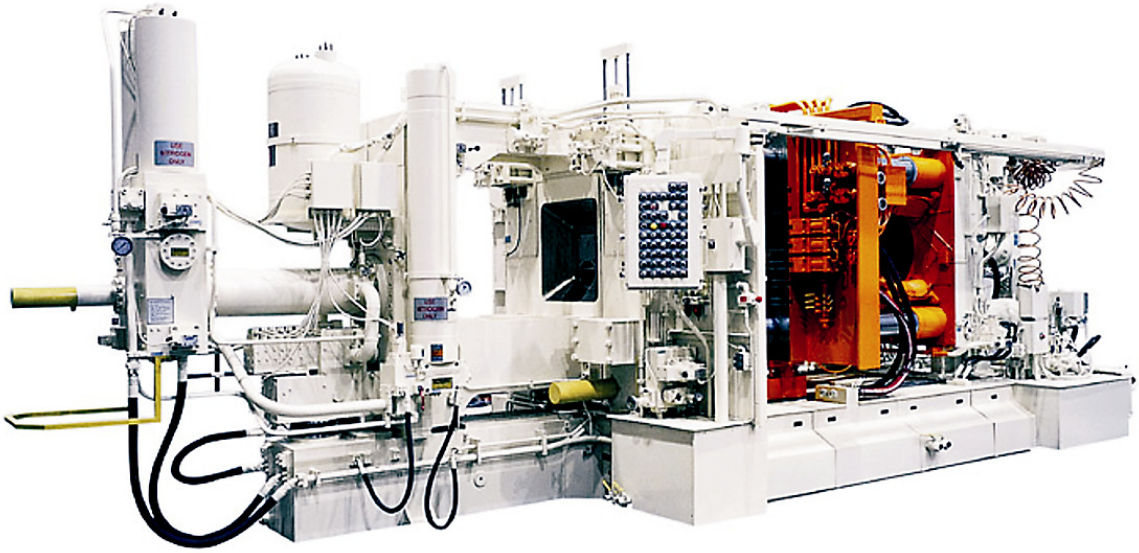
TECHNICAL BULLETIN: **M/L-661**

Micro/Level® Isolation Mount Installation & Leveling Instructions for

Die Casting Machines



VIBRO DYNAMICS a Socitec company

2443 Braga Drive, Broadview, IL 60155
Tel.: 800.842.7668 vibro@vibrodynamics.com
www.vibrodynamics.com

The Importance of Leveling

Micro/Level® Isolation Mounts are designed to provide precision leveling and alignment, which is critical for proper operation and performance of die casting machines. The way a machine is installed directly affects its performance. The machine must be accurately level since this directly affects the opening and closing of the die. It is critical that the die open and close with the die faces parallel and held within the same plane. If not, then the dies will wear prematurely; part quality and repeatability will suffer; machine wear and tear accelerates; and catastrophic failures may occur.

Micro/Level Isolation Mounts also makes releveling of the machine easier should the foundation or floor settle or if the machine goes out-of-level for any reason. Welded or grouted installations cannot easily be adjusted.

Listed below are a couple of helpful points to remember when leveling machinery:

- Since the machine is one structure, leveling adjustments are not made independent from one another. Every leveling adjustment made will affect the prior adjustments made to the other mounting points. When a leveling adjustment is made, the level readings should be retaken at all of the level positions.
- As the leveling adjustment screw is turned, two things happen:
    - *One*, the mounting position is raised by the pitch of the leveling screw, and
    - *Two*, the load supported at that point increases, which then further deflects or compresses the mount's resilient cushion. This in turn offsets the pitch of the leveling screw, resulting in a very fine adjustment.

Preparation

1. The concrete surface under the isolation mounts must be clean, flat, and trowel finished. There should not be any holes, cracks, or lumps directly under the isolation mount. Patch all holes and broken concrete.
2. Clean and inspect the mounting points. Repair any cracks or damage. The bottom of the mounting surfaces must be clean and flat over the contact area with the top of the mounts. Clean all debris from the mounting holes.
3. Machine leveling locations must be clean, flat, and free of scratches and dents. Use a polishing stone to remove scratches and dents.
4. Due to the number of leveling locations, multiple precision machinists' levels will greatly speed up the leveling process. All levels must be checked for accuracy. See "*Level Calibration*" section in M/L Bulletin 647 for concise instructions.

Installation

Installation of Vibro/Dynamics Isolation Mounts is specific to the Model and Type being used. For detail instructions, refer to the *Installation Section* of one of the following documents:

M/L 674 - *Installation and Leveling Instructions for Micro/Level® Vertical Leveling Screw Isolators.*	**M/L 685** - *Installation and Leveling Instructions for Micro/Level® Wedge Style Isolators.*
	

Leveling and Isolation Mount Loading Procedure

Please read this entire procedure before starting the leveling process!

1. Check machine documentation or with the manufacturer for machinists' level locations.
2. For most manufacturers, it is accepted practice to place the level(s) on the machine rails. See Figure 1. *Do not* level the machine by placing levels on the tie bars, plates, or piston rods!

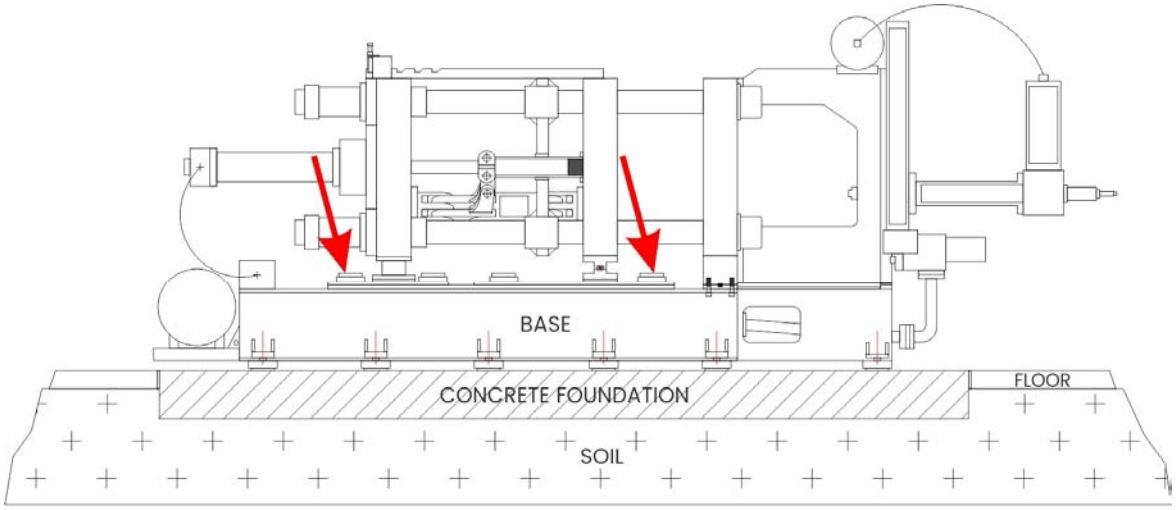


FIGURE 1

3. Close the die space to the anticipated average die height, but leave enough space for a level to be placed at the very end of the rail as shown in Figure 1.
4. The rails must be clean and flat. If the rails are scored or scratched, they must be repaired. A polishing stone works well for slight imperfections.

Isolation Mount Loading

5. Prior to making leveling adjustments, it is beneficial to start by making sure the isolation mounts are all carrying load. Adjust all mounts up 1/8", except those under mounting points A6 and B6; mounting points A6 and B6 should initially remain unloaded during the leveling process on the clamp section.
6. The leveling screw torques give a good approximation of the amount of load carried by the isolation mount. The weight distribution of the machine is not uniform, so neither will be the torque values. Keep this in mind when checking the mount torque. Wedge mounts tend to have a more precise load vs. torque relationship, compared with isolators having vertical leveling screws. A Torque Value vs. Load Chart for wedge mounts is available in the *Addendum Section* of this document.
7. Figure 2 shows a Plan View of the machine base. The level locations are indicated by 1a, 2a, 1b, 2b, etc. Machine support locations are indicated by A1, B1, A2, B2, etc. Side-to-side leveling locations are 1, 2, and 3.
8. Check all of the isolation mounts leveling screw torques around the machine.

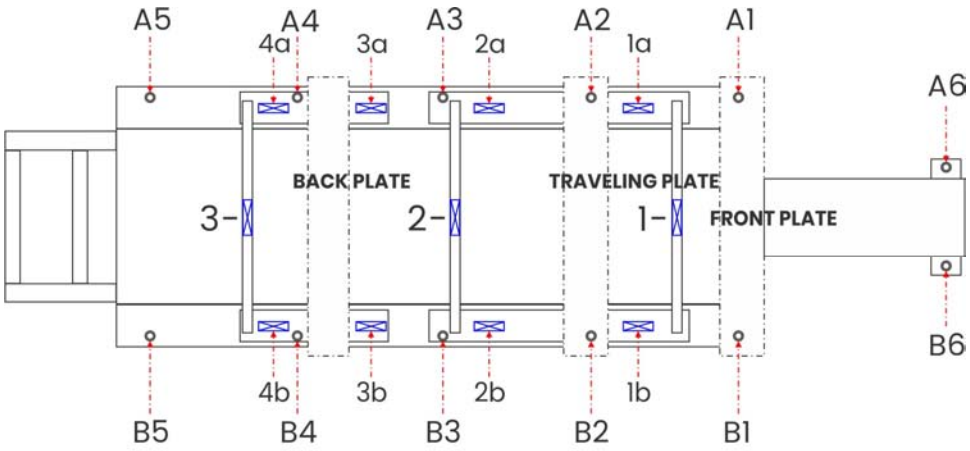


Figure 2

9. Some mounts will be carrying very little load, while others will be carrying too much. During the leveling process, generally raise only the isolation mounts that are lightly loaded. Adjusting these mounts upward increases the load carried by them and decreases the amount of load carried by the other mounts.
10. Continue adjusting the mounts until all are carrying a logical amount of load. This is a subjective measure. Mounts that are next to each other should be carrying similar loads. Remember, the weight distribution of the machine is not uniform, so neither will be the torque values nor the load supported by individual mounts.
11. Now that the mounts are carrying close to their proper amount of load, they can be adjusted in groups to level the machine. The objective is to precisely level the machine so that the die contact surfaces are parallel at closing, and the machine weight is distributed among all isolators as uniformly as possible.

Leveling Process

12. An initial overall leveling assessment should be taken of the machine's level condition.
13. Use a sheet of paper, or the worksheet provided in the Addendum, record the machine's overall level condition at all positions shown in Figure 2.
14. Start by making leveling adjustments on the lowest side of the clamp section, along either Side-A or Side-B.
15. For example, let's assume we will start with Side-A. Place the levels in the locations as shown in Figure 2-1. Raise the isolator at the lowest mounting point (use hydraulic jacks to assist). If isolator location A2 is low, raise A2 until level readings at 1a and 2a are level. It should be possible to achieve level readings of 0.000 inches/foot.
16. Find the next lowest mounting point and repeat the above procedure until Side-A is completely level.
17. Repeat steps 15 and 16 for Side-B until completely level. See Figure 2-2.
18. Recheck the level positions on Side-A and make any necessary adjustments.
19. The clamp section of the machine should now be level in the left-to-right direction along both Side-A and B.
20. Check the front-to-rear level readings at positions 1, 2, & 3 as shown in Figure 2-3. These three readings should now be approximately the same and show either Side-A or Side-B as the low side.

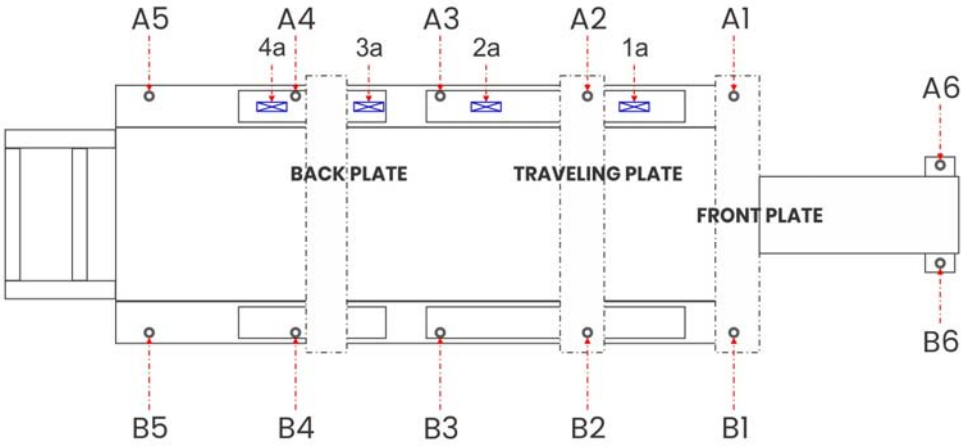


Figure 2-1

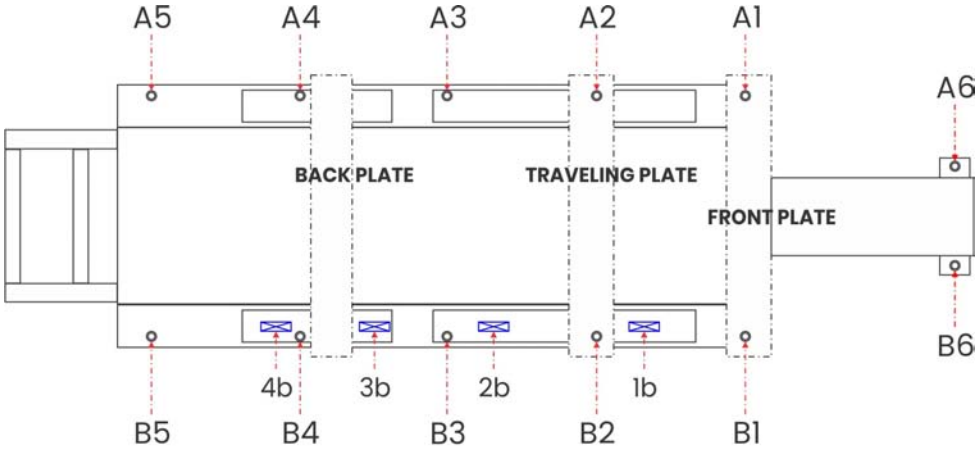


Figure 2-2

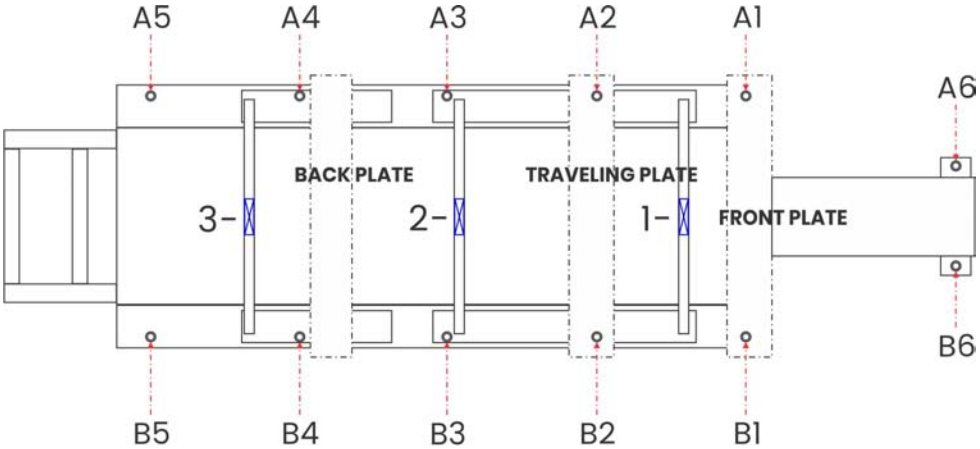


Figure 2-3

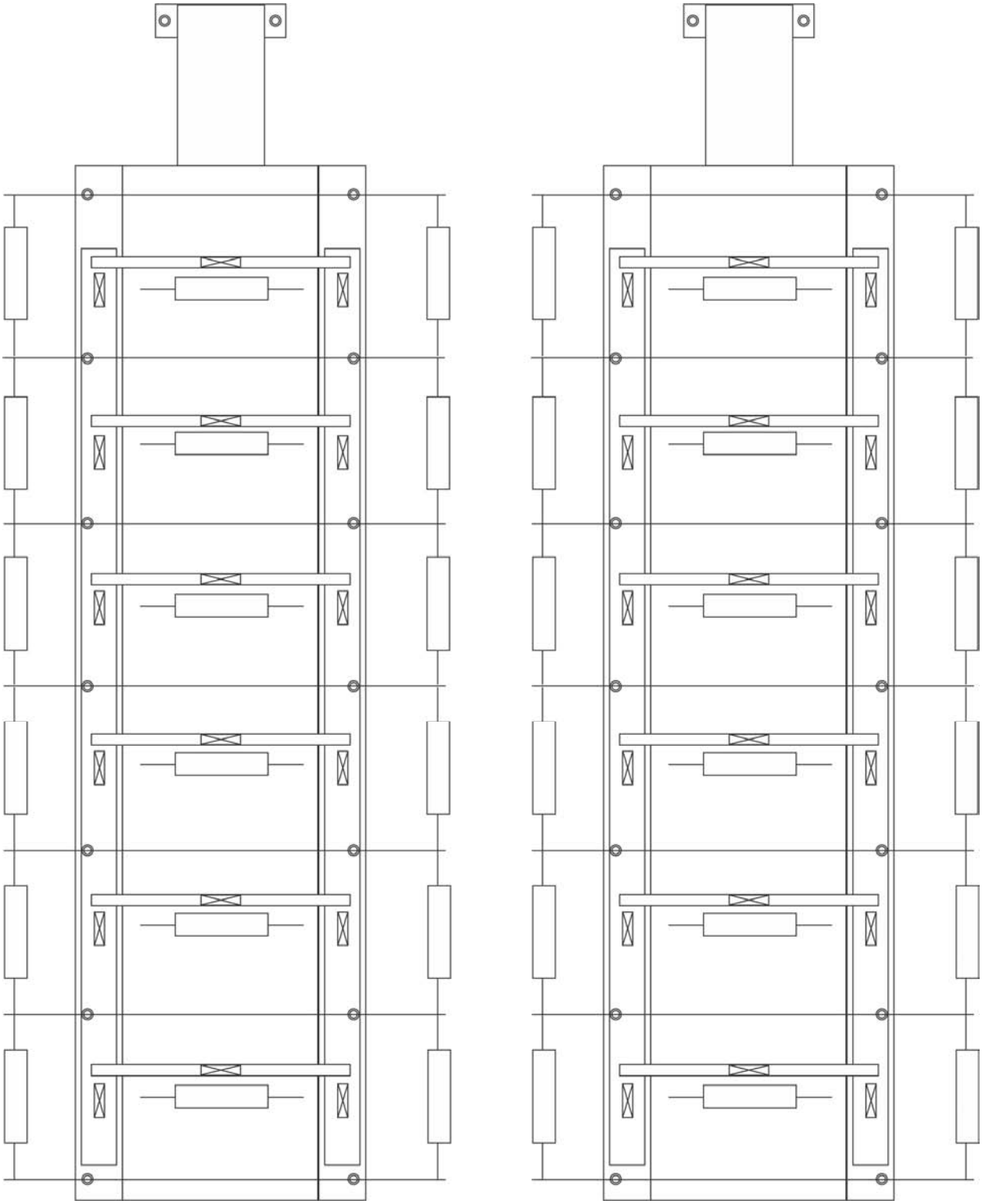
21. Raise the low side of the machine by raising all of the mounts on that side an equal amount until the machine is level. Small adjustments are recommended.
22. Once the clamp section of the machine has been leveled in all directions, adjust shot section isolation mounts A6 and B6 for proper alignment *(cold chamber machines only)* with stationary platen and to sufficiently support the weight at those points. Check clamp section level readings again, and adjust isolators if necessary.
23. If vertical leveling screw type isolation mounts were used, then tighten all of the lock nuts.
24. If clamp section was leveled with no die attached to the Traveling and Front Plates, we recommend raising the isolators at location A2 & B2 only slightly to compensate for slightly more frame bending and isolator compression due to the added weight of the die. Again, the objective is to provide for the mating surfaces of the die to be parallel with each other at closing.

Additional Considerations

1. Die casting machines generate horizontal forces. The hydraulic control valves should be adjusted if possible to smooth the opening and closing of the die to minimize the generated force.
2. There should not be any solid connections between the machine and the foundation or building structure. Flexible connections are recommended for all plumbing and electrical conduit.

Please call if you have any questions or need assistance.

ADDENDUM 1 – Leveling Worksheets



ADDENDUM 2 – Wedge Mount Torque Curves