

## DESIGN OF TWO WHEEL AUTOMATIC ELECTRIC FORKLIFT FOR INDUSTRY WAREHOUSES & DOMESTIC PURPOSE

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**Abstract:** The two Wheel Automatic Electric forklift is a small electrical vehicle designed to build a cheap forklift for industry warehouses & domestic purpose. A goods transportation device which can drive by any one. Safe movement during picking, stacking and traveling with loads. The dynamics of the vehicle is simple to the control the vehicle which means that it is stable. This is prevented by two small supporting wheels for balance the vehicle and its time derivative, controlling the motors to keep the vehicle balancing. This kind of vehicle is interesting since it contains a lot of technology relevant to an environmentally friendly and energy efficient transportation industry. The rider controls are supposed to be natural movements; leaning forwards or backwards and the direction of the vehicle is obtain by giving the DC supply only one motor  
**Keywords:** Lower Frame, Upper frame, Fork, Carriage Support rod, Axle Shaft

### I. INTRODUCTION

Factories, industries and storage go downs need forklifts and cranes for storage and moving large goods. Also there are a number of goods weighing around 40 – 60 kg that are comparatively lighter but cannot be moved around easily by human labor. To fill this need we here propose a 2 Wheel Automatic Electric forklift to lift and transport such medium weight goods across factories & industrial warehouses.

The 2 Wheel Automatic Electric forklift is a fast, efficient and low power consumption vehicle that does not require much space to move around. The mini forklift will run on 2 Brushless DC motors and can drive small weight with pickup arrangement across small distances easily. For this we use a mini 2 wheel vehicle body frame designed with a platform with 2 motorized wheel mounts. It has a perpendicular handle ahead to hold on the operator.

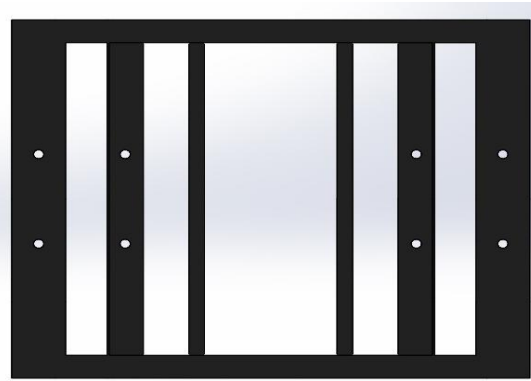
Also we design a forklift type mechanism on the front handle of vehicle using 2 bent metal strips and lifting mechanism. The lift mechanism comprises of large supporting rod for sliding the carriage. This mechanism is connected to a linear actuator. We now mount the control circuitry on the vehicle with wires that allow the vehicle to be controlled by person.

Thus we provide a easily controlled forklift for small goods transportation in industrial sector. The demonstration version can lift 40-60 kg to demonstrate the concept.

### II. DESIGN PARAMETERS

#### (a) Lower Frame

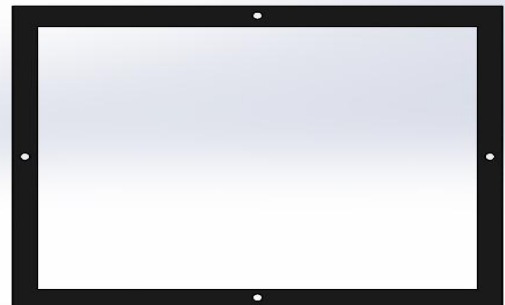
It is the main part of the chassis in which hub, motor and actuator are fit. It is made by using rectangular pipes.



#### Specification

• Length	500 mm
• Width	400 mm
• Height	25.4 mm
• Hole diameter	4 mm

#### (b) Upper Frame



#### (c) Carriage support rod

The purpose of using the carriage support rod to give the guidance for movement of the carriage when lifting the load. It gives the smooth sliding of carriage upward and downward direction.

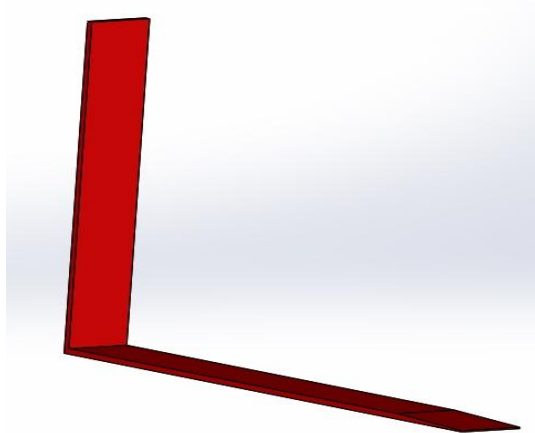


Specification

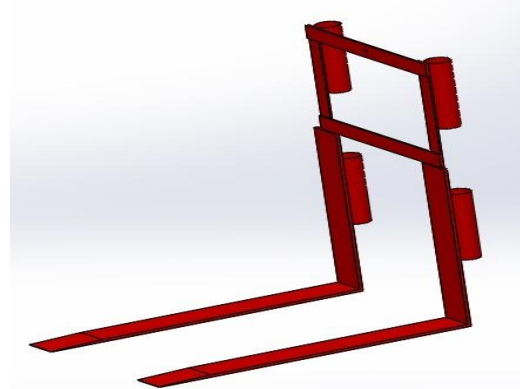
- Length 300 mm
- Height 800 mm
- Width 90 mm
- Outer diameter of rod 25 mm
- Inner diameter of rod 16 mm

(d) Fork

The fork is the main part of the forklift. It is used to pick up the goods from one place to other place. These are two bend strip made by iron. The face of the fork of is very sharp and tapered.



- Iron Strip width 20 mm
- Gape b/w Upper & Lower strip 118 mm
- Outer dia. of pipe 28 mm
- Inner dia. of pipe 26 mm

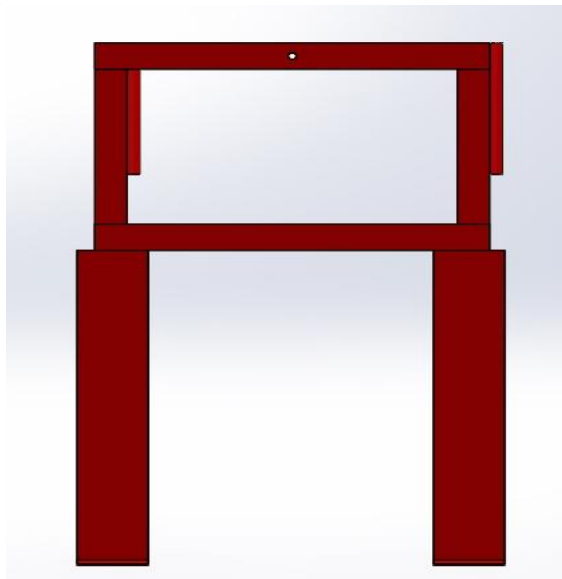


Specification

- Length of fork 360 mm
- Width of fork 44 mm
- Height of fork 240mm
- Thickness 4mm

(e) Carriage

Carriage is used to support the forks. The fork are fitted on the carriage. It is made of iron strip having thickness 20 mm. It also use the four hollow pipe which is slide on the carriage support rod.

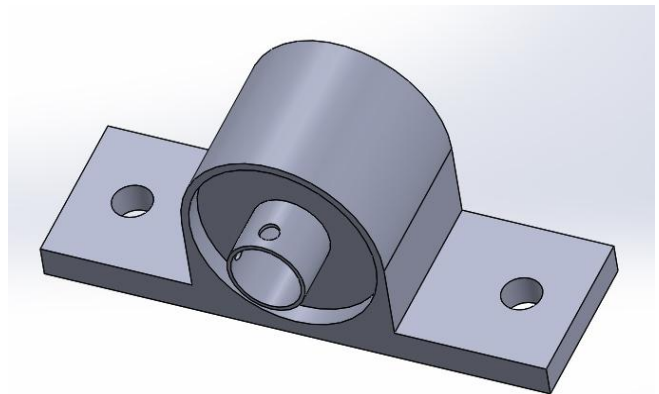


Specification

- Length of carriage 290 mm
- Width of carriage 245 mm

(f) Hub

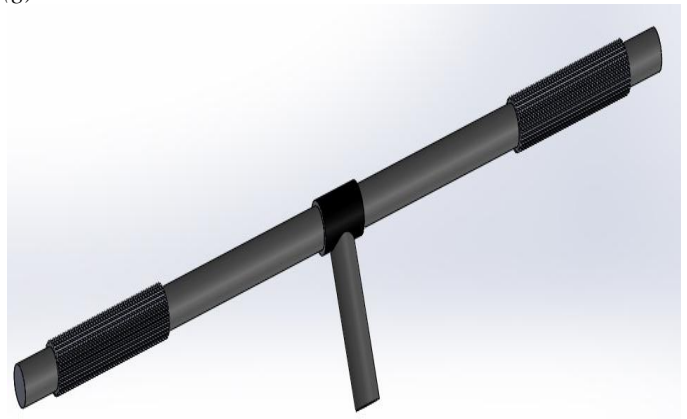
A hub is the central part of a wheel that connects the axle to the wheel itself. Many expressions use the term for a literal or figurative central structure connecting to a periphery. In the construction of the forklift 4 hub are used.



Specification

- Length of hub 130 mm
- Width of hub 40 mm
- Height of hub 60 mm
- Outer diameter of bearing 52 mm
- Inner diameter of bearing 18 mm

(g) Handle



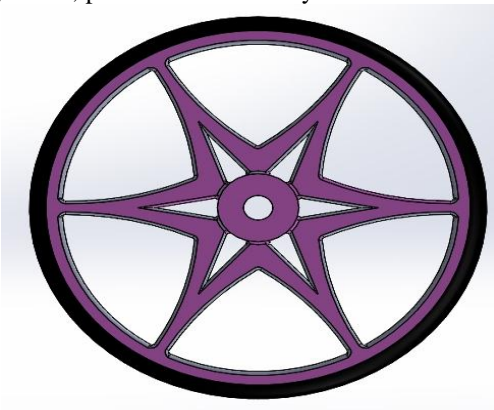
A handle is a part of, or attachment to, an object that can be moved or used by hand. The design of each type of handle involves substantial ergonomic issues, even where these are dealt with intuitively or by following tradition. Handles for tools are an important part of their function, enabling the user to exploit the tools to maximum effect. In the our forklift handle is used for only giving the support to the operator not for taking the turning of the forklift. The handle is made by using the hollow iron rod.

Handle Specification

- Length of handle 580 mm
- Dia. of handle rod 30 mm
- Height of handle 205 mm

(h) Wheel

A wheel is a circular component that is intended to rotate on an axlebearing. The wheel is one of the key components of the wheel and axle which is one of the six simple machines. Wheels, in conjunction with axles, allow heavy objects to be moved easily facilitating movement or transportation while supporting a load, or performing labor in machines. Wheels are also used for other purposes, such as a ship's wheel, steering wheel, potter's wheel and flywheel.



Front view of wheel



Orthogonal view of wheel

Wheel Specification

- Outer diameter of wheel 280 mm
- Inner diameter of wheel 18 mm
- Outer dia. of support wheel 60 mm
- Inner dia. of support wheel 10 mm

(i) Axle Shaft

A drive shaft, driveshaft, driving shaft, propeller shaft is a mechanical component for transmitting torque and rotation, usually used to connect other components of a drive train that cannot be connected directly because of distance or the need to allow for relative movement between them.

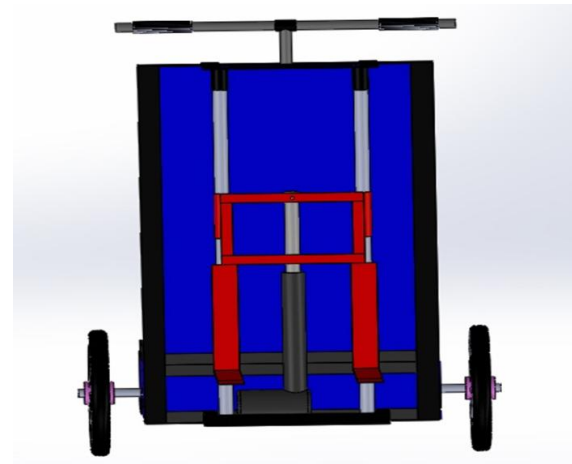
Specification of Shaft

- Length of shaft 240 mm
- Diameter of shaft 18 mm
- Length of thread on shaft 130 mm

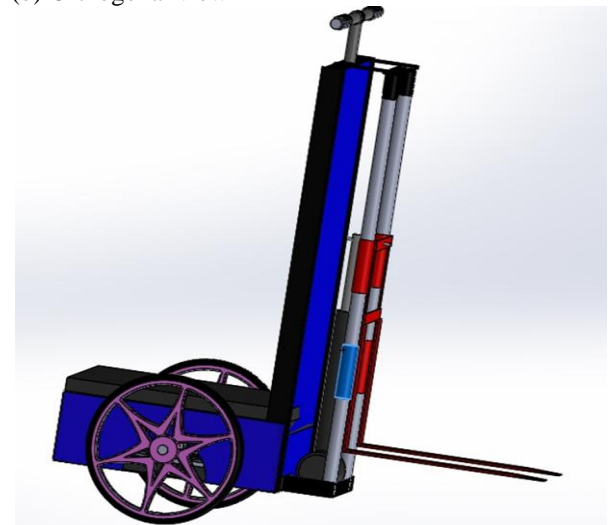


DIFFERENT VIEWS OF FORKLIFT

(a) Front view



(b) Orthogonal view



Advantage:

- Less costly.
- Easy to operate.

- Easily Attachable & Detachable.
- Reduce time.
- Require less space for riding, parking.
- A clean, green, eco-friendly machine.

### III. CONCLUSION

- There is a large scope of transportation of goods from one place to another place easily.
- The potential is huge and the return on investment is also very good.
- It require less space for working and parking.
- It is a clean, green, eco-friendly machine.
- It uses less time for transportation of heavy goods(Approximately 40-60 kg) from one place to another place.
- Our forklift would be so simpler that even kids can drive safely& easily.

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