BAJA SAE Bandit

UCI RACING 2017

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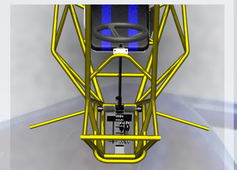
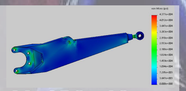
SAMUELI SCHOOL OF ENGINEERING
UNIVERSITY of CALIFORNIA • IRVINE

HUMAN INTERFACE



- ❑ Straight Shaft steering column
- ❑ Ackerman steering for better control and reduced tire slip
- ❑ Bump steer reduced to 0” at steering wheel

REAR SUSPENSION

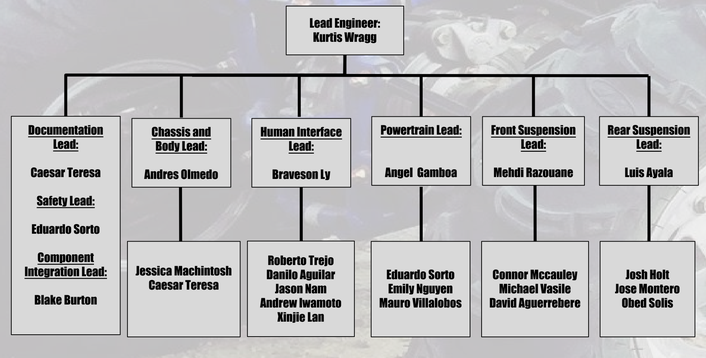


- ❑ Reduced trailing arm weight from 4.8 lbs to 3.8 lbs
- ❑ 1300lb measured shock force used for FEA with an added F.S. of 2
- ❑ Ease of manufacturing due to self-jigging water jet parts
- ❑ Enclose trailing arm structure to prevent mud collection
- ❑ Internal gusseting prevents buckling of side plates
- ❑ Billet aluminum uprights to save on weight, and allow for outboard brake

FRONT SUSPENSION

- ❑ 12” Ride Height with 12” of Travel
- ❑ Reduce scrub radius to <0.5” to reduce loading seen into steering system
- ❑ Bumpsteer at wheel <2 °
- ❑ Improved Upright Design
  - 12 gauge 4130 Alloy Steel
  - Plate triangulation Gusset design
  - Waterjet cut with self jigging properties

ORGANIZATION



Advisors:
Prof. Michael McCarthy, Robert “Smitty” Smith, Phil Chipman

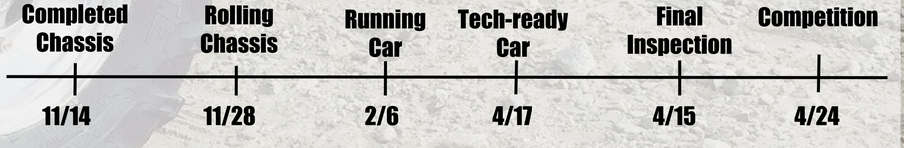
GOAL - Top 20

The 2016 vehicle was evaluated based on its placing at competition events and the data collected during testing. The key characteristics necessary to place among the top 20 teams were identified and resulted in the following design criteria for BANDIT for 2017.

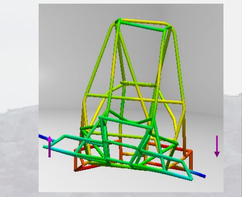
Requirements:

- ❑ Reduce weight (Target: 430lbs → 375lbs)
- ❑ Reduce wheel base (Target: 66” → 60”)
- ❑ Change suspension characteristics (Reduce bump steer and ackerman steering)
- ❑ Increase top speed (Target: 28mph → 32mph)

TIMELINE

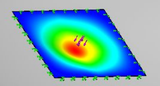


CHASSIS



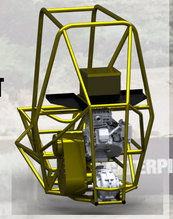
- ❑ Reduced weight by 15lbs compared to 2016
- ❑ Shortened Chassis length by 8”
- ❑ Maintained Driver Comfort
- ❑ Increased Torsional Rigidity by 350 ft lbs/degree

BODY

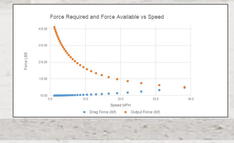


- ❑ Improved Belly Pan
  - 24 gauge 4130 Alloy Steel
    - Withstands three times the load without puncture

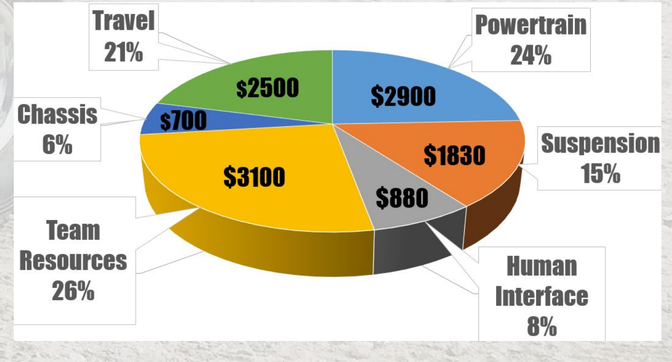
Powertrain



- ❑ Removable fuel tank saves time while refueling
- ❑ Dyno setup allows for testing which maximizes CVT efficiency and increases top speed (>30mph)
- ❑ Reinforced engine mount
- ❑ Stacked Engine configuration allows for reduced wheelbase



BUDGET



2016-17 Car Budget = $9500
Est. Travel Costs = $2500
Total = $12,000