Motorcycle-Powered Generator

Mockup Review

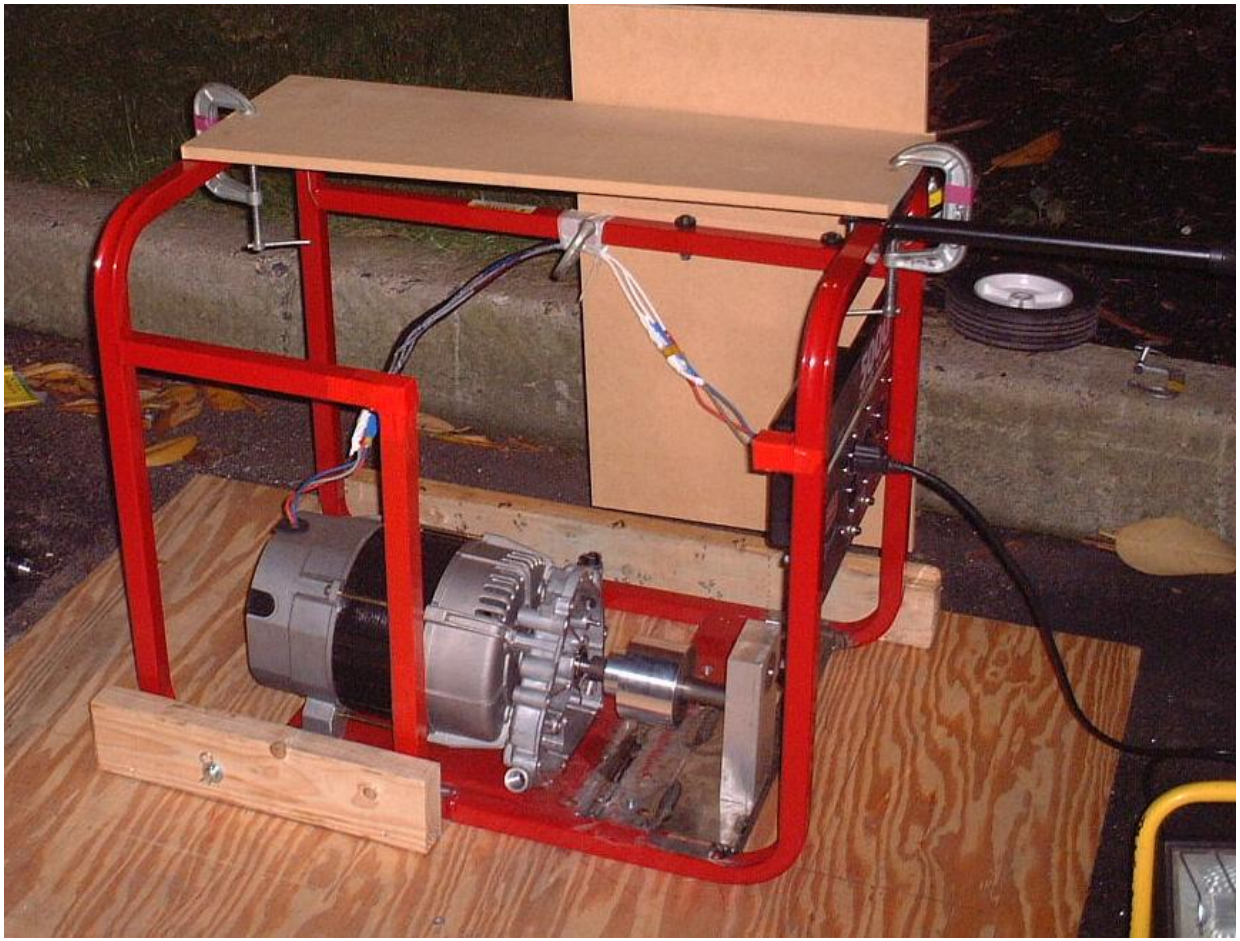
Yellow Team Section B

Key Challenges

We needed to:

- Better understand
  - Connection between the bike and generator
  - Factors affecting generator output (motorcycle specs, friction)
  - Forces applied to wheel and stability of set up
- Asses safety concerns
  - Bike must remain secure in fixture
  - Engine must not overheat or burn users
- Identify market and contact customers

Mockup Model



Analysis

Desired Output from generator: 500W
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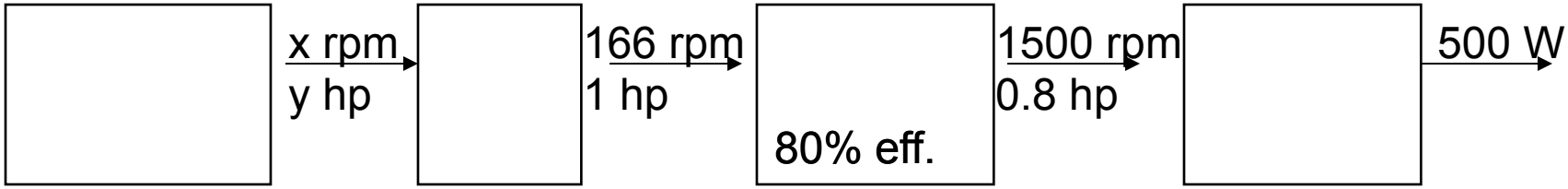
Existing diesel generator in India: 50 Hz, 500W output at 1500 rpm; $.10/kWh



Motorcycle	Dia. (m)	Rpm	km/L of gas	hrs @ 500W/L	kWh/L	$/kWh
TVS Scooty	.254	166	50	6.3	3.2	0.24
Bajaj Sprit	.254	166	45	5.7	2.8	0.26
Kinetic Zing	.254	166	60	7.6	3.8	0.20

Safety

- **Cooling the engine:**
  - **Cooling the engine:**
    - Alternate cooling methods are internal, require modification of engine e.g. liquid cooling
    - Most feasible external solution
      - external cooling fans (forced convection)
      - 400ft/min (2.2m/s) effective wind speed for 166rpm
      - (2%-5% of output)
  - **Stability:**
    - Should withstand customer leaning, extraneous forces
      - Generator mounted to stable surface (plywood board on mockup)
      - Motorcycle on stand (center-stand on mockup)

Market Details

electricity that own a 2 wheeled vehicle

- 60,180,685 rural households have part-time or unreliable electricity connections
- Similar conditions for millions of households and shops in small cities (2001 census)

- Generating capacity cannot keep up with increasing consumer demand
  - More power shortages and a growing need for on-site generation

- **9,222,638** rural households own a two-wheeled vehicle (scooter, motorbike)

small appliances, reducing use of hazardous biofuels and improving quality of life

Next Steps

- Implement any necessary cooling, safety steps
- Obtain direct customer, distribution companies
- Optimize design to reduce costs

Conclusion

- Identified various interface designs and

contributions to power output

  - Identified strong market, current scooters fit

requirements to generate power