

ME, ECE, IE Capstone Design Programs



Team 27: SAE Baja

Sponsors: Mr. Jack Rettig, IPS LLC, Feagan Gathering LLC, River City Metal Fabrication, CB Gears, & Just Print It

Objective

Engineer and manufacture a safe off-road vehicle that adheres to the 2017 SAE Baja Rules while earning a top 20 finish in the SAE Baja competition at Gorman, CA.

Design Improvements

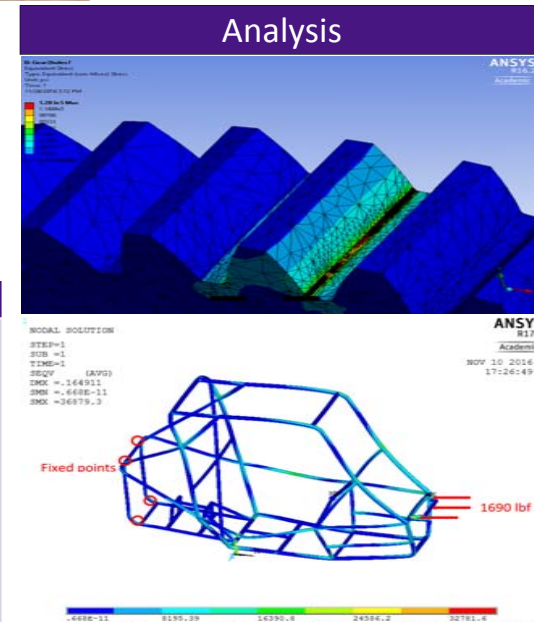
- Reverse Capability
- Improved CV Plunge With Rear Suspension
- New Semi-Trailing Arm Geometry
- Compact & Lightweight Frame
- Lightweight Aluminum For Suspension Components
- New Pro-Ackerman Steering Geometry

Specifications

- Overall Weight: 415 lbs.
- Wheelbase: 60"
- Track Width: 58"
- Ride Height: 15"
- Maximum Speed: 37 MPH
- Engine Displacement: 305 cc
- Gear Reduction Ratio: 6.8
- Maximum Torque: 511 ft-lbs.

Event Scoring

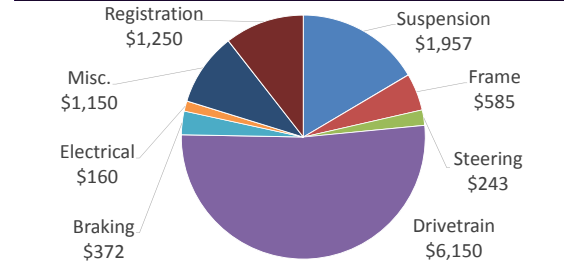
Category	Event	Points Scored	Placement	Overall Placement
Static	Cost Report	of 100		
	Design Report	of 150		
	Presentation	of 50		
Dynamic	Acceleration	of 75		
	Maneuverability	of 75		
	Hill Climb	of 75		
Endurance	Suspension	of 75		
	4 Hour Race	of 400		



Manufacturing

Frame	-In-house manufacturing -Dom steel tubing: 1.25" OD, 0.062" thick
Drivetrain	-Purchasing Engine, CVT, and CV axles -Custom made gearbox by IPS
Suspension	-In-house manufacturing for A-arms and trailing arms -6061 Aluminum -Purchasing shocks
Brakes	-In-house manufacturing for rotors and wheel hubs -Purchasing all other components
Steering	-In-house manufacturing for linkages and supports -Purchasing pinion and steering wheel
Electrical	-Purchasing all components

Budget



Testing

Weld Strength	Suspension
<ul style="list-style-type: none"> 'Y' and 'T' joints will be produced by the team welder and subjected to a strength test given by SAE judges. These specimens must pass the test in order for the frame to be deemed safe. 	<ul style="list-style-type: none"> Vehicle will be dropped from 5 feet off the ground. This will simulate severe landings the vehicle could experience while at competition.
Maneuverability	Acceleration and Braking
<ul style="list-style-type: none"> Vehicle will be driven through a cone course. Driver must be able to weave in between the cones without knocking them over. 	<ul style="list-style-type: none"> The vehicle will be timed on how long it takes to reach maximum speed. The brakes will be engaged at full speed and the stopping distance will be measured.

Members: Jarrett Ealey (IE), Chris Geiger (ME), James Goodrum (ME), Landon Hazel (ME), Jacob Landry (ME), Brian Schilleci (IE), Nathan Sirgo (ME), James Sliger (ME), Brady Sperier (ME), Matthew Theriot (ME), Ryan Toups (ME), Michael Walker (ME)

Advisor: Dr. Glenn Sinclair