4-18-2012

Novel Concepts for Spring-Based Mechanical Energy Storage in Motor Vehicles

Jonathan W. Lauden
University of Dayton, stander@udayton.edu

Follow this and additional works at: http://ecommons.udayton.edu/stander_posters

Recommended Citation
http://ecommons.udayton.edu/stander_posters/104

This Book is brought to you for free and open access by the Stander Symposium at eCommons. It has been accepted for inclusion in Stander Symposium Posters by an authorized administrator of eCommons. For more information, please contact fricel@udayton.edu, mschlangen1@udayton.edu.
Development of Novel Spring-Based Energy Storage Systems for Motor Vehicle Applications

Jon Lauden
Advisors: Drew Murray, Ph.D
Dave Myszka, Ph.D

**Objective:** To improve efficiency and environmental safety of motor vehicles by utilizing springs in mechanical energy storage systems, such as hybrid drivetrains and engine starters.

**Introduction/Motivation**
- Inherent disadvantages of electrical energy storage systems: hazardous, inefficient
- Gas-electric hybrid systems are costly: limited use in developing countries

**Methodology**
- Review of available spring materials
- Tensile testing to examine the energy storage potential of material samples
- Mechanical starter and hybrid drivetrain concepts developed
- Proof-of-concept prototypes built and tested

**Conclusions**
- Natural rubber material samples showed the greatest energy storage potential of those tested
- Transmission refinement needed for hybrid system
- Mechanical starter is most promising concept due to ease of potential integration with current vehicles
- Research is ongoing

**Future Direction**
- Refinement of hybrid drivetrain concept including transmission development
- Motorcycle will be purchased
- Starter prototype will be adapted to meet size and power requirements of motorcycle engine