Hydrogen Gas Generator

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What is a Hydrogen Gas Generator?
- Uses electrolysis to break down H₂O into H₂ gas and O₂ gas.
- Electrolysis is the break down of a chemical compound by running current through it
  \[ 2\text{H}_2\text{O} (l) \rightarrow 2\text{H}_2 (g) + \text{O}_2 (g) + 4e^- ; \; E = -1.229 \; \text{V} \]
- Has one positive and one negative electrode.
- Each electrode is connected to a series of plates to maximize the area on which our reaction occurs.

Why use a Hydrogen Gas Generator?
- It is a relatively low cost device.
- It can increase the efficiency of the internal combustion engine.
- It can implemented on already existing applications.
- It can be a “bridge” technology between current technology and the next generation technology.
Methodology

➢ Do extensive research on existing Hydrogen applications as well as the safety concerns associated with Hydrogen.
➢ Design multiple types of plate arrangements
➢ Test plate arrangements and choose final plate arrangement
➢ Test final arrangement on an engine to determine the effects of running with a Hydrogen Gas Generator.
➢ Compare the output of our system to that of a known system (wind turbine).

Circle Plates
➢ Has the most surface area of any design.
➢ Must be sure the positive plates do not touch the negative pole and vice versa.

Semi-Circle Plates
➢ Has less surface area.
➢ Easier to implement because each set of plates would be positive or negative.

Rectangle Plates
➢ Most difficult to implement because of our canister design.

Challenges in Testing
➢ Sealing containers
➢ Cost of stainless steel
➢ Safely harvesting the Hydrogen/Oxygen mixture

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Final Design
- 4” clear PVC canister
- Stainless Steel Plates
- ½” bolts for the electrodes

Expected Results
- By how much will the efficiency of the engine increase?
- Will this justify the power requirement of the Hydrogen Gas Generator?
- How much will the operating temperature of the engine increase?
- Final Testing is still to be done.

Future uses:
- Photovoltaic cells on a house
- Hydrogen used in a Combustible engine
  Ex: Lawnmower
- Solar electrical Energy to a battery
- Electrical energy converted Into Chemical energy via Electrolysis