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PREVIEW TEST

# The Electric Tropica

## Finally, a battery-powered car that promises little, and delivers a little more.

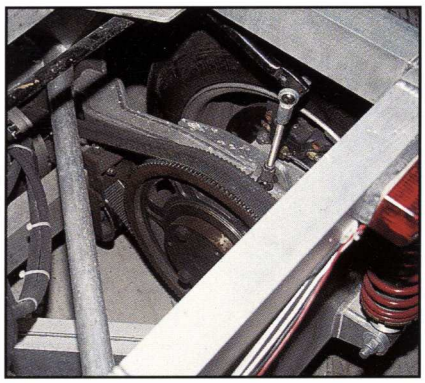
BY FRANK MARKUS

Brace yourselves. You're about to read some favorable words about an electric car -- right here in the pages of Electric Car Skeptics Quarterly. We haven't been bought off by CARB nor infiltrated by Calstart -- we're simply impressed by the Tropica, an electric car built by Renaissance Cars Inc. of Florida. It shocked us by successfully completing our full battery of tests, by demonstrating a reasonable range, and by doing it all at a very reasonable price.

This small company appears to have discovered the formula for building a successful electric car. The secret was not lurking in Unobtainium Oxide batteries, nor in an exotic carbon-Kevlar body. The secret is to build a car that doesn't promise too much.

Company founder Bob Beaumont cut his teeth in the electric-car biz as the head of Sebring Vanguard, another small company that won fame as the world's largest volume producer of street-legal electric cars. Its Sebring CitiCar didn't win any beauty pageants -- it looked like a cross between a doorstop and a milk carton. But it promised freedom from gas lines, and it certainly delivered.

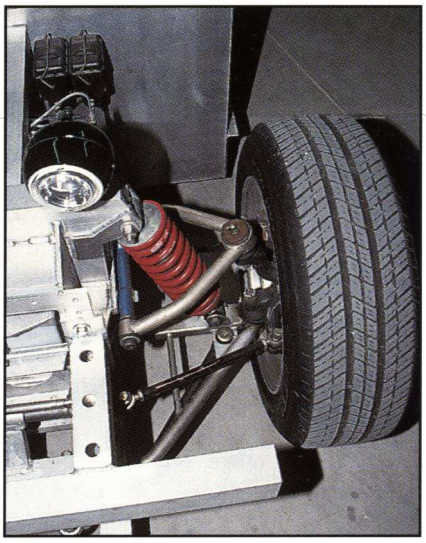
What Beaumont's new Tropica promises to be is a great-looking, fair-weather, short-range, urban roadster -- a fun second car. This happy-go-lucky goal frees the Tropica of many of the killjoy concerns that cripple those electric cars promising the transportation and convenience of gasoline cars. Being roofless discourages anyone from trying to operate the Tropica in cold weather -- which batteries hate as much as people do. The roadster format also evades regulations involving laminated windshield glass, wipers, front and rear defroster, and A-pillars capable of supporting the car. Likewise, to save weight, improve performance and extend its range, the climate control, side windows and door locks have been jettisoned. The only things the topless Tropica requires are a roll bar, a Lexan windscreen, and nice weather.



Direct-drive motors power each rear wheel independently via toothed belts.

Tropica's styling is a welcome departure from ugly-duckling forebear. Prototype interior lacks digital gauges, passive belts.


Beaumont entrusted Tropica's styling to Jim Muir, the Florida design consultant who styled the CitiCar. This time, instead of milk cartons and doorstops, Muir looked for inspiration at Dodge Vipers and Shelby Cobras. The shape of the car he created is captivating. A 72 inch width and 61-inch track give the Tropica a broad, aggressive stance that was often mistaken for a Viper's among Florida's automotive incognoscenti.

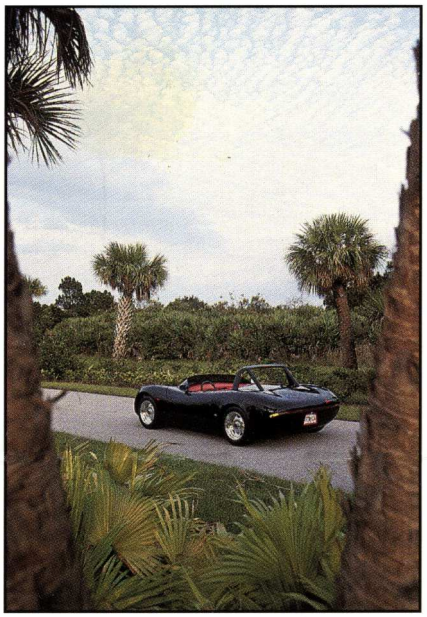


To go along with the Tropica's exotic looks are several clever features, such as a fixed driver's seat with adjustable pedals, and cable actuated steering. In place of a conventional steering column, the Tropica mounts a lightweight rack and pinion gear just behind the dash. A heavy duty marine steering cable is used to connect this rack to a slave rack up front that turns the wheels. The doors and passive restraints were not functional on our fiberglass-bodied prototype. Production cars will use lighter vacuum-formed ABS plastic. An on-board air compressor replaces the spare tire, so there's room in the trunk -- it has 5 cubic feet of space -- enough for two golf bags.

A welded aluminum monocoque chassis was chosen for its strength-to-weight benefits and small-volume manufacturability. Twelve 6v batteries ride in a slide-out tray mounted low along the center of the car. The fully independent suspension features unequal length control arms in front and trailing arms in back. Two DC motors mounted on the rear trailing arms provide a peak of 24.5 HP directly to each rear wheel through a toothed rubber belt, eliminating the need for a differential. Braking is by four-wheel cross-drilled discs with low-drag calipers. Regenerative braking would extend range slightly, but it was deemed too costly to be included on the first Tropicas.

After a lengthy walkaround spent scribbling notes, we mounted our testing gear on the roadster and took to the track -- full of a skepticism born of previous lackluster electric-car drives. But from the first drop of the accelerator pedal, it was clear that lightweight, topless, purpose-built electric cars can run rings around gas production cars converted to electrics. With peak torque at zero RPM, the Tropica leapt off the line. A rather loud whir from the motors combines with the wind in your face to make the ensuing acceleration seem much quicker than it is. Thirty miles an

hour comes up in 5.2 seconds, about 2.5 seconds slower than the average gas-burner but 4.1 seconds quicker than the Toyota Paseo converted to electric power -- the Aesop -- we tested last March. Top speed is 57 mph, at which point having a conversation or a good hair day is not in the cards. So a clapped-out Yugo could run rings around it, but at least the Tropica delivers its performance throughout its entire driving range.



And range is the most significant performance difference between the Tropica and the electric Aesop. After an overnight charge of 10 hours on 110-volt household current, the Tropica underwent a mixed loop of stop-and-go driving, some sustained 45-mph cruising, and three simulated errand stops of between 10 and 45 minutes. All accelerations were done at full throttle -- no babying was allowed. After running for 30 miles, the Tropica was still capable of 45-mph cruising and acceptable acceleration. By contrast, the electric Aesop's performance seemed to degrade noticeably with each acceleration.

Then, during mile 36, our battery pack charge dropped below its 65-volt threshold and the controller shut down the motors. While the Tropica coasted, the battery voltage climbed enough to allow the motors to come back on. In this accelerate/coast mode, we travelled on for 2 more miles at a safe speed before stopping at mile 38. Last March, the Aesop ran for 35 miles in all, but it was less driveable in the last half of its range.

A range of 38 miles is not bad for a wind in the face runabout, but the final, finished product is expected to go farther. A major diet will trim 400 pounds from the prototype's portly 2200-pound curb weight, which should improve both acceleration and range. New aluminum drive sprockets will provide a slightly taller final drive ratio, which is expected to increase top speed to just over 60 mph.

The ingredients in a great-handling car are a low center of gravity, a 50/50 weight distribution, and a wide track. With a bit more tuning, the Tropica could qualify. The prototype's quick ratio marine steering gear allows way too much play on center and dulled road feel. The prototype was twitchy at the limit, where it tended toward unannounced oversteer. A tighter, slower rack is on the way, Beaumont says. That, along with a bit less roll control (especially in the rear) should improve drivability. With only two inches of suspension jounce and rock-hard low rolling resistance tires, the ride is on the harsh side of sporty.

That brings us to the critical issue of cost. For electricity, figure between one and two cents per mile. Then add 4 cents to replace the $800 battery pack somewhere between 20,000 and 30,000 miles. Figure another penny for brakes and tires, and we're close to the average cost of 6.4 cents per mile of our recent long-term test fleet. The purchase price is the shocker. Beaumont says he can profitably sell 1200 fully equipped Tripicas per year through his Florida dealer network at $12,500 each. To encourage non-gas cars, the federal government offers a ten-percent tax credit for electric cars, which would drop the Tropica's price to $11,250. In an electric car market full of $30,000 converted Paseos and $100,000 Ford and Chrysler vans, the Tropica strikes us as a genuine bargain.

As an alternate mode of fun transport in the vein of a hovercraft or snowmobile, the Tropica is styled and priced right, and will probably satisfy its sunshine-state owners. Will it replace your gas car any time soon? Nope. When it comes to four-season electro-motoring, we're still Electric Car Skeptics Quarterly.

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# CAR AND DRIVER TEST RESULTS

**Vehicle type:** mid-engine, rear-wheel-drive, 2-passenger, 1-door roadster

**Price as tested:** $12,500 (estimated)

**Major standard accessories:** none

**Sound system:** none

**ENGINE**

| | |
|---|---|
| Type | two 72-volt series-wound direct-current electric motors (Advanced DC model XP-1150) powered by 12 six-volt deep-cycle lead-acid batteries |
| Engine-control system | twin solid state 550-amp Mosfet controllers |
| Emissions controls | none |
| Power (continuous/max) | 15 bhp @ 4600/ 49 bhp @ 2000 rpm |
| Torque (SAE net) | 160 lb-ft @ 0 rpm |

**DRIVETRAIN**

| | |
|---|---|
| Transmission | 1-speed direct drive |
| Final-drive ratio | 5.64:1 |

| Gear | Ratio | Mph/1000 rpm | Max. test speed |
|---|---|---|---|
| I | 1.00 | 12.6 | 57 mph (4550 rpm) |

**DIMENSIONS AND CAPACITIES**

| | |
|---|---|
| Wheelbase | 89.0 in |
| Track, F/R | 61.0/61.0 in |
| Length | 156.0 in |
| Width | 72.0 in |
| Height | 44.5 in |
| Frontal area | 14.0 sq ft |
| Ground clearance | 4.5 in |
| Curb weight | 2200 lb |
| Weight distribution, F/R | 50.0/50.0% |
| Battery storage capacity | 156 amp-hrs |

**CHASSIS/BODY**

| | |
|---|---|
| Type | unit construction |
| Body material | fiberglass-reinforced plastic |

**INTERIOR**

| | |
|---|---|
| SAE luggage space | 5 cu ft |
| Front seats | bucket |
| Seat adjustments | none (pedals adjust for reach from stationary seat) |
| Restraint system | door-mounted 3-point belts |
| General comfort | poor **fair** good excellent |
| Fore-and-aft support | poor fair **good** excellent |
| Lateral support | poor fair **good** excellent |

**SUSPENSION**

| | |
|---|---|
| F: | ind, unequal-length control arms, coil springs, anti-roll bar |
| R: | ind, trailing arms, coil springs, anti-roll bar |

**STEERING**

| | |
|---|---|
| Type | rack-and-pinion |
| Turns lock-to-lock | 2.0 |
| Turning circle curb-to-curb | 22.0 ft |

**BRAKES**

| | |
|---|---|
| F: | 10.0 x 0.3-in cross-drilled disc |
| R: | 11.1 x 0.4-in cross-drilled disc |
| Power assist | none |

**WHEELS AND TIRES**

| | |
|---|---|
| Wheel size | 7.0 x 15 in |
| Wheel type | cast aluminum |
| Tires | Goodyear Invicta GFE, 205/60SR-15 |
| Test inflation pressures, F/R | 44/44 psi |

**ACCELERATION**

| | Seconds |
|---|---|
| Zero to 30 mph | 5.2 |
| 40 mph | 9.8 |
| 50 mph | 20.0 |
| Street start, 5–50 mph | 21.1 |
| Top-gear acceleration, 30–50 mph | 15.4 |
| Standing 1/4-mile | 23.4 sec @ 52 mph |
| Top speed (drag limited) | 57 mph |

**BRAKING**

| | |
|---|---|
| 50–0 mph @ impending lockup | 123 ft |
| Modulation | poor fair **good** excellent |
| Fade | **none** light moderate heavy |
| Front-rear balance | poor fair **good** |

**HANDLING**

| | |
|---|---|
| Roadholding, 200-ft-dia skidpad | 0.81 g |
| Understeer | **minimal** moderate excessive |

**URBAN RANGE (10-HOUR CHARGE)**

| | |
|---|---|
| *C/D* observed | 38 miles |

**INTERIOR SOUND LEVEL**

| | |
|---|---|
| Idle | 42 dBA |
| Full-throttle acceleration | 98 dBA |
| 50-mph cruising | 98 dBA |
| 50-mph coasting | 98 dBA |