Many SAE Baja Team’s need a better functioning transmission. Different options were researched to find one to be work with the continuously variable transmission (CVT) that will be new to this year’s car, lighter in weight and sustainable. The methods used to reach these criteria; was finding the gear ratio (Reduction ratio), torque for the wheels, the specification sheet for the gear sets as well as failure analysis. Our calculated reduction ratio is 6.63 which will allow the engine power to be used efficiently to maximize the speed of the Baja car. The torque of the wheels found was 249.18 ft-lb. The torque is the turning power of the car and determines how quickly a speed can be reached. We are also working with a gear ratio of 6.63:1. From this data this transmission can work with CVT Gaged (GX9): and can work at a smaller size and less weight from the current working model.

To find the final reduction ratio for CVT Gaged (GX9):

Reduction Ratio (R_A) = \( \frac{\text{RPM engine} \times \text{Cwheel}}{2.167 \times \text{V Vehicle}} \)

Where:

- RPM engine = 3800 rpm using Briggs & Stratton Engine
- Cwheel = \( \pi \times \text{diameter of wheel} \)
- V Vehicle = The required speed for the Baja Vehicle = 42 mph

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R_A = \frac{3800 \times \pi \times 22 \times 1 \text{ ft} \times 1 \text{ mile} \times 60 \text{ min}}{0.9 \times 42 \text{ mph} \times 12 \text{ in} \times 5280 \text{ ft} \times 1 \text{ h}} = 6.63 
\]

Theoretical (SolidWorks Model)

Prototype

Physical

3D Printed

Theoretical (SolidWorks Model)

Make BAJA team competitive