



EVDL.org

The Comuta-car's small size and quick reflexes enable it to zip through any traffic situation.

# Living with an electric car

We take home a production electric car and get a charge . . . and some shocks.

by Tony Assenza AUTO EDITOR

Owning an electric car these days is probably one of the last great opportunities the average motorist has of exercising his pioneering spirit. The current state of development of these volt guzzlers is comparable to that of aviation a few years after the Wright brothers flew their first hundred yards. In that sense, anyone who buys an electric is embarking on a trip through uncharted territory. He leaves behind the automotive world as we know it and, like any pioneer, is left pretty much on his own, to sink or swim as best he can. I discovered this one evening when the batteries gave up, leaving me stranded in the middle of the Brooklyn Bridge.

In a gas-engine car, running out of fuel isn't yet a major problem. But who do you turn to when you need to revitalize 200 pounds of dead batteries? Have you ever tried calling the



PM photos: Ralph deMasi

AAA and asking for 12 batteries? I can guarantee that their answer is anything but encouraging.

The problem is that nobody in the entire country is able to provide this unique type of emergency road service. The only recourse is to ride home slung off the back of a tow truck. And that's a very uninspiring position, especially for a pioneer.

Fortunately, that night on the bridge I didn't need a tow truck. A good Samaritan named Serge from Trenton pushed me off the bridge to a gas station, one of the greatest institutions of the 20th century. Where else can you get anything from a loaf of bread to a rebuilt transmission . . . and a charge for a dead electric car?

I never got a chance to properly thank Serge from Trenton. He took off in his Beetle before I even got a chance to get his full name. So,

wherever you are, Serge, thanks for the push.

Getting stranded far from a plug was the worst that happened with the electric car. But once I got it safely home, life became less complicated and actually very enjoyable. All I had to be aware of was the state of charge and my mileage. As long as I stayed within the range limit, the car was as effortless to live with as a gasoline-engine car.

While tooling around the neighborhood I discovered something else about owning an electric. Short of passing out hundred dollar bills on a street corner, having this car is the best way of making friends ever invented. Park it and it will draw more crowds than the Super Bowl.

## Tough as a football helmet

The object of all this attention on the street, our test vehicle, is called

Comuta-car. It is one of the few electric vehicles currently available for sale. There are dozens like it in various stages of testing and evaluation but none of those are on the market. The reason we picked this car was its availability and the reasonable price, just under \$5000. The few other electrics available cost a lot more.

What you get for the money is a sturdy, two-passenger car that carries 13 batteries in an aluminum floorpan, all wrapped up in a Cylolac ABS plastic body shell, the plastic used to make football helmets.

To meet the government's crash tests, the manufacturer placed four of the batteries in a tray in front of the car. In a head-on collision, the tray is designed to absorb most of the impact and prevent the batteries from being pushed into the passenger compartment. A similar arrangement is at the rear of the car.

To provide even more occupant protection, a roll bar is installed over the seats and another crash bar runs beneath the dashboard. There is still another bar that runs down both sides of the windshield. This roll-cage arrangement is similar to that used by race cars.

While the interior lacks most of the luxury touches found even in subcompacts, it is not uncomfortable. There is no seat adjustment, but anyone under 6 feet should have no trouble being comfortable.

In fact, no one should have much trouble adapting to driving this car. It works pretty much like any other car with automatic transmission.

To get the car under way, you insert a key and turn it. But, instead of hearing an engine turning over, there is silence. The red parking-brake lamp goes on. The parking brake is an interlock mechanism that prevents current from reaching the motor while the brake is engaged.

Forward and reverse are selected by a three-position toggle switch; forward is up, middle is neutral and reverse is down. The switch can't accidentally change position.

Once the switch is positioned, a tap on the accelerator will get the car rolling. The accelerator in this case is a conventional pedal that controls the amount of electrical power delivered to the engine. There are three forward and reverse speeds, each one automatically activated by relays when the accelerator is depressed. When you're driving, the only sound the car makes is the whine of the electric motor and the clicks of the relays as each one is activated.

The instrument package consists  
(Please turn to page 173)

## A HANDSOME HYBRID, BUT YOU CAN'T LIVE WITH IT—YET

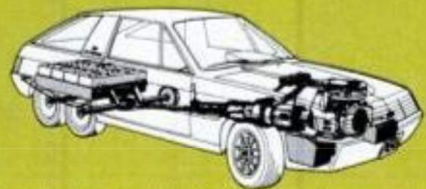


Two rear axles are used to evenly distribute the weight of the batteries. On the road it cruises at over 60 mph. Diagram illustrates twin-engine layout.

Thus far, no fully practical vehicle that is entirely gasoline-free has been perfected. But after 18 months in the works, the Briggs & Stratton Corp. (the world's largest manufacturer of small internal-combustion engines) has unleashed the next best thing: the Gasoline/Electric Hybrid. This sporty, family sedan can be driven by either its 8-hp Baldor, series-wound d.c. electric motor or an 18-hp Briggs & Stratton gasoline engine. Or it can be driven by both together to produce variable gas mileage from 25 to 150 mpg.

While some of the major automobile manufacturers are just now receiving large government grants to experiment with such vehicles, the Briggs & Stratton Hybrid is already being tested. It's a roomy, contemporary, aerodynamically sound, good-looking car with passable performance, maximum fuel efficiency, and the one big thing all pure electrics have lacked: long-range capability. The car offers a range of approximately 60 miles under battery power, but when that cuts out, the driver just switches on the ignition and motors happily home under gasoline power. Combined range: over 300 miles.

When Briggs & Stratton undertook the hybrid project, one of the first choices to face project engineer Doug Janisch and then vice president of research and development Bob Harkness was between the two common approaches to combining gasoline and electric powerplants. The first—and simplest—



method is to add an engine-driven generator to the electric motor to recharge its batteries. This "series-hybrid" design adds nothing to the electric motor's performance, however, only its range, and suffers significant mechanical-electrical-mechanical conversion losses that make it an inefficient system. According to Harkness, "the series system loses energy at every step, and it takes a very complicated electrical circuit to take large inputs of energy from the generator and store them into the batteries."

Thus, Briggs & Stratton has employed the "parallel-hybrid" principle, whereby the heat engine is directly connected to the electric motor, applying its power mechanically to the driveline. In addition to acting as a reserve when the electric power is depleted, the gasoline can be—and usually is—used as a supplement to the electric motor to produce increased power.

On level ground the electric motor will propel the car at about 45 mph, the gasoline engine at about 44. Under hybrid power—gasoline and electric together—the car will cruise easily in the low 60s.

With the parallel-hybrid system, no attempt is made to recharge the batteries during the car's operation. That is accomplished at home, via two chargers, in anywhere from two to eight hours at a cost of anywhere from 75 cents to \$3.75, depending on the time of day (night rates are cheaper) and the cost per kilowatt in your area.

Driving the Hybrid differs very little from driving an ordinary car. Starting up is as easy as flipping on a light switch, in this case a toggle located on the lower left portion of the dash. What is disconcerting is that, even with the switch on, the car makes absolutely no sound. Press the accelerator, however, and it

(Please turn to page 173)

PM photos: Dave Goolley



The little internal-combustion engine is hooked up directly to the electric motor.

of a voltmeter calibrated like a fuel gauge—F to E—and a d.c. ammeter. The ampere gauge indicates when the batteries are fully charged during plug-in periods.

The rest of the dash contains conventional auto controls like windshield wipers, defroster, headlights and high beams, directional signals, horn and heater.

### Driving for two cents a mile

Despite its limited range of 40 miles, and its low top speed of 38 mph, learning to live with the Comuta-car is a remarkably pleasant experience.

The routine of plugging in every night and checking the electrolyte once a week becomes second nature very quickly. Unlike a gas engine, it has no sparkplugs to clean, oil to change or timing to be set. And best of all, you will never have to worry about the engine not starting. As long as the batteries are charged, you're always ready to go.

The greatest satisfaction of electric-car ownership is knowing you will never have to stop at a gas pump. Instead, you have the convenience of plugging in at your home

outlet. No special wiring is needed because the Comuta-car is charged on regular house current. And the cost? It's about the same as running a 40-watt bulb all night. In New York that works out to about 80 cents per charge. Given the 40-mile range the net cost per mile is *two cents*.

During the time that we had the electric car, my wife Lillian and I almost ignored our regular car. The Comuta-car fulfilled almost all of our local transportation needs and we only fired up the gas burner when a long trip was called for.

### Ideal urban car

The Comuta-car, or any limited-range electric car, is an ideal urban car. Where a gasoline-powered car is most inefficient, stop-and-go driving, an electric is very efficient because it uses no power while stuck in traffic or waiting for traffic lights.

Because of its size, it can fit into parking spaces that are too small for even the tiniest subcompact cars. In addition, there is enough room behind the two seats for four grocery bags, which makes it great for shopping.

For short-range hauling, this little wedge has got to be one of the cheapest modes of transportation. But if you're thinking of buying one, my only word of caution is don't stray far from home.

For more information about this car, contact General Engines Co. Inc. 591 Mantua Blvd., Sewell, N.J. 08080. **PM**

### A HANDSOME HYBRID

(Continued from page 87)

springs instantly into motion, accompanied by the quiet hum of an express elevator and the loud clicking of relays.

The Hybrid, rushed to completion, still has a few bugs in it. One is the noise. The gasoline engine sounds like a lawnmower and the clicking of the relays is annoying. Both can be easily remedied, however. The car also needs a buzzer to warn that the electricity is on, so the driver doesn't accelerate unless he means to go, and to warn him to turn it off again before exiting the car.

The dual capability of the Hybrid seems to be the perfect answer to the limitations of pure electric cars. While it won't free us completely from dependence on oil, it is certainly a step in the right direction.

Now, since Briggs and Stratton doesn't plan to manufacture the Hybrid, we'll just have to wait for a large auto manufacturer to produce it.—Virginia DeMoss