



University  
of Idaho



**IDAHO**  
CSC



## CSC REAR DRIVE

### TEAM SKIDADDLE :

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# VALUE PROPOSITION


Modern Snowmobiles have a track which is turned/driven with cog-drivers in the front. This pushes the track, which being a flexible element, bunches up. This leads to both drivetrain and handling inefficiency. A solution is to pull the track, by having the drivers in the rear. Currently, there are no rear driven snowmobiles on the market as an OEM or Aftermarket platform.


At the SAE Clean Snowmobile Challenge (CSC) which the U of I CSC Team competes in every year, technical innovation is highly valued. The Team

To meet both these challenges, the goal is to develop a rear driven snowmobile system that will be able to directly generate data to compare rear-driven and traditional drive technologies. Our team is proposing a swappable front to rear drive system for this year's CSC team and snowmobile. Our design seeks to have similar suspension design and performance, while being easy to swap with the stock configuration.

In Short:

- The value to industry will be data showing the validity of rear drive vs. forward drive
- The value to the UICSC team will be an innovative project to bring to the 2020 CSC





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# PRODUCT REQUIREMENTS



## A Brief Selection From The Product Requirements Document

- The braking system must have comparable performance to stock, and the suspension must have similar performance and geometry to stock
- The drive belts are capable of transmitting 1000 lbf of tension
- The design shall be able to transfer a torque of at least 150 ft-lbs from the chain case to the rear drivers
- The total system shall weigh no more than 35 lbs. more than the stock skid



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# FULL ASSEMBLY



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# DESIGN: MAJOR SUBASSEMBLIES

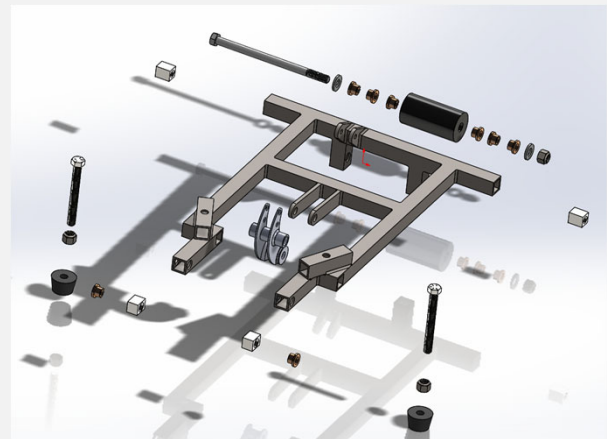
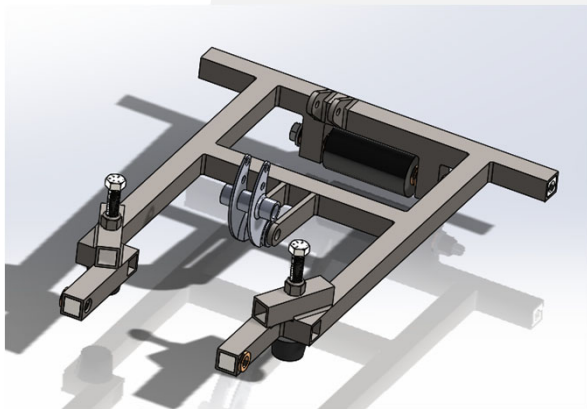


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# FORWARD SUSPENSION

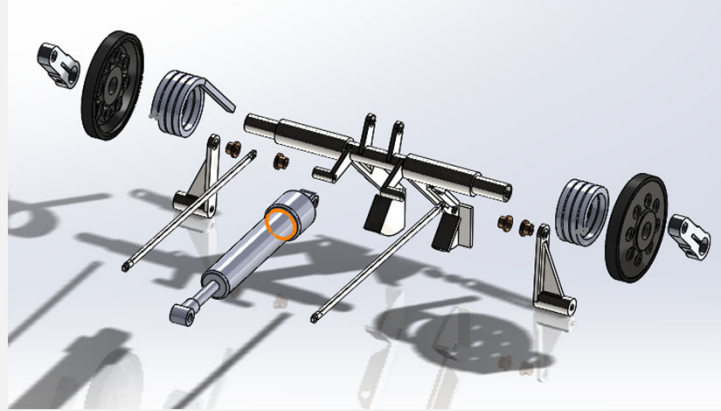
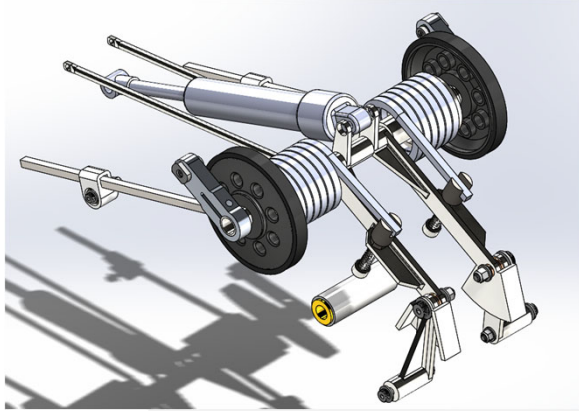


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# REAR SUSPENSION

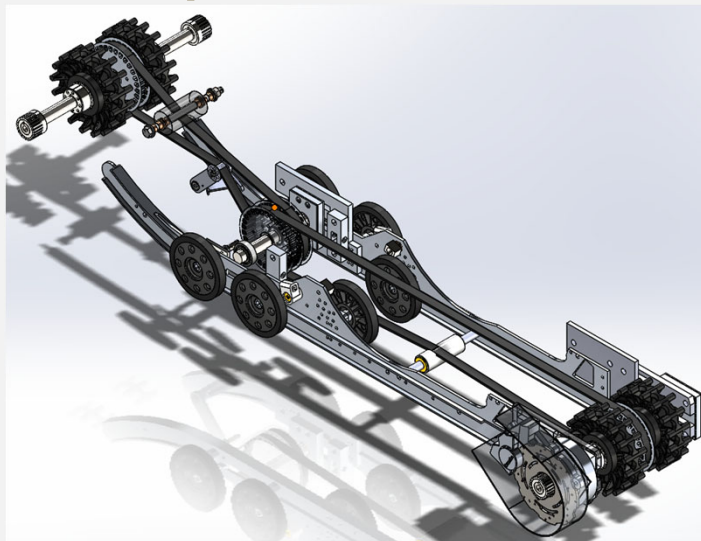


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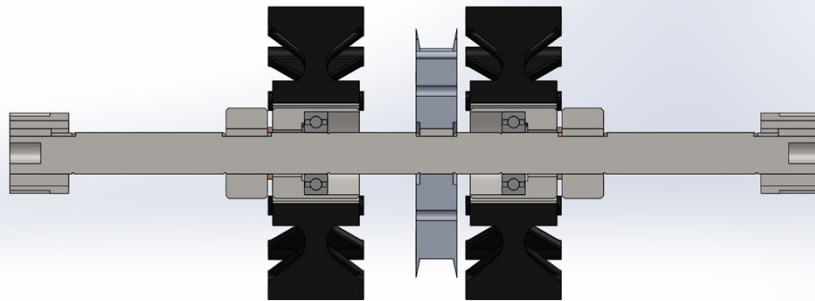
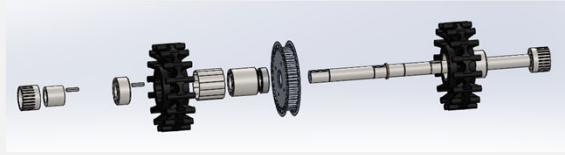
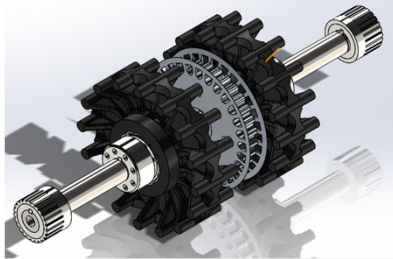
# POWERTRAIN/BELTS



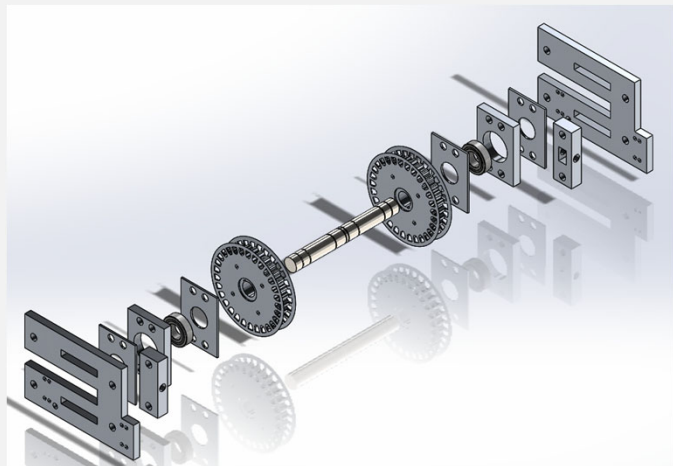
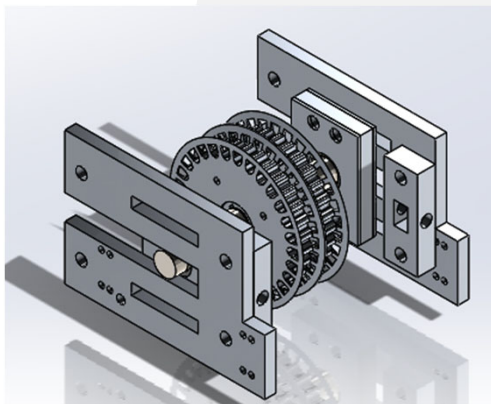
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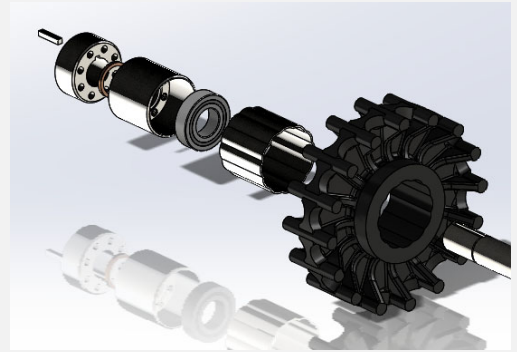
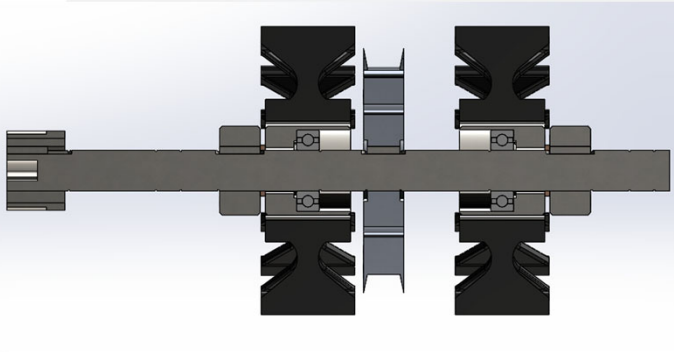
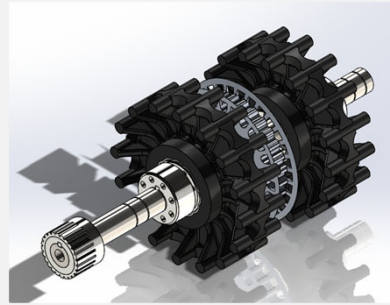
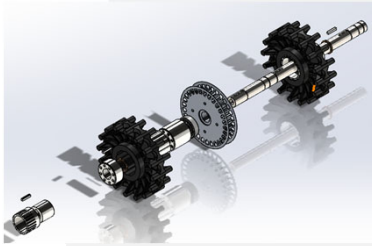
# FORWARD AXLE



# INTERMEDIATE AXLE

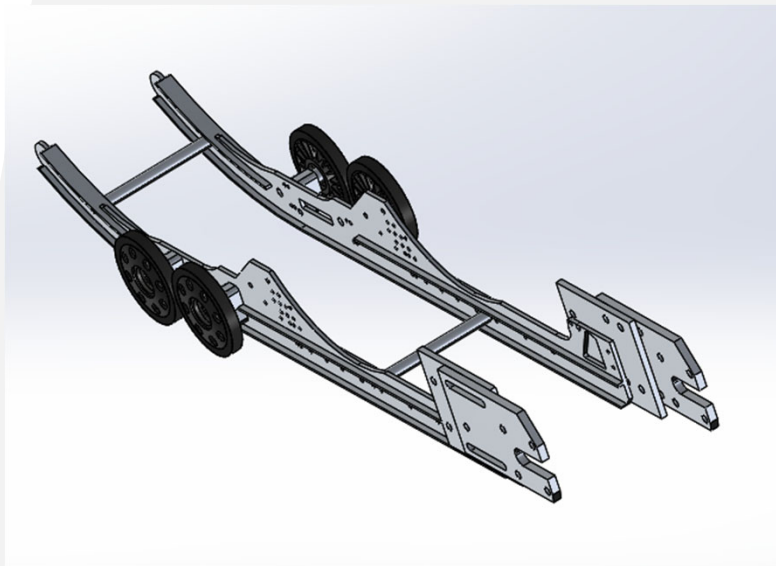


# REAR AXLE



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# RUNNERS/MOUNTS



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# BILL OF MATERIALS



- Belts
  - gates-14mgt-2380-20-belt
  - gates-14mgt-1400-20-belt
- Plate Aluminum
  - Varying thicknesses, and sizes.
- Plate Steel
  - ¼" thickness, 2 sq. ft.
- Square Tubing
  - 1"x1"x80"
- Round Stock
  - 4' of 4140 1" Ground Stock
  - Delrin- Various
  - Aluminum - Various



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# MANUFACTURING



- Materials
  - Bayshore materials
  - Tube steel acquired from Facilities
  - BRP/Valley Power Sports – Silent Drivers, Skid Runners
- Services
  - Ag. Sci. Plasma cutter
  - Painting/Coating
- ME Machine Shop Services
  - Welding
  - Machining



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# VALIDATION



- Data to Collect
  - Suspension compression (3+ in.)
  - Weight
  - Roll down test
  - Acceleration test
  - Braking test
  - Endurance runs
  - Fuel Economy tests



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# PROJECT MANAGEMENT



- Gantt Chart
  - Design Freeze – 01/06/2020
  - Manufacturing Freeze – 01/20/2020
  - Competition – Week of 03/09/2020
- Budget
  - U & I Give Foundation – raised \$1800+
  - UICSC Team Contribution - \$1000
- Major Costs
 

▪ Runner(s)	\$500
▪ Silent Drivers	\$800
▪ Belts -	\$400
▪ Pulleys -	\$160



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# RISK MANAGEMENT



## ■ Project Risks

- Manufacturing
  - Fabrication
  - Delay of Deliverable Risk
- Testing
  - Rider Risk
  - Vehicle Damage Risk
- Competition
  - Rider Risk
  - Vehicle Damage Risk

## ■ Mitigation

- Risk Waivers
- Training

