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Laboratory Tables

63-500 Series High-Performance Lab Tables



Figure 1 *63-500 Series High-Performance Lab Table*

Introduction

The 63-500 Series Laboratory Tables employ Gimbal Piston Isolators that 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 of this document.

Tools Required

- Leveling wrench (provided)
- 5/16 inch Allen wrench for accessories (provided)
- Utility Knife
- 3/4 inch wrench (for casters)

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Air Supply Plumbing and Valve Setup Instructions

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.

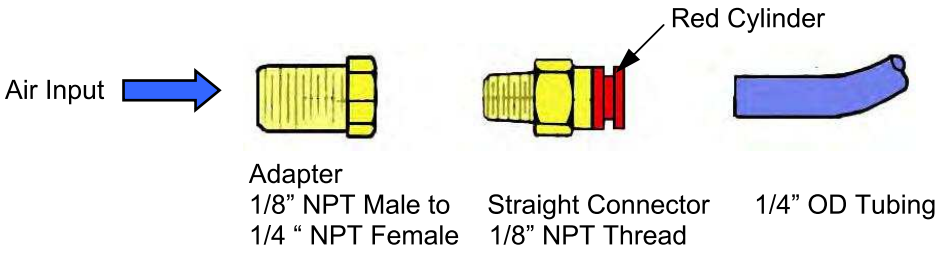


Figure 2 *Air Supply Input Connection*

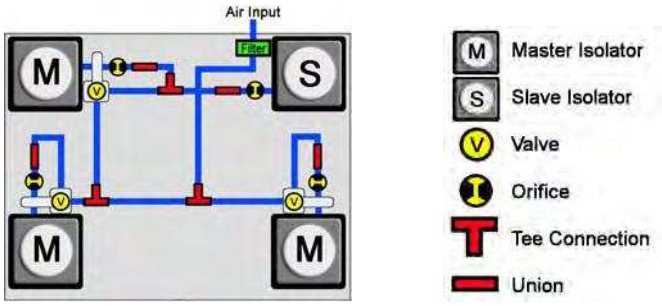
Connecting Insert the air tube firmly into the self sealing fitting.

Disconnecting Push the *red cylinder* with your thumb and forefinger toward the center of the fitting body while pulling the tube in the opposite direction.

Internal Air Supply Tubing

Systems are internally plumbed at the factory as shown in figure below.

M = Master Isolator with Height Control Valve (V)
S = Slave Isolator (no valve)



Symbol key

Figure 3 *Valve schematic for a 4-isolator system*

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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.

Important Do not remove or change the location of these orifices. If lost or damaged, please contact TMC for replacement pigtails.

Installing and Leveling TableTop

Step 2 Ensure the main air supply is **Off.**

Step 3 Using the leveling wrench provided, adjust leveling feet as shown in figure below to ensure all four legs are in solid contact with floor.

Level frame by referencing the top surface of the horizontal tie-bars.

Carpenter accuracy leveling is more than adequate.

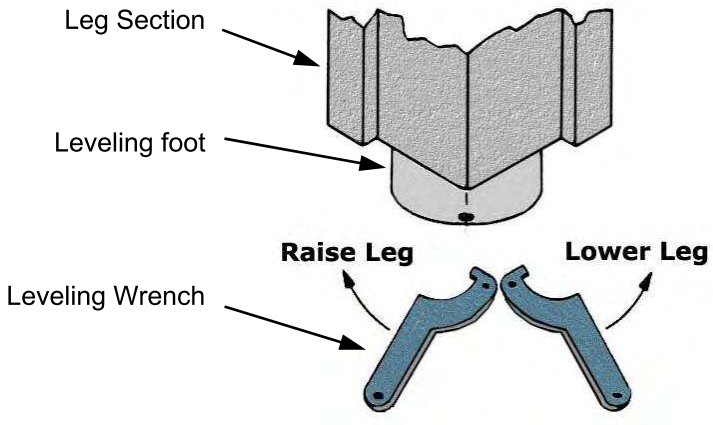


Figure 4 *Adjusting leveling feet*

Note Skipping the above step may compromise vibration isolation performance.

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Step 4 Place tabletop slowly down symmetrically on deflated isolators to avoid any damage to isolators as shown in figure below.

The top should be symmetric over the isolator frame. If the floor is uneven, one of the 4 isolators may not contact the payload. This gap should be closed by further lowering the leveling foot on the corresponding post.

Caution The tabletops weigh approximately **275-300 pounds**. Take proper precautions.

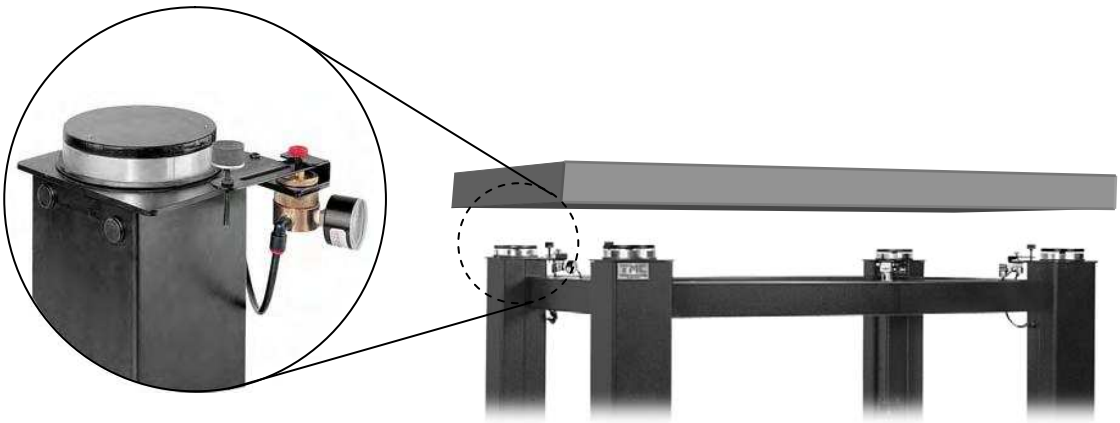


Figure 5 *Table top placed symmetrically over 4 legs*

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Attach Horizontal Lever Arms

Step 5 Locate the three *height control valves* mounted on *isolators* as typically shown in figure above and referencing figures 3 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.

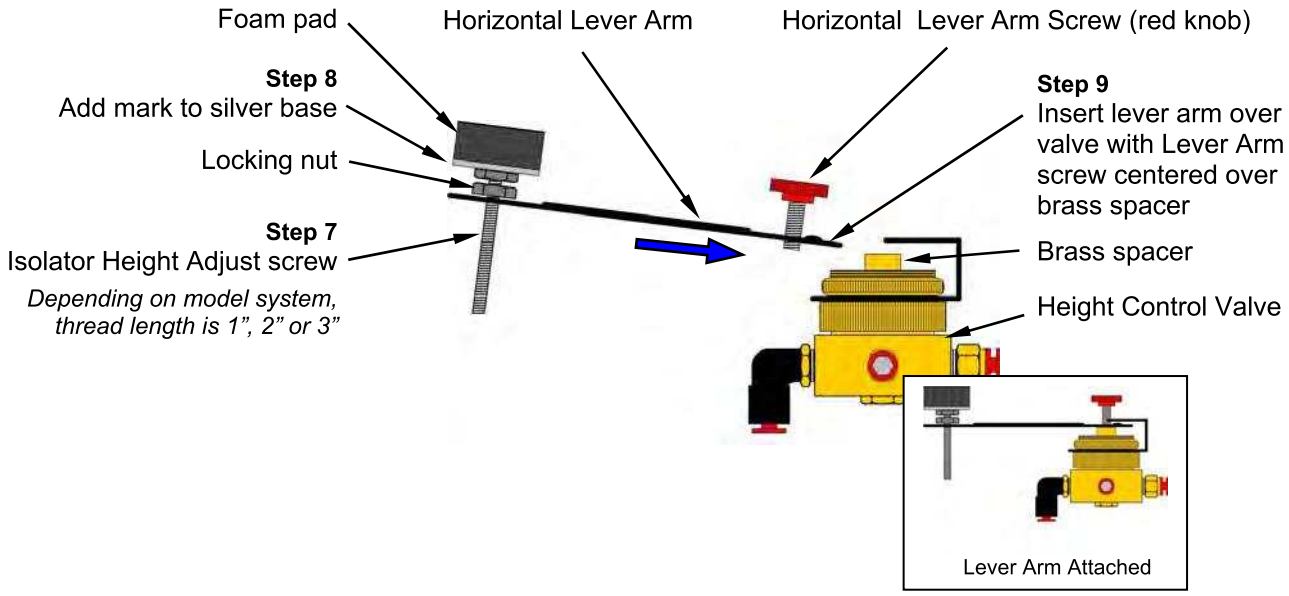


Figure 6 *Attaching Horizontal Lever Arm*

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 **ISOLATOR HEIGHT ADJUST**.

Step 9 Insert *horizontal lever arm* onto *height control valve* ensuring the end of the **HORIZONTAL LEVER ARM SCREW** fits over the center of the *brass spacer* located on the top of the valve as shown in figure 6 above.

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Step 10 Loosely fasten *horizontal lever arm* with **HORIZONTAL LEVER ARM SCREW** (red knob) and adjust to position arm horizontal with valve.

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 to raise *foam pad* until it is in slight contact with the tabletop.

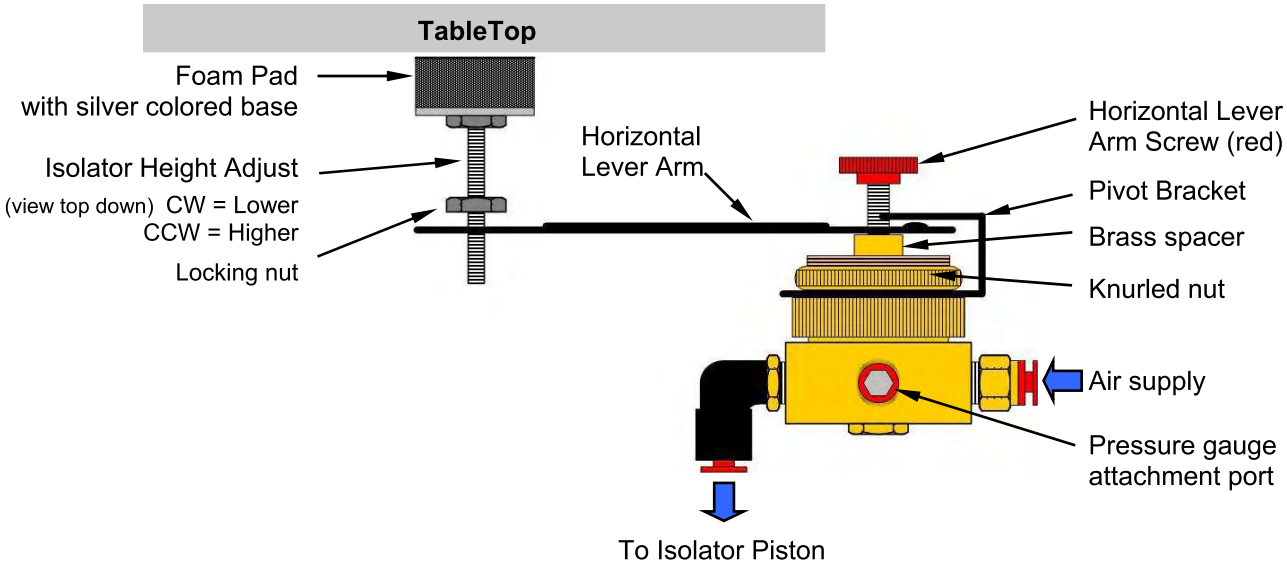


Figure 7 *Height Control Valve*

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,** or more depending on model system being applied to.

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.

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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 On systems with Gimbal Pistons, 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 a tilt of the Gimbal Piston.

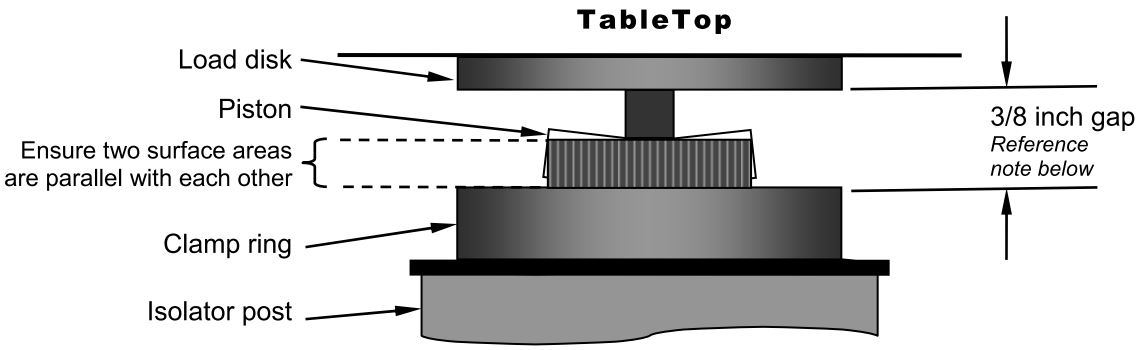


Figure 8 *Gimbal Piston*

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.

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Step 17 Tighten *locking nut* on **ISOLATOR HEIGHT ADJUST** for all three valves as shown in figure 7 above, *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 single gauge pressure reading. 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.

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Troubleshooting Tips

Table Not Floating Properly

If slave piston is too high or too low, adjust **HEIGHT ADJUSTMENT** screw for master valve controlling it to raise the piston.

Also, for piston diagonally opposite, slightly adjust the **HEIGHT ADJUSTMENT** screw in the opposite direction.

Instability

If table oscillates uncontrollably, turn off air supply and contact TMC. This problem is due to a combination of high mass and high center of gravity and can be corrected.

Poor Isolation

To optimize isolation, ensure that tabletop is free to move vertically and horizontally. Check section *Installing and Leveling TableTop* earlier in this procedure.

Pistons Completely Down

If isolators do not rise from the down position, then the leveling valves are not adjusted correctly or the air supply pressure is insufficient.

Pistons Completely Up

If an isolator cannot be lowered from the up position, the leveling valves are not adjusted correctly or the system is not plumbed correctly.

Reference air supply diagram at the beginning of this procedure, *Air Supply Plumbing and Valve Setup Instructions.*

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