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BLOG POST

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**PIONEERING AERODYNAMICS FOR THE NEW LEXUS UX CROSSOVER**

**In its quest to reset the benchmark for crossover handling, Lexus has developed several ‘world-first’ aerodynamic innovations for the new UX:**

**• Distinctively shaped rear lights that stabilize in crosswinds**

**• Stepped wheel arch mouldings for improved handling**

**• Aerodynamic wheels that cool disc brakes and lower wind resistance**

With the first cars arriving at European dealerships early next year, already journalists have praised the UX for its agile handling. But how did Lexus go about creating a crossover that is so dynamic to drive?

The answer lies with UX Chief Engineer Chika Kako and her team: “I wanted the UX to deliver the benefits of a conventional crossover – features like a higher seating position and better visibility - yet with the dynamic performance and agility of a hatchback,” explains Kako.

Inspired by Akio Toyoda’s determination that “every Lexus should be fun to drive”, Kako’s first tasked her team with engineering an incredibly rigid platform – the foundation for class-leading refinement and handling - with aluminium and composite body panels to save weight and lower the centre of gravity.

But this was only the beginning**…**

**Advanced Lexus aerodynamics**

In search of a significant breakthrough in handling characteristics, Chika Kako was able to call on the vast experience of the aerodynamic engineers responsible for landmark models like the ultra-high performance Lexus LFA supercar and Lexus ‘F’- line range. This collaboration led to the following three innovations:

**1. Aero stabilising rear light**

The rear combination light on the new UX features an advanced design that is not only eye-catching but also aerodynamically efficient. Fins are integrated into the light to reduce air pressure changes by about 16%, contributing to excellent rear stability during cornering as well as in side winds. For a distinctive look, a continuous single line of light is formed by 120 LEDs, tapering gently towards the centre and measuring just 3mm at the narrowest point.

**2. Aerodynamic wheel arch mouldings**

Wheel arch mouldings on crossovers typically protect the bodywork from gravel thrown up by the tyres. On the new UX, Lexus decided to give them a second function: “We incorporated a step at the top of the moulding that suppresses vertical

body waver during cornering, thus increasing stability and steering firmness,” explains Kako.

**3. 17” aero ventilating wheels**

Finished in metallic silver, the 17-inch aero ventilating wheels feature flaps on each side of the spokes and are a world first for Lexus. The flap shape is based on the

‘Gurney Flap’ used on the rear wing of Formula 1 race cars to regulate the airflow and increase downforce. This innovative new wheel design enables more confident driving by providing stable braking performance, increasing cooling efficiency, and reducing turbulence along the vehicle sides.

**Tested in one of the world’s largest wind tunnels**

“At Lexus we’re fortunate to have one of the world’s largest and most advanced aerodynamic facilities. Opened in March 2013, the wind tunnel loop is 22 metres high and 260 metres long,” says Kako.

“Its main function is to generate a steady flow of air over the car. For instance, when a vehicle like the new Lexus UX is cruising at 100 km/h, wind resistance accounts for as much as 70% of the forces affecting overall performance.”

As well as the above innovations, to reduce the UX’s drag coefficient - which in turn lowers fuel consumption, turbulence and wind noise - Lexus engineers perfected both a flush underbody and aerodynamic wing mirror inspired by the LC coupé.

**Tuned by ‘Takumi’ master drivers**

After wind tunnel and circuit testing was complete, the new UX was handed over to a team of Lexus ‘master drivers’ who fine-tune cars like a virtuoso would a musical instrument. Driving thousands of kilometres in all kinds of conditions, they did not rest until they had achieved the perfect balance between road and vehicle.

“With the order books now open and the first cars arriving in the showrooms in early 2019, I often think about the new UX owners. I really hope they enjoy their new Lexus. That is reward enough for me,” says Chief Engineer Chika Kako with a confident smile.

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