

HIGHER TECHNICAL INSTITUTE

MECHANICAL ENGINEERING
DEPARTMENT

DIPLOMA PROJECT

VIBRATION TESTING USING THE
HAMMER IMPACT EXCITATION
TECHNIQUE

M/844

DEMETRIOU DEMETRIS

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HIGHER TECHNICAL INSTITUTE	PROJECT NO. 3011
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I would like to dedicate this diploma project
to no one, except
myself, my family, my friends,
my tutor Mr. Stasis,
my town, my country
my world.

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SUMMARY

The objective of this project is a vibration test using the hammer impact excitation technique.

The vibration test component is a shaft. On the shaft I marked the points of impact. With the help of a wire and a table I hang the shaft so that the shaft was not touching anywhere to change the vibration response.

Before starting the vibration test I spent about two weeks learning the analyzer (magnitude frequency, phase-frequency, Nyquist and Bode diagrams, frequency response function, Fourier transform).

After I learn how to use the analyzer I start the test. I place the accelerometer on the shaft (behind the points of impact) and I start to impact the shaft with the hammer.

I take three frequency response measurements and I examine the amplitude of the frequency response function at the number of points of shaft and the direction of vibration at each point.

Mode shapes have been developed and plotted by hand using a technique called normalisation (using the amplitude of the frequency response function and the direction of the vibration).