear-view mirror and looking through the windscreen, keeps an eye on traffic in front of the vehicle. It can detect vehicles and other objects up to six metres in front of the car's front bumper. City Safety reacts to vehicles in front of the S60 that are either stationary or moving in the same direction.

Based on the gap to the vehicle in front and the car's own speed, the system makes 50 calculations per second to determine the braking force needed to avoid a collision. If the calculated braking force exceeds a certain level without the driver responding, the system determines that the risk of a collision is imminent.

City Safety helps either avoid or reduce the severity of the collision by automatically braking the car and reducing the throttle opening. At the same time, the brake lights are automatically activated to warn other traffic. According to Thomas Broberg: 'City Safety automatically brakes at the last possible moment - at the point of no return. This is the point where, if City Safety were not activated, there would be an accident. Our studies show that if the speed difference with the car in front is under 15 km/h then City Safety should avoid an accident entirely. If the speed difference is greater, then an accident will probably happen, but the severity will be substantially reduced.'

The Volvo S60 is the first sedan in the world to be offered with City Safety, and only the second vehicle after the XC60.

The system can also secure owners up to a 20 per cent reduction in insurance costs when compared to competitors.

Roll Over Protection System (ROPS) segment first

First seen in the Volvo XC90 in 2003, the all-new Volvo S60 introduces Roll Over Protection System (ROPS) as a first in this segment. The gyroscope in the crash sensor detects an angle at which a roll over is unavoidable and the system is activated.

This includes the deployment of the Inflatable Curtain and the activation of the seatbelt pre-tensioners - on all seats. The fuel supply is cut off, doors are unlocked and interior lights are turned on. The Volvo safety cage then plays its part in maintaining the body structure and preventing roof deformation.

A high proportion of Australia's road fatalities are caused by roll overs.

Adaptive Cruise Control with Distance Alert and Queue Assist Function

To help the driver maintain a safe distance from the car in front, Adaptive Cruise Control (ACC) is an option on the all-new S60. It uses a radar sensor to continuously measure the distance to the vehicle in front and automatically adapts the speed of the car to help ensure a safe distance is maintained from speeds of 0 km/h through to 200 km/h.

The driver simply activates the cruise control, setting the desired maximum speed and choosing the minimum distance interval to the cars in front. There are five different distance intervals to choose from.

The system is also equipped with Queue Assist functionality, which enables the car to not only maintain a safe braking distance to the car in front but also slow down to a complete stop. When the driver presses the resume button on the steering wheel or engages the accelerator, the vehicle will move off again and speed up to the pre-determined speed - or continue to follow at the speed of traffic ahead.

Distance Alert is another feature included in this option. The system helps the driver maintain a safe distance to the vehicle in front even when Adaptive Cruise Control is not in use. Activated via a button on the centre console, the driver can choose between five settings.

If the time gap to the car in front gets shorter than the selected speed, the driver gets visual information in the head-up display on the lower section of the windscreen.

This technology also forms the basis of several of Volvo's advanced driving and support systems, including Collision Warning, and Pedestrian Detection with Auto Brake.

Hands on the wheel - eyes on the road

The all-new intuitive audio module enables drivers to operate all infotainment systems - including navigation, car settings, audio and Bluetooth - from the

steering wheel. All functions are available from the steering wheel controls, so the driver never has to take their hands off the steering wheel.

With optional navigation (T5 and D5), voice control functionality can also be activated from the steering wheel for navigation and Bluetooth.

Active Bending Lights 'see around corners'

Compared with conventional halogen headlights, Volvo's active bending lights using dual xenon technology - more than double the driver's range of vision. The lamps are motorized, and can turn up to 15 degrees in either direction, as they follow the direction of the steered wheels. Thus, they help the driver 'see around corners'. The headlights also self-adjust, always maintaining the correct angle to the road, maximising illumination and avoiding dazzling oncoming motorists.

Side Impact Protection System (SIPS), including dual-stage airbags

Volvo has further developed its SIPS side impact protection system. The body's entire side structure is both strong and light thanks to a well balanced combination of high-tensile steel of different grades (High Strength Steel, Extra High Strength Steel and the extremely strong Ultra High Strength Steel). The various components and grades of steel interact to reduce penetration into the passenger compartment.

Dual-stage seat-mounted side airbags further protect occupants from side intrusion. These side airbags get two separate chambers: one for the hip section and one for the chest. The hips can withstand greater force than the chest, so the lower chamber inflates with up to five times more pressure than the upper section. The side impact airbags interact with the inflatable curtains, which offer excellent head protection for children and adults alike. The gyro measuring the vehicle's yaw rate (part of the DSTC), along with the various accelerometers in the vehicle, can provide early activation of the inflatable curtains. Dual-stage driver and passenger airbags are naturally offered as well. All airbags are standard across the range.

Whiplash Protection System (WHIPS)

WHIPS reduces the risk of neck injuries in a rear-end collision. The front seat backrest accompanies the passenger's initial body movement and dampens the incoming force rather like one's hand does when catching a ball.

The S60 features the same generation WHIPS mechanism introduced on the latest S80. This latest generation WHIPS ensures a gentle damping motion and provides good contact between the head and head restraint throughout the impact sequence.

WHIPS is a highly effective technology avoiding one of the most common injuries suffered in motor accidents.

Alerting tired drivers - and avoiding distraction

The Volvo S60 is full of solutions to keep drivers alert and reduce distractions. These include:

• Driver Alert Control (DAC)

A unique technology to alert tired and distracted drivers, DAC monitors the car's movement between the lane markers and warns the driver of driving pattern changes in a random or uncontrolled way. Part of Volvo's Lane Departure Warning system.

• Lane Departure Warning (LDW)

Alerts the driver if the car runs across the lane markings without the indicator being used.

• Blind Spot Information System (BLIS)

Helps detect vehicles in the offset rear blind spot on both sides of the car. A warning lamp beside the relevant door mirror alerts the driver to the danger.

• Intelligent Driver Information System (IDIS)

A standard feature, IDIS is an electronic information system that helps prevent the driver from becoming distracted by irrelevant information in busy driving conditions. By continuously monitoring certain functions in the car, such as brake application and movements of the steering wheel, accelerator pedal and indicators, IDIS can assess the complexity of the driving situation. The information is processed and at a certain level of complexity, any information that is not essential to safety - for instance incoming phone calls or service information - is delayed.

• Emergency Brake Light (EBL)

Another standard feature across the entire Volvo range, EBL knows the difference between normal and emergency braking. In an emergency stop, the brake lights flash at four times a second. Once speed drops below 30 km/h, the brake lights stop flashing and the hazard lights flash instead.

The safest Volvo of all

'No previous Volvo model has ever had such advanced safety technology as the all-new Volvo S60,' says Thomas Broberg. 'It is a worthy representative of our aim to build the world's safest cars - and it marks yet another step towards our goal of no fatalities or serious injuries in a new Volvo car by the year 2020.'

6. QUALITY AND EQUIPMENT

- High level of standard equipment
- Premium Swedish design
- Allergen free high quality cabin materials and pollen filter
- High-quality in-car entertainment
- Three year / Unlimited kilometre warranty

The all-new Volvo S60 comes to Australia in three levels: T5, D5 and T6. Early next year, the R-Design option will be available on the T5 and T6 models. All models will come equipped with Volvo's dynamic chassis - the touring chassis is available as a no cost option - while R-Design vehicles are equipped with the sport chassis.

Volvo's award-winning City Safety technology is fitted as standard to the S60 range as well as the following suite of other Volvo safety systems:

- Anti-lock Brake System (ABS) with Ready Alert Brakes (RAB)
- Hydraulic Brake Assist (HBA) and Electronic Brake Distribution (EBD)
- Emergency Brake Assist (EBA)
- Emergency Brake Light (EBL), flashing
- Dynamic Stability and Traction Control (DSTC)
- Advanced Stability Control (ASC)
- Airbag, driver and passenger, dual stage
- Inflatable Curtain (IC)
- Pyrotechnic safety belts with pre-tensioners for all five occupants
- Safety belt reminder, all seats
- Rear belt detection, left, right and middle belts
- Side impact Protection System (SIPS) with two-chamber side airbags in front seats
- Whiplash Protection System (WHIPS)
- Intelligent Driver Information System (IDIS)

Design director Peter Horbury commented: 'Safety is the cornerstone of all

Volvos. That's why this safety equipment is standard.'

The pedestrian detection and avoidance technology forms part of Volvo's Adaptive Cruise Control system, which is offered as an option for \$4,175. To make its advanced safety technology more accessible, Volvo has packaged up its driver assistance systems into a pack called the 'Driver Support Pack' for \$4,990, which offers owners the following technology valued at \$7,525:

Driver Support Pack - \$4,990

- Lane Departure Warning with Driver Alert Control
- Adaptive Cruise Control with Queue Assist Function
- Collision Warning with Full Auto Brake and Pedestrian Detection
- Blind Spot Identification System

Combined with Volvo's sharp pricing for the Volvo S60 range, no other competitor in this competitive segment can provide the same level of safety for its occupants - with or without the Driver Support Pack.

Other key standard features across the range include leather upholstery, steering wheel and gear knob, electric-powered driver seat with memory function for seat and side mirrors, auxiliary audio input, USB for iPod connectivity, Bluetooth with audio streaming, rain sensor wipers, park assist rear, electric park brake with drive away release, automatically dimming interior rearview mirror, electric climate control with pollen filters, electric windows and mirrors, Cruise control and on-board diagnostic system with Trip computer, rear armrest with cupholders and storage, 'home safe' approach lights and puddle lights in door mirrors.

In addition, the Volvo S60 range offers 60:40 split-fold rear seats as well as a folding front passenger seat - an unusual touch in a sedan but a feature that adds to the car's functionality and versatility.

Volvo S60 T5 & D5

In addition to the aforementioned standard items across the range, the T5 and D5 also offer 17-inchNjord alloy wheels and Volvo's High Performance Sound system with five-inch colour screen, CD player, AM/FM radio, four 40-Watt amplifiers, auxiliary input jack for MP3 players, a USB port for iPod functionality and eight speakers as standard equipment.

Options for the S60 T5 include Volvo's Four-C chassis, Volvo Navigation System (VNS), rear parking camera, power glass sunroof and Active Bending Lights.

Volvo S60 T6

With the surging power of its 225 kW inline six-cylinder engine and the security of Volvo's AWD all-wheel drive system, the S60 is the performance leader in the allnew T6 range.

As the most luxurious model in the all-new S60 range, the T6 comes with Volvo Navigation System (VNS) as standard, which utilises a super-fast processor to plot routes quickly.

The T6 model also received the top-of-the-range Premium Sound audio system with Dolby Pro-Logic II surround sound, DVD player, seven-inch colour screen, five 130-Watt amplifiers, auxiliary input jack for MP3 players, a USB port and 12 speakers as standard.

This sound system makes the Volvo S60 one of the first cars in the world to use Audyssey Laboratories MultEQ technology, the standard for room equalisation in the home and professional theatre markets. MultEQ removes distortion caused by the car cabin's acoustics, enabling crisp, clear sound for everyone in the car.

Standard S60 T6 equipment also includes power adjustment for both driver and front-passenger seats, with memory settings covering both external mirrors and

seat position on the driver's side, front park assist is also standard as are 18-inch Sleipner alloy wheels.

<u>Warranty</u>

The S60 is backed by a three-year/unlimited kilometre warranty. There's a threeyear, unlimited-kilometre warranty on the paintwork and 12 years guarantee against rust perforation. All Volvos have free recovery Volvo Assistance cover for one year, including breakdown assistance.

7. SECURITY

- Optional Personal Car Communicator (PCC) enhances security
- Home Safe and Approach Lighting
- Remote control central locking and alarm
- Laminated side (water repellent) windows available

No car company has a better reputation for safety than Volvo. But increasingly safety also involves personal security. The Volvo S60 is packed with security features to give owners extra peace of mind.

Side laminated glass

To make break-ins more difficult, the Volvo S60 can be specified with laminated glass in the side windows. The glass repels rain for improved visibility in poor weather.

Personal Car Communicator

Although it looks remarkably like a regular remote control, the Personal Car Communicator (PCC) can do a lot more than just activate the locks and alarm. A simple push of a button can, within a few seconds, tell the car owner if:

- the car is locked or unlocked;
- the alarm has been triggered.

The information is available and up-to-date as long as the distance between the PCC and the car is 100 metres or less. In addition, the most recent data is logged so the owner can at any time and any place check whether the car was locked when it was parked.

Home Safe and Approach lighting

By pressing a button on the remote controller when approaching the car, the driver can turn on the inside lights and the side marker lights. On leaving the car, pulling the headlamp stalk activates the dipped beam headlamps for 30, 60 or 90 seconds (programmable), lighting the path to the door.

Remote control locking

When locked by remote control, not only are the doors deadlocked but the power windows and sunroof (if fitted) are also automatically shut.

- Ends -

Note to Editors

The All-New Volvo S60 Pricing*:

S60 T5	\$51,950
S60 D5 AWD	\$57,950
S60 T6 AWD	\$64,950

*Pricing does not include dealer delivery and other statutory on road costs.

- Ends -