

TEAM#45: Campus CamperVan

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Background/Objective

Design and build a travel van with completely interchangeable and removable interior modules that can suit the van for multiple travel environments

Engineering Specifications

Specification	Value	Results
Modules and Connection System must withstand a Car Accident	35 MPH initial velocity 80G's max deceleration	Withstands 75 G's
Weight <Max Load Capacity	Weight of modules and passengers < 3155 lbf	894 lb max weight
Bed must meet the specifications of a 95 th percentile male	216 lbf 5' 10 height	84" Long > 5'10 Able to sleep 2
Weight distribution must be in accordance with the BEG	4% of the centroid width	1.7% of centroid
Installation Time	Under 5 minutes	3:30 mins max

Safety

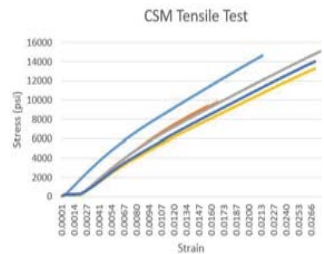
- Safety Codes and Standards
- Contains a smoke and CO detector and fire extinguisher
- Conforms to seatbelt codes

Testing

- Mechanical
 - Tensile Testing of Fiberglass
 - Impact test of Modules
- Electrical Systems
 - Test if A/C successfully maintains 70° for 7 hours
 - Check if batteries are charging correctly
 - Full systems Testing



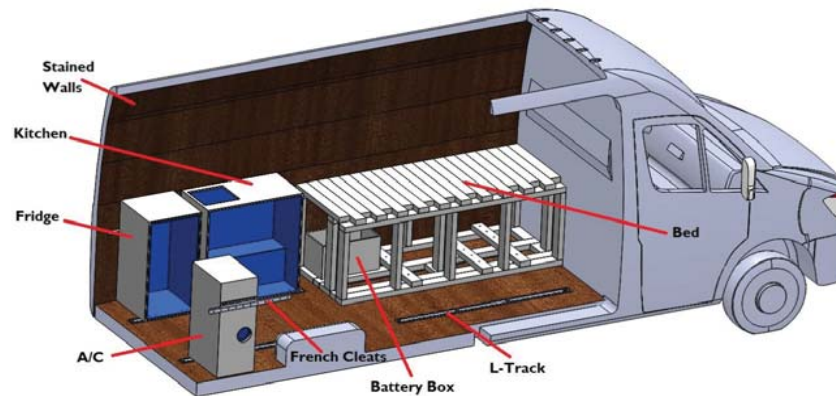
Tensile Coupons



Potential Customers

- Anyone interested in hiking, camping, tailgating, or any other activity that requires a means of travel
- Individuals who travel often for work

Prototype



Expenses

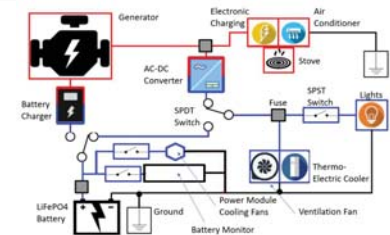
Electrical		Mechanical	
A/C	\$ 274.99	Insulation	\$ 135.16
Battery	\$ 1,469.99	L-Track Bolts	\$ 147.50
Ventilation Fan	\$ 188.08	French Cleats	\$ 171.70
Converter	\$ 34.99	Tensile Test	\$ 30.00
Smoke Detector	\$ 33.84	Bed Frame	\$ 65.00
3 Position Switch	\$ 21.54	Paint	\$ 60.00
Wires	\$ 40.15	Walls	\$ 100.00
Outlets	\$ 17.02	Hitch	\$ 165.00
Thermal Electric Cooler	\$ 80.00	Extra Epoxy	\$ 90.00
Induction Stove Top	\$ 75.00		
Small Batteries	\$ 38.00		
Cords	\$ 18.00		
Fuses	\$ 5.00		
Total	\$ 2,296.60		\$ 964.36
Total Expenses	\$ 3,260.96		



Functional Requirements

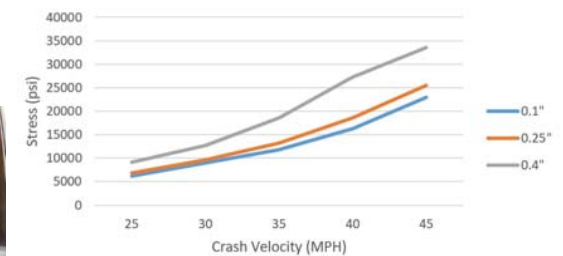
- Components are removable and Mountable
- Multiple Connection Points
- Provide Sleeping/ Living Arrangements
- Provide place to store/ cook food
- Have an electrical system to power all applications

Engineering Analysis



Schematic of electrical components

Refrigerator Housing Stress vs Initial Velocity for Variable Thickness



Conclusion

- The Campus Campervan modular system is designed to house appliances in a way that prevents them from becoming a hazard in the event of a crash.
- Uses interchangeable modules and a connection system that attaches them to the van's interior.
- Gives customers the ability to customize the van with appliances for their specific trip.



Sponsors: Eric Crouch, Jack Rettig, ExxonMobil

Faculty Advisors: Dave Giurintano