



## Experiment Details

Department Name	Mechanical
Class	TY B. Tech.
Semester	1st
Subject Name	Dynamics of Machines
Experiment No.	1
Experiment Name	Bifilar Suspension

## Version History

Sr. No.	Version Number	Created By	Approved By	Date
1	v1.0	Vedant Mandrupkar	Mr. Rohit Ghulanavar	07/10/2020



#### AIM:

To determine the radius of gyration of rectangular bar by bifilar suspension.

#### THEORY:

Bifilar suspension method is used to find Moment of Inertia of different objects practically. The experiment gives idea about theory behind the Moment of Inertia. Also to find Center of gravity of components like connecting rod is studied in this experiment.

#### PRE TEST:

Explain the following points

- 1) Definition of Moment of Inertia
- 2) Derivation for bifilar suspension calculation

#### PROCEDURE:

1. Enter Length of Suspension 'L'.
2. Run the simulation.
3. Note down the time period 't' of 10 oscillations.
4. Repeat above with 4 different values of Length of Suspension.
5. Calculate periodic time 'T' and mean time 'T(exp)'.
6. Use following formulae to calculate experimental 'K(exp)' and theoretical 'K(th)' radius of gyration of rectangular bar and also calculate experimental 'M.I.(exp)' and theoretical 'M.I.(th)' Moment of inertia.
7. Compare the results and draw conclusion.

#### FORMULAE:

$$1) K(\text{expt}) = T(\text{exp}) / 2\pi \sqrt{\frac{ga^2}{L}}$$

Where,  $2a$  = distance between 2 wires

$K$  = radius of gyration of Bifilar suspension.

$$2) K_{th} = l / 2\sqrt{3}, \text{ where, } l = \text{length of rectangular bar}$$

$$3) M.I. \text{ expt} = m(K_{\text{expt}})^2 \text{ and } M.I. \text{ th} = m(K_{\text{th}})^2$$



OBSERVATION TABLE:

Sr no	Length of suspension 'L' in m	Distance from C.G 'a' in m	Time for oscillations 't' in sec	Periodic time $T = t/10$ in sec	Mean time T(exp)
1					
2					
3					
4					

POST TEST:

Write minimum five MCQ's along with answer. (Based on given experiment)

REFERENCES:

- 1) Theory of Machines

Book by J. K. Gupta and R. S. Khurmi

- 2) Link to the book:

<https://drive.google.com/file/d/0B6mmcxyrKnEhSmxiZDJ0UGxQYXM/view?usp=drivesdk>