

INTRODUCTION

A quarter-car test rig is used to study the behavior of vehicle due to the variation in road profile which is commonly known as ride analysis. The performance criteria in designing vehicle suspension system are body acceleration, suspension travel and wheel acceleration. Performance of the suspension system is characterized by the ability of the suspension system in reducing those three performance criteria effectively. The quarter car test rig should be developed in such a way that closely resembles the quarter part of a real vehicle. The quarter car test rig should have the ability to mount several different designs of actual car suspensions, able to perform a wide range of tests which include variation in body loads and the frequency of road disturbance, and still have the ability to expand for future developments.

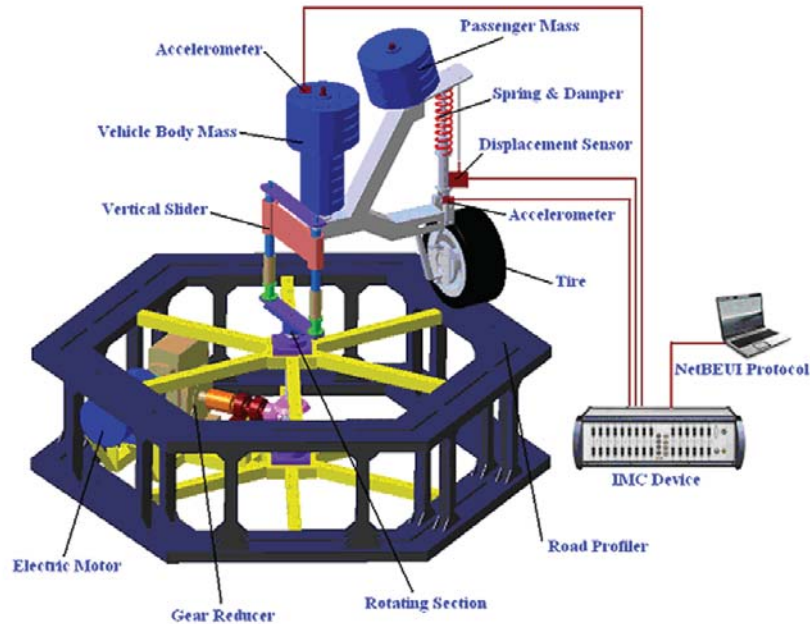


Figure 1: Physical Representation of the Full Scale Quarter Car Test Rig

ADVANTAGES

In this project, a state-of-the-art quarter-car test rig has been designed and constructed to offer increased accuracy and testing flexibility at a reasonable cost which has the following features:

- ~ More realistic in representing the quarter portion of real vehicle compared with the existing quarter car test rig
- ~ The frequency of road disturbance can be easily adjusted
- ~ Variations in vehicle body and passenger masses can easily be simulated
- ~ Vertical and rotational dynamics of tire are considered in vehicle modeling to avoid a gross error in the representation of the actual vehicle response
- ~ Has the flexibility to test a multitude of suspension designs

POTENTIAL APPLICATIONS

- ~ to investigate the vehicle response in the presence of road disturbance
- ~ to study the damping characteristics of suspension system
- ~ to perform a study on the application of a control system to the rig for reproducing test vehicle response.
- ~ to study the vibration characteristics of seat suspension in future developments

Researchers Info

Dr. Khisbullah Hudha
 Hilmi Bin Amiruddin
 Mohd. Zakaria Bin Mohd. Nasir
 Sisu Arman Bin Amir
 Ubaidillah

Tel : +6(06)-233 2323
 Fax : +6(06)-233 2828
 E-mail : khisbullah@utem.edu.my