

## **Executive Summary**

The original goal of this project was to create a conversion kit that would allow owners of the Ford Ranger Electric Vehicle to use off the shelf batteries in the truck instead of the stock battery pack that was provided with the vehicle. This kit would be useful to owners of the Ranger EV because Ford no longer supports the vehicle, and the stock battery pack does not allow the user to replace individual batteries within the pack. The conversion kit is to be designed in order to provide the same performance (voltage, operational time, etc.) as the stock battery pack, fit within the space allocated under the vehicle, and within the team's budget of three thousand dollars.

Several design options for the case have been explored, in an attempt to make the conversion kit as simple and as cost effective as possible. The first attempt involved replacing the stock 8-volt batteries with off the shelf deep cycle batteries; however, this was not a practical solution as there are no commercially available 8-volt batteries that meet the design requirements. The team also determined that it would not be possible to use two 4-volt batteries wired in series to simulate a single 8-volt battery, as this configuration would not provide sufficient amp hours to run the vehicle and would be much larger than the allotted space. The final two possibilities that we considered for repairing the vehicle are to either repair the existing battery pack through BatteryMD, or completely overhaul the stock control system and battery pack. Our short time prevented us from manufacturing a new case or controller, which is what we found to be our best option.