

CAR NEWS

## Driving the Edison 2 Very Light Car 4.0

Featherweight EV redefines vehicle architecture

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Edison 2's VLC 4.0 is a drivable chassis, featuring an innovative lightweight in-wheel suspension system. Photo by Eric Tegler.



By: Eric Tegler on 4/19/2013

Oliver Kuttner got into the alternative car business to make money. Or, more accurately, he got into it to win money. In 2010, the \$5 million Progressive Insurance Automotive X Prize was up for grabs and Kuttner, a Charlottesville, Va., real estate developer and former IMSA/ALMS racer, won it with his single-cylinder-engined Very Light Car ("Lightweight Endeavors," June 27, 2011).

In so doing, he transformed his race team into a company called Edison 2 and embarked on developing a new architecture with light weight as its key driver. From lightness and good aero, Kuttner reasons, come energy and manufacturing-resources efficiency, and the accessibility of low cost.

"If you want to build a greener future, you must make it affordable," he explains.

The quest led Edison 2 to build an electrically powered Very Light Car (VLC) in 2011. The four-seat streamliner achieved a record 245 mpg-e in the five-cycle EPA test. While the X Prize winner and its successor demonstrated remarkable efficiencies, Kuttner wanted to build something of greater significance.

The VLC 4.0 is the result. It replaces the race car-like tube-frame chassis of earlier VLCs with an aluminum sheetmetal center section similar to an Indy-Car tub. The section is enclosed by two sophisticated bulkhead castings to which the engine cradle subassembly and a novel suspension are mounted. The bulkheads allow flexibility for what's in between, a variety of possible passenger compartments. The chassis weighs just 989 pounds without resorting to exotic materials.

It rides on Edison 2's patented "in-wheel" suspension, the most innovative (and likely most commercially attractive) aspect of the project. The arrangement consists of front and rear crossbeams attached to each bulkhead. The beams carry the in-wheel suspension and absorb its loads.

Entirely within 17-inch wheels are small, specially fabricated control arms, coil-over shocks/springs and a hub/spindle assembly.

Up front, the in-wheel suspension mounts to the beam through a carrier that anchors both the upper shock mount and a bearing that allows a large carrier to swivel. Out back, in-wheel components mount to the beam via short trailing arms. Driveshafts couple to a cogged-belt system within the hub assembly. Eliminating conventional strut

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VOTE

towers confers packaging benefits. Kuttner has launched a new company, Edison 4, specifically to market the unique suspension.

Drive for the VLC 4.0 comes from a 45-kW electric motor, but the rear/mid-engine design is agnostic, happily accepting internal combustion or **hybrid powertrains**. Without a body, the entire package comes in at 1,089 pounds. The forthcoming body will be another streamliner with outboard wheel fairings.

We were the first to drive the VLC 4.0 outside the company. The feel is something between a traditionally suspended full chassis and a go-kart. Watching the beam move vertically in relation to the in-wheel suspension is fascinating. There's little body roll, but in hard cornering on rough pavement the chassis tended to understeer mildly then skip with noticeable bump steer. Narrower tires and revised springs will increase compliance for the street. Inside, basic controls are no problem, but the narrow rear seat and high floor are.

These are problems an automaker can sort out. That's what Edison 2 is aiming for. Kuttner says he already has interest and limited funding from a couple companies. He calls the VLC architecture a "new operating system." We may see bits of it in entry-level cars of the future.

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