

ALFA ROMEO 147 JTD PROVES PERFORMANCE AND ECONOMY CAN GO HAND IN HAND

Alfa Romeo, a name synonymous with performance and style, will now also mean economy with the launch of the Alfa Romeo 147 JTD, a turbo diesel version of Alfa Romeo's award-winning hatch back that provides a unique blend of performance and economy.

"The great news is the 147 JTD uses little more than half the fuel of the already frugal 147 Twin Spark, but the real surprise is that it is also quicker," says David Stone, General Manager of Alfa Romeo in Australia. "This remarkable engine doesn't just have more torque than the 2.0 petrol 147; it has more torque than the most powerful Alfa Romeo engine, the 3.2 litre V6 in the GTA and that means storming performance and remarkable get up and go in every gear."

The fact that the 147 JTD offers such a useful blend of performance and economy is no surprise in Europe. Diesel versions of Alfa's range of stylish sedans, coupes and Sportwagons account for 76 per cent of sales. Indeed, in the most stylish model, the GT, diesels account for more than 80 per cent of sales and it's the same engine that is now available in Australia in the Alfa 147.

"Fuel may be expensive in Europe, at prices most Australians couldn't imagine, but that's not enough to force Alfa Romeo owners to abandon performance and style," says Mr



Stone. "What is driving these figures is the all-round ability of this latest generation of diesel powered cars. Using the second generation of the Fiat-developed common rail direct injection diesel technology, the JTD M-Jet engines offer similar power to petrol engines of the same capacity and considerably more torque, while also offering remarkable fuel economy."

Although the Alfa Romeo 147's diesel engine is, at 1.9 litres, slight smaller than its petrol counterpart, the 2.0 litre Twin Spark engine, they both produce same power, 110 kW. But it is when it comes to torque that the JTD engine really punches above its weight. Compared to the Twin Spark engine's 181 Nm of torque, the 1.9 JTD produces an epic 305 Nm, or, to look at it another way, 5 Nm more torque than the 3.2 V6 engine in the 147 GTA.

Of course, this translates in excellent performance. The 147 JTD is quicker to 100 kmh by half a second compared to the petrol car and goes on to the same 208 kmh top speed. The huge torque figure and the low engine speed at which it is achieved means that the 147 JTD offers remarkable in-gear performance right across the speed range.

But the 147 JTD does not just offer superior performance. On the open road, the 147 JTD is using just 4.7 litres per 100 kmh or 60 mpg in the old money, a figure normally reserved for the slowest, smallest econo-boxes. There's more good news when it comes to emissions, too. Carbon Dioxide emissions, the so-called Greenhouse Gas, are slashed from more than 210 grams per km to just 157.

The fact that the 1.9 litre JTD engine is also unusually light and compact compared to both diesel rivals and petrol engines with similar torque figures not only enhances economy, it also further improves handling and roadholding as it reduces weight over the front wheels and enables even more effective use of that 305 Nm of torque.

This astonishing combination of performance and economy achieved with the use of the most advanced diesel engine available. The Fiat Group invented what has become known as common rail, direct injection diesel engines, but which are more correctly known as Unijet.

The next generation of engines are called Multijet and, as the name suggests, each cylinder now gets an injector with six, rather than one hole, allowing for more efficient and



effective fuel burn. The turbocharger is a variable displacement unit that can offer the lag-free, low engine speed operation of small turbo at the same time has been able to generate increased boost at high revs without getting breathless.

And the only place that this technology is available is from Alfa Romeo. While the Fiat Group has licensed Bosch to produce Unijet for a wide range of other car makers, Multijet remains the preserve of Alfa Romeo.

The Alfa Romeo 147 JTD, therefore, provides the previously unheard of combination of exemplary performance and economy. But what about luxury? Have all the desirable features that have made the 147 one of the best equipped cars in its class been removed, as in most other economical cars?

Of course not. Alfa Romeo's reputation for performance and style goes hand in hand with its reputation for value for money and, therefore, the Alfa Romeo 147 JTD shares its entire equipment and feature list with the five door Alfa Romeo 147 TS.

Which just leaves one question: The price. The recommended retail price of \$39,990 should not just be contrasted with the price of the 147 Twin Spark. It has to be remembered that the Alfa Romeo 147 JTD offers superior performance, as well as economy and a six speed gearbox, so it truly is variant that sits above its petrol counterpart.

"Alfa Romeo 147 JTD owners really can have their cake and eat it," says David Stone. "On one hand they have economy and emissions that can put to shame most basic economy cars, while on the other there is sports car performance. All of this is then wrapped up in a car that oozes style and charisma. The cream on the cake is that it is also lavishly equipped and comes at a price that only Alfa Romeo can offer. With this combination, the question has to be asked, how long before diesel dominates Australian Alfa sales, as it does in Europe?"



THE NEW ALFA ROMEO 147: MORE STYLE FOR LESS MONEY

The Alfa Romeo 147 JTD is the latest version of the revised Alfa Romeo 147 launch in mid-2005. Like its petrol cousins, it shares a wide range of improvements and enhancements to Alfa Romeo's awarding winning hatchback.

Styling Changes

The new Alfa 147, available with 3 or 5 doors, forcefully expresses all the creative vitality of the brand, a special way of appreciating motor cars that is very far from thinking of them as simply useful means of transport. Alfa Romeos have always been designed for people with expectations that go beyond the strictly necessary into the realm of emotions: aesthetic taste, a passion for sophisticated engineering, the sheer pleasure of sitting behind the wheel and an expression of one's own personality. The Alfa Romeo stylists and engineers took these premises as the base for a car that is quite different from the original 147

A quick look at the outside tells you all you need to know. The car retains the tried and tested box shapes of the 147 and the biggest changes are reserved for the front end. The changes to the rear are more minor. The car features a new grille that is now bigger and enhanced by new design headlights. The final result is a front end that oozes performance and prestige.

It also looks more aggressive because the grille has been lowered in relation to the bonnet. This impression is reinforced by the elongated appearance of the headlights - a lip of glass enclosing three round chrome elements on a black background - and the air intake that is divided by three vertical elements, one in the middle and two at the sides.

The overhang is also longer while the bumpers and front spoiler are new.

At the rear, the designers reworked the tailgate and made slight changes to the tail-lights to make them more stylish: the light clusters have now been lengthened into a more triangular shape emphasized by a chrome moulding. The triangular motif so typical of Alfa Romeo design is referred to explicitly in the New 147. For example, the protruding shield that describes a jutting corner when viewed from above is emphasized at the front by the design of the bumper. The stylistic changes are based on triangular shapes and sloping lines that increase the perception of dynamism and overall sleekness.

Inside the New Alfa 147 retains the same acclaimed driving position and the excellent balance between the compact, embracing boxes, uncluttered surfaces and smooth, spare lines. Some exterior traits have been changed to underscore the look of sporty elegance that we have come to expect from Alfa Romeo cars.

Firstly, a new combination (grey on grey) has been introduced for the two-tone facia which joins the existing classic combinations of black on black, black on grey and black on beige, though the latter have also been revised through the introduction of a more sophisticated 'water buffalo' embossing. The New Alfa 147 features new instrument and control graphics, on a silver or black background, designed for clarity and legibility, a new 'cannelloni' trim for the door panels enhanced by a chrome frame that highlights the



tweeters in the door handle panel - and a brand new design rear head-restraint that can be lowered for better visibility.

The 1.9 litre 110 kW 16 valve JTD M-JET engine

At the end of 2002, Alfa Romeo introduced its 104 kW 1.9 16v M-JET, the first of the second generation of Common Rail engines in the world. The engine was adopted in Europe for the Alfa 147, 156 and Sportwagon with a sporty six-speed manual gearbox and has now been further developed for the Alfa GT, now offering a power output of 110 kW and from now on also on the New Alfa 147.

The unit is a 4 cylinder in line engine with a bore of 82 millimetres and a stroke of 90.4 mm, capable of delivering a power output of 110 kW at 4000 rpm and a torque of 305 Nm at 2000 rpm.

The new turbodiesel has undergone several engineering changes to increase performance and engine torque at low speeds and to reduce noise and vibration levels.

For example, the Common Rail system used on the 1.9 JTD 16v M-JET includes two new strategies for automatically calibrating and balancing the diesel injected to lower noise and reduce vibration. It goes without saying that, so equipped, the New Alfa 147 guarantees extremely attractive performance figures: the top speed is 208 km/h and acceleration from

0 - 100 km/h takes place in 8.8 seconds. All this comes with very frugal fuel consumption:

- 8.0 l/100 km over an urban cycle.
- 4.7 l/100 km over an extraurban cycle.
- 5.9 l/100 km over a combined cycle.

The Multijet system, secret of second generation JTD engines.

The underlying principles of second generation turbodiesel engines remain the same, i.e. high injection pressure and electronic injector control. But one extra feature has been added: during each engine cycle, the number of injections increases over and above the current number of two. In this way, the same amount of diesel is burnt inside the cylinder but in several portions to achieve smoother combustion.

The advantages include lower running noise, reduced emissions and a 6-7% increase in performance. All this comes with a level of engine efficiency that improves performance still further.

These results are not to be underestimated, particularly because they are obtained with an engine that represents an incredible leap forward from prechamber diesels and even improves on first generation JTD engines.

The secret of the Multijet engine lies in the control unit that governs the electric injector opening and closure system (and also in the injectors themselves). The crucial element is the electronic control unit itself that can perform a set of injections that may be very closely spaced.

Fiat Auto's researchers developed the parts (together with the injectors) especially for this application. It is designed to deliver the multiple injections that assure the designer more accurate control of pressures and temperatures developed inside the combustion



chamber and also more efficient use of air taken into the cylinders.

This enables further goals to be achieved: quieter combustion, reduced emissions and increased performance.

The Multijet system is underpinned by long years of research. Fiat engineers began by resolving the problem of limits imposed by the control units. Then they went on to map the benefits they could achieve by plotting different multiple injection sequences (two secondary injections very close to the main injection; one secondary injection not too close to the main injection plus two closely-spaced secondary injections; one secondary injection and then two main injections close together after a certain period etc.) against different engine service conditions: idling; with low loads and low rpm; with high rpm and moderate load; with low rpm and high load etc.

The study revealed the potential of the system and showed that great benefits are achievable in all cases, though these tend to focus on one field or another according to the type of sequence chosen and the engine service area targeted. In some cases, for example, the priority is to reduce start-up times and fume levels, in other cases it is to increase torque and reduce noise while in others it is to reduce emissions and ensure a quieter drive.

This research strand has led to the creation of the Multijet engines: another first for the Fiat Group in the diesel engine field. But we had been putting in a lot of hard work behind the scenes since 1986, the date that marked the arrival of the Croma TDI, the first direct injection diesel vehicle in the world.

At that time, this represented a true engineering breakthrough that was later adopted by other manufacturers. Direct diesel injection engines offered better performance and lower fuel consumption but failed to resolve the problem of excessive engine noise at low rpms and while speeding up or slowing down. So work began on a more advanced direct injection system and a few years later this led to the development of the Common Rail principle and the Unijet system.

The idea first came from the Zurich University research laboratories where scientists were working on an injection system that had never before been applied to a vehicle, i.e. the Common Rail system. The idea is simple yet revolutionary. If you continue to push diesel into a tank, the pressure inside will rise and the tank itself will become a hydraulic accumulator (or rail), i.e. a reserve of pressurised fuel ready for use. Three years later, in 1990, the Unijet system developed by Magneti Marelli, Fiat Research Centre and Elasis on the Common Rail principle entered the pre-production stage.

This stage was complete in 1994, when Fiat Auto started to look for a partner with superlative knowledge of diesel engine injection systems. The final stage of the project, i.e. completion of development and industrial production, was eventually entrusted to Robert Bosch.

In 1997 the Alfa 156 JTD was launched with its revolutionary turbodiesel engine. Compared to conventional diesel power units, the JTD guarantees an average improvement in performance of 12% together with a 15% reduction in fuel consumption. These results meant that cars fitted with the engine were an immediate hit.



Now the time is ripe for the second generation of JTD engines, the Multijet and multivalve units: in 2002 with the 1.9 16v M-JET (forerunner of this new family of multipoint injection engines) in 2003 with the 1.9 upgraded to 110 bhp for the Alfa GT and the 129 kW (175 bhp) 2.4 JTD Multijet 20v available on Alfa 166, Alfa 156 and Sportwagon models all clearly demonstrating not just Alfa Romeo's commitment to diesel power units, but also its technical prowess.

Now comes the turn of the New Alfa 147 to enjoy all the benefits of the 150 bhp/110 kW 1.9 JTD 16v M-JET.

The 2.0 litre 110 kW engine

The Alfa Romeo Twin Spark engine has entered the history of the marque as one of its leading engines, with its unique combination of efficiency, excellent power-to-weight ratio, low emissions, exceptional torque and power spread and – an essential for all Alfa Romeo engines – a sound and character that is an integral part of the Alfa Romeo experience.

For its instillation in the Alfa Romeo 147, the Twin Spark unit was changed to suit its new environment. Improvements over previous Twin Spark engines included:

- ✚ Changes to the valve drivetrain.
- ✚ Improved thermodynamics; the adoption of small diameter valves and ports together with a compact combustion chamber built for lower fuel consumption, particularly with low load and low speed.
- ✚ The use of a metal cylinder head gasket that requires lower tightening torques and thus reduces power uptake by the timing system.
- ✚ Other improvements allowed reduction of engine weight from a minimum by 3.0 kg. This was achieved by refacing the crankshaft and pistons.
- ✚ Engine noise was reduced by cutting the weight of reciprocating masses to obtain a smaller shift in the centre of gravity and a consequent reduction in vibration during engine operation. This has been reduced still further through the adoption of two counter-rotating shafts.
- ✚ An electronic throttle control, or fly-by-wire system, was also adopted to do away with a mechanical link between throttle and accelerator pedal. The engine electronic control unit, naturally acting upon the driver's request, governs throttle body opening to improve handling during acceleration and deceleration and also reduce fuel consumption and emissions.
- ✚ The 2.0 Twin Spark engine also adopts a variable geometry intake system managed electronically by the injection control unit on the basis of engine service conditions. It therefore uses ducts of different lengths in different situations: longer at low rpm and shorter at high rpm. This device exploits 'ram' and acoustic resonance effects to ensure that the cylinder fills efficiently for improved engine performance.

These engineering improvements have produced a petrol engine that offers plenty of torque at low speeds: 90 per cent of the maximum value is available from 2,000 rpm.



The 2.0 Twin Spark unit is the top of the Alfa 147 petrol engine range and balances top performance and driving flexibility to excellent effect. Variable geometry intake ports allow engine potential to be exploited to the hilt both in town traffic and on the motorway.

The Alfa 147 2.0 Twin Spark engine reaches its maximum power output of 110 kW at 6,300 rpm and delivers a torque of 181 Nm at 3,800 rpm. With this engine, the Alfa 147 reaches a top speed of 208 km/h and takes 9.3 seconds to accelerate from 0 to 100 km/h. Fuel consumption over a combined cycle is 8.9 l/100 km (ECE + EUDC). The figures are the same for both the Twin Spark manual and the 147 Selespeed

The Alfa 147 gearboxes are silent, slick, sturdy and reliable. They allow rapid gear changes and ensure the generous engine performances can be exploited to the full.

This result is due to careful choice of materials, precise assembly and machining and also meticulous testing at the bench and on the car.

Great attention has also been devoted to component installation in order to ensure the product meets design requirements. Pre-inspections are carried out in the factory followed by final electronic tests: operating load with the car standing still, efficiency, flexibility, clearances and so on.

The Alfa 147 is also the first car in its segment to be fitted with a sequential gearbox with controls on the steering wheel, the 147 Selespeed.

Alfa 147 gearbox choice

There are now three different gearboxes available in the Alfa Romeo 147. The Twin Spark is available with a choice of a five speed manual or a five speed Selespeed. The 147 JTD is fitted with an all new six speed gearbox and clutch designed specifically to work with the torque characteristics of the new diesel engine and maximize its abilities.

The 147 2.0 Twin Spark with the five speed manual gearbox

The Alfa 147's five-speed gearbox is noiseless, slick, sturdy and dependable. It allows fast shifts and ensures the generous engine performance is exploited to the full.

This result is due to careful choice of materials, precision engineering and machining and also meticulous inspection carried out at the bench and on the car.

The gearbox uses a new twin-cable external gear control. This is made out of hi-tech materials (high-performing technopolymers) that are used for their different properties of strength, weight and self-lubricating capacity.

The device ensures low noise levels and easy manoeuvres while also eliminating shaking and vibration of the selector lever.

A Borg-Warner baulk ring synchronisation system reduces gear engagement effort significantly. The synchroniser is triple-cone for the first and second speeds and double cone for the third speed, the ratios most commonly used in town traffic.

The gears have high-meshing teeth and in addition fifth speed and final drive gear sets



are machined to a superfinish following heat treatment. These features make component operation quieter and minimise drive transmission irregularities.

Gears inside the gearbox are lubricated by ducted oil flows. This offers many advantages: more effective torque transmission, less wear and easy to manoeuvre at low temperatures due to the use of synthetic oil that is relatively insensitive to heat fluctuations.

The clutch pump is equipped with a plastic case, steel cylinder and plastic piston.

A hydraulic coaxial clutch release control (CSC) is used on the 147 2.0 Twin Spark.

The CSC offers many advantages over a conventional hydraulic control where the actuator is positioned on the gear mount and controls a fork that in turn acts on the thrust bearing. The new device makes the gearbox more functional and reliable: it also increases driving comfort by reducing noise and vibration from the power unit.

Sophisticated component preparation methods and the use of innovative materials (such as plastic or aluminium) bring a weight reduction of more than two kilos and ensure that the clutch pedal returns more quickly.

The Alfa Romeo 147 Selespeed

The Selespeed gearbox offers 147 drivers a choice that is easy, sporty, comfortable and safe in all situations.

Easy, because the innovative five-speed transmission with robotised gear shifts and clutch control may be operated by two paddles located beneath the steering wheel or a gear stick sequential control on the console between the seats.

Sporty, because the unit allows fast, slick gear changes for much better performance. It actually makes the car drive in the same way as the current Ferrari Formula 1 cars and it uses the same hardware and software as the World Championship-winning car.

Comfortable, because it is less tiring than a conventional gearbox. There is no clutch pedal and the speeds are easy to engage: no risk of grating or binding and the engine never stalls accidentally. The unit also allows smooth changes and gradual torque delivery to the wheels. When in 'city' mode, the Selespeed can also convert to a relaxing self-changing transmission that is ideal in town traffic.

The Selespeed is also very safe. It boasts a series of features that prevent the driver issuing incorrect instructions. It also allows full control of the steering wheel to be maintained even during gear changes because the driver does not need to take a hand off the wheel to reach the gearstick. Without a clutch pedal, the driver can anchor themselves more effectively to the seat on corners by bracing themselves with their free left leg.

How Selespeed works

The Selespeed system may be broadly divided into two sections. There is the computer control system that sits apart from the engine and gearbox. It has a wide range of inputs and it controls the electro-hydraulic actuator, which it's atop the gearbox. This has three arms, one to change gears and two to operate the clutch.

Gears are changed exactly as per the normal manual car - by releasing the accelerator pedal and depressing the clutch. The electronic control unit that controls the gearbox lets



out the clutch, reduces torque regardless of the extent to which the accelerator is depressed and also selects and engages the gears.

The Selespeed is not an automatic transmission but a manual robotised gearbox because the driver decides which speed to engage. As already mentioned, the driver uses the steering wheel levers or a joystick located between the seats instead of a conventional gearbox.

The two levers located beneath the steering wheel are operated by pulling towards the driver. The 'up' lever on the right (identified by a '+' sign) is for sequential speed engagement during acceleration: the 'down' lever on the left (identified by a '-' sign) is used to change down during deceleration.

The selector between the seats works in a similar way: it is moved in the direction of motion to change up or towards the rear of the car to change down.

The 'city' control on the central tunnel is used to activate automatic gear changes (when travelling in this mode, you do not need to use the controls on the steering wheel or the joystick). The unit differs from conventional automatic transmissions in one respect because it works in one mode only, i.e. suited to town use or routes with heavy traffic when frequent gear changes are required.

A multifunctional display located on the control panel indicates speed engaged, 'city' mode activation or system faults.

How to drive the Alfa Romeo 147 Selespeed

To start moving, depress the brake pedal down and engage an initial gear: first, second or reverse. The joystick on the central console must be used to carry out this operation because the steering wheel controls are inactive when the car sets off and up to 10 km/h.

The driver then simply depresses the accelerator after releasing the brake. The system gradually lets out the clutch to allow the car to start moving. Once it is travelling at 10 km/h, the driver may begin to change gears using the steering wheel controls or continue to use the joystick. The lever takes priority if both controls are operated simultaneously.

Approaching a crossroads or traffic light, release the accelerator. The Selespeed unit recognises your intention to slow down and automatically changes down through the gears and opens the clutch to prevent the engine stalling. If you intend to set off again without bringing the car to a complete halt, the driver selects the best gear ratio for accelerating again. The system automatically engages first gear when the car is stopped.

The Selespeed unit also recognises when the car is on a downhill gradient: a speed is engaged and the accelerator pedal is not depressed. In this case, the system automatically closes the clutch once a pre-established speed has been reached to allow the car to benefit from the engine braking effect.

To ensure maximum safety, the gear change command is activated only if compatible with engine speed maxima minimum thresholds.

The same gear shift procedures also apply when the 'city' control is engaged. The speed to be engaged is selected on a map that correlates accelerator pedal position with speed and optimal ratio. When the accelerator is released, the Selespeed acts in the same way



as with semi-automatic operation: it closes the clutch to ensure the engine brake comes into action if the car is slowing down.

When the car is at a standstill, press the brake and push the gear lever to the right to engage neutral. If the accelerator and brake pedals are not touched for one minute, the gearbox automatically returns to neutral. Engagement of neutral is prevented for safety reasons at speeds over 40 km/h.

A gear must be engaged before the engine can be turned off and the ignition key taken out. A buzzer goes off if the ignition is turned off with the gearbox in neutral. The system deactivates in two seconds once it has received a zero speed command from the engine and a gearbox input and output command and has also stored operating and diagnostic data in the control unit memory.

The Selespeed automatically sets itself to neutral upon re-starting.

Suspension Changes

All versions of the Alfa 147 sold in Australia are fitted with the new 'Comfort Suspension' which is ideally suited to local road conditions.

The new configuration combines a double wishbone front suspension with a MacPherson layout at the rear that guarantees greater levels of comfort without affecting handling. The front shock absorbers have therefore been modified, lengthening the rod to 13 mm (against the present 11.5) and the rod guide is Teflon-coated. In addition, the use of these particular shocks has demanded a specific setting at both front and rear in order to guarantee the correct suspension timing.

This modification has also affected the architecture of the suspension system and not simply a specific setting with which only a damping effect is obtained. As far as customers are concerned, all these changes mean great stability and ease of control even at the limit of grip. Steering movements are very smooth and balanced and great comfort is assured under all service and road surface conditions.

The basic layout of the 147 suspension is a high double wishbone at the front and a MacPherson strut layout at the rear. Then our engineers set to work to adjust the suspension to the car's specific weight distribution and individual characteristics. As far as the front wishbone configuration is concerned, the improvement was achieved by introducing a new spring type and setting and by the adoption of a new hollow anti-roll bar.

Altogether these changes allow a weight reduction of 1.7 kilograms for the same stiffness and roll qualities.

The result is a compact car with a drive that combines the great control typical of a front wheel drive with the outstanding precision and response of a sports car. The New Alfa 147 offers maximum lateral hold, fast approaches to bends and a very effective, precise steering response. This excellent on-road behaviour is aided by the rear end – a MacPherson configuration with asymmetrical arms benefiting from improved elastokinematic properties – that ensures stability in high speed manoeuvres and agility over mixed roads.



Safety and Comfort

The New Alfa 147 has outstanding torsional and flexural rigidity of the body: 110,000 kgm/rad for the 3 door version and 95,000 kgm/rad for the 5 door version. Not to mention the fact that the new model offers a power assisted hydraulic braking system made up of two independent crossover circuits. This particularly effective system offers prompt, smooth braking and short stopping distances. In particular, the front discs are ventilated with a diameter of 284 millimetres and 251 millimetre solid discs with Lucas aluminium floating callipers with two pistons (38 mm).

The new Alfa 147 complements its high-performing brake system with an ABS antilock brake system as standard over the range complete with an EBD (Electronic Brakeforce Distributor). The New Alfa 147 also assures absolute mastery of the car under all conditions, however extreme, due to its VDC (Vehicle Dynamic Control) and ASR (Anti Slip Regulation) systems. The VDC cuts in under extreme conditions when car stability is at risk and also helps the driver to control the car. As befits a true Alfa, the VDC is a sporting device that allows outstanding roadholding. It allows the driver the full satisfaction of controlling the car as long as conditions are normal but cuts in just before things become critical. 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. The ASR (Anti Slip Regulation) system, an integral part of the VDC, optimises traction at any speed with the aid of the brakes and engine control.

The excellent on-road behaviour of the New Alfa 147 is also aided by its tyres that achieve the best possible compromise between handling and comfort. To guarantee constant drift on bends coupled with an outstanding ability to absorb obstacles, the Alfa Romeo engineers choose generous tyres for the 147: 215/45 R 17.

VDC (Vehicle Dynamic Control)

The VDC is a system that cuts in under extreme conditions when car stability is at risk and also helps the driver to control the car. As befits a true Alfa, the VDC is a sporting device that allows outstanding roadholding. It allows the driver the full satisfaction of controlling the car as long as conditions are normal but cuts in just before things become critical. The VDC is permanently engaged.

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 (interior or exterior) 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:

- a Body computer that constantly exchanges information with the ABS, engine management unit and automatic transmission unit;
- an electronic throttle (that communicates with the ABS in turn);
- a 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.

ASR (Anti Slip Regulation)

The ASR (Anti Slip Regulation) system, an integral part of the VDC, optimises traction at any speed with the aid of the brakes and engine control. The device computes degree of slip on the basis of wheel rpm calculated by the ABS sensors and activates two different control systems to restore grip: when an excessive power demand causes both drive wheels to slip (e.g. in the case of aquaplaning or when accelerating over an unsurfaced, snowy or icy road), it reduces engine torque by reducing the throttle opening angle and thus air flow; if only one wheel slips (e.g. the inside wheel following acceleration or dynamic load changes), this is automatically braked without the driver touching the brake pedal. The resulting effect is similar to that of a self-locking differential.

This allows the New Alfa 147 to acquit itself with ease over ice - only one wheel needs to grip to allow the car to exert traction - and under off-road conditions when the car is twisted and suspended on two diagonally opposed wheels with one of the other wheels hanging in space. The ASR is activated automatically whenever the engine is started but must be turned off by means of a cut-out switch on the central console. The ASR only needs to be turned off when snow chains are used because the wheel must be able to slip by tiny amounts to pile up the snow so that force can be transmitted to the ground and the ASR tends to prevent this occurring.

Curtain-bags

Over the entire range, the New Alfa 147 offers as standard curtain-bags that drop down over the windows to safeguard occupants' heads in case of side collision. The curtain-bags adopted on the new model are more protective than other products (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.

Automatic dual zone 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 or her 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 147 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 dual 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 New Alfa 147 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 fully deactivate the air conditioning system.

Cruise Control

Cruise Control is a system that helps motorists to manage vehicle speed and improve travelling 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 switch. 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.



The New Alfa Romeo 147: Technical Specification

	Alfa Romeo 147 Twin Spark		Alfa Romeo 147 Selespeed		Alfa Romeo 147 JTD M-JET
	Three door	Five door	Three door	Five door	Five door
Engine					
Type	Transversely installed, water cooled, four cylinder engine with an iron block and an alloy head with twin camshafts, 16 valves and twin spark plugs per cylinder.			Transversely installed, water cooled, four cylinder engine with an iron block and an alloy head with twin camshafts, 16 valves, Multijet common rail fuel injection, variable displacement turbocharger, intercooler	
Number of main bearings	5			5	
Capacity (cc)	1970			1910	
Compression ratio	10 : 1			18.0 : 1	
Maximum power kW/rpm	110/6300			110/4000	
Maximum torque Nm/rpm	181/3800			305/2000	
Valve operation	Twin overhead camshafts, four valves per cylinder, electro hydraulic variable valve timing			Double overhead camshaft, four valves per cylinder.	
Fuel Feed	Bosch Motronic ME.7 electronic injection combined with ignition, variable geometry inlet manifold.			Bosch EDC 16 C8 electronic engine control system	
Ignition	Electronic, 4 HT coils, two spark plus per cylinder			~	
Battery capacity (Ah)	60			60	
Alternator (A)	100			105	
Emission control	Two pre catalyts in the engine bay, a main catalyst under the floor; three lambda probes.			~	
Transmission					
Type	Front wheel drive, manual five speed gearbox	Front wheel drive, five speed sequential change gearbox with electro hydraulic actuator. Self changing city mode or manual gear selection via gear stick or steering column mounted paddles	Front wheel drive, manual six speed gearbox		
Clutch	Dry, single plate with thrust operation and co-axial hydraulic control	Dry single plate with thrust operation via electro hydraulic arms	Dry, single plate with thrust operation and co-axial hydraulic control with dual mass flywheel		
Plate diameter (mm)	230			235	
Friction ring dimensions (mm)	230 x 155			230 x 155	
Gear ratios 1 st	3.545 : 1	3.545 : 1	3.800 : 1		



2 nd	2.238 : 1	2.238 : 1	2.235 : 1
3 rd	1.520 : 1	1.520 : 1	1.360 : 1
4 th	1.156 : 1	1.156 : 1	0.971 : 1
5 th	0.919 : 1	0.919 : 1	0.763 : 1
6 th	~	~	0.614 : 1
Reverse	3.909: 1	3.909: 1	3.545 : 1
Final drive	3.866 : 1	3.866 : 1	3.353 : 1

Wheels and Tyres

Wheels	Alloy 17 6.5J inch	Alloy 17 6.5J inch
Tyres	215/45 WR17	215/45 WR17
Spare wheel	TRS/80R15 95M	TRS/80R15 95M

Chassis and Suspension

Steering	Power assisted rack and pinion
Steering column	Three sections with two universal joints, collapsible, height and rake adjustable
Steering turns lock to lock	2.2
Front suspension	Independent with double wishbones and an anti roll bar mounted on ball joints
Flexibility at the wheels	0.45 mm/kg
Wheel displacement upper/lower (mm)	80/80
Rear suspension	Independent, MacPherson struts with lower side arms and an anti roll bar mounted on ball joints.
Flexibility at the wheels	0.51 mm/kg
Wheel displacement upper/lower (mm)	80/115
Shock absorbers	Pressurized hydraulic twin tube

Brakes

System type and features	Cross over with floating calipers, twin split hydraulic, 10" vacuum assist servo, ABS/ASR/VDC with EBD
Brakes - front	Ventilated disks, 284 mm
Total lining area (mm ²)	200 (4 x 50)
Brakes - rear	Solid disks, 251 mm
Total lining area (mm ²)	100 (4 x 25)

Dimensions (mm)

Cd	0.32
Length/width	4223/1729
Height	1442
Wheelbase	2546
Track front/rear	1512/1509
Over hang front/rear	946/731
Turning circle	11.5

Internal dimensions

Waist width front/rear	1351/ 1308	1351/ 1308	1351/ 1308	1351/ 1308	1351/1308
Elbow width front/rear	1442/ 1412	1442/ 1412	1442/ 1412	1442/ 1412	1442/1412
Front seat height (sunroof)	981 (948)	981 (948)	981 (948)	981 (948)	981 (948)
Rear seat height (sun roof)	940 (921)	940 (921)	940 (921)	940 (921)	940 (921)
Brake to steering wheel	593	593	593	593	593
Seat travel	230	230	230	230	230

Luggage compartment (l)

Seats up	292	292	292	292	292
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Seats folded	1042	1042	1042	1042	1042
Height to parcel shelf	480	480	480	480	480
Maximum width	1257	1257	1257	1257	1257
Length	824	824	824	824	824

Capacities

Fuel tank (l)	60				60
Engine sump and filter	4.4				4.4
Coolant	7.2				7.2
Gearbox and differential	2.01				2.0
Brake fluid	0.5				0.5
Windscreen washer	3.2				3.2
Power steering	1.2				1.2

Weights

Kerb weight (kg)	1250	1270	1250	1270	1310
Distribution front/rear	815/435	815/455	815/435	815/455	TBC
Fully laden weight	1770	1790	1770	1790	1830
Distribution front/rear	940/830	940/850	940/830	940/850	990/980
Max payload	520	520	520	520	520
Max towable weight (kg)	1300	1300	1300	1300	1300

Performance

Top speed (kmh)	208	208	208	208	208
0 – 100 kmh (secs)	9.3	9.3	9.3	9.3	8.8
0 – 1000 m (secs)	30.2	30.2	30.2	30.2	30.0

Fuel Consumption and emissions (l/100 km)

EC Directive 93/116					
Urban cycle	12.1	12.1	12.1	12.1	8.0
Extra urban	7	7	7	7	4.7
Combine cycle	8.9	8.9	8.9	8.9	5.9
Co emissions	210.9	210.9	210.9	210.9	157
Australian Fuel Figure					
	8.9	8.9	8.9	8.9	5.9

Warranty

Mechanical	Three Years/100,000 km				
Corrosion	Six years/Corrosion perforation				
Paint	Three years				
Roadside assistance	Three years				

The New Alfa Romeo 147 - Features and Equipment

▲ Standard O Factory fit optional extra D Dealer fitted option NA Not available

	Alfa Romeo 147 Twin Spark		Alfa Romeo 147 Selespeed		Alfa Romeo 147 JTD M-JET
	Three door	Five door	Three door	Five door	
Exterior					
Aerial, roof mounted 'Stylus' design	▲	▲	▲	▲	▲
Alloy wheels, 'Supersport' Design, 17 inch, 215/45	▲	▲	▲	▲	NA
Alloy wheels, 'Elegant' Design, 17 inch, 215/45	NA	NA	NA	NA	▲
Central closing of all windows and, when fitted, sunroof	▲	▲	▲	▲	▲
Central locking for doors and boot	▲	▲	▲	▲	▲



Colour matched bumpers, mirrors	▲	▲	▲	▲	▲
Door handles, aluminium	▲	▲	▲	▲	▲
Door mirrors, electrically operated	▲	▲	▲	▲	▲
Door mirrors, heated	▲	▲	▲	▲	▲
Show me the way home lights	▲	▲	▲	▲	▲
Gas strut bonnet opening	▲	▲	▲	▲	▲
Mini spare	▲	▲	▲	▲	▲
Paint, Iridescent Nuvola	○	○	○	○	○
Paint, Metallic	○	○	○	○	○
Rear window wiper with continuous and intermittent operation	▲	▲	▲	▲	▲
Sunroof, electric, six positions, anti pinch feature	○	○	○	○	○
Tinted Windows	▲	▲	▲	▲	▲
Interior					
AirCon with twin zone climate control system	▲	▲	▲	▲	▲
Audio system, Boot mounted mutichanger	D	D	D	D	D
Audio system, CD player, eight speakers	▲	▲	▲	▲	▲
Clock, analogue	▲	▲	▲	▲	▲
Coin/card holder, folding	▲	▲	▲	▲	▲
Cruise control	▲	▲	▲	▲	▲
Cup holder, folding	▲	▲	▲	▲	▲
Electric windows, Front	▲	▲	▲	▲	▲
Electric windows, Rear	NA	▲	NA	▲	▲
Exterior temperature gauge	▲	▲	▲	▲	▲
Front armrest, adjustable with locker	▲	▲	▲	▲	▲
Front seat, pocket on squab	▲	▲	▲	▲	▲
Front seats, adjustable lumbar support	▲	▲	▲	▲	▲
Front seats, heated	○	○	○	○	○
Front seats, Sports Seats	○	NA	○	NA	NA
Front seats, position memory function	▲	NA	▲	NA	NA
Gear knob, leather	▲	▲	▲	▲	▲
Glove box with fiction damped opening lid	▲	▲	▲	▲	▲
Glove box, interior lights	▲	▲	▲	▲	▲
Glove box	▲	▲	▲	▲	▲
Heated rear window, with timer	▲	▲	▲	▲	▲
Interior lights, dimmer	▲	▲	▲	▲	▲
Instrument lighting, dimmer	▲	▲	▲	▲	▲
Instruments, partial black out of lighting	▲	▲	▲	▲	▲
Interior lights, puddle light on bottom of doors	▲	▲	▲	▲	▲
Interior lights, boot	▲	▲	▲	▲	▲
Interior lights, from map reading	▲	▲	▲	▲	▲
Interior lights, rear twin individual	▲	▲	▲	▲	▲
Kick panel, aluminium trim panel	▲	▲	▲	▲	▲
Pollen filter, active carbon	▲	▲	▲	▲	▲
Rear armrest, centre	▲	▲	▲	▲	▲
Remote interior boot release	▲	▲	▲	▲	▲
Steering wheel with Selespeed and radio controls	NA	NA	▲	▲	▲



Steering wheel with radio controls	▲	▲	NA	NA	NA
Steering wheel, leather	▲	▲	▲	▲	▲
Steering wheel, height and rake adjustable	▲	▲	▲	▲	▲
Trip computer, multi function display	▲	▲	▲	▲	▲
Upholstery, Sports Cloth	▲	▲	▲	▲	▲
Upholstery, Sports Leather	▲	NA	▲	NA	NA
Upholstery, Momo leather	NA	▲	NA	▲	▲
Safety/Mechanical					
ABS Brakes with EBD (Electronic Brakeforce Distribution)	▲	▲	▲	▲	▲
Airbag, Driver's	▲	▲	▲	▲	▲
Airbag, Front passenger	▲	▲	▲	▲	▲
Airbag, Side	▲	▲	▲	▲	▲
Airbag, Window	▲	▲	▲	▲	▲
ASR (Automatic Slip Regulator)	▲	▲	▲	▲	▲
Children's safety locks on rear doors	NA	▲	NA	▲	▲
Fire Prevention System (FPS)	▲	▲	▲	▲	▲
Foglights, front	▲	▲	▲	▲	▲
Foglights, rear	▲	▲	▲	▲	▲
Head rest, centre third head rest	▲	▲	▲	▲	▲
Head rests, height adjustable front and rear	▲	▲	▲	▲	▲
Headlight height adjustment, electric	▲	▲	▲	▲	▲
Headlight washers	○	○	○	○	○
Immobiliser with Alfa code protection	▲	▲	▲	▲	▲
Power Steering	▲	▲	▲	▲	▲
Seat belt, centre rear lap and sash	▲	▲	▲	▲	▲
Seat belts, front pretensioners and load limiters	▲	▲	▲	▲	▲
Seat belts, front, height adjustable	▲	▲	▲	▲	▲
VDC (Vehicle Dynamic Control)	▲	▲	▲	▲	▲