# Review on "Different cross-sectional traditional diamond shape structure bicycle frame"

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***Abstract*- In the twentieth century, in the alleged third universe of undeveloped and rising nations where four-fifths of our planet's six billion individuals live, bicycles and human-controlled machines in a large number of structures are presently the staple of individual transport. 80% or a greater amount of the present worldwide bicycle armada is in creating nations. Surge hour in, state, a foremost Indian city, with a huge number of bikes moving in steady streaming streams - many conveying whole families, or shocking burdens - is a sensational sight.**

**Present study gives a brief review on various aspect of Different cross-sectional traditional diamond shape structure bicycle frame.**

**Index Terms- Geometric Parameters, stain, framed cycles, simulations etc.**

## I. INTRODUCTION

For simplicity of make and progressing upkeep, a large number of these bikes are mechanically minimal not quite the same as those created c. 1910. Straightforward, emphatically made workhorse machines convey the greater part of the world's kin and light products. In the twentieth century, in industrialized nations, the bike experienced further sensational innovative advancement, yet its job in the public eye was influenced by two world wars, and significantly affected by the ascent of the automobile. Amid the 1914 – 18 and 1939-45 clashes general bike fabricating was suspended for creating war materials, however in times when petroleum and mass transportation were rare, bikes demonstrated more valuable than any time in recent memory.

### 1.1 Bicycle Frame Geometry

Generally bike outlines were works in different sorts of plan and geometry. It is on the grounds that, the bike was worked by the measure of clients and as per their determination. The cylinder size of the edge additionally has numerous factors of breadth and divider thickness. Likewise, the bicycle outline includes many sub structures as demonstrated the Figure 1.1

The head tube edge in the image is the point at which the head tube is to the ground. The head tube edge can be balanced by the style of riding and tracks, the more extreme head point, there is less exertion required to guide it which implies the bicycle has quicker controlling. While, the good-for-nothing head point will require more exertion to control it and the bicycle has slower directing. For examination of head tube plot for various bikes as precedent Touring bikes around 71-72 degrees, Road bikes around 73-74 degrees and Cyclocross or CX around 72-73 degrees. The directing can be quicker when the fork rake is expanded, while, the guiding turns out to be slower when the fork rake is diminished. It is plainly demonstrating that the head tube point and the fork rake as the estimation of the speed of directing. The Touring bikes have more rake than street and Cyclo-cross bikes to build their wheelbase length, give more toe leeway and to expand the forks comfort. The wheelbase length is the separation from the focal point of front tire to the focal point of back tire.

One of the more vital estimations on an edge bicycle is the chain-stay length. A more drawn out chainstay length is attractive to expand the wheelbase (making the bicycle increasingly steady) and to give abundant heel freedom from the panniers. Impact point freedom is particularly critical for riders with substantial feet. Chain-stay all the more precisely known as the back focus. This is the even estimation between the focal point of the back haggle focal point of the Bottom Bracket (BB). Short back finishes are

not really something to be thankful for in light of the fact that they make a bicycle circle out more effortlessly on trips and, in opposition to mainstream thinking, don't resist to corner. It is a confounded issue, yet together with the front focus, the chainstay length figures out where you are on the bicycle (focal, further back, further forward). There is no set in stone here, yet more noteworthy length can assist a bicycle with feeling increasingly stable slipping, and furthermore help hold the front end down when climbing. As a harsh guide, 450mm is the standard on most 29ers, 435mm on 650b bikes.

Top cylinder is additionally the principle geometry in the bike outline. Top cylinder can be partitioned into two classification which is Top Tube length (TT) and Effective Top Tube length (ETT).

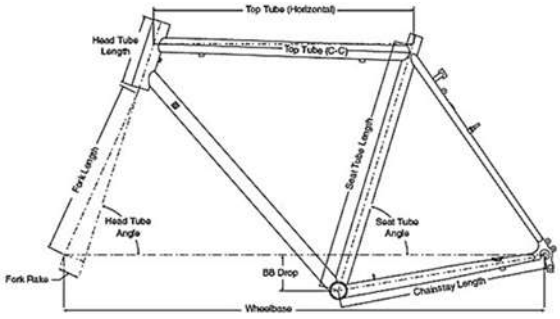


Figure 1.1 Basic Bicycle Frame

1.2 The Kinds of Cycles

Once there were nevertheless two essential sorts of bikes: sport bikes with drop handlebars and derailleur gears, and regular roadsters with level handlebars and center apparatuses. Game bikes sub-separated into two fundamental gatherings: lightweight racers without any decorations, and all the more firmly constructed tourers furnished with pannier racks and mudguards. Roadsters were overwhelming and generally highlighted a chainguard, mudguards, a bearer rack, and conceivably implicit lights and a prop stand. There were further sub-types inside every classification, except just a look at a bicycle was expected to comprehend its type and reason.

1.3The Elements of a Bicycle

A bike consists of the:

- Frame;
- Suspension (optional);
- Wheels (hubs, spokes, rims, tyres);
- Transmission (pedals, chain set, gear changers,chain, freewheel);
- Brakes;
- Handlebars, stem and saddle.

The frame carries the maker's brand name –Raleigh, Trek, Giant, Fisher, Cannondale, Condor, etc. – and the rest of the components are known as the specification. Some bicycle manufacturers make their own frames, others buy them from outside builders, and many do both. Frames vary in quality from crude through to ultra-fine, and are produced by firms that range from lone builders through to huge factories. Components are supplied by specialist companies, in various designs and quality grades. Some firms produce specific components such as rims or brakes; others produce group sets containing all the components of a complete specification. Group sets are identified by a name or model number, as in Campagnolo Chorus or Shimano 105, and are ranked by design and quality, or cost. Sources of components are diverse, but volume sales to bike manufacturers are dominated by the Japanese firm Shimano. Equipping frames with components from various sources is a method of manufacture somewhat unique to lightweight bikes; the majority of the over 110 million bikes produced each year are simple machines made in factories that are as self-contained as possible. Until recently however, a hand-made frame was a necessary prerequisite for a quality bike, and since this market sector was relatively small, specialization was inevitable. One person or outfit did frames, others did the bits. Nowadays quality frames are mass-produced, yet almost paradoxically, the growth in size of the market for good bikes means that specialization in components is still cost-effective. Enough bicycle manufacturers need, say, lightweight rims, to give capable rim manufacturers the sales volumes to realize greater cost efficiencies than a single bicycle maker might achieve.

## II-LITERATURE REVIEW

2.1 Back Ground

To achieved research objective, literature review of previous research is made to gain more information, technique and as a guideline for this research. The contents reviewed include the latest researches carried out by various researchers for the mechanical and property analysis for frame of bicycle.

2.2 Previous Researches

Bert Blocken; 2018 systematically investigates the drag discounts in pelotons of 121 cyclists. A biking peloton is the main organization of cyclists using closely collectively to lessen aerodynamic drag and power expenditure. Previous research on small companies of in-line drafting cyclists showed discounts all the way down to 70 to 50% the drag of an remoted rider at identical velocity and those values have also been used for pelotons. However, inside a tightly packed peloton with a couple of rows of riders imparting safe haven, large drag discounts can be expected. High-resolution CFD simulations are carried out with the RANS equations and the Transition SST-okay-ω model. The cyclist wall-adjacent cell length is 20 μm and the total cell rely consistent with peloton is sort of 3 billion. The simulations are tested by using 4 wind tunnel checks, which includes one with a peloton of 121 fashions. The effects display that the drag of all cyclists inside the peloton decreases in comparison to that of an remoted rider. In the mid rear of the peloton it reduces right down to five%–10% that of an remoted rider. This corresponds to an "equivalent cycling speed" this is 4.5 to three.2 instances less than the peloton pace. These results may be used to enhance cycling strategies.

Bicycles are concern to a huge range of hundreds at numerous locations across the frame. The first posted measurement of hundreds applied to a bicycle befell in 1968 with Hoes et al measuring pedalling masses the use of stress gauges established on the pedal and crank of a bicycle ergometer. Since then, hundreds had been measured across the bicycle on the pedals/cranks, handlebars, saddle/seatpost and hubs in the lab environment as well as outside (consisting of each on and off-street conditions). Most generally, these masses were measured not directly using stress gauges, with other strategies used such as cine-movie evaluation, piezo-electric powered pressure sensors, force platforms and Hall effect pressure transducers.

Motor motorcycle is the only famous transportation in Indonesia. Due to required gasoline as an strength source, it will become unfriendly to the environment. Nowadays peoples start to understand; pedal bicycle is right for fitness and surroundings-pleasant. To build bicycle to work in each day tradition isn't always easy. An electric powered vehicle for transportation is the great invention to increased transition from motor motorcycle culture to emerge as bicycle to work way of life. Electric bicycles and motorcycles have emerged as a probable manner of enhancing the transportation gadget sustainability.

Sukmaji Indro Cahyono; 2017 offers a simulation Finite Element Analysis (FEA) model of electrical trike frames. The model of electric trike frame is a general bicycle body with addition modification at the again facet for battery percent factor and passenger hundreds. The electric powered motor is driven to put in front wheel for smooth renovation. Due to gain maximum safety inside the passenger vicinity and smooth assembling, the body is manufactured via round steel tube inside the front facet and rectangular metal tube within the again side. FEA simulation has been investigating right model based on metal tube profile. The profiles are circular and oval metallic tube 1.65mm thickness, (1, 1 ½, and 1 ½) inch diameter in front and rectangular metal tube 2 mm thickness, (30x30, 40x40 and 50x50) mm size in the back. The aid tube of the electric bicycle body is similar to the National Standard street bicycle (SNI). The validation of this simulation is the use of experiment technique and adaption method for optimizing new release time and accuracy. The result of the simulation is a element of safety. Von misses strain distribution from simulation result is showed the critical are in becoming a member of tube below driving force of the body structure. The oval tube is reached safety aspect higher than the circular tube, and it's had a better overall performance towards the vertical load. The nice variable is variable three oval tube fifty six.6x40 mm diagonal size with 1.Sixty five thickness. Its maximum passenger load is 700Kg. It may be a advice to remodel destiny frame of the electrical bicycle.

The spearheading endeavors to decrease drag of a plane wheel with spokes is checked on first. This assemblage of early information demonstrates the significance of the shape factor, D/d, i.e. proportion of wheel-to tire width. Two bike wheels having diverse shape factors are tried. Splitter plates of 2d and 4d length are fitted. Some decrease of drag coefficient is discovered just for 2d splitter plate. The little viability of splitter plates is ascribed to feeble vortex shedding from the wheel. The full-length splitter plate going about as a circle expands the side-constrain multiple times in examination with that of

the exposed wheel. Comparative tests are done on a bike outline fitted with splitter plates. The drag decrease is observed to be minor. Once more, it might be contended that vortex shedding from all individuals from the edge is feeble. (M.M. Zdravkovich)

## III-CONCLUSION

The following observation has been found out on the basis of previous research papers;

1) It has been observed that the shear force generation in the circular cross section frame is more compare than the other sections frame. The shear force generation is minimum in oval cross-sectional frame, which can be favorable condition.
2) The oval cross-sectional frame shows the less bending moment compare then the other.

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