

—RAKO STUDIOS—

1974 Civic electric car conversion

A 9-inch dc motor, Curtis controller, and ten RV batteries make a spiffy impractical car.



A machinist across the parking lot had this car behind the shop. Someone had started and electric conversion on it. They used an aviation generator and had 10 golf-cart 6-V batteries in the back. There was no controller or all the other things I soon learned were necessary to make a working car. I replaced the generator with a 9-inch [Advanced DC motor](#). I bought a [Curtis controller](#) capable of running off an 120-V battery stack. I used ten [Trojan RV/marine batteries](#) to make the stack.

The car would go 80mph on the freeway. On the downside, if I floored it on every light it would run empty in 11 miles. Driving gingerly on flat land, I think the range was maybe 30 miles. When I learned I could not drive it over the hill to Santa Cruz, it became more of a toy.

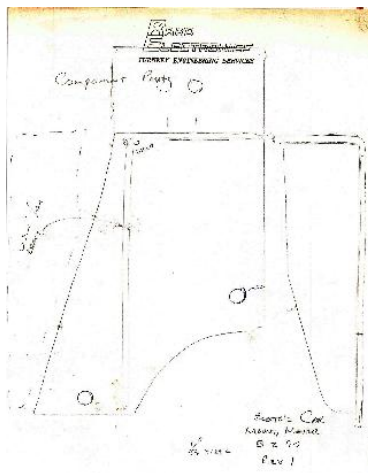
In addition to the motor, controller, and batteries, I had to buy cables and terminals, power brakes, and a vacuum brake booster pump, and a 144-to-12V converter. You still have to run the wipers and lights off of 12V.

In addition, I bought a throttle potentiometer so the "gas" pedal would vary the speed of the controller. I also needed a big disconnect to keep lethal voltages off when the car was sitting. I also put in an eMeter and a voltmeter. The eMeter required a current measuring shunt in the main power cable.

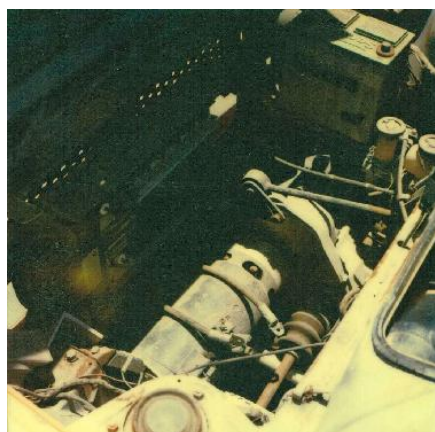
The biggest challenge was to make an adapter plate for the motor that tied into a custom motor mount where the engine used to attach to the car. The previous work made this easier.



The engine compartment with all the goodies.



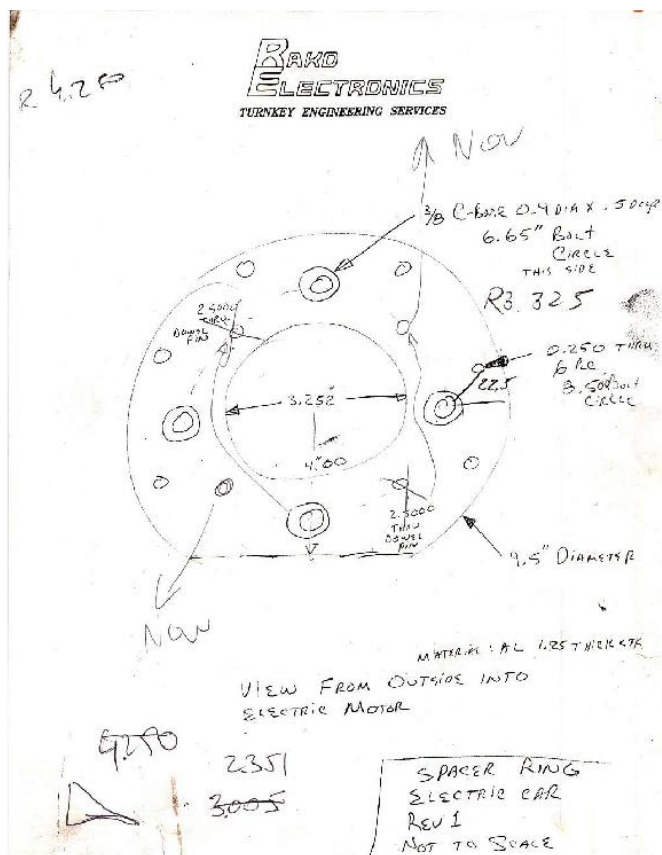
In addition to the spacer plate I modified this motor mount that was on the old conversion. It was a big help to have that to start from instead of a gas engine. I still have the generator, who know for what.



The car came with an aircraft generator that you can run as a motor. It has a shunt field so the control is more complex. I went with a dc traction one.



The motor fits well, with the controller in front where the radiator would be. Good for cooling.



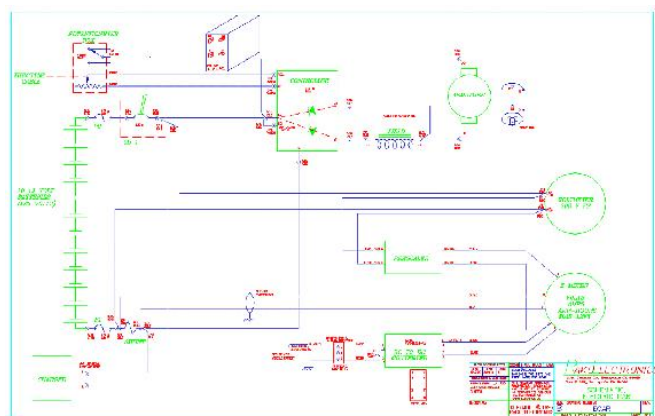
I designed this spacer ring to mount the motor.



The controller heat sink behind the grill.



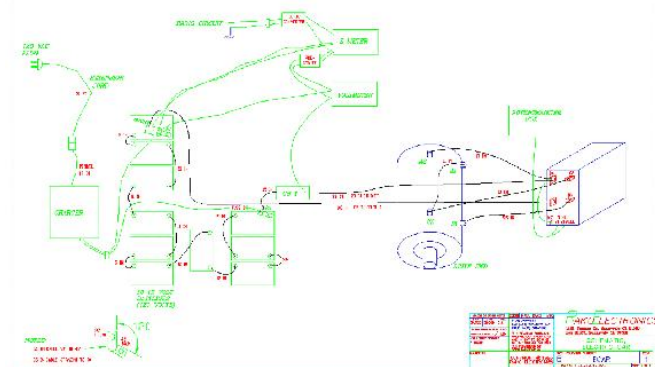
Original 6-V batteries weighing down the back.



The schematic of all the hook-ups. I never did get a 120V charger, I charged the batteries separately with a regular car charger.



12V batteries with passenger seat removed.



Here is the physical layout of the components. Its a big job to install and connect all this stuff.



Batteries are in a stronger place in the car.



I used a junk aluminum power supply frame to mount an eMeter and a large dc voltmeter. The eMeter would read current, power and other variables. It was quite handy to understand how much juice was flowing at acceleration or at high speed. Note the baking soda to sprinkle on the tops of the batteries now and then.



The right side has the car battery and the 120v-12V converter to keep the car battery charged. I put in a power brake master cylinder.



The left side has the vacuum pump so the brake booster works. There is a PVC reservoir for the vacuum on the firewall. The big box below to the left of the pump is the vacuum switch.



The engine compartment is not as crowded as with a gas engine. That motor and controller are heavy though. Engines are bulky but mostly hollow. This is the motor compartment now.



A stylish view of the car. I never did wire in those fog lamps. I did get it street legal.

MODERN ICE & COLD STORAGE CO.		No. 22811	
950 OAKLAND ROAD SAN JOSE, CALIFORNIA 95112 (408) 284-2577			
ACCOUNT NAME <u>PAUL</u>		DATE <u>8-30-95</u>	
EQUIP. NUMBERS		AXLE	
#1	TRUCK	F1	
#2	TRAILER	F2	
#3	TRAILER	F3	
#4		F4	
#5		F5	
OR		F6	
PAID CASH \$ <u>10,000</u>		GROSS	8-30-95 16x26A 2200 LB
CHARGE <input type="checkbox"/>		DRIVER'S SIGNATURE	

I took the car to the ice plant where they could weigh it. It came in a 2200 pounds with no drive. Since the Civic had a GVW (gross vehicle weight) of 2400 pounds, that meant the structure of the car would only take 200 pounds more. So no luggage if you weigh 200 pounds. See why it was a good idea to remove the passenger seat? The car sat level unlike when it had the 6-V batteries in the trunk. The batteries in the center all lower the center of gravity and reduces the polar moment of inertia.



1973 Civic Hatchback

Here is what the car would have looked like new. It was a fun project, but taught me electric cars are impractical with lead-acid batteries and dc traction motors. This was back in 1995.