



## NFC ENABLED DRIFT TRIKE

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### ABSTRACT

A drift trike is also called as three wheel vehicle designed and made for drifting. In some country like Germany it is used for drift trike racing championship. It is small three wheeler run by Bike and car engine with Go kart rear tires. Currently it is a factory made product; it can be made by mechanical/automobile engineers. This report documents the process and methodology to produce a drifting trike. Simple but innovative, we are going to use NFC (near field communication) technology for ignition of an engine. We use some part of cycle for the front chassis of trike. There is no suspension used in this trike just because of low trajectories of frame and less amount of parts. The purpose of making this trike is we are trying to automate the ignition by the use of card, wallet, mobile phone. In the modern era in the automobile vehicle the engine ignition starts by the use of key and button, so we use chip and tags system to make this.

**KEYWORDS:** drifting trike, Bike engine, Go kart tyres

### 1. INTRODUCTION

A drift trike is a three wheel vehicle powered by engine called as trike car [1] or three wheeler. They are designed to drift by loss of traction to the rear wheels and counter steering to negotiate corners [1]. They are usually ridden on paved surface with corner and switchbacks [1]. The origin of drift trike comes from New Zealand [1]. In drift trike the front wheel has more diameter as compared to rear wheel the rear wheel used in the drift trike are Go Kart Tires and they have more cross section area as compared to front wheel the rear wheel are responsible for drifting the trike. Drift trike also gives the 360 degree horizontal rotation about its head tube present in the front part of the trike. We use pulsar 150cc engine for the purpose of motorizing the trike pulsar 150cc engine provides maximum power 13.7 brake horse power (Bhp) @ 7998 RPM [2] and also it provides maximum torque of 13.3 Nm @ 5994 rpm [2]. This drift trike consists of self starting ignition engine by the use of NFC also called as Near field communication [3], NFC is an update of RFID technology [3]. The RFID is also known as radio-frequency identification it uses electromagnetic field to automatically track tags attached to objects [4]. These tags contain electronically-stored information [4]. In this drift trike we



used NFC for ignition (start the engine) and also unlocking of vehicle it means if we forget car key at home so we can start or unlock our trike by the use of wallet, mobile, hand watch these object contain tags and another tag is attached to the trike so it secure our vehicle. The NFC work within 4cm(1.6 inch) range it means the distance between the trike(1<sup>st</sup> object) and wallet, Mobile, hand watch(object 2<sup>nd</sup>) is 4 cm[3].

## 2. LITERATURE REVIEW

**2.1**The trike is low to the ground, with the rider's feet positioned in the middle of the large front wheel on two pieces of metal, placed there for this purpose - otherwise, the rider's feet would be on the ground. The back wheels have an outer plastic layer that purposely reduces the traction to create the drifting motion. This outer layer was made out of two plastic buckets, since the ideal material – PVC pipe [5].

**2.2**Alametal studied the significance of aerodynamic design and comfortable riding of human powered tricycle. Wind tunnel testing was reported to find out the key characteristics of this human powered vehicle. The magnitude of aerodynamic drag significantly varied with the test vehicles physical profiles. They observed that the human powered vehicle manufacturers did not necessarily took into account the importance of aerodynamics in conventional tricycle design. This study showed a significant reduction in aerodynamic drag compared in an appropriately designed vehicle (aerodynamically) compared to a conventional vehicle. The seating position in such vehicle plays an important role. The reclining position further backward allowed an additional reduction of frontal area thus it lowered net drag force. Additionally, the reclining position further backward shifting may provide better physical advantages for endurance as indicated by observations at a race event. As expected, component add-ons and their positions generally increased drag more at low speeds than at high speeds. Wheels covers reduced total drag on the vehicle than uncovered wheel one [6]

**2.3**Norcliffe studied that working tricycles in China's cities serve as the platform for millions of microenterprises. A study was undertaken by Kendalla et al., on the hydrogen fuel cell hybrid vehicles which were introduced in Birmingham Campus [7].

**2.4**Jawwad A. K. Lodhi, Nafees P. Khan (December 2016) [1]

Here they proved that a proactive design of a bike is possible when it has three wheels. Mainly they used wishbone suspension system as the active leaning mechanism. For the design process they used banding stress formula to calculate induced bending stress. [8]

**2.5** Kaustubh Dilip Patil, Prashant S. Mulmule 2 Vikrant S. Satalkar, Ramesh S. Thorat (September 2015) [2]

They used a rocker arm design for the leaning mechanism, but this design is not reliable. They have used Mild steel black material for the construction of mechanism and mild steel for the construction of chassis. By this mechanism they success fully achieved 36 degrees of leaning.[9]



**2.6M.** Ravi Chandra, S. Sreenivasulu, Syed Altaf Hussain, (July-Aug 2012)

They gave the best data of the automobile vehicle chassis and also they studied the behaviour of the ladder chassis, monocoque chassis and backbone chassis. They have done different bending analysis on I,C and Box channel section chassis. They have considered steel, E-glass, S-glass, carbon epoxy materials.[10]

**2.7** Jawwad A.K. Lodhi1 Nafees P. Khan (2016) [9]

They have concluded that three wheeler has great potential to bring innovative design in the market. They also shown that accidental death is increasing day by day and they prove it by giving a data of number of accident.[11]

**2.8** Asst. Prof. N.Vivekanandan, Abhilash Gunaki , Chinmaya Acharya, Savio Gilbert and Rushikesh Bodake (june 2014). In this literature they have studied about materials like ASIS1018, ASIS1040 and ASIS4130. They also determined the allowable stress for ductile material about 345.83MPa. Also they determined the centre of roll by which roll over stability of the vehicle is considered.[12]

**2.9** In the work carried out by K.Preethi, Anjali Sinha and Nandini the main object was to put forward a comparison between all the existing techniques used for communication between two networking devices, it moreover illuminates the potential of NFC and how it could be used more in real-life scenarios. It brings up the possibility of how NFC can be used with other radio techniques or communicating techniques to be more efficient and secure.[13]

**2.10** In the research done by Vibhor Sharma, PreetiGusain and Prashant Kumar the main objective highlighted here is the comparison of NFC with Bluetooth and the possible security threats that can be faced in NFC. NFC proves to be more beneficial than Bluetooth if the devices are in close proximity and it moreover allows the communication of data in both the directions rather than unidirectional flow of data as in case of Bluetooth. In addition to this the data transfer of Bluetooth is slower than NFC. One major drawback of NFC over Bluetooth usage is that large amount of data cannot be transmitted here. Kenya is adopting the technology rapidly and it has huge scope in the future because it makes the transactions easier for the user in addition to the less amount of time taken. The major step to be taken in order to create vast use of NFC is to create a secure platform so that the data transferred is valid and genuine.[14]

**2.11** The research written by Andres Diaz Lantada, Carlos Gonzalez Bris, PilarLafontMorgado and Jesus SanzMaudes a new system has been proposed which gives us an application of NFC in medicine. According to the new idea, we can monitor various bruxism events and it also helps in the diagnosis.[15]



**2.12** In the research carried out by Hongwei Du the main objective of the research paper was to explain the applications of NFC in m-commerce recently undertaken by various companies. In today's world people are dependent on technology, in particular m-commerce so Hongwei has tried to integrate m-commerce with NFC to make it easier for the end users. Google has also taken initiative to support and further explore this by the Google Wallet payments [16]

**2.13** In a research carried by Anusha Rahul, UnniKrishnan, Gokul Krishnan and SethuramanRao. According to the survey conducted by them the NFC is one of the most recent and effective technology in wireless communication. Two devices can communicate through NFC by as simple way as pointing towards each other or touching each other. Though it has many advantages it also has many disadvantages like the short range it has to achieve or acquaint itself with. The communication is brought about in the NFC enabled devices only and within a theoretical range of 20cm only[17].

### **3. RESEARCH METHODOLOGY**

**3.1** The automotive Near Field Communication (NFC) market is rapidly emerging, driven by combined forces of the NFC-enabled mobile device growth and new automotive service trends such as car sharing, corporate fleet management, Bluetooth and Wi-Fi pairing, and the demand for personalization inside cars. All of these can potentially make good use of NFC-enabled mobile devices. It believes that combining the automobiles' electronic platform with powerful NFC-enabled mobile devices is the catalyst leading to multiple innovations [18].

**3.2**NFC services and implementations continue to be prototyped and tested. NFC can connect vehicles and car keys to portable devices and infrastructure, opening up the possibility for a broad range of innovations in the field of connected car solutions. The following list of the NFC-enabled applications is most likely to make it to the market over the next few years[18]

**3.3** NFC has taken over 10 years to finally gain some traction in the mobile device sector. IHS Technology projects that NFC-enabled mobile handsets will grow significantly in the next five years. However, such fast growth has yet to be seen in the automotive industry, given that the product life cycle within the car industry is much longer than the consumer electronics industry. Plus, except for a few early adopters, many automotive OEMs are still reluctant to take on NFC solution and are still in favor of other alternatives. For instance, Volvo this month announced that beginning in 2017 it will start selling its new cars with Bluetooth-enabled digital car keys only to lock, unlock and start the car. Volvo's position on adopting Bluetooth indicates that the incorporation of NFC inside the vehicles will take time. [18]



#### **4. ADVANTAGES**

**4.1** Car access: use NFC-enabled phones or wearables as a car key to unlock doors [18]

**4.2** Engine start by using NFC.[18]

**4.3** Create personalized settings: Climate control settings; Automatic seat and mirror adjustments. [18]

**4.4** Pair and connect hands-free interface or entertainment systems with Bluetooth. [18]

**4.5** Set up Wi-Fi or WLAN connections to control trike ignition. [18]

**4.6** Acquire vehicle information. [18]

#### **5.DISADVANTAGES**

**5.1**Slower Connectivity and Limited Range in drift trike.[19]

**5.2**Vulnerabilities Due to Security Issues. [19]

**5.3** Cost Implications from Shortcomings. [19]

#### **6 APPLICATIONS**

**6.1**Car access use NFC enabled phones as a key to unlock doors.

**6.2** For engine start NFC enables chip are used.

**6.3** Vehicle management can be done by NFC.

**6.4** Alert the owner of pending service requirement.

#### **7. EXPECTED OUTCOMES**

In the research carried out we have tried to analyse NFC technology, its working and its advantages and disadvantages from the various research papers published related to the above topic which is Near Field Communication (NFC). NFC has a lot many scopes in future because it makes it easier for the end users to use the technology efficiently and accurately. Though there are some security issues in the implementation to get valid data, there is research going on in various areas as how it can be implemented in fields of Health Care, Housing, making payments, institutional and educational purposes.



The corporate industries like the credit card companies are trying to merge with mobile development companies to implement the concept of NFC, so that payment can be made without having the need to carry wallets. There is a high scope in this area of technology that can bring a huge change in our day to day lives. Companies like Google and PayPal have started using this technology.

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