Design& Fabrication of Mini Electric Go Kart Model

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Abstract- *Everyday price of fossil fuels vary and it's not good to pollute the environment just for karting. Since fossil fuels costs more and makes pollution like air pollution and sound pollution, so there is a need for electric Go Karts. Go Karts are not available for small children to play and have fun in hilly regions like mahableshwar.This project aim is to develop working model of a mini electric go kart available in low price, small children can drive it and have fun in the hilly region. Its base structure is made of PVC pipe and wood and it is powered by high torque DC motor.*

This mini electric Go kartis light in weight and strong enough to take a load up to 70kg. Two high torque motors gives the vehicle the speed up to 15km/hr with 40kg load. Vehicle has its self-weight of 30kg.

Keywords- electric go kart, PVC pipes, Plywood, DC motor.

I. INTRODUCTION

Karts which operate on Electric motor and DC Battery are called as Electric Go-Kart.Go-karts are running on gasoline, petrol or diesel engine which gives out emission of harmful gases and pollute the air and also makes sound pollution due to its louder noise. So to avoid these pollution & environmental issues we have designed the mini go kart especially for small children so that the can also have fun of karting without pollution. Also this mini electric go kart is made of light PVC structure & 10mm plywood which handles the weight upto 70kg and two high torque motors drive the rear wheels and give speed up to 15km/hr.

II. CALCULATION

For motor,

$$P = \frac{2\pi NT}{60}$$

Where,

N = Number of revolutions per minutes
T = Torque
P = Power

Assume,

N = 200rpm

$$P = \frac{2\pi * 200 * T}{60}$$

Consider,

Torque required fortwo-wheeler is 14 N.m

Maximum weight two-wheeler takes is 300kg.

P = 200W

Max. Weight mini go kart should handle = 50kg

$$\frac{300kg}{50kg} = \frac{14}{x}$$

300kg × x = 50kg ×14

$$x = \frac{50 \times 14}{300}$$

x = 2.33 N.m

Considering Factor of Safety,

F.O.S = 0.80

Required Torque for mini electric go kart,

T = 3.13 N.m

$$P = \frac{2\pi \times 200 \times 3.13}{60}$$

P=65.65Watt is required power of go kart motors

Then,
Circumference = π×Diameter of wheel

C = π×40.64

C = 125.6 cm

i.e. C = 1.256m

Motor speed = 200 rpm

Mini Go Kart travels distance of 251.2m after 200 rotations of wheel.

Speed of mini electric Go kart (S) =251.2×60

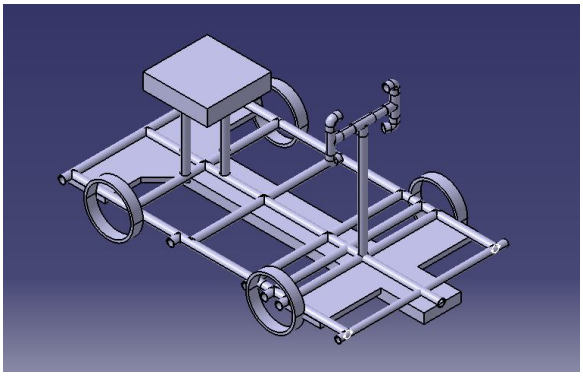
S=15,072m/hr
S=15.072km/hr

III. WORKING

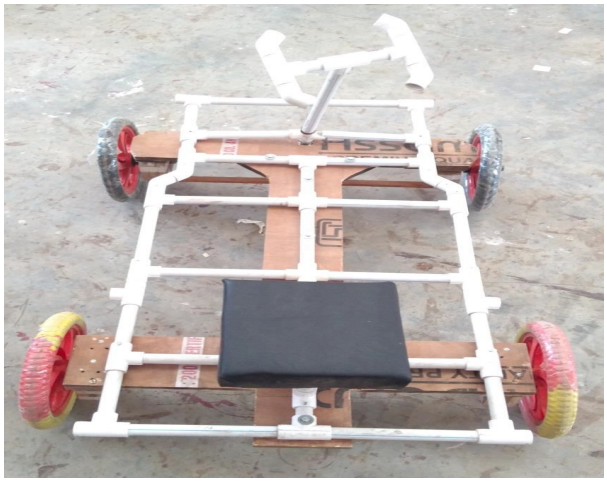
1) It consists of electric DC motor, speed controller and batteries. Electric motors is an electric machine which convert electric energy into mechanical energy
2) The speed of DC motors is controlled by speed controller.The electric motors produce rotary force to move the vehicle.
3) Battery is a device which consisting of electrochemical cells .It gives supply to motors.
4) First the full charged battery is mounted in the vehicle then the electric dc charge is transfer from the wire to the electric distributor and then the current is transfer to the on off button then to the speed regulator then the speed is regulated by the electric regulator.
5) Then the electric dc motor is connected to the speed controller and the shaft of the motor are connected to the wheels.
6) The rotational motion is transmitted from the motor shaft to coupling and to the wheel.
7) Thus by the torque created by the motor help to move the kart according to drivers wish which can be controlled by the steering.

IV. CATIA MODEL

Simple CATIA model of is shown in figure below:



V. ACTUAL MODEL



VI. CONCLUSION

1) A mini electric Go kart chassis of PVC pipes & plywood of 10mm thickness has been prepared for light and strong structure of mini electric Go Kart
2) Single seated mini electric Go kart has the maximum capacity of 50kg and we have to used factor of safety of 30kg so total weight the Go kart can handle is 70kg.
3) Two high torque motor give the speed of 15km/hr. With a 45kg human weight and 20kg vehicle weight.

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