

Dynamic Automatic Adjusting Suspension System

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Abstract— Suspension system adjust the suspension of an automobile to adapt to bumps or potholes that are encountered in the road as the vehicle is driving. These system have the potential to improve safety, performance and ride comfort in automobiles. An integral part of suspension system is a device to detect irregularities in the road current detection system that are available lack either in precision, resolution or speed. A senior design project, dynamic automatic adjusting suspension system (daas).development of the dynamic automatic adjusting suspension system totally new design and road profile sensor (rps).the road profile sensor was implemented through the design of a range finder that uses a lidar sensor with a laser to measure distance. The distance from the sensor to the road changes as irregularities in the road are encountered, and this change in distance is measured by the road profile sensor to determine the size if the irregularities. Vehicle have suspension components that help to isolate the chassis of the vehicle from the road over which it travels. This is accomplished by placing a spring and damper system between the wheels and the chassis if the vehicle. The suspension components are chosen to optimize the automobiles handling on flat ground with minor irregularities and do not handle large bumps well. Common automobiles drive very poorly in rough situation .a vehicle that is roads much better, but will not handle as well as high speeds or in sharp corners where stiffer suspension improves performance.

Keywords: Fabrication, Ball Screw

I. INTRODUCTION

The road profile sensor is a detection system for suspension system in automobiles. It scan a road for bump in real time and send that information to an on board suspension controller. Dynamic automatic adjusting suspension system adjust the suspension road condition that it detects prior to impact. The system that detects these road condition is the road profile sensor(rps).i will begin by describing projects dynamic automatic adjusting suspension system and the role of the road profile(rps) within the greater project and then i will discuss the development. Automatically adjusting suspension system to achieve the best possible all around suspension performance. The gola of (daas) is to detect irregularities in the road ahead of a vehicle. A vehicle that is bumps crossing during to handle large irregularities in the road. Suspension that controls the vertical roads much better. Movement of the wheels relative to the chassis or vehicle body with an on board system. Will handle rough.



Fig. 1: Ball Screw Frame

A. Function Of suspension

Automatically adjusting suspension system to achieve the best all-around suspension performance. The goal of (DAAS) is detect irregularities in the road ahead of a vehicle.

A vehicle that is bump crossing during large irregularities in the road .Suspension that controls the vertical roads much better.Movement of wheels relative to the chassis or vehicle body with an on board system.Will handle rough.

B. Advantages

- Comfort to passengers.
- Fully automatic level control.
- Good handling.
- Minimum vibration.
- Increase life of vehicle.
- Excellent Suspension & Comfort to Passenger
- Increase Life of Vehicle.
- Stability Control
- Accurate Force Control
- Improved Road Holding Tendency of Tires
- Suspension Improved Safety, Performance and Ride Comfort in Automobiles.

II. LITERATURE REVIEW

[1]The basic idea in active control of suspensions is to use an active element (the actuator, e.g., a hydraulic cylinder) to apply a desired force between the vehicle and the wheel. Car's control unit computes the desired force to reach certain performance objectives under external disturbances (e.g., passenger comfort under road imperfections). The active suspension systems require several components such as ACs, servo valves, highpressure tanks for the control fluid, sensors for detecting the system, etc.

Figure 1 describes[2] basic component of active suspension. The associated power, which must be provided by the vehicle engine, may be very high depending on the required performance. Furthermore, these suspension systems are very expensive as the full-active [3] suspensions have better performance than passive suspensions. Suspensions control is highly a difficult control problem due to the complicated relationship between its components and parameters. The researches were carried out in suspensions control systems cover a broad range of design issues and challenges. The control strategies of full-active suspension have been studied in many suspension systems to describe and improve the ride comfort and handling. For example, Hrovat

Explored the connections between LQG-optimal one DOF (degrees of freedom) and two DOF models. The optimal two DOF systems indicated that both ride and handling can be improved by reducing the vehicle unsprung mass.

Turkay and Akcay [4] used a quarter-car active suspension system by using the vertical acceleration and/or the suspension travel measurements for feedback. The influence of tire damping on the design of an active suspension system for a quarter-car model by a mixture of the LQG methodology and the interpolation approach was also illustrated. It was shown that tire damping by coupling the motions of the sprung and unsprung masses eliminates a constraint on the wheel-hop mode. Recently, ArefSoliman 2011

III. PROBLEM DEFINITION

A suspension system is considered critical damped when the chassis does not oscillate and return state as quickly as the spring will without oscillation.

Rack and worm screw design preload adjusting is method same as the adjusting spanner mechanism our suspension works

General detection system typically measure the speed of the vehicle. Speed base system for example, adjust suspension setting based on the speed of the vehicle.

A. Working Procedure

Suspension system adjust the suspension of an automobile to adapt to bumps or potholes that are encountered in the road as the vehicle is driving. These system have the potential to improve

Safety, performance and ride comfort in automobiles.

The road profile sensor is a detection system for suspension system in automobiles. It scan a road for bump in real time and send that information to an on board suspension controller. Dynamic

Automatic adjusting suspension system adjust the suspension road condition that it detects prior to impact. The system that detects these road condition is the road profile sensor (rps).

I will begin by describing projects dynamic automatic adjusting suspension system and the role of the road profile (rps) within the greater project and then i will discuss the development.

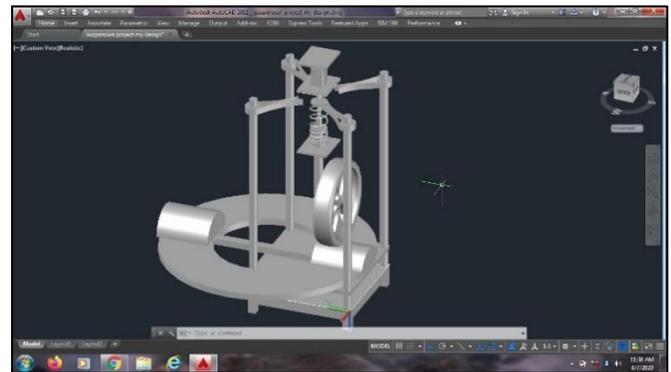


Fig. 2: 3D Wireframe of DAASS in AutoCAD

IV. CONCLUSION

From the whole discussion in suspension system, it is observed in suspension system provides the energy to a vehicle to protect the energy to a vehicle to protect itself from damaging, increasing life of the vehicle, handling and comfort of passengers and many more.

V. FUTURE SCOPE

- 1) Now days, every vehicle using the normal suspension system like wishbone suspension system to vertical movement the control of vehicles ex front wheel drive and rear wheel drive the main disadvantage of this system is minimum comfort provided that is possible for suspension system.
- 2) Automatic adjusting suspension Due to awareness of the safety many people using the vehicle. So in suspension system is required so much better comfort provide. So we are introducing new concept of "dynamic system" which vehicle can shock without moving from the bumper that the vehicle has comfortable ride.

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