

## **Toyota Alessandro Volta**

***The hybrid takes a supercar disguise for promoting a new way of designing the environment friendly car of the future.***

*"We have entered a new era. We have created a hybrid that has nothing to do with the typical electric power vehicle which so often flaunts rather unappealing characteristics", Fabrizio Giugiaro asserts.*

*"When creating the volumes of this eco supercar, the idea at the back of my mind was to recapture the stylish features of the central-engine models, which I had already used with the BMW Nazca, the Alfa Romeo Scighera and the Volkswagen V 12, to demonstrate that if a racing shell can combine a "clean" and innovative propulsion system, the headroom for creating and designing environmentally-friendly sedan and compact cars of the future would be huge."*

Mindful of this, Alessandro Volta, the Italian physicist and discoverer of the voltaic pile, was called to bear witness to an exciting stage of automotive technological research, a momentum placing demands on the depth of resources required from automobile manufacturers to meet head-on pressing environmental issues such as gas emissions and the unrelenting consumption of oil-derivative products.

Italdesign-Giugiaro could not have chosen a more appropriate partner than Toyota for venturing into this theme of thought. As confirmed by Giorgetto Giugiaro: *"We have been working with Toyota for more than 25 years. We are proud to have worked towards putting in place a hybrid prototype because the advanced expertise and commitment of the Nagoya Carmaker to mixed wheel-drive moves beyond day-to-day boundaries"*

### **Innovative layout for sporting performance**

Toyota furnished to Italdesign-Giugiaro a derivative of its ultimate hybrid system, the one adopted on the Lexus RX 400. On the Volta, the 3.3 liter V6 petrol engine is fitted behind the rear axle and not connected directly to the wheels. Indeed, motion is ensured by two electrically powered engines, one per axle thereby securing all-wheel drive and enhanced safety.

As such, this epoch-making mechanical layout paves the way to eliminating the traditional transmission and gearbox longitudinal encumbrance.

Indeed, operating electronics enable the power transmitted by the electric motors to the wheels to be modulated, thereby rendering superfluous the gear/clutch unit.

Housed under the lightweight, carbon-fiber chassis, designed and engineered by the Italdesign Giugiaro technical department, are the batteries, weighing 70 kg.

Result: significantly leaner weight, balanced and encompassed between the axles, 300 kW/408 HP output, top speed limited at 250 km/h with acceleration from 0 to 100 km coming in 4.03 seconds.

### **Sparkling fuel-efficiency performance.**

*"But the more prestigious performance captured by this compact supercar, 4.3 meters long and less than 2 meters wide – emphasizes Fabrizio – is most certainly its capability to cover 700 km at highway average speed with a 52-liter tank. In addition, having freed the central tunnel from the propeller shaft and from the exhaust pipe, we gained a flat floor that enables us to seat 3 passengers.*

*Without doubt, 70 kg of batteries represent a significant increase in weight. However, it should be recalled that an all-wheel drive for a mid/upper range model caps 100/120 kgs. As such, resorting to the hybrid has paved the way towards creating a compact, light and "socially responsible" sports car with all-wheel drive.*

### **Supercar livery for a physique of excellence**

The Volta sets the innovative content of the hybrid drivetrain in classic supercar livery: compact volumes, downward flattened trim, tapered bonnet, minimum rear overhang and truncated tail.

The dragon-fly winged doors are upward hinged in the front riser. Ample aeration in the grill design, slanting lamps fitted in the fender motive on an upper plane to the "aquiline" route followed by the bonnet's center point.

In the body side, a sturdy belt band yet again stretches upward to the rear wheel shaft enabling two "claw-marks" to be grazed as air intakes, whilst fitted in the Grecian motive traced on the horizontal-base traverse allowing glimpses of the carbon fiber chassis, are two thermal engine exhaust pipes.

The body side and the upper tail merge and flow upward towards where the roof and rear window meet: from there is triggered a rather singular truncated tail profile, surmounted by the spoiler's embossed motive protecting the optic unit.

The tail's lower band allocates the engine's cooling air outlets.

### **Interior ergonomics**

*"As a rule –Fabrizio Giugiaro confirms– a sports car with a central engine expands lengthwise: engine, drivetrain and suspension push through significant weight and occupy significant space to the detriment of passenger legroom. With Alessandro Volta, we have confirmed the same performances attaining better weight distribution and more comfortable seating. Indeed, thanks to the flat floor, I set my mind to building a decidedly innovative interior geared towards the 3-seat offering and a flexible steering wheel and pedal board clamping."*

As a result of adopting the By Wire technology, the pedal board and steering wheel can slide along strips, whether to the right, center or left.

This did not translate into having to adopt a bench seat, but paved the way towards creating extremely ergonomic and sophisticated sliding seats, thereby ensuring personalized driving comfort. A sturdily built driver, for example, can move the seat away from the door or a three-seating arrangement can be obtained for two adults with one child sitting in the middle. Even with three passengers, the interior offers more sitting and legroom than in normal sports coupe models.

In order to obtain maximum driving seat adaptability, Fabrizio Giugiaro also turned a keen eye to dashboard design. Dashboard information has been stripped down to the essential: speedometer, speed indicators and fuel level confirmed; temperature indicators eliminated; navigator and stereo Toyota interfaces installed.

Also for the Volta, Italdesign-Giugiaro went beyond the shell, utilizing its testing and engineering department to design the carbon fiber chassis, the push-rods and the mechanisms regulating pedal/steering column block traslability, whilst its prototyping construction workshops to crystallize the styling model and operational prototype.

Other than the petrol propulsor, also drawn from the collaboration with Toyota are the electric engines, the batteries and all operational management electronics plus the expertise gained in an avant-garde specialty.

*"With the Volta – Fabrizio Giugiaro concludes – we have reconciled top performance with low gas emissions and noiseless operation. And when one drives through a historic town center, a supercar of this genre does not "fret" at low speed: at 20/30 km/h, the driver can switch to the absolutely silent electric engine. Sheer pleasure from the historic town center to the race-track."*

## Technical data

Length	4358 mm
Width	1925 mm
Height	1140 mm
Wheelbase	2570 mm
Front Track	1652 mm
Rear Track	1640 mm
Front Overhang	1004 mm
Rear Overhang	736 mm
Weight	1250 Kg
Max Speed limited	250 km/h
Autonomy	700 Km x 50 litres fuel
Acceleration 0-100 km/h	4.03"
Engine	V6 3.3 300 kW / 408hp Totaloutput Thermic Plus Electric
Drive	4WD
Suspensions	
Front	"Push rod" with centrally positioned single shock absorber (overlapping triangles)
Rear	"Push rod" with two shock absorbers (overlapping triangles)
Brakes	Brembo CCM Monolithic caliper 8 titanium pumping elements
Pirelli Tyres	
Front	245/40 ZR19
Rear	285/40 ZR19
Rims	BBS 8.5" x 19" front / 10"x19" rear