



System 1 Modular Post-Mount Supports

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Introduction

System 1 is a family of modular post mounted Vibration Isolators and Rigid Leveling Stands that can be configured as follows.

- 4-post or 6-post sets bolted together in a rigid corral frame.
- Individual, free standing posts with oversize baseplates.

Structural Posts: The structural posts are formed from heavy gauge **3/16** and **1/8 inch** thick steel configured with either a Rigid Support leveling jack screw or a Vibration Isolation System.

The base of each post can be left “open” or configured with either an oversized baseplate or in some systems, internal caster fixtures. The high capacity post systems do not accept casters.

Air Supply: Vibration Isolators require a continuous supply of compressed air or Nitrogen to operate properly. For a complete discussion of the air supply requirements, see System Air Supply Requirements in Introduction section.

All System 1 models are shipped with the components partially assembled (excluding the tie-bars).

Gimbal Piston Isolator Upgrade Systems configured with the small and intermediate capacity posts, can be upgraded from the Rigid Supports to the Gimbal Piston Vibration Isolators.

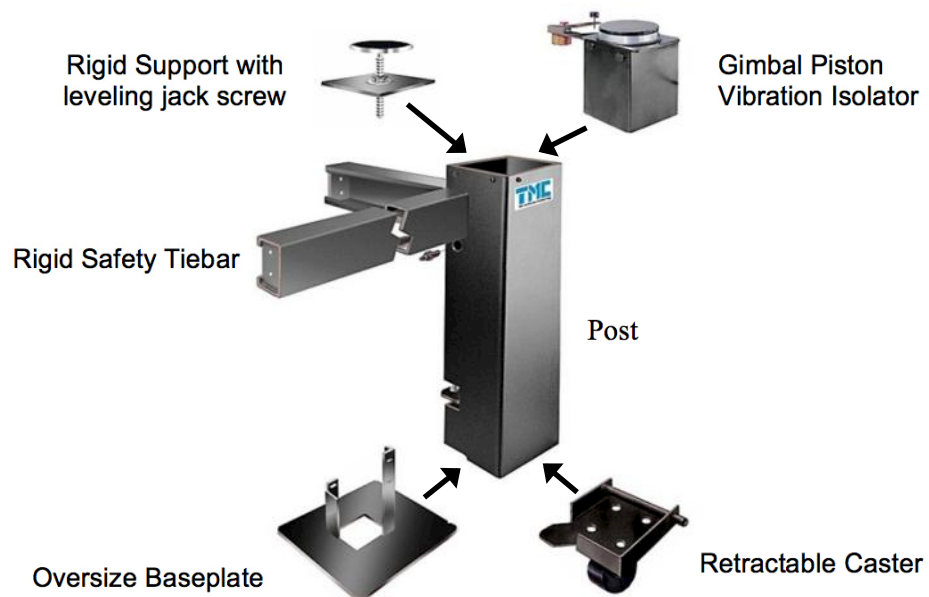


Figure 1, *Modular Post-Mount Supports*

Installation Procedure

Tie-bar Installation

(Installation steps for systems equipped with tie-bars only.)

Systems are designed to optionally add a second row of tie-bars, one row at the top and a second at the base for custom applications. Systems equipped with tie-bars are typically supplied with one row for mounting near the top of the posts.

Tie-bars longer than 40 inches: Systems requiring tie-bars longer than 40 inches achieve this length by joining two short tie-bars bolted end-to-end with a spacer plate.

Hardware: 3/8-16 hex head bolts and matching nuts

Tools: 9/16 inch socket wrench

Step 1 Place the posts on the floor to form either a 4-post or 6-post rectangle as appropriate and referenced in figure below.

Systems with non-isolated rigid supports All posts will be identical.

Systems with vibration isolator supports Three points determine a plane. Three isolators are equipped with a Height Control Valve (V) attached and are referenced as Master Isolators (M). The remaining isolators do not have a valve and referenced as Slave Isolators (S).

All systems have only three isolators with a Height Control Valve attached regardless of the total number of posts.

Arrange Isolator posts so that a slave isolator is located adjacent to a master isolator as typically shown in figure below.

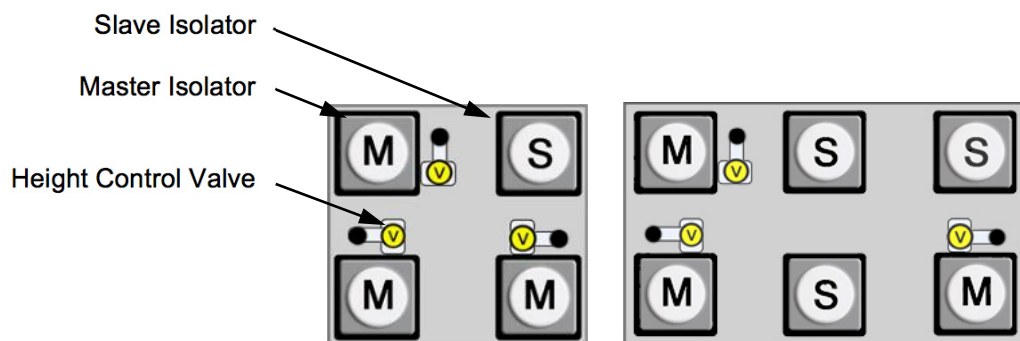


Figure 2, Typical 4 isolator and 6 isolator system layout

- Step 2** Assemble posts into a rectangular frame with **3/8-16** hex head bolts & nuts and using a **9/16 inch** socket wrench.

Tie-bars greater than 40 inches in length

- Tie-bars having a total length greater than 40 inches first require bolting two shorter tie-bars together end-to-end using an alignment spacer plate. Reference figure below.
- Identify correct combination of short tie-bars for connecting together by first observing system part number and then correlate the last two digits with table below for both the table length and table width tie-bars.

System 1 part number example:

p/n **XX - XXX - nn**

└── code number for **table length**
└── code number for **table width**

Part Number Code	Total Tie-bar length in inches	Short tie-bar combination lengths in inches
1	15	n/a
2	20	n/a
3	30	n/a
4	40	n/a
5	50	20 + 30
6	60	30 + 30
7	70	40 + 30
8	26	n/a
9	35	n/a

Table 1 *Short Tie-bar Identification*

- Attach tie-bars together and then attach to posts using the pair of tapped holes located at the upper area of each post. *Refer to figure below.*

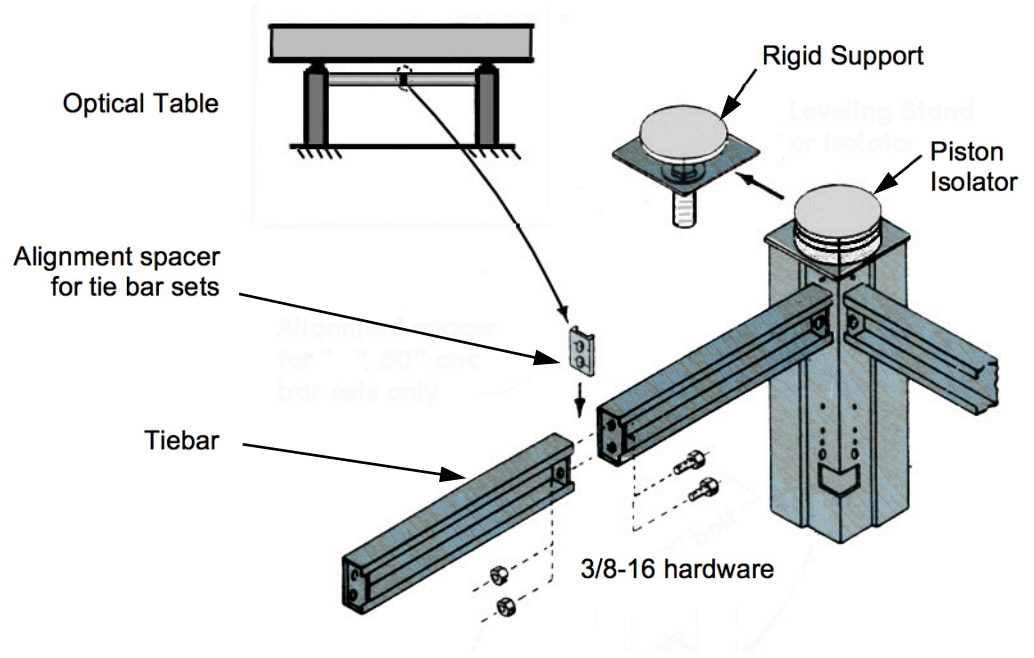


Figure 3, Rectangular frame assembly

Attach the tie-bars to posts using the pair of tapped holes located at the top of each post.

Air Supply Plumbing, Valves and Tabletop Placement

For systems with Rigid Level Supports, skip to the end of these instruction steps to section, Systems with Rigid Leveling Supports.

Air Supply Input Connection

Step 1 Plumb tubing between air supply and system’s input air filter as appropriate.

Fittings: Tubing can be connected to a 1/4 or 1/8 inch NPT female fitting as shown in figure below.

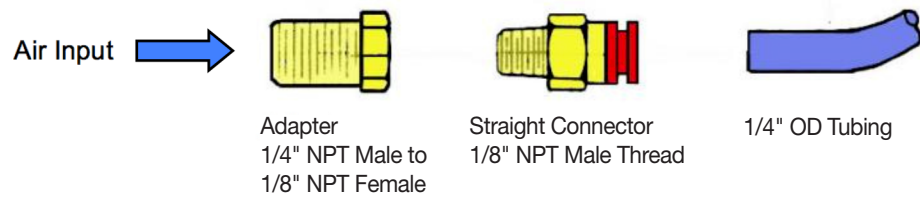


Figure 4, Air Supply Input Connection

Internal Air Supply Tubing

Step 2 Install air supply tubing between *air supply filter*, *isolators*, and *control valves* as appropriate.

M = Master Isolator with Height Control Valve (V)

S = Slave Isolator (no valve).

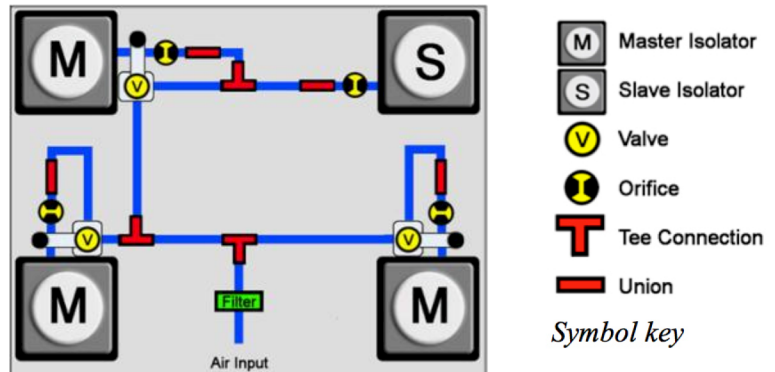


Figure 5, Typical valve schematic for a 4 post isolator system

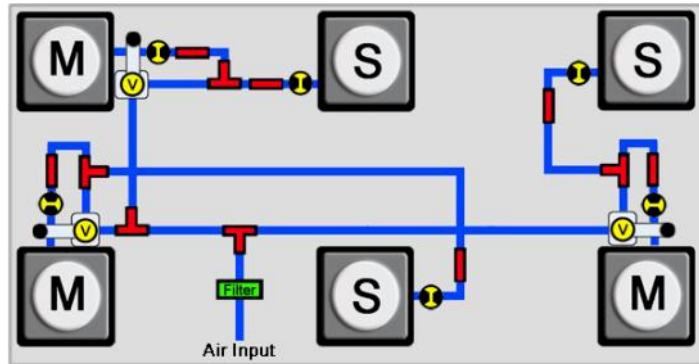


Figure 6, Typical valve schematic for a 6 post isolator system

Ensure the slave isolator [S] is plumbed down-stream from its corresponding master isolator [M].

Optional self-sticking “J” clips are provided for neatly attaching the air hose to the tie-bars.



Note Each post is shipped with a short section of tubing with a union coupler already attached to the input elbow. This “pigtail” segment should not be tampered with. Each pigtail contains a small, flow-restricting orifice to damp table motion and stabilizes the load. A small red ring around the tube marks the orifice position.

If lost or damaged, please contact TMC for replacement pigtails.

Connecting tube Insert the air tube firmly into the self-sealing fitting as shown in figure below.

Disconnecting tube Push the red cylinder with your thumb and forefinger toward the center of the fitting body while also pulling the tube in the opposite direction as shown in figure below.

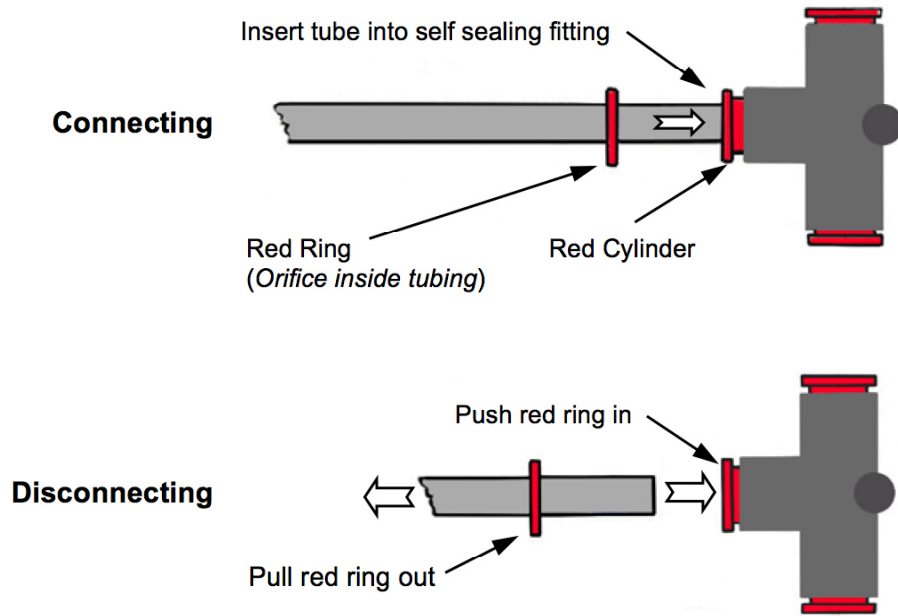


Figure 7, Air tube connections

Orifices Flow restricting orifices are critical to damping system motion. Orifices are located both inside the isolators and in the air tubing marked by a red ring as shown in figure above.



Important Do not remove or change the location of these orifices without consulting TMC.

TableTop Placement

Step 3 Check to ensure assembled isolator frame is reasonably level. Adjust with floor shims if the floor is extremely uneven.

Step 4 Place the table top down on deflated isolators as shown in figure below.

The top should be symmetric over the isolator frame.

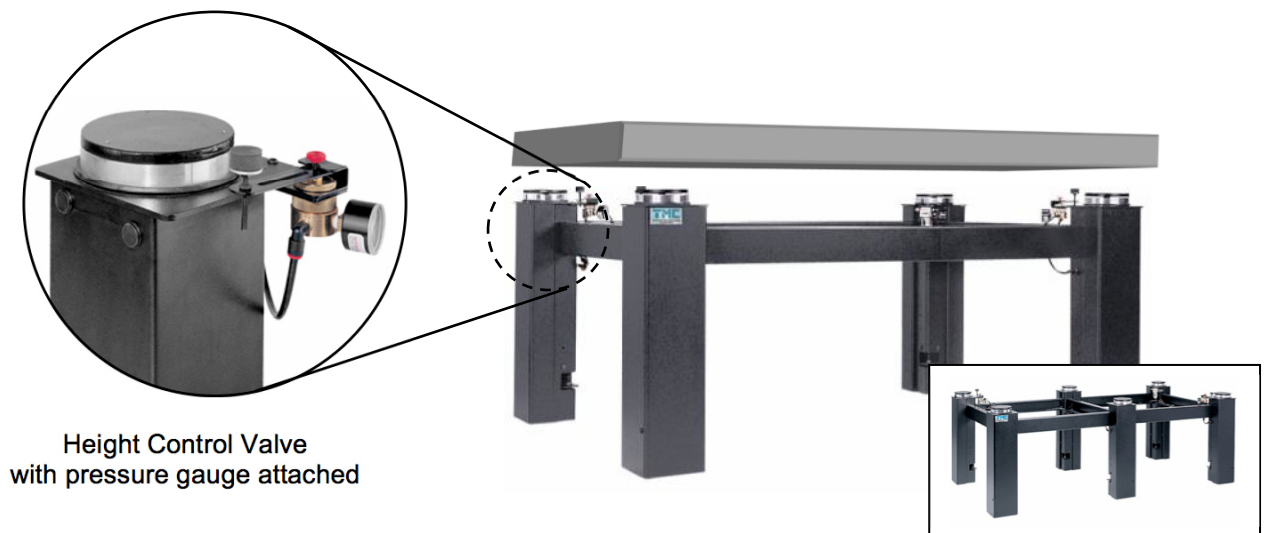


Figure 8, *Typical 4 and 6 post assembled isolator frames*

Attach Horizontal Lever Arms

Step 5 Locate the three *height control valves* mounted on isolators as typically shown in figure 8 above and referencing figures 5 & 6 earlier.

Step 6 Ensure the main air supply is **Off**.

Step 7 Adjust the **ISOLATOR HEIGHT ADJUST** screw CW (clockwise as viewed top down) to lower *foam pad* down to the lowest position close to the *horizontal lever arm* as referenced in figure below. Retract *locking nut* as required.

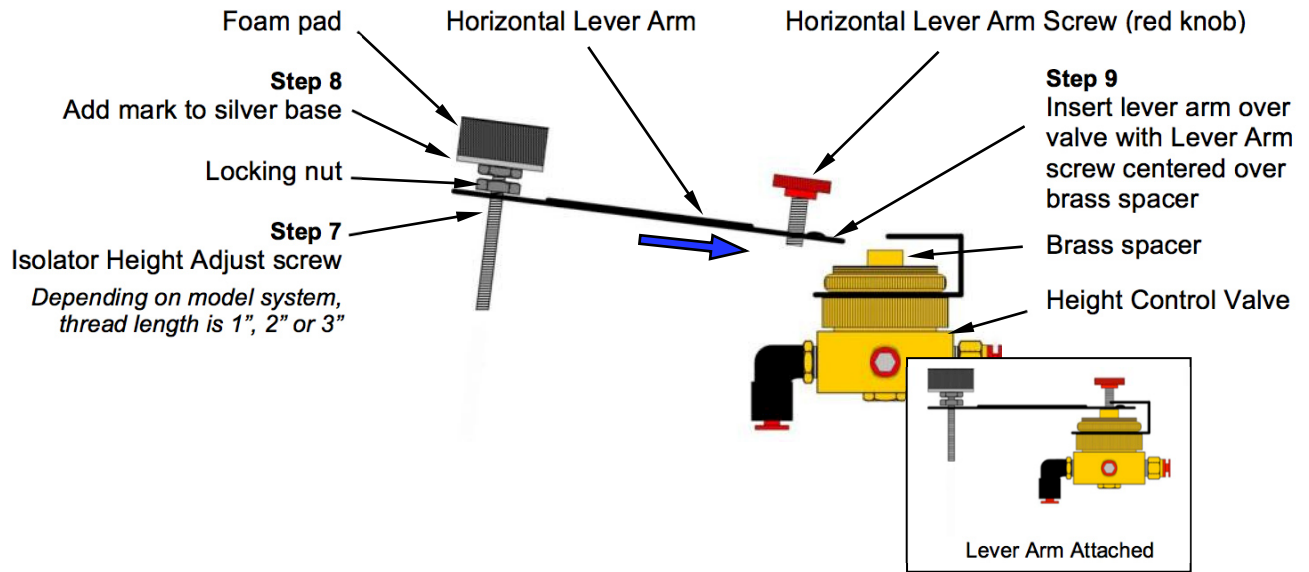


Figure 9, Attaching Horizontal Lever Arm

Step 8 Using a marking pen, mark a spot on the edge of the *foam pad*'s silver colored base to later use as a rotation indicator for the **ISOLATOR HEIGHT ADJUST** referenced in figure above.

Step 9 Attach *horizontal lever arm* onto *height control valve* ensuring the end of the **HORIZONTAL LEVER ARM SCREW** fits over the center of the *brass spacer* as shown in figure 9 above.

Step 10 Loosely fasten *horizontal lever arm* with **HORIZONTAL LEVER ARM SCREW** (red knob) and adjust to position lever arm horizontal with valve as shown in figure 9 insert.

Step 11 Repeat above steps for attaching *horizontal lever arm* onto remaining two valves.

Isolator Height Adjustment

- Step 12** Adjust the **ISOLATOR HEIGHT ADJUST** screw raising *foam pad* until it is in slight contact with the tabletop.

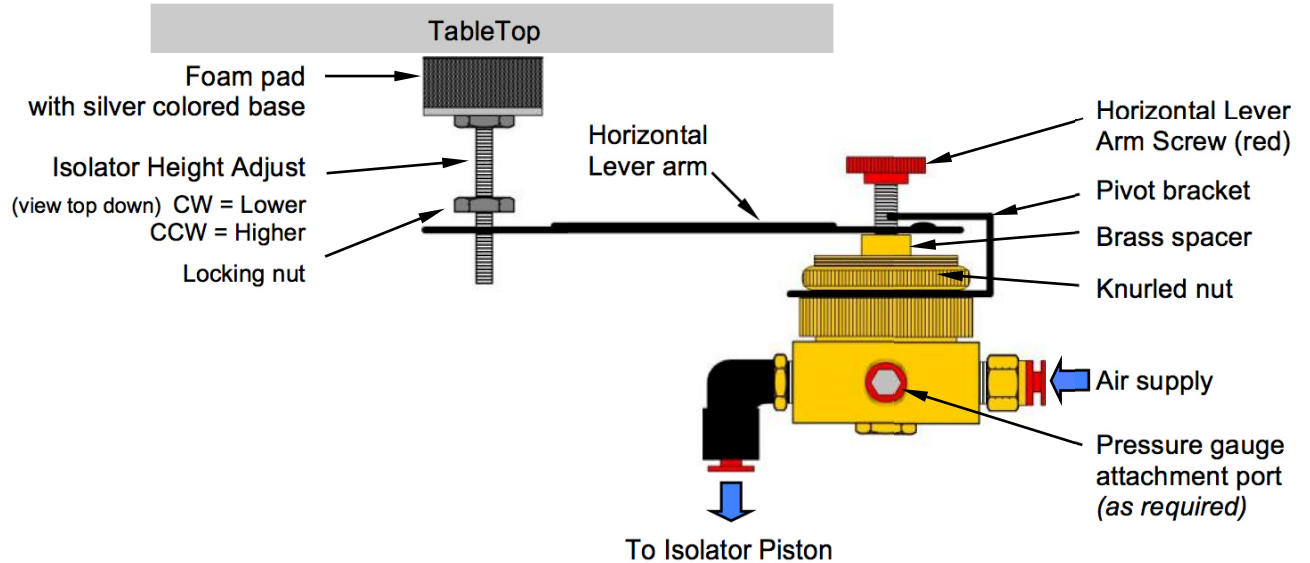


Figure 10, *Height Control Valve*

- Step 13** While observing spot marked on the base of the *foam pad* earlier, continue to adjust **ISOLATOR HEIGHT ADJUST** screw another **5 turns CCW** (counter clockwise).

The foam pad material will compress against tabletop.

- Step 14** Repeat above steps for **ISOLATOR HEIGHT ADJUST** on remaining two isolators with a valve attached.

Gimbal Piston Adjustment

- Step 15** Turn on the main air supply and set to **60-80 psi max.**
After a short delay, all the load disks should lift away from the clamp rings and the tabletop will then be floating.
- Step 16** Check to see that the top of the piston and the top surface of the *clamp ring* are parallel as shown in figure below.
Sliding or tapping *load disk* towards the low spot of the piston will correct any tilt.

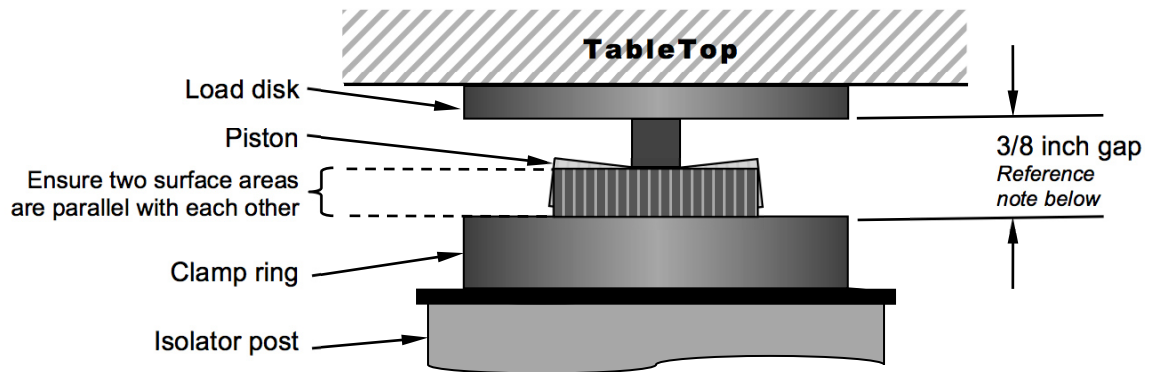


Figure 11, *Gimbal Piston*



Note Centering the Gimbal piston mechanism is important to achieve best horizontal isolation properties.

The mid-point of the vertical range should be determined by the gap between bottom surface of *load disk* and top surface of *clamp ring*.

Gap distance is as follows and referenced in figure above.

4 x 4 inch cross section: **3/8 inch** gap

6 x 6 or **8 x 8 inch** cross section: **1/2 inch** gap.

Some deviation from these heights may be necessary for proper leveling.

The table top should be free to move both vertically and horizontally. Any further leveling should only be done with the **ISOLATOR HEIGHT ADJUST** screw.

Step 17 Tighten *locking nut* on **ISOLATOR HEIGHT ADJUST** for all three valves as shown in figure 10, *Height Control Valve*.



Note There will be some slight settling and improvement in the valve's height sensitivity within the first few days of operation. Again adjust **ISOLATOR HEIGHT ADJUST** if required.

Adjust Air Pressure

Step 18 Adjust the regulated air pressure down to **15–20 psi** above the highest pressure reading of the three pressure gauges. This will optimize damping control of coarse disturbances.



Note Reducing the supply pressure differential will minimize the prolonged disturbance effects of sudden payload forces.

The valves must maintain a positive supply differential or air will be exhausted and the system will deflate.

Air flow through the valves is buffered with controls built into the isolators.

Systems with Rigid Leveling Supports only

(non-isolated tabletop systems)

The rigid leveling support option provides a rigid, non-resonant leg stand for optical tables with a height adjustment. The top of each post has an adjustable jack-screw mechanism with **3 inches** of vertical travel.

Step 1 Place the tabletop down on *rigid supports*, symmetrically over frame as shown in figure below.

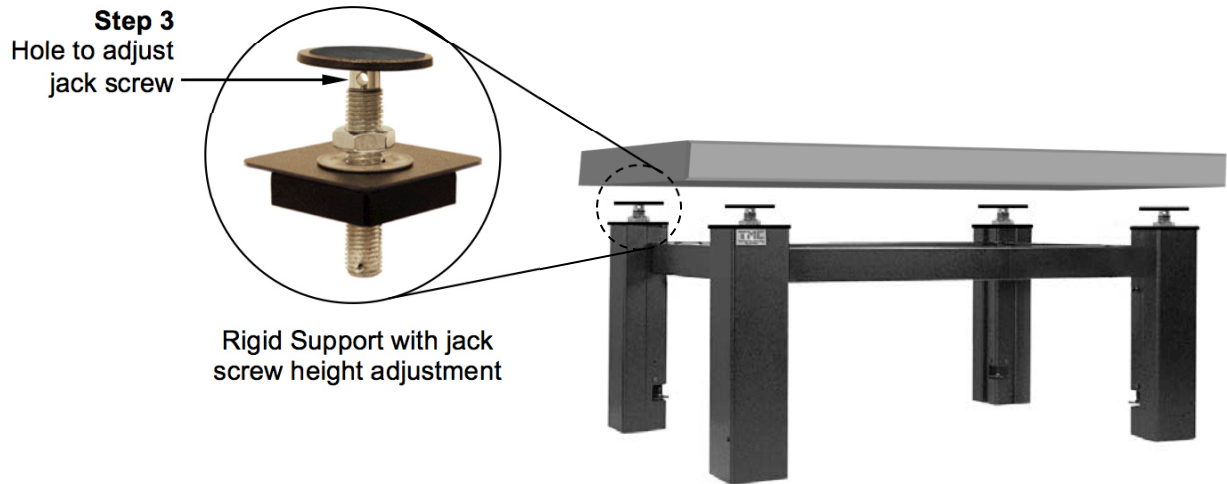


Figure 12, *Typical 4 post assembled frame*

Step 2 Adjust each support point to ensure that the tabletop is supported at each post and level as required.

Step 3 Adjust *rigid support* height by inserting a screwdriver or other type of bar into jack screw hole and rotate jack screw. Reference figure 12 above.

Baseplates Installation

System 1 frames can be configured with freestanding posts as an alternative to having tie-bars. This requires an external baseplate on each post. Some model system configurations may already have baseplates installed as shown in figure 1 earlier in this section.

For systems that require baseplate installation proceed with either of the following procedures as appropriate.

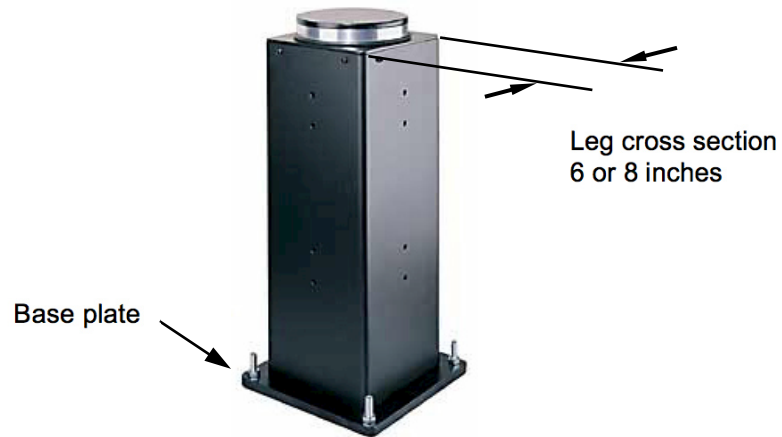


Figure 13, *Post with base plate installed*

Systems with 6 x 6 inch legs

- Step 1** Invert post so that the open end is facing up.
- Step 2** Install the four “clips” in their corresponding window and then rotate in position as shown in figure below.

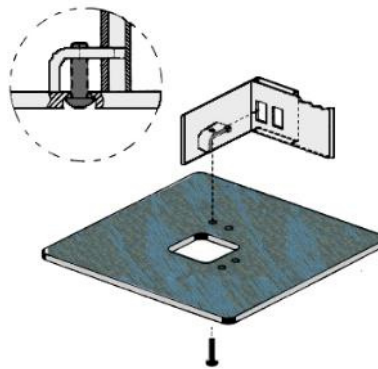


Figure 14, *Baseplate clips*

- Step 3** Position baseplate over post and screw button head cap-screws through baseplate into clips.
Ensure the counter-bored side of plate faces the floor.

Systems with 8 x 8 inch legs

- Step 1** Invert post so that the open end is facing up.
- Step 2** Place the baseplate over the leg and attach using the hardware provided.
Ensure the counter-bored side of plate faces the floor.

Caster Attachment Instructions

An optional set of retractable casters are typically shipped on systems with tie-bars already installed. They cannot be used on systems without tie-bars.

They are engaged with the floor by turning the caster drive screw using a wrench.

The casters should always remain disengaged when not in use for maximum stability and isolation.

- *Lighter Capacity Systems:* Use **4 x 4 inch** square posts. The retractable casters are attached outside of the post.
- *Intermediate Capacity Systems:* Use **6 x 6 inch** square posts. The retractable casters are attached inside of the cross-section post.

Caster attachment to 4 x 4 inch posts

Step 1 Retract wheel position setting.

Using a wrench, rotate caster **HEIGHT ADJUSTMENT** screw shown in figure below.

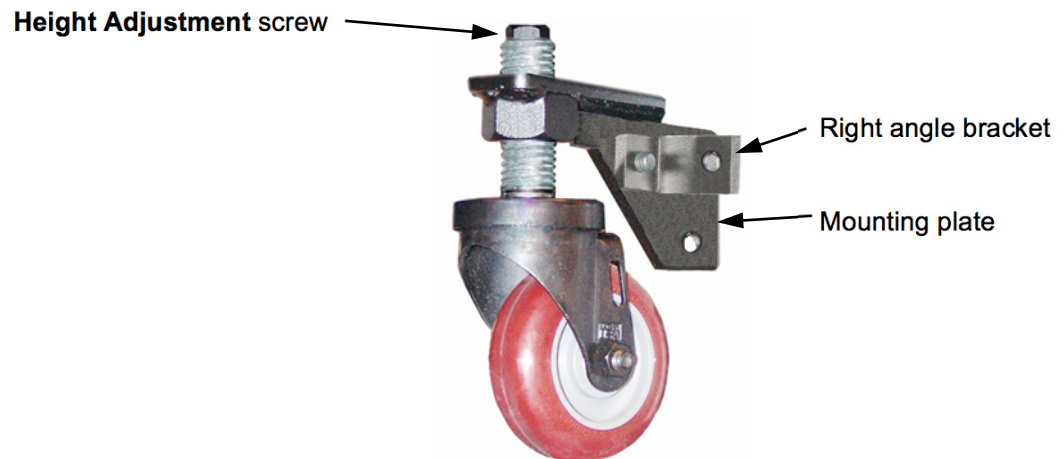


Figure 15, *Lighter System Caster Assembly*

Step 2 Fasten right angle bracket to caster's mounting plate as shown in figure above.

- Step 3** Fasten caster mounting plate to the base of post as shown in figure below.

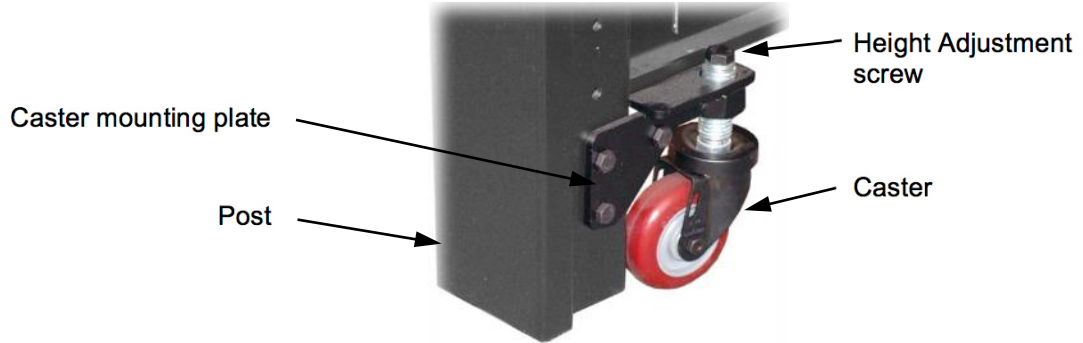


Figure 16, *Attaching caster to post*

- Step 4** Fasten right angle bracket to post.

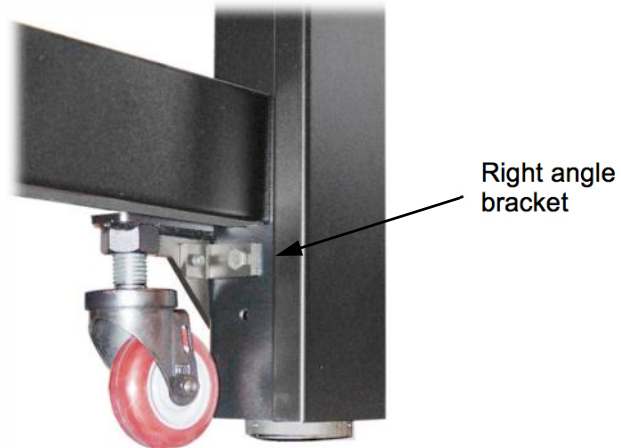


Figure 17, *Right angle bracket to post*

- Step 5** Adjust caster **HEIGHT ADJUSTMENT** screw to engage caster with the floor. Reference figure 15 & 16 above.



Important Retract the casters after use or vibration isolation performance will be compromised if the casters are left engaged with the floor.

Caster attachment to 6 x 6 inch posts

Step 1 Invert post so that the open end is facing up as shown in figure below.

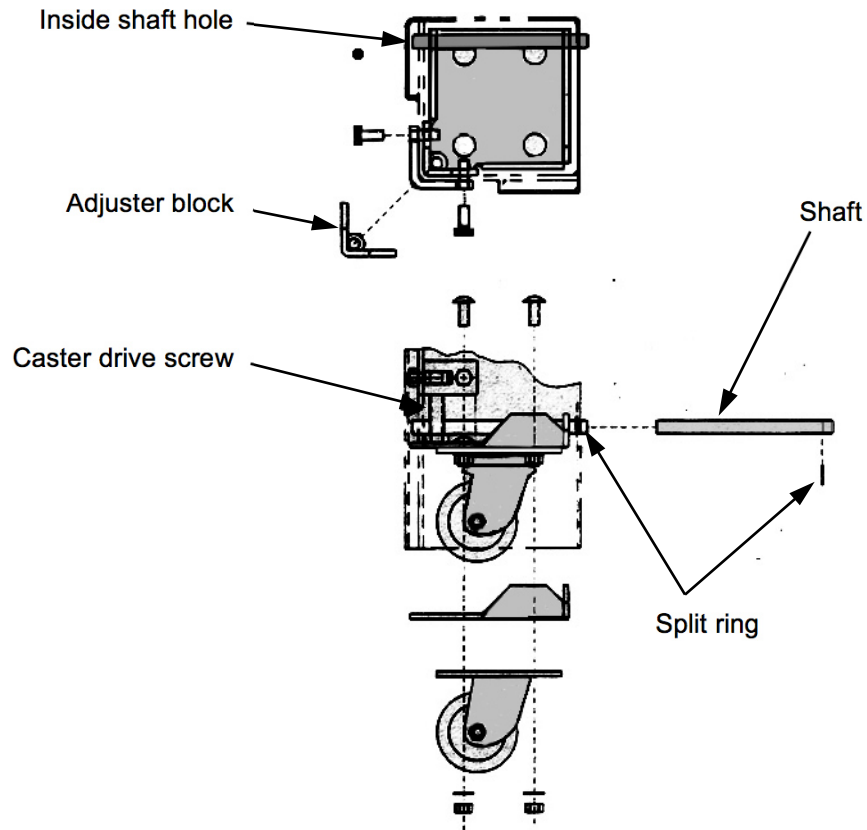


Figure 18, *Heavy System Caster Assembly*

Step 2 Attach adjuster block to inside of post by inserting caster drive screw (**1/2-13 x 2-1/4 inch** hex head bolt) into adjuster block with bolt head facing to the bottom end of the post.

Step 3 Insert caster plate assembly by aligning shaft with shaft holes and then placing shaft through the inside shaft hole first with grooved end of shaft out.

Step 4 Fasten shaft with split ring and secure using a flat end screwdriver.

Step 5 Invert post back into the upright position.

Step 6 Engage or disengage caster as required using the caster drive screw.

Rigid Supports to Vibration Isolator Upgrade

Introduction

Both the *Rigid Support* module and *Vibration Isolation* module drop into the top of the support post and hang from their top bulkhead. Set screws from the two adjacent inside plates hold the module insert securely in place.



Figure 19, *Support Post*

Vibration Isolator Support Modules Three isolator modules have a Height Control Valve (V) attached and are identified as a Master Isolator (M). The remaining isolator modules do not have a valve and are identified as a Slave Isolator (S).

Three points determine a level plane. All systems have only three support modules with Height Control Valves regardless of the total number of support modules.

Upgrade Instructions

- Step 1** Configure support post upgrade layout so that a slave isolator module is located adjacent to a master isolator module as typically shown in figure below.

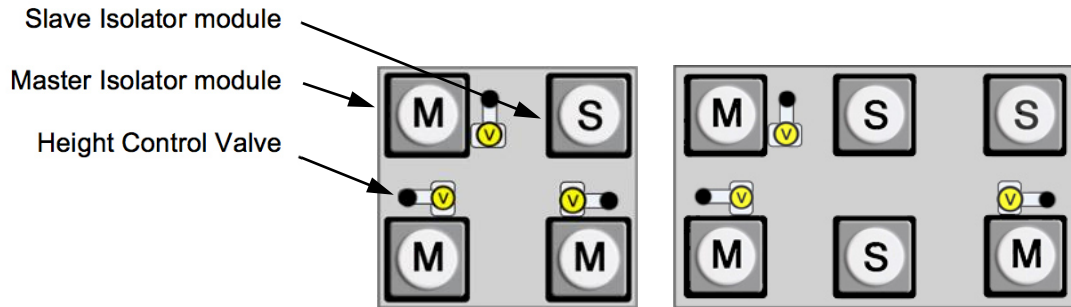


Figure 20, Typical 4 post and 6 post support module layout

- Step 2** Loosen the set screws from inside plate and lift out *Rigid Support* module. Reference figure 19.
- Step 3** Insert the *Isolation* module and re-tighten the set screws.
- Step 4** Upgrade remaining posts as appropriate.
- Step 5** Connect the appropriate air fitting to each module through a small port in the outer post.
- Step 6** Follow instructions for [Air Supply Plumbing, Valves and Tabletop Placement](#) earlier in this section.



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