



CAPSTONE PROJECT

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The Start

- Four our capstone project our teacher gave us some independence. He said do what you would like to do. Me and Evan thought long and hard and we decided we wanted to take apart a lawnmower and put it back together. Sounds easy right? Wrong! It is quite difficult when you are two high school students learning as they went along. Here is our project, see if we succeeded in our challenge.

Understand

- To understand the lawnmower we researched how it worked. We tried to understand how it really cut grass. We followed a program given to us that was designed by Briggs and Stratton. It showed us how to take things apart and helped us understand the basics of lawnmower engine technology. We are now fairly confident in our engine technician abilities.

Explore

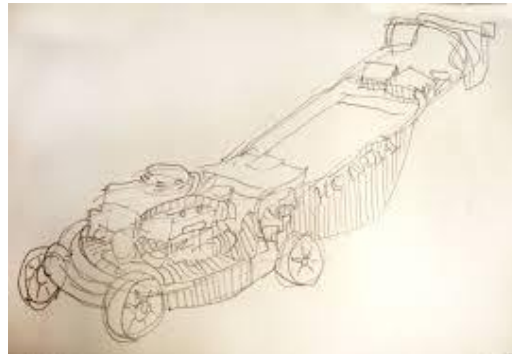
- We explored the world of lawnmower technology. We researched the different types of lawnmowers, and found out which model we had. We explored our lawnmower specifically. We took it apart, we explored and strengthened our knowledge.

Define

- We took apart our lawnmower according to our teachers requirements. We took it apart until he said we could try to put it back together. We had to remember which screw was for what and where everything went. The difficult part was that for some reason, whoever was designing it, chose to use as many different sized screws as possible. So that we had to use an array of sizes of wrenches. In the end we did everything we had to do.

Ideate

- We sketched the lawnmower a few times. We tried to be creative, however Evan and I aren't the most creative people out there. We are very flamboyant and some may say free spirits, but we are not creative. We kept a little journal, planning out what we had to do. We kept most of the screws in baggies.



Prototype/Test

- The test we did was starting it after putting it together. The ultimate test was if it started or not. Luckily we passed the ultimate test! The first pull it started right up! We were ecstatic. We were happily pleased with our abilities, as were our classmates. They were all positive that our lawnmower would not start, we proved them wrong! Our teacher was also surprised, I think he doubted our abilities, but the ultimate test showed everyone that we had done the impossible.

When it began

- We started with a 2009 Lawnboy standard lawnmower. It is a one cylinder engine with self propelled. At the time, the lawnmower was barely starting and the self propelled was broken. The engine misfired a lot and the wheels were very unstable.



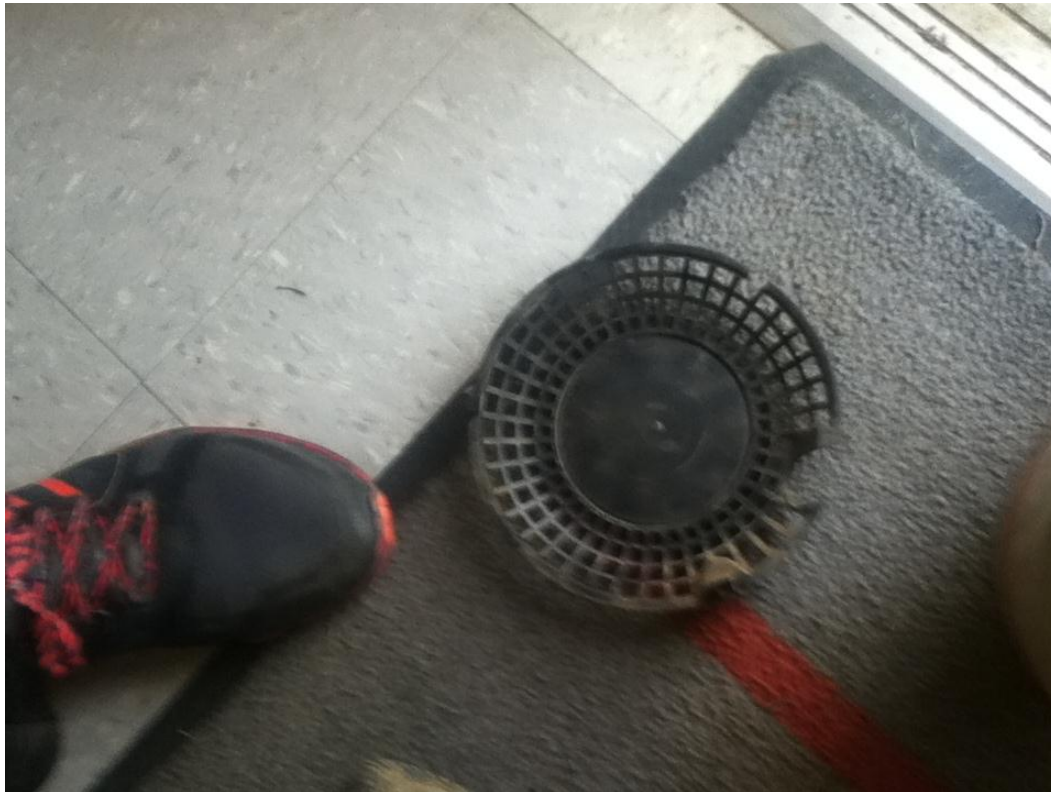
First

- The very first thing we did was to take off the handle. We took off the throttle connector and the whole handle assembly.



Second

- The second thing we did was take off the cover to the flywheel assembly and the pull cord.

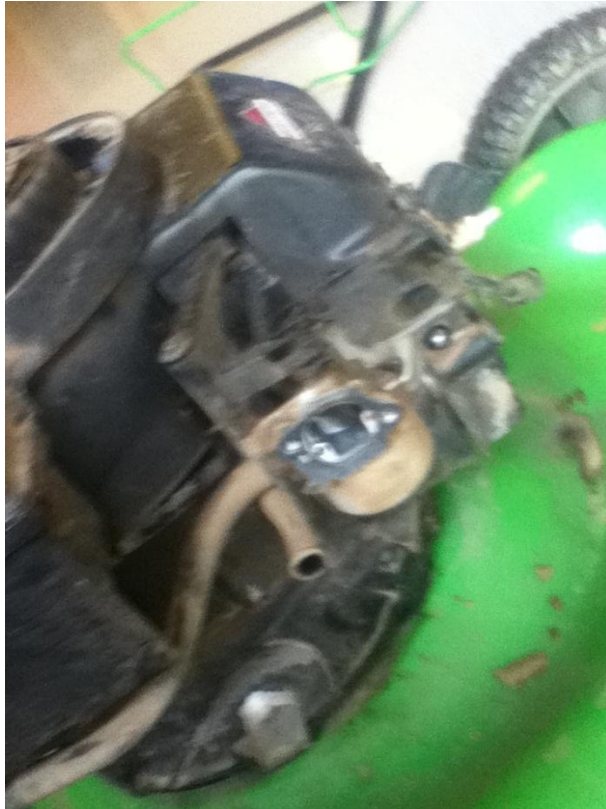


Thirdly

- The third thing we did was take off the air filter. The air filter was very filthy and we were honestly astounded that it had started with that air filter. We took out the air filter and cleaned it. Then we took the air filter holder off of the governor. Not very hard, just a few screws.



Thirdly- Continued



Fourth

- The fourth thing we did was unplug the sparkplug. We were kindly informed that you should unplug the sparkplug before working on the engine. We did not know this, luckily our kind teacher told us that we should.



Fifth

- The fifth thing we did was take off the gas tank. The gas tank, in my opinion has wayyyy too many screw. It was two underneath and four on top. When in reality you only need two. Anyway we took off the gas tank so that we could take off the governor next.

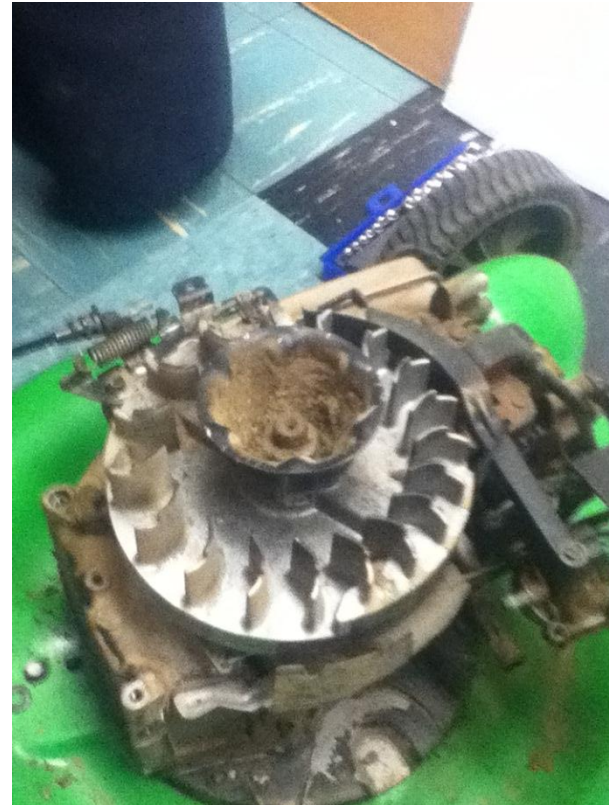


Fifth-Continued

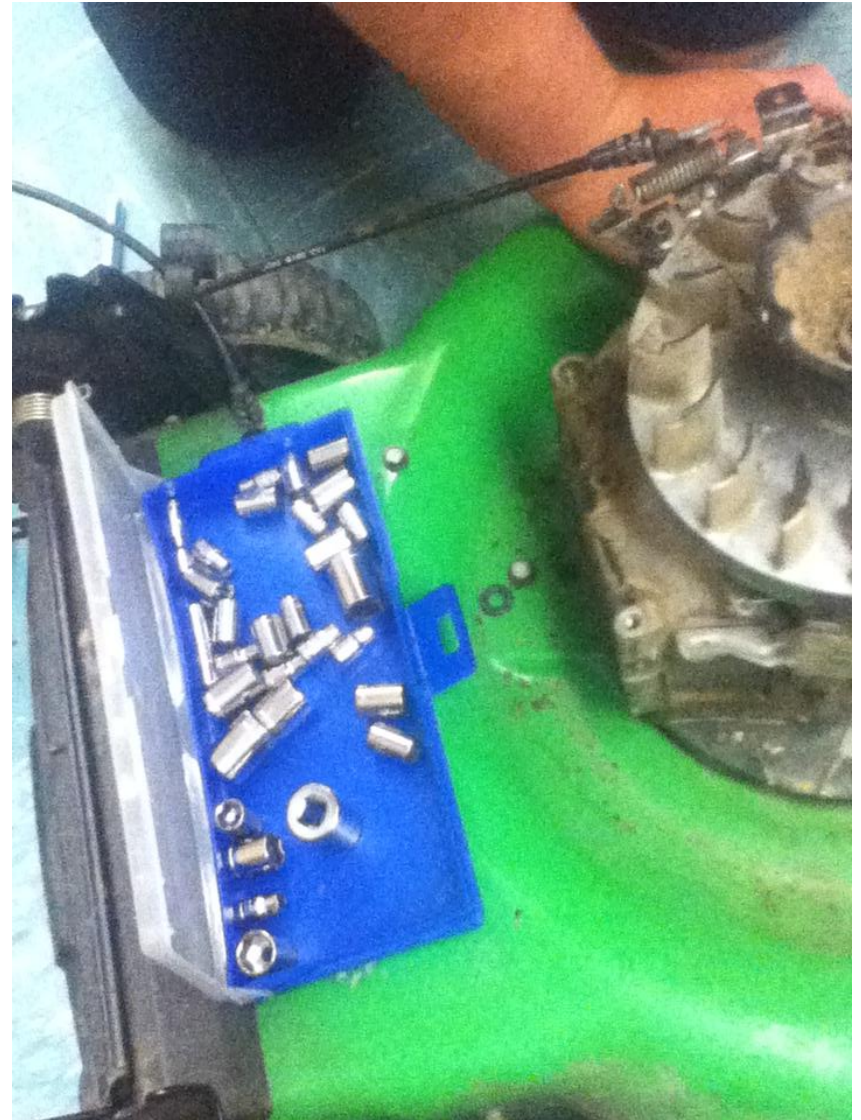


Sixth

- Next we took off the flywheel cover. The flywheel cover covers the flywheel and the governor linkage. We needed to take it off so that we could get to the whole engine.

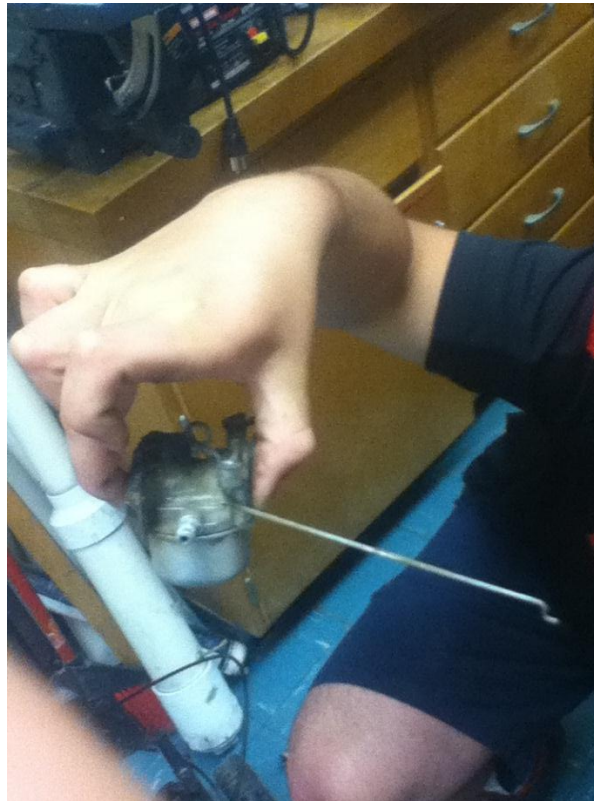


Sixth-Continued



Seventh

- Finally, after some hard work and determination. We managed to finagle the carburetor off of the engine. One of the hardest part of the whole tear down was taking off the carburetor.



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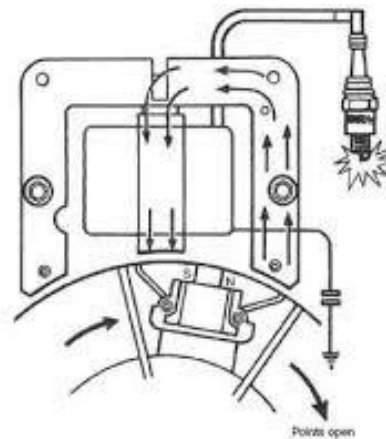
Eighth

- Next we took off the muffler. The muffler is one of the things broken on the lawnmower. We have decided to replace it at a later date. However we felt the need to take it off and examine it, then we put it back on.



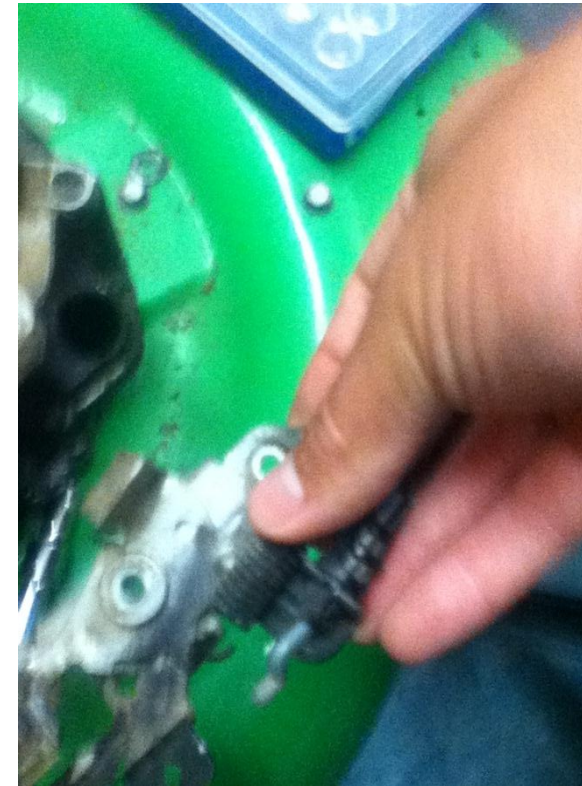
Ninth

- After that we took off of the magneto ignition system. This is what makes the sparkplug spark. This is what makes the engine start. Pulling the cord, making the flywheel spin, makes the magneto ignition system spark the sparkplug and start the engine. Its all rather interesting really.



Tenth

- Next we took off the throttle. Nothing more to say, we unscrewed the screws and removed it.



Eleventh

- Eleventh we took off the bolt that holds the flywheel in place. It is a very large bolt, and it was very hard to take off. You are supposed to use a special tool to hold the flywheel, but we just held the blade with a 2x4 and we used good old American ingenuity to get the bolt off.

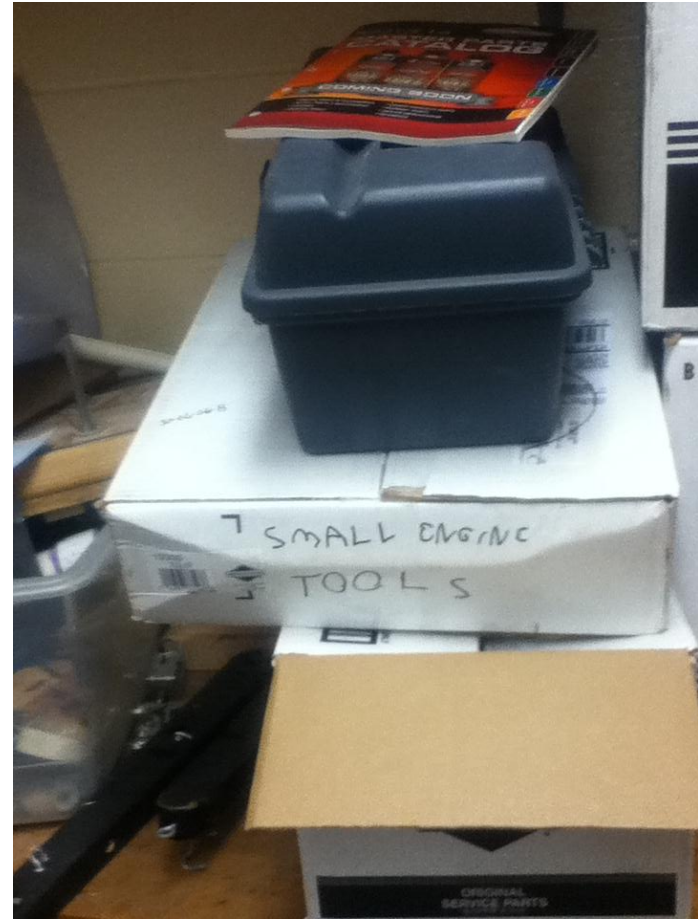


Twelfth

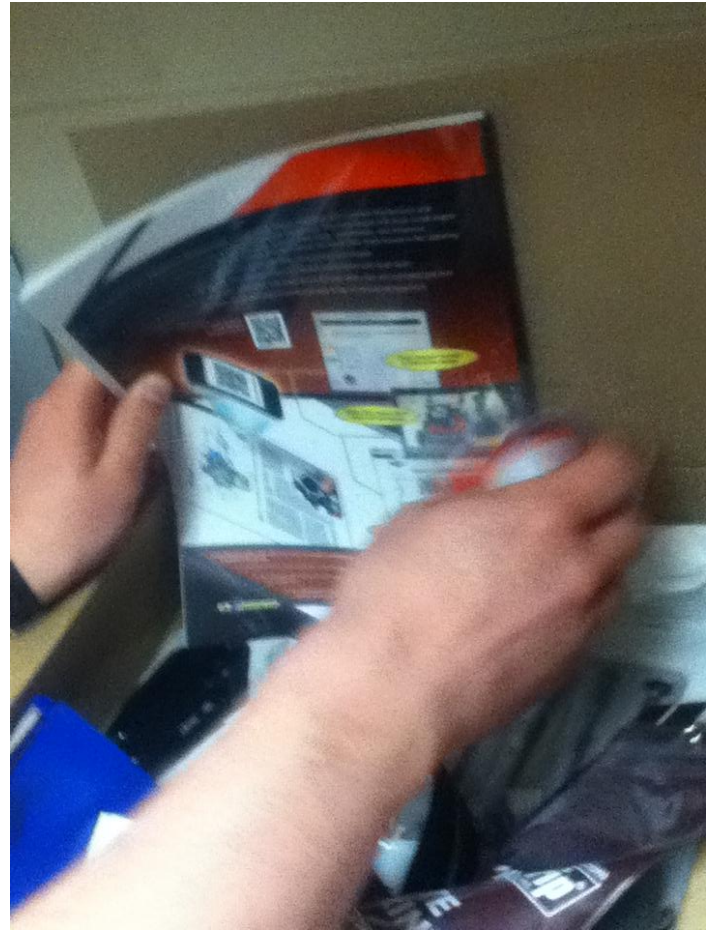
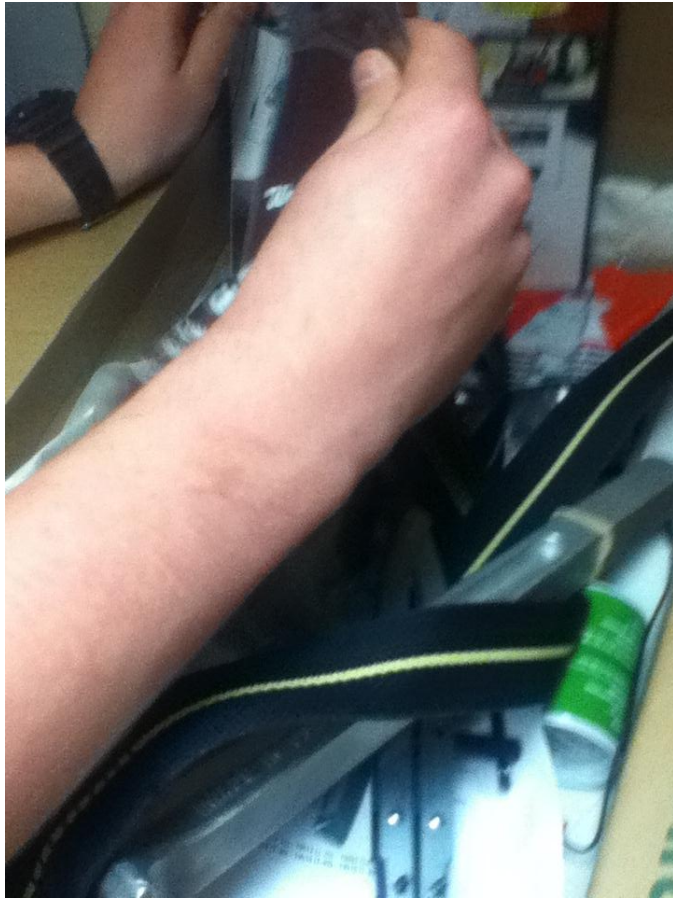
- Finally, we took off the flywheel. We tried brute strength, did not work. We tried a certified flywheel puller from Briggs and Stratton, did not work. Finally we averted back to brute strength and we finally got it off, without breaking anything.



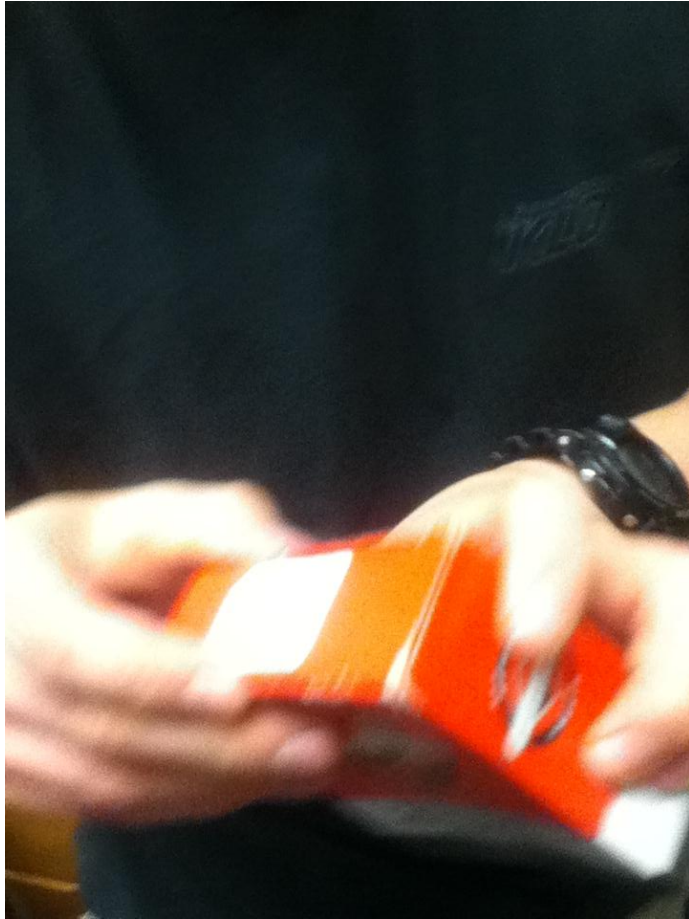
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Thirteenth

- Thirteenth we took off of the front of the engine. To see the one and only piston. This was harder then you would think aswell. The screws were on there tight, and there were at least 8 of them. We had to be careful to not bend the aluminum.



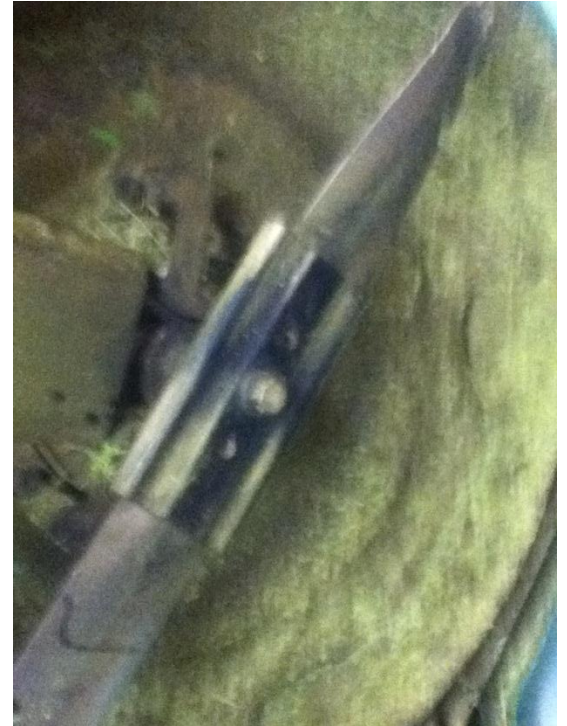
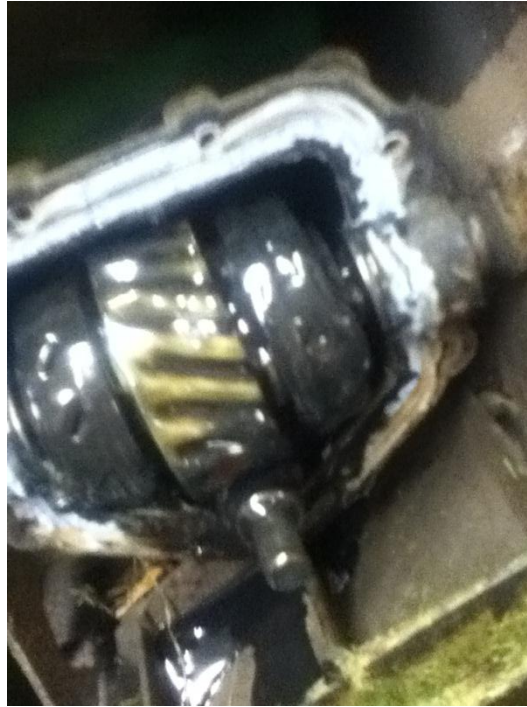
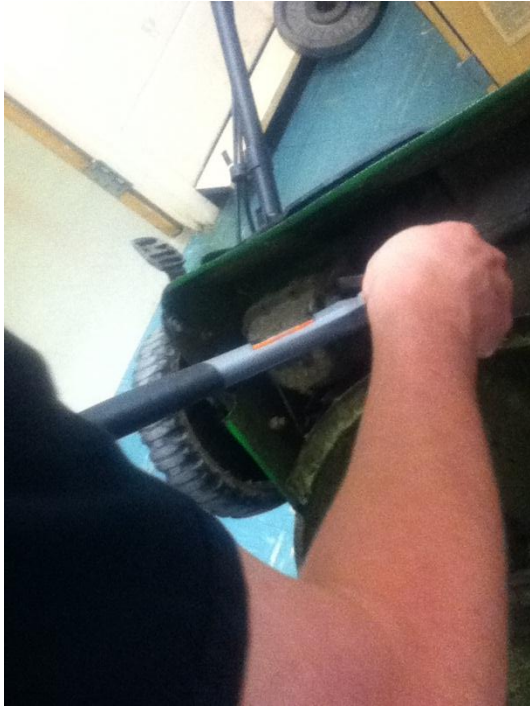
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Fourteenth

- Fourteenth we learned about the self propelled. It is actually fairly simple. A belt connected to the blade spins a little gear box, which spins the tires, In laments terms. We took it apart and figured out that the gears inside the gearbox were all warn down. Instead of replacing it, we decided to just take off the self propelled. So now it is just like a normal lawnmower with out self propelled.

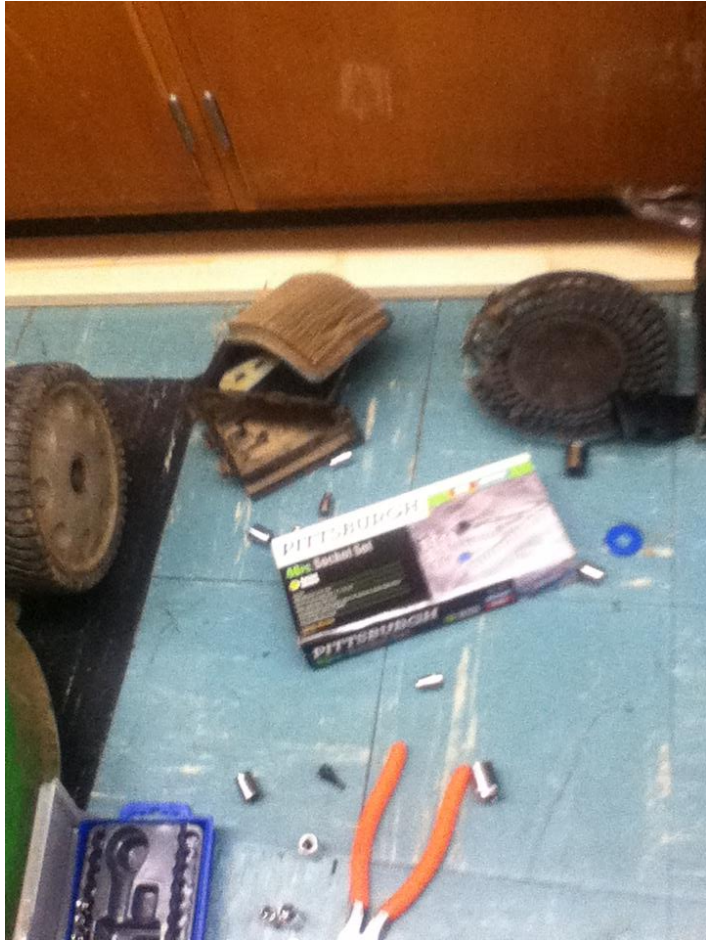
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Conclusion

- In conclusion, me and Evan took apart the lawnmower completely and put it back together. We were very impressed with ourselves and now we are certified engine technicians.

Other Miscellaneous Photos



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