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Four Wheel Leaning Suspension Vehicle - A Review

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Abstract: ***Four wheel leaning suspension vehicles have been acknowledged as a mainstay in the industrial commercial and domestic domain. The idea is to change the perception remote area for actuating manual operated four wheel leaning suspension vehicle. Four wheel leaning suspension vehicles is a system combining many subsystems that interact among themselves as well as with the environment in which the four wheel leaning suspension vehicle works. In this vehicle, front swing and Rear swing, shockups, hinges, universal joint, end bearing, plane bearing, bearing with bearing hub, are the devices etc. designed to interact with the environment it is gradually making its headway into the domains of military, and vehicle applications domain. The use of four wheel leaning suspension in hilly as well as off road condition becoming more popular in recent years. The trend seems to continue as long as the leaning technology meets diverse and challenging needs of the producers.***
Keywords: Front Swing, Rear Swing, Hinges, Universal Joint, End Bearing, Plane Bearing.

I. INTRODUCTION

A. *History*

This system remained the basis for all suspension systems until the turn of the 19th century, although the iron chains were replaced with the use of leather straps by the An early form of suspension on ox-drawn carts had the platform swing on iron chains attached to the wheeled frame of the 17th Century. Obadiah Elliott registered the first patent for a spring-suspension vehicle; - each wheel had two durable steel leaf springs on each side and the body of the carriage was fixed directly to the springs attached to the axles. Horse-drawn carriages and the Ford Model T used this system, and it is still used today in larger vehicles, mainly mounted in the rear suspension. Four wheel leaning suspension vehicle is an automatic or virtual intelligent agent that can be carried out any desired any leaning surface automatically with help of front and rear swings as well as shockup typically in practice vehicle is usually does not give the comfort and achieve any desired position in remote area hilly areas Four wheel leaning suspension vehicle are used with an increasingly wide verity of task such as for commercial applications. This vehicles used in hills stations remote areas and any inclined surface in any areas while developing this vehicle and implementation work The idea is to change the perception remote area for actuating manual operated four wheel leaning suspension vehicle. Four wheel leaning suspension vehicles is a system combining many subsystems that interact among themselves as well as with the environment in which the four wheel leaning suspension vehicle works.

B. *Objective of Study*

1) main objective of this vehicle is used for leaning purposes.
2) The goal of our project is to create a functioning double suspension system
3) The objective is to integrate our suspension system into a vehicle that we also design.

C. *Scope of Study*

The scope of this project are estimating the model and parameters of the passive system includes sprung mass and unstrung mass (spring constant of body, ski, damper coefficient, and spring constant of tire, kit) and choose the suitable model for the system by comparing the simulation and experimental results without controller.

II. CONSTRUCTIONAL FEATURES

A. *Front Swing*

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Figure 2.1**:** Front swing

Front swing consist of round pipe square pipe, MS plate, end bearing, hinges and bearing with bearing hub. The function of front swing used to give the flexibility in vertical as well as horizontal direction the hinges and end plane bearing very important role in swing.

B. Rear Swing



Figure 2.2: Rear swing

Rear swing consist of round pipe square pipe, MS plate, plane bearing, hinges and bearing with bearing hub. The function of Rear swing used to give the flexibility in vertical direction the hinges and end plane bearing very important role in swing.

C. Power Transmutation System



Figure 2.3**:** Power Transmission system

Power from engine is transmitted to the one of the rear wheel of the vehicle with help of chain and sprocket mechanism, universal coupling, bearing with bearing hub the power from engine is transmit from engine shaft to the sprocket mechanism with help of chain then sprocket mechanism connected to the universal coupling due to this direction of power transmission is change. In this way power is transmitted engine shaft to the one of the rear wheel.

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III. WORKING



Figure 3.1: Working

As far as working is concern when the vehicle start power is transmitted from engine shaft to the chain sprocket with help of chain this chain sprocket is further connected. When any wheel subjected to irregular surface that time another wheel will try to maintained stability of hole vehicle. We can used this vehicle in hilly and remote areas As well as on rode and off condition also.

IV. APPLICATION

A. Leaning suspension vehicle is used avoid the damping effect.
B. It also Minimize the shocks when driving.
C. It offers comfort to the rider in off rode areas.

V. CONCLUSION

All related areas of the Four wheel leaning suspension vehicles have been covered including: selection of materials, various links, tilting mechanisms & fabrication of all linkages for better and smooth working.

REFERENCES

[1] Ayman A. Aly, "Vehicle Suspension Systems Control: A Review", International Journal Of Control, Automation And Systems Vol.2 NO.2 July 2013.
[2] Jafar M., Aejaz A., "Studies On Readymix Suspension Of Ampicillin Trihydrate And Development, Charecterization And Invitro Evaluation", International Journal of Pharmacy and Pharmaceutical Sciences Vol. 2, Suppl 2, 2010.
[3] Joshua Ikoni Ogaji, "Effect of Adansonia digitations Gum on Some Physicochemical Properties of Paracetamol Pediatric Suspension Formulations", International Journal of Research in Pharmacy and Science IJRPS 2012
[4] Mamatha Jyothi Ancha, "Formulation And Evaluation Of Pediatric Azithromycin Suspension" International Journal of Pharma and Bio Sciences.
[5] Niranjan Singh, "General Review Of Mechanical Springs Used In Automobiles Suspension System", International Journal of Advanced Engineering Research and Studies E-ISSN2249–8974
[6] Rajesh M. Patel, "Parenteral Suspension: An Overview", International Journal of Current Pharmaceutical Research Vol. 2, Issue 3, 2010.
[7] Saeed ur Rasheed Nazir, "Development Of Diclofenac Suspension And Its Stability Study At Different Temperatures", International Journal of Drug Development & Research.
[8] Sameer J. Nadaf, "Formulation and evaluation of ciprofloxacin suspension using natural suspending agent", International Journal of Pharma Sciences and Research (IJPSR).

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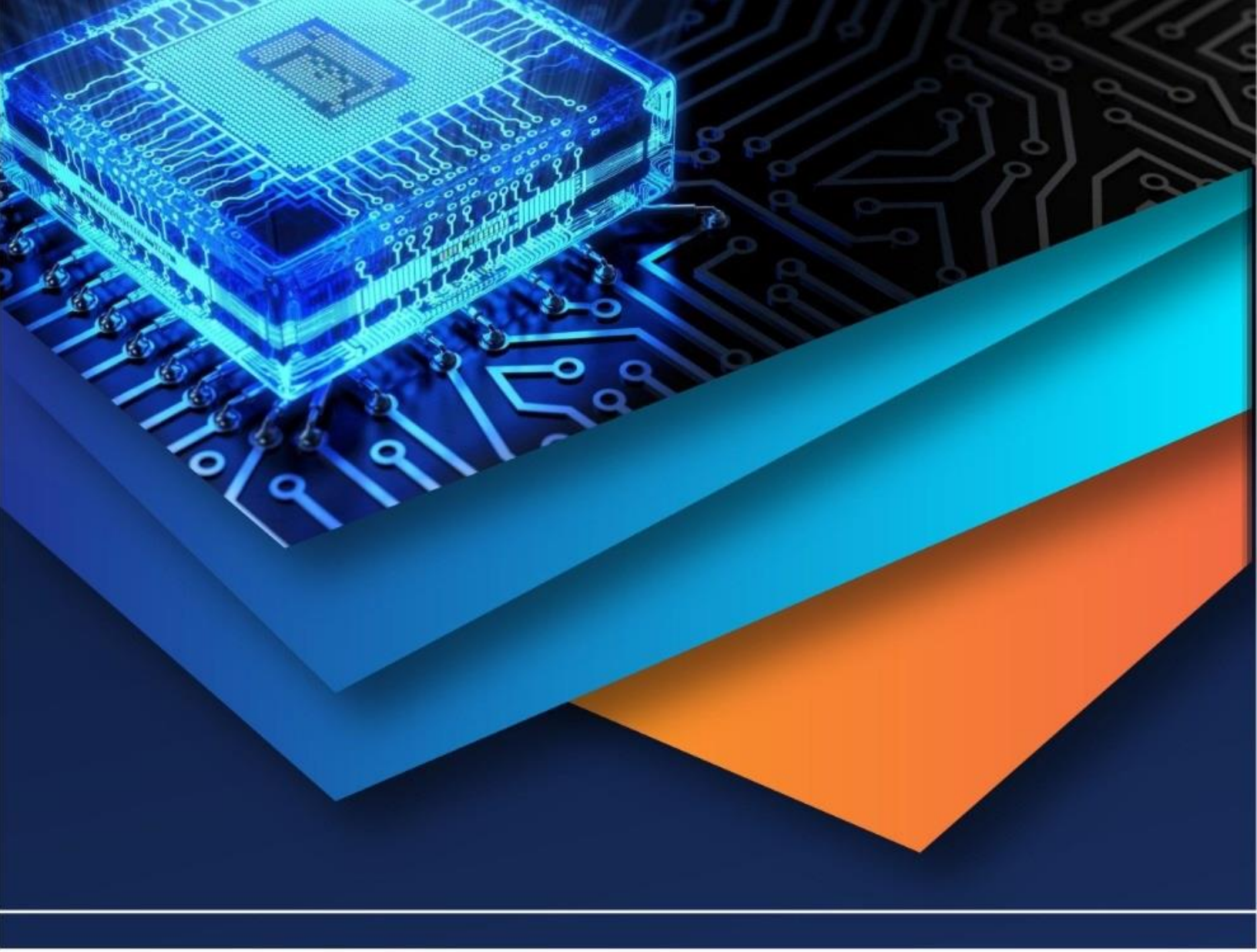


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