



**CHANDIGARH
UNIVERSITY**

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ELECTRIC GO-KART PROJECT

Subject Code - MER-256

Department - Mechanical (ME-1)

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Introduction

The Go-Kart is a vehicle which is simple, lightweight and compact and easy to operate. The go-kart is specially designed for racing and has very low ground clearance when compared to other vehicles. The common parts of go-kart are engine, wheels, steering, tyres, axle and chassis. No suspension can be mounted to go-kart due to its low ground clearance.

The JK Tyre National Karting Championship offered a real boost to the efforts the company undertook in taking the sport to the masses. The company introduced the discipline in 1997 and patronized tracks in seven cities across India and thereafter developed a karting series in 2000



Application of Electric Car

The first known electric car was built by chemist Robert Davidson in Aberdeen, Scotland, in 1837—48 years earlier than the first internal combustion car. Thomas Parker, an English inventor, built the first *practical* electric car in London in 1884 and started production soon thereafter.

Benefits of Electrical Transportation

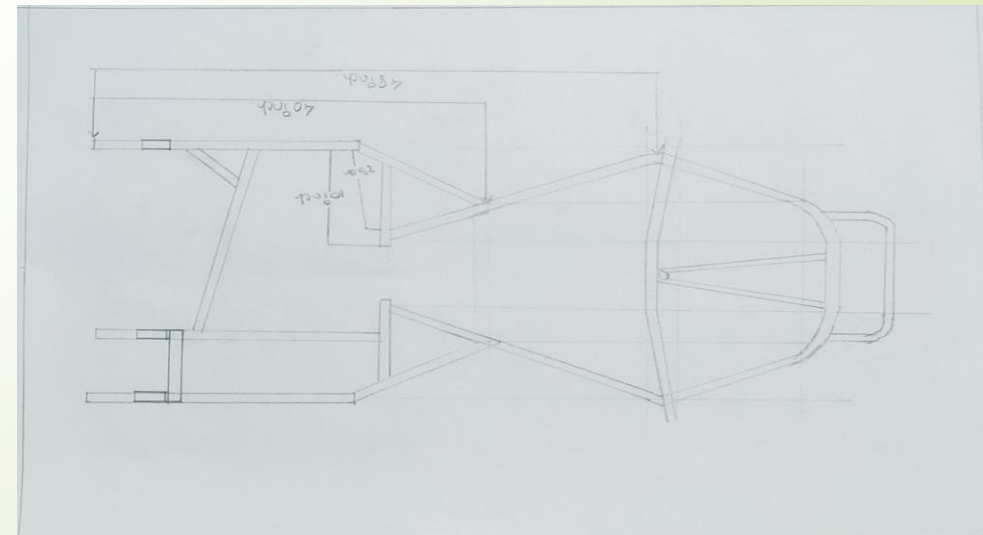
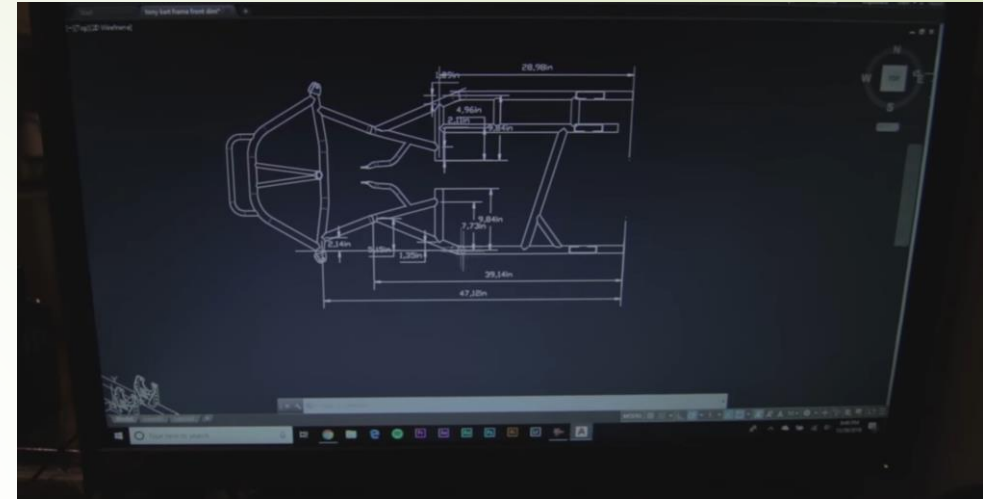
- 1) Reduced Pollution
- 2) Cost Savings
- 3) Economic Growth



Frame Design

The chassis of go-kart is a skeleton frame made up of hollow pipes and other materials of different cross sections. The chassis of go-kart must be stable with high torsional rigidity, as well as it should have relatively high degree of flexibility as there is no suspension

The tube/rectangular pipe used in the fabrication of the chassis or the other frames/supports may be seam or seamless. Minimum cross section must be 1 inch (25.4mm), for pipe it will be OD and for rectangular section or square section it will be its minimum height. Material certification is essentially required to be produced during the technical inspection



Frame Design

- 1) Rear Bumper
- 2) Front Bumper
- 3) Side Bumper
- 4) Chassis Material
- 5) Ground Clearance
- 6) 25.4 mm (1 inch)



Steering System

The steering system must be able to control (simultaneously) at least two (2) wheels. The steering system must have positive steering stops that prevent the steering linkages from locking up either in RH or LH turning

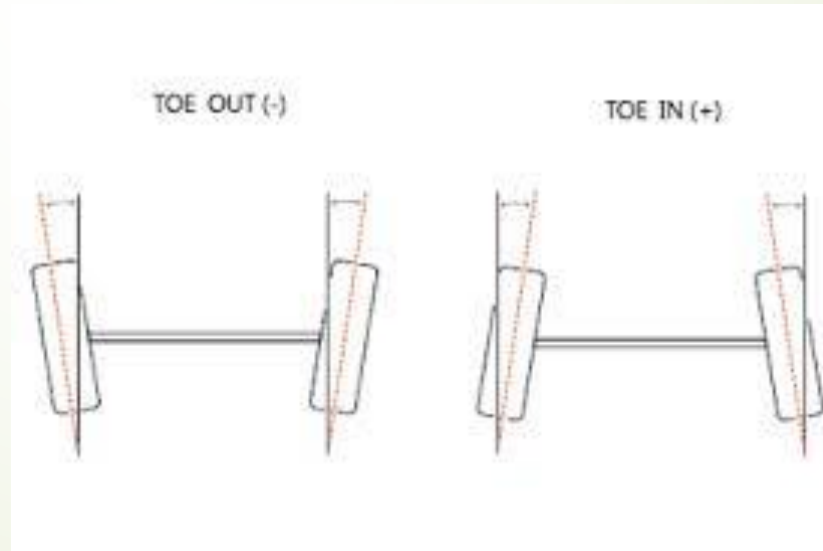
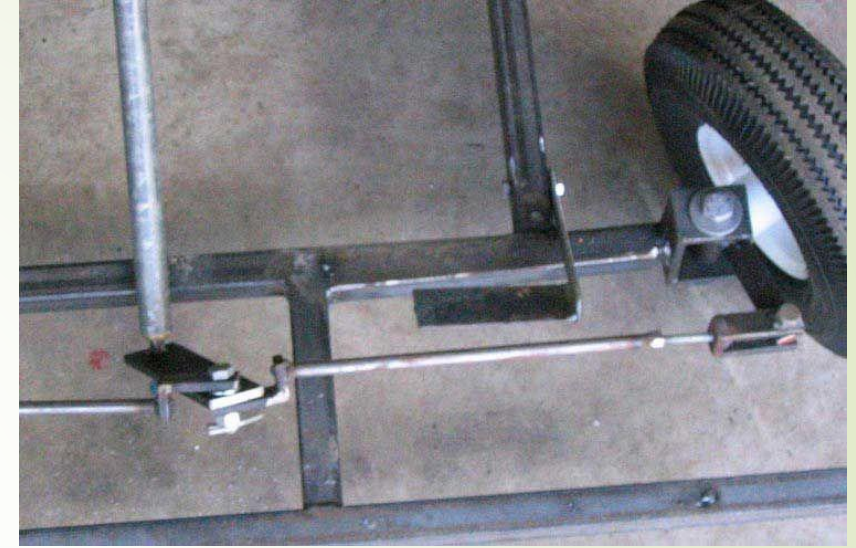
Toe angle

Toe angle is the angle that a wheels makes with a line drawn parallel to the length of the car when viewed from above

Negative and positive toe angle

- 1) Toe in
- 2) Toe out
- 3) Neutral

We used neutral steering system in go-kart



Braking System

Brakes are essentially a mechanism to change energy forms. When you are travelling at speeds your vehicle has kinetic energy. When you apply the brakes the pads or shoes that press against the brake drum or rotor convert that energy into thermal energy via friction

Types of brakes

- 1) Drum
- 2) Disc brake

We used disc brake in go-kart



About Battery

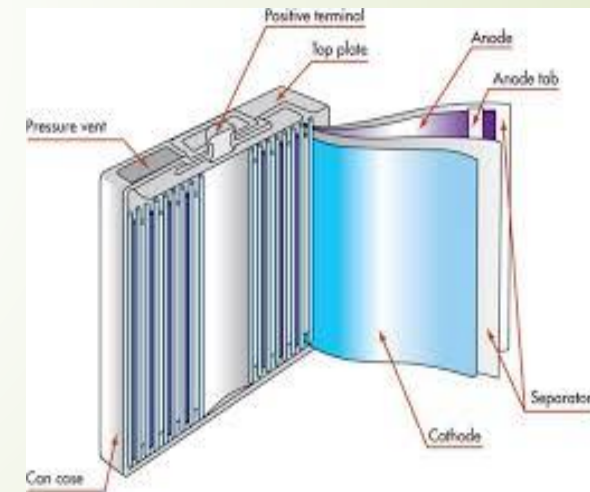
Batteries are a collection of one or more cells whose chemical reactions create a flow of electrons in a circuit. All batteries are made up of three basic component an anode (the '-' side) a cathode (the '+' side) and some kind of electrolyte (a substance that chemically reacts with the anode and cathodes)

We used $12\text{v} + 12\text{v} = 24\text{v}$ battery in go-kart

Lithium-ion battery

Batteries used in EV are generally lithium-ion based batteries because they offers a very high volumetric energy density and the energy to weight ratio is also high.

They can be recharged again and again for over a large number of times without any effect on the healthy of battery

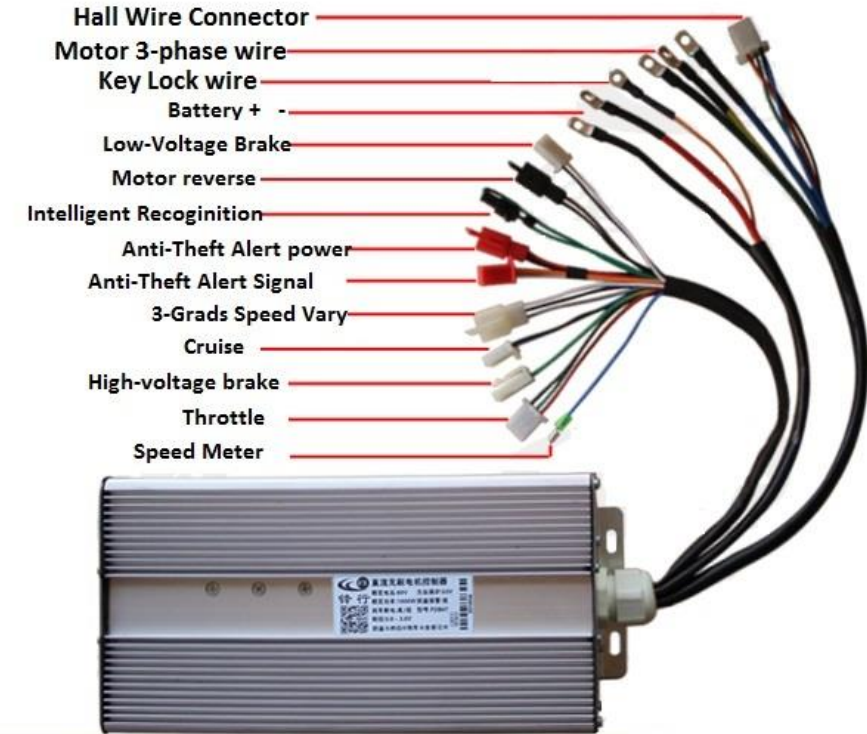


Speed Controller

The controller or electronic speed controller (ESC) is an electronic circuit that controls the speed of the motor in an electric scooter. It receives input from the throttle and precisely controls the flow of current from the battery to the motor. For most scooters, the controller also provides regenerative braking capabilities.

Types of speed controller

- 1) 250v (scooter)
- 2) 350v (bike) or (go-kart)
- 3) 650v (electric sport bike)



Important keys in speed controller

- 1) Battery
- 2) Motor
- 3) Throttle
- 4) Power lock (ignition)
- 5) Brake light
- 6) Indicator lights
- 7) Brake



Electric motor

Due to low inertia, BLDC motors have faster acceleration. BLDC motors have less weight. They can run at high speed than a conventional DC motor. They have many advantages like low cost, simplicity, reliability, good performance, long life.

We used Electric go kart motor BLDC motor, rated current: 42A. A Brushless DC motor requires less maintenance. The considerable power output of 2000W ensures its high working efficiency. Voltage: DC 48 V.

Brushed Vs Brushless Hub Motors



Wheels

A wheel is a circular component that is intended to rotate on an axial bearing. The wheel is one of the main component of the wheel and axle which is one of the six simple machines, wheels, in conjunction with axles allow heavy objects to be mover easily facilitating movement or transportation while supporting a load

Tire properties

- 1) Non-skidding
- 2) Uniform wear
- 3) Load carrying
- 4) Tyre noise

Dimension of tyre used in go-kart

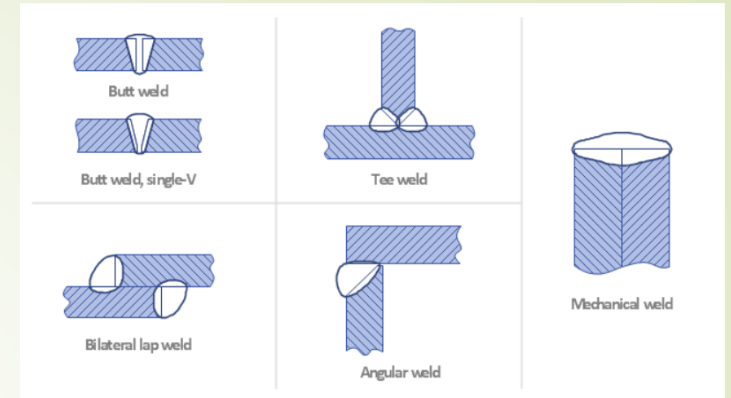
Front tyre is 10*4.5-5

Rear tyre is 11*7.1-5



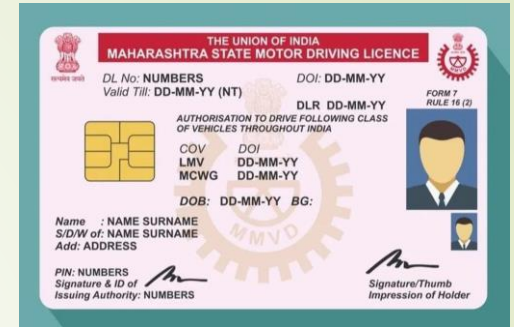
Manufacturing rules


- 1) Visibility Requirements
- 2) Path for wires and pipes
- 3) Pipe Bending
- 4) Pipe Joint
- 5) No sharp edges



Safety

- 1) Age-
- 2) Driver's License
- 3) Driver's Insurance
- 4) Helmet-
- 5) Fire Extinguisher
- 6) Seat Belt





Complete 3D Views

