

Plug-and-Play 914s

Kutscha asked himself, “Do I really want an electric VW Rabbit or Geo Metro in my garage?” The decision to go with a 914 was fairly easy

by Kristen Hall-Geisler

Thrifty consumers admired the Honda Insight and Toyota Prius gasoline/electric hybrids when they were launched in 1999 and 2000, but one group was distinctly unimpressed—the EV classic car gang.

Electric vehicle (EV) enthusiasts can trace their roots back to 1834 and since then, more than 130 manufacturers like Detroit, Baker, Rausch & Lang—even Studebaker and Oldsmobile at one time—have flipped the switch and swept silently away from Big Oil. In 1917, you could buy a Detroit Electric that promised up to 80 miles at 25 mph.

Limited range and lengthy recharging still confine electric cars to city use, but simplicity and reliability made them popular in the early 20th century, and numerous examples survive. The weight and short range of lead-acid batteries have always been a stumbling block, but expensive lithium-ion batteries and quick charging may change this.

In the meantime, EV fans convert gasoline-powered vehicles, and Porsche 914s are popular donors, thanks to their mid-engine design and trunks (for batteries) at both ends. Two Portland, Oregon, enthusiasts have converted 914s recently, using different power plants and kits made by California-based Electro Automotive.

Hardcore 914 enthusiasts might stop reading here, as a one-owner, original car formed the basis for one EV and a fully restored car donated itself for the other. Neither project was cheap either; one cost \$16,500 and the other \$23,500, which seems like a healthy premium for about 40 miles of freedom between charges. At that rate, San Francisco is about 18 days away, and since both trunks are mostly filled with batteries, you’ll be buying clothes along the way or stopping at laundromats while you recharge.

The DC kit

John Benson chose DC (direct current) technology for his EV project back in 1997. DC motors, like those in forklifts, have brushes that contact spinning rotors and are the most common EV power plants. Benson discovered Electro Automotive’s 914 kit and found a good-condition, one-owner, California 914 as his sacrificial lamb.

Benson logged about 100 hours on lunch breaks and weekends in putting his EV together. It helped that the Porsche mechanic from whom he bought his 914 let Benson use his lift. “The DC kit was very thorough and very detailed,” Benson says. “If you can hot-rod a car, you can definitely do this.”

The AC kit

In 2006, Tim Kutscha constructed an AC (alternating current) 914, after being inspired by the documentary “Who Killed the Electric Car?” AC motors work like



Benson and his DC Porsche

two magnets set to repel each other; the field on the outside of the motor repulses the field on the inside to make it spin and generate power.

Kutscha found ready-made, highway-capable EVs were expensive and rare and selected Electro Motive’s newly available AC kit for his 914. Kits for a variety of cars were available, but Kutscha asked himself, “Do I really want a Rabbit in my garage? Or a Geo Metro? That decision was fairly easy.” He bought a rust-free, fully restored 914, with new upholstery, new paint as a donor.

Porsche 914s are ideal for electric conversions, according to Kutscha. All he had to do was unbolt the engine and jack up the car, and the engine essentially fell on the floor. Plus, the 914s have an extensive online EV community, where owners discuss modifications and post detailed schematics.

The AC kit was shipped piece by piece over eight months. While the AC instructions are a tricky addendum to the DC manual, Kutscha said that the company makes sure the buyer gets every piece.

Problems during conversions tend to have to do more with the 914 than the kit, he says. “People run into more rust than they expect, or the car has sagged, or it’s been in an accident. Parts might not fit as well as you had hoped, and you have to pull out the hammer and drill.”

The DIY conversion

Otmar Ebenhoech built his DC-powered 914 at about the time he started his own EV controller company, Café Electric in Corvallis, OR, because he needed a car to



914 innards make conversion easy



caption



Watch the cord!



Front trunk holds three batteries



Kutscha's car recharges

test his high-powered, high-speed motor controllers. He drag races his 914 and provides parts for other EV racers.

Ebenhoech had experience, so his first conversion only took him about a month. He chose the 914 because he had decided never to make another electric vehicle that wasn't a convertible, which seems like a somewhat odd choice given the weather in the Pacific Northwest.

Parts and advice for scratch builders can be found online, helping you decide what motor and which batteries to use. Ebenhoech recommends buying batteries locally, as they are too heavy to ship. Lead-acid batteries weigh about the same as a gasoline engine and last about three years.

What about performance?

Ebenhoech says a builder's technical skill can be the difference between an average EV and an exceptional one and "your conversion will never be better than the vehicle you start with." His 914, with its custom controller and other parts, can hit 0-60 in under five seconds, though unmodified DC kit cars take over 20 seconds.

EVs are works in progress and Benson has replaced every component in his car twice in the past decade. He upgraded from lead-acid to Nickel Cadmium batteries, is using a more powerful controller from Café Electric and still searching for more performance.

Kutscha's AC EV only generates about 30 hp to pull

about 3,000 pounds, so it's not quick. But the AC motor can go about 40 miles between charges, 25 percent further than the DC kit. Unlike DC motors, AC units have nothing in contact with the rotor, only bearings on the end. Kutscha is considering upgrading his AC24 motor to an AC55, doubling his torque.

For these 914 owners, the main payoff is being an early EV adopter. Kutscha takes his car to EV shows to prove that an AC conversion is possible, while Benson notes that a DC conversion is easier than hot-rodding a combustion-engine car. "You've recycled an old car and turned it into something better," he says. ♦

Details

	DC Kit Conversion	AC Kit Conversion
Used 914	\$1,500	\$6,500
Sold the engine	-\$350	-\$700
DC Kit	\$9,000	\$13,000
Batteries	\$2,000	\$1,800
Miscellaneous	\$1,000	\$1,000
Owner's Labor @ \$25/hr	\$2,500	\$2,500
Total Investment	\$16,000	\$24,800
SCM Price Guide for 914/4	\$5,000-\$10,000	\$5,000-\$10,000
More	Electro Automotive, www.electroauto.com Café Electric, www.cafeelectric.com Kutscha's Blog, www.914ev.blogspot.com	