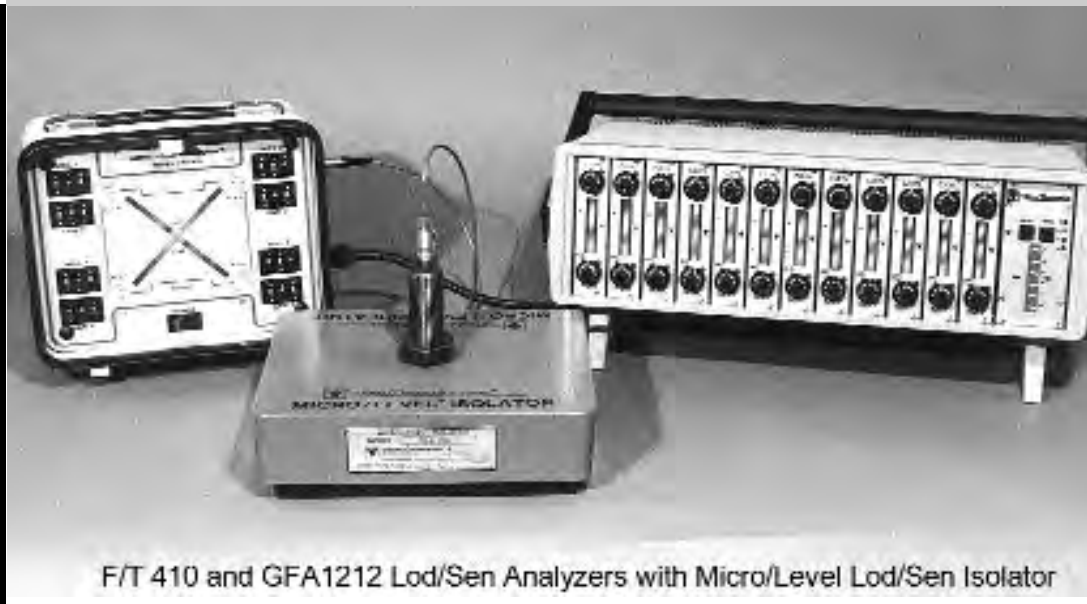
VIBRO/DYNAMICS

H&O DIE SUPPLY, INC.

Electronic Fine/Tuning EFT™ System

LOD/SEN™

Optimum Support for Industrial Machinery



F/T 410 and GFA1212 Lod/Sen Analyzers with Micro/Level Lod/Sen Isolator

Vibro/Dynamics' Lod/Sen™ is an optional Electronic Fine-Tuning (EFT) System available in our Micro/Level® Elastomeric and Hy/Speed® Spring Isolators.

Electronic sensors within each isolator are connected to a Lod/Sen analyzer to accurately determine a machine's support condition. Easy-to-read graphical displays on Lod/Sen analyzers indicate which isolators to adjust, and how much to adjust them, for optimum machine support. EFT Systems are especially useful when installing machinery with four or more mounting points.

Ultra-precise leveling and support adjustments, without guesswork, result in an optimally supported, more productive machine.

VIBRO/*DYNAMICS*

LOD/SEN™
Load Sensing Isolators

Better Machine Performance

A machine's support condition directly affects its level, parallelism, alignment, and the overall geometry of the machine. Improved machine performance, part quality and increased tooling life and productivity all result when a machine's support condition matches its weight distribution.

Optimum Support

When a machine is hard mounted, there is either too much or too little support at each mounting point due to the high stiffness between the foundation and machine. Anchors are often used to pull a machine down at lightly loaded mounting points in order to bring it into level and alignment. This process introduces twisting forces into the machine and proper support is never achieved, especially for machine tools with four or more mounting points.

The Lod/Sen System, combined with the elastic properties of our isolators, does not rely on brute force to bring a machine into level and alignment. Precise support and level adjustments bring a machine into perfect geometry. By optimizing the machine's support condition, the level,alignment and geometry of the machine is precisely obtained.

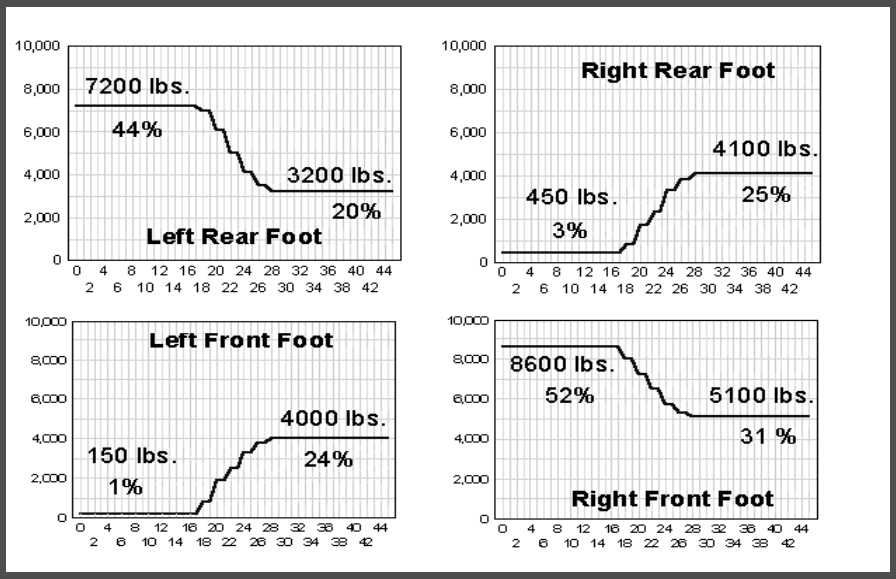
How the System Works

Load Sensors within each isolator are connected to an EFT Lod/Sen analyzer that graphically displays the static load on each isolator. All isolators are then adjusted to carry a logical amount of load based on the machine's construction and its center of gravity.

The machine is then leveled and aligned using the isolator's precision Lod/Sen leveling screws and either a laser or a precision machinists' level to measure machine level, flatness, and alignment. As the machine is being leveled, its support condition is monitored using a Lod/Sen analyzer. If a mounting point is not carrying its fair share of the load, it is adjusted (Fine-Tuned) while keeping the machine level and aligned.

An optimum machine support condition is achieved when the machine is perfectly aligned with all mounting points properly supported.

Case History



The above strip charts were taken with an oscillographic recorder connected to the output of a Lod/Sen analyzer during the installation of a 60 ton press. When the press was set down and rough leveled, there was much more weight supported by the Left Rear (44%) and Right Front (52%) feet. This diagonal pair of mounting points carried 96% of the press weight. This is typical of a hard-mounted machine. After the machine was leveled and Fine-Tuned, the weight distribution across the LR & RF diagonal was 51% compared to the LF & RR's 49%. Since the center of gravity of a machine is seldom in the center, an equal amount of support on each mounting point is not expected. The goal of the Fine-Tuning process, on a four-legged machine, is to have a perfectly leveled and aligned machine with an approximately 50-50 weight distribution across the diagonals. This support condition eliminates twisting forces within the machine.

EFT Lod/Sen Analyzers

The GFA Series analyzers are designed for machine tools with up to 24 mounting points. Easy-to-read bar graph displays show a machine's support condition. The F/T 410 Fine Tune Analyzer is ideal for machines with four mounting points. A 50-50 Fine-Tuned support condition across the diagonals is easily achieved using the analyzer's "X" pattern display.

All analyzers come equipped with output jacks to connect oscilloscopes, oscillographs, and other data acquisition devices.

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