

**APPENDIX V**  
**Final Report for SARE Grant FNE03-472**  
**Converting an Allis Chalmers "G" Cultivating**  
**Tractor to an Electric Vehicle**

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### **1) Goals**

Many small farms rely on older tractors, which can pollute and can also be difficult to maintain. We were to convert an Allis-Chalmers "G" from a gas engine to run on electric power, and will then develop materials so that other farmers can do the same thing.

The overall goals are to reduce pollution, improve quality of life, and improve the power and versatility of the original tractor. The plans and instructions will be posted to a Web site and available in printed format for anyone to use.

### **2) Farm Profile**

Huguenot St Farm is a 77 commercial organic farm with about 24 acres under cultivation and about 10 acres in cash crops in any given year. We sell mostly through a 225 members CSA as well as to several local restaurants and one co-op. Before we started this grant we had one operating electric tractor. This grant enabled us to build a second, much better tractor, and to publish the results on the internet so that other farmers could make one as well.

### **3) Participants**

Bob Battson of Electric Vehicles of America wasn't actually listed as a collaborator, but he did a lot of work to make this possible for free. Herman Niekamp was a machinist in Kingston, NY. He devoted many times the number of hours we had budgeted for to vastly improve on the proto-type we had running before. Kathryn Khosla, my wife, and he friend, Happy Porecha don't know much about tractors or machines in general. They were my "test subjects" in trying to make sure that these instructions could be understood by the common person.

### **4) Project Activities**

We built the new improved tractor. It's a great success. Though I went way over budget and spent innumerable hours more than I budgeted in the grant I don't regret it at all! The reward is in having the second tractor to use on a daily basis, and we've also updated the first tractor to be as good as the one we built for this grant.

I also created a website and I've taken a lot of phone calls about this project. Even though the grant is over I plan to keep the website updated as people email and call with questions.

The project didn't change over time, it just took more time to complete than I expected. I originally thought that people would just take these plans to a local machinist and have them make the few components that are not "off-the-shelf". In fact, this is DEFINITELY possible, but it is more time consuming than I had expected. So although I left those instructions in the website/manual, I encouraged people to just order the pieces pre-made from Niekamp Tool Company. I worry a little that this may be improper, since then Niekamp Tool Company would be profiting from the work they did helping me make this grant, but... I don't see any other way around it, and in fact ordering pre-made components from them is actually cheaper than ordering them from a local machinist. Furthermore, I am still including the diagrams and instructions necessary for people that DO choose to go with a local machinist (or to do the work in their own shop).

### **5) Results**

We completed the tractor and made the website and at least one person has already started building an electric tractor based on this website. There are several more farmers that seem to be serious about starting soon, as well as MANY people who have expressed interest and appreciation for the project and some of them may actually build tractors as well.

### **6) Conditions**

N/A, although I do go into much greater detail about the conditions on our farm and modifications that people may want to make to the tractors depending on their soil type and conditions.

### **7) Economics**

The tractor cost a little more than I expected, but not much. It will take people far fewer hours to make the tractor than I expected assuming they order the pre-made machined parts.

### **8) Assessment**

This was a great project. We really learned a lot in terms of pushing the tractor to its maximum potential, and it performed far better than I had even hoped, which is encouraging. I really think that this is an awesome type of Electric Vehicle –FAR more practical than an electric car. It has more power, less breakable parts that over decades have shown they are more robust than gasoline engines. It is economic, it is silent and non-polluting... and on our farm we are proving on a day-to-day basis that it makes us more efficient and more profitable.

### **9) Adoption**

(See above)

### **10) Outreach**

We've held several farm tours that highlighted the electric tractor. People have driven all the way from Missouri and even Ontario, Canada just to see how it works and how well it works. I've taken a lot of phone calls.

Most significantly, I've created a website that goes into great detail describing the tractor. Now that it is REALLY done, I can submit it to search engines and I will be sending out a short "press-release" to several farm publications that had previously expressed interest in being updated when I finish the project.

### **11) Report Summary**

We converted an Allis-Chambers "G" from its original gas engine to run on electric battery power. The new converted tractor was inexpensive to build and the conversion can be done by inexperienced people in one relaxed weekend. Detailed (and updated) instructions on what to buy and how to build the tractor can be found at [www.flyingbeet.com/electricg](http://www.flyingbeet.com/electricg). The converted tractor is MORE powerful than the original gasoline tractor, is far more robust than the original (and easy to repair if there was a problem) and has additionally proven to be a significant marketing draw for our farm.