



# LOTUS TIMES

March 2006

No. 2

## Club News

Great February meeting! Thanks all for showing up in less than perfect weather!

Things are getting ready to spring back into action. The weather has been more than kind to us and the tree buds are already starting at the ski hill. March break for those with kids in Ontario with Quebec having already had theirs. News travels fast and the Elise is starting to show up at dealer locations across Canada. See the further details in this month's issue.

Lots of car people are getting ripped off by quick buck auto parts purveyors. You pay your hard earned money for automotive parts that look the same as original quality parts but, when finally installed in your vehicle, don't perform as they should. Often we are unsuspecting buyers of parts that look the same but are of vastly inferior quality than the parts we had thought we ordered.

If it's too cheap then most times you just end up getting "too good a deal" and actually get what you paid for; nothing but trouble. Parts don't fit at all well, don't last or are just plain dangerous in use.

Counterfeit goods are a real problem and you should be concerned. From <http://www.fordmuscle.com/archives/2006/02/EditorsCorner/> "A **counterfeit** product is one that is deliberately made to look and deceive the consumer." "A **knock-off** product is one where a company reproduces the original company's product and sells it as their own. The company is not attempting to outwardly deceive the customer into thinking they are buying the original product, but is usually marketing the product as "the same as" or "equivalent to" at a substantially lower price. Often times the knock-off company will copy everything down to the part numbers and instructions, only changing the brand name to their own. These companies are banking on the prospect that consumers will be willing to pay less for something that appears to be just as good as the original." Be careful when purchasing that you actually get what you pay for.

## Up & Coming ECLC Dates

- Mar. 15  
Regular Monthly meeting at the Swan on the Rideau – après 5:30
- Mar. 25  
British Car Clubs Darts Tournament from 1:30 - 4:30 pm. See invite...
- Apr. 19  
Regular Monthly meeting at the Swan on the Rideau
- Apr. 23  
Boot n' Bonnet 6<sup>th</sup>. Annual Auto Jumble. Portsmouth Harbour, Kingston, ON 10am-2pm
- June 22-25  
The 27<sup>th</sup> Annual International Vintage Racing Festival – Mosport [www.varac.ca](http://www.varac.ca)
- July 15  
The 2<sup>nd</sup> Annual All British Car Day – Britannia Beach Ottawa. [www.britishcardav.ca](http://www.britishcardav.ca)



We have the regular monthly meeting on the 3<sup>rd</sup> Wednesday of each and every month to catch up with each other. We still meet at the Swan on the Rideau, 2730 River Rd., just outside Manotick Ontario on the 3<sup>rd</sup> Wednesday of each and every month. As always, owning or driving a LOTUS is really optional in this season. Come on out and join us.

### Elise now available in Canada!

from The Globe and Mail,  
Thursday 9 March, 2006.



Auto Buzz by Michael Bettencourt  
"Lotus finally overcomes  
government delays

It took longer than anyone had hoped, but Lotus Cars has officially re-entered the Canadian market with the Lotus Elise, two years after it went on sale in the United States.

The first cars arrived on Canadian shores in late January direct from England, said John Simoes, principal of Gentry Lane Lotus of Ontario.

Gentry Lane had four cars on display at the Canadian International Auto Show, mere weeks after receiving the final government approval that it passed all Canadian safety emissions, bumper and language vehicle regulations.

"It's taken along time to get certified," said Alastair Florance, public relations manager for Lotus Group at the Geneva auto show.

"Frankly, there was a lot of paperwork that took a tremendous amount of time to get through." The Elise' was first offered for

sale in England in 1995 as a light-weight sports car that was both more affordable, and closer to Lotus founder Colin Chapman's automotive philosophy of performance through light weight than the Lotus Esprit. It went on sale in the U.S. in 2004 after the National Highway Traffic Safety Administration gave it a three-year exemption to federal standards, as it reportedly did not meet American bumper standards. The North American Elise is called the 111R in Europe, and is powered by a high-revving 190-hp 1.8-litre Toyota engine, using a top line version of the engine from the dearly departed Toyota Celica. Lotus says the car will do the 0-100 km/h sprint in 4.9 seconds from this modestly-sized engine thanks to its supermodel-light 900-kg curb weight, which is 315 kg less than a Mini Cooper S. "All this while returning seven or eight litres per 100 km of driving," said Florance, in combined city and highway driving.



The Elise starts at \$58,550 in Canada, outside of freight and options. The even lighter Lotus Exige extreme performance model is heading to the U.S. by April, said Florance, although Simoes says it won't make it to Canada,



at least the near term, but perhaps by next year.

By then, the next-generation Elise will reportedly be on its way, as it is scheduled to be unveiled this year as a 2007 model. Lotus has not yet announced its North American plans for this car, but it's generally believed that the car has been designed with North America in mind.



**Annual Multi-Club Darts Tournament**

- March 25 - 1:30 pm start

British cars, pubs, and DARTS.... They just go together.

All British car clubs are invited to participate in the annual British Car Clubs darts tournament on Saturday March 25, from 1:30 - 4:30 pm.

We will be playing at GreenFields Pub in Barrhaven. They are located at 900 Greenbank Road, Unit12, Nepean. It is just a bit south of Fallowfield Road, near the Food Basics store. Their phone number is 823-9900.

Playing starts at 1:30 pm, so please try to arrive a few minutes before that if possible so we can set up the playing order.

Everyone is welcome to just show up on the day of the event, but if you would like to register your team beforehand, please send an email to Don Leblanc

<dleblanc@businessaccelerators.ca> and let me know. Although it is not required, it would help me to receive an indication from those people who know they will be there, just to give me an idea of approximately how big to make the game ladder.

We'll have prizes for the winners and losers. Come on out for a fun social afternoon of beer and darts with the members of the local British car clubs.

**APX by Lotus Engineering**

Geneva Motorshow (28/02/06 - 01/03/06).

APX by Lotus Engineering (APX stands for "Aluminium Performance Crossover") is the first example of a complete vehicle built on the innovative Versatile Vehicle Architecture (VVA).



APX is a demonstration of Lotus Engineering's ability to create innovative and exciting, high performance products through its world class capability in Vehicle Design, Performance Powertrain Engineering and niche vehicle development, the first production car from this technology will be the new Lotus mid-engine super sports car.

It is a 7-seater (in reality a 5 + 2 with the two rear seats being occasional) four-wheel drive "Crossover" vehicle with a front mounted 300 hp supercharged V6 petrol engine. Weighing in at just 1570 kg and with a power to weight ratio of



191 hp per tonne, the APX has sportscar like performance of 5.4 seconds to 100 km/h (5.0 seconds to 60 mph) before reaching a top speed of 245 km/h (152 mph). These performance figures are as good as the highest performing 4x4 "Crossover" vehicles from other brands with up to 195 hp per tonne. Crucially though, whereas those vehicles need higher output engines to compensate for heavy weight, APX does not. Combined fuel consumption for APX is estimated to be 8.7 litres / 100 km (or 32 mpg) - impressive on its own and more so when compared to its production rivals which often consume more than 13 litres per 100 km (22 mpg).



APX is manufactured predominantly from aluminium in the form of high-pressure die-cast corner nodes, stampings and extrusions. It uses advanced assembly techniques, including adhesive bonding, self-piercing rivets and flow-drill screws for construction - joining techniques that Lotus calls Riv-Bonding. Lotus has optimised the use of these technologies thus significantly reducing the number of mechanical fixings within the monocoque structure. This has reduced the level of investment required in manufacturing equipment.

APX is not just a Lotus Engineering concept, but a feasible prototype close to

production; it is not a concept indicating a strategic direction of Lotus Cars; it is, however, a brilliant demonstration of VVA and the skills of the team from Lotus Engineering into what is regarded as the future of niche vehicle manufacture. APX is production feasible as all the components can be made cost effectively and in high niche volume (up to around 30,000 per year).

APX is powered by a V6 engine has been designed by Lotus Engineering's powertrain division. The directive for Project NEF was to produce a high performance prototype engine without the need to resort to exotic materials or manufacturing technology, allowing manufacture around the world. APX's engine is a supercharged 3 litre (2996 cc, Bore: 88 mm, stroke: 82.1 mm) V6 DOHC engine, mounted longitudinally in the front of the vehicle.

Performance of the engine is maximum power of 224 kW (300 hp, 304 PS) at 6250 rpm and a torque of 360 Nm at 4500 rpm.

Like the vehicle, the engine is not just a Lotus Engineering concept, but a feasible prototype close to production; however it is not a concept indicating a strategic powertrain direction of Lotus Cars. The engine is production feasible and it is expected that the commercialisation of this engine will be of interest to the automotive clients of Lotus Engineering.



Simon Wood, Director of Lotus Engineering explains the rationale behind building APX: "the first production car from Lotus to use the Versatile Vehicle Architecture will be the new mid engine "super sportscar", which will go into production in 2008. Lotus Cars customers eagerly await this vehicle that will be a class-leading and phenomenally high performing car.

However, we wanted to demonstrate the true versatility of the VVA technology, and what better way than to build a type of car that no one would expect from Lotus - a 4-wheel drive "Crossover" vehicle. I am delighted with this vehicle and we believe that this technology and strategy is what the motor industry must follow to be able to produce niche vehicles efficiently and quickly.

Simon Wood continues; "There is already a great deal of interest in both APX and VVA technology from our client base and we will work hard to see how Lotus Engineering can help them with their strategic product solutions".

APX by Lotus Engineering in more detail Background At the Geneva International Motorshow 2005 Lotus Engineering showed the first example of a VVA understructure. This understructure is the basis for APX. Traditionally OEMs seeking to gain competitive advantage

through exciting niche vehicles have to either design a new platform or share one already available. Engineering a bespoke low-volume platform is an expensive, time-consuming solution, whilst sharing a mainstream chassis normally results in compromises in performance and design.

Lotus Versatile Vehicle Architecture (VVA) has been developed to bridge a gap in the investment-volume curve to exploit the benefits of producing at medium volumes but for niche markets, thereby giving the best chance of business case success and favourable returns. The key to the VVA architecture is the high-pressure die cast corner nodes that are combined with bonding, mechanical fasteners, extruded and pressed aluminium. Lotus Engineering is a world leader in aluminium, steel and composite body engineering, joining techniques, and vehicle systems integration. The innovative VVA technology offers a fast-to-market, cost-effective approach to differentiated niche products by spreading the development, investment and bill of materials burden across a range of niche vehicle variants, without the compromise that stems from conventional 'platform sharing'.

The philosophy is based on the commonality and versatility of key elements of the vehicle structure and body systems across a 'family' of niche vehicle variants, with a combined annual production rate of up to around 50,000 units. Structural components common to each family member are arranged in different configurations in each variant around the ingenious corner nodes.

The great advantage of this technology is that it can be



used by one OEM looking to develop a range of niche products, or by a group of OEMs looking to share investment, but still retain a high degree of end product separation.



#### The Engine

- 300 hp, 3-litre V6 APX is a front engine and four wheel drive "Crossover" vehicle for occasional off road use. The V6 engine has been designed and developed by Lotus Engineering's powertrain division. The directive for the project was to produce a high performance prototype engine without the need to resort to exotic materials or manufacturing technology, allowing manufacture around the world.

The supercharged V6 is part of a family of normally aspirated and supercharged high performance engines which includes 2.2 litre and 3.0 litre normally aspirated derivatives. All of these engines are at the prototype stage and are production

feasible, but are not currently planned for production. The engine is production feasible and it is expected that the commercialisation of this engine will be of interest to the automotive clients of Lotus Engineering.

APX's engine is a supercharged 3 litre (2996 cc, Bore: 88 mm, stroke: 82.1 mm) V6 DOHC engine, mounted longitudinally in the front of the vehicle. It uses a Rootes-type supercharger with a compact air-to-water Laminova-type charge cooler with separate parallel coolant system using its own water pump and heat exchangers allowing a charge temperature reduction of approximately 50 degrees Celcius.

Performance of the engine is maximum power of 224 kW (300 hp, 304 PS) at 6250 rpm and a torque of 360 Nm at 4500 rpm. 80% of peak torque is between 1500 rpm and maximum revs of 6500 rpm. Like all products from Lotus, it follows the adage of "performance through light weight", in that the engine weighs just 171 kg (fully dressed, dry weight). This gives a phenomenal specific output of around 1.31 kW/kg (1.7 hp/kg). Specific performance is 74.6 kW/litre (100 hp/litre, 101.3 PS/litre).

This light weight comes from using cast lightweight aluminium alloy cylinder block (with thin wall iron liners), aluminium cylinder head, and an aluminium structural oilpan, able to support the front drive shafts. The oilpan also includes coolant and lubrication channels to the oil cooler and filter, and an electronic oil level and temperature sensor. Even the pistons are lightweight - with each on weighing just 454 grams! The construction of the V6 engine is arranged around the



two banks of cylinders at an angle of 75 degrees with a compact cylinder offset of just 32.5 mm. This allows the engine to be compact, with good vibration characteristics, eliminating any requirement for balance shafts and the related extra cost, weight, height and complexity.

The Engine Management System uses a state of the art 32 bit ECU processor capable of over 200 million calculations per second. The ECU is Euro IV / E-OBd and LEV/OBDII compliant. And of course the engine satisfies the European End of Life Requirements (ELV) with respect to recyclability and recovery.



The V6 engine is an example of extensive research into "engine downsizing by Lotus Engineering's Powertrain Team. Engine downsizing is the concept of using advanced technologies to enable a small engine to produce the power and torque of a much larger engine, with the obvious reduction in fuel consumption and emissions. One of the key demands of the automotive industry is to produce engines with not only low emissions and high fuel economy but also extremely good performance. These two demands for performance and economy are not normally compatible unless

there is a significant change in the engine development strategy. Like the vehicle, the engine is not just a Lotus Engineering concept, but a feasible prototype close to production; however it is not a concept indicating a strategic powertrain direction of Lotus Cars. The engine is production feasible and it is expected that the commercialisation of this engine will be of interest to the automotive clients of Lotus Engineering.

#### Vehicle Structure:

Prior to design release for the manufacture of this vehicle, the project was subject to industry standard engineering processes to ensure a quality product.

Industry standard APQP processes have tracked and validated CAE (Computer Aided Engineering - Computer analysis for strength, durability, crash performance, Vibration, Aerodynamics, Fluid Flow etc), NCAP targets for crash, pedestrian impact, torsion, bending and modal stiffness targets, full static and dynamic CATIA V5 DMU (Digital Mock Up - Digital build

of the car to demonstrate the vehicle build and prove the fit of each part) to minimise build issues and the full suite of Material and Process simulation and validation to confirm manufacturing feasibility. This coupled with tolerance analysis, full DFM/DFA (Design For Manufacture/Design For Assembly) and advanced joining technology research has been delivered in a true simultaneous engineering environment. The vehicle build proved very successful with only a handful of build concerns.



A number of assembly validation builds were eliminated from the project saving both time and cost essential for niche vehicle projects needing 'Right First Time' design and engineering philosophies to overcome tight project constraints. All significant components and structural items are made from Aluminium.

This means that APX weighs in at a sector leading light weight of 1570 kg so even though it is not a Lotus car, it adheres rigidly to the fundamental core values of the Lotus brand of "Performance Through Light Weight". Of course lightweight structures are Lotus Engineering's forte and this is the industry recognised area where the greatest improvements in performance and fuel economy can be gained.

**Understructure Construction:**  
The understructure is riv-bonded aluminium, consisting of high-pressure die-castings, stampings and extrusions, and uses advanced assembly techniques, including adhesive bonding, self-piercing rivets and flow-drill screws for construction. The self-piercing rivets are used in a similar way to spot welding on a conventional steel shell, with the flow-drill screws used for single-sided access on closed sections. Both suffice to hold the structure together during the adhesive cure cycle, and contribute to the performance of the structure during both static and dynamic impact conditions. The heat-cured high strength structural adhesive is the main joining medium, and used in combination with the mechanical fasteners, produces an immensely strong, durable joint and a lightweight shell with exceptional torsional stiffness.

The whole vehicle is 4697 mm long and 1852 mm wide. Wheel base is 2700 mm and track is 1554 mm (front) and 1556 mm (rear).



**The Design:**  
The brief for Lotus Design was to create a visually arresting "Jekyll and Hyde" car that fulfilled the needs of practical and flexible everyday transport but also provided the enthusiast with a focused driving machine.

As with all crossover vehicles the solution is tailored to a specific niche buyer who will instantly identify with these unique attributes. Russell Carr, Chief of Design for Lotus explains: "We saw the customer as a sportscar enthusiast who, with a typical family of 2 young children, occasionally wants to carry four or five adults in addition to their children. To facilitate this, a third row of fold flat coupe style rear seats are accommodated within the cabin."

The flexibility of the VVA platform system enabled the Lotus Design Studio a rare opportunity to create a highly tailored solution that would meet, both, the complex requirements of the occupant and technical package as well as being aesthetically pleasing. The car has to look and feel like a sportscar but accommodate a 5 + 2 seating package.





Exterior Design:

Russell Carr explains the exterior design philosophy: "We wanted the design to communicate the driving experience of the car, which is characterised by extreme power, performance and grip. Therefore the form language had to convey strength and velocity whilst looking planted to the road. As with all designs the essences of strength and movement are generated from stance and proportion which are, on this car, characterised by an extreme cab rearward, teardrop like silhouette and prominent wheel arches. The illusion of speed is further communicated by a taut, fluid form language within which feature lines and surfaces stretch seamlessly from the penetrative nose to the boat-tail rear end. Power is re-enforced by a prominent hood line, similar to classic front engined sportscars, and flared arches, whilst strength is given by a deep bodyside and coupe style slim glasshouse."



Interior Design:

The brief for the interior of the car was to create an environment with the visual drama of a sportscar but with a high degree of functionality and a contemporary sense of luxury.

Russell Carr explains further: "We started by working with the engineering group to optimise the driving position and major controls. Then we created memorable features and controls that combine intuitive function with a unique design and high quality materials. This is evident in the design of the HVAC control, the start button and instrument pack. The latter communicates the cars sporting personality through a distinctive sports bike look which mixes analogue and digital displays within a high quality aluminium casing."

The digital screens of the instrument pack have multi-functionality enabling major data, including Satellite Navigation, to be placed logically in front of the driver. Great care was taken in developing the grains, textures and material finishes ensuring an ambience of sportiness and contemporary luxury.

Ed. Note: It is interesting to see the potential construction techniques of new cars emanating from Lotus embodied in this little Lotus "sportcote" vehicle including a home grown supercharged 3 litre V6 DOHC engine! I would imagine that all future products would be built this way and thereby demonstrating Lotus VVA technologies. The next version of the Elise is well on its way and a v6 something like the new Europa S is already in the cards to fill the Lotus dealer showrooms. Now all we need to do is to wait for the high-end Esprit replacement.



## The Silly Bits...

A restoration video of a 1970 Seven I happened across. Although there are many, many parts of this project that don't make sense for a 1970 Lotus - I'm sure everyone will be able to enumerate all of them - its still very worth while.

<http://video.google.com/videoplay?docid=-1154498079482422367&time=70000>

I know you Prisoner fans will enjoy this...

Finally; an inexpensive Seven...  
<http://www.priz.co.uk/build/caterham.seven.php>

The whole site is fun to look through... one link led me to the following:

Several fan-made spoofs of "The Prisoner" have been made over the years, of varying quality (<<http://www.theunmutual.co.uk/fanfilms.htm>> for a review of these films) but few are as well made and enjoyable as "The Prisonbear - Revival", which has completed production.

Inspired by the "Toy Movie" segments of the 1990s Channel 4 comedy series "The Adam and Joe Show", "Prisoner" fan Paul Smith has created a spoof of "The Prisoner"'s opening episode using Teddy Bears and other toys! We are very impressed, and highly amused, with the production values and attention to detail in the film which is littered with jokes, and

references, whilst remaining faithful to the original.

You can find that here:  
<http://www.snapsandbytes.co.uk/prisonbear/>

"Be seeing you"



All British Car Day 2005

**Lotus Times** is the unofficial newsletter of the Eastern Canada Lotus Club (ECLC) and may be published anytime between January and December. The opinions within may not necessarily represent the views of its members, directors or anyone else living or deceased and knowing that British Car Week is from May 27 thru June 4 this year. Get out and drive your British car to spread awareness in your community!

The Eastern Canada Lotus Club (ECLC)  
1034 Hindley Street  
Ottawa, Ontario K2B 5M1  
CANADA

President: Harald Freise, [hfreise@igs.net](mailto:hfreise@igs.net) (613) 828-3411  
Treasurer: Claude Gagné (613) 443-0998  
Webmaster: Ron Wanless [ronwanless@sympatico.ca](mailto:ronwanless@sympatico.ca) (613) 359-1013  
Web Site: <http://lotuscarclub.ca>