

Modeling Analysis and Simulation of Wheel Suspension System's Response for Quarter Car Model by Using 20-sim Software for Honda Civic Lx 2019 Sedan

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Received: 21 March 2021, Accepted: 09 September 2021, Published online: 17 November 2021

Abstract

This paper exhibits a study of car passive and active- suspension system to improving drive exhilarate to passengers while also enhancing vehicle stability by decreasing the effect of oscillation on the suspension. Modeling and simulation by using the bond diagram. They much concede a prime arrangement of the machine to the exterior surrounding: street quality, atmospherically circumstances, while guarantying driver as well as passengers, major safeness and more potentially exhilarate. Automotive aid it course manners. The result cleared this action plan at different set during the vehicle mean, but particularly in evolution level. It is also clear the proportion of suspension system's mass to the vehicle's mass. Also graphical representation of suspension system' parameters like vertical passenger displacement, potential energy of mass of suspension system and acceleration. To foretell the comportment of a car, it is necessary to make design, modeling, and simulation. Honda Civic Lx 2019 sedan car has used for modeling, and simulation.

Keywords

simulation, Bond graph, 20-sim, wheel suspension system

1 Introduction

Since the dawn of the automobile era, one of the most important priorities of researchers has been the suspension system. To this point, people demands have risen with time, and several studies have been conducted to boost the effectiveness of vehicle suspensions in order to increase vehicle convenience while driving, to reach this target.

The quarter version of modeling the automobile with two degrees of freedom presented in the first half of this study. Section 2 discusses a touch simulation consequence from the 20-sim software. The targets of the present paintings are to have a look at the Bond graph used to model the dynamic behavior of automobile vehicles: technique, modeling, and analysis of suspension for a quarter version of the automobile.

2 Related work

Many studies had been causing to signify difference road profiles borrowed with the aid of automobiles [1, 2].

In various research studies of varying complexity of models based on the intended application, quarter automobile models with two degrees of freedom that manage transverse movements of the vehicle have been used to manage perpendicular movements of the machine. Defined the velocity of vibration converted to passengers and limits of comfort [3–6]. Semi model automobile with four degrees of freedom [7–9] also a seven-degree-of-freedom complete orthogonal simulation of the automobile [10–13].

The technique Bond diagram will be deployed in this paper [14–16]. For modeling suspension quarter, it has formerly worked on this approach [17, 18].

3 Mathematical modeling and analysis

The elements that have an effect on the state with vibration of the car suspension gadget in particular positioned internal the spring in suspending, damping, and elastic damping properties of tires. The automobile suspension