

Deconstruction of an RC Car

74177W; Henderson Nevada

By Adam Satterlee & Faris Tucktuck

Table of Contents

1.0 Report

2.0 Deconstruction Process

3.0 Description of Components

3.1 PCB

3.1.1 Front View

3.1.2 Back View

3.2 Battery / Switch

3.2.1 Battery

3.2.2 Switch

3.3 Steering Components

3.4 Rear motor components

3.5 Miscellaneous

3.5.1 Frame

3.5.2 Wheels

3.5.3 PCB Cover

3.5.4 Shocks

Report (1.0)

Why Did We Choose an RC Car?

We chose an RC Car because we have larger ones at home, enjoy playing with them, and wanted to know how they work. RC Cars are one of the most popular toys and bring joy to all ages.

How do RC Cars Work?

It all starts with the battery; this RC car has a 600mah battery. Unfortunately, the battery text was blurry, so that we couldn't find the wattage. Once the battery is plugged in, electricity moves to the switch. When the switch is in the off position, it blocks the flow of electricity. When the switch is in the on position, it lets electricity flow.

Now the electricity flows to the circuit board, also known as PCB, and it can receive a signal from the remote control. The PCB is full of resistors. Without resistors, components of the car could receive too much electricity. If a motor receives too much electricity, it could overheat.

When you press buttons and move switches on the remote, it sends a signal. The antenna on the PCB receives that signal telling it to give a certain amount of electricity to the motor or servo; this could make the motor turn forward or turn 20 degrees.

The motors in the RC car were brushed; these are the most common type. Inside the motor are two magnets, one south, and one north. Between the magnets is a copper wire with an electrical current. Copper brushes are on the ends of the wire. When the wire spins around because of electrical current, it changes the direction of electricity, turning it more.

The steering motor is called a servo; these are weaker but slower, which helps with steering. The servo is converted into side-to-side motion, which turns the wheels.

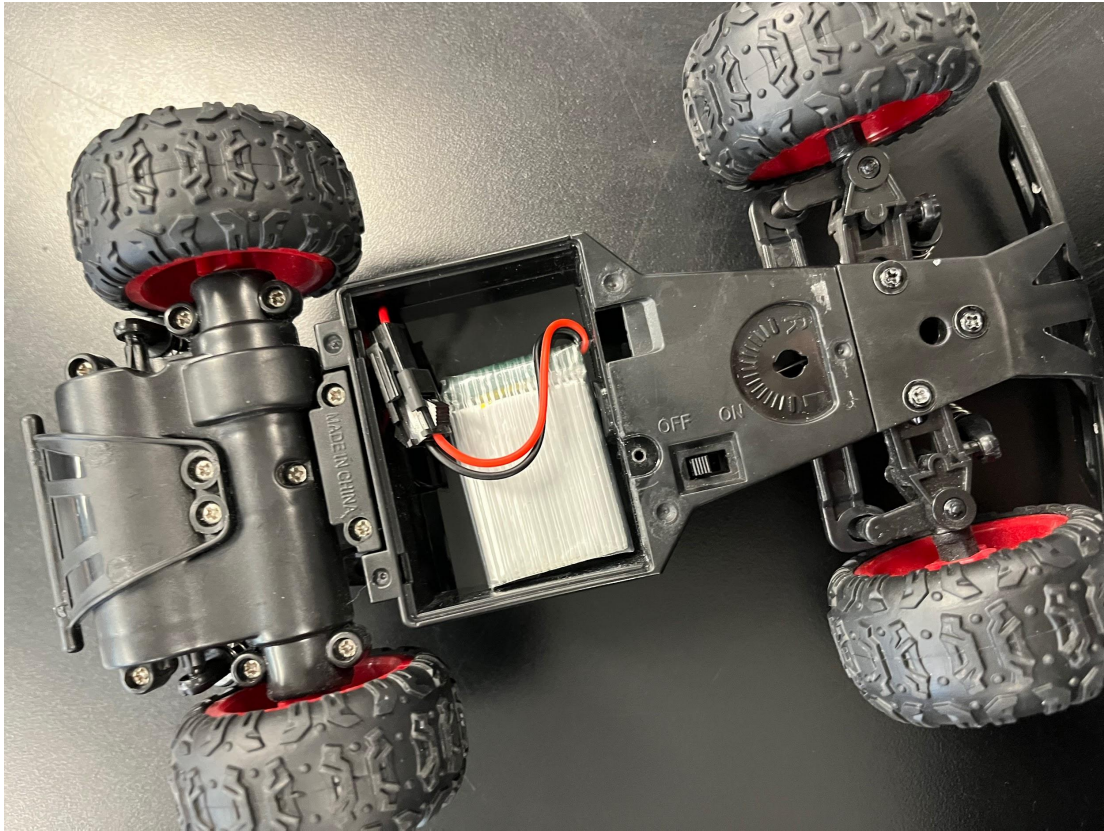
The rear motor spins at very high speeds, which makes it weak. There are gear ratios that make it firm but not as fast. The final gear is connected to shafts that then drive the wheels.

Summary

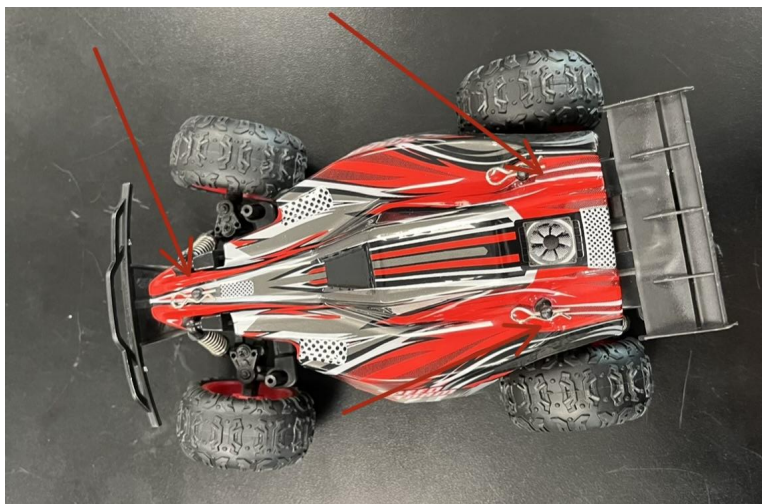
Overall, we learned a lot about how RC Cars work and how the components work. We also learned critical skills like finding reliable resources to find information. We also learned how to improvise; we ran into stripped screws during the deconstruction process. Stripped screws were a real challenge; we tried rubber bands as grip, cutting into the screw, and finally, it worked. This project wasn't just fun but also taught us a lot.

Deconstruction Process (2.0)

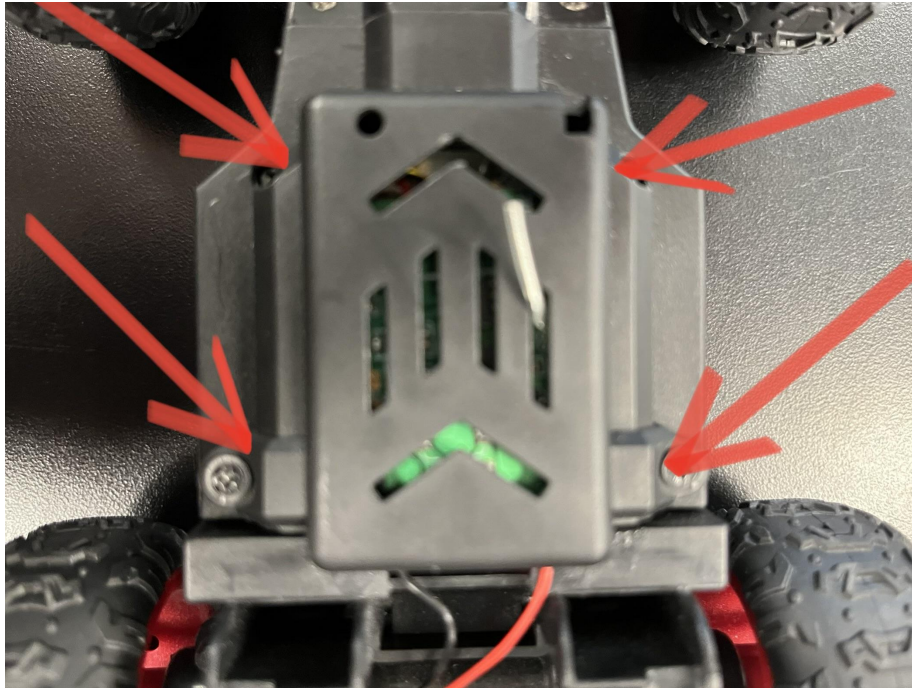
Step 1: The first step was to take one screw out to access where the battery is held and take out the battery.



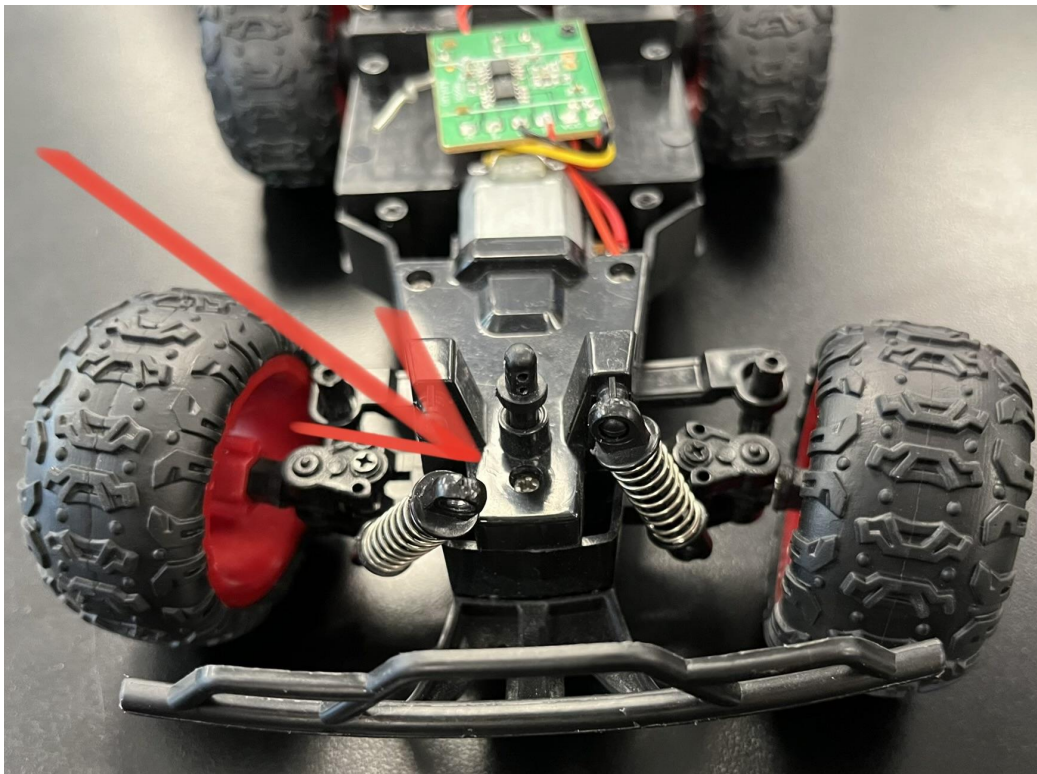
Step 2: Next, we flipped the car and took out the top three pins holding onto the car's shell.



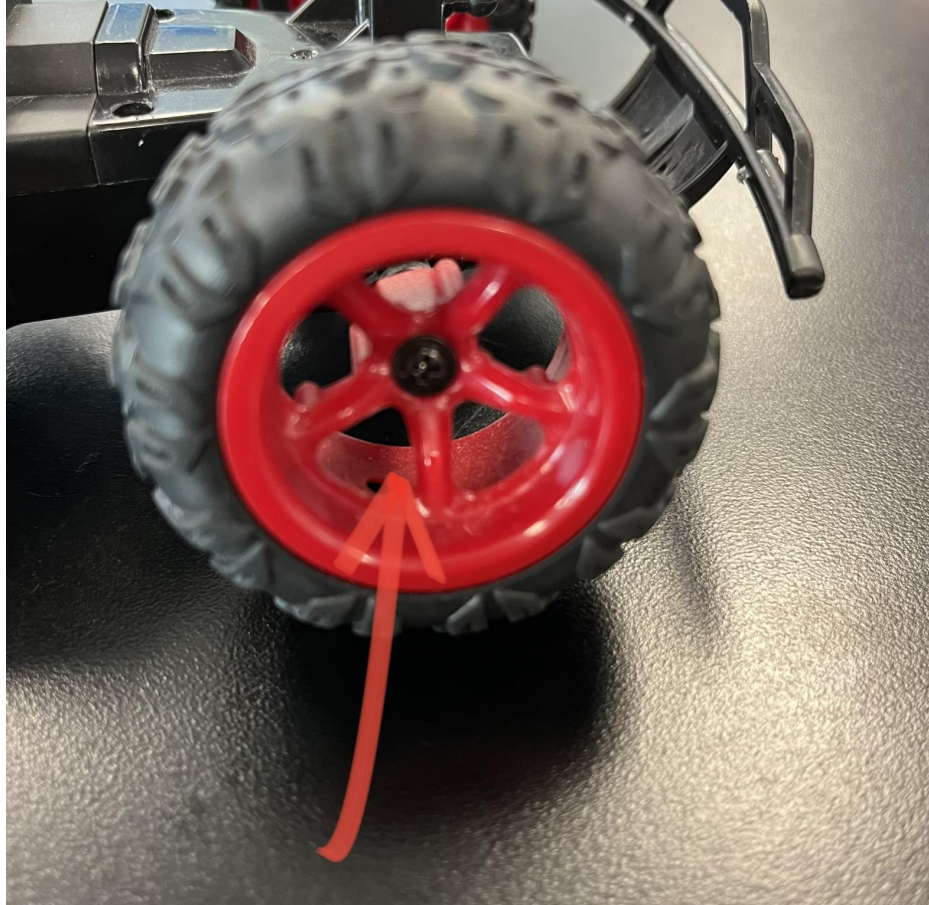
Step 3: We took out the four screws covering the circuit board.



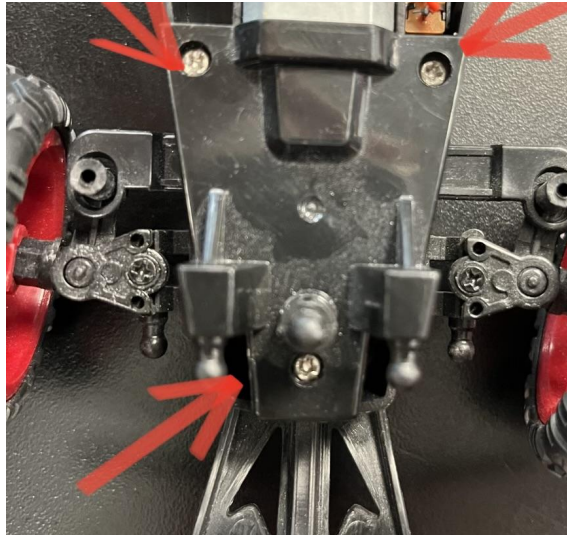
Step 4: Next, we took out the shocks. A ball joint connects them. When we took them out, it felt like it was going to break, but lucky for us, they didn't.



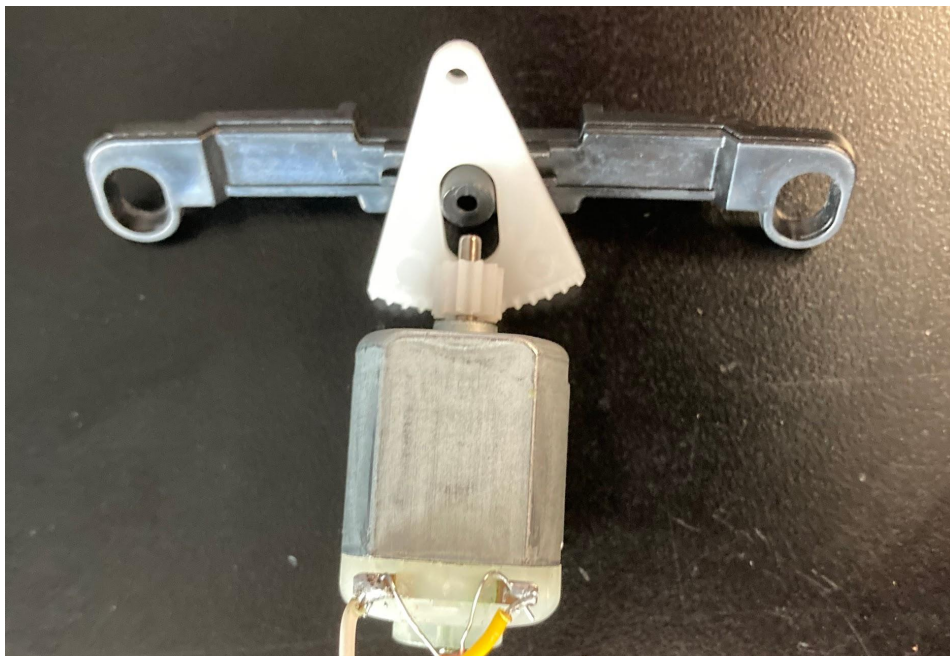
Step 5: We took out all the screws holding the wheels on. Then we removed the wheels. Doing this task will make it easier for us to access the rest of the car.



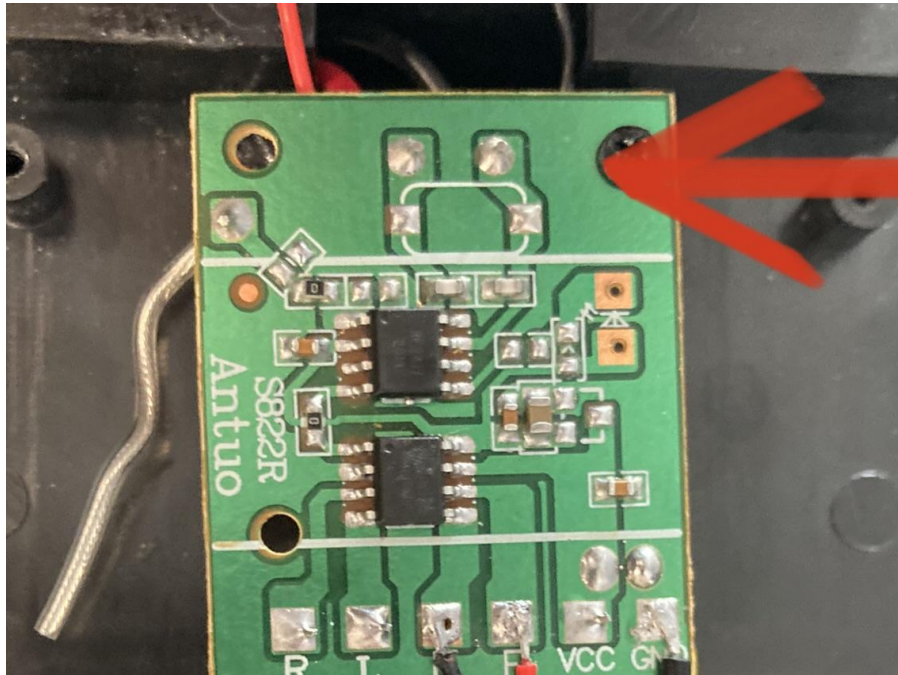
Step 6: We took off the screws holding the cover above the servo and steering components, then took the lid off.



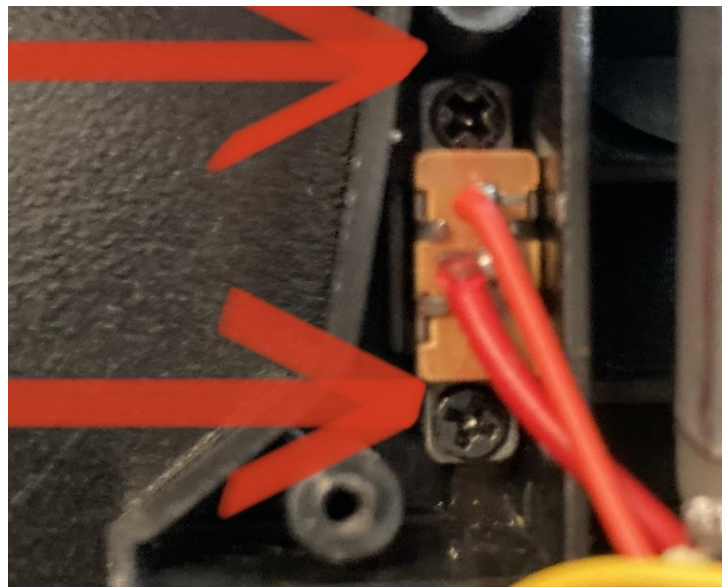
Step 7: We set the steering components and the servo to the side but didn't remove them. We could have cut the wires holding everything together but decided to leave them together.



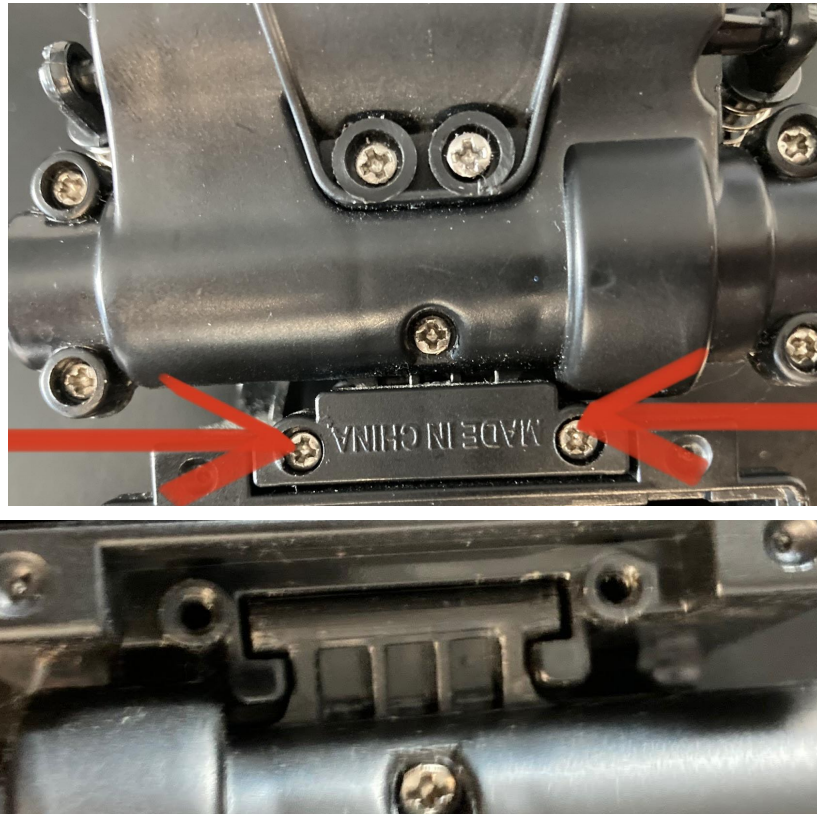
Step 8: We unscrewed the circuit board and moved it out of the way but didn't entirely remove it. As we said in the previous step, we could have cut the wires, but we left them on.



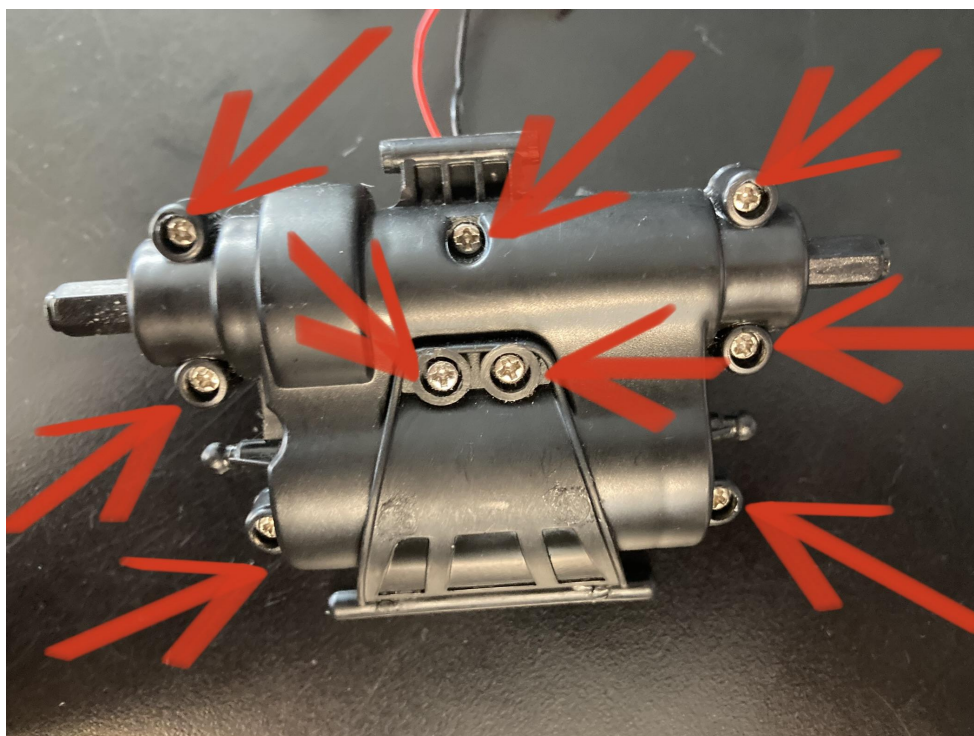
Step 9: This is where we took out the On/Off switch and two screws held onto it. After this, we could fully take out the circuit board, servo, and switch.



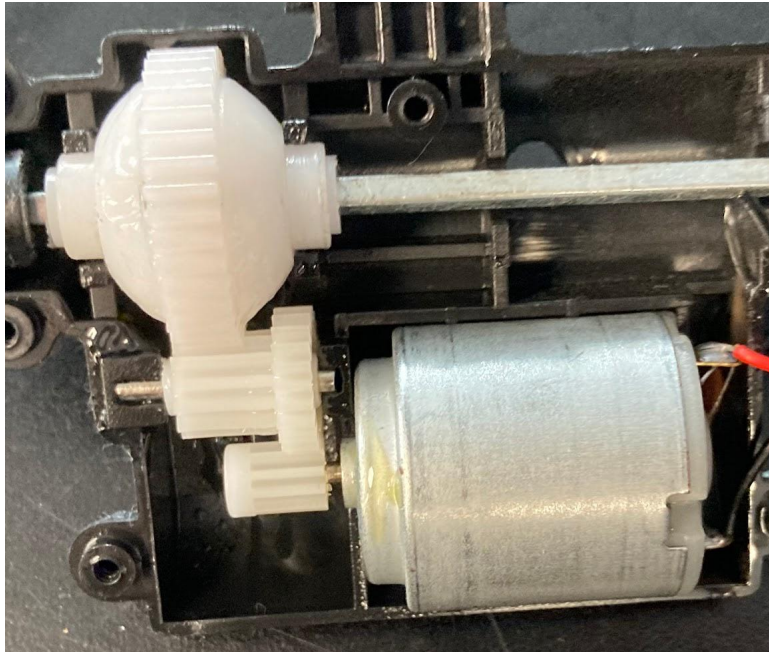
Step 10: This is when we will disconnect the rear motor module. Two screws held a bracket holding the rear motor module, and then we lifted the module.



Step 11: Once you pulled out the motor module, we needed to unscrew all nine screws holding the rear motor module together.



Step 12: This was when we took out the motor that drives the car. We couldn't get the motor out without cutting the wire.

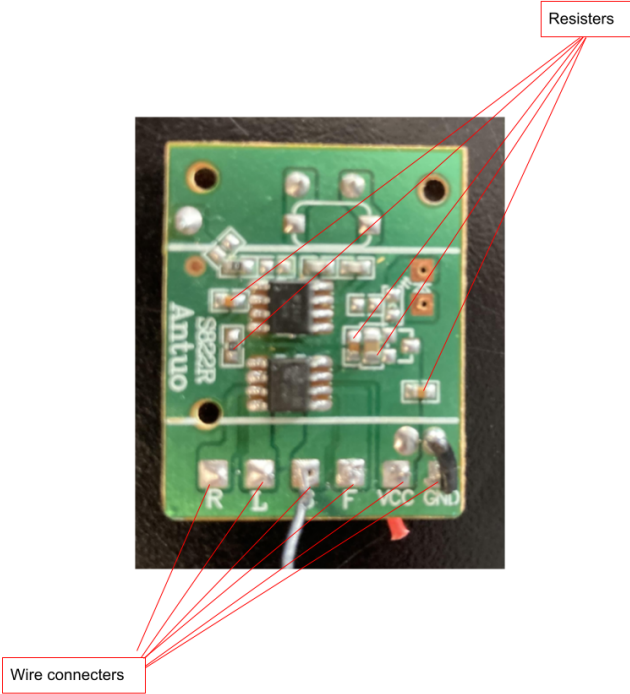


Step 13: The final step was to remove all the gears and shafts. All the parts were now separate, and we inspected them further.



Description of Components (3.0)

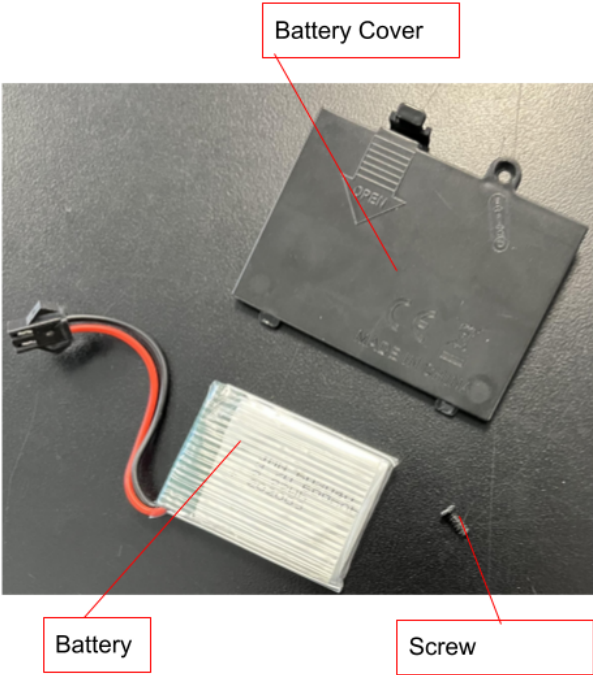
PCB (Front) 3.1.1



PCB (Back) 3.1.2



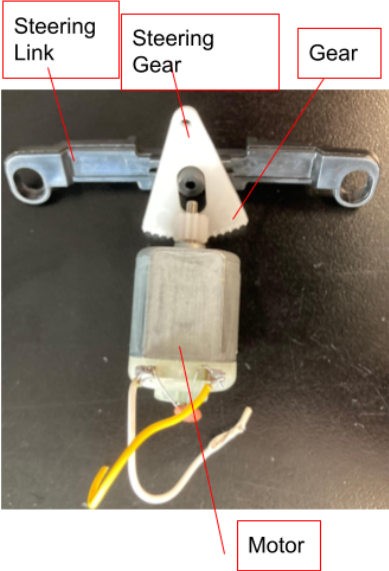
Battery 3.2.1



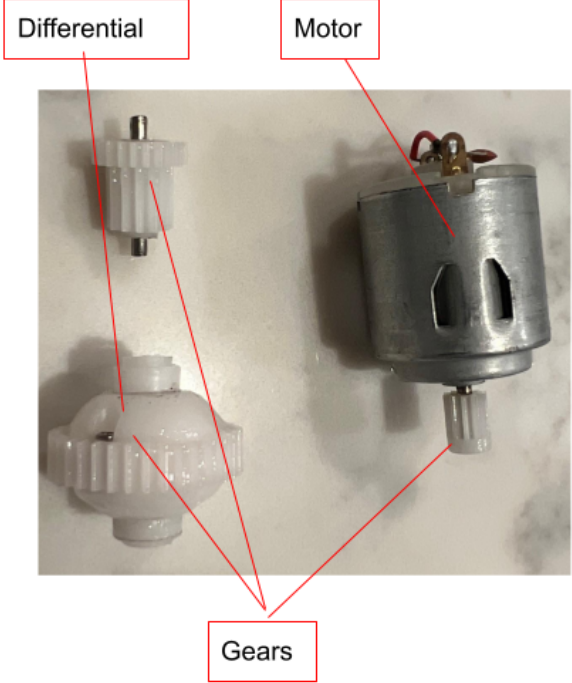
Switch 3.2.2



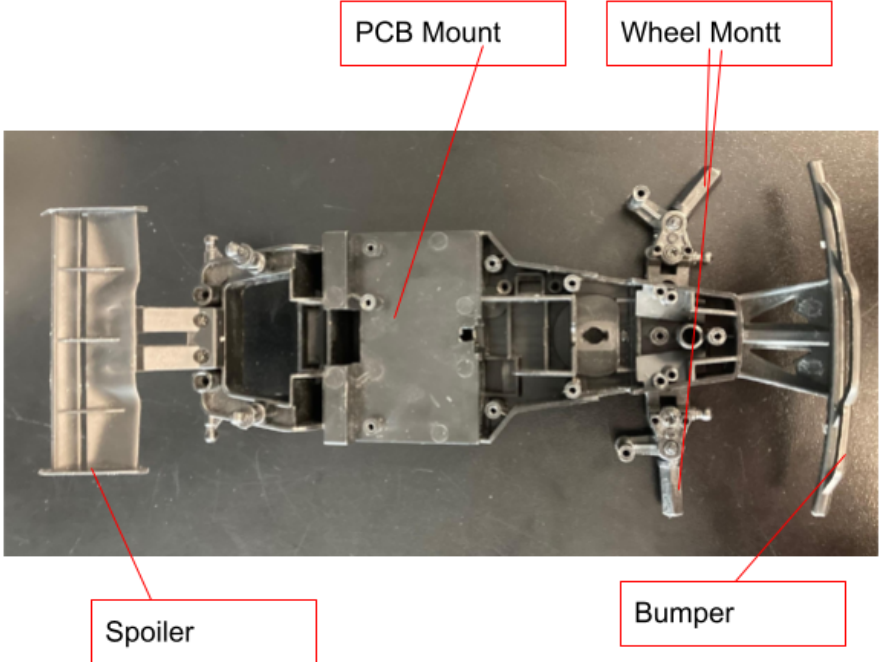
Steering Components 3.3



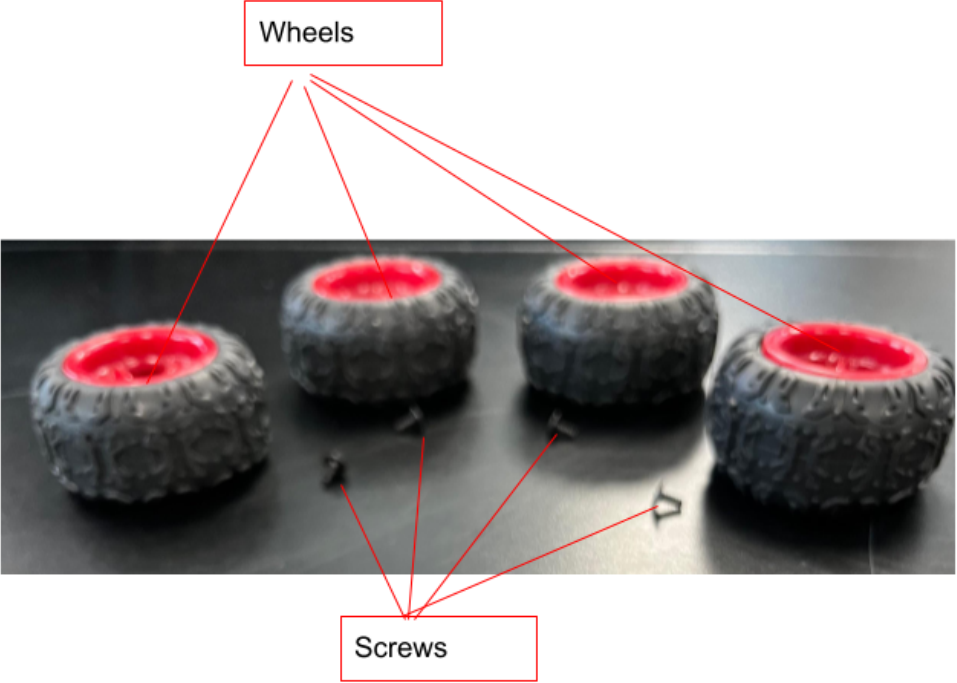
Rear Motor Components 3.4



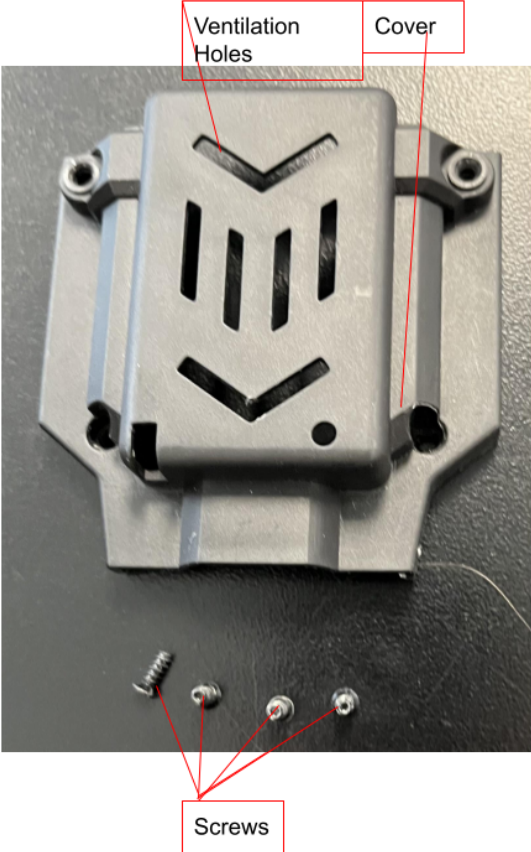
Frame 3.5.1



Wheels 3.5.2



PCB Cover 3.5.3



Shocks 3.5.4

