## **Rear Battery Cage**

The rear battery cage was redesigned during the fabricating process. Modifications were made to the cage in order to save material and improve the rigidity of the cage. The cage was redesigned in Pro-Engineering as shown by figures 39 and 40 (bill of materials and individual parts figures are shown in the appendix by figures A4-1 through A4-9). In addition, another stress analysis was conducted using a computer program called Algore to show that the cage is able to hold the weight of the batteries and withstand the force caused by the batteries in case of braking. The analysis was done by applying forces as shown by figure 41, in which a downward force of 462lbf was applied based on the weight of the batteries, and a side force of 618lbf was attained by braking completely at a speed of 70 mph (calculations are shown in the appendix under Algore battery cage calculations). Algore showed that the new design has a maximum stress of 14,537lb/in<sup>2</sup> and a maximum displacement of 0.07 inches as shown by figures 42 and 43. Moreover, comparing the values obtained from Algore for the old and new cage shows that the stress and displacement will decrease by 6808 lb/in<sup>2</sup> and 0.34inches respectively.



Figure 39: Rear battery cage assembly view

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	Part	Exploded View	
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Figure 40: *Rear battery cage Exploded view* 



Figure 41: Forces acting on the battery cage



Figure 42: Stress Analysis using Algore (maximum stress 14,537 lbf/in<sup>2</sup>)



Figure 43: Displacement Analysis using ALGORE (maximum Deflection of 0.07in)