

## **THE NEW ALFA ROMEO 156: SAME BEAUTIFUL LOOKS, NEW MUSCLES, NEW BRAIN**

Alfa Romeo has made no changes to the stunning good looks of its award-winning Alfa 156 to produce the new 156, but it is all-change under the skin with new engines, technology, trim and equipment ensuring that the Alfa 156 remains the benchmark car in its class.

Leading the changes to the 156 is the new JTS engine, the most advanced engine of its type in the world. The JTS engine has set a new standard for direct injection lean burn technology, delivering the performance, fuel consumption and emission gains promised by this cutting edge technology and removing the drawbacks encountered by other car makers.

Fitted with the new JTS engine, the Alfa Romeo 156 in both five speed manual and Selespeed sequential manual gearbox versions now has a top speed of 220 kmh and it dispatches the dash to 100 kmh in just 8.2 seconds, while also offering average fuel consumption in the EU test of 6.6 litres per 100 km.

Alfa Romeo has also revised the 2.5 litre version of its legendary V6 engine to make it cleaner and more powerful. With this engine under the 156's shapely bonnet, it has a top speed of 230 kmh in six speed manual form and it dispatches the 100 kmh sprint in 7.3 seconds. With the Q-System automatic gearbox, the figures are 227 kmh and 8.5 seconds.



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Safety is enhanced at all levels. Active safety – the ability to avoid accidents – is enhanced with the standard fitment of Vehicle Dynamic Control (VDC), Motor Speed Regulator (MSR) and Emergency Brake Assist (EBA).

These, respectively, help the driver maintain control of the car in emergency situation, stop wheel lock up skids caused by sharp gear changes and take over braking in emergency situations for the fastest possible stop, reducing braking distance by up to 35 per cent in an emergency.

Every Alfa Romeo 156 is now fitted as standard with six airbags, with window air bags joining the front air bags and the side impact airbags fitted in the sides of the front seats. This combination of six airbags enables the new Alfa Romeo 156 to offer, combined with features such as the occupant safety cell surrounded by deformable sections, a new level of occupant safety in the event of an accident.

Inside the new Alfa Romeo 156 the classic style that made the 156 such a breath of fresh air compared to the cold clinical interiors of its competitors remains, but it has been enhanced with new equipment, a new finish to the dashboard and a new centre console.

The new equipment includes a multi-zone climate control air conditioning system that enables the front seat occupants to set their own temperature settings. Its efficiency is enhanced by larger dashboard top vents in a new unit that also houses the Alfa Romeo InfoCentre, an LCD screen that houses the trip computer and external temperature readout.

Even in an Alfa Romeo there are times when the road is so ordinary or where speed limits mean that the natural ebullience of the 156 must be suppressed that a cruise control is required and a sophisticated electronic cruise control is now standard. Working directly on the engine management system, the new cruise control provides smooth, unfussed operation.

Complimenting the glorious sound made by Alfa Romeo engines, the new JTS and the refined and reworked 2.5 litre V6 engine, the Alfa Romeo 156 has a new Blaupunkt audio



system that is fully integrated into the new centre console. In addition to its powerful amplifier, six speakers and state of the art CD player, operation is simplified by new steering wheel mounted controls.

Completing the new interior is the new centre console trim that leads to redesigned panels around the handbrake and a new armrest that includes a storage box.

Compared to the out-going car, the new Alfa Romeo 156 – already a very well equipped car – gains Split Climate Control Air Con, automatic rain sensing wipers, headlight washers, window airbags, ASR Traction Control, leather upholstery (the standard car had cloth, leather came either as an option or with the Monza versions), Blaupunkt stereo system integrated into the dashboard, trip computer, Side Skirts (not standard on the entry level car, they were part of the Monza versions), VDC and EBA on the ABS brakes

The new Alfa Romeo 156 range opens with the Alfa Romeo 156 JTS – which replaces the 156 Twin Spark versions – and this model is available with a choice of a five speed manual gearbox at \$49,950 or with Alfa Romeo direct-from-Formula One Selespeed sequential manual gearbox at \$52,950. Fitted with a revised version of Alfa Romeo legendary V6 engine, the Alfa Romeo 156 V6 24V is now priced at \$57,500 with the six speed manual gearbox and \$59,950 with the unique Q-System automatic gearbox with its “H-Gate” operation.

“These changes to the award-winning Alfa Romeo 156 now only enable it to maintain its benchmark position in the sports sedan class,” says Kevin Wall, General Manager for Alfa Romeo in Australia, “they will enable it to extend its position in the Australia market and contribute even further to Alfa Romeo’s Australian success.”

## **THE ALFA ROMEO JTS ENGINE: DELIVERING THE LEAN BURN PROMISE**

It has long been known that lean burn technology and direct fuel injection held out the promise of better fuel economy, lower emissions and more power and torque for a given



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engine capacity. However, until now, the drawbacks of poor high engine speed performance, the requirement for low-sulphur fuel and the requirement for extensive emission equipment to cut the nitrogen oxide emissions (and which lead to nitric acid rain) have proven substantial barriers to putting this technology in production.

But for Alfa Romeo, renowned for its highly efficient engines – the 2.0 litre Twin Spark engine, with 114 kW was, until the arrival of the JTS, one of the most efficient and highest specific output engines in the world – direct injection and lean burn technology offers a significant step up in efficiency, emissions and performance.

That Alfa Romeo has met its targets is clearly illustrated by the figures. The new JTS engine has exactly the same capacity as the Twin Spark engine it replaces, yet power is up from 114 kW to 121 kW; torque rises from 187 Nm to a remarkable 206 Nm. The new engine meets the ultra tough Euro 4 emissions standards and yet, despite the performance gains, fuel consumption stays virtually the same. And, particularly important in Australia, there is no requirement for low sulphur fuel. It also delivers smooth and potent performance to the top of its rev-range.

On the road this translates into providing the Alfa 156 with more tractable performance in all the gears, a smoother torque and power curve delivers more refined performance and, in raw figures, top speed rises from 216 to 220 kmh and the zero to 100 kmh time is cut from 8.6 to 8.2 seconds.

So how has Alfa Romeo managed to achieve what other car makers have been trying to do for decades?

Alfa Romeo's answer is as simple as it is sophisticated. At low engine speeds, which the engine operates for the major part of the time, it operates as a lean burn engine, while at higher engine speeds it progressively switches to a normal fuel air mixture to provide the top end performance so beloved of Alfa Romeo drivers. The latter is both enhanced and enabled by



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the use of direct fuel injection, with the fuel pumped directly into the cylinder head around the sparkplug, boosting volumetric efficiency and performance.

With regard to emissions, the combination of the direct injection and lean burn only at lower engine speeds means that  $\text{No}_x$  emissions are similar to normal engines and the large  $\text{No}_x$  catalyst converters are that are typically needed and which reduce performance with high back pressures are not required. The absence of these catalysts also means that JTS owners do not have to worry about high sulphur fuel.

In all, the Alfa Romeo JTS engine is a technical tour de force and is worthy successor to the array of advanced, high performance engines on which Alfa Romeo has built its reputation.



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## The **New** Alfa Romeo 156

### **Design integrity leads to sustained success**

There is no doubting the success of the Alfa Romeo 156. It has redefined Alfa Romeo for the 21<sup>st</sup> Century and provided the spring board for a host of other models, some already on sale, such as the Alfa 147, and many more to come.

Its success, made possible by the skill of its styling and supported by the integrity of its engineering and production, has endured since the debut, through countless awards to thousands of customers around the world.

The Alfa Romeo 156 has won the hearts of more than half a million owners in 80 countries in four years for the sedan and two years with the 156 Sportwagon. In Europe, this car has easily tripled Alfa Romeo's market share (+335 per cent) of the medium-sized saloon segment to take Alfa Romeo's market share from 0.7 per cent in 1996 to 3.3 per cent in 2001 (+350 per cent). It has also made a crucial contribution to boosting overall Alfa Romeo sales that have risen from 117,500 in 1996 (0.9 per cent) to 202,100 in 2001 (1.4 per cent), with an increase of 72 per cent in Europe.

In Australia the 156 transformed Alfa Romeo from a niche sports car company, to a company that has increased its sales every year and grown into a true competitor for the major players in the sports and luxury sectors.

Four years after its launch, the model has not only met its ambitious targets but exceeded them beyond Alfa Romeo's wildest dreams. This is apparent in the plaudits of the specialised press, who have awarded the car no fewer than 36 prizes to date to acknowledge the Alfa 156's brand-new approach to sports sedans that encompasses comfort, safety and sophisticated technology. Above all, this success is confirmed by the opinion of the 100,000 motorists – in 2001 alone - who chose the car in one of the 80 countries where it is sold. This Alfa sports saloon is currently the most widely-sold Fiat Auto model in the world.

Every European market without exception has confirmed its appreciation for this model, in a segment (segment D) where some three million units are sold in Europe every year. In 2001, the Alfa 156's share of 13.9 per cent in Italy was backed by a share of 2.1 per cent in France, 1.9 per cent in Great Britain, 1.6 per cent in Germany and 1.2 per cent in Spain. In Australia the 156 took 3.3 per cent of its market sector, demonstrating just how influential this model has been for the brand locally.

Interestingly enough, the more opulent and exclusive versions make up a significant proportion of total model sales. For example, Alfa 156 and Sportwagon cars with JTD engines account for a 51 per cent share (with 38 per cent showing an overall preference for the 1.9); while the 2.0 and 2.5 versions represent 21 per cent of the total (40 per cent of these are fitted with sophisticated Selespeed and Q-System gearboxes).



In Australia, 156 sales have been dominated by the 156 Selespeed, which has taken anything up to 80 per cent of the 156's Australian sales, depending on Alfa Romeo's ability to meet demand.

These results confirm customer interest for premium model versions and are particularly interesting considering the fierce sales competition generated by the arrival of new models and radically face-lifted models on the international scene. A total of 52 models were present in 2001. Despite all this, the Alfa's innovative stylistic flair, pronounced personality and air of distinction, enabled it to hold its head up with pride and win over customers from other brands in unprecedented numbers: 87 per cent in Great Britain, 73 per cent in Spain, 71 per cent in Germany, 70 per cent in France and 56 per cent in Italy. In Australia, with no model to replace, every sale was a conquest from another manufacturer, the hardest type of sale to achieve, making the instant sales performance in Australia even more impressive.

All in all, the Alfa 156 has lived up to its promise and managed to achieve major goals. The credit is definitely due to the model's solid grounding: the best of Italian design combined with state-of-the-art engineering and a very good mix of power units and gearboxes. These have been complemented by a steady flow of new features to keep the public's attention. Simply think back to the 2000 launch of the Sportwagon, a car that was obviously not just any old station wagon version of the Alfa 156. And then the arrival of the 156 Selespeed with its 2.0 Twin Spark 16V engine and robotised gearbox with steering wheel controls directly derived from the single-seater F1 Ferrari. These were then joined by another Alfa 156 with 2.5 V6 24V engine that offered customers Alfa Romeo's version of automatic transmission, i.e. a device created to ensure maximum comfort under all conditions but able to guarantee all the driving satisfaction of a manual device when required.

The New Alfa 156 represents the next stage of this process, where more comfort and safety features, more opulent interiors and a revolutionary direct injection petrol engine have been added to complement the appeal of the 156, something that customers cannot seem to get enough of.



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## **The New Alfa Romeo 156**

### **JTS: Setting a new performance standard**

Alfa Romeo cars have always been distinguished by their up-to-date power units and scintillating performance, a motoring tradition that fills many pages of the international motoring history books and remains alive in the New Alfa 156.

The heart under the bonnet of the new 156 is the revolutionary 2.0 JTS, forerunner of a new direct injection petrol power unit family that will equip brand models from now on. In addition the legendary Alfa Romeo V6 engine has been upgraded with more performance and lower emissions to translate heritage into a 21<sup>st</sup> century power unit.

Performance engines, therefore, that also offer moderate fuel consumption and respect for the environment. These engines come with efficient, precise gearboxes, such as the innovative Selespeed system that offers a revised operating strategy for greater driving satisfaction in complete safety.

### **JTS: Alfa Romeo's interpretation of the direct injection petrol engine**

At its first outing in autumn 1997, the Alfa 156 immediately won the hearts of public and experts alike for its good-looking styling, thrilling performance and on-road behaviour and also for its sophisticated engineering, so perfectly consistent with the brand's great motorsport tradition. This was the first car in the world to be fitted with common rail direct injection turbodiesel power units. The engineering principle that was subsequently to win such success with other manufacturers.

The Alfa 156, aiming for more engineering excellence, now offers another world first: the first direct injection petrol engine with a specific power greater than 60 kW/l (82 bhp/l) and a specific torque of more than 100 Nm/l. An ultra-high performance power unit that takes the name of JTS (Jet Thrust Stoichiometric) from its specific combustion system, an acronym that is destined to identify an entire family of future Alfa Romeo engines.

As far as the customer is concerned, this means a two litre car that:

- Already meets stringent Euro 4 emission limits;
- Does not need low sulphur petrol but is able to use the normal petrol already on sale in Australia, Europe and the United States.

The New 156 is the first petrol engine from Alfa Romeo (and indeed Fiat Auto) with injectors that work directly in the combustion chamber. It achieves its end by interpreting the principles of stratified charge and the creation of motion in the mixture inside the cylinder in an entirely





original way.

### **Lean burn, but not too lean**

The possibility of injecting petrol directly into the combustion chamber instead of the intake duct has been known since Nikolaus Otto (who took out a patent in 1877) and has been applied for two different purposes over the years, on racing cars in the Fifties and Sixties to increase engine power and more recently from since 1996 to reduce fuel consumption.

Recently, manufacturers have devoted all their efforts to this latter direction and good results have been achieved with the stratified charge method. The principle is simple: instead of injecting all the petrol required to maintain the normal air-fuel ratio of 14.7:1 (stoichiometric) throughout the combustion chamber, only a small amount of fuel is injected that mixes with the air to form a core of almost stoichiometric composition about the spark plug. The resulting mixture is stratified or layered because it is richer where the ignition spark ignites and increasingly lean (more air and less fuel) as it approaches the outside of the chamber.

So far the benefits of this lean burn system, usually applied in the rpm band up to 3000 rpm, have amounted to a fuel saving of some 10 per cent. The disadvantages may be summarised as follows:

- A drop in performance when the car is required to deliver full power (because the ducts and pistons are shaped in a certain way that is essential to reduce fuel consumption at low speeds);
- The need to use sulphur-free fuel that is difficult to find in Europe and practically unknown in Australia and in the US;
- The requirement for exhaust gas treatment methods (DE-No<sub>x</sub>) to reduce the higher nitrogen oxide emissions generated by the leaner burn.

It goes without saying that Alfa Romeo's approach to the new technology had to be quite different. Category-topping performance and irrepressible driving behaviour have always been essential requirements for all Alfa Romeo models.

But what was to stop Alfa Romeo from using direct injection to increase engine power and torque in keeping with the sporty applications of this technology? Then, Alfa's engineers reasoned, the stratified charge system could be brought in to reduce fuel consumption within a restricted rpm band around idle speed.

The result was an entirely original Alfa Romeo approach to applying direct injection in petrol engines. A solution that offered a compromise between the two methods pursued to date.

The New Alfa 156 2.0 JTS works using a lean burn approach up to around 1500 rpm and this saves fuel, although not as much as on other lean petrol direct injection engines. Above this rpm, the engine burns a stoichiometric air-fuel mixture, i.e. with a normal 14.7:1 ratio between both components. All this means outstanding performance. This is much better than would be obtained using a normal indirect injection petrol unit.



Firstly, because petrol injected directly into the combustion chamber instead of the duct cools intake air to increase the engine's volumetric efficiency. As temperature drops, the gases increase in density and their volume therefore decreases: this means that more air can be introduced into the combustion chamber.

Power unit susceptibility to knock is also reduced by chamber cooling. It is therefore possible to increase the compression ratio – in this case from 10:1 for the 2.0 T. Spark to 11.3:1 for the 2.0 JTS.

This means more power for the new Alfa Romeo engine that is, moreover, able to deliver its power unhindered because the exhaust gas treatment system used on the 156 does not generate the strong back-pressure typical of the  $\text{No}_x$  catalysts used by lean petrol DI engines.

Direct introduction of petrol into the chamber improves power unit response speed to the accelerator control and it is faster overall than a conventional petrol engine.

### **Benefits: higher performance and lower fuel consumption**

Compared to the current 2.0 Twin Spark unit and other currently-available direct injection petrol engines, the 2.0 JTS unit fitted to the New Alfa 156 offers slightly lower fuel consumption and a generous increase in power and – above all – torque. The new JTS engine has exactly the same capacity as the Twin Spark engine it replaces, yet power is up from 114 kW to 121 kW; torque rises from 187 Nm to a remarkable 206 Nm. And all this is achieved using petrol currently on sale and current catalytic converters.

### **A new combustion chamber principle**

The new JTS combustion system displays two distinctive features:

- The principle followed to generate the movement that propels the air and fuel mixture toward the spark plug inside the cylinder;
- The range of rotation speeds within which the engine works using a lean burn system.

In other Gasoline Direct Injection (GDI) engines, the air's force drags the fuel spray into the area where the ignition spark ignites. This option is determined by a desire to achieve a very lean mixture (up to 60:1) and thus consistent fuel savings. But it brings a need to change the air's motion within the combustion chamber - the charge motion - according to rpm level and this complicates the air input mechanisms, such as throttles, duct closure systems etc.

On the 2.0 JTS, however, the force of the fuel spray (Jet Thrust) propels the fuel toward the spark plug as it mixes with the air. In this way, it achieves a charge that is less lean overall (the ratio remains constant at all speeds and is 25:1) and less fuel is consequently saved. But the engine's internal mechanism is far less complicated because it lacks systems for altering the air's motion.

The same process of simplification also guarantees the limitation of lean burn technology to



rpm levels around idle speed (up to 1500 rpm). GDI engines that use stratified charge within a broader speed band (up to 3000 rpm) must employ modified piston and duct profiles. The resulting shape does not allow power to be optimised at high speeds.

The use of stratified charge only up to 1500 rpm, however, means that the pistons and ducts on the 2.0 JTS Alfa Romeo are hardly altered. Because their shape is more similar to those of current indirect injection engines, they are able to exploit all available power at high speeds.

The addition of an exhaust gas treatment system ( $\text{No}_x$  catalyst) to remote nitrogen oxides is also only required when the lean burn range is extended up to 3000 rpm. This also dictates the use of sulphur-free fuel, i.e. the only type that will not damage the catalytic converter.

The use of stratified charge only at speeds around idle speed, however, allows the 2.0 JTS unit fitted to the New Alfa 156 to use a conventional catalytic converter system. This result is also made possible by a more extensive use of exhaust gas recirculation, which reduces the production of nitrogen oxides ( $\text{No}_x$ ). Because Alfa Romeo engines are fitted with variable valve timing, exhaust gas is recirculated to the intake on the 2.0 JTS directly between the intake and exhaust valves (internal EGR).

### **Engineering: what changes**

The main engineering changes on the 2.0 JTS compared to the corresponding Twin Spark engine affect the cylinder head (with Bosch injectors fitted in the chamber), pistons, camshafts and exhaust system. All these components are completely new.

The intake ports are high performance; the fuel manifold is high pressure (common rail type); piston compression ratio is higher - and the exhaust – built to Euro 4 standards – is cascade type.

The exhaust gas treatment system works conventionally despite an unconventional layout: the system no longer consists of a preconverter and a main converter located under the body. Instead it comprises two main catalytic converters built into the manifold (each connected to a double branch that leads to two cylinders). This frees up the space under the body for a silencer that is more permeable and thus more able to reduce back pressure for fuller engine power delivery.



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## **The New Alfa Romeo 156**

### **The Alfa Romeo Selespeed Gearbox**

Following its success on the Alfa 156 and Sportwagon and then on the Alfa 147 2.0 Twin Spark, the Selespeed gearbox is again playing a significant role in the new range, especially in Australia where it accounts for up to 80 per cent of sales.

The system operating functionality has, however, been improved – particularly when the device is used in 'CITY' mode. On this setting, the driver can now change a gear, to perform an overtaking manoeuvre, for example, without coming out of City mode.

The Selespeed unit fitted to the New Alfa 156 is therefore even more sophisticated and offers customers the possibility of discovering an easy, sporting, convenient and safe way of driving in all situations.

Easy, because the gearbox, with its robotised gear shift and clutch control, can be manoeuvred using two paddles behind the steering wheel or a sequential gear stick control on the tunnel between the seats.

Sporting, because it allows fast, accurate gear changes for improved performance.

Convenient, because it is less tiring than a conventional gearbox. The system lacks a clutch pedal and gears are easy to engage: there is no risk of grinding gears or slipping the clutch and the engine never stalls accidentally. The transmission also ensures smooth shifts and gradual torque delivery to the wheels. And of course the Selespeed converts into a relaxing automatic transmission that is ideal around town when in CITY mode.

The Selespeed is also very safe. It boasts an array of features designed to prevent the driver from making incorrect commands. It also allows the driver to maintain full control of the wheel even during gear changes when the driver does not have to take a hand away from the steering wheel to reach the gear stick. Without a clutch pedal, the driver is also more firmly anchored in the seat on corners because he can brace himself with his free leg.



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## **The New Alfa Romeo 156**

### **More Safety – VDC, EBA, MSR & 6 Airbags**

The new Alfa Romeo 156 employs the most sophisticated devices currently on the market allow maximum protection for driver and passengers. On the active safety front, the New Alfa 156 offers: VDC with Emergency Brake Assist for total control of car dynamic stability under all conditions. As far as passive safety is concerned, the array of features is complemented by front airbags, front sidebags and window-bags.

#### **VDC with Brake Assist**

To ensure absolute mastery of the car under all conditions, however extreme, the entire New Alfa 156 range is fitted as standard with VDC (Vehicle Dynamic Control) with an emergency brake assist device (EBA).

This innovative device cuts in under extreme conditions when car stability is at risk and also helps the driver control the car. As befits a true Alfa, the VDC is a sporting device that allows outstanding roadholding. It allows the driver to experience the full pleasure of controlling the car as long as conditions are normal and only cuts in when the situation is just about to become critical.

The VDC is permanently engaged.

The MSR (Motor Speed Regulator) cuts in when the gear is shifted down abruptly under conditions of low grip. This device restores torque to the engine to prevent the wheel skidding as a result of lock.

To achieve this result, the VDC continually monitors tyre grip in both longitudinal and lateral directions. If the car skids, it cuts in to restore directionality and ride stability. It uses sensors to detect rotation of the car body about its vertical axis (yaw speed), car lateral acceleration and the steering wheel angle set by the driver (which indicates the chosen direction). It then goes on to compare these data with parameters generated by a computer and establishes – via a complex mathematical model – whether the car is cornering within its grip limits or if the front or rear is about to skid (understeer or oversteer).

To restore the correct trajectory, it then generates a yawing movement in the opposite direction to the movement that gave rise to the instability by braking the appropriate wheel (any of the four wheels) individually and reducing engine power via the throttle. This is the key attribute of the device designed by Alfa Romeo engineers. It acts in a modulated fashion on the brakes to ensure the action is as smooth as possible and the drive is not therefore disturbed. The engine power reduction is contained to ensure outstanding performance and great driving satisfaction at all times.

As it carries out its complex task, the VDC stays in constant communication with the brake sensors and engine control unit but also with:



- The Body computer that constantly exchanges information with the ABS, engine management unit and automatic transmission unit;
- The electronic throttle (that communicates with the ABS in turn);
- The control panel (active warning lights);
- The steering wheel and steering column (via the steering sensor);
- A gyroscopic sensor installed on the passenger compartment floor to record car yaw and lateral acceleration.

The VDC fitted to the New Alfa 156 also comes with an emergency brake assist device. The function is carried out electronically by the ABS control unit and is referred to as EBA (Emergency Brake Assistance). In panic braking situations, most drivers recognise a situation of danger and press the brake pedal very quickly. But not, however, with sufficient force. This is because people, unless they are professional drivers, are used to applying a certain load to the brake pedal. Because people tend to switch to autopilot mode when they carry out repetitive actions, the same level of force tends to be applied in all circumstances.

On the New Alfa 156, however, the Brake Assist device cuts in at this point. Although the pressure on the pedal is unchanged, the car is decelerated by the same amount as it would be if it were braked with all the necessary force. The figures: If an average load of 9 Kg is applied to the brake pedal, the HBA reduces the stopping distance by 35%.

And there is more. Panic brake assist devices can even help experienced drivers who brake quickly and apply the correct amount of force in emergencies. This is because the system reduces braking attenuation time in all cases, i.e. the period between the time when pressure begins to be applied to the pedal and the moment when the circuit reaches maximum pressure and is able to offer maximum performance. This means that a vital tenth of a second is gained. At 100 km/h, this means nearly three metres (2.8) and more than three and a half metres (3.6) at 130 km/h.

## **Window-bags**

These airbags are fitted as standard on all versions and drop down along the windows to safeguard the passengers' heads in the case of side impact. Compared to other solutions, the window-bags adopted on the New Alfa 156 are more protective (because they always take up the correct position), faster to inflate and less invasive for passengers.

They open from top to bottom and do not involve a risk of secondary damage to occupants' arms. They also effectively safeguard the heads of front and rear passengers because they extend along the entire width of the window and ensure protection even during rollover.

Two bags (one on the right and the other on the left) are located under the roof rails where they are folded into a closed compartment. At the appropriate moment, the covering bends open to allow the bags to expand and drop downward.



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## **The New Alfa Romeo 156**

### **More comfort, More convenience**

The New Alfa 156 inherits from its predecessor an interior that is able to ensure all the comfort you expect from a sports saloon in terms of user-friendliness and space available to driver and passengers. It now also offers all the extra systems and devices that have been made available by technological advances: bi-zone automatic climate control system, Cruise Control, new instrument panel, radio with steering wheel controls and a sophisticated Hi-Fi system.

#### **Bi-zone automatic climate control system**

Interior climate is one of the main comfort factors during a trip and is also very important for interior safety because temperature, humidity and ventilation affect the driver's well-being and thus his level of alertness. And of course the heating and ventilation system is also responsible for demisting the windscreen and side windows. For this reason, the New Alfa 156 comes with a sophisticated climate control system that automatically controls temperature, air flow, air distribution, compressor activation and recirculation by means of an electronic control unit. It also acts as a bi-zone climate control system, i.e. able to ensure two different temperatures simultaneously: one in the right part of the passenger compartment and the other in the left.

The Alfa 156 also implements an equivalent temperature climate control strategy. It records internal and external temperature by means of certain sensors and assesses the sensation of thermal well-being experienced by passengers, i.e. the energy exchange between human body and passenger compartment that is affected by humidity, temperature and treated air flow.

Another sensor located in a central position at the windscreen base records solar radiation on the car and the angle at which the rays strike the passenger compartment. This allows the system to prevent an excessive increase in temperature inside the car caused by the sun and thus to inform the climate control system in time.

All these parameters are monitored continuously and used to update the distribution, ventilation and mixing automatically. Air temperature at the outlets and fan speed are therefore adjusted to ensure passengers experience the desired sensation of thermal well-being (achieved by setting the required temperature). The result is a constant climate, even with significant changes in external conditions.

The system may be adjusted to one of seven set combinations to allow air taken into the car to reach all areas of the passenger compartment. The system also offers three possible temperature settings: 'LO' (maximum cooling), 'HI' (maximum heating) and 'MAX DEF' (fast defrost).

The possibility of altering interior temperature gradually, half a degree at a time, makes for



outstanding climatic comfort. The knob can be used to bring about a temperature change of 16°C, with a maximum temperature difference of 7 degrees between the left and right areas.

Manual adjustment is used for: setting the interior temperature (right and left), voluntary air flow distribution changes, fan speed (if air flow is to be altered) and fan deactivation, compressor deactivation (in practice, the system works in the same ways as an automatic heater), recirculation control and the 'MAX DEF' function for fast defrosting.

Manual choices always over-ride automatic settings. They are also indicated by deactivation of the Full Auto led and stored until the user cancels the command. Each time the system is turned on, it returns to the conditions saved upon deactivation, except for the 'MAX DEF' function, which is zeroed. The entire system can also be turned off manually to deactivate the air conditioning system fully.

## **Cruise Control**

The New Alfa 156 is fitted as standard with Cruise Control, a system that helps the motorist to manage vehicle speed and improve traveling comfort. The device allows a cruising speed set by the driver to be maintained automatically by governing the engine throttle directly.

The device is controlled by means of a lever on the column switch with two wheels. The first is turned to ON to activate the system while the second (actually a manual accelerator) must be moved to the plus (or minus) sign to achieve the required speed. When the control is released, the car continues to travel at the saved speed without the driver pressing the accelerator pedal.

The Cruise Control system can work within the entire range of rpm levels allowed by the engine, but only at speeds over 30 km/h. It is therefore advisable to turn it on only if road conditions allow the set value to be maintained in safety.

When the accelerator pedal is pressed (during overtaking, for example), the Cruise Control system is temporarily disabled even though the system stays on. The car therefore accelerates as required, but the system automatically restores the car to the stored speed as soon as the pedal is released. For obvious safety reasons, the device is released automatically when the driver presses the brake or clutch pedal.

In this case, you can go back to the preset speed by pressing the RECALL button at the end of the Cruise Control stalk.

Turn the wheel OFF and turn off the engine to deactivate the Cruise Control finally and cancel all previous settings. A warning light on the multifunctional display indicates system operation or deactivation status.





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### **Multifunctional display**

A revolutionary multifunctional display in the middle of the New Alfa 156 and Sportwagon facia performs the twofold function of providing the driver with information on the main trip parameters and providing instant feedback on car faults and action required.

The device provides access to several menus (with submenus) that speak the motorist's language (the choice is between Italian, English, Spanish, Portuguese, French, German and Dutch) and offer the benefits of a host of functions and information. For example: data, outdoor temperature, speed limit setting, fault display etc.

The customer can also use the Trip computer to find out a set of data from a previous trip or the current journey: fuel consumption (instantaneous and average), average speed, remaining range, journey time (since the trip started) and kilometres covered.

### **Integral radio with steering wheel controls**

The New Alfa 156 offers - as standard throughout the range - a built-in radio with CD player that is a carefully put together sound system designed and adjusted to suit the passenger compartment that comprises six speakers and offers a power output of 4 x 40 Watts. It is also more easily operated with finger tip controls on the steering wheel meaning key functions can be operated without the driver having to take their hand from the steering wheel.

The radio is integral with the dashboard design and located in the middle of the facia in a position that is convenient for both driver and passenger. It can store up to 30 stations. It offers RDS (Radio Data System), TA (Traffic Announcement) and PTY (programme choice option) options in addition to an automatic device that adjusts the volume to the car speed and a large alphanumerical display. Each time the radio is turned on, the volume is the same as when the set was turned off. The device is equipped with controls for an external CD stacker.

The radio with CD player also comes with a 7-band graphic equaliser. This device offers a choice of four equalisation settings: the default setting and also Jazz, Rock and Classic. The motorist can also choose special effects or adjust and save the sound parameters.



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## The New Alfa Romeo 156

### The new interior

While the exterior styling has remained more or less unchanged, the appearance of the New Alfa 156 interiors has been radically altered, even though the passenger compartment still displays the same smooth, unbroken lines of the previous model and all the distinctive traits that have always distinguished the Alfa 156: the attention devoted to the driver's cockpit and the classic, uncluttered control panel. But the New Alfa 156 adds important new features to the details that typify Brand and model.

Firstly, the fascia has been fully revised to make it better looking and more practical. The newly designed central section, for example, houses a display that offers information and updates on the current trip data. Chrome inserts that match the glove compartment lock barrel stand out against a new fascia trim that is embossed with a new pattern. To cut down reflections inside the passenger compartment, the fascia and door panels are processed using laser technology to create surface micro-roughness that refracts the light in a different way and increases the sensation of tactile gratification. The built-in radio and automatic bi-zone climate control system controls are located low down in the middle of the fascia. The latter are produced in a brand-new up-to-date, sophisticated design.

The steering wheel range features a new look and materials while the new central diffuser upper outlets are bigger and adjustable horizontally and vertically to improve air flow. The central console is also different because the sensation of space has been increased through the use of bigger ashtray and compartments and more user-friendly mirror and fog lamp positioning. A new front armrest, fitted as standard, has a convenient oddments compartment.

The fascia and central tunnel are different, while other apparently minor parts that are nevertheless important from an aesthetic viewpoint have also been changed. This applies to the buttons on the steering wheel, climate control system and gearbox control panel and also the instrument surrounds. All parts are now coated in Techno grey metalluro. The fascia outlet and door handle rings are now in chrome while the seat adjustment controls are soft touch.

Handcrafted Momo Italian leather is one of the signature features of Alfa Romeos and with the new JTS it is standard on both the JTS and the Selespeed.

The load compartment now features bigger speakers and better air intakes. A brand-new cloth also covers the roof lining, with its window-bags, while the interior rear view mirror has changed from grey to a more stylish black. A passenger compartment full of new features with very linear styling in the very best Alfa Romeo tradition and the spirit of a fast, powerful sports car. This is borne out, for example, by the red instrument panel, sill plate with aluminium inserts, the brand new design leather trimmed steering wheel combined with new gear knobs and electrical radio controls.



## The 2003 Alfa Romeo 156: TECHNICAL SPECIFICATIONS

	Alfa 156 2.0 JTS		Alfa 156 2.5 V6 24V	
	Manual/Selespeed		Manual/Q-System automatic	
<b>ENGINE</b>				
	4, in line, 2 counter-rotating shafts, front transverse driving the front wheels		6 in 60° V, front transverse, driving the front wheels	
Bore x stroke (mm)	83 x 91		88 x 68.3	
Capacity (cc)	1970		2492	
Compression ratio	11 : 3		10.3 : 1	
Max power output kW/rpm	121/6400		141/6300	
Max torque Nm/rpm	206/3500		218/5000	
Timing system (drive)	2OHC (toothed belt) 4 valves per cylinder and electronic variable valve timing		2OHC per bank, hydraulic tappets (toothed belt) 4 valves per cylinder	
Cylinder spacing (mm)	90		133	
Main bearings	5		4	
Cylinder block	Segmented cast iron		Light alloy	
Cylinder head	Regenerated aluminium, incorporating a water pump and plastic variable geometry manifold.		Light alloy	
Number of valves per cylinder	4		4	
Valve position	In 47 degree V		In 37 degree V	
Timing gear	Twin overhead camshafts with hydraulic tappets, electro-hydraulic variable valve timing from the camshaft driven by the Motronic control unit		Twin overhead camshafts per bank with hydraulic tappets	
Timing control	Toothed belt		Toothed belt	
Ignition type	Static, electronic digital with ignition and knock sensor, 4 HT coils fitted in the head, one spark plug per cylinder		Static, electronic combined with injection with two knock sensors, 6 HT coils fitted in the head, one spark plug per cylinder.	
Lubrication	Forced feed with geared pump, water/oil heat exchanger, cartridge oil filter			
Fuel system	Bosch Motronic MED 7.1.1 phased electronic multipoint fuel injection with electronic injection combined and ignition variable layout intake manifold		Bosch Motronic ME 3.1 electronic multipoint fuel injection electronic injection combined with ignition	
<b>ELECTRICAL EQUIPMENT</b>				
Battery: capacity (Ah)	60		70	
Generator (A)	100		120	
<b>TRANSMISSION</b>				
Drive	Front		Front	
	Manual	Selespeed	Manual	Q-System automatic
Gearbox: 1st	3.909 : 1	3.909 : 1	3.500 : 1	3.900 : 1
2nd	2.238 : 1	2.238 : 1	2.235 : 1	2.228 : 1
3rd	1.520 : 1	1.520 : 1	1.520 : 1	1.447 : 1
4th	1.156 : 1	1.156 : 1	1.161 : 1	0.062 : 1
5th	0.946 : 1	0.946 : 1	0.971 : 1	-
6th	-	-	0.811 : 1	-



Reverse	3.909 : 1	3.909 : 1	3.545 : 1	4.271 : 1
Final drive	3.563 : 1	3.563 : 1	3.973 : 1	2.864 : 1
Clutch Diameter (mm)	230		235	NA
Lining Dimensions	230 x 155		235 x 155	NA
<b>TYRES AND WHEELS</b>				
Tyres	205/55 VR16		205/55 VR16	
Wheels	Alloy 6½x16		Alloy 6½x16	
<b>STEERING</b>				
Steering box	rack and pinion with power steering		rack and pinion with power steering	
Turns lock to lock	2.2		2.2	
Turning circle (m)	11.1		11.6	
<b>SUSPENSION</b>				
Front	Independent, double wishbones with double trailing arm and anti-roll bar on ball joints			
Rear	Independent, MacPherson type with lower side rods and reaction struts, anti-roll bar on ball joints			
<b>BRAKES</b>				
Front: dia. (mm)	Disc 284 (ventilated)		Disc 284 (ventilated)	
Rear: dia. (mm)	Disc 251		Disc 251	
<b>BODY – DIMENSIONS</b>				
No. of seats	5		5	
No. of doors	4		4	
Length/width (mm)	4430/1745		4430/1745	
Height (mm)	1415		1415	
Wheelbase (mm)	2595		2595	
Front/rear track (mm)	1511/1498		1511/1498	
Luggage capacity (l)	378		378	
<b>CAPACITIES – WEIGHTS</b>				
Fuel tank (l)	63		63	
Kerb weight DIN (kg)	1285		1355	1385
Max. towable weight (kg)	1300		1400	
<b>PERFORMANCE AND FUEL CONSUMPTION</b>				
	Manual	Selespeed	Manual	Q-System Automatic
Top speed (km/h)	220	220	230	227
Acceleration (s)				
0-100 km/h	8.2	8.2	7.3	8.5
0-1000 m	29.8	29.8	27.8	29.0
<b>EU Fuel Consumption (l/100 km)</b>				
urban cycle	12.2	12.2	17.5	17.5
out-of-town cycle	6.6	6.6	8.5	8.8
combined cycle	8.6	8.6	11.8	11.9



## Alfa Romeo 156 JTS: Standard equipment and options

✓ standard    ○ optional ~ not available

	Alfa 156 2.0 JTS Alfa 156 JTS Selespeed	Alfa 156 V6 24V Manual/Q System
<b>EXTERIOR</b>		
Alarm	○	○
Alloy Wheels	✓	✓
Body Kit with front and rear splitters	○	○
Body-coloured bumpers	✓	✓
Central locking	✓	✓
Central locking with remote control with side light actuation warning	✓	✓
Door mirrors, heated, electrically operated and body coloured	✓	✓
Electric front windows	✓	✓
Electric rear windows	✓	✓
Metallic paintwork	○	○
Polished stainless steel tail-pipe	✓	✓
Headlight washers	✓	✓
Side Skirts	✓	✓
Sports spoiler	○	○
Sunroof	○	○
Wipers, Automatic rain sensing, two speed with 4 intermittent settings and smart wash	✓	✓
<b>INTERIOR</b>		
Analogue clock	✓	✓
Audio controls on the steering wheel	✓	✓
Audio system, Blaupunkt Digital CD player, BOSE amp/speakers	✓	✓
Automatic climate control system with twin zone temperature setting	✓	✓
Boot and fuel filler flap opening from inside	✓	✓
Check control	✓	✓
Cruise control	✓	✓
External temperature gauge	✓	✓
Front seats with adjustable lumbar support and centre armrest	✓	✓
Front, passenger-side courtesy light with reading spotlight and two rear courtesy lights	✓	✓
Glove compartment with flap	✓	✓
Height-adjustable driver's seat	✓	✓
InfoCentre Readout with outdoor temp, trip computer, check control.	✓	✓
Instrument panel lighting adjustable to three levels	✓	✓
Leather steering wheel and gear knob	✓	✓
Metallic gray instrument and control background	✓	✓



Pouch on back of front seat squab	✓	✓
Rear armrest with ski tunnel	✓	✓
Rev counter	✓	✓
Steering wheel with height and axial adjustment	✓	✓
Timed heated rear window	✓	✓
Titanium effect centre console	✓	✓
Upholstery, Momo leather	✓	✓
Velour carpets	✓	✓
<b>SAFETY/MECHANICALS</b>		
ABS + EBD + EBA	✓	✓
Airbag, Driver	✓	✓
Airbag, Passenger	✓	✓
Airbag, Side	✓	✓
Airbag, Window	✓	✓
Alfa Code Security Immobilizer	✓	✓
ASR/MSR	✓	✓
Foglights, front	✓	✓
Foglights, rear	✓	✓
FPS (Fire Prevention System)	✓	✓
Front seat-belt electronic pretensioners	✓	✓
Headlight alignment adjustment	✓	✓
Headlight wash/wipe	✓	✓
Height-adjustable front and rear head-restraints	✓	✓
Height-adjustable front seat-belts	✓	✓
Power steering	✓	✓
Rear door child safety locks	✓	✓
Side impact air bags	✓	✓
Third brake light	✓	✓
VDC	✓	✓