

# Manufacturing Trike-the Helper

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**Abstract:-** This paper related to automobile sector. India's population 127, 42, 39769 and growing. Apr 8, 2014 - India has an youth demographic 65% of its population. Census 2001 has revealed that over 21 million people in India as suffering from one or the other kind of disability mainly injured from leg. This is equivalent to 2.1% of the population. April 1,2011 it increased to 3%. Dec 29, 2013 - The country's disabled population has increased by 12.4%, most of the causes for accident. Some Facts about Persons with Disabilities Around 15 per cent of the world's population, or estimated 1 billion people, live with disabilities Often employers assume that persons with disabilities are unable to work due to lack of their leg condition. This paper deals with development and manufacturing of Trike-The Helper with minimum cost. The report presented here gives detailed overview of making of the Special purpose vehicle. This report touches to numerous aspects of engineering, which has been covered in the curriculum of Diploma and UG programs of Mechanical and Automobile engineering. The report is compiled with a simple and easy to follow approach for building up of a vehicle.

## I. INTRODUCTION

An effort is taken to develop and manufacturing a Special purpose vehicle for handicapped people. The report presented here gives detailed overview of making of the Special purpose vehicle from old vehicle. The report touches to numerous aspects of engineering, which has been covered in the curriculum of Diploma and UG programs of Mechanical and Automobile engineering. The report is compiled with a simple and easy to follow approach for modification up of a vehicle. The manufacturing of assembly and subassemblies are elaborated using photographs and video clips whenever required during the process. Report covers detailed manufacturing scheme of selected critical components. Total cost of production is been calculated as per the available. We have also given my suggestions to future development of vehicle and some findings which may be helpful for the customer using the set-up. Reader's views, observations, constructive criticism and suggestions are welcome.

## II. PRESENT VEHICLES:

Present vehicles for handicapped people are either hand operated or motorized. The major problem faced in hand operated trike is very large amount of human effort is needed to drive it.



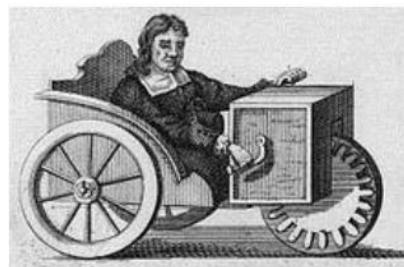
In motorized trike at present conditions available trikes are very costly. The height of trike is also more for some handicapped peoples. The main thing is they do not have a reverse gear. Such types of many problems are faced in trikes available.



The available motorized trikes in the market are very heavy in weight. They are not specially designed and produced for handicapped people. Many people cannot afford them.

## III. LITERATURE SURVEY

*History*



Stephan Farffler's hand-controlled three-wheeled wheelchair



19th century tricycle used in Iran

A three-wheeled wheelchair was built in 1655 or 1680 by a disabled German man, Stephan Farffler, who wanted to be able to maintain his mobility. Since he was a watch-maker, he was able to create a vehicle that was powered by hand cranks. In 1789, two French inventors developed a three-wheeled vehicle, powered by pedals; They called it the tricycle. In 1818, British inventor Denis Johnson patented his approach to designing tricycles. In 1876, James Starley developed the Coventry Lever Tricycle, which used two small wheels on the right side and a large drive wheel on the left side; power was supplied by hand levers. In 1877, Starley developed a new vehicle he called the Coventry Rotary, which was "one of the first rotary chain drive tricycles." Starley's inventions started a tricycling craze in Britain; by 1879, there were "twenty types of tricycles and multi-wheel cycles ... produced in Coventry, England, and by 1884, there were over 120 different models produced by

20 manufacturers." The first front steering tricycle was manufactured in 1881 by The Leicester Safety Tricycle Company of Leicester, England, which was brought to the market in 1882 costing £18. They also developed a folding tricycle at the same time.

Tricycles were used by riders who did not feel comfortable on the high wheelers, such as women who wore long, flowing dresses. In the UK, upright tricycles are sometimes referred to as "barrows". Many trike enthusiasts in the UK belong to the Tricycle Association, formed in 1929. They participate in day rides, tours, time trials, and a criterium (massed start racing) series. A delta tricycle has one front wheel and two rear wheels. Tadpole A tadpole tricycle has two front wheels and one rear wheel. Rear wheel steering is sometimes used, although this increases the turning circle and can affect handling (the geometry is similar to a regular tricycle operating in reverse, but with a steering damper added). Other Some early pedal tricycles from the late 19th century used two wheels in tandem on one side and a larger driving wheel on the other. An in-line three-wheeled vehicle has two steered wheels, one at the front and the other in the middle or at the rear.

#### IV. METHODOLOGY

1. Finalizing Problem Statement
2. Collection of past data
3. Finding best possible solution
4. Fabrication of vehicle
5. Testing for performance

#### V. EQUIPMENT REQUIRED

1. Tool box
2. Hand Drill
3. Chopsaw Cutter
4. Hand Grinder
5. Bending Machine
6. Vice
7. Round File
8. Grinder
9. Welding Machine
10. Allen key set

#### VI. CONSTRUCTION PROCESS

1. Finding suitable vehicle.

- A vehicle which can sustain the weight of the rider as well as it should have the driving comfort.

- It should not have the gears but the belt drive engine.

- It should be light in weight and economically stable.

We found all the specifications in Honda Activa which is an 100cc scooter. Hence we bought old activa and started our work on it.



2. Strip down of vehicle

-Firstly we removed all the excessive heavy body panels.

-Then we removed the stock silencer of the vehicle which was heavy.

-We removed the stock handle bar accessories and the handle bar.



3. Making of front chassis.

-We bought Iron pipe which is 3mm thick and 20 mm diameter for fabricating front chassis.

-We cut that pipes according to required dimensions and bended it.

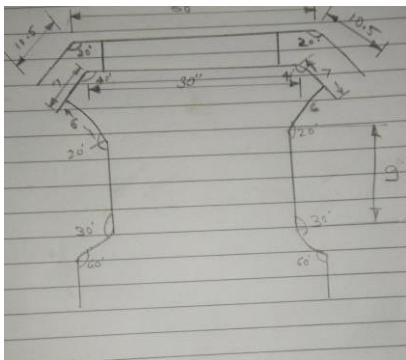
-Then we assembled it according to the design and welded it.

-The front chassis was constructed.



#### 4. Design and Fabrication of Chassis.

- Firstly we cut the pipe as per dimension and then bended the same.
- By arranging the frame design we welded the frame.



#### 5. Welding front chassis to body.

- We adjusted the welded frame to the body of the moped.
- Then we added support for the frame.
- Lastly we found all the corrections and finally the frame was welded to the body of moped.



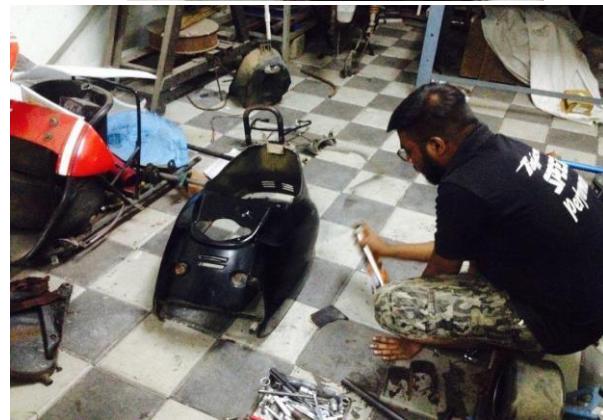
#### 6. Body Fabrication.

- For covering of engine components and the frame. The covering panels was essential to cut as per our requirements.
- We marked on the panel of old activa, and as per marking we cut the panel with the help of hand grinder.



#### 7. Painting and finishing.

- For aesthetic look, painting and finishing is essential.
- We used spray paints for coloring the panels and rims of tyre.



#### 8. Completed Trike

- Atlast we fabricated and connected the steering linkages.
- Rear Brakes were installed.
- Battery and other electrical connections were made.



#### Features Required In New Vehicle

The vehicle produced will be working on a moped engine.

1. Fuel used will be CNG and petrol so that it will not harm the environment.
2. It will have low center of gravity so that the vehicle will be stable while taking turns.
3. The engine will be equipped with K&N Air filter and free flow exhaust for better performance.
4. The vehicle will have 2 wheels at front which will give more stability to vehicle.
5. It was manufactured with very less cost and from most of the waste material

#### VII. EXPENDITURE

Sr. No.	Item details	Amount
1.	Engine Cleaning	70
2.	Activa 2002 model	6000
3.	Throat Cable (2)	340
4.	Petrol Bill (2)	130
5.	Kick gear	100
6.	Bearing	240
7.	Cutting Tool	120
8.	3mtr wire and 4 LED strip	52
9.	MS pipe (20ft)	600
10.	Engine Oil	280
11.	Spark Plug, M-seal and Bond	100
12.	Bearing (2), Aalen key and shaft (2)	265
13.	Grinder Tool	20
Total		8317

#### VIII. CONCLUSION

After completion of this project we successful to achieve following points

1. Successful to develop best suitable vehicle option for disabled person.
2. Fabricated the vehicle within minimum cost.
3. Vehicle with light in weight so too easy to handle.
4. Front two wheels provide more directional stability.

#### IX. FUTURE SCOPE

1. This vehicle can be improved in future by using different covering structures which can be useful to modify its aesthetic look with certain adjustments.
2. Presently the vehicle can run on petrol, which can be modified for CNG or electric motor,
3. This concept can also be used for other model vehicles.
4. Many more sensors can be added to the trike such as speed sensor, automatic braking sensor, Automatic night lamp sensor etc.
5. It can be coupled with a reverse drive so that the person driving it will able to reverse it without any problem. An electric motor will be coupled with the rear drive for reversing. Also when the motor is not implemented it will produce energy and store it in a battery.

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