

### MICRO/LEVEL® ISOLATOR INSTALLATIONS WHEN THE MOUNTING HOLES IN THE FEET ARE OFF-CENTER

A couple of questions are occasionally asked regarding the centering of Micro/Level Isolators under the feet of a machine. These questions arise because in some installations, the machine foot may not be completely resting on top of the isolator and/or part of the isolator may be sticking out from the edge of the machine foot.

There are usually two primary concerns:

- Will the off-center location affect the performance and loading of the isolators?
- Are the machine feet and legs strong enough to be supported by an isolator that does not completely cover the entire bottom surface of the machine foot?

It has been Vibro/Dynamics' experience, after installing thousands of machines on Micro/Level Isolators, that the isolators will perform at their maximum efficiency and provide adequate support for the machine foot even if they are off-centered under a machine foot.

The performance and effectiveness of Micro/Level Isolators does not depend upon the location of the mounting holes in the machine feet, nor on the position and orientation of the isolators under the machine feet. The unique design of Micro/Level Isolators distributes the load supported by each isolator over the entire surface area of the resilient cushion, even when only a portion of the isolator housing is supporting the bottom of the machine foot.

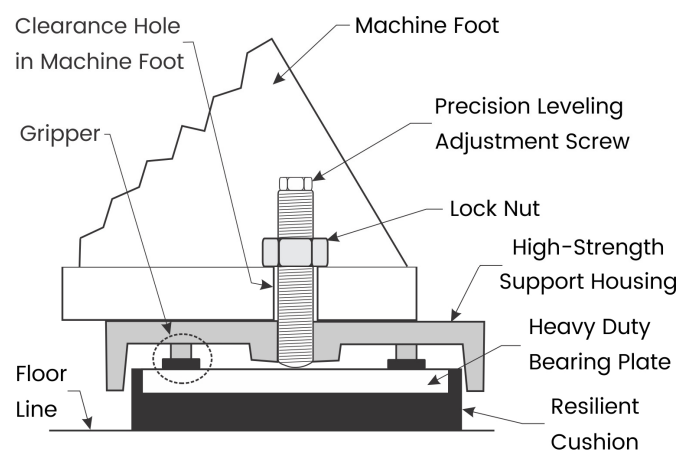
Since the leveling screw threads into the isolator housing, the threads of the isolator housing and the leveling screw carry all the machine weight whether or not the full area of the housing is covered by the machine foot. The tip of the leveling screw transfers the load to the middle of a heavy-duty bearing plate that spreads the load uniformly over the entire area of the resilient cushion. See drawing.

Micro/Level Isolators are designed to be very strong and durable. They have to be in order to handle all the stress of being installed under a machine, particularly a punch press.

Micro/Level Isolators are carefully selected based on a press' total weight, center-of-gravity, dynamic force, stroke length, speed, construction, and tonnage capacity. Even presses weighing over 5,000,000 lbs. have been successfully isolated and supported by Micro/Level isolators.

Micro/Level Isolators are designed to provide the following benefits:

1. Reduce impact forces between the press feet and the floor or foundation.
2. Reduce transmitted vibration and noise.
3. Provide proper support so that the press' support distribution equals its weight distribution.
4. Remove bending and twisting stresses in the press structure caused by irregular floor surfaces.
5. Precisely level the press bed into one flat horizontal plane.



CUTAWAY VIEW OF A MICRO/LEVEL ISOLATOR

## TECHNICAL BULLETIN: M/L- 631

The press builder can best analyze the design and the strength of press feet and legs and their ability to be supported by Micro/Level Isolators. However, we have installed thousands of presses and work closely with the press builders and have found that in the vast majority of cases, the press feet and legs are strong enough to be supported on Micro/Level Isolators using the mounting holes provided in the press feet.

We have found through working with press design engineers that they design the press legs and feet to have sufficient strength to be mounted on isolators. The press builders make recommendations on how the press should be mounted, but in the end have little control over the floor condition on which the press feet rest. The press feet may rest on a surface that is sloped or one that is not flat as shown in the drawing on the right. If in one of these conditions exists, the bottom of the press foot will not be uniformly supported. The press designer must take these worst-case scenarios into consideration when designing the legs and feet of a press. Our experience shows that they are aware of these scenarios and design the press feet and legs to be strong enough to be supported at the mounting hole centerline by isolators. The press legs, when mounted on isolators, will actually have less stress than if hard mounted in a condition shown in the drawing.

When a press is mounted on Micro/Level Isolators, achieving proper support on the four feet is easy since the isolators are precisely adjustable. By adjusting the isolators leveling screws to fine-tune the press's support condition results in all four press feet supporting their proper share of the press weight.

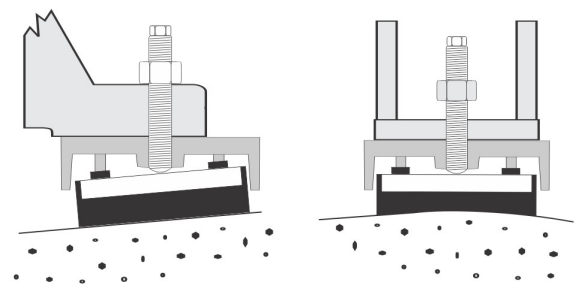
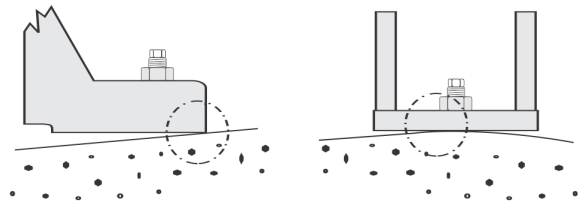
When a press is hard mounted, most of the press weight is carried by one diagonal pair of isolators, with the other diagonal pair supporting little press weight.

Since the floor is hard and very rigid, the support under any one foot tends to be either too much or not enough.

When a press is hard mounted, each press foot may be supported at a single or concentrated point depending on the slope of the floor, as illustrated below. In some cases, the press foot will be supported at the outer edge and in other cases on the inner edge. In some cases, the left edge and other cases the right edge. In short, you will not know how the press foot is being supported.

With Micro/Level Isolators, you know that the bottom of the press foot is being uniformly supported and there is much less stress in the press feet and legs.

### OUT-OF-LEVEL FLOOR CAUSES IMPROPER SUPPORT OF MACHINE FEET



### MICRO/LEVEL ISOLATORS COMPENSATE FOR OUT-OF-LEVEL CONDITIONS

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When a press is mounted on Micro/Level Isolators, the center of support for the press foot is located at the centerline of the leveling screw in the isolator. The internal bearing plate and resilient cushion of the isolator automatically swivel to compensate for the slope of the floor, while the top of the isolator housing maintains uniform contact with the bottom surface of the press foot.

When a press is mounted on Micro/Level Isolators, the impact force in the foot of the press is much less than when it is bolted down. Up to a 97.2% reduction has been documented. (Ask for Technical Bulletin M/L-422.)

If a press has been previously hard mounted, it is a good idea to check for any damage to the press legs that may have been caused by hard mounting. If there are any cracks or weld fractures, the press legs and feet should be repaired before installing the press on Micro/Level Isolators.

In Summary,

1. Off-center location of a Micro/Level Isolator under a press foot, due to the mounting hole location, does not affect the performance of the isolators.
2. Generally speaking, if a press foot is strong enough to withstand the severe stresses caused by hard mounting; it is capable of withstanding the much less severe conditions when the press is installed on Micro/Level Isolators.
3. If an analysis of the machine structure indicates that a machine cannot be supported at the mounting hole, then one of the following options should be considered.
  - Using Vibro/Dynamics Wedge Isolators.
  - Relocating the mounting holes,
  - Reinforcing the machine structure/leg.



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