

## **ALL-NEW JAGUAR XK – THE FULL STORY**

### **INTRODUCTION**

The launch of the all-new Jaguar XK marks an exciting new era for Jaguar in terms of both design and engineering, and reinforces the marque's reputation for building ground-breaking cars that are as rewarding to drive as they are gorgeous to look at.

The XK generation that ceased production in June 2005 was Jaguar's fastest-selling sports model of all time. The challenge for the team that designed and engineered the all-new XK was to produce a model that bettered that success story. The new XK has been engineered above and beyond the high expectations that customers rightly have for a Jaguar sports car, a fact made possible because everything from its advanced aluminium chassis to its sophisticated transmission and exquisite interior has been designed in pursuit of a luxurious, advanced and stunning new Jaguar.

The all-new Jaguar XK will be launched early in 2006 and will allow Jaguar to emerge as a world leader in Lightweight Vehicle Technology while retaining its reputation for beautifully designed and crafted cars.

"The new XK delivers the unique blend of performance, luxury and style that only a Jaguar can," says Bibiana Boerio, managing director, Jaguar Cars. "And its beauty is more than skin-deep – this is a sports car with the heart and soul of every great Jaguar."

## ALL-NEW JAGUAR XK KEY POINTS

- All-new Coupe and Convertible Jaguar XK, each designed as a 2+2 sports car
- First of a new generation of beautiful, fast Jaguars
- The most technologically advanced Jaguar ever
- Succeeds the Jaguar XK range introduced in 1996
- All-aluminium construction assists best-in-class torsional rigidity in Coupe form. In Convertible form, there is a 50 percent improvement in stiffness over the previous XK Convertible
- All-new XK is lighter than its predecessor and key rivals, with Coupe at 1595kg kerb weight and Convertible at 1635kg
- In Convertible form the Body-in-White weight, at just 287kg, is 20 percent lighter than the previous XK Convertible
- Lightweight body offers a 10 percent improvement in power to weight ratio.
- Delivers a balance of superb performance, driving dynamics and Jaguar sophistication
- Intuitive controls and driver-focussed technologies – such as Keyless Entry, Keyless Start and Active Front Lighting – enhance driver enjoyment
- Spacious, elegant sports car cabin exemplifies Jaguar craftsmanship, luxury and quality
- Launched with latest generation naturally aspirated 4.2 litre Jaguar AJ-V8 engine, developing 300bhp (224kW) SAE / 298PS (219kW) EEC
- AJ-V8 engine developed to satisfy Euro 4 emissions requirements and features Exhaust Gas Recirculation
- New Jaguar Sequential Shift 6-speed automatic transmission system incorporates steering wheel-mounted paddles for manual gear changes
- XK Coupe reaches 60mph from standstill in 5.9 seconds and completes quarter mile sprint in 14.4 seconds – less than half a second off the pace of the previous 400bhp supercharged model
- XK Convertible takes just 6.0 seconds to reach 60mph – 0.3 seconds quicker than the previous model
- XK Coupe accelerates from 50-70mph in just 3.1 seconds – 0.2 seconds quicker than the previous model (Convertible XK also 0.2 seconds quicker from 50-70mph at 3.2 seconds).
- Top speed of 155mph (electronically limited)
- Convertible roof operates electrically in less than 18 seconds to be stowed below lightweight aluminium tonneau cover
- In the event of a pedestrian impact, pyrotechnic deployable bonnet (Jaguar Pedestrian Contact Sensing) automatically deploys in the blink of an eye to create a cushioning effect between the bonnet and the engine
- New XK on sale from early 2006, with prices announced at the beginning of the year.

## THE XK MARKETPLACE

The XK competes in what the motor industry categorises as the 'Large Premium Sports Car' sector. This market is growing in importance and competitiveness – between 1996-2004, the total segment worldwide has more than doubled, from 48,000 to 99,000 units. Additionally, the number of key competitors increased over that period from four to seven. Forecasts predict that the sector size will remain constant over the next five years, with at least eight key competitors expected in the market by 2007.

Conventionally, the Large Premium Sports Car sector consists of two key product groups:

- Grand tourers, which maintain a high degree of luxury and refined comfort
- Overtly sporty cars, where high performance and handling are the main attributes.

Clearly, a product like the new XK that delivers well on both attributes will have immense appeal. The new XK offers the customer a sporty drive without compromising on luxury while its superb performance and handling will allow it to be bought by customers who previously would only have considered outright sports cars which compromised luxury and space in favour of more aggressive handling characteristics.

The new XK will appeal to a select group of affluent potential purchasers, who have an affinity with luxury products. They are looking for a grand tourer as well as a car with pure sporting credentials, one that provides exhilaration and escapism combined with status and exclusivity – 'luxury in a sports skin'.

Consequently, the new XK's beautiful exterior styling - which echoes Jaguar's lineage and signals performance - meets exactly those requirements. Similarly, customers will be delighted with an interior that engages and excites all the senses. It promotes driver focus, uses quality materials, colours and details, and has technology features that assist driver convenience and promote performance.

Advanced technology that adds to the driving experience will attract these 'savvy' consumers looking for features such as Adaptive Cruise Control and a touch-screen information and control centre. In short, the all-new XK offers customers the best of both worlds - sport and luxury, versatility and capability.

## DESIGN

- **Beautiful, modern exterior indicates future of Jaguar design**
- **Classic Jaguar oval air intake and power bulge on bonnet**
- **Convertible side profile sleek and elegant with roof stowed**

The all-new XK is visibly more assertive and sportier than the model it replaces, but in true Jaguar tradition it is also elegant, understated and mature. In hard-top guise it has classic, ground-hugging Coupe proportions, with a long bonnet, steeply raked windscreen and rear window, arch-filling wheels, and minimal overhangs. The front-wing power vents are a new Jaguar styling signature recently seen on the special edition XJ Super V8 Portfolio. The distinctive oval grille opening, prominent bonnet power-bulge and practicality-enhancing rear Liftback all echo the classic E-type, while details like the sweeping front and rear light shapes and powerful stance catapult Jaguar sports car design firmly into the 21<sup>st</sup> century.

Inside the new XK, traditional craftsmanship and contemporary luxury materials, like finely stitched leather, contrast with a choice of more high-tech trim surfaces including metallic finishes. The layout is driver-focussed and sporty, with excellent ergonomics and body-hugging seats, set low against the high waistline to give a strong 'cockpit' feel. With the new XK's longer wheelbase, wider track and taller roofline, the 2+2 layout has significantly more interior space for front seat occupants than the XK that it replaces.

Also like the XK it replaces, the all-new XK will be available in both two-door Coupe and Convertible forms, each model developed in parallel under one umbrella programme. The decision to give the Convertible version a classic soft-top rather than a folding hard-top means the open option offers exactly the same 2+2 seating layout, without compromising the elegant lines of the rear body, the strong, rising waistline or the light weight of the car.

The fully-lined triple-layer roof has exceptional wind and road noise isolation. It opens at the touch of a button in less than 18 seconds, and when dropped it stows below an aluminium tonneau cover without unacceptable intrusion into the large luggage space. Furthermore, the loadspace can be increased by 83 litres by stowing the retractable loadspace separator when the Convertible roof is up. The use of a soft-top has also allowed the exterior body to be designed with much cleaner lines and a relatively low deck, meaning the door waistline can be carried right through the vehicle from the front of the car to the tail.

The roof is constructed from three layers. The outer layer is a completely waterproof cloth/rubber/cloth laminate, and the inner layer is a luxurious cloth lining which is taut and smooth when the roof is closed. The 'sandwich filling' is an insulation layer, using 3M Thinsulate material. This gives significantly better

insulation for less than half the thickness of the previous XK soft-top construction. It is not only lighter, it takes up significantly less volume when the roof is stowed, allowing more space for passengers and luggage. The rear window is toughened glass, with a heating element, and is bonded into the roof. The door glass automatically drops slightly as the doors are closed, and rises again to seal inside the roof water channels. Additionally, the Convertible's rear windows can be lowered even when the roof is up.

The soft-top is raised and lowered by a single press of a button, using hydraulic actuators and electronic controls. It can even be operated on the move, at speeds up to 10mph. It will go from fully open to fully closed in under 18 seconds, which includes automatically raising the side windows and rear quarter glasses at the end of the cycle.

When the soft-top is up, the profile has sleek, elegant lines and the 'C' pillar area visually fits comfortably over the rear wheels. Attention to detail is continued with a chrome finishing strip fitted to the door capping and continuing around the soft-top base.

The all-new XK was created by Jaguar's design team under the leadership of Design Director Ian Callum, to push Jaguar deeper into the 21<sup>st</sup> century. The new XK's lines are bold and beautiful, powerful but elegant. In Ian Callum's words, it looks "just like a Jaguar should – powerful and exciting. That power comes from a sense of tension, muscle and form and is very much part of the new design language we are creating."

That new language begins with the proportions and stance, which are dramatically different from those of the previous XK. The new car sits on a longer wheelbase but it has markedly shorter overhangs, so it is very little longer overall. Its width, strong, high waistline and short, powerful haunches give an impression of a car crouched ready for action. With its dynamic bonnet and roof lines it looks much more compact, more contemporary, and extremely muscular and athletic - suggesting movement, power and agility even when it is stationary.

Although the new XK looks very compact, it has excellent luggage space, and the Coupe is designed to be able to carry two golf bags. The rear overhang is 122mm shorter than on the previous XK, but the rear luggage volume is only 8 litres less, or actually 22 litres more when the optional runflat tyres are specified – and of course it has gained the enormous benefit of the all-new Liftback design, which provides excellent access to the loadspace area. The Convertible will also carry two medium sized golf bags.

"I am very proud of the new XK," says Ian Callum. "It is contemporary with wonderful modern proportions yet we have succeeded in integrating design cues from our heritage. The front grille, for example, is pure E-type, and makes the perfect statement that this is, first and foremost, a Jaguar."

## LIGHTWEIGHT VEHICLE TECHNOLOGY

- **All-aluminium construction gives best-in-class torsional rigidity for Coupe and Convertible**
- **Lightweight body structure means better performance, handling, safety and economy**
- **Volume production of aluminium monocoque body structure unique to Jaguar in the automotive industry**

Key to the all-new XK's character is Jaguar's industry-leading bonded and riveted aluminium monocoque body structure, introduced with the latest XJ saloons. The aluminium body incorporates the latest thinking in epoxy bonding and riveting techniques to produce a chassis that is very safe and very light. In fact the new XK's aluminium chassis is significantly lighter and stiffer in both Coupe and Convertible form than the steel model it replaces. The new Coupe chassis is over 30 percent stiffer than the previous XK, while the Convertible is an impressive 50 percent stiffer.

As a consequence the new XK accelerates faster, uses less fuel and produces lower emissions than the model it replaces, while offering high levels of safety, reduced noise and vibration intrusion, and improved ride and handling characteristics thanks to improved suspension dynamics.

Jaguar's Lightweight Vehicle Technology is unique in the industry as a complete aluminium monocoque body structure as distinct from an aluminium spaceframe with separate aluminium panels. Developed from aircraft industry methods, where strength is critical, Jaguar's manufacturing process produces a massively strong but very light structure. The new XK takes the concept a step further with extended use of lightweight aluminium castings and extrusions as well as the pressed aluminium panels. Its strength and light weight come from the way the shell is constructed, using new jointing technologies developed by Jaguar and its suppliers.

There is only a single welded joint in the new XK Coupe body, the one 'cosmetic' joint on the roof. That also has an environmental benefit in that the body construction needs no high electrical current, produces no welding sparks or fumes, and needs no water for cooling. All the other joints in the new XK shell are formed using Jaguar's unique combination of riveting and bonding. Most joints are produced using self-piercing rivets applied by hydraulic pressure against a fixed tool. Where access to only one side of the joint is possible, as in some of the new extruded box sections, a new riveting process has been developed; and where particularly high stiffness is required in a joint, a combination of riveting and bonding is used – with the adhesive bond in effect creating a continuous joint which is stronger than a similar, riveted-only joint. All visible exterior panels are bonded to the underlying structure, and a new automated seam-sealing process seals all relevant areas of the shell before painting, to ensure that no gaps are missed.

In the new XK, a secondary front bulkhead of aluminium and composite materials helps reduce noise transmission from the engine compartment and provides a dry area under the bonnet for accommodating electrical components. The new structure also has benefits in refinement; castings used for the mounting points for the engine, transmission and suspension make those points significantly stiffer, further reducing transmitted noise and helping to improve suspension dynamics. In terms of long-term strength, Jaguar's all-aluminium shell has durability approaching twice that of a traditional spot-welded steel body.

Another major advantage of this Lightweight Vehicle Technology is that all the necessary stiffness is in the structure of the body shell, with very large rectangular-section side sills. So the Convertible, even without a roof, does not need the traditional additional stiffening panels seen on many other convertibles - meaning no added weight and no penalty in stiffness or refinement. The aluminium monocoque construction is the biggest contributor to the low overall vehicle weight of the new XK, and the Coupe shell is over 30 percent stiffer than the previous model, while the Convertible boasts an impressive 50 percent improvement in torsional rigidity.

That lightweight body significantly also offers a 10 percent improvement in power to weight ratio. The all-new XK is up to 90 percent stiffer and 180kg lighter than key rivals, with a kerb weight of just 1595kg. In Convertible form the BIW weight, at just 287kg is 19 percent lighter than the previous XK Convertible.

"The lightweight vehicle architecture really helps the all-new XK to handle, steer and brake better than ever," says Al Kammerer, Jaguar's product development director. "Imagine how much easier it is to turn a lightweight object travelling at speed compared to a heavy one. The aluminium chassis makes the XK so much more controllable in corners and a whole lot of fun to drive!"

Safety is another major benefit of this very strong construction method. That is partly inherent in aluminium as a material, which absorbs significantly more energy per kilogramme of material weight than steel when it is deformed. But the strength advantage doesn't only apply to high-speed impacts, it also means lower-speed accident repair costs are kept to a minimum. The reduction in the number of joints in the all-new XK further increases strength, and the front of the body is protected by easily replaced 'crush cans' that absorb the energy in impacts up to 15kph.

The all-new XK's all-aluminium doors are each over 6kg lighter than an equivalent steel door and their mountings are significantly stiffer, which allows smaller gaps. Mounting the window glass rails directly to the aluminium castings at the front and rear of the door gives better sealing from the frameless layout, and an impressively solid sound and feel when closed.

The all-aluminium Liftback rear door is strong, light and simple to operate. Once it has been lifted manually through the first 20 per cent of its opening arc, gas struts lift it the rest of the way.

With lower weight and higher strength, Lightweight Vehicle Technology is the starting point for improved performance, safety, refinement, economy, emissions performance and driving dynamics in the new XK.



## POWERTRAIN

- **Latest generation naturally aspirated 4.2 litre V8, develops 300bhp (224kW) SAE / 298PS (219kW) EEC and 310lb ft (420Nm) SAE / 303lb ft (411 Nm) EEC of torque**
- **Engine satisfies Euro 4 emissions requirements and features Exhaust Gas Recirculation**
- **New Jaguar Sequential Shift 6-speed automatic transmission incorporates steering wheel-mounted gearchange paddles**

## ENGINES

A key element in the character of a sports car is its engine. The new XK will be launched with a powerful four-cam naturally aspirated 4.2 litre AJ-V8 powerplant. This compact, lightweight engine is based on that fitted to the latest generation XJ saloon and has undergone significant development compared with the engine used in the previous XK, including new fuel-injection technology. The latest 4.2 litre engine satisfies Euro 4 emissions requirements as well as stringent US emissions regulations.

The naturally aspirated 4.2 litre V8 engine produces 300bhp SAE (298 PS EEC) and develops maximum torque of 303 lb ft (411Nm) EEC at 4,100rpm. Again, the spread of torque is an important ingredient in the XK's effortlessly sporty character, and this engine delivers more than 85 percent of torque all the way from 2,000 to 6,000rpm. Yet it still offers fine fuel economy and low emissions figures, with a drop in CO<sub>2</sub> emissions of 5 percent over the previous XK.

The naturally aspirated 4.2 litre V8 XK Coupe has an electronically limited maximum speed of 155mph and a 0-60mph time of 5.9 seconds, plus instant throttle response and broad flexibility for punchy performance across the range. With the all-new XK's weight savings, the new naturally aspirated 4.2's standing quarter-mile time of 14.4 seconds is less than half a second off the pace of the previous supercharged 4.2 XKR.

The latest AJ-V8 engine was developed to satisfy Euro 4 emissions requirements. Compared to the Euro 3 requirements, that meant a 50 percent reduction in hydrocarbons (HC) and oxides of nitrogen (NOx) and a 60 percent reduction in carbon monoxide (CO) emissions. The new engine also satisfies more stringent American regulations requiring a 50 percent reduction in HC emissions. It features Exhaust Gas Recirculation and the latest generation of catalyst cores with thinner coatings of higher density catalysing material – which reduces exhaust gas restriction and is more efficient.

The compact AJ-V8 engine has very stiff but lightweight all-aluminium construction, with eight cylinders in a 90-degree vee. The combination of strength and lightness begins with a ribbed cylinder block and cylinder heads. The 4.2 litre version has bore and stroke of 86.0x90.3mm for a capacity of 4196cc. The

fully balanced four-throw, six-counterweight crankshaft is supported in five main bearings. The connecting rods use split-fractured big-end journals for strength with light weight and perfect balance. Each cylinder head carries two chain-driven overhead camshafts, which are hollow, to save weight and improve performance by allowing higher engine speeds. The camshafts operate four valves (two inlet and two exhaust) in each pentroof combustion chamber, around a central spark plug. An unusually narrow 28 degree included valve angle allows a compact combustion chamber shape and narrower heads, which benefits overall packaging.

The inlet camshafts allow variable inlet valve timing, with VCP Variable Camshaft Phasing, which is controlled by three-dimensional digital maps stored in the Engine Management System, on the basis of engine speed, throttle position and oil temperature data gathered from a series of sensors in the engine. The phase of the inlet camshafts is varied hydraulically and continuously (advancing the opening of the inlet valves at high engine speeds to allow the combustion process to start earlier). That delivers faster throttle response at all engine speeds, and gives optimum performance at all speeds and under all loads - with more torque at low speeds and maximum power at high speeds, while optimising fuel consumption. The VCP system has the added advantage of providing a degree of internal exhaust gas recirculation – which reduces emissions of NOx by slowing the combustion rate, and of hydrocarbons by re-burning some of the exhaust gases.

The major difference between this engine and the previous generation 4.2 litre XK engine is in the fuel injection technology. This latest V8 now uses multi-hole injectors, which improve the fuel spray pattern in the combustion chambers, improving both power and fuel efficiency.

Optimum throttle response (a crucial ingredient in confirming the new XK's sports car character) is delivered by full 'drive-by-wire' electronic throttle control, with no mechanical connection between the accelerator pedal and the throttle body. The response is based on the torque demand for every instantaneous driving situation. That is calculated by the electronic engine management control, based on parameters including the driver's accelerator input, and other vehicle factors such as road speed, engine speed and gear selection. The electronic controls then call up the required torque at any instant by adjusting throttle position, variable cam phasing, fuel flow and exhaust gas recirculation settings.

Equally important for its new role in Jaguar's sportiest cars, the 4.2 litre engine has been engineered to give the sound expected from a real sports car engine – especially under acceleration – but without being undesirably noisy. The new XK's Semi-Active Exhaust system varies the flow of exhaust gases through the main, large silencer box depending on the pressure in the system, and features acoustically tuned tailpipes that eliminate low speed boom. There is also an underfloor resonator with two chambers (one for each cylinder bank) which balances the sound from the two banks. By tuning the sounds from the air-induction system and the exhaust system, Jaguar concentrated on both the solid, powerful low-

frequency sounds and more technically 'sophisticated' higher frequency sounds, to give a feeling of power and performance.

## **TRANSMISSION**

The new XK uses the latest version of Jaguar's class-leading six-speed epicyclic automatic transmission, which is widely regarded as one of the best automatic transmissions in the premium, sports car market. Like the new XK's AJ-V8 engines, it is notably light and compact. It features Bosch Mechatronic shift – an electro-hydraulic shift mechanism whose adaptive shift strategy responds to both road conditions and driving style, to give the smoothest shifts with optimum performance.

The XK's transmission introduces a new generation of automatic gearshift for Jaguar, replacing the familiar 'J' gate with the Jaguar Sequential Shift system with Park, Reverse, Neutral, Drive and Sport modes. The fully automatic Drive mode adapts to individual driving styles, while a Sport Auto mode can also be selected. This offers an even more responsive fully automatic shift strategy, also utilising an automatic blip of the throttle to maintain ultra-smooth downshifts.

For the first time in a Jaguar, drivers will be able to use steering wheel-mounted paddles to change gear. In either Drive or Sport modes instant access to manual operation is achieved via the shift paddles. In manual mode, the transmission controller uses an alternative parameter set to control gear shifts, enabling delivery of extremely rapid and responsive manual shifts, whilst maintaining class-leading Jaguar shift quality in automatic modes. Interaction with the torque-based engine management system allows for precise torque control during shifts – engine inertia is used to enhance acceleration during power-on upshifts, and an engine torque increase ('throttle blip') is used to significantly shorten over-run downshifts.

The epicyclic geartrain utilises clutch-to-clutch synchronous shifting to ensure that a controlled amount of torque is always being transferred during power on upshifts. This makes the shift much smoother than in the automated manual gearboxes adopted by some of the new XK's competitors, where the use of an automated clutch completely interrupts the flow of torque during shifts. The extremely rapid shift times often quoted for automated manual transmissions relate solely to the duration of this torque interrupt; the true shift time is significantly longer since the clutch must be disengaged prior to the ratio change, and re-engaged after. In contrast, the Jaguar Sequential Shift suffers no torque interrupt resulting in a smoother more powerful shift feel, and a very short total shift time of approximately 600 milliseconds from the driver touching the shift paddle to the completion of the shift event. In fact, during development, comparison tests between Jaguar Sequential Shift and rival automatic transmissions in the class showed the new XK's transmission to be the fastest system of all, changing gear at least 400 milliseconds faster than a standard automatic and 100 milliseconds faster than the best automated manual system.

## CHASSIS AND DRIVING DYNAMICS

- **Latest Computer Active Technology Suspension (CATS) ensures optimum ride and handling**
- **Incredibly stiff chassis ensures more positive steering feedback for driver**
- **Bigger ventilated disc brakes ensure more stopping power, better pedal feel and greater resistance to fade**

The light, ultra-stiff all-aluminium monocoque body structure of the all-new XK forms a solid basis for the suspension components. The reduced body weight also allows other components to be located as required to deliver optimum weight distribution and avoid any compromises with the suspension layout. The XK uses Jaguar's well proven and classically sporty combination of unequal length wishbones at the front and unequal length wishbones using the driveshafts as upper links at the rear. The body's light weight and careful packaging provide the perfect platform for Jaguar's renowned expertise in combining exceptional handling and roadholding with comfort and refinement.

In unison with this ultra-stiff body, Jaguar is able to use a conventional, mechanically sprung suspension layout, with coil springs and telescopic dampers all round, that gives more natural, more positive feedback to the driver, exactly as a sports car should.

As Jaguar's chief engineer Mike Cross explains: "The stiff and lightweight body has allowed us to engineer precision and agility into the new XK without losing refinement. It may sound obvious, but it's much easier to tune the dynamics on a car that is intrinsically right in the first place. And while the basics are all there, this is also a very advanced car. The driver is the centre of attention and we've used technology to help us where it makes sense."

That technology includes a new version of Jaguar's Computer Active Technology Suspension (CATS), which is a two-stage adaptive damping system that ensures the optimum balance between ride and handling whatever the road conditions or style of driving. The car's pitch and yaw rates are measured using accelerometer sensors. That data, plus information on steering wheel angle and brake demand, is processed and electronically controlled hydraulic valves continuously vary the damper settings accordingly. In the previous XK, the CATS system adjusted front and rear dampers in pairs, limiting the control variation to pitch only. The all-new XK's version controls all four dampers separately, which allows control of roll as well as pitch, for even better ride and handling balance, with a very sporty feel.

## **WHEELS & TYRES**

The all-new XK offers a choice of aluminium alloy wheel designs in three sizes, with an optional tyre pressure monitoring system and, depending on wheel choice, the option of a run-flat tyre specification.

The 4.2 litre XK has 18-inch alloy wheels as standard, with the option of 19 or 20-inch wheels. The 18 and 19-inch wheels have conventional solid rims, the 20-inch wheels have a split-rim look, giving a sporty, high-tech appearance. On each model, and whatever the wheel diameter, the rear wheels are wider than the front ones – to optimise the steering characteristics, handling balance and traction.

With 19-inch wheels, run-flat tyres are available as optional equipment. They are designed to allow the driver to drive on following a puncture, and are capable of travelling for 80 to 120km at speeds of up to 50mph (80kph) after a total deflation. The new XK offers Jaguar's new Tyre Pressure Monitoring System (TPMS), which uses a pressure sensor in each wheel continuously to monitor each tyre.

Data from the sensor is transmitted by radio frequency to a receiver in each wheel arch, and in turn to the central control module. In the event of a loss of pressure, the system displays clear warnings in the instrument cluster to help the driver to take appropriate action. The TPMS system is standard equipment with run-flat tyres, and available as an option with all other tyre types. Where run-flat tyres are fitted, no spare wheel needs to be carried in the luggage compartment and the unused spare wheel well is fully trimmed and shaped to take a suitcase and increases the total loadspace by 30 litres.

## **BRAKES**

The new XK features a braking system with bigger ventilated discs, more stopping power, better pedal feel and better resistance to fade than the previous XK. Extensively tested at facilities including Nardo in Italy and the Nürburgring test track in Germany, where Jaguar has a permanent research facility, the new brakes are specifically tuned to be more responsive for the enthusiastic driver. The new XK has four-channel ABS with analogue control which is more refined than simpler 'on-off' digital controls, and Electronic Brakeforce Distribution which ensures the correct balance of braking forces between all four wheels irrespective of road or vehicle-load conditions. It also uses Jaguar's excellent Electronic Parking Brake system.

## INTERIOR

- **Driver-focussed interior design produces sporty and functional atmosphere**
- **Increase in leg, head and shoulder room over previous XK**
- **Touch-screen information centre controls all major functions**

The interior of the new XK is as modern and forward-looking as the exterior, and designed specifically with the sporty, enthusiastic driver in mind. It is roomy and comfortable, and in its choice of materials and equipment, it is genuinely a premium, luxury car. It was important that it displayed the understated craftsmanship and restrained contemporary luxury associated with Jaguar. But being a sports car there was no place for overly ornate or fussy design – ergonomics were more important. So the seats hold the driver and passengers firmly but comfortably, the interior has a light and airy ‘cockpit’ feel, and the lowered position of the instrument panel also gives a feeling of greater cabin space.

“Jaguar interior design has always scored highly with our customers,” explains Giles Taylor, Senior Design Manager, Jaguar Cars. “In terms of comfort, ergonomics and general environment, our cars are ahead of the opposition. With the all-new XK we naturally looked to enhance that strength. The new interior is somewhere the driver and passengers will feel at ease; it produces a sense of well-being and harmony.”

That sense of well-being comes in part from the fact that the car is roomier than the previous XK, and has the classic 2+2 sports car layout with individual sculpted seats in the rear. There is 59mm more seat-track travel, 54mm more front leg room, up to 31mm more front head room and 32mm more shoulder room. There is better foot space all round, and Jaguar’s electronic parking brake liberates the space that was previously needed for the outboard handbrake lever. There are more interior stowage spaces, and the combination of more interior space plus longer seat travel effectively increases rear seat space and makes rear seat access through the long doors easier.

The interior is very clean and driver-focussed, with simple architectural forms and minimalist detailing. What’s in front of the driver essentially defines the feel of the car, which is sporty and functional. The dashboard lines flow from the A pillars to the centre console, whose advanced touch-screen carries the controls for many of the car’s features – allowing the number of switches on the instrument panel to be kept to a minimum. At the same time, the basic controls are carefully laid out for quick and easy access.

The main instrument binnacle in front of the driver is designed to relate to the shape of the three-spoke steering wheel and it houses two classic round dials flanking a multi-function Driver Information Centre based on Thin Film Transistor technology. The speedometer and tachometer dials are backlit with green backgrounds and their pointers are illuminated with white light. The central Driver Information Centre

display is split horizontally into zones, each showing specific information. The top zone shows the selected gear, the next shows cruise control information, the central 'message centre' zone normally shows a clock but can also relay information from low fuel level to low tyre pressures, with a graphic to show which wheel is affected. The Driver Information Centre border changes colour through white to yellow to red to indicate the urgency of the problem, and even if the driver clears the display warning a yellow warning triangle stays lit to remind the driver that remedial action is necessary. Below that there is a small back-up display for the navigation system turn directions.

The large, seven-inch centre console touch-screen is a menu-driven information and control system. It is designed to offer the required number of functions, but with minimum distraction and complexity to the driver – so in each menu level a maximum of only five items is available for selection. For example, the first menu level allows the driver to select between climate, audio, navigation, telephone and vehicle settings. To make selection easier for some modes and further to avoid distraction from the road, when the driver's finger is close to but not touching one of the screen icons, that particular icon 'grows' and an audible indication of the selection is given, so the driver can touch the correct icon without even having to see it.

Where available, the centre screen also incorporates the display for the standard DVD-based satellite navigation system, which is also controlled via the touch-screen. A significant advance over previous systems is that as well as giving turn direction instructions, the new XK's system also gives audible 'towards' information at junctions – to the main town or city indicated by the local signpost, or (on a local level) to the next street name. Full postcode-based information is a further enhancement from previous systems. In Europe, the system is supplemented by Traffic Messaging Channel information, received from local radio stations via the radio antenna.

As well as being a sports car, the new XK is a premium luxury car, and is equipped as such. Its sophisticated dual-zone climate control system (which can be regulated via the touch-screen as well as by its conventional controls) has a comprehensive list of features including heating and cooling, humidity control which senses the risk of misting and switches to a dehumidified airflow to the windscreen area, and automatic demisting after cold starts. The defrost function includes heated front and rear screens and heated mirrors. Heated seats (even an optional heated steering wheel rim) are controlled by the climate control system, and selectable from the central touch-screen.

In the Convertible, a dedicated strategy operates when the car is being driven with the roof down, automatically changing the distribution of the airflow (warm or cool) to give more flow to the face vents.

The new XK offers a choice between high and optional premium-quality audio systems. The standard six-speaker high-spec system supports conventional audio CDs as well as discs containing WMA and

MP3 digital files, and the single dash-mounted CD slot is actually a six-disc changer. The premium system, by Alpine, has eight speakers, a remote six-channel amplifier, 520 watts output and Dolby® Pro Logic® II Surround Sound.

The built-in communication interface is Bluetooth™ based, and can communicate wirelessly with compatible Bluetooth™ mobile phones – which only have to be in the passenger compartment, for instance in a brief case or jacket pocket. The completely hands-free system has volume and answer controls on the steering wheel, and a ‘do not disturb’ mode to inhibit incoming calls when selected. The dialling keypad is contained in the touch-screen and can be selected from the telephone menu; and the touch-screen can also display phone book and incoming call information.

The interior combines traditional luxury and high technology. The choice of materials was as important as the shapes, so it is important that they are seen – and details like the traditional stitching are an integral element of the design. There is a choice of two leather trims including Soft Grain, which can be extended as an option to cover the instrument panel top, door cappings and seats. In each type there are four interior colour schemes, two of them two-tone, with contrasting and complementing colours. Ivory and Charcoal is clean and light; Ivory and Slate Blue is contemporary; Charcoal is sporty; and Caramel is warm and gently inviting.

There are three veneer options – Aluminium, Burr Walnut, and the much lighter, more modern Poplar wood. The aluminium option is a very contemporary choice, giving a real high-tech appearance. Where traditional wood veneers are specified they are produced by Jaguar’s own highly specialised, in-house wood veneer department.



## **SAFETY**

- **Pyrotechnic pedestrian deployable bonnet (Jaguar Pedestrian Contact Sensing) is a world first**
- **Bonnet raised in around 30 milliseconds using forces up to 50 times the force of gravity**
- **Passive bumper system helps prevent leg injuries with crushable foam**

The all-new XK is engineered to meet all worldwide impact requirements with only one design, and its effectiveness was proved using many computer-simulated and real world crash tests. Enhanced safety features play a major role, both for passenger and pedestrian protection, and the latter includes the introduction of one completely new, industry-leading feature – the pedestrian deployable bonnet.

Jaguar is one of the first manufacturers to meet Phase One of new European safety legislation using an active deployable bonnet system. The new standards are designed to help mitigate the severity of injuries to pedestrians in the event of a collision with a car. Legislation in the European market requires manufacturers to commit to a two-phase introduction of a range of active and passive safety improvements on all new cars to improve the protection of pedestrians in case of accident.

In the unfortunate event of a pedestrian impact, the deployable bonnet on the new XK automatically ‘pops’ up a few inches, to increase space between the engine and the bonnet. This helps to isolate the pedestrian from hard points in the engine compartment - and takes place in less than a tenth of the time it takes to blink an eye. An advanced sensing system is mounted in the front bumper to help discriminate between a pedestrian collision and any other possible front-end collisions.

“The Jaguar design team embraced the idea of using a deployable bonnet when it was first considered during early concept discussions on the new XK. This clever feature saves up to 65mm in height off the bonnet surface and a similar amount off the roofline, allowing the design team to maintain a very low, sleek Jaguar sports car profile on the new XK,” said Ian Callum, Jaguar Cars Design Director.

The active system fitted to the all-new XK is complemented by a passive bumper system, the design of which helps to mitigate leg injury through the use of crushable foam and plastic covering.

## **PASSENGER SAFETY**

The all-new XK has comprehensive protection for driver and passengers, starting with the inherent strength of its all-aluminium body construction and effective energy absorbing deformation zones. It offers an ‘intelligent’ driver airbag which senses seating position, whether the driver is wearing a seatbelt and the severity of any impact, and deploys the airbag accordingly. It has a passenger front airbag that minimises injury even if the passenger is sitting awkwardly or too close to the airbag, and there are two

combined front-seat head and thorax side airbags developed to protect occupants in the event of impacts with larger vehicles and stationary objects such as poles. The all-new XK is fitted with Jaguar's Protec dynamic headrest system, which is designed to minimise whiplash injuries in the event of an impact from behind, by automatically pushing the headrest forwards to support the head and reduce the risk of injuries to the neck. It also has ISOfix child-seat fixings in both rear seats, plus a top tether that gives additional security in fixing ISOfix child seats.

Although they are not a legal requirement, the Convertible features a Roll-over Protection Device consisting of two aluminium hoops that are automatically deployed if the car's sensors detect the onset of a roll-over accident. That creates a protected area between the hoops and the reinforced windscreen structure around the restrained occupants. The system is deployed by an advanced solid-state gyro sensor system. It also has a patented design to allow it to deploy through the rear window area if the roof is up, so the lines of the car have not been compromised by the inclusion of this safety system.

## **DYNAMIC DRIVING AIDS**

The new XK offers the most up-to-date electronic dynamic safety systems, including Traction Control System (TCS) and Trac DSC function.

TCS assists traction from rest or on slippery surfaces by applying the appropriate brake to a driven wheel if slip is detected, transferring drive torque to the other driven wheel where that has more grip. DSC uses selective braking and controls engine torque output to prevent excessive oversteer or understeer, excessive or fast transient roll, and unwanted wheel lock under hard engine braking. Trac DSC is a feature aimed at the sportier and more experienced driver. It is a driver-selectable second stage of the DSC stability control that retains the full TCS traction control function (and ABS and EBD functions) but raises some of the sideways slip thresholds by delaying the intervention of the DSC functions. That allows the skilled driver to take more responsibility for controlling the car's cornering attitude. It is not possible to select the function unintentionally – the driver has to hold the switch for three seconds or more to select this level of DSC.

To confirm the all-new XK's driving character, steering feel was a key issue. The all-new XK features Jaguar's Servotronic 2 steering, as used on the XJ but re-engineered to suit a high-performance sports car with a faster ratio steering rack. It is a mechanically assisted system (hydraulically powered by an engine-driven pump) with electronic control. The control module uses data about vehicle speed and steering input to regulate the degree of steering assistance. It provides higher assistance at low speeds for easy manoeuvring, and less assistance at higher speeds for increased feedback to the driver – resulting in class leading steering characteristics.

## OTHER DRIVER AIDS

Jaguar believes in the intelligent use of technology - to enhance the driving experience, while avoiding over-use of technology that only adds complexity rather than user-benefit. But Jaguar also believes in making its cars safer and more relaxing to drive. The new XK offers a range of driver aids that support that philosophy, including Cruise Control or Adaptive Cruise Control, Forward Alert, parking sensors, and automatic lights and wipers.

Cruise Control is standard on the new XK and allows the driver to set a fixed speed via steering wheel mounted controls, with the usual accelerate, coast and resume functions. Adaptive Cruise Control is an option, and in addition to the normal cruise control functions it uses microwave radar technology to monitor the road ahead and automatically reduce speed if traffic conditions make it necessary. It normally reduces speed simply by reducing power, but if necessary (for instance if another car pulls sharply into your path on a motorway) it will also use the ABS braking system to slow more quickly, as appropriate. The gap to the vehicle in front is based on time, so as speeds increase, so does the gap. It is also possible to adjust the gap to three levels by a simple steering wheel switch, to a space that the driver feels most comfortable with.

Contained within the ACC is Forward Alert, which uses the XK's forward-facing sensors to help warn the driver of a potential collision. When approaching another vehicle or other obstacle it continuously estimates the braking effort required to avoid it. If the distance available falls below the safe threshold, Forward Alert sounds an audible warning to prompt the driver to take appropriate action. It is still the driver's responsibility, though, to stop in an emergency.

Rear parking aids are standard on all-new XK, with four ultrasonic sensors in the rear bumper which can detect objects up to 1.8 metres away to the rear and corners of the car and give an audible warning. The warning comes through the car's audio system and changes tone with the proximity of the car to the object. The car's touch-screen gives a visual indication of which part of the car is near the object. A front parking aid system is optional.

The all-new XK's wiper system is rain sensitive and its headlights are light sensitive, so when either function is switched to automatic mode it will respond to rain or darkness respectively – although it is also possible, of course, to control wipers, washers and lights manually.

The standard bi-xenon headlamps incorporate power-wash and self-levelling systems. A separate beam comes on at low speeds and when the direction indicator is used, to light up an area to the sides of the car for low speed manoeuvring. The optional Active Front Lighting system provides enhanced night-time

visibility by automatically swivelling the dipped beam lenses depending on road speed and steering angle.

At the rear, the lamps are split between the body and the rear liftback or bootlid. The liftback segments incorporate a single reversing light on one side and a high intensity fog light on the other. Both use high-power LED lights, and the new XK's white LED reversing light is an industry first.

## **SECURITY**

The all-new XK has a Thatcham category 1 alarm system with microwave intrusion sensing, door protection and tilt-sensing to detect the vehicle being opened, jacked up or moved. It features two-stage unlocking, which unlocks the driver's door with one push of the unlock button and the passenger door with a second push. The steering lock is electrically engaged when the car is locked.

Amongst the user-friendly advanced technologies in the all-new XK is the Jaguar Smart Key System, which provides Keyless Start with a push-button starter, and also optional keyless entry simply by carrying the Jaguar Smart Key in your pocket or bag.

## **XK LINEAGE**

At Jaguar, XK has always stood for sports car and for Jaguar, sports cars have always been used to push technology forwards. The badge first appeared on the XK120, unveiled at the London Motor Show in 1948. Like the new XK, the very first XK120s had aluminium bodywork and although the production models reverted to steel bodies, they still had abundant performance – mainly thanks to the first appearance in production of the classic Jaguar six-cylinder twin-cam XK engine and retention of lightweight aluminium closure panels. In 1949 the XK120 justified its name, by topping 120mph in an official record run on the Jabbeke motorway in Belgium. Not only was it the fastest sports car of its day, it also started a golden era for Jaguar in sports car racing.

The legendary C-type racer that was developed from the XK120 took the innovations to the next level. In 1951, with a new tubular chassis and a beautifully streamlined aluminium body designed by Jaguar's aerodynamics specialist Malcolm Sayer, it won the greatest sports car race of them all, the Le Mans 24-Hours. The C-type won again in 1953, after famously introducing disc brakes to motor sport the previous year – a perfect illustration of Jaguar introducing cutting edge technologies in their sports cars, and invariably quoted as one of the greatest examples of 'motor racing improving the breed'.

While the XK140 and XK150 followed the XK120 as Jaguar's mainstream production sports cars, that dual-purpose road/race character started by the C-type evolved into its even more exotic successor, the D-type. The D continued to be based around the brilliant XK engine but now had an aluminium semi-monocoque chassis built on aircraft principles, and even more efficient low-drag aerodynamics, again developed by Sayer. In 1955, 1956 and 1957 the D-types added a stunning Le Mans hat-trick to bring Jaguar's 'first generation' 24-Hour victory tally to five wins in seven years.

When the E-type stole the show in Geneva in 1961 there was no mistaking that although it was a full-production road car, it was from the same DNA as the D. It was actually the last Jaguar sports car to use the XK engine, but once again it had rewritten the sports car rule book with its stunning looks, its semi-monocoque construction and its astonishing performance-to-price ratio – something else Jaguar had made a speciality of.

When the next XK, the XK8, appeared, in 1996, it reflected the times. It was a very different kind of car – much more grand tourer than classic sports car in the 1950s and 1960s mould, but every inch a Jaguar, and destined to be the fastest selling sports car in Jaguar history. Like its predecessors it was looking forwards, not backwards and made clever use of new technologies to make it quicker, safer, more refined and more efficient. By 2001 it had Jaguar's A.R.T.S. Adaptive Restraint Technology System and Adaptive Cruise Control; in 2003 it adopted the larger, more powerful 4.2 litre V8, plus the 400bhp supercharged version. It also adopted Jaguar's class-leading six-speed automatic transmission,

Emergency Brake Assist and Dynamic Stability Control. And one more generation of changes in 2004 carried it through to the end of production in May 2005 with its sporting dynamics and stunning looks still giving it a very special appeal.

Now, the all-new XK takes the Jaguar sports car line to another level. It is lighter, faster and better equipped than the model it replaces, with substantial improvements in performance, handling dynamics, braking distances, safety and economy. In looks it pays homage to the legendary Jaguars of the past – the front grille, for example, is a clear evolution of the classic front ends seen on the D-type, E-type and last-generation XK. But beneath that gorgeous skin there has never been a more fitting representation of how Jaguar's sports cars offer cutting-edge technology to match their unparalleled appearance.

ENDS

## ALL-NEW JAGUAR XK - TECHNICAL SPECIFICATION

	XK 4.2L V8 COUPE	XK 4.2L V8 CONVERTIBLE
<b>CHASSIS</b>		
Body	Riveted and bonded aluminium	Riveted and bonded aluminium
<b>ENGINE</b>		
Cylinders/valves per cylinder	8/4	8/4
Bore/stroke – mm	86/90.3	86/90.3
Capacity – cc	4196	4196
Maximum power – SAE bhp (kW)	300 (224)	300 (224)
EEC PS (kW)	298 (219)	298 (219)
@ rpm	6000	6000
Maximum torque – SAE lb ft (Nm)	310 (420)	310 (420)
EEC lb ft (Nm)	303 (411)	303 (411)
@ rpm	4100	4100
Transmission	6-speed automatic. Jaguar Sequential Shift with steering wheel-mounted shift paddles	6-speed automatic. Jaguar Sequential Shift with steering wheel-mounted shift paddles
<b>PERFORMANCE (Manufacturer's figures)</b>		
0-60 mph (0-100 kph) - seconds	5.9 (6.2)	6.0 (6.3)
50-70mph – seconds	3.1	3.2
1/4 mile – seconds	14.4	14.5
Top speed – mph (kph)	155 (250) electronically limited	155 (250) electronically limited
Braking 60-0mph (feet)	113.5	113.5
<b>AERODYNAMICS</b>		
Cd	0.33	0.34
<b>FUEL ECONOMY<sup>1</sup></b>		
Urban – mpg (l/100km)	16.5 (17.1)	16.5 (17.1)
Extra Urban – mpg (l/100km)	34.9 (8.1)	34.9 (8.1)
Combined – mpg (l/100km)	25.0 (11.3)	25.0 (11.3)
CO <sub>2</sub> emissions - g/km	269	269
<b>WEIGHT</b>		
Kerb weight – lb	3516	3605
Kerb weight – kg	1595	1635
Weight Distribution – Fr/Rr %	52.6/47.4	52.1/47.9

(1) The fuel consumption figures were obtained in tests carried out in line with the Passenger Car Fuel Consumption and CO<sub>2</sub> Emissions Information Regulations 2001 (Reflecting EU Directive 80/1268/EEC as amended by 2004/3/EC). These figures were correct at the time of going to press.

## XK 4.2L V8 COMPARISON - TECHNICAL SPECIFICATION

IMPROVEMENT	COUPE		CONVERTIBLE		
	NEW	PREVIOUS	NEW	PREVIOUS	
<b>PERFORMANCE</b>					
Improved 0-60mph (0-100kph)	<b>Coupe 0.2s/Convertible 0.3s faster</b>	5.9 (6.2)	6.1 (6.4)	6.0 (6.3)	6.3 (6.6)
More power – SAE bhp (kW)	<b>2% more powerful</b>	300 (224)	294 (219)	300 (224)	294 (219)
Power to weight ratio - bhp/kg	<b>Coupe +10%/Convertible +13%</b>	188	172	183	163
More torque – SAE lb ft (Nm)	<b>2% more torque</b>	310 (420)	303 (411)	310 (420)	303 (411)
Torque to weight ratio - Nm/kg	<b>Coupe +10%/Convertible +13%</b>	263	240	257	228
Torsional stiffness - Nmm/deg	<b>Coupe 31%/Convertible 48% stiffer</b>	29600	22591	15300	10317
<b>DIMENSIONS</b>					
Head room - in (mm)	<b>More head room</b>	38.2 (970)	37.4 (950)	38.3 (972)	37.0 (941)
Shoulder room - in (mm)	<b>More shoulder room</b>	56.5 (1434)	55.2 (1402)	56.5 (1434)	55.2 (1402)
Leg room - in (mm)	<b>More front-seat leg room</b>	45.1 (1146)	43.0 (1092)	45.1 (1146)	43.0 (1092)
Weight - kg (lb)	<b>Coupe 5% lighter/Convertible 8% lighter</b>	1595 (3516)	1685 (3715)	1635 (3605)	1775 (3913)