

International Journal of
Engineering Research and Science & Technology



ISSN : 2319-5991

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The Multi-Purpose Bike

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Abstract-

A multi-work tricycle is the way of the future for cycling, because its style is both unique and traditional. In both urban and rural areas, you may travel short distances on a tricycle, which is also known as a trike. In addition to being more comfortable, the price is cheaper. Mammals are usually the ones that do the driving. Loading and unloading products is also accomplished with classic tricycles, which use outdated technology. The designers have created a space-efficient, lightweight option. As an additional option, you may try pedalling the rear wheel. The first tricycle designs used a configuration called a Deltatrike, which had one front wheel and two back wheels. This design had stability problems while turning at high speeds. The absence of care or lower centre of gravity gives it great stability. This tricycle system is sturdy and long-lasting since it prioritises efficiency and space. Before anything else, make sure the trike is stable and big enough to keep the passengers safe. Motorbikes should not be too large since streets are not made for them. Standard tricycles and cars are notoriously shaky in corners, which increases the likelihood of accidents caused by tire slippage and rollovers. The amount of accidents caused by the slip-and-roll phenomenon might be reduced with the installation of a lowering mechanism in three-wheel vehicles. The tilting technology not only makes riding more comfortable, but it also provides better directional and dynamic stability, as well as better braking performance. Our team has built a tricycle with a steering mechanism and a suspension system that uses coil springs. Using

Solidworks, we constructed the tilting mechanism; we aimed for simplicity, efficiency, and scalability in our design. The tilting mechanism may be fastened to the tricycle's mainframe with ease. We have included a coil spring suspension system into our idea to enhance traction, braking performance, passenger comfort, and safety while keeping the designs basic.

Keywords-Transit, Bicycle, Growth, and Stopping Power

INTRODUCTION

The tricycle, a three-wheeled vehicle propelled by pedals, was invented in 1789 by two French inventors. For most developing nations, transit is the backbone of their social and economic infrastructure. The need for passenger and goods transport becomes increasingly intricate and challenging to provide as a city's size and population increase. Therefore, create a new tricycle design.

This tricycle is more efficient than others. You may utilise a multiwork tricycle for a lot of different things, including transporting items and carrying baggage. A tricycle's size can be adjusted based on its intended use. Mild steel is used to make it. It may be used for transportation, fitness, and shopping. This tricycle, sometimes known as a tadpole trike, has three wheels: two up front and one in the rear. The first is that you can enlarge the tricycle's backshaft to accommodate greater room, and the second is that you can detach the front wheels to carry heavy baggage more easily. It is quite helpful and easy to use. In the tricycle project, human muscles are the sole source of energy. I love how solid and simple it is to use. Innovative designs for the maximum loading 60 kg on integrated lock basket. Compared to other tricycles, it is more stable, has a lower centre of gravity, and requires less care.

**Fig-1**multiworktrike**1.1 NORMALTRIKE**

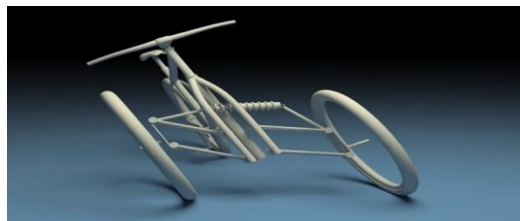
It looks like a keatadpole or delta, and it's a three-wheeled vehicle with either one front wheel and two rear wheels or one front wheel and one rear wheel. In contrast to the tadpole trike, which has two wheels in front and one behind, the delta trike has one wheel in front and two behind (as seen in Figure). The huge

turning radius makes the delta turbines more manoeuvrable than the tadpole turbines. Equal to the wheelbase is also the turning radius. With a larger centre of gravity, the Tadpole is more stable during a trade strike. Additionally, compared to delta trike, the building of tadpole trike is straightforward.

Which trike is right for me?**Fig-2**Deltatrike&Tadpoletrike**1.2 TILTINGTRIKE**

A tricycle is a three-wheeled vehicle that can tilt like a motorbike or moped, which is a great manoeuvre for corners. The tilting feature offers superior stability compared to a regular tricycle. A Lewis-bone suspension system

with a joint-shaft base at an angle is similar in construction to the tilting mechanism. It simplifies construction, makes the ride more pleasant on tyres, and improves braking performance owing to more wheels on the front side.

**Fig-3**Tiltingtrike

2. PROBLEM ANALYSIS

2.1 MORE SPACE

In the available tricycles, the space is not enough to transport extra luggage and goods.

Then make a different type of tricycle for more spacing and more stable.



Fig-4 Morespace

2.2 LARGER TURNING RADIUS

The centrifugal force and the vehicle's tilting system increase the inner wheel and the vehicle's chances of rolling out of control while the vehicle is

turning at a speed of 30 kmph. Larger turning radius is necessary to prevent this issue, however it is restricted to the set speed limit for this tricycle.

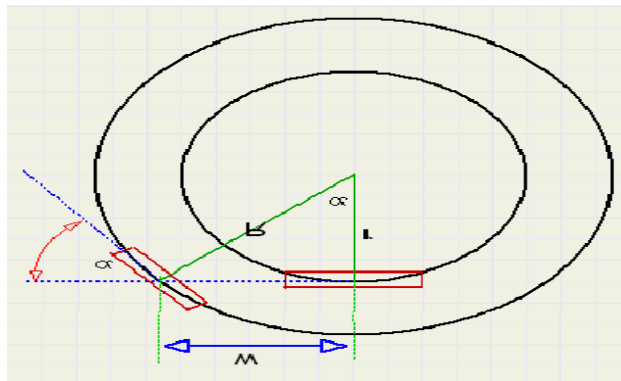


Fig-5 Turning radius with or without tilting

3. METHODOLOGY

The use of two sets of gears on a single axle allows the rear wheel of a tricycle to grow. This is one of three such ideas. The height of the centre of gravity should be less than half of the track width and less than the distance to the front axle in order for it to be stable.

3. The vehicle will be most stable at all speeds and its turning radius will be maximised if the centre of gravity is at the front.

4. DESIGN

The tadpole type has been considered for the design of the tilting mechanism of the tilting trike because it is more stable than the delta type and has greater space for transportation needs, and its construction is simple. Finding the track width with the wheelbase and the chain mechanism for transferring the rear wheel of the tricycle is the first step in creating the trike. The motorcycle's misaligned tilting

mechanism was caused by the wheelbase's 1230 mm. It was from the concept of the crossover bike that the idea for the multiwork tricycle came to be at the end of 2017. The motivation to create a sustainable mobility alternative to the car is the scope of this studies. Different models of bikes can be equipped with suspension tricycles and convertible bikes.

**Fig-6**Designing

5. MACHINING OPERATIONS Milling Turning and Phasing Drilling, Boring, Welding (MIG). Screw Thread cutting.

6. OBJECTIVE

The main objective of our project is to create a tilting trike for transportation purposes by adding a tilting mechanism in a normal tricycle with better stability, comfort and good braking and performance.

- Work faithfully below completely different operating conditions.
- Decrease the value of trike.
- Decrease efforts by using double gears.
- Simply the main purpose of this tricycle is more spacing.

7. WORKING PROCESS

The tricycle uses a common propulsion mechanism consisting of a pedal on a crank and

ring around a crank gear that is connected to sprockets by a chain that drives the rear wheel of the trike.

- The rear wheel of the multiwork trike can be folded out sideways with one simple movement without any tools.
- This creates space behind the saddle for loads as luggage.
- And this creates separation between front and back wheel according to use.
- The multiwork trike is a unique means to transport that fits completely.

Parts software life cycle
7.1.1 HANDLING

Appearing is a part of the machine that limits the relative motion of the shafts and lessens the friction between them. By reducing friction caused by relative

motion, for example, many bearings make the prescribed motion as easy as possible. The direction of the evaluation, the kind of operation, and the emotions permitted all have a role in the general classification of bearings.

8.1.1 TYPES OF BEARING • Ball bearing

- Roller bearing • Jewel bearing • Fluid bearing • Magnetic bearing • Flexure bearing

8.2 SUSPENSION Mechanism

To dampen the effects of shocks and passive springs for impact absorption, most traditional suspensions include dampers or shock absorbers. To store energy and sustain a force between contacting surfaces, a mechanical device known as a coil spring is often used. The material is elastic and forms a helix shape; when not in use, it returns to its original length.

Cycle tyre 8.3

There is a type of tyre that fits onto the wheel of a bicycle. All vehicles will even be able to use them. Tyres on bicycles provide a great deal of the suspension and friction forces needed for riding, as well as the lateral forces required for turning and reconciliation, and the longitudinal forces required for moving forward and stopping.

7. BENEFITS

- Portable.
- Minimal in size. Plainly comprehensible and readily extensible.
- Chains and gears that are mechanically simple.

There is greater stability on a tricycle than on the typical two-wheeled bike. It has more space is my company. It is safe to turn due to the due-to-tilting mechanism.

Section 10: Use

- It is utilised in the field for regular people to drive, to travel about the campus on the pavement. It is the most useful for the small size box with a

weight of about 60 kg for shipping.

- It may be used to carry materials without the need for fuel.
- It may be used for regular transportation and even for people's everyday needs.

11. Cautionary Notes

- Needs to be handled carefully. Overuse of muscles is a potential risk. Put sixty kilogrammes into the basket. Travel at a maximum speed of around 20 km per hour.

CONCLUSION

We used chain and gear systems to run this tricycle, making it the most practical and cost-effective solution for our project. You can get the materials needed to build this tricycle just about anywhere. Getting about town is when this trike really shines. Stylish, uncomplicated, and wonderfully cozy—that is what it is. These tricycles are great since they don't need a lot of physical effort to ride. In comparison to other bicycle options, the tricycle is more budget-friendly. That being said, more research into the most comfortable and functional hand cycle designs for different types of riders is necessary. Not only should the interior space be optimised to assure excellent mobility, but users' overall work capacity should be maximised and vehicle mechanical loss should be further reduced. The current uptick in manufacturing of crank-propelled cycles in industrialised countries has the potential to assist a wide range of individuals, not limited to young and athletic tricycle riders.

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