

Summer Internship Report 2017

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Atlanta Custom Creations
Atlanta, Georgia

Provide an overview of the organization/research project and a summary of your responsibilities, tasks, and/or projects.

I shadowed and worked with many of the mechanics at a Toyota Land Cruiser specialty garage that did mostly custom work for off-roading and restorations for older vehicles. Brian, the owner, did not hesitate to put me to work even though I did not have much experience working on cars. One of my first tasks was to remove the window from an 80 Series Land Cruiser and put it into the shops project 80 Series Land Cruiser, which entailed removing the door card, removing and disassembling the window mechanism and putting everything back together. A few days later I pulled apart both the front and rear axles and as someone dreaming to be an automotive engineer this really gave me some insight at how much engineering goes into making a car, especially a vehicle engineered to the standards of the Land Cruiser. I also pulled out the front and rear differential, getting more hands on experience with many of the key mechanical components of a car. I continued to take things apart by myself and help the mechanics install new parts, mainly suspension components. One technical task that I completed was measuring and correcting the pinion angles of the rear driveshaft connected with the pinion flange on the transfer case and rear differential, making them the same by adjusting the rear lower control arms. Overall I was able to observe many of the automotive engineering techniques by taking apart components and seeing how the components have evolved over time, particularly from the 1970s to current day vehicles.

During your internship, what did you accomplish or how did you make a difference? In what ways did you grow in your professional and technical skills?

I had numerous accomplishments such as tearing apart both the front and rear axle of a vehicle, taking out the front and rear differentials of a vehicle, installing a number of suspension components and learning how to use a number of shop tools like a sandblaster, welder, press, body saw, and many more. I also learned how to weld and created a cool art piece for practice using a differential, two bearings, and a component from a drum brake. Overall I mostly took components off vehicles, prepped parts to be powder coated, cleaned parts, and assisted the techs with installing new parts. My knowledge of how cars work was vastly improved as well as learning what it is like to work nine hours a day five days a week. The experience I gained working with basic shop tools has given me confidence and a good foundation that will carry over into the engineering shop classes and Formula SAE.

Describe a problem that you helped to solve at your internship. What skills or knowledge from your education at Sewanee helped you address the problem?

I was able to acknowledge a rattle in the exhaust piping of a vehicle and stop the rattle by putting in new exhaust hangers along with chopping off around a fifth of the exhaust itself. You could say my problem solving abilities from physics and computer science at Sewanee helped, but my knowledge from Sewanee really helped me understand why the engineers designed components a certain way and understand how the car worked. Thermodynamics from physics helped me understand how an engine works and my knowledge from physics, specifically electricity and magnetism, proved helpful when learning about cars electrical systems, consisting of the battery, copper wires, fuses, the alternator and other components. I could also see fluid dynamics at work with many of the coolant hoses, brake lines, and hydraulic power steering lines.

In what way were your teamwork skills strengthened?

My teamwork skills were improved almost each day considering that I helped the techs with most of their work. One example was bleeding the brakes, which consisted of me modulating the brake pedal in different ways while the tech adjusted the brakes. We had to communicate what position the pedal was in and how the pedal feel was. This particular task helped me improve my patience as it was repetitive and took a long time.

How did your internship affect your career plans?

This internship made me realize how much effort it takes to run a small business. The owner and his wife both were at the shop everyday and constantly communicating with customers and other businesses. It also made me realize how useful an engineering background would be in running an automotive shop of any kind. Being able to creatively use my physics and engineering knowledge to build cars in a hands on manner would be much more ideal than sitting at a desk in an engineering firm, designing parts on a computer. My dream would be to open a full service shop that builds street and race cars, but also engineers high quality parts for different vehicle platforms. Working at ACC has taken me one step closer to my goal and the owner has already put me in contact with another shop that works on Porsches and Ferraris.