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## FIFTH WHEEL CAR PARKING

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**Abstract:** In earlier methods of parking, the time taken is 2 minutes, the driver needs to be more alert while parking in order to avoid hitting of the car during the reverse motion. Therefore, to avoid these inconveniences, a concept of fifth wheel parking is made, where the total time will be 50 to 60 seconds. This parking can be done using an additional wheel fifth wheel. A screw is used to control fifth wheel to land and lift. DC motor enables the forward and reverse motion for the screw. It also helps to know malfunctions during landing or lifting of the wheel. This concept is mainly used for four-wheeler vehicles. This setup makes the vehicle to turn parallel in a significant angle with reference to the front axle within a short period. The model enables the driver to park the vehicle between two vehicles, where the space is limited. **Keywords:** Parking System, Screw, Control Unit, additional wheel, DC motors.

**Keywords-** Ultrasonic Welding, Transducer, Kinetic Energy

### I. PROBLEM STATEMENT

In automobiles, parking system is complicated and time taking to park the vehicle, needs to be more alert while parking in order to avoid hitting of the car during the reverse motion. Therefore, to avoid, a concept of fifth wheel parking is made.

### II. LITERATURE REVIEW

Priyadarshini R, et al.[1] done the work on parallel parking of car using fifth wheel. According to his study, Parallel parking is the method of park the vehicle parallel in between the two-vehicle keeping the safe distance. They developed a system by introducing a fifth wheel at the rear side of the vehicle. The pneumatic system is used as a jack to lower the wheel and lift the vehicle from the rear side. The prime mover is used to provide a power to the fifth wheel and for forward and reversed rotation is also done by motor. Firstly, the driver places the vehicle at an angle from the front. As soon as the driver push the button the wheel is goes downwards and vehicle lifted up from rear side. The prime mover gives the rotation to the wheel as per the requirement (Forward or Reversed) and the vehicle park in between the vehicles. For this system they implement a digital display to indicate the status of the fifth wheel.

K.R.Prabhu, S. Gokulraj, L. Jeeva, M. Leon Richardson, R. Manikandan, done the work on fabrication of parallel car

parking, using 5th wheel according to his study ,In earlier methods of parking, the time taken is 2 minutes (approx), the driver needs to be more alert while parking in order to avoid hitting of the car during the reverse motion. Therefore, to avoid these inconveniences, a concept of parallel parking is made, where the total time will be 50 to 60 seconds. This parking can be done using an additional wheel, A pneumatic cylinder and solenoid valve set up is used to control fifth wheel to land and lift. A DC motor enables the forward and reverse motion for the fifth wheel. A digital display is used to indicate the status of the wheel for the driver reference. It also helps to know malfunctions during landing or lifting of the wheel. This concept is mainly used for four-wheeler vehicles. This setup makes the vehicle to turn parallel in a significant angle with reference to the front axle within a short period. The model enables the driver to park the vehicle between two vehicles, where the space is limited. This is carried out by us made an impressing task in four wheelers. It is very useful for parking four wheelers, because they need not take any risk for park the vehicle and quick operation. This project will reduce the cost involved in the concern. Project has been designed to perform the entire requirement task at the shortest time available. [1]

Priyadarshini R, Indumathi T, Pavithra M, Rini priya T, Sahaana V, done the work on Parallel Parking of Car using

fifth wheel according to his study, Parallel parking is a method of parking a vehicle in-line with other parked vehicles. Parallel parking requires initially driving slightly past the parking space, parallel to the parked vehicle in front of that space, (hence the term 'Parallel Parking'), keeping a safe distance, and then followed by reversing into that space. Subsequent position adjustment may require the use of forward and reverse gears. Parallel parking is considered to be one of the hardest skills for new drivers to learn. Parallel parking enables the driver to park a vehicle in a smaller space than would be true of forward parking. Driving forward into a parking space on the side of a road is typically not possible unless two successive parking spaces are empty. Reversing into the spot via the parallel parking technique allows one to take advantage of a single empty space not much longer than the car (in order to complete the parking within three wheel-turns the parking space would generally need to be about one and a half car-length long). This is carried out by us made an impressive task in four wheelers. It is very useful for parking fourwheelers, because they need not take any risk for park the vehicle and quick operation. This project will reduce the requirement of time & effort task during parking of vehicle.[2]

A. Albagul, K. Alsharif, M. Saad, Y. Abujeela, done the work on, Design and Fabrication of an Automated Multi-level Car Parking System, according to his study, In this paper, the basic multi-level car parking system with three floors is considered to show the use of control systems in parking systems. The control system will play a major role in organizing the entry to and exit from the parking lots. It also presents the design of multi-level parking lots which occupies less need on the ground and contains the large number of cars. In the modern world, where parking-space has become a very big problem, it has become very important to avoid the wastage of space in modern big Automatic multi-level car parking system helps to minimize the car parking area companies and apartments. The parking lots have an elevator to carry cars to different floors according to the vacancies. The elevator is controlled by a programmable logic controller (PLC) along with the help of some sensors. The multi-level car parking system had successfully been designed and developed. The control strategy for the traffic flow to the multi-level car parking system was carried out using the PLC. The PLC with the help of some sensors checks the availability of the vacant place on each floor. It can be noticed that the control system for the multi-level car parking system has achieved the anticipated performance to regulate the entry and exit of the car to/from several floors accurately. The movement of the elevator between the floors was continuous and smooth as requested. The number of entering and existing car from all the three floors was controlled as per the signals from the sensors on each floor at

the entry and exit point. The entry and exist phases of the cars depends on the availability of the elevator and the time required for exist. The preference for the entry will be for the car that is present at the stopping in front of an elevator at the ground floor. Meanwhile, the preference for exist from other floors will depend firstly on the space and secondly on the time demanded for exist. [3]

Trupti Y. Nirwan, Akash S. Waghmare, Gaurav R. Rahate, Kartik Bhujade, Asaraf Ali Saiyyad, Adarsh Shahu, Prof. A.D. Anjekar, done the work on, introduction to vertical multistage car parking system according to his study, In metropolitan cities, vehicle parking has become a major concern in all busy areas and a good traffic system needs a good parking system. Different types of vehicle parking are applied worldwide namely Multi-level Automated Car Parking, Automated Car Parking System, Volkswagen Car Parking, vertical car parking etc. Parallel parking is challenge for all drivers say amateurs or the experts. An multistage car parking system is a solution to this ordeal. This paper explains in detail a simple and precise multistage car-parking introduction, advantages, characteristics, etc. This paper give the information to develop a reduced working model of a car parking system for parking 6 to 24 cars within a parking area of 32.17 m<sup>2</sup>. The chain and sprocket mechanism is used for driving the parking platform and a one fourth hp brake motor shall be implemented for powering the system and indexing the platform. The platform is fabricated to suit. Vertical Car Parking model has been designed; all the parts in it were manufactured and assembled and tested successfully. Analysis of the model has been done and developed with the scaling of 1:9 for life size model Such as SUV's like Fortuner. As the life cycle model involves proper design and advanced methods are to be used to meet the requirements of the customer. Quick Automated Parking and retrieval of vehicles. Up to 12 cars can be easily and safely parked. Surface space required equivalent to just 2 surface car parking spaces. Most suitable for Staff or dedicated user parking. Engineered to ensure Driver safety by use of an electronic Safety zone. Low maintenance levels required by the system. [4]

### III. EXPERIMENTAL SETUP

While working on this project, the first stage is all about the designing of the project model. For the designing purpose we use the CATIA as a work bench software. We choose the CATIA software because it has simple command method and also easy to use. As per the guidelines this is just the representation of the project model on the paper work that how the project basically oriented in future. Hence all designing procedure is carried out without specific dimensions.

All group members equally contributed in the project work. We also get some collective information like the fifth wheel

car parking mechanism was actually used in the vehicle in 19th century for the easy parking. But at that time the number of vehicles were less, so driver can easily get the big space for the parking the vehicle. Also, the mechanism of this parking system was bulky. Hence the use of this parking mechanism got decrease and one day the mechanism totally eliminated from the automobile.

But now a days, the number of vehicles is increasing rapidly with respect to the population on the earth. Very large number of vehicles are running on the road and also required the big space for the parking system. Parking the vehicle is big problem for the drivers nowadays. Fifth wheel car parking mechanism is the best solution on the parking problem. It requires less time for parking, and easily get parked in the less space. We choose the CATIA software because it has simple command method and also easy touse. As per the guidelines this is just the presentation of the project model on the paper work that how the project basically oriented in future. Hence all designing procedure is carried out without specific dimensions

#### IV. WORKING

The System is consisting of drive system, propeller shafts, pneumatic cylinder, solenoid valve, fifth wheel and its supporting wheels with chassis frame. Vehicle is controlled by pneumatics clutch & drive system arrangement. Initially, when the driver finds a slot for parking, he can place the pneumatic clutch as well as fifth wheel of the car in any rotation for parking in any curve profile. When the driver pushes the button for the forward or reversing, the solenoid valve actuates the pneumatic clutch with cylinder; this will land the fifth wheel on the road and slightly lifts the rear side of the vehicle. The fifth wheel is moved forward /reverses using a DC motor. After parking the vehicle in correct alignment, the fifth wheel is lifted when the cylinder retracts. Simultaneously, the driver gets the status of the process in the indication kept in the the car. This will helps to diagnose the problem during parking in restricted place.

#### Components To Be Used

- Lead screw
- DC motor
- Wheels
- Chassis OR Frame
- Battery

#### V. ADVANTAGES OF SYSTEM

Vehicle can do the parking on the low effort & time as compare to the old parking method. The operation of the new vehicle parking is well controlled, well balanced system.

In low cost the system can alter in to parallel parking system. Only simple support structures are required design & fabrication is easy. It is having faster process of tank parking. More accurate and economical that compare to old parking method. It minimizes misalignment & less space is required

during parking. It increases the safety and working condition of man during parking

#### VI. SCOPE FOR FUTURE

As per recent condition the people will get problem for the parking space because the in cities, Restaurants, Cinema halls where people regularly use to visit, they required the space to park the vehicle between to two vehicles in less space. This mechanism overcome this type of problem.

Time required for parking the vehicle between the two vehicle is more. And drive should have conscious otherwise the vehicle gets smashed with the other one. Where the fifth wheel car parking mechanism is time efficient and safe.

This parking mechanism is cheap in cost because it do not required any sensors and costly ECU. It is just simple mechanism.

#### VII. CONCLUSION

This project report on the Fifth Wheel Car Parking Mechanism is to improve the parking system with less cost. It define the time saving while car parking in the crowded area. It also introduce a method to eliminate the complex mechanism which is used in recent cars with number of sensors and complicated microcontrollers.

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