*Sinhgad Technical Education Society’s*

**Sinhgad Academy of Engineering, Pune**

**DEPARTMENT OF MECHANICAL ENGINEERING**

Date: 01.08.2013

**BE Project Registration Form (2013-14)**

**Project Group No.:** 46

**Name of students in the group:**

1) Pranav.M.Pishawikar (B-52)

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3) Debjyoti Mazumdar (B-106)

4) Abhishek Nathe (B-22)

**Project Title:** Performance analysis of shock-absorber using test-rig.

**Project Guide:** Prof. P. P. Hujare

**Relevance:** Shock-absorbers are widely used today as damping systems in automotive and other industries where damping of vibrations is necessary. This project consists of understanding and analysing the performance characteristics of shock-absorbers under various damping conditions and different amplitudes.

**Present Theory and Practices:** The effectivity of the shock-absorber system is measured in terms of TR (Transmissibility Ratio). The higher the ratio, the better the system.

**Proposed Work:**

The shock-absorber is mounted on a mechanical test-rig. The setup uses a reciprocating type cam actuated by a speed reduction gearbox to simulate the load conditions on the shock-absorber. The gearbox is driven by a 0.5HP D.C. electric motor.

Suitable transducers (load-cells, etc.) are used to measure the required variables. Interfacing of these transducers with a computer is done using a custom-made circuit, and the electrical signals from them are fed as input.

Suitable software (MATLAB, VisualBasic, etc.) are used to take these inputs and generate required transmissibility curve of force transmissibility ratio (TR) vs. Frequency ratio of the shock-absorber.

**Benefits:**

1. This setup is used to find the performance of different shock absorber systems.

2. This setup is used to plot transmissibility curve against different operating frequencies

**Expenditure:** Approximately Rs. 20,000

**References:**

1) “Mechanical Vibrations” - Singiresu S. Rao

2) MatlabWorld – A Wolfram resource

3) “Vibration and Shock Isolation” – C.E. Crede

4) “Damped Simple Harmonic Motion” – Weisstein Eric W.

**Project Guide: Project Coordinator: HOD:**

Prof. P.P. Hujare Prof. S.S. Kore Prof. S.C. Shilwant