

VOLVO S60

DRIVING DYNAMICS

ENGINES

The Volvo S60 is a sports saloon with a strong emphasis on performance, available with a range of aluminium, five-cylinder, 20-valve engines offering the performance expected by premium sports saloon customers.

A range of turbocharged petrol engines is now topped by the awesome 300bhp Volvo S60 R, and complemented by Volvo's refined and economical turbodiesel, while Bi-Fuel models have an engine that runs on gas or petrol with lower, cleaner emissions and ensures that there's a power source to suit every motoring need.

- Range of aluminium, five-cylinder, 20-valve engines
- Four turbocharged petrol engines with generous torque and power with outputs of 180bhp (2.0T), 210bhp (2.5T), 260bhp (T5) and 300bhp (S60 R)
- D5 163bhp turbodiesel uses direct-injection and common rail technology for refined performance and excellent economy of 44.8mpg on Combined cycle
- 2.4-litre Bi-Fuel model available to operate on CNG or LPG with petrol as the reserve fuel. Fully crash tested, with full type approval, built on same production line as standard car and sold with standard three year Volvo Car UK warranty
- Service intervals: Petrol 18,000 miles/1 year; Diesel 12,000 miles/1 year; S60 R 12,000 miles/1 year

Technical specifications:

Engine	Size	Bhp	Torque Nm@rpm	co2 g/km	Comp ratio	Bore x stroke, mm	Top Speed mph	0-62 mph sec	Kerb* weight Kg	Ins grp	MPG Urban/Extra urban/Comb
2.0T	1984cc	180	240@1850	212	9.5:1	81 x 77	140	8.8	1492	14E	22.8/40.9/31.7
2.5T	2521cc	210	320@1500	217	9.0:1	83 x 93	146	7.0	1497	15E	21.9/40.9/31.0
D5	2401cc	163	340@1750	166	18.0:1	81 x 93	130	9.5	1539	14E	32.8/57.6/44.8
T5	2401cc	260	350@2100	220	8.5:1	81 x 93	155	6.5	1530	16E	22.2/38.7/30.4
R	2521cc	300	400@1950	252	8.5:1	83 x 93	155	5.7	1653	18A	19.5/34.4/26.9
Bi-Fuel:	2435cc	140	214@4500	184	10.3:1	83 x 90	127	10.3	1520	14E	18.3/31.4/24.8
LPG	2435cc	140	220@3300	214	10.3:1	83 x 90	130	10.2	1520	14E	22.8/40.4/31.4
Petrol											
Bi-Fuel:	2435cc	140	192@4500	159	10.3:1	83 x 90	127	10.7	1542	14E	22.2/42.8/31.7
CNG	2435cc	140	220@330	208	10.3:1	83 x 90	127	10.2	1542	14E	23.7/41.5/32.5
Petrol											

* minimum kerbweight. (Actual kerbweight dependent on spec)

Steering/tyres	Rack and pinion with 205-235 (16in-18in) section tyres. S60 R: 18in 235/40Y Pirelli P-Zero Rosso
Turning circle, m (ft)	11.9 – 12.0 (38ft 9in – 39ft 4in). S60 R: 13.0 (42.7)
Transmission	5 speed manual (2.0T, 2.5T, D5, Bi-Fuel) 6 speed manual (T5 and S60 R) Auto: 5 speed
Brakes: Front discs	15in – 286mm Ventilated (D5, Bi-Fuel) 16in – 305mm Ventilated (2.0T, 2.5T) 16.5in – 316mm Ventilated (T5) 330mm (S60 R)
Rear discs	15in – 288mm Ventilated (D5, Bi-Fuel) 16in – 288mm Ventilated (2.0T, 2.5T) 16.5in – 288mm Ventilated (T5) 330mm (S60 R)
Fuel Tank litres (gallons)	70 (15.4) Bi-Fuel: LPG 50 (11.0)/Petrol 29 (6.4); CNG 23Nm ³ /petrol 29 (6.4)
Load capacity: litres (cu ft)	394 (13.9)
Rear seats down	808 (28.5)
Load length: rear seats up	824mm
Load length: rear seats down	1661mm
Dimensions: (mm)	
Length	4576
Width (excluding mirrors)	1813
Unladen height	1428
Wheelbase	2715
Front track width	1561
Rear track width	1542

(Full technical data, prices and options information available on separate file/section, or www.media.volvocars.co.uk)

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A range of turbocharged petrol engines is now topped by the awesome 300bhp Volvo S60 R, and complemented by Volvo's refined and economical turbodiesel, while Bi-Fuel models have an engine that runs on gas or petrol with lower, cleaner emissions and ensures that there's a power source to suit every motoring need.

The S60 uses four of Volvo's 'RN' five-cylinder, all aluminium petrol engines. These are turbocharged (except Bi-Fuel) and feature four valves per cylinder, a twin cam head, centrally mounted spark plugs and Dual Continuously Variable Valve Timing (CVVT) to optimise the combustion process. CVVT permits a dynamic variation in the outlet timing (up to 20 degrees), improving low-end torque and cutting fuel consumption. The system works on the inlet and exhaust camshaft and makes it possible to close the inlet valves earlier in relation to opening the outlet valves. This generates more torque at lower engine speeds.

2.0T

With a low-pressure turbo, the 1984cc, 2.0T version offers a generous 180bhp of power and was recently tweaked to provide the flexibility of maximum 240Nm of torque right from as low as 1,850rpm (instead of 2,200rpm) up to 5000rpm, resulting in a 0-62mph sprint of 8.8sec, a 140mph top speed and emissions of 212g/km.

2.5T

Also using a low-pressure turbo, the larger 2521cc unit in the 2.5T develops 210bhp with a generous 320Nm of torque available from just 1500rpm up to 4,500rpm. The 2.5T sprints from 0-62mph in just 7.0sec and reaches 146mph. But despite this impressive performance, the 2.5T engine returns over 30mpg (in manual form) on the official Combined test cycle with emissions of 217g/km.

T5

The T5 employs a larger low-pressure turbo than the 2.5T engine to deliver greater performance – and fun.

The T5 was upgraded from 2005 model year with a larger 2401cc unit (instead of 2319cc) and a power increase from 250bhp to 260bhp at 5500rpm, while 330Nm of torque is available all the way from 2100-5000rpm. With the standard six-speed manual gearbox, the S60 T5 sprints from 0-62mph in 6.5sec, but can still return over 30mpg on the Combined cycle.

S60 R

For maximum performance and exhilaration, the S60 range is topped by the S60 R. The five-cylinder, 2.5-litre high-pressure turbo engine in the Volvo S60 R provides extremely dramatic performance with a peak power output of 300bhp and 400Nm of torque available from just 1,950rpm, ensuring that the engine is as flexible as it is potent. With the standard six-speed

gearbox, this performance flagship can rocket from 0-62mph in just 5.7sec and on to an electronically limited top speed of 155mph.

D5

Another popular engine in the Volvo S60 range is Volvo's refined 2.4-litre, five-cylinder D5 turbodiesel, which features the latest variable nozzle turbine, Exhaust Gas Recirculation and common rail and direct injection technology. A second generation common rail system enables the fuel to be distributed under very high pressure via a single 'common' fuel line or 'rail'. The combustion can be controlled very precisely, reducing emissions and ensuring maximum performance and refinement.

The D5 engine develops 163bhp and 340Nm of torque from 1,750rpm to 3,000rpm, providing excellent mid-range thrust, a 130mph top speed and a 0-60mph time of 9.5sec. But despite strong performance, the Volvo S60 D5 manages 44.8 miles on a gallon of diesel on the official Combined test cycle, with carbon dioxide emissions of 166g/km.

Bi-Fuel

The lowest, cleanest emissions and potential running costs are also a major benefit of the Bi-Fuel engine that runs on (cheaper) gas with petrol as a reserve fuel. In contrast to some of its rivals, Volvo's Bi-Fuel cars are built on exactly the same production line as the petrol and diesel models and enjoy full type approval and the standard three year Volvo Car UK warranty.

The provision of Bi-Fuel power was also integral to the Volvo S60's original design and so the additional fuel tank has been accommodated without any impact on luggage capacity. What's more, grants may be available from the Energy Savings Trust 'Powershift' programme towards the additional purchase cost of these models, which, once registered, enjoy an exemption from London's congestion charging regulations.

The 2435cc Bi-Fuel engine is the only normally aspirated engine in the S60 range and can be specified to run on either LPG (Liquefied Petroleum Gas) or CNG (Compressed Natural Gas), with petrol as the reserve fuel. The power output is unchanged at 140bhp whether the car is running on petrol or gas, but the torque and emissions figures do vary.

In petrol form, the Volvo S60 Bi-Fuel develops 220Nm of torque and CO2 emissions of 214g/km (LPG) or 208g/km (CNG), which compares with 214Nm and 184g/km when running on LPG and 192Nm and 159g/km for CNG.

In terms of performance, with a manual gearbox, the Volvo S60 Bi-Fuel sprints from 0-62mph in 10.2sec in petrol mode, while it takes 10.3sec when powered by LPG, and 10.7sec for the

CNG variant. However, the lower running costs (especially for Companies that 'bunker' gas supplies), and environmental savings from lower and cleaner emissions offer ample compensation.

CHASSIS

The Volvo S60 was designed from the outset to be an engaging sports saloon, delivering driving pleasure with a high level of active safety. The combination of a sophisticated suspension set-up with extensive use of lightweight aluminium components, high torsional rigidity, a class-leading track width and the latest electronic DSTC (Dynamic Stability and Traction Control) stability systems as standard ensure the S60 is always a pleasure to drive.

An optional Sports Handling Pack is also available, plus Volvo's advanced, second generation Four-C (Continuously Controlled Chassis Concept) active chassis with Sport and Comfort settings.

However, for drivers seeking the ultimate high-performance all-rounder there is the S60 R. This 300bhp flagship saloon has All Wheel Drive (AWD) incorporating an electronic Haldex coupling that works in conjunction with Volvo's active 'Four-C' sports chassis that's specifically tuned for the variety of UK road conditions with Advanced Sport as well as Sport and Comfort settings.

- High-performance sports saloon with high level of active safety
- Sports chassis
- High torsional rigidity of over 20kNm/degree
- Sophisticated multi-link rear suspension with extensive use of lightweight aluminium components
- Long wheelbase and wide front track provide stability and control
- Dynamic Stability and Traction control (DSTC) standard on all models
- Sports Handling Pack available (optional)
- Volvo's second generation 'Four-C' active chassis available (optional)
- Volvo S60 R uses Volvo's second generation 'Four-C' active sports chassis with All Wheel Drive using electronic Haldex coupling

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High torsional rigidity allows the suspension to do its job properly and its provision was integral to the Volvo S60's design. Extensive use of High Strength Steel (HSS) in the car's construction has resulted in a torsional stiffness in excess of 20kNm/degree, compared with a typical rating for a four-door saloon of between 6 and 14kNm/degree. This benefits not only the ride and handling characteristics of the Volvo S60, but also its crash-worthiness.

Suspension

All UK specification S60s (except Bi-Fuel) have Volvo's sports chassis set-up. An independent, MacPherson strut arrangement at the front incorporates anti-lift and anti-dive technology to enhance the car's stability in all conditions. At the rear, the Volvo S60 employs a sophisticated multi-link system, mounted in a chill-cast aluminium subframe. This permits a small degree of passive rear-wheel steer when cornering, to maximise stability and control. Anti-roll bars also feature at both ends.

The class-leading front track width and long wheelbase provide a further contribution to the Volvo S60's exceptional stability. The wide track helps improve the car's balance, enabling it to cope with high cornering forces, while providing clear and consistent feedback to the driver. Likewise, the long (2715mm) wheelbase contributes to a balanced weight distribution with a low minimal moment of inertia. In practical terms, this enhances the steering response and helps ensure that the Volvo S60 responds in a controlled, predictable manner in all circumstances, making a major contribution to active safety.

DSTC, EBD and EBA

The S60's carefully honed mechanical set-up is backed by sophisticated traction and stability control systems. Dynamic Stability and Traction Control (DSTC) is standard on every model and prevents wheelspin by either braking the wheel that has lost traction (up to 25mph) or, at speeds above 25mph, by reducing engine power and using extra sensors to detect the onset of a skid. The system then automatically slows the appropriate wheel to restore control. It ensures that the driven wheels get exactly as much power as they can transfer to the road.

All S60's benefit from ABS brakes with EBD (Electronic Brake Distribution) and EBA (Electronic Brake Assist) which senses an emergency stop and automatically brings the car to a halt in as short a distance as possible.

Enthusiastic drivers can choose to enhance the S60 further with the options of lowered sports chassis with load compensating suspension, Sport Handling Pack or Volvo's advanced 'Four-C' (Continuously Controlled Chassis Concept) active chassis system.

The Sports Handling Pack

For more responsive handling and some added 'cool' appearance, a Sports Handling Pack includes 18in 235/40 Nebula BBS split rim alloy wheels, Volvo's active 'Four-C' chassis and speed dependent steering.

Second Generation 'Four-C' Chassis

The advanced electronics of Volvo's second generation 'Four-C' (Continuously Controlled Chassis Concept) technology allow all of the car's dynamic systems to communicate and work in unison and has now been specifically optimised for the variety of UK road conditions.

The car's speed, wheel movement and steering are continuously monitored via Multiplexed control systems that update the suspension settings 500 times per second.

The advanced electronics allow the driver to choose between different suspension settings at the touch of a button on the dashboard for maximum driver choice, control and enjoyment.

Standard models have the choice of two settings -Sport or Comfort chassis settings, which are tuned for a more sporting ride for the S60 (compared to V70 or XC70).

This is taken one stage further for the S60 R with Sport, Comfort, plus an additional third setting – Advanced Sport:

Sport – Standard mid-setting for sporty driving. ('Sky-hook' control technique)

Advanced Sport – Uncompromising sports car handling, prioritising maximum driving pleasure using 'direct road contact' control technology, ('Road Contact' control technique)

Comfort – Optimises ride comfort using 'Sky Hook' control technology to make the car feel like it is suspended from an artificial horizon. ('Sky-hook' control technique)

For the S60 R the 'Four-C' system works in conjunction with a sophisticated all-wheel drive system. Developed in conjunction with the Swedish specialist Haldex, the AWD operates independently of driver input, distributing torque automatically between the front and rear wheels via an electronically controlled coupling for the best possible grip in all conditions.

The intelligent AWD system uses a variety of sensors to monitor the road surface and the steering wheel, brake and accelerator pedal positions. In normal driving conditions on dry roads, almost all the power is distributed to the front wheels. However, if the sensors detect slippage, torque is proportionately diverted to the rear wheels to maximise traction. This

system responds in just one-seventh of a wheel turn, making an outstanding contribution to active safety and driver enjoyment.

STEERING, BRAKES AND TRANSMISSIONS

The Volvo S60's power assisted ZF rack and pinion steering (available with optional speed-sensitive function) is responsive and offers plenty of driver feedback, while the anti-lock brakes are boosted by Electronic Brakeforce Distribution (EBD) and Electronic Brake Assist (EBA).

A five-speed manual is standard across most of the range, with the exception of the T5 and S60 R which have six-speed gearboxes. But for those who prefer to let a computer take the strain, Volvo offers two five-speed automatic transmissions. Both adapt their shift points to suit individual driving styles but the alternative Geartronic system also permits sequential manual changes for added control.

- Power-assisted rack and pinion steering tuned to optimise feedback and response. Speed sensitive steering also available (optional)
- Anti-lock brakes (ABS) with Electronic Brakeforce Distribution (EBD) and Electronic Brake Assistance (EBA) standard on all models
- Six-speed manual standard on T5 and the S60 R. Five-speed manual standard on all other models
- 'Spaceball' aluminium gearlever std on manual T5, Sport models and S60 R
- Five-speed adaptive automatic available (optional)
- Geartronic adaptive automatic with sequential manual shift facility available (optional) on D5, 2.5T, T5 and S60 R

The Volvo S60 uses a power-assisted ZF rack and pinion steering system that has been developed to optimise driver feedback and response. The steering feel has been improved through careful tuning of the torque build-up during cornering. This helps the driver place the car accurately on the road and to assess the available grip.

An optional speed dependent steering is available that provides additional assistance at low speeds and more steering feel as speed increases.

The large disc brakes are derived from those fitted to the larger, heavier Volvo S80, and have been designed to reflect the car's sporting potential. Larger, four-piston Brembo brakes front and rear ensure the S60 R's braking matches its performance. And as you'd expect from Volvo, an anti-lock braking system is fitted as standard, plus DSTC (Dynamic Stability and

Traction Control), joined by Electronic Brakeforce Distribution (EBD) and Electronic Brake Assist (EBA).

EBD constantly distributes braking power between the front and rear wheels to ensure maximum retardation regardless of the road conditions or how the car is laden. EBA automatically senses when an emergency stop is required and adjusts the braking pressure so that the car comes to a halt in the shortest possible distance.

Four different transmissions are available on the Volvo S60. Most models have a five-speed manual gearbox, while for maximum flexibility the T5 and S60 R have a sixth ratio.

A stylish, aluminium 'Spaceball' gearlever is standard for manual transmissions on all Sport models, the T5 and S60 R, but also available as an option for other models.

For drivers who prefer to let a computer take the strain, Volvo has a choice of two automatic gearboxes. There's a fully adaptive unit available for the 2.0T and Bi-Fuel with five speeds that automatically adjusts its shift patterns according to an individual's driving style. But on the D5, 2.5T, T5 and Volvo S60 R models, this is upgraded to a Geartronic system with a fully adaptive five-speed automatic that also offers the driver the opportunity to choose gears manually. Gears are selected sequentially by tipping the lever forwards to change up and backwards to change down.