

On the time of contact between the hammer and string on a piano.

S. Converse - The piano hammer as a nonlinear spring



Description: -

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When the KEY is released the HAMMER is then freed to be reset and repeat, and the DAMPER is lowered on to the strings to stop the sound. The added mass is simply a strength stiffness issue. Less mass is needed toward the outer portions of contact because it is traveling faster.

The piano hammer as a nonlinear spring

Hammers that are canted or tilted to mate with the slanted strings of the tenor and bass especially on smaller pianos have a center of gravity that is away from their direction of travel and create strain on the hammer flange. In a dynamic measurement, a piano hammer strikes a piece s of piano wire attached to the face of a force transducer, securely mounted in a drill press. What effect does this actually have.

How the Piano Action Works

The HAMMER continues by its own inertia to strike the string. This is why high-speed photography shows the hammer hitting the string several times when struck. To balance the inertia, more mass is needed inward, toward the rotational point — because it is traveling slower.

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If the strike-point of the hammer is a little crooked, or one string is higher or lower than the other two, not all strings will be struck with the same force. From this figure we might predict that treble hammers will show greater changes in stiffness than bass hammers if both are tested over the same range of velocities.

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It is difficult to test the dynamic hardness of hammers except by listening to them in a finished piano.

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