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## **Commuter Cars'**

By

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Commuter Cars Corp., located in Spokane, WA has developed its *Tango* two-seat commuter car that offers surprisingly hot performance. Not only is the *Tango* at home in city traffic including the fast lane on the Interstate, but also at a dragstrip or on an autocross course. The design is an ultra-narrow, freeway-capable, stable, safe vehicle that fits anywhere a motorcycle fits.

Recognizing the financial difficulty in marketing such a radical EV at price that will attract commuters, the company is taking an interesting approach to attract the media, potential investors and public attention. The first 10 *Tangos* built will be high-end, high-performance cars - a Dodge Viper-eating "super EV." For example, the *Tango* production prototype shown here is fitted with a Conolly leather interior, MoTeC dash like used in Le Mans and formula race cars, 400-watt Nakamichi CD700 sound system and air conditioning. Performance-wise, the *Tango* features components used in the top performing electric drag racers. Then they plan to demonstrate these *Tangos* at dragstrips and well-known road courses like Laguna Seca or Sears Point where they are confident that the *Tango* can turn in quicker lap times than other stock sports cars driven by well-known drivers. This, according to company president, Rick Woodbury, "is the best way to prove to the automotive press that the *Tango* is a contender for supercar status. Once recognized by the

automotive press, this should demonstrate to potential investors that there is a volume market for lower performance, considerably lower priced commuter car versions.

While the *Tango* can seat two adults in tandem, it is only 38-inches wide – 6-inches narrower than a Honda Gold Wing motorcycle – and 101-inches long so it can be parked perpendicular to the curb. Other dimensions include a height of 60-inches and 4-inches of ground clearance. The *Tango* prototype weighs about 3,000 pounds of which 1125 pounds are for the batteries.

Commuter Cars has given much attention to safety and stability in designing the *Tango*. For example, it features a roll cage that meets or exceeds both SCCA (Sports Car Club of America) and NHRA (National Hot Rod Association) regulations that specify cage design for protection in over 200 mph crashes. While very narrow, the company says its stability exceeds that of most sport cars.

Commuter Cars recently received a U.S. patent for its “Ultra-Narrow Automobile Stabilized with Ballast.” Here the ballast, typically the batteries is heavy enough and positioned low enough to provide a low center of gravity and a high rollover threshold. Incidentally, Woodbury initially envisioned the concept for a hydrogen-powered car with the ballast being iron- titanium hydride for hydrogen storage. Becoming impatient with the slow rate of development of hydrogen technology, he decided to build a battery-powered car now.

The design includes rack and pinion steering, unequal length A arm front suspension, trailing arm rear suspension and coil-over Pro shocks. Many of the components come from much bigger cars like four-wheel disc brakes with Acura Integra calipers and wheel hubs and bearings from

Pontiacs and Cadillacs. The Tango rides on 5 bolt alloy wheels shod with BF Goodrich Euro T/A 175/50R13 tires.

While the *Tango's* design could also be adapted for an internal combustion engine or a fuel cell, currently it is battery-powered for zero-emissions commuting at half the operating cost of a gasoline car. With conventional lead-acid batteries, the *Tango* has a range of 80 miles. With advanced technology batteries, this could be increased to up to 150 miles on a single charge.

Battery options include 25 Optima Yellow Tops or Panasonic EV1260Us, with room for up to 28 Ovionic Gen II batteries with water cooling.

Typically, batteries could be completely recharged in under three hours using a 220 Volt home dryer outlet for the next day's commute. The car is now fitted with a 50 amp on-board charger with an Avcon conductive coupling with a 200 amp charger under development. A trailer hitch allows towing a generator cart for range extension.

Two Advanced DC motors, each driving one of the *Tango's* rear wheels delivers a total of 560 ft-lb of combined torque. Two direct drive gear boxes designed by Bert Transmission of St-Constant, Québec, a manufacturer of dirt circle track race car transmissions, are used. Finally, there is a Café Electric Zilla motor controller providing up to 1,800 Amps at 300 Volts.

The *Tango's* performance is spectacular for an EV, indeed, spectacular for any wheeled vehicle. According to the company, the design and components have the potential to accelerate from 0 to 60 mph in under 4 seconds and cover the quarter mile in under 12 seconds at a speed of

approximately 120 mph. A top speed of 124 is based on a limitation based on a practical red-line for the motors of 8,000 RPM with the standard 3.86:1 gear ratio. With other ratios, top speed could reach 164 mph with reduced acceleration capability.

Currently, the company plans a kit version of the *Tango* available this year followed by a *Foxtrot* offered in 2003. The *Foxtrot* meeting FMVSS requirements would have lower performance - 0 to 60 mph in 7 seconds.

#### ILLUSTRATIONS:

No. 1. The *Tango* is only 101-inches long, but can carry a second passenger and several bags of groceries with rear seat installed.

No. 2. As many as four *Tangos* can fit in one parallel parking space.

No. 3. *Tango* passengers sit in comfort, and safety.

No. 4. There is considerable cargo space with the rear seat removed.

No. 5. Prototype *Tango* shows steel cage protection.