



**CALIFORNIA STATE SCIENCE FAIR
2013 PROJECT SUMMARY**

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| Name(s) Ernesto R. Soto, Jr. | Project Number S0324 |
| Project Title A Quantitative Analysis of Venturi Effect to Fabricate a Novel Prototype to Maximize Air-Intake on a Naturally Aspirated | |
| <p style="text-align: center;">Abstract</p> <p>Objectives/Goals Our objective was to create an apparatus that would successfully increase the intake of air, while decreasing backpressure after it passes through a velocity stack and carburetor essentially increasing the potential horsepower.</p> <p>Methods/Materials We constructed a controlled experiment in a controlled environment to determine how we could improve the air intake of a velocity stack and carburetor after each variable change we would repeat the experiment three times each.</p> <p>Results 1. When the air passed through the velocity stack and carburetor without the shroud roughly 30% of air intake was lost. In actuality, we found that in front of the velocity stack the air intake speed peaked at 19.7 m/s, which converts to 44.06 miles per hour. While behind the carburetor it reduced to (average of peak speeds) approximately 13.33 m/s or 29.82 mph, consequently resulted in a 32.31 percent drop in air intake speed. 2. Adding the shroud increased the air intake speed to an average of 13.36 m/s, which is a slight margin (an increase of .08 miles per hour) of change. 3. After rotating the shroud 45 degrees the air intake speed reduction was to a lesser extent and actually increased the air intake speed to 14.23 m/s or 31.83 mph. Which turns out to be a 2.01 mph boost in air intake speed.</p> <p>Conclusions/Discussion Our conclusion is that the shroud successfully created backpressure resistance outside the velocity stack and increased the intake by 2.01 mph when rotated 45 degrees. This is an important discovery because, although a 2 mph increase does not seem significant, it can translate to a substantial increase in rear wheel horsepower.</p> | |
| Summary Statement The central focus of my project was to increase the air intake of a 4-stroke internal combustion engine that has a ram-air intake system. | |
| Help Received Jacob Bagnell, Jim Snyder and Elizabeth Gonzalez provided the materials, time, space, and guidance | |