

# ZERO DEGREE STEERING FORKLIFT FOR WAREHOUSE

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## **ABSTRACT**

In traditional steering mechanism involves traditional steering principle. Its advantage is that it is very safe and even prime the propensity and balance of vehicle at very high immediacy. But it can't be used at highly sharp steers (i.e. steers at where vehicle has to rotate about an angle of 90 degree) or at steers where there is not enough space for the car or automobile to rotate. This that is arduousness connected with the traditional procedure of steering is completely replaced by installing a four wheel steering mechanism. Four wheel steering is a comparatively new technology, that imposes transport propensity in little cars, sedan, SUV, heavy duties and other. In normal two wheels steering vehicles, the rear mounted of wheels are consistently place forward therefore and do not involves an engaging the function in regulating the steering in four wheel steering mechanism the back wheel can steer left and right. To carry on the driving regulation as without any difficulty as possible. The forklift cornering will conduct itself become not easily upset and controllable at greater immediacy as well as on wet less gripped road surfaces. The vehicle reaction to steering input becomes faster and more

accurate from starting to end the vehicle enter immediacy range. By moving the rear wheels in the prolongation further side the front wheels at slow immediacy, the car's steering circle is greatly made little. This action of the wheels enables the vehicle to steer circular, without moving from the position, i.e. the forklift has zero steering radius.

## **INTRODUCTION**

Zero degree steering forklift as the name itself indicate that the forklift steering mechanism is design such a way that it will take zero degree steer and give us circular path without leaving its vertical line passing through the centre.

Today most of the forklift uses the 2 wheel steering mechanism as their conventional steering mechanism. The two wheel steering mechanism has the below average effectiveness as compared to 4 wheel steering mechanism. The four wheel steering mechanism can be implemented in some forklift to rise their steering action, rise forklift steadiness when moving at certain immediacy, or to reduce steering

radius at low immediacy. Four-wheel steering is a invention, extraordinary effort on the part of automotive design engineers to provide almost moderate steering.

In present time vehicle four wheel steering is usually implemented in the action with the car's ECU which looks at the engine immediacy when making steering rectification of error. At less moment the front and rear wheels will steer in the further directions which will make the vehicle steer in enclosed circles for better transport propensity in parking lots, and short U-steers for example. At present immediacy there will be less effect, the rear wheels will not steer at all but at top immediacy, a little left steer will cause both the front wheels to steer left and the rear wheels to steer left as well. Such that the wheels stay collateral. At high immediacy, changing direction is for lane changing and you don't make quick steers or you will role the vehicle. When the wheels steer in the identical direction the car tends to slip over changing lanes and not heel as much risking losing regulation and flipping the car. In other words, developing propensity making lane changes or broad curves at high immediacy.

### **PROJECT OBJECTIVE**

The prime objective of the project is to design a forklift that can be used in warehouse for little load lifting. Forklift model is implemented with 4 wheel steering so it will take zero degree steer or 360° steer. Forklift are often use in big industry for lifting and transfer of heavy load carriage from one place to another.

Thus using this forklift for little scale purpose would be beneficial.

The mock-up of zero degree steer forklift is designed to lift little and moderate weight and is lightweight, clean, friendly and completely independent of fossils fuels.

### **LITERATURE SURVEY**

According Arunkumar research report, in these report they have express in words the steering mechanism. They also express in words the dissimilar classification of steering mechanism. The target of steering is to make that the wheels are towards in the achieved directions. This is achieved by a series of linkages, bars, pivots and gears. The elementary concepts is that of caster angle of each wheel is steered with a pivot point ahead of the wheel. In the report they also express in words the dissimilar classification of steering mechanism like 2 and 4 wheel steering mechanisms, crab mechanism etc.

According to the K.Lohith research report they construct the 3D model using ADAMS software and simulations to know out the steering radius and maneuver propensity. 4WS physical model was construct considering identical stub axle for front and rear. Test was conducted to check maneuver propensity. Steering radius were checked between physical and ADAMS models.

According to Vaibhav Desai research report they created model and transmitted model manually by means of chain and sprocket paddle mechanism. They transmitted power to wheels by this arrangement. As they

rotate the steering wheel, bevel gear gives power and motion to rack and pinion and thus shaft will rotate and work is done.

According to Bansode research report they created a mock-up in which they implemented pneumatic mechanism to give motion to steering the wheels thus like power steering giving power to 4 wheels and arrangement where identical like Lohith model only addition was they added electric motor and some sensors.

### **FUTURE SCOPE**

With the increasing number of industry need of forklift have risen and thus forklift have rear wheel steering that can be replaced to 4ws. This project focuses and targets on designing an All Wheel Steer platform, which is having the propensity of achieving Zero Steer Radius. It forms a way-out for above discussed problem. Zero Steer Radius steering mechanism drive wheels in a unique manner such that four wheels of the vehicle follows exact circular path, so that the chassis will be having the propensity of rotating about a fixed point. Hence, this would reduce the requirement of moving the forklift in a defined path with large steer radius, as employed in traditional steering mechanisms. Thus mechanism can be implemented to normal road vehicle so it can solve to move the car in tight spaces.

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