



Electric Vehicles

The Missing Page of History

History

- 1835 Thomas Davenport (rail)
- 1838 Robert Davidson (rail)
- 1839 Robert Anderson (car)
- 1899 Baker Electric
 - 50 mile range
 - Top speed of 15 mph
- 1900 Baker Torpedo
 - Top speed of 75 mph
- Many electric trams in existence today
- 1990s (less than 2,000 of each produced)
 - GM EV-1
 - Honda EV Plus
 - Ford Ranger EV
 - Toyota Rav 4 EV

Electric



Not Electric!



Electric!



Pros of Conversion Electric Vehicles

- Recycling cars saves energy and resources
- “Zero pollution vehicles”
- Low maintenance (motor service at 80,000 miles, few parts)
- Recharge for under \$20 per MONTH!
- Can be serviced safely at home with few tools
- Nearly silent operation
- Conversion is relatively inexpensive considering cost of operation and longevity of parts
- Batteries are 100% recyclable
- Total system efficiency around 90%, 30% for ICE.

Electric!



Cons

- Limited range
- No production models available
- Little research/testing
- Water, corrosion, collision, and frequency
- Heat and Air conditioning
- Braking, steering, suspension
- Limited space

Debated Pros/Cons

- Battery technology
- Market acceptance
- Zero Pollution
- Safety
- Peak Lithium
- Automaker profit
- Strain on electric grid

NOT ELECTRIC!



Components of ICE

- Engine
- Alternator
- Battery
- Exhaust system
- Cooling system
- Catalytic converter
- Oil!
- Gasoline/diesel
- Belts, pushers, tensioners, gaskets, and other thingamabobs

Toxins emitted by the ICE

- Hydrocarbons
 - Ozone
 - Asthma
- Nitrogen Oxides
 - Acid Rain
- Benzene
 - Cancer
- Carbon Monoxide
 - Heart disease
- Carbon Dioxide
 - Global Warming
- Formaldehyde
 - carcinogen
- Sulphur Dioxide
 - Smog, acid rain
- Butadiene
 - Mutagen
 - carcinogen

Toxins emitted by NICE

Not Electric



The EPA

- <http://www.epa.gov/otaq/consumer/05-autos.pdf>
- “Driving a private car is probably a typical citizen’s most “polluting” daily activity”.
- Critical levels of toxins in most cities today.
- Groundwater affected heavily by automobiles

Components of NICE

- Motor (series wound DC 120 volts or more)
- Controller (Curtis, Café Electric, DC Power systems)
- Contactors
 - Allow low voltage devices to control high voltage devices
- Gauges
 - AMMETER
 - VOLTMETER
 - CHARGE GAUGE
- Batteries and accessory battery (6-12 volt deep cycle)
- 15 feet of cable
- Switches, relays, shunts, and interlocks
- Power brake pump
- Low rolling resistance tires

The Conversion Process

- Find Car
- Remove ICE components
- Degrease chassis
- Install battery boxes
- Install power brake system
- Mate motor to transmission
- Wire large/small gauge
- Replace tires with low rolling resistance tires
- Triple-check and test with wheels off the ground

My Go Kart



The Saturn





The Golf



=



The Mower



C2EC2T

- Commuter Car Electric Conversion Course for Teachers
- Started in 2005
- Open enrollment
- \$300 (food, lectures, experience, and fun)
- Attendees from Canada, NYC, Ohio, Texas, Maryland, etc...
- No experience necessary



PUFF da mechanical DRAGON



A.K.A.

Internal Combustion Engine

2006/01/02

Abran Quevedo

“Mr. Q”

- Migrant farm worker from Mexico
- Received masters degree from SDSU
- Retired auto shop teacher
- Community activist
- Grant from Miramar College
- EV program for low-income families
- Fighting to reduce health problems in cities due to emissions.
- First Q industries vehicle rolled out in August



Conversions

- \$4,000 - \$10,000 for basic conversion
- Expect 500-800 hours of labor
- Manual transmission only (only two gears)
- Must do calculations on your own
- Donor car issues (age, condition, weight)
- Must be <3,000lbs after conversion
- Need space for batteries
- No guarantees!

Is an EV right for me?

- Do you drive 50 miles or less to work, school, or the store each day?
- Do you have access to a longer distance vehicle?
- Are you prepared to learn a new way of driving?
- Do you care about the health of planet and the people on it?
- Are you prepared to drive past the gas station, listen to others complain about fuel prices, and assist in the end of the use of foreign oil?

Electric!



Not Electric?



NEVS

- Not real cars
- No good for highway commuters
- No heat, protection from winter snow and rain
- No protection from collision
- Not a real threat to auto industry
- Give EVs a bad name due to low speed, low quality, and outrageous price.

AC or DC?

- Regen 25% of energy from braking
- More efficient use of batteries
- Extended range
- Three times the cost of DC
- Need EE degree to understand concepts
- More dangerous, but not that much more
- Not a vast improvement...for now

Batteries

- Deep cycle lead acid
- AGM Advanced Glass MAT
- 2nd Generation Deep Cycle
- Lithium ION
- NiMh
- NiC
- NiCd

Electric!



Making the Case

- 98% of all trips under 20 miles
- A minimum of 75% cleaner than ICE
- The technology is here right now and will only improve
- Conversions are compatible with battery upgrades
- They don't cause cancer
- Last longer
- Are more inexpensive than ICE
- Are completely recycled and recyclable
- Compatible with wind and solar technologies
- V2G (Vehicle to Grid) saves energy
- Pride of ownership
- No money to corporations that do not support green technologies
- no dependence on foreign oil
- Fuel Costs are only going up

Fuel Comparison

50 miles at 30mpg for \$3.15/gallon=\$5.25

20 commutes per month= **\$105**

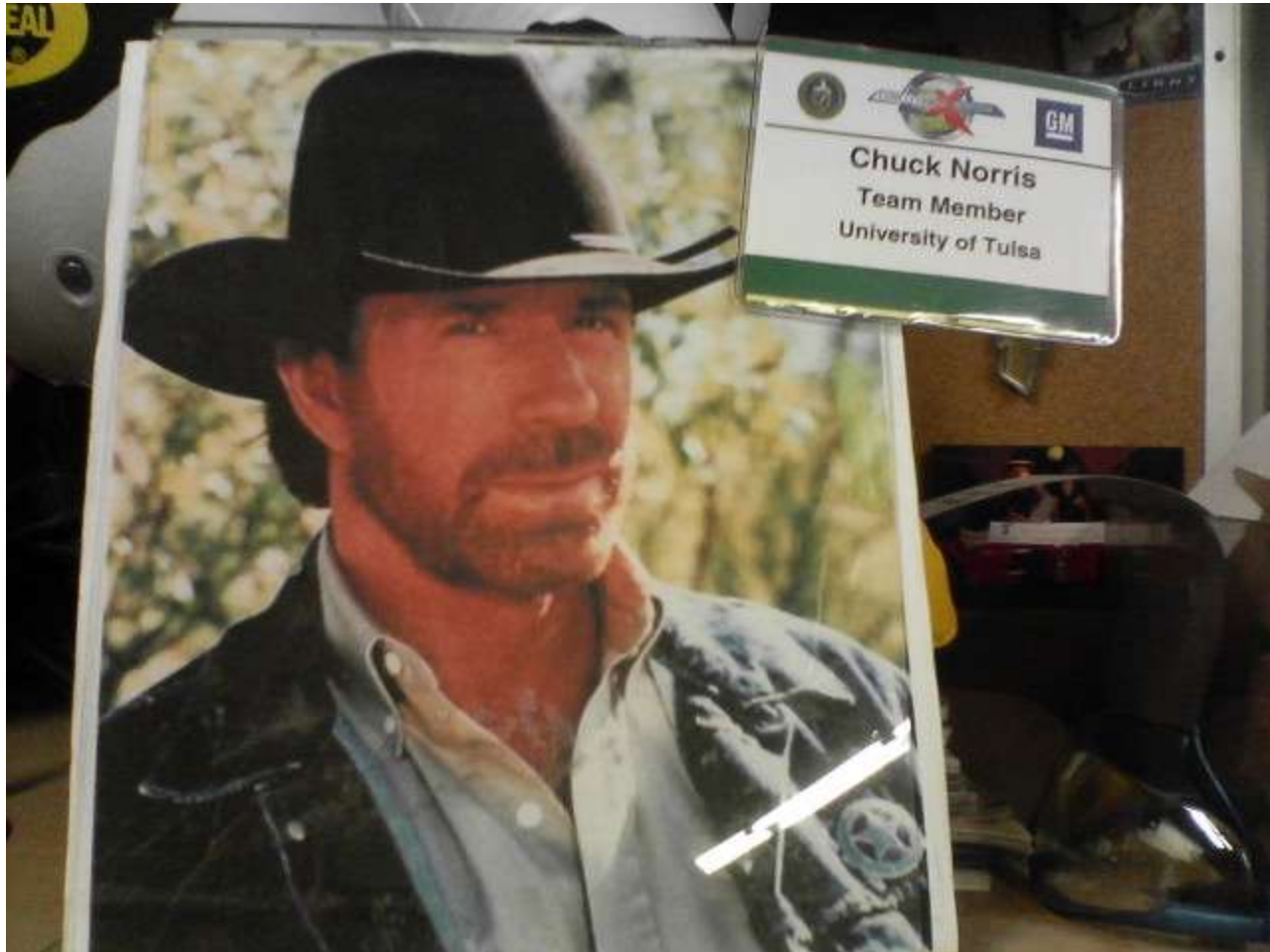
50 miles at 2 cents/mile= \$1.00

20 commutes per month= \$20

Battery cost per month = \$35

Total cost after conversion = **\$55 per month***

Best Teammate...Ever!



EVs on the road

- Tesla
- Phoenix
- Venturi
- Zenn
- Th1nk
- EV-1
- Rav-4 EV
- Ranger and S-10 EV

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Hybrids

- Gas-Electric
- Electric-Gas
- Simultaneous
- Less pollution
- Longer distance
- Reduced use of petroleum products
- Complicated
- The Volt “problem”

Ethanol?

Biodiesel?

- Ethanol's numbers don't add up!
- Biodiesel production is hard on the earth
- Biobutanol may be better option.
- Ethanol more viable in hybrid application
- "Peak Soil"
- **IT IS STILL POLLUTION!**

Hydrogen?

Natural Gas?

- Hydrogen problems:
 - Storage
 - CO
 - Production of H₂
 - Fuel cell cost
 - Not available to average consumer
 - Range issues
 - It is already an electric car

Convert it!



Electric!



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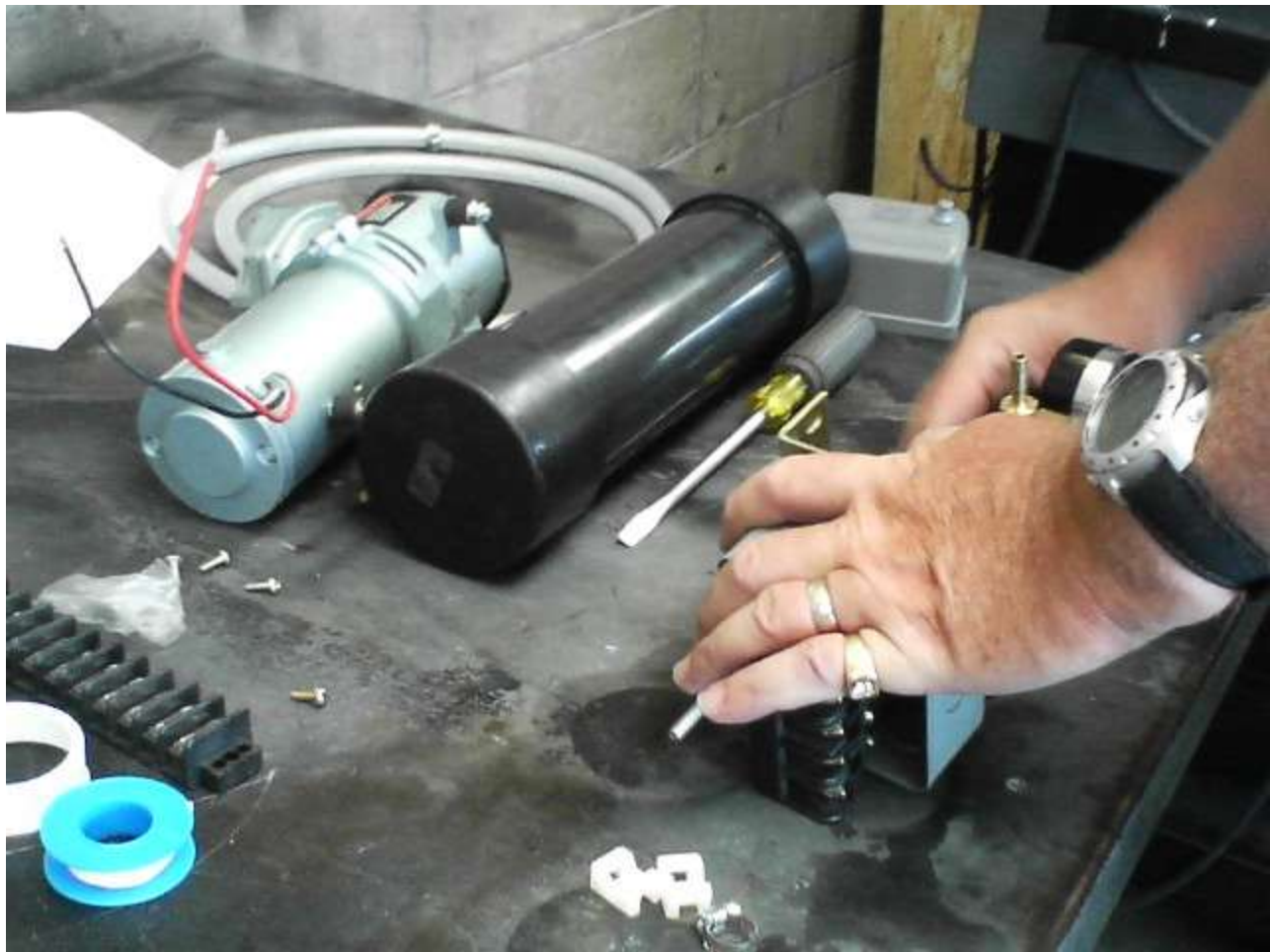


Not electric!



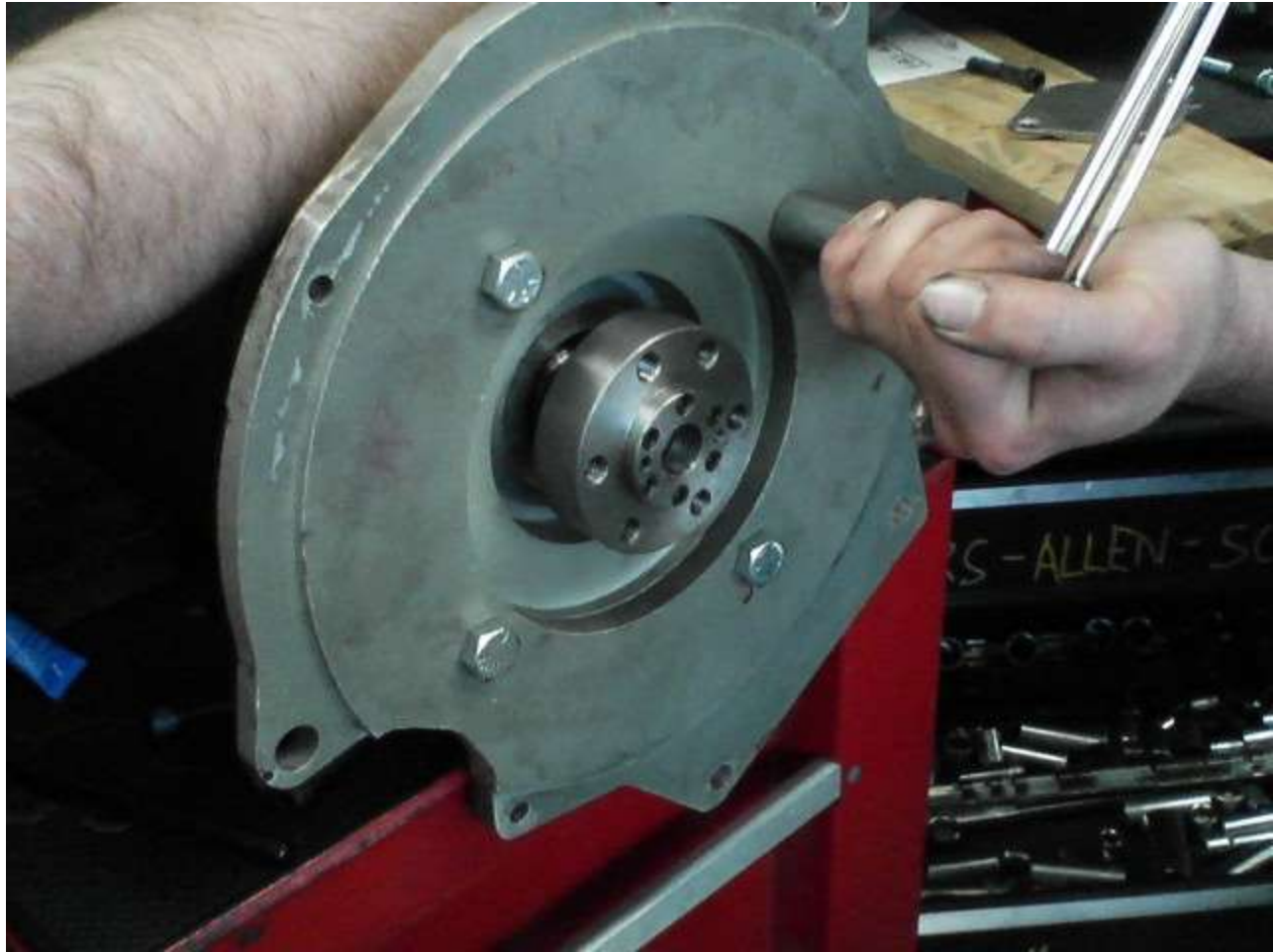




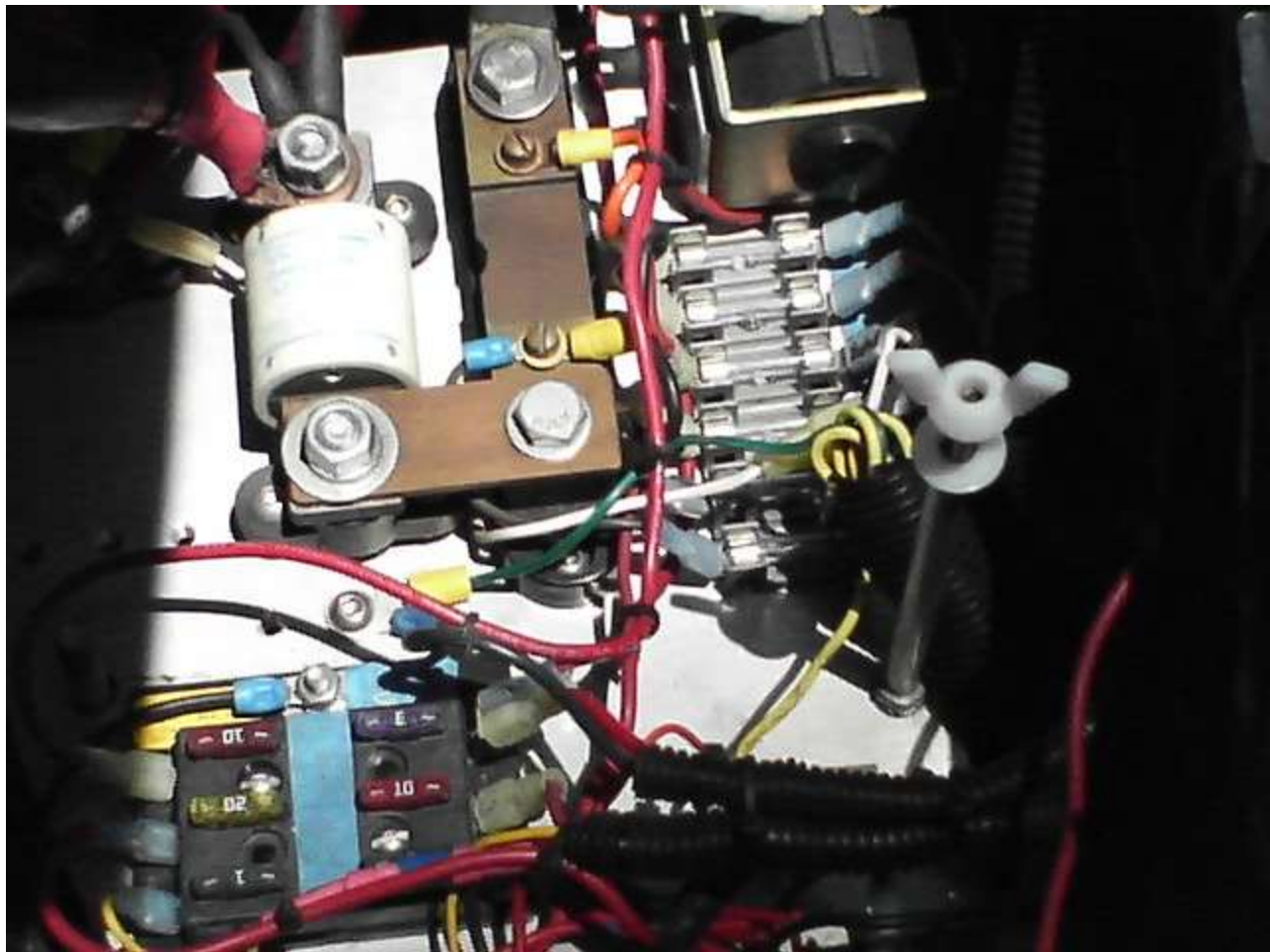














Designed to fit over shock tower

