VIBRO/DYNAMICS MICRO/LEVEL® ISOLATORS PROTECT PRECISION MACHINE TOOLS, INSPECTION, AND MEASURING EQUIPMENT

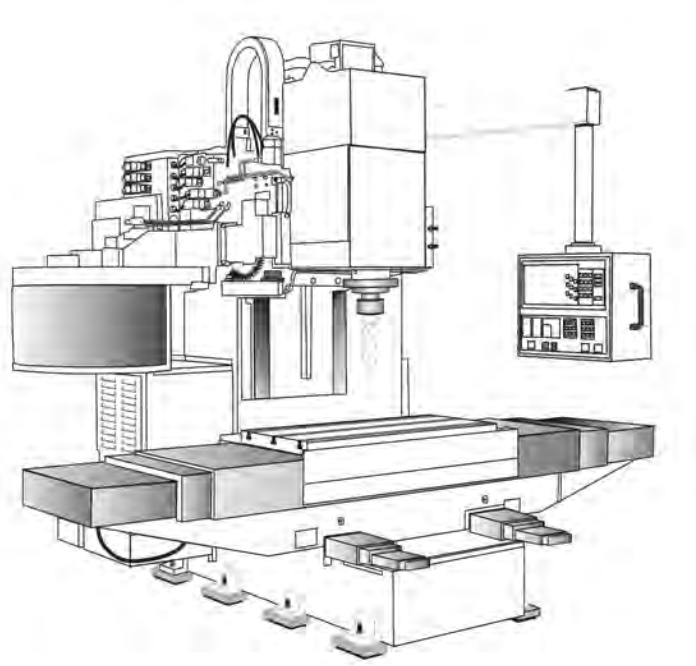
Machine tools are designed and built to produce parts to extremely close machining tolerances. Unfortunately, vibration transmitted to equipment through the floor may disrupt the precision performance of even the best machine tools, causing production parts to fall far short of acceptable tolerances.

Coordinate measuring machines and other types of inspection equipment are designed and built to measure parts to extremely close tolerances, but in service do not always perform to the standards desired. This difference in performance is often not the fault of the machine or of the tooling. Many times it's due to vibration entering the machine from the floor.

Vibro/Dynamics LLC is a leader in the development of vibration control isolators *(machinery mountings)* designed to provide a high degree of vibration isolation effectiveness combined with very precise leveling and alignment features that allow precision machine tools to perform at their best even in the harshest vibration environments.

To illustrate the effectiveness of Vibro/Dynamics Micro/Level Isolators in protecting machinery, vibration measurements were made on a simulated machine tool holder while the floor adjacent to the machine's base was impacted. Measurements were taken with the machine hard mounted, mounted on Micro/Level Isolators, and mounted on other brands of isolators.

The results of these vibration tests indicated decisively that the transmission of floor-induced vibration can be reduced very effectively by using high quality, high efficiency isolation mounts to protect a precision machine tool. In addition, the tests showed a tremendous difference in performance between varying brands of isolators.



The test results show that one model of Micro/Level Isolator was over *25 times* more effective in isolating equipment from floor vibration as a competitor's mount specified for the same weight and type of machine.

The oscilloscope tracings on page 3 illustrate the effectiveness of typical Vibro/Dynamics "M" type Micro/Level Isolators, designed to support and protect machinery of slow speed and with only slight unbalanced forces. In this test, overall vibration in the tool holder was reduced by 96.5% when compared to the "hard-mounted" condition.

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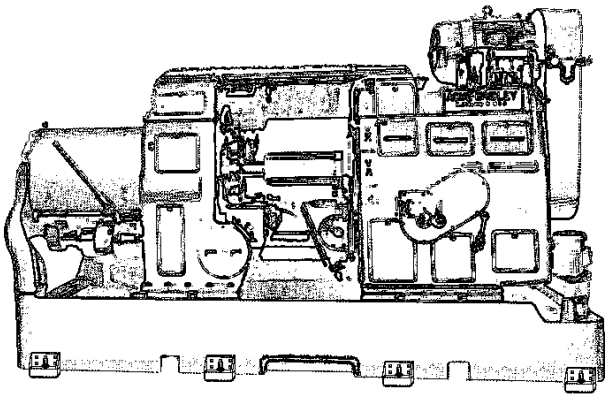
The second tracing on page 3 shows that the competitor's mount reduced the transmission of vibration at the tool holder by only 10% when compared to hard-mounting, and allowed over 25 times more vibration than the Micro/Level "M" type isolator.

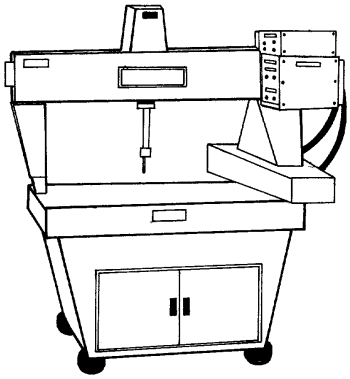
Page 4 illustrates the effectiveness of typical "L" type Micro/Level Isolators, designed to support and protect machinery of medium speed and minor unbalanced forces. The vibration measured with the test machine base on the "L" type isolators show the vibration reduced 92.5% compared to hard-mounting, and 12 times more effective than Brand "X".



Some Machines require the support stiffness of type "K" Micro/Level Isolators, designed to support and protect machinery with high speeds and significant unbalanced vertical and horizontal forces. As can be seen in the tracings on page 5, the "K" type isolators were twice as effective as Brand "X" and reduced vibration at the tool holder by about 55% compared to the hard-mounted condition.

Vibro/Dynamics LLC is a leader in the development of isolators for machine tools as well as methods of installing and leveling these machines to prevent floor vibration from compromising their part quality and productivity.

Over 100 basic models, with over 3,000 variations, of Micro/Level Isolators are available for almost any application, each custom-engineered to achieve optimum support conditions and vibration control efficiency for almost every type of machine tool.



Vibro/Dynamics Isolators are available for machines ranging in size from lightweight, vibration sensitive equipment up to huge punch presses weighing over 5,000,000 lbs. Many models may be equipped with optional features, such as electronic load sensing and fine-tuning capabilities (Lod/Sen™) and with built-in hydraulic power lift (Hydra/Level®).

For further information, please contact
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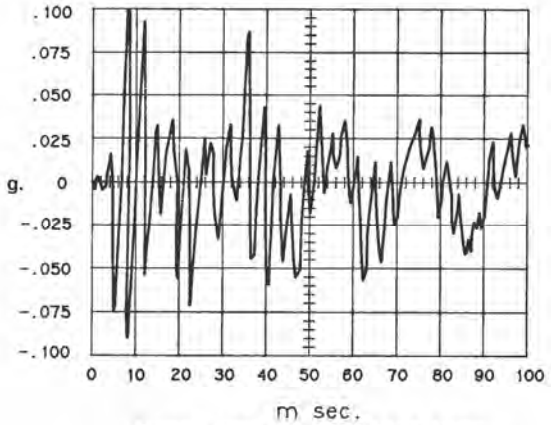
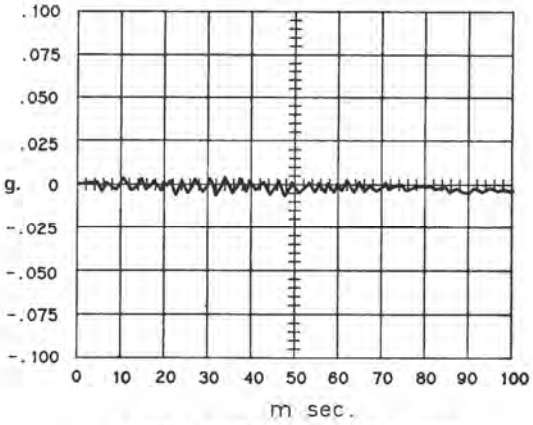
Effectiveness of Vibro/Dynamics "M" Style Isolators in Reducing Vibration of a Simulated Toolholder Resulting from Floor Vibration

With Machine Hard Mounted Directly on the Floor



Scale .005g/Small Divisions
Maximum g shown = 0.1 g

With Machine Mounted on Vibro/Dynamics "M" Style Isolators

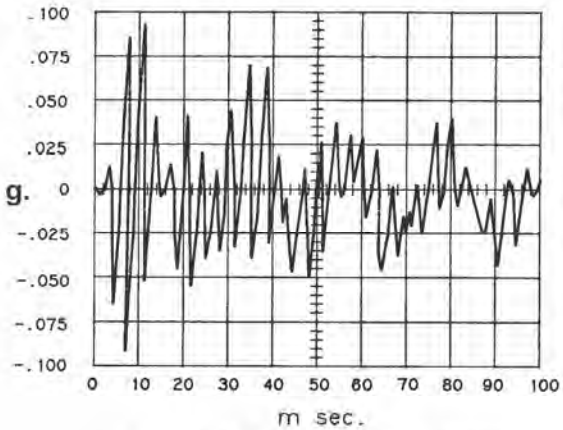


Scale .005g/Small Divisions
Maximum g shown = .0035 g

All Pass

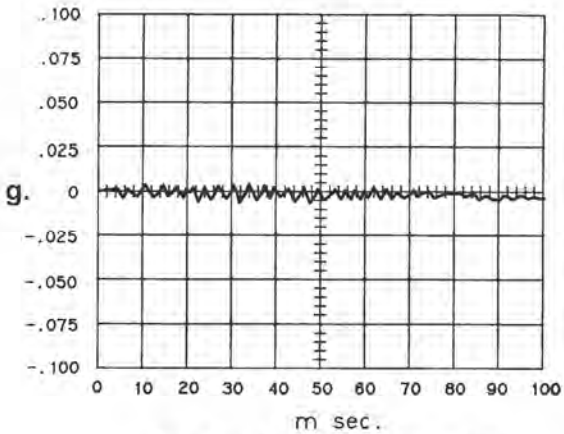
Comparison of Vibration of Simulated Toolholder Resulting from Floor Vibration for Machine Mounted on Brand "X" vs. Vibro/Dynamics "M" Style Isolators

With Machine Mounted on Brand "X" Mounts



Scale .005g/Small Divisions
Maximum g shown = 0.090 g

With Machine Mounted on Vibro/Dynamics "M" Style Isolators

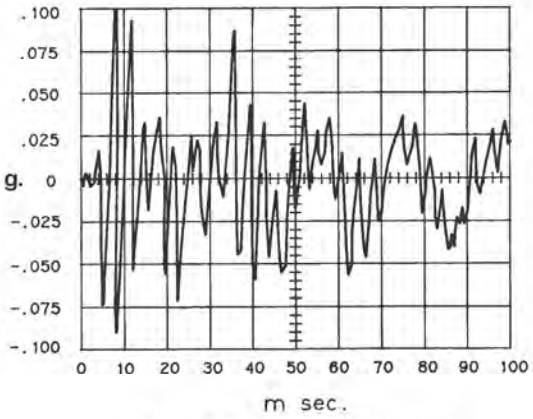


Scale .005g/Small Divisions
Maximum g shown = 0.0035 g

All Pass

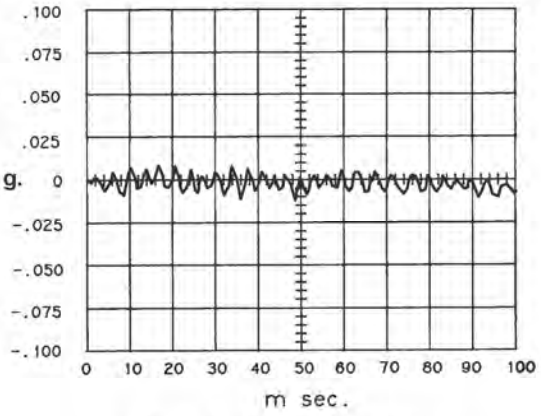
Effectiveness of Vibro/Dynamics "L" Style Isolators in Reducing Vibration of Simulated Toolholder Resulting from Floor Vibration

With Machine Hard Mounted Directly on Floor



Scale 0.005g/Small Divisions
Maximum g shown = 0.1 g

With Machine Mounted on Vibro/Dynamics "L" Style Vibration Isolators

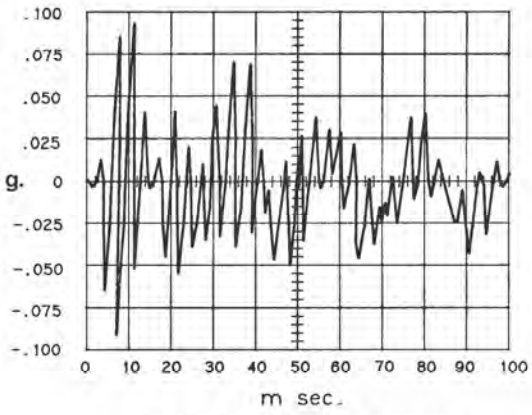


Scale 0.005g/Small Divisions
Maximum g shown = 0.0075 g

All Pass

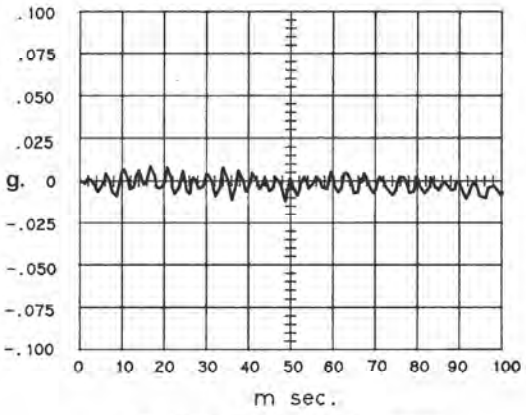
Comparison of Vibration of Simulated Toolholder Resulting from Floor Vibration Machine Mounted on Brand "X" vs. Vibro/Dynamics "L" Style Isolators

With Machine Mounted on Brand "X" Mounts



Scale 0.005g/Small Divisions
Maximum g shown = 0.09 g

With Machine Mounted on Vibro/Dynamics "L" Style Isolators

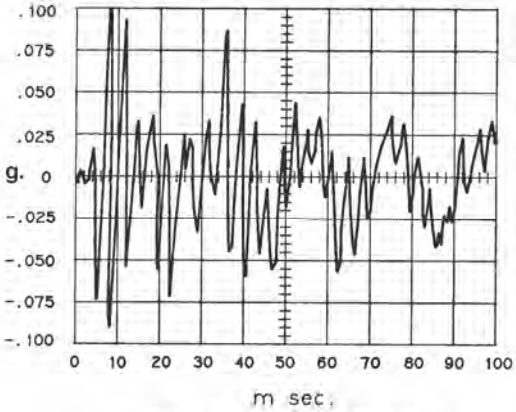


Scale 0.005g/Small Divisions
Maximum g shown = 0.0075 g

All Pass

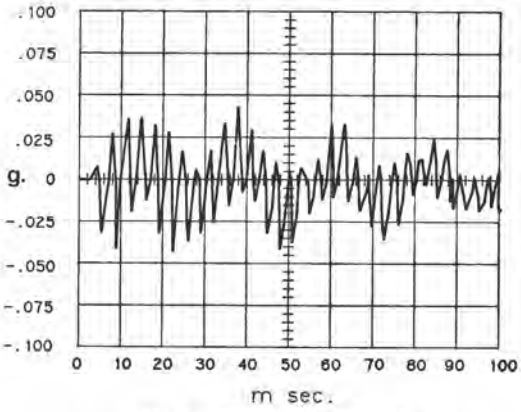
Effectiveness of Vibro/Dynamics "K" Style Isolators in Reducing Vibration of Simulated Toolholder Resulting from Floor Vibration

With Machine Hard Mounted Directly on Floor



Scale 0.005g/Small Divisions
Maximum g shown = 0.1 g

With Machine Mounted on Vibro/Dynamics "K" Style Vibration Isolators

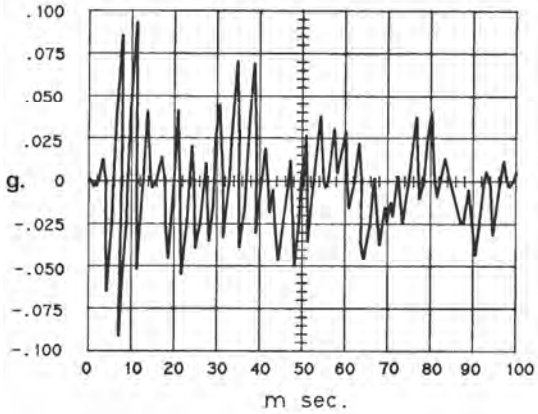


Scale 0.005g/Small Divisions
Maximum g shown = 0.045 g

All Pass

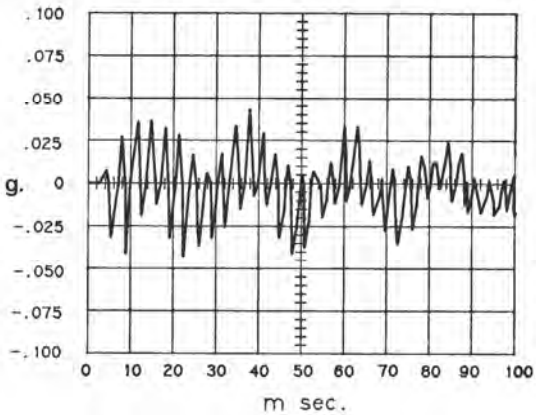
Comparison of Vibration of Simulated Toolholder Resulting from Floor Vibration for Machine Mounted on Brand "X" vs. Vibro/Dynamics "K" Style Isolators

With Machine Mounted on Brand "X" Mounts



Scale 0.005g/Small Divisions
Maximum g shown = 0.09 g

With Machine Mounted on Vibro/Dynamics "K" Style Vibration Isolators



Scale 0.045g/Small Divisions
Maximum g shown = 0.0075 g

All Pass