Technical Breakdown of FlipStunt Rally RC Car

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Contents

History of The RC Car

Fig. 1. A poster showing the features of the FlipStunt Rally RC car. (Amazon, n.d.)

Playing on the monkeybars in the playground afterschool, you focus on getting to the next bar; when you're done, you start to hear a distant whirring, the sound gets higher and higher in pitch until you notice a toy car race past your feet. RC cars, otherwise known as radio controlled cars, are scaled down versions of real-life motor-vehicles; they are designed for speed and agility, allowing for fast travel on their intended terrain (Mouli, 2022). These battery or nitro-powered miniature cars are controlled by an external controller that sends specific radio frequencies in order to control the movement and acceleration of the RC car (Mouli, 2022). Toy cars were made as a response to the invention of motor vehicles, plastics were used in the 1950s to make sturdy and accurate minurate models of cars with low costs (Cars as toys, n.d.). The first ever RC car created was the nitro-powered Ferrari 250LM in 1966, created by the Italian electronics company: Elettronica Giocattoli. Within a year, RC cars were being commercially produced by Mardave, a company based in Leicester (Mark, 2017). In 1979, Japanese company Tamiya, introduced the concept of off-road RC cars, these cars had textured rubber tires and powerful motors which enabled them to drive on rough terrain, compared to previous cars whom

were only able to be used on smooth road (Mark, 2017). Over time, the scale of these RC cars began to go down, from 1/8 scale at the beginning, all the way to 1/18 as RC cars became even more popular to consumers (Mark, 2017).

Exterior Overview

Fig. 2.1 Topside of RC car. (Pak, 2023)

Fig. 2.2. Bottomside of RC car. (Pak, 2023)

The FlipStunt Rally RC car consists of 4 wheels, the chasis is split in 2 symmetrical parts (Fig 2.1-2.2), Fig. 2.1 has black paint with white accents and the number 8, Fig. 2.2 has white paint with black accents. Both parts are modeled differently, with the topside sporting a wide body and windows, having a sunroof on the top, the bottomside, in comparison, has a thinner body, a large rearview window, thin sideview windows, and a smaller windshield. The chasis is made of durable hard plastic and has a matte feel to it, embedded in each part were 2 semi-transparent headlights; they contain LEDs that emmit a bright white light. Running a finger over the tires, I was able to feel grooves, one was long and was shallower than the other, the other felt like the rumble strips found on highways; it vibrated my finger as it slid across it. The tires are made of a soft black rubber material; rather than being filled and pressurized with air, the tires

are molded as such that they are able to be pressed down without any hard resistance, allowing them to maintain their shape.

Interior Breakdown

Stripping the car of its tires and unscrewing the Phillips-head screws throughout the body exposes the interior of the body of the FlipStunt Rally RC car (Fig. 3.1 thru Fig. 6.):

Fig. 3.1. Top view showing the internals of the RC car. (Pak, 2023)

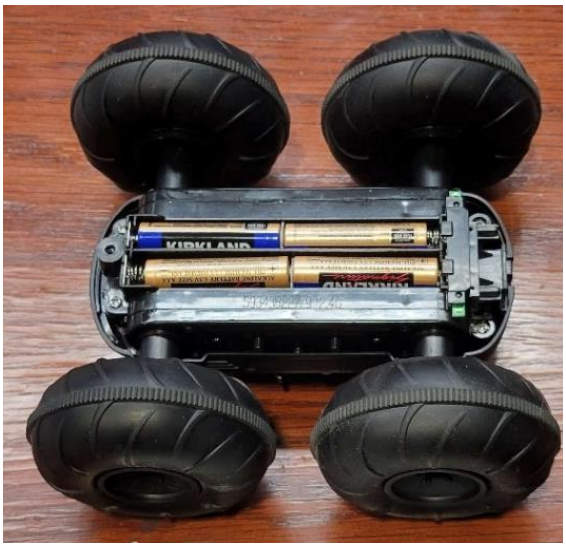

Fig. 3.2. Bottom view showing the battery compartment. (Pak, 2023)

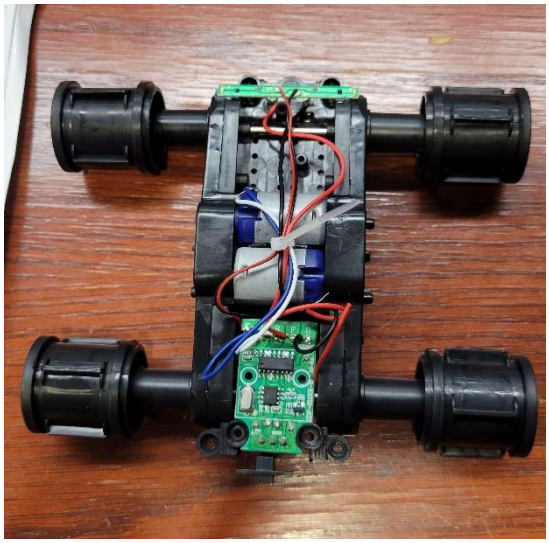

Fig. 3.3. Top view, no tires. (Pak, 2023)

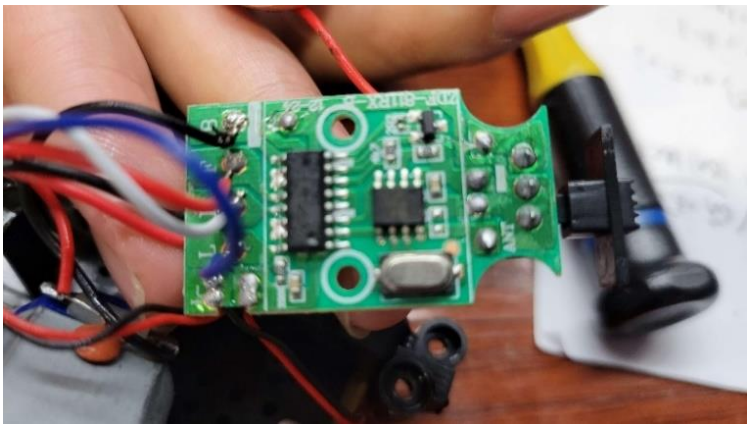

Fig. 4. Circuit board containing the parts needed to connect the batteries to the motor and LED lights. (Pak, 2023)

Fig. 5. The circuit board at the front and back of the car, each side contains a white LED. (Pak, 2023)

What is revealed to us are the tightly bundled insides of the RC car. The motor and the circuit board are bound together like a present with a zip-tie to prevent the movement and damage of the interior parts while the car is in motion. Electrical wires connect the battery to the circuit board, allowing for the distribution of electricity to the motors and LEDs. Printed throughout the board are copper circuits that electrically connect and mechanically support other mounted components on the board (AX Control, Inc., 2021). The black prisms with centipede-like metal legs are the integrated circuits of the circuit board. Their range of functions is vast but the ones on this RC car board serve as an amplifier, which allows the board to receive instructions wirelessly (T.T, 2021). In the middle of the body are the motors, attached to each other magnetically and facing opposite from each other, they are the main mechanical force behind the movement of the RC car. They move the wheels via an assembly of gears within the sides of the RC car. The wheels

themselves are made of the same material as the body and feature extrusions that help with the attachment of the tires.

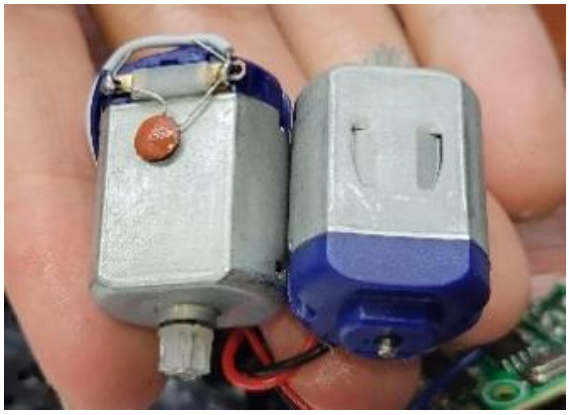

Fig. 6. Motors used to power the rotation of the wheels. Each one has a small gear attached to the shaft. (Pak, 2023)

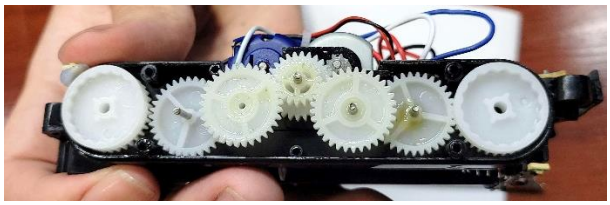

Fig. 7. The assembly of gears needed to connect the motor to the wheels. (Pak, 2023)

Fig. 8. Back-view of the internals of the wheels. One gear is taken off to show the relationship between the base gears and the wheel gears. (Pak, 2023)

On each side of the RC car is an assembly of 12 total gears, which are symmetrical through the middle of the RC car. The entire assembly is covered in a greasy oil, which lubricates the gears so that minimum friction can be achieved to reduce wear and tear of the gears. Each gear ranges from 5 to 37 teeth, with two of the gears having two levels of teeth. On the backside of the wheel assembly is an indent where the gears fit in to turn the wheels.

Function

This specific model of RC car is designed to be used for entertainment within the category of a racing/trick electrical toy. The use of the texture edges on the wheels combined

with the ability to move when it's upside-down makes it a great demonstration of what an off-road RC car can do.

Conclusion

With how much entertainment the RC car bought to people within the past 70 years, the improvement of the RC car within that time also skyrocketed. Many RC cars can flip, angle their wheel axis', and go to speeds as fast as a motor vehicle. With it still being a favorite hobby of many today, one can look forward to the future of RC car innovations.

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Sharper image remote control RC cars flip stunt rally car toy for kids, 49 MHz, 2-in-1 reversible design for racing, cool stunts, tricks, led headlights, AAA battery powered

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