To Predict ▶ To Design ▶ To Perform

College of Engineering
Department of Mechanical & Industrial Engineering

ME, ECE, IE Capstone Design Programs

TEAM #4: 1940 PACKARD LIMO REBUILD

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BACKGROUND

- 1940 Packard-Henney Hearse
- Poor initial condition
- Tasked with rebuilding the chassis
  - Frame
  - Suspension
  - Drivetrain

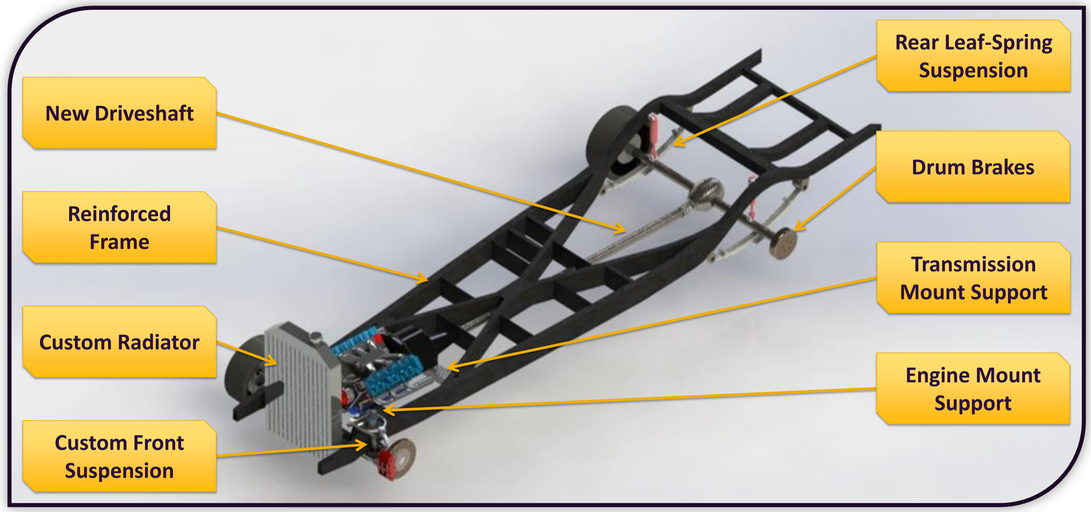


SPECIFICATIONS

- Propulsion of chassis forward and backward.
- Fully functioning braking system.
- Adequate cooling provided for engine.
- Minimum payload capacity of 2400 lb.
- Ground clearance greater than 4 in.
- Comfort level greater than 1 hr.

OBJECTIVE

Provide fully functioning rolling chassis capable of forward and reverse motion under its own power with adequate braking system to fully stop the chassis.



ANALYSIS

- Heat Dissipation of Cooling System
- Engine Mount Stress
- Transmission Brace Stress
- Driveshaft Angle, Twist, and Minimum Diameter
- Braking Distance
- Steering Shaft Torsion
- Front End Component Stresses
- Systems Comfort Analysis on Front Suspension
- Material & Structural Analysis of Frame Members

RESULTS

- Engine provides max 340 HP & 485 ft-lb max torque.
- Front & rear brakes installed and tested.
- Radiator provides 1.37 times necessary cooling.
- Design load equates to stress levels at 40% of yield.
- Final ground clearance 5.25 in.
- Average comfort level measured to be 8+ hrs.

MANUFACTURING

TESTING

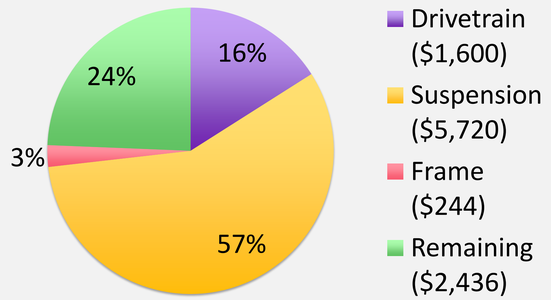
Frame	Drivetrain

• Penetrating Dye Test
• Material Test
  • Carbon Steel
  • σ_u=46 ksi
  • σ_y=33 ksi
• Static Load Deflection Test
	• Engine Testing
	  • Compression Test
	  • Air Intake Test
	  • Fuel Intake Test
	  • Spark Production Test
	• Noise Production Test

Suspension	**System**
• Static Load Test • Dynamic Load Test • Vibration in Operation Test	• Forward Motion • Reverse Motion • Braking Ability • Vibration Dissipation

BUDGET

Total Budget: $10,000



CONCLUSION

The deliverable is a drivable chassis with functioning brakes and steering, adapted to accommodate modern drivetrain & suspension systems.

Project Start: September
Concept Generation: October
Analysis: November
Final Design: December
Manufacturing / Analysis Refinement: January, February, March
Testing: April, May

Sponsors: Kearney Lejeune, Owner, *Kel's Custom Classics, LLC*

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