



FABRICATION OF GO-KART

P.Manigandan¹

¹ Assistant Professor, Department of Mechanical Engineering, Kings engineering college, Chennai

S.Balaji², M.Munirathinam³, L.Siddharthan⁴,
Student, Department of Mechanical Engineering,
Kings engineering college, Chennai

Abstract: A go-kart is a small four wheeler run by I.C. Engine. It is miniature of a racing car. This go-kart is powered by Honda GX-160 engine. The chassis is made of steel tubes .A go-kart must be driven only on racing track. Kart racing usually used as a low cost and relatively safe way to introduce drivers to motor racing. Karting is considered as the first step in any serious

racer's career. The fabrication process of our go-kart is in such a way that it can attain good speed and acceleration. Even the breaking ability is considerably good.

Keywords: Go-kart, racing car, steel tube, fabrication, speed, acceleration.

1.Introduction:

Many motor sports are there in this world. Bikes, Cars, Formula one are examples of them. The drivers in these are very professionals and accurate. They can drive it very fast. But there are also motor sports which do not need professional drivers and need not much speed. The vehicles used are also less amount. Such a motor sport is Go-Kart. They resemble to the formula one car but it is not as fast as F1 and also cost is very less. The drivers in go-kart are also not professionals. Even children can also drive it. Go-karts have 4 wheels and a small engine. They are widely used in racing in US and also they are getting popular in India. Go-kart or kart is a small single seater, open, four wheeled vehicle without a traditional suspension. Karting is considered a very safe motorsport where risks of injuries are rare and generally non-life-threatening. Karting has always been seen as a gateway in become a professional racer in the higher and more expensive ranks of motorsports. Go Kart is a single passenger kart which is operated by an Engine. The Main Aim of our project is to increase the speed and to manufacture a vehicle which works efficiently in the growing fuel Area.

2.Literature review:

FABRICATION OF GO-KART, Abhishek O S, International Journal of Scientific & Engineering Research, Volume 7, Issue 4, April-2016 ISSN 2229-5518, Pg. No (491)

A Go-kart is a small four wheeled vehicle. Go-kart, by definition, has no suspension and no differential. 'Carting is commonly perceived as the stepping stone to the higher and more expensive ranks of motor sports. Kart racing is generally accepted as the most economic form of motor sport available. Kart racing is usually used as a low-cost and relatively safe way to introduce drivers to motor racing In addition, it brings an awareness of the various parameters that can be altered to try to improve the competitiveness of the kart that also exist in other forms of motor racing.

DESIGN AND FABRICATION OF A GO- KART, AritraNath International journal of innovative research in science engineering and technology, Volume 4, issue 9, September-2015 ISSN 23198753, PG.NO (9090)

A Go Cart also spelled as Go Kart is a four wheeled vehicle designed and meant for racing only. It is a small four wheeler run by I.C Engine. It is a miniature of a racing car. This report documents the process and methodology to produce a low cost go-kart. Simple but innovative,. The chassis are made of steel tube. There is no suspension therefore chassis have to be flexible enough to work as a suspension and stiff enough not to break or give way on a turn. We are replacing hollow tubular shaft with hollow rectangular shaft. The purposes of this replacement are; For the same length of tubular shaft, rectangular shaft weighs the same, for visual improvement, for better mounting ability



and the main thing is, it is found that hollow rectangular shaft has more bending stress than the tubular shaft.

DESIGN AND ANALYSIS OF HYBRID GO- KART, ALPESH V.MEHTA, International journal of Advance engineering and technology, Volume 2, issue 1, March-2011 ISSN 09763945, PG.NO (277)

Since last 2-3 decades the average temperature of earth increased by 3-40C because of the greenhouse effect. Due to increase in the fuel prices and continuously depletion of natural resources for the fuels causes fuel crises in the modern society. Due to which demand of development of newly energy efficient vehicles increases. The hybrid technology fulfil this requirement by incorporating various combinations of bio-fuels and also by combinations of highly efficient electric drive systems. Along with the same it reduces the emission and cut the fuel cost. This project illustrates an implementation of hybrid technology on a small scale. Project aims at improving the mileage of the car using simple mild parallel hybrid technology with combination of electric motor drive and the petrol engine drive. We have used the straight open kart chassis design. The results show that alone a petrol engine gives best 25Km/lit, alone a electric motor gives 12kms on full battery charge. The combination of above two gives 40Kms.

3. Main components of Go-Kart:

- Chassis or frame
- Engine
- Transmission
- Braking system
- Steering system

3.1 Chassis or frame: The chassis is an extremely important element of the kart, as it must provide, via flex, the equivalent of suspension to give good grip at the front. Karts have no suspension, and are usually no bigger than is needed to mount a seat for the driver. The chassis of a Go kart or also known as the Go kart frame is like a foundation that attached to the axles and holds the motor of the Go kart. It is crucial to have a good design of chassis that will give the Go kart better traction for the driver to maneuver especially diving in corners at high speeds. Hence, according to Walker (2005), the absence of conventional suspension in Go kart compare to a normal vehicle requires the chassis itself to be flexible as a replacement of the suspensions. Yet, the Go kart chassis has to be rigid enough to withstand the strains it might experience such as weight of the drivers. In addition, a good traction from a proper design will also have less vibration which resulting a longer chassis life span.

There are four types of chassis which are caged, open, offset and straight chassis. A caged chassis have a roll cage that surrounds and protect the driver in an event of a roll-over. It usually used for karting on a dirt track where the terrain mostly uneven. As for open, offset and straight chassis, it does not have roll cage. Offset and straight chassis simply differentiate from each other based on the different position of the driver. The chassis are made of steel tube. There is no suspension therefore chassis have to be flexible enough to work as a suspension and stiff enough not to break or give way on a turn.

Kart chassis are classified in the USA as 'Open', 'Caged', 'Straight' or 'Offset'. All CIK-FIA approved chassis are 'Straight' and 'Open'.

3.1.1 Frame material: Historically, the most common material for the tubes of an Go-Kart frame has been Carbon Steel. Frames can also be



made from aluminum alloys, titanium carbon fiber, and even bamboo and cardboard. Occasionally, diamond (shaped) frames have been formed from sections other than tubes. These include I-beams and monologue.

Materials that have been used in these frames include wood (solid or laminate), magnesium (cast I-beams), and thermoplastic.

The material used for the frame is ASTM A106 grade B as it is available in reasonable price and provide enough strength and safety to the driver. The hollow steel pipe is of diameter 30mm and thickness is 3mm

The chemical property of the material is

carbon	0.30%
Manganese	0.45%
Silicon	0.01%
Sulphur	0.012%
Phosphorous	0.023%
Nickel	0.02%
Chromium	0.04%
Molybdenum	0.077%
copper	0.044%

The physical property of the material is

property	metric
Tensile strength, ultimate	415 mpa
tensile strength, yield	240 mpa
Modulus of elasticity	2.1 mpa
Poisson ratio	0.3
Shear modulus	8.0786×10^5 pa
Elongation at break	30%
Bulk modulus	1.75 mpa

3.2. Engine: Go-kart can be run by both engine and motor. The Power is transmitted from the engine to the rear axle by way of a chain drive. An engine is a machine designed to convert one form of energy into mechanical energy. Heat engines burn a fuel to create heat, which is then used to create a force. Electric motors convert electrical energy into mechanical motion; pneumatic motors use compressed air and clockwork motors in wind-up toys use elastic energy. The word "engine" derives from Old French engine, from the Latin ingenium—the root of the word ingenious. In modern usage, the term engine typically describes devices, like steam engines and internal combustion engines, that burn or otherwise consume fuel to perform mechanical work by exerting a torque or linear force (usually in the form of thrust). Examples of engines which exert a torque include the familiar automobile gasoline and diesel engines,



as well as turbo shafts. Examples of engines which produce thrust include turbofans and rockets.

3.2.1. Engine specification:

Engine Type	Air-cooled 4-stroke OHV
Bore x Stroke	68 X 45 mm
Displacement	163 cm ³
Net Power Output	4.8 HP (3.6 kW) @ 3,600 rpm
Net Torque	7.6 lb-ft (10.3 Nm) @ 2,500 rpm
PTO Shaft Rotation	Counter clockwise (from PTO shaft side)
Compression Ratio	9.0 : 1

Dry weight	33lbs(15.1kg)
Lamp/Charge coil options	25W, 50W / 1A, 3A, 7A
Carburetor	Butterfly
Ignition System	Transistorized magneto
Starting System	Recoil Starter
Lubrication System	Splash
Governor System	Centrifugal Type
Air cleaner	Dual Element
Oil Capacity	0.61 US qt. (0.58 L)
Fuel Tank Capacity	3.3 U.S. qts (3.1 litres)
Fuel	Unleaded 86 octane or higher

3.3.Steering system: The steering of a Go Kart is very sensitive. Because of lack of a differential, a kart's natural direction of travel, forwards, is very difficult to change. However, the two rear wheels are attached by a solid axle, and must therefore move together, so in order to turn, one of the wheels needs to skid over the track surface. In this kart we use a special kind of steering system, disc and link mechanism. This mechanism with modification is widely used in racing cars especially formula one car.

Steering is used to control the vehicle. Our designed steering comprises of tie rod mechanism and no complicated mechanisms. It is easy for the driver to control the vehicle. It has steering wheel, a pipe column and tie rod setup. The most conventional steering arrangement is to turn the front wheels using a hand-operated steering wheel which is positioned in front of the driver, via the steering column, which may contain universal joints to allow it to deviate somewhat from a straight line

Steering box	Recirculating ball-and-nut type
Gear ratio	15.6-18.1
Steering angle, inside	$29^{\circ} \pm 3^{\circ}$
Steering angle, outside	$26^{\circ} 26^{\circ}$
Steering wheel diameter	300 mm
Toe-in	2-6 mm (0.079-0.0236in)
Wheel alignment	
Camber	1 degree (1°)
Kingpin inclination	9 degree (9°)
Caster	3 degree 30 min



Steering arrangement

3.4.Transmission system: Chain drives are popularly used in the automobile vehicles. We are using transmission chain and sprockets. It is also called as roller chains. A roller chains provides a readily available and efficient method for transmitting power between parallel shafts. They can be used for long as well as short centre distance. The transmission of power from Engine to the rear axle is made by the chain and sprocket assembly.



Chain arrangement

3.5.Braking system: An excellent braking system is the most important safety feature of any land vehicle. we selecting the disc brake system. The main requirement of the vehicle's braking system is that it must be capable of locking all four wheels on a track. A disc brake is a wheel brake which slows rotation of the wheel by the friction caused by pushing brake pads against a brake disc with a set of calipers.

The brake disc (or rotor in American English) is usually made of cast iron, but may in some cases be made of composites such as reinforced carbon-carbon or ceramic matrix composites. This is connected to the wheel and/or the axle. To stop the wheel, friction material in the form of brake pads, mounted on a device called a brake caliper, is forced mechanically, hydraulically, pneumatically or electromagnetically against both sides of the disc. Friction causes the disc and attached wheel to slow or stop.



Brake disc mounting



Master cylinder

4. Methodology:

List of steps followed





5.Conclusion: We fabricated our Go Kart according to the design given by the Design and Analysis Team for our own Project. We got better speed while comparing to other Karts. This Go Kart attained a very good speed when participated in the competition which was held in Andhra Pradesh during January 27th – 30th 2017. The acceleration, pick up and the brake system worked very efficiently. This Go-Kart is fabricated according to the rule book VKC-2017. The engine used in our Go-Kart is Honda GX-160 which was given by the competition organizers. Our Go-Kart ran for 2 hours continuously during the Endurance round in the competition.

6.Reference:

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