

Senior Design Project Description for FALL 2016

Project Title: Air Powered Charger (RTE_CHARGE)

Supporter: Power R Thomas Engineering

Supporter Technical Representative: ASSIGNED

Faculty Mentor: _____ ASSIGNED TBD (check one)

Single Team Dual Team _____ (check one)

Personnel (EN/ET): 1 E, 1 Cp, _____ Cv, 3 M, _____ SE

(Complete if the number of students required is known)

Expected person-hours: (250 per student)

Description of Project:

The BNC Charger design is based upon the idea of using a renewable and no cost energy source to produce a constant and sustainable electrical energy output supply. For this project the source is air, which is readily available and easily replenished at no operational cost and relatively minimal equipment cost. When a vehicle drives over an air filled tube in a Peristaltic manner the compressed air becomes an energy source. This energy source can be used to generate electricity and charge an energy storage device.

Initial Project Requirements (e.g. weight, size, etc.):

The project will include the following components:

1. Air input system – consists of the input hose where the point-pressure input is converted to a lower volume/higher pressure output and sent to the air tank
2. Air storage and regulation system – consists of the pressurized air tank where the airbursts from the input system are accepted and a constant output sent to the pneumatic motor
3. Air-to-Electric converter system – consists of the pneumatic motor and alternator where the constant air input is converted to a mechanical torque to drive the electric alternator. The alternator then delivers a steady DC voltage to the output system
4. Electrical output system – consists of the inverter and load where the electrical energy will be to charge a battery system.

To increase the system efficiency it can be coupled with other uses such as a speed bump or rumble strips.

Expected Deliverables/Results:

The deliverables will include the design and calculations necessary to fabricate a proof of concept for the system. The system is to be thoroughly tested. Based on the results of the testing recommendations are to be provided to enhance the design.

List here any specific skills or knowledge needed or suggested (If none please state none):

None