

TABLE OF CONTENTS

How to Make an Electric Vehicle

Preface

- 1 Introduction
 - A. Why build an Electric Vehicle
 - B. How to Fund Your Project
 - C. Overall Expectations of Project: Cost, Time, Performance, Operating Costs, etc.

- 2 Vehicle
 - A. Factors to Consider in Choosing a Car
 - B. Why a Chevrolet S-10
 - C. Why a Miata was Chosen
 - D. Conversion Process
 - C. What Parts of the car to keep and what parts to scrap / sell?
 - D. Motor Assembly
 - E. Motor Shaft Adapter
 - F. Motor Adapter
 - G. Motor Insertion
 - H. Motor Alignment

- 3 Motor
 - A. What Types of Electric Motor to Choose from – what makes sense?
 - B. Sources for Electric Motors
 - C. Motor Mount
 - D. Motor Mounting Considerations

- 4 Controller
 - A. Types of Controllers Available
 - B. Sources for Controllers
 - C. Self Designed Motor Controller
 - D. Motor Controller Mounting Considerations

- 5 Transmission
 - A. Do You Need it or Not?

- 6 Clutch
 - A. Do You Need One or Not?
 - B. Why I Chose what I Did

- 7 Transmission Adapter
 - A. What is Required and How to Get it Made
 - B. What I Did for a Transmission Adapter.

- 8 Batteries
 - A. Choices available: pros and cons
 - B. Why I chose what I did
 - C. Battery Maintenance

- 9 Battery Boxes
 - A. S-10 Battery Boxes
 - B. Possible Locations
 - C. Battery Connections
 - D. Miata Battery Boxes

- 10 Battery Charger
 - A. Sources for Chargers: What's Important?
 - B. Why I chose what I did

- 11 Vehicle Power Control

- 12 Safety
 - A. The Dangers of High Voltage DC
 - B. Importance of Wire Sizing, Routing and Insulation

- 13 Vehicle Schematic
 - A. Working Diagrams
 - B. Chevrolet S-10 Pickup Schematic
 - C. Miata Schematic

- 14 Throttle
 - A. Connections from the Accelerator Pedal to the Controller
 - B. S-10 Throttle Mechanism
 - C. Miata Throttle Mechanism

- 15 DC to DC Converter
 - A. Need 12Vdc Vehicle Accessories
 - B. How to Integrate with Original Vehicle Systems

- 16 Suspension
 - A. Frame Considerations: Weight, Springs Shocks

- 17 Instrumentation
 - A. Main Battery Voltage
 - B. Motor Current
 - C. State of Charge meter
 - D. Battery Status at a Glance
 - E. Vehicle Accessory Battery Voltage
 - F. Tachometer
 - G. Speedometer
 - H. Resettable Odometer
 - I. Controller Temperature Gauge
 - J. Motor Temperature Gauge

- 18 Power Brakes
 - A. Separate Vacuum Pump Choices

- 19 Power Steering
 - A. Do you need it or not? Possible choices
 - B. How to integrate standard automotive system

- 20 Air Conditioner
 - A. Do you need it or not? Possible choices
 - B. How to integrate standard automotive system

- 21 Heater
 - A. Possible choices
 - B. Why I chose what I did and how I did it

- 22 Body
 - A. Removal of all Chrome
 - B. Sanded After Chrome Removal
 - C. Ready to Paint
 - D. After Paint

- 23 Interior
 - A. Chevrolet S-10 Interior
 - B. Miata Interior

- 24 Cost
 - A. Chevrolet S-10 Cost
 - B. Miata Cost

Preface

This book describes an easy way to build your own Electric Vehicle at the lowest possible price. Funding for these electric vehicles was made possible by refurbishment of two Corvettes. Profit from the first Corvette funded the second Corvette, profit from the second Corvette funded the first electric vehicle, and the sale of the first electric vehicle funded the second electric vehicle. To read about the Corvette refurbishment, refer to another E-book entitled “How to Own Corvette Inexpensively”.

Any electric vehicle, no matter the age, attracts attention because today everyone is saddled with the need to fill the gas tank of their internal combustion vehicle with fuel. People are looking for a different form of transportation. We are captive to the ever changing fuel price that is constantly moving with time. We also know that some of the money we spend for fuel goes to the very people who desire to put an end to the way of life we have today. In addition, the internal combustion engine’s inefficiently converts most of the energy obtained from gasoline into heat with a byproduct of pollution. So, not only are internal combustion engines inefficient they are a source of much of the air pollution that affects the health of those who live around them.

With this overall philosophy aside, we all want a vehicle that we can be proud to own. We want a vehicle that people will admire and be interested in learning more about. Even if you are not the world’s best mechanic, know nothing about electronics or you don’t have a complete tool set, you can turn an old vehicle into a show room electric vehicle that everyone will admire.

The most important part is to make it look as professional as possible. Attention paid to every detail during the fabrication process is what makes an average vehicle an outstanding electric vehicle.

Whether you want a classy good looking electric vehicle to drive to work every day or a car to drive once a year in a parade, you can do almost everything yourself. Your budget and your expertise will determine how much you want to have done by outside professionals and how much you want to do yourself. The satisfaction that you get from doing it yourself will last you a lifetime.

As you will see, with a little money to start you can work up to an excellent electric vehicle with smart purchases, quality workmanship and good trading.

Unlike most “How-to Do It Books” this book will look at the economics behind rebuilding older vehicles. You will be told how the cost decisions were made, be included in the decision of whether to buy a new part or rebuild the old part. You will see how a small initial expense can be turned into a high quality electric vehicle.

This book is written for two types of potential electric vehicle owners. The owner who wants to review one person’s electric vehicle restoration processes can read the main text and skim over the detailed sections within each chapter and the owner who is going through the process himself and wants to read the detailed explanations.