Abstract and Objectives

With rising fuel prices comes a demand for an increase in vehicular fuel efficiency. The Shell Eco-Marathon competition gathers teams from all around North America to race concept vehicles in a competition for the highest fuel efficiency. The UCSB Supermileage Team set the goal to successfully replace the 2-stroke engine with a 4-stroke engine and integrate it into the vehicle’s existing drivetrain.

- Successfully integrate the new 35cc motor into the existing chassis and drivetrain
- Fabricate a bearing support system to reduce the stresses on the internal engine bearings
- Compete in Houston, TX at the Shell Americas Eco-Marathon event
- Record an official fuel consumption rate

Why the Smaller Engine?

- Increase efficiency by utilizing lower engine displacement
- Decrease weight
- Less complicated operation, therefore increased durability and reliability

Background

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Analysis

Prior to fabrication, the components were analyzed using FEA to determine the deflection and stresses at key locations due to the belt tension and CVT weight.

Conclusion

The 2012 UCSB Supermileage Team successfully achieved the set goal of creating a vehicle which would compete in the Eco-Marathon competition. The design proved to be simple and robust, for the UCSB team was one of few to pass inspection and run full ten laps on the first attempt.

Future Design Considerations

- Replace pull start with an electric start
- Adjust fuel flow with implementation of EFI system
- Reduce weight by maximizing part design

By increasing engine component efficiencies and reducing overall weight this vehicle will compete at a higher level in future competitions

Acknowledgments and References

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