

REV Newsletter



SEMESTER UPDATES

To start off the new year, REV is looking to bolster team membership. This semester there are plans for targeted recruitment, in order to expand all three subsystems, and bring new ideas into the club. With the help of professors, we will be able to recruit directly from the classroom environment. Additionally, there are plans for an increased number of team and celebratory events to motivate the team as we begin the first stages of our newest design phase.

Another objective of this semester is to further improve our MAPS project management system. Feedback from our advisors has led us to begin modifying documentation to encourage tables and bulleted lists rather than long paragraphs. This is to increase readability, and ensure as much information as possible is retained by the reader.

Our goal is start off this semester strong, and make REV great again!

SHELL ECO-MARATHON UPDATES

Last spring, much to the dismay of the team, we were unable to attend the 2016 Shell Eco-marathon. As we were leaving for spring break, final preparations were being made to ensure a running car before the competition. Throughout the semester, the motor controller proved to be the limiting factor, and on one fateful afternoon, it was the straw that broke the camel's back. As a team it was decided that going to shell with a broken car and little chance of getting it working was a waste of money, and not in our best interests. As a result to backing out of the Eco marathon late in the process, we were blacklisted from the event for a year. We have kept up contact with Shell, and as of now plan on attending their competition in the spring of 2018.

On a brighter note, REV will be attending Electrathon America's Electrathon in the spring. Instead of racing purely for efficiency the goal is to drive the furthest distance possible on one battery charge in an hour. Based on previous competition results, we expect to perform well. Although we do not hope to make this competition a regular event, it is a low cost, and manageable short term replacement for the Shell Eco-marathon.

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SPECIAL POINTS OF INTEREST

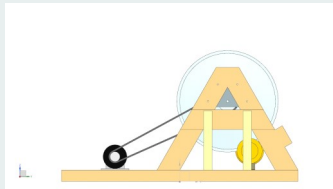
- Preliminary new car design, and planning for the upcoming semester is underway
- Targeted recruitment to rebuild team



End of Semester team dinner

“Burning oil (which is quite precious) is like taking furniture from your house and setting it on fire for heat.”
-Elon Musk

INSIDE STORY HEADLINE



DRIVETRAIN UPDATES

Over the past semester the Drivetrain subsystem has been upgrading many of Testa’s older, worn components. After reinstalling the drivetrain, it was found that the brakes needed to be recalibrated. The rear brake cable housing had deteriorated, and is currently being replaced. Both nylon bushings in the steering system have worn down as well, and one has cracked. New nylon 6/6 stock is being acquired to machine new bushings.

The Drivetrain system has also been working on creating a test stand for Testa. Currently, it is impossible to secure an outdoor testing location for our car. The purpose of the test stand is to allow us to safely test the motor, motor controller, and battery inside, within a controlled environment. Additionally, this mini-project has been set-up as a learning process, spending many meetings outlining our needs and requirements for the test stand, the specifications, and every possible solution, before the final concept selection. Ultimately, it was decided to use a bike rim brake with a flywheel, to allow us precise adjustment of the applied load, while keeping the cost low, and design from being unnecessarily complicated.



Chassis after welding

BODY/CHASSIS UPDATES

The Body-Chassis System undertook a mini-project designed to last a single semester and teach the Engineering Design Process to new members before beginning design work on REV's next car. A ladder was chosen as many elements can be analyzed and designed using the same techniques as a traditional vehicle chassis. The project allowed body chassis to incorporate constraints set by customers- in this case, the RPI safety department, OSHA, and "outside stakeholders", giving all members, new and old, the opportunity to refine their ability to formulate engineering problems and systematically create and evaluate solutions.

Work has also been undertaken in order to make the Testa 3.0 Vehicle compliant with Electrathon America's rules. In preparation for the April 2017 competition, new aluminum chassis supports have been manufactured and welded into the existing chassis. New mounts and latches to properly secure the upper and lower body segments have been installed as improvements to old methods of attachment. Additionally, improvements to the seatbelts and driver seat are also underway and scheduled to be installed by the end of the semester.

Team members have started to identify customer needs for REV's next car. These needs are compiled internally from members and externally from sources such as the Electrathon and Shell Eco-Marathon rulebooks.





ELECTRONICS UPDATE

The electronics system has been hard at work fitting Testa 3.0 to run smoothly & efficiently. A new lead-acid battery was purchased to replace the previous LiFePO₄ battery used last year. This was required due to a recurring issue with the previous battery management system (BMS). This new battery has a more stable chemistry, allowing the cells to be charged independently without the use of a BMS, solving our problem.

Due to complications, a prebuilt Alltrax motor controller from a previous car iteration is currently in use, while the electronics system begins work on designing a new motor controller for the 2017 two-year prototype car. With the Alltrax motor, electronics has been able to wire the car for in-house testing, and get Testa 3.0 ready to run from an electronics standpoint.

Moving forward the electronics system are looking to begin design work on a new motor controller. They hope to utilize past documentation and outside sources to broaden the team's knowledge base. There are also plans to build a smaller prototype circuit in order to test designs with a less stressful load. These lower-cost designs can then be scaled up to the higher load found in the new car. The electronics team is looking forward to making progress and passing on our gathered knowledge to the future generations of the Rensselaer Electric vehicle team.

Rensselaer Electric Vehicle

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Useful Links:

Shell Eco Marathon:

<http://www.shell.com/global/environment-society/ecomarathon/events/americas.html>

Electrathon Americas:

http://www.electrathonamerica.org/Welcome_to_Electrathon_America.html

REV Promotional Video!

<https://youtu.be/-eSsRq2CbJk>

Rensselaer Electric Vehicle is an RPI student organization that works together to design, build, optimize, and compete electric vehicles. Our mission is to educate our members on the principles of the engineering design process and professional development through hands on experience and involvement. Drawing from our diverse talents, skill levels, and majors, we aim to create the most efficient vehicle possible.

All students are welcome to join at any time. Shoot us an email and check out our website, <http://rev.union.rpi.edu>, for more information!

