Transmission System of Go-Kart

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***Abstract*- progressively costly positions of engine sports. Kart hustling is commonly acknowledged as the most monetary type of engine sport accessible. As a leisure time action, it very well may be performed by nearly anyone and allowing authorized hustling for anybody from the age of 8 onwards. Kart dashing is typically utilized as a minimal effort and generally safe approach to acquaint drivers with engine hustling. Numerous individuals partner it with youthful drivers, however grown-ups are additionally exceptionally dynamic in karting. Karting is considered as the initial phase in any genuine racer's profession. It can set up the driver for highs-speed wheel-to-wheel hustling by creating guide reflexes, Exactness vehicle control and basic leadership abilities. Moreover, it brings an attention to the different parameters that can be adjusted to endeavor to improve the intensity of the kart that likewise exist in different types of engine dashing.**

Index Terms- Transmission, go-kart, final drive sprocket, gear

I. INTRODUCTION

A transmission is a gadget or machine that comprises of intensity source and power transmission framework, which gives controlled utilization of the power. Frequently the term transmission alludes essentially to the rigging box that utilizes apparatuses and gear trains to give speed and torque change from a pivoting power source to another machine gadget.
The elements of a vehicle differ with speed: at low speeds, increasing speed is restricted by the latency of vehicular gross mass; while at cruising or greatest rates wind opposition is the overwhelming boundary. While switching gear, The motor torque is exchanged from one apparatus to the next ceaselessly, so giving delicate, smooth rigging changes without either losing force or yanking the vehicle.

II. DESIGN METHODOLOGY

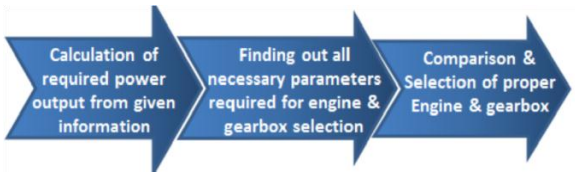

Fig.1. Methodology of transmission system

III. TRANSMISSION SYSTEM

A. Goals

The primary capacity of a transmission framework is to guarantee continuous development of the wheels with assistance of engine. The expectation for the transmission framework to be configuration was To accomplish greatest conceivable speed utilizing gears.

- To achieve maximum torque at the starting and continues.
- With a possible extent, to reduce the major and minor power losses.
- Selecting of components carefully to avoid the power losses and to overcome the above view.
- To achieve high torque at low rpm.
- To achieve high efficiency.

B. Engine Selection

A motor of a go-kart is typically a little one. About l00-200cc.so this kart, we utilize a HONDA SHINE Single Barrel 125cc 4-stroke oil motor, which creates about 10.30 BHP of intensity at 7500 rpm. We use 4-stroke motor since this is utilized for dashing and great mileage too.
We pick the HONDA SHINE 125 cc motor as per correlations with other

1. Engine Specifications

- Engine Type : 4 Stroke Single Cylinder
- Cooling: Air cooled
- Displacement: 124.73 cc
- Bore x Stroke:52.4 mm x 57.8 mm
- Compression Ratio:8.2:1

- Max Power:10.30 Nm @7500 rpm
- Max Torque:10.30 Nm @5500 rpm
- Ignition: digital twin spark ignition system

2. Clutch and Transmission

Gear Box: 5 speed constant mesh with the following ratio.

- 1st-3.076
- 2nd-1.944
- 3rd-1.473
- 4th-1.190
- 5th-0.95

C. Calculations

Final Drive Ratio (F): Obtaining a higher torque at the wheels is our priority, which means reducing the top speed. However it is a compromise because it reduces fuel economy.

Tire radius =(r)=139.7mm

S=118 Kmph

w= v/r =1235 RPM (At the wheels)

Engine RPM =1 0 redn Ratio x

5th gear ratio x F x SF=1.86,

Which is the final drive ratio.

Drive sprocket diameter =10.6cm

Shaft Diameter and

Angle of Twist Torque

At drive axle,

T=Engine torque x Primary Reduction Ratio x First Gear Ratio x Final Drive Ratio T=210.83NM

T/Working Stress=πd3 3

Considering a 30 mm dia.

Mild steel shaft, Working

Stress/Working Stress FOS

=2.28

Stress/Radius=Rigidity Modulus x Angle of twist=0.071 rad, or 4.06 degrees

The maximum speeds attainable by the kart in different gear

•Tractive force: umg

= 0.6*140*9,81

=824.04N

•Starting torque: FT*R

= 824.04*0.27

=225.786

•Velocity

=Engine rpm *wheel tire perimeter/gear Ratio*axle ratio

=9000*60*3.14*2*11*25.4*.000001/2*4

=118.4321 Kmph

IV. WHEEL ASSEMBLY

A. Introduction

1) Selection

Tires are the significant part which takes the heap of the vehicle and gives tractive powers to move the vehicle careful overview was made on the accessibility of various tires reasonable for a go kart .It was chosen to utilize standard go kart exchanged tires which accessible in the market which give better footing on dry and wet conditions. The back tires are more extensive and greater in measurement than the front tires as the heap is one-sided towards the back and to limit moving obstruction.

B. Goals

- To provide maximum grip at the tires.
- To transmit power from the shaft to the rear wheels with minimal power loss.

C. Front wheel assembly

Front wheel get together includes center points, and wheels. The arms are associated with the center which is associated with the wheels which is welded on to the undercarriage. The installation gives movability in caster point. The measurements are chosen to the point that there is no impedance between the directing segments and the skeleton in the dynamic condition. The 3D reproduction of the guiding instrument was done in the strong works

The measurements and the tendency of the controlling connection are chosen to the point that it holds fast to the kinematics of directing structured. It is intended to suit the wheel center and a positive stop is given to verify the center set up.

Tire	Standard go-kart traded tires
Wheel diameter	9”
Wheel width	3.8”
Rim diameter	4.5”

D. Rear wheel assembly

The rear wheel assembly comprises of a single shaft, hubs, bearing unit and wheels.

Tire	Standard go-kart traded tires
Wheel diameter	10”

Wheel width	6.90”
Rim diameter	4.5”

V. CONCLUSION

In this work, a detailed methodology of the virtual design and testing has been presented including the reasoning of using the materials used for the fabrication of the chassis and axle. Also, the reasoning of fabrication of new chassis design of go-kart which is different than the chassis design of the standard Go-Kart has been given and proven. Even if the entire process of design and testing proposed has shown interesting results but methodology must be still validated through dynamic experimental tests. This will allow the creation of mathematical model completely defined and validated, giving the basis of future developments regarding the optimization process of go-kart performance.

ACKNOWLEDGEMENT

We would like to thank our college, Lords Institute of Engineering & Technology, Hyderbad for providing us with moral support and different lab facilities. Also, we would like to thank the Head of Department (Department of Mechanical Engineering) Dr. Syed Azam Pasha Quadri We would also thank Mr. Mohammed Feroz Ahmed(Assistant Professor Dept. of Mechanical Engineering) and Mr. Ch Rajendra Prasad (Assistant Professor Dept. of Mechanical Engineering) for providing us with mentorship.

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