

TECHNICAL BULLETIN M/L- 676

Vibro/Dynamics vs. Non-Swiveling Wedge Isolators

Do wedge type isolators really support a machine better than Vibro/Dynamics' Micro/Level® vertical leveling screw (VLS) type isolators? This may appear to be the case because usually the wedge isolators are completely located underneath a machine foot, but in reality Vibro/Dynamics' VLS Isolators provide better machine support than wedge type isolators that do not have a swiveling feature. Vibro/Dynamics' VLS Isolators have all the design features necessary for a quality, long-term machinery installation. They offer better machine support; provide greater machine stability; precise leveling, alignment and parallelism; and have superior isolation effectiveness unmatched by any other brand or type of isolator – wedge or otherwise.

Uniform Support

Vibro/Dynamics VLS Isolators have a unique “swivel” design that keeps the bottom of the machine feet from being subjected to stress concentrations and point loading. See Figure 1.

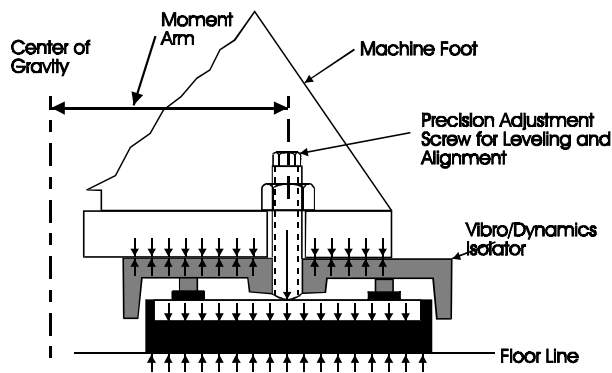


FIGURE 1

Floor and foundation surfaces are seldom parallel to the bottom surface of the machine feet. This out-of-parallel condition causes stress concentrations and uneven foot loading. Since Vibro/Dynamics' VLS Isolators have a unique

“swivel” action, static and dynamic loads are applied uniformly over the bottom surfaces of the machine feet under *all* surface conditions, whether they are parallel to the floor or not. See Figure 2.

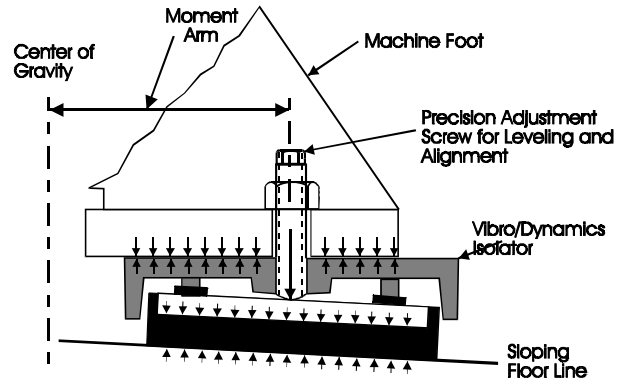


FIGURE 2

The swivel action also provides uniform distribution of static and dynamic loads over the entire area of the isolator's elastomeric cushion. The result is superior isolation, better performance, and longer life for both the machine and the isolator.

Machine Leg and Foot Stress

The bending moment, or torque, on the machine leg is similar for both the Vibro/Dynamics' Isolator and the wedge mount. When determining the length of the machine leg's moment arm, the middle of a Vibro/Dynamics' Isolator is always used. With non-swiveling wedge mounts, the length of the moment arm will vary with the load center of the mount. The geometrical center of the wedge mount can only be used if the floor and the bottom of the machine foot are perfectly parallel in all directions, which is seldom the case. See Figure 3.

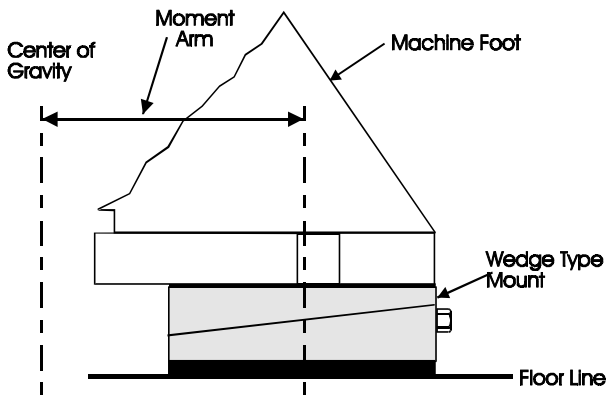


FIGURE 3

When the floor and bottom surface of the machine feet are not parallel, the wedge mount applies uneven load and support to the bottom of the machine foot. This causes the support center to shift away from the center of the wedge mount, changing the length of the moment arm. See Figure 4.

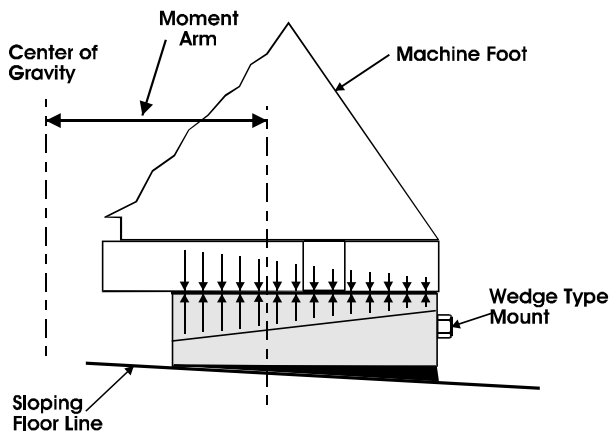


FIGURE 4

This may seem advantageous if the support center moves closer to the center of gravity or centerline of the machine thus shortening the length of the moment arm, but floors usually slope in more than one direction, making it just as likely that the concentration of machine support is at the outside edge of the machine foot as it is at the heel of the foot. See Figure 5.

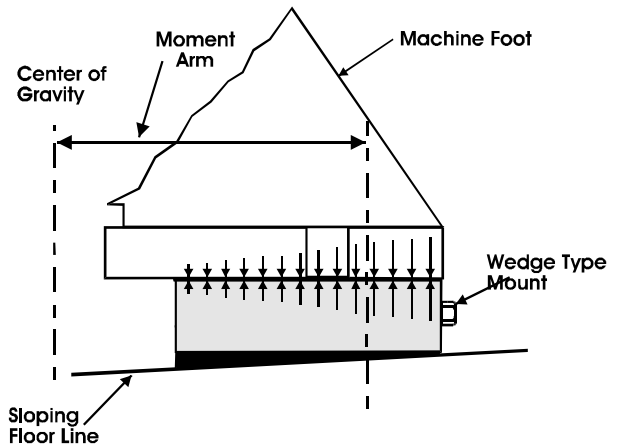


FIGURE 5

In fact, in severe out-of-parallel conditions, the high stiffness characteristics of the wedge mount's elastomer and its inability to swivel can cause a gap to occur between the floor and the elastomer. This causes even greater stress concentration to be applied to the bottom of the machine foot. See Figure 6.

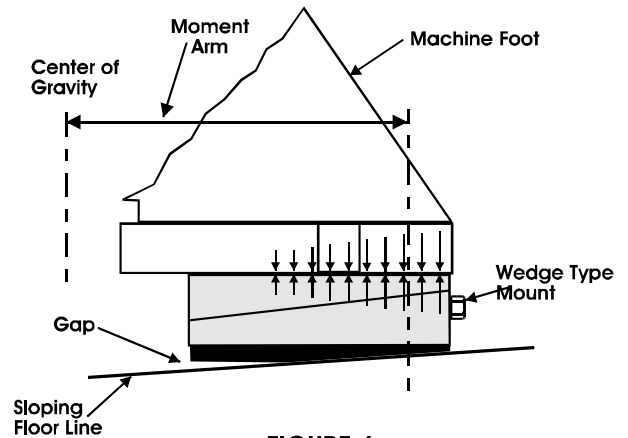


FIGURE 6

Some wedge mount designs offer a swiveling ring to compensate for out-of-parallel conditions. Many of these designs do not provide ample surface area to properly support the machine feet.

Improved Machine Stability

The support condition of a machine directly affects machine stability and the amount that the machine will move. Figure 7 shows a typical machine support condition when installed on non-swiveling wedge mounts.

Since an out-of-parallel condition between the floor and the bottom of the machine feet will cause the wedge mount's center of support to vary, a symmetrical perimeter of support is unlikely, resulting in excessive motion, rocking, and even walking. Excessive motion is likely to occur if the wedge mount's center of support is concentrated at the heel of the machine foot. This effectively narrows the "wheelbase" of the machine, causing it to sway excessively if the machine generates rocking forces.

With Vibro/Dynamics' Isolators, the center of support is always at the center of the isolator. See Figure 8. The support condition is always consistent and predictable – there's no guesswork. Optimal machine support and stability are direct benefits resulting from a properly supported machine.

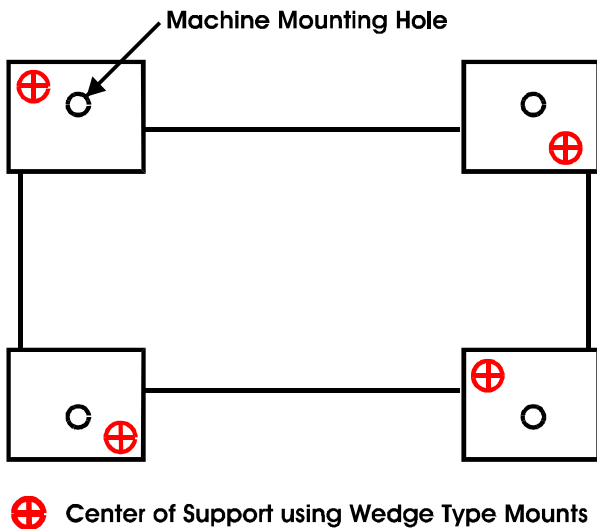


FIGURE 7

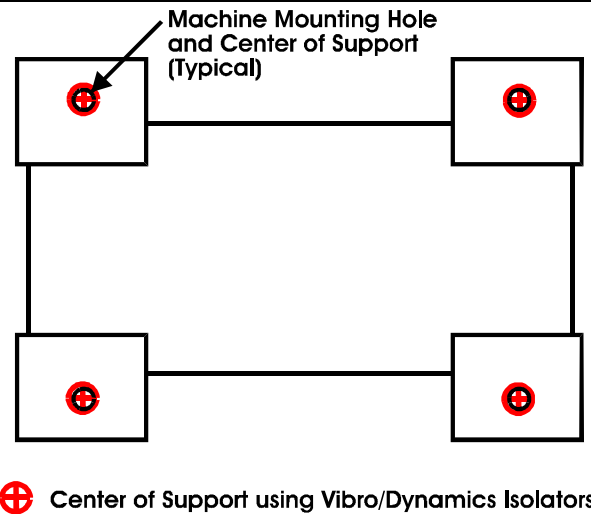


FIGURE 8

Precision Leveling, Alignment, & Parallelism

Vibro/Dynamics' Isolators offer greater precision in machine leveling, alignment, and parallelism. Precision adjustment screws, combined with custom-engineered elastomers that maintain resiliency and won't pack down, are the key.

Two things happen when the isolator leveling screw is turned. *First*, the housing is raised and *second*, the amount of load that the isolator is carrying increases. The increased load causes the elastomer to deflect, partially offsetting the adjustment of the leveling screw, resulting in a very fine leveling adjustment. The softer the elastomer, the more it offsets the leveling screw adjustment.

Wedge mounts are equipped with side-adjusting leveling screws that drive opposing wedges together and apart to adjust up and down. The wedge configuration decreases the effort required to turn the leveling screw, making it difficult to determine how much load that it is carrying. This makes fine-tuning a machine's support condition difficult especially in light of the high stiffness characteristics of most wedge mount manufacturer's elastomers.

Isolation Effectiveness

The machine legs and feet are subjected to less stress and strain when installed on Vibro/Dynamics' Isolators. This is due to the superior isolation and greater impact force reduction (*up to 98% documented*) that Vibro/Dynamics' Isolators provide using custom-engineered elastomers specifically designed for machinery mounting applications. Most wedge mount manufacturers use very stiff isolation material made from felt-composition, vinyl-impregnated cork, or plastic (e.g., PVC, etc.). This material often "creeps" and "packs-down" over time, offering very little machine level stability and vibration isolation.

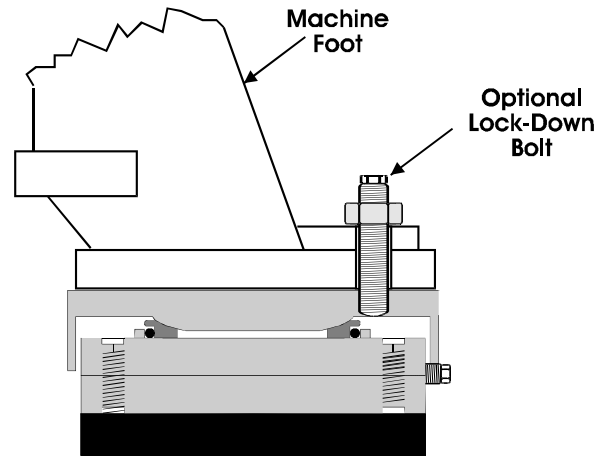


FIGURE 9

Vibro/Dynamics Wedge Isolators

For machines that do not have mounting holes, mounting holes that are too small, machines with known weak leg designs, or where it is desirable to have an isolator centered under a machine foot for whatever reason, Vibro/Dynamics' Wedge Isolators are available.

Unlike other manufacturers, Vibro/Dynamics' Wedge Isolators feature our patented Glide-Ring™ Damper that swivels to compensate for out-of-parallel conditions and to absorb horizontal forces that cause machines to walk. See Figures 9 and 10. The isolator's top surface area is also large enough to span foot gussets and to properly support the bottom of the machine foot. Vibro/Dynamics' Wedge Isolators also feature the same quality, high performance elastomers as the Micro/Level® VLS style isolators.

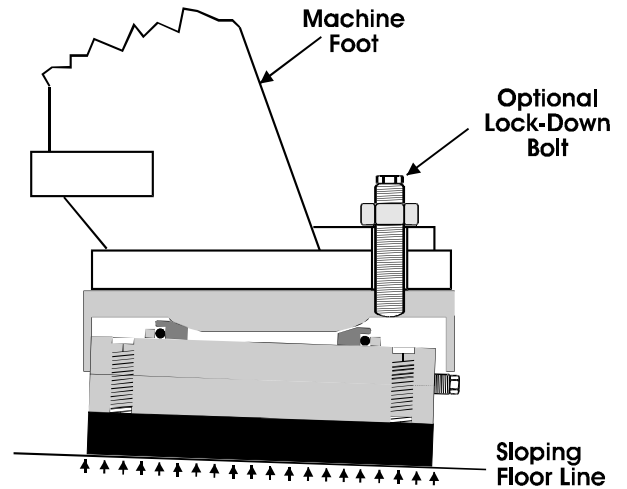


FIGURE 10

Summary

No matter what type of isolator you need, Vibro/Dynamics offers the best designs and materials available in the industry. No competitive brand or design out performs Vibro/Dynamics in design, quality, and protecting your equipment and environment from the harmful effects of vibration, shock and noise.

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