

LOTUS EVORA NORTH AMERICAN DEBUT
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THE EVORA 2010 IN DETAIL

With its stunning visual impact, exhilarating overall dynamic performance, innovative chassis technology and high levels of luxury, packaging and convenience, the Evora makes its North American debut at the Los Angeles Auto Show.

Los Angeles, CA - The first all-new Lotus since the iconic Elise made its debut in 1995, the Evora enters the sports car market as the world's only mid-engine 2+2. Powered by a Lotus-tuned 3.5-liter V6 engine producing 276 hp, and weighing just 2,976 lbs.

(prototype specification), the Evora promises breathtaking performance. During preliminary testing around the famous Nürburgring, the Lotus chassis development engineers report Evora is extremely agile and great fun to drive – even when clad with the full development disguise that hid the beautiful lines from the prying motor industry paparazzi.

In addition to its excellent performance and exemplary handling, the Evora offers a more refined ownership experience than Lotus's existing smaller four-cylinder models. Evora's contemporary cabin is elegantly trimmed and its equipment list includes such high-tech features as an advanced touch-screen multi-media system incorporating a state-of-the-art Alpine satellite navigation and audio system. Because one of the roles of the Evora is to attract new customers to the Lotus brand, much attention has been paid to its ease of use. Wider, taller door apertures and narrower sills make getting in and out of the cabin a less athletic undertaking than it is in Lotus's smaller sports cars (the Elise, Exige and 2-Eleven), while the design of the cabin itself will accommodate two 99th percentile (6ft 5in tall) American males in the front seats.

The 'convenience factor' of the Evora extends to less obvious areas of the car. For instance, beneath the skin the entire front-end structure is a high tech aluminium sacrificial modular sub-frame unit, attached to the main extruded aluminium tub. This modular unit is designed to deform for maximum safety, and to reduce repair costs in the event of a frontal impact.

The Evora has been designed with global automotive regulations in mind, and in preparation for future variants that are planned including a convertible. The Evora will be hand-crafted and built on a dedicated new assembly line within Lotus's advanced manufacturing facility at Hethel in the east of England. Capacity limitations will restrict production to approximately 2,000 cars a year, ensuring the dynamic new sports car's rarity and exclusivity.

Mike Kimberley, CEO of Group Lotus plc, has this to say about the exciting new model: "The Evora is the biggest milestone Lotus has achieved since the Elise was born 13 years ago and is part of our bold five-year strategic plan, which includes the introduction of new cars and technologies to many more markets around the world. The Evora also represents Lotus core values of performance through light weight and efficiency and proves that you can have phenomenal performance, fuel-efficiency elegant design and practicality all in a class leading mid-engine 2+2 sports car, which will meet global safety and homologation standards."

Mike Kimberley continues, “Looking to the future, we will continue to research, develop and produce lighter, more efficient vehicles which are linked to our extensive work on all aspects of future fuels, alternative engines and electric and hybrid vehicle propulsion systems. We all have an environmental responsibility to future generations and the Evora is our latest proof that Lotus’ value of “performance through light weight” improves the efficiency and sustainability of the automobile.”

THE EVORA IN DETAIL

Style or function? Have both...

Designed ‘in-house’ by Lotus Design, the sleek and athletic shape uses fluid forms and crisp surfaces to communicate velocity, agility and sophistication. Low and wide with modern cab forward proportions, muscular rear haunches and function-optimized side air intakes; this is clearly a serious mid-engine sports car that skilfully hides the practicality of its two-plus-two capability.

Russell Carr, Head of Lotus Design, led the Evora design team with Steven Crijns, Design Manager responsible for the exterior and Anthony Bushell, Senior Designer, responsible for the interior.

“A cornerstone of the design's success was working closely with the technical team to develop a package that allowed us to get the proportions correct,” says Head of Design Russell Carr, “The asymmetric wheel sizes, the short rear overhang, long front overhang and cab forward visor screen all contribute to giving the car visual movement and an agile stance. This is incredibly important to us because we want the car's aesthetics to communicate its driving characteristics.”

Lotus products have always embodied a perfect balance between form and function and the Evora successfully continues this heritage. “We never lost sight of the fact that, although this car must provide real world usability, sports cars are emotional purchases and you have to seduce the customer through beguiling looks and exotic persona. We are, therefore, very proud that we have been able to use technical needs and user functionality to positively drive the design in key areas and create some of the car’s most distinctive features,” says Carr. “Ingress and egress, for example, dictated a minimal “step-over” to get into the Evora. We simply cut away the surface under the door and created a unique and dramatic piece of sculpture that enhances the stance of the car as well as its usability.”

Elsewhere, aerodynamic considerations for drag, downforce and cooling had significant but positive influence on the overall form and details such as air intakes. A desire to create balanced downforce, that increases cornering performance, led to the adoption of the now Lotus “signature” top exit radiator vent, race car inspired diffuser and “floating rear wing”. Drag limitation, drove the dramatic tear-dropped cabin layout and the curvaceous plan view has given the car a more muscular rear shoulder that conveys a level of sophistication appropriate to this market segment. “We believe that our designs should be honest as well as dramatic and so we are really pleased with the fact that these iconic features all do a real job” says Steven Crijns, Design Manager.

This inherent understanding of the relationship between the technical and the aesthetic paid dividends the first time a full-scale model of the Evora was wind tunnel tested – only minimal adjustments were required to the car’s aerodynamic package to meet the targets for downforce and stability. Steve Crijns continued, “Overall the design language shows

a clear DNA link with its Lotus siblings, while also establishing its own distinctive and contemporary theme. The undulating shoulder line is brilliantly mirrored in the lower part of the body side by the cutaway sill that creates a torso-like muscularity.”

“The front three-quarter view is really powerful” Russell Carr continues, “Your eye is drawn effortlessly, from our signature mouth, rearward by fluid surfaces and fast lines that create a sense of speed even when the car is stationary. From this angle you can also see how dramatically the visor screen sweeps around the teardrop form of the cabin and the gently tucked plan shape perfectly accentuates the muscularity of the rear fender. This is unmistakably mid-engine design language and the Evora is unmistakably a Lotus.” The view from the rear three-quarters is just as striking and the one that many will become familiar with as the car passes them on the road. The tapered cabin, diffuser, floating wing, centrally mounted twin tailpipes and distinctive engine bay vents all combine to create a completely unique look.

Moving right inside...

The design language of the interior reflects that of the exterior – simple, fluid surfaces, soft forms and crisp feature lines wrap around the cabin cossetting the occupants. Unlike recent Lotus products that use a race car inspired, technical minimalism, the Evora employs a softer approach that utilizes premium quality materials and finishes to create a contemporary but luxurious ambience that is unique to Lotus products. It is, according to Head of Lotus Design Russell Carr, “A huge departure from what people might expect based on Lotus’s recent past. We wanted the Evora’s cabin to feel special and to be surprising as well as sporty. Precision engineered metal inserts and quality edge-lit switches are brilliantly juxtaposed against soft hand-stitched leather surfaces to give a modern interior with a classic twist.”

Russell Carr continues, “The flat bottomed steering wheel, figure hugging sport seats, contemporary instrumentation and ergonomically positioned controls provide an intuitive environment that instantly forms a connection between driver and car ensuring that it becomes an extension of his or her body.”

Senior Designer Anthony Bushell explains the choice of materials in the Evora’s interior, “Tactile quality is incredibly important within this segment so we wanted the interior to use honest premium materials. Much of the switchgear is bespoke, and every metallic component is actually metal.” Focused courtesy lighting is used throughout the interior, giving a spectacular illuminated feel to the sculptured design feature of the cabin. The extensive use of handcrafted, premium leather differentiates The Evora from other Lotus products and is so important to the character of the car that an entire new trim shop has been built at the Lotus Headquarters in the UK, dedicated to its production. Even the entry level versions of the Evora will feature leather-upholstered seats, upper door trim panels and facia, but it is expected that most customers will opt for the full leather interior treatment. With a range of leather colors available, customers will have the opportunity to personalize their Evora.

High-tech treats

Contemporary technology also features in the Evora’s cabin. A newly developed Alpine multi-media system with a 7-inch touch-screen provides advanced audio, satellite navigation, video, Bluetooth® hands-free telephone and iPod® connectivity functions.

The screen also serves as a monitor for the Evora's optional reversing camera. The satellite navigation element of the system is removable, allowing you to program it from the comfort of your home, or take it with you to continue your journey in an unfamiliar pedestrian location.

The Alpine audio set-up is one of the most sophisticated automotive systems in the world. Called IMPRINT and using MultEQ sound enhancement technology, it is able to cancel out sound imbalances caused by the cabin window glass, for instance, creating echoes, while carpets suppress mid-range frequencies – resulting in amazingly crisp, clear, undistorted sound reproduction wherever you are seated in the car. A bespoke air-conditioning system developed by Bergstrom is standard on all models, and has been designed for the hottest climate or highest humidity to help provide maximum occupant comfort. Lotus traction control and onboard tire pressure monitoring will also be available.

One size fits all

The leather clad front seats are very supportive with a lightweight manual adjustment mechanism for fore and aft, rake and lumbar. The rear seats of 2+2 versions of the Evora are intended for children and smaller adults. There will also be a two-seater derivative with a luggage shelf in the back. To maximize comfort in the rear, there's a decent amount of foot room under the front seats, while both back seats also feature ISOFIX mountings for secure child seat fitment. When unoccupied, the rear seats provide a convenient stowage area, adding to the Evora's appeal as an everyday car. The 5.7 cubic foot trunk, which ingeniously features a fresh air cooling system to reduce the effect of any heat ingress from the engine bay, will also accommodate a full set of golf clubs.

Easy in, easy out

With the Elise and its derivatives, the no-compromise character of the car makes getting in and out across a wide sill and through a comparatively narrow door/window opening part of the charm of ownership. For the Evora to be a serious daily driver, and to attract newcomers to the Lotus brand, greater convenience and practicality is provided. As a consequence the sill is now lower and slimmer (just over 3 inches wide compared with almost 4 inches in the Elise), and the whole door aperture taller. The doors open wider than on the Elise and its siblings, while the height of the front seat is raised 2.5 inches. While the Evora is undeniably more liveable in respect to its everyday practicality, once you're seated behind its flat-bottomed steering wheel, it feels every bit as exotic and sporting as you would expect a Lotus to be.

Safely does it

In common with the Elise and its derivatives, The Evora's bonded extruded aluminium chassis tub has incredible inherent strength, particularly in regard to side impacts. Additional torsional strength is given to the whole structure by the tubular steel seatbelt anchorage frame that also acts as a rollover structure.

Deformable sacrificial aluminium front and steel rear subframe modules are attached to the tub using joints which are designed to minimise damage to the tub, protecting the main passenger cell in the event of an accident. Driver and passenger airbags are standard. The airbag on the passenger side is cleverly engineered to deploy vertically and

then be deflected rearwards by the windscreen, to provide protection for children as well as adults.

Anti-lock brakes are standard on all models, as is Lotus Traction Control (LTC); these systems have been specially developed in co-operation with Bosch and enable less skilled drivers to consistently exploit the braking and acceleration capabilities of the Evora, while allowing skilled enthusiasts the freedom to enjoy the full Lotus driving experience.

The chassis: Production Low Volume Versatile Vehicle Architecture

The Evora's chassis is an evolution of the Versatile Vehicle Architecture (VVA) from the Lotus APX concept vehicle previously showcased at the Geneva Motor Show, and allows for the development of a range of vehicles up to a gross vehicle weight approaching 4,200 lbs. This architecture has been designed to be more applicable to mid-volume vehicles by utilizing our low capital investment manufacturing processes. The Evora structure progresses the Lotus 'bonded and riveted' technology used in the Elise family of vehicles with unique extrusions and folded panels, while providing contemporary ease of ingress/egress, build modularity and lower repair costs. The low volume VVA architecture has been designed so that it can be extended in width, length and height. The strength and stiffness of the low volume VVA chassis can be modified cost effectively by varying the wall thickness of the extrusions, without altering the exterior dimensions. The ability to lengthen or shorten extrusions with the option to tailor the chassis stiffness, vastly increases the number of vehicles that can be developed from this vehicle architecture. Front and mid engine installations have been considered, as well as hybrid and Electric Vehicle (EV) applications.

The Lotus Evora employs a composite roof as a stressed structural member to give an exceptional vehicle stiffness of 26,000 Nm per degree, thanks in part to the seatbelt anchorage frame's secondary function as a roll over structure, and partly because the high-tech composite body panels are stressed items. However, despite this high stiffness, the complete chassis and modules weight just 440 lbs. (prototype weight), helping to keep the weight of the whole car to just 2,976 lbs. (prototype weight).

To deliver this high performance structure, bonded and riveted high-grade aluminium extrusions and simple and elegant folded sheet elements are used in the lower structure, building upon award winning research projects in this field. Lotus pioneered the technology of bonded aluminium extrusions for use in road vehicles and has successfully developed high performance cars for other car companies around the world.

The central tub is attached to an extruded aluminium subframe at the front and a lightweight welded steel subframe at the rear. These subframe modules also offer advantages in terms of convenience and low cost of repair. During manufacturing these subframe modules can be brought to the production line fully assembled, ready to be attached.

The high technology Lotus Evora chassis will be manufactured at the new Lotus Lightweight Structures facility in Worcester, UK. LLS employs 120 skilled engineers, technicians and sales staff and will manufacture all the Lotus aluminium structures, including those for the Elise, Exige, 2-Eleven and Europa and aluminium and composite structures and components for Lotus's extensive global client base.

Suspended & animated

The Evora suspension wishbones are forged from aluminium to reduce the unsprung mass. These are similar in weight, and stiffer than the steel items found on the much smaller Elise, Exige and Europa vehicles, and have a far higher vehicle weight capacity. They are attached to the front and rear modules via custom bushings. The Evora will use Bilstein high performance dampers and Eibach springs with unique dual path top mounts for optimized vehicle refinement. Hydraulically assisted power steering is provided by a Lotus-tuned TRW steering rack.

All in all, the Evora delivers. It has incredible Lotus handling and provides unsurpassable driving pleasure. In fact, the Lotus the ride and handling team believes that the new car is likely to become a class standard bearer for speed and agility.

Stop right now...

Vented and cross-drilled brake discs – massive 13.8 inch on the front and 13.0 inch at the rear – and high performance Lotus AP Racing 4-piston calipers insure impressive stopping power. Everyone connected with the brake testing program, conducted on the punishing corners, climbs and descents of the Nürburgring, has described the brakes as ‘phenomenal’ with excellent thermal performance and outstanding feel even after extended sessions of extreme use. Part of that testing program was to finalize settings for the ABS system being developed in conjunction with Bosch. The system is set to very high thresholds and operates so progressively that drivers are often unaware that they have actually triggered the ABS.

Safe. Fun. Lotus Traction Control

The switchable Lotus Traction Control (LTC) system has been developed simultaneously with the ABS and works through the engine management system to reduce power when required to maintain traction. Unlike many traction control systems, LTC has been tuned to complement the skills of the driver without taking over. The Lotus LTC is active above 5 mph (8 km/h) and operates much more quickly than many brake based systems. The system can be deactivated completely, giving no traction control intervention.

Keeping a grip – 18 inch at the front, 19 inch at the rear.

Tire choice is a vital component in the handling performance of every Lotus and for the Evora Yokohama was chosen as development partner. Lotus’s long-term relationship with Yokohama was swiftly rewarded during development when initially the front tire size did not generate the Lotus required lateral grip, the Japanese grip gurus went away and developed custom designed tires especially for the Evora – 225/40 ZR18 at the front and larger diameter; 255/35 ZR19 at the rear. Both have carcass construction and rubber compounds unique to Lotus and are identified by the letters ‘LTS’ on the sidewalls.

The V6 Engine - dual VVT-i (‘intelligent’ variable valve timing)

The exceptional working relationship that Lotus has enjoyed with Toyota for many years, combined with the overwhelmingly enthusiastic reception for the company’s four-cylinder powerplants in the Elise and Exige, guaranteed the Japanese giant’s inclusion on the shortlist for the Evora engine supplier. The final choice was Toyota’s all-alloy 2GR-FE 3.5-litre V6 DOHC, with dual VVT-i (‘intelligent’ variable valve timing). Lotus has painstakingly developed its own T6e engine management software for this engine to

optimize its compatibility with the unique requirements of the Evora to give a peak power output to 276 hp at 6400 rpm, while boosting its maximum torque to 252 lb. ft. at 4700 rpm (prototype figures).

Changes to the engine management and exhaust systems also allow the V6 to rev more freely and provide rapid throttle response; feedback from the development team suggests that the strength of the engine's mid-range torque means that gutsy performance will be easily accessible without having to thunder through to the redline. This makes the Lotus Evora a thoroughly satisfying car for everyday road use and a rewarding one when you just want to drive.

The 2GR-FE V6 engine is mated to a manual six-speed gearbox, again Toyota sourced. A close-ratio version of this gearbox is also currently under development for the even more sport-focused driver.

Many Lotus owners enjoy the blend of unique performance and efficiency that the brand's cars offer. True to the Lotus value of "performance through light weight" CO2 emissions are expected to be a class leading sub-225 g/km (prototype figures) while testers report fuel consumption in the region of 30+ miles per gallon on the highway (pending formal homologation testing).

What'll she do?

Full performance figures have yet to be compiled on a production specification Lotus Evora. While for Lotus top speed is of less importance than stability at speed, early indications suggest a maximum speed of 160 mph and the ability to sprint from 0-60 mph in under 5 seconds (prototype figures).

Test. Test. Then test some more

It's a global car, so the Evora has been tested around the world. Evora has experienced the icy vastness of the arctic to the heat of the desert, the high altitude of the Alps as well as the country roads around the Hethel factory. It has spent hours howling around the Nürburgring and endlessly lapping Lotus's test track. By the time the Evora enters production, prototypes will have travelled hundreds of thousands of miles along some of the worst public roads in the world and been tortured for as many miles on some of the toughest proving grounds the motor industry has to offer. It has been flung into barriers at low and high speeds, at a multitude of angles, including head-on; it has even had its roof compressed! By the time the Evora reaches North American Lotus showrooms in late 2009, it will be the most thoroughly tested Lotus car in the history of Lotus. It will also be one of the company's great milestones.

Final specifications, options and prices of the production Lotus Evora will be published closer to the sale date in the many Lotus markets around the world. Mike Kimberley, Chief Executive of Group Lotus plc sums up, "This year Lotus celebrates its 60th anniversary and it is fitting that 2008 is also the birth of the Lotus Evora, a fantastic addition to the Lotus range. The Lotus Evora represents Group Lotus, a company that is at the forefront of the automotive industry, in a changing world where priorities of efficiency, economy and environmental impact go hand in hand with performance, design and individuality. I think Colin Chapman would have approved."

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