

Document details

[Back to results](#) | 1 of 1[Full Text](#)[View at Publisher](#)[Export](#)[Download](#)[Add to List](#) | [More...](#)

IOP Conference Series: Materials Science and Engineering

Volume 184, Issue 1, 3 April 2017, Article number 012045

3rd International Conference on Mechanical, Automotive and Aerospace Engineering, ICMAAE 2016; Kulliyah of Engineering, International Islamic University Malaysia (IIUM)Kuala Lumpur; Malaysia; 25 July 2016 through 27 July 2016; Code 127354

The Investigation of a Ride Quality of Nonlinear Half-Car Model (Conference Paper)

Darsivan, F.J.

Department of Mechanical Engineering, Faculty of Engineering, International Islamic University Malaysia, Malaysia

Abstract

[View references \(6\)](#)

The paper discusses the ride quality response of a half car model when a bilinear model and a power law model were implemented in the suspension of half car vehicle. The models were subjected to a step and double pothole disturbances. The nonlinearity of the model is contributed by the power law damper models which are located both at the front and at the rear of the vehicle. Passenger car dampers were initially tested on the damper test bench where the dynamic characteristics were obtained. From the experimental results it clearly showed that the automotive damper behaves nonlinearly. From the force-velocity graphs a backbone model was then developed and plot. Based on this graph two types of non-parametric model namely the bilinear model and power law model were then obtained through the Lavenberg-Marquardt curve fitting algorithm (LMA) method. From the multibody system simulations they clearly showed that the bounce and pitch responses of the bilinear damper model illustrates an overestimations of responses compared to the nonlinear damper model which may lead to a less accurate representation of a realistic damper. © Published under licence by IOP Publishing Ltd.

Indexed keywords

Engineering controlled terms: Aerospace engineering; Automobile seats; Curve fitting; Indexing (of information); Magnetic levitation vehicles; Model automobiles

Automotive dampers; Curve fitting algorithm; Dynamic characteristics; Lavenberg-marquardt; Multi-body system simulation; Non-parametric model; Nonlinear damper models; Nonlinear half-car model

Engineering main heading: Damping

ISSN: 17578981 Source Type: Conference Proceeding Original language: English

DOI: 10.1088/1757-899X/184/1/012045 Document Type: Conference Paper

Sponsors: Publisher: Institute of Physics Publishing

References (6)

[View in search results format](#) All [Export](#) | [Print](#) | [E-mail](#) | [Save to PDF](#) | [Create bibliography](#) Rao, M.D., Gruenberg, S., Torab, H.1 [Measurement of dynamic properties of automotive shock absorbers for NVH](#)*SAE Technical Papers*. Cited 11 times.

doi: 10.4271/1999-01-1840

[View at Publisher](#) Duym, S., Stiens, R., Reybrouck, K.2 [Evaluation of shock absorber models](#)*Vehicle System Dynamics*, 27 (2), pp. 109-127. Cited 90 times.[View at Publisher](#) Dixon, J.3 [The Shock Absorber Handbook](#). Cited 240 times.

(John Wiley amp; Sons)

Cited by 0 documents

Inform me when this document is cited in Scopus:

[Set citation alert](#)[Set citation feed](#)

Related documents

[Fatigue life calculation of an automotive shock absorber shim assembly using different simulation techniques](#)

Kulkarni, S., Magdum, M., Ravi, B. (2013) SAE Technical Papers

[Simulative analysis of dynamic characteristics of automobile shock absorbers based on fluid-structure interaction](#)

He, L., Gu, L., Long, K. (2012) Jixie Gongcheng Xuebao/Journal of Mechanical Engineering

[Application of modern robust optimal design method to the shock absorber in a car](#)

Zhang, R., Tan, R., Chen, Y. (2003) Chinese Journal of Mechanical Engineering (English Edition)

[View all related documents based on references](#)

Find more related documents in Scopus based on:

[Author](#)[Keywords](#)