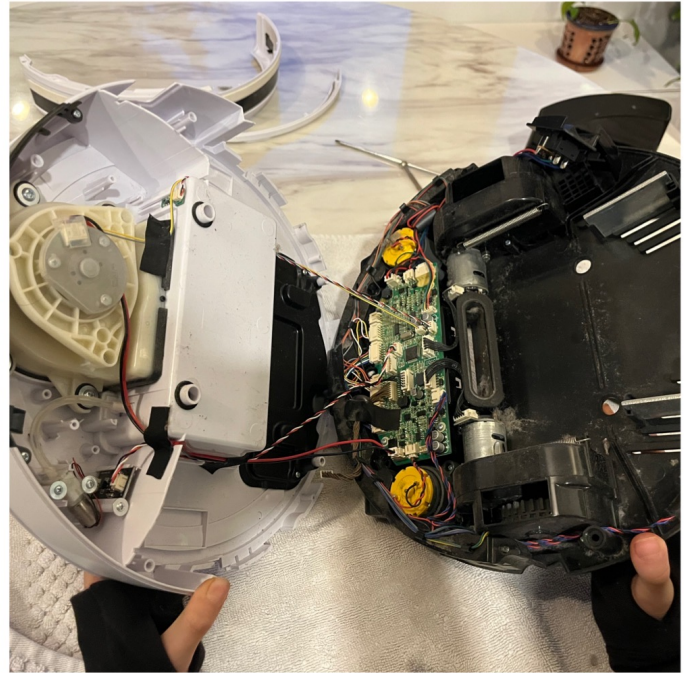


Reverse Engineering Challenge

VexIQ Robotics Online Challenge

By Dominique - Team 1012M West Vancouver - British Columbia

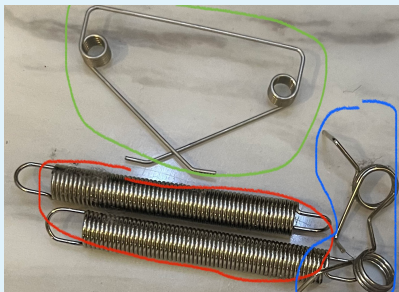
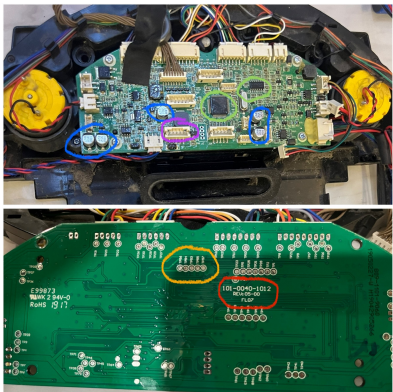
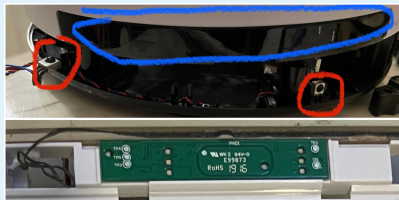


Electronic Device I Chose And Why

I chose a robot vacuum because it has similar parts to the robot we make in Vex robotics, and I wanted to see how it was made. Another reason was because it stopped working and I wanted to see if I could find the issue and fix it.

Identifiable Parts And Their Role

Pictures	Parts	Role The Parts Play In The Robot
	Covers - Decoration Covers - Functional Covers	Some covers have functional roles with rubber seals to protect from moisture and dust. Some covers are for aesthetics and hold the parts together.
	Wheels - Rubber wheels - Plastic spherical wheels	The rubber wheels move the robot and allow it to roll on different surfaces. The wheels are attached to coil springs to help them move over obstacles.
	Gears and motors	The main motor for the brushes is in the top left picture. It has 3 gears to fit the shape of the case, and the gear ratio helps it to turn fast. The gears are powered by the motors. The white goop pictured is lubricant to make them spin smoothly. The wheels are run by the motors circled in red.

Pictures	Parts	Role The Parts Play In The Robot
	Springs	The compression springs circled in red pull the wheels up so it can manage uneven surfaces. The torsion spring circled in blue opens and closes the cover. The green circled torsion spring is on the front of the robot so when the robot bumps into something, it pushes a switch to tell the robot to turn.
	- Compression spring - Torsion spring	
	PCA (Printed Circuit Assembly)	The PCA is the brain of the robot. Connectors connect wires to the circuit board. The wires are attached to motors, sensors, etc. The connector labels tell you which signal goes to what wire on the board. The capacitors store up power and release it when needed. The integrated circuit provides logic or functions. The revision label tells you the version of the board. The bottom is coated to protect from moisture or dirt.
	- Connectors - Capacitors - Integrated circuit - Connector signals - Revision Label - Clear coating	
	Sensors	The infrared sensors circled in red transmit light and wait until it reflects back so it can tell the distance. It is behind the blue circled dark window to let the light through. A mechanical switch is a sensor that tells the robot if it hit an object.
	- Infrared - Mechanical switch	
	Power Sources	The battery provides power to the robot and is charged by the docking station. The wires provide power to the motors. When you click the on switch, it turns the power on.
	- Docking station - Rechargeable Battery - Wires - On/Off switch	

What I learned

I learned that the robot vacuum and Vex robot I am building are similar. They both have sensors, wires, wheels, motors, etc and are designed to do a specific job and solve for challenges. I learned about the parts on the robot and what they did - especially all the parts on the PCA. This challenge made me more curious about how things work. It inspired me to make a few tweaks on my robot. For example: I like how the robot was able to lower its wheels and I think that could help solve some challenges I have faced in tournaments. Because the robot needed to look good for sales, it took aesthetics into consideration, whereas our teams robot does not - yet!

