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W12M04 Tuned Mass Damper

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A tuned mass damper, also known as a harmonic absorber or seismic damper, is a device mounted in structures to reduce the amplitude of mechanical vibrations, that consists of a mass that is mounted on one or more damped springs.

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The oscillation frequency of the mass is tuned to be similar to the resonant frequency of the object they are mounted to. Tuned mass dampers are used to reduce the maximum amplitude of the object while weighing very much less than it. Their application can prevent discom

~~Tuned mass damper~~ — Wikipedia
From Simple English Wikipedia, the free encyclopedia Main article: Earthquake engineering After seismic waves make a structure vibrate, a tuned mass damper (or seismic damper) can decrease their damaging effect and improve the building's seismic performance. Vehicles use small dampers and buildings use large ones.

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1 Damped Primary System,
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Consider a damped single-degree-of-freedom (SDOF) oscillator (with mass m , stiffness k and damping c) driven by a sinusoidal force $f(t) = \bar{f} \cos \omega t$ with an attached undamped and unforced SDOF oscillator, (with mass m_2

~~Tuned Mass Dampers — Duke University~~

mass ratio: $\mu = m_2 / m_1$ damping ratio: $\zeta = c / 2\sqrt{2m_2 k_2}$ static deformation: $u_{1;stat} = p_0 / k_1$ It is easy enough to write the

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amplitudes in terms of these parameters. We get $A \frac{1}{\omega} \sqrt{\frac{1}{2} \left(\frac{2 \zeta \omega}{\omega^2 - \omega_n^2} + \frac{2 \zeta \omega_n}{\omega^2 + \omega_n^2} \right)^2 + \frac{4 \zeta^2 \omega^2 \omega_n^2}{(\omega^2 - \omega_n^2)^2 + 4 \zeta^2 \omega^2 \omega_n^2}}$

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In mass-spring-damper problems

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Dynamic absorbers, also called tuned mass dampers, are widely applied to attenuate vibration at a specific frequency [1]. The terms "tuned mass damper" and "dynamic absorber" may be considered synonymous for the most part, but the former denotes the explicit addition of a loss mechanism { usually a viscous or friction damper.

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