
INSTRUCTION MANUAL

KINETIC SYSTEMS, INC.

500 SERIES VIBRAPLANE OPTICAL TABLE

SUPPORT SYSTEMS

The Quality Leader in Vibration Isolation

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Section I

As You Begin:

Congratulations! The 500 Series VIBRAPLANE Optical Table Support System you have purchased has been designed by Kinetic System, Inc. for many years of trouble-free user service. It will deliver superior vibration isolation performance for a broad range of research, quality assurance, and production application.

The 500 Series VIBRAPLANE Optical Table is supported by four or six legs. The maximum gross load capacity for the 505 Series Active-Air Isolation are 500lbs. per leg at 50PSI, 1000lbs. and 2000lbs. at 90PSI, 500RC Retractable Casters and 500A "drop-in" Active-Air Isolation are two load ranges 500lbs. at 50PSI and 1000lbs. per leg at 90PSI, 500AP "drop-in" Active Air Pendulum Isolation are 1000lbs., 500R Rigid Leg Units 2000lbs., 500P "add-on" Passive-Air mounts is 1600lbs. per leg at 90PSI. If the VIBRAPLANE Optical Table is to be operated at less than maximum gross load capacity, a proportionately lower pressure air source may be used. For example, a 30 to 50PSI air source is generally adequate for most small instruments.

In order to get full benefit from your 500 Series VIBRAPLANE Optical Table, we suggest you follow the easy, step-by-step instructions in this manual.

Technical Assistance

Need Technical Assistance? First, refer to the "Trouble shooting" Section of this Manual. If your problem persists, the technical supports staff at Kinetic Systems, Inc. will be glad to answer any questions. Contact us at (617) 522-8700, or FAX (617) 522-6323 or Email kineticsystems.com.

Damage due to shipping

When your 500 Series VIBRAPLANE Optical Table arrives, inspect it carefully for any damage due to shipping. *IF ANY DAMGAGE IS DETECTED, NOTIFY THE SHIPPING CARRIER IMMEDIATELY. SAVE ALL PACKING MATERIALS.*

Section II

Set Up Procedure:

The following equipment's and tools are recommended to set up your 500 Series VIBRPLANE Optical Table:

- Hydraulic lifting device
- Carpenter's level
- Adjustable Wrench

Refer to Figure 1. for outline drawing of 500 Series Optical Table. All 500 Series Optical Table is fully completely assembled and tested at the factory.

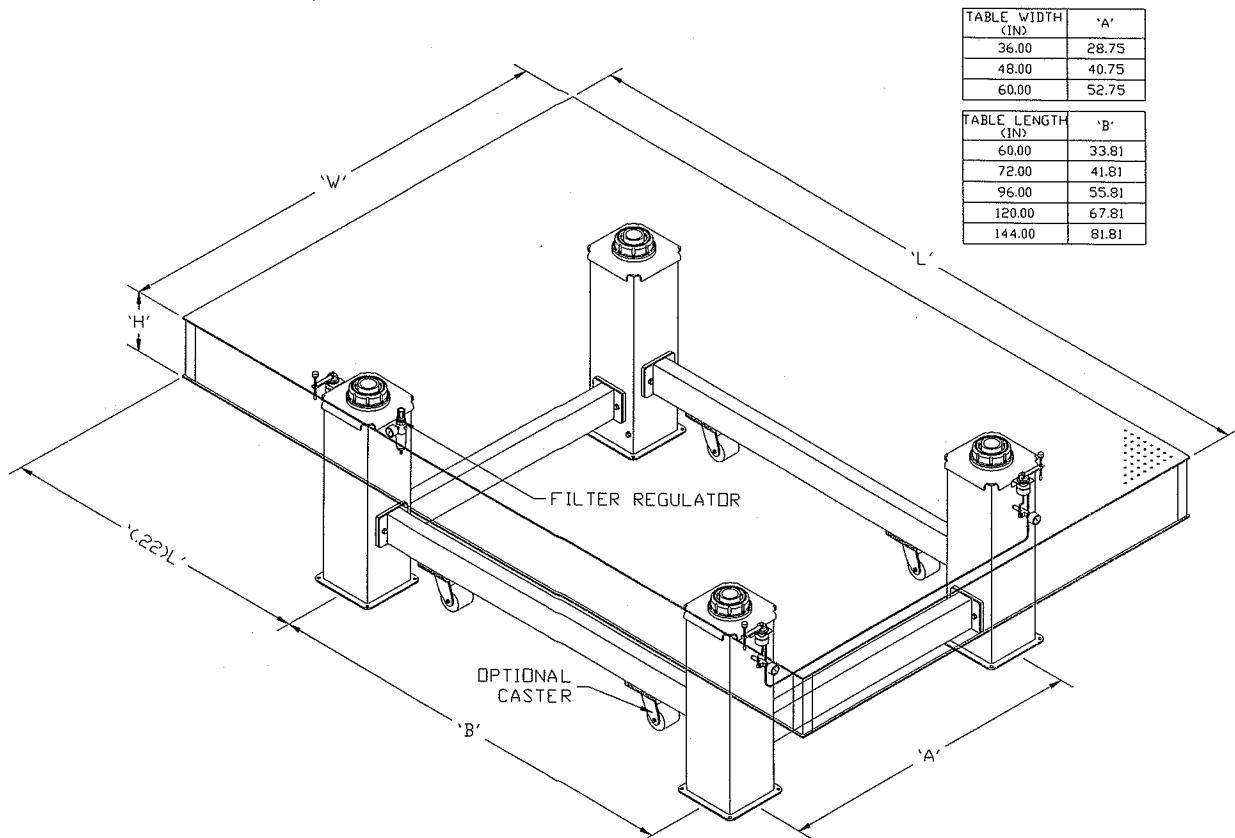


Figure 1. Outline view and placement of 500 Series Isolation Airmount Stand Location

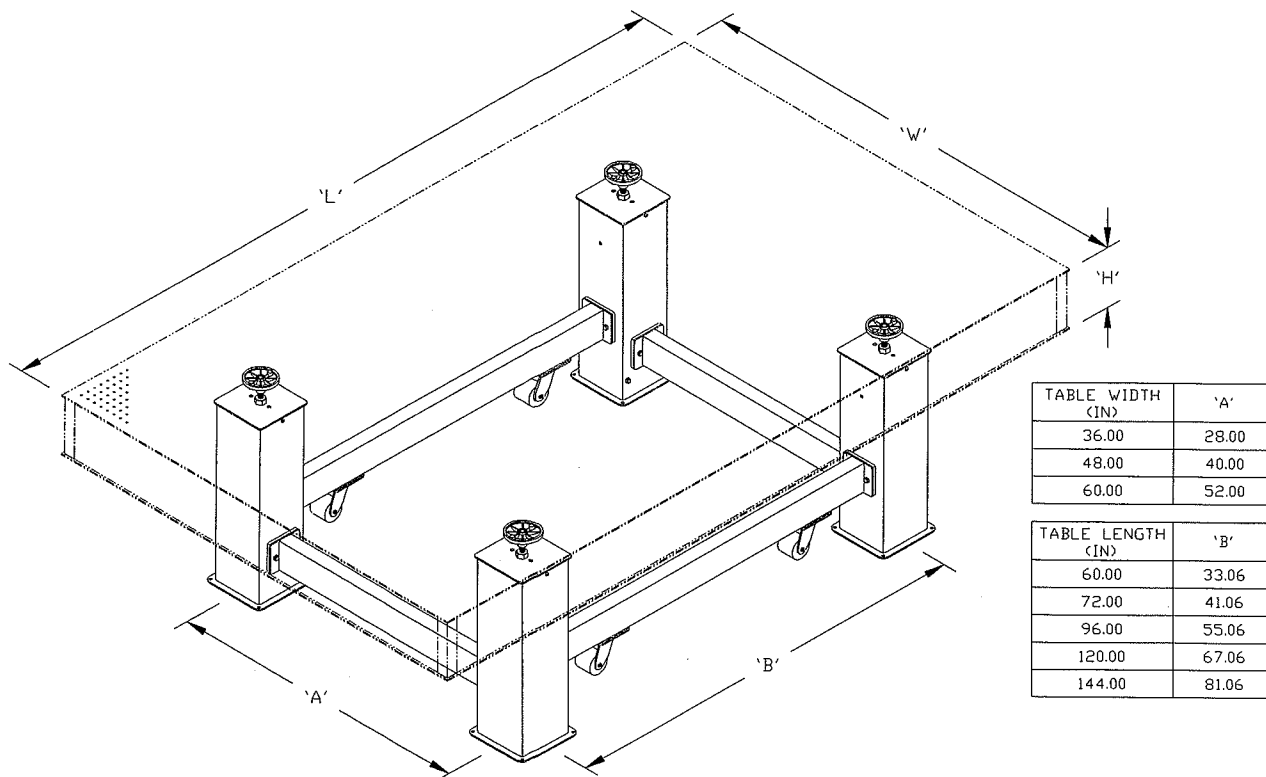


Figure 2. Outline view and placement of 500R Non-Isolated Stand Location

General:

1. Carefully remove all shipping material (metal strapping, cardboard, etc.). Because of its weight, a lifting device should be used in moving the Optical Table. Additional parts such as optional Casters, Enclosure, Over Head Monitor Shelf, and Hanging Shelf have been packed separately inside the shipping container. Set these parts aside for later installation.
2. Clean floor location where Support System is to be placed.
3. Carefully remove the legstand to final location. If the back of the table is to be positioned against the wall, be sure to leave enough access space to permit attachment.
4. Place 4 Leveling Mastic Pads under the corners of each individual base plate of isolator or legs prior to placement. These pads are provided to compensate for floor imperfection that will allow isolator to rock (See figure 6)
5. Figure 1 and 2 shows the points at which your table should be supported in order to assure minimum bending due to the table's weight.

6. If your Optical Table is to be supported on a VIBRAPLANE 5501 Isolation System please read and follow the manual supplied with that system.
7. The Tabletop weights several hundred pounds, so use of a hydraulic lifting device is recommended for its installation. Place the Tabletop on four isolators. Center the Tabletop left-to-right and front-to-back. Proper positioning of the Tabletop is important for even distribution of weight on the legs.
8. Place a carpenter's level diagonally across the Tabletop and check for level condition (both directions) at its final location by adjusting the Vibra-Level Valve Adjustment for Active-Air Isolator, adjusting the leveling pad for Non-Isolator, and see page 9 for Passive-Air Isolator.
9. In most applications it is not necessary to bolt these isolators to the floor. This is because of the inherent low stiffness and natural frequency of the 500 Series Isolator. The primary application of the system is to attenuate disturbances which are substantially less than 1 G and will affect the performance of sensitive equipment.
10. Your 500 Series VIBRAPLANE Isolation is now ready for operation.

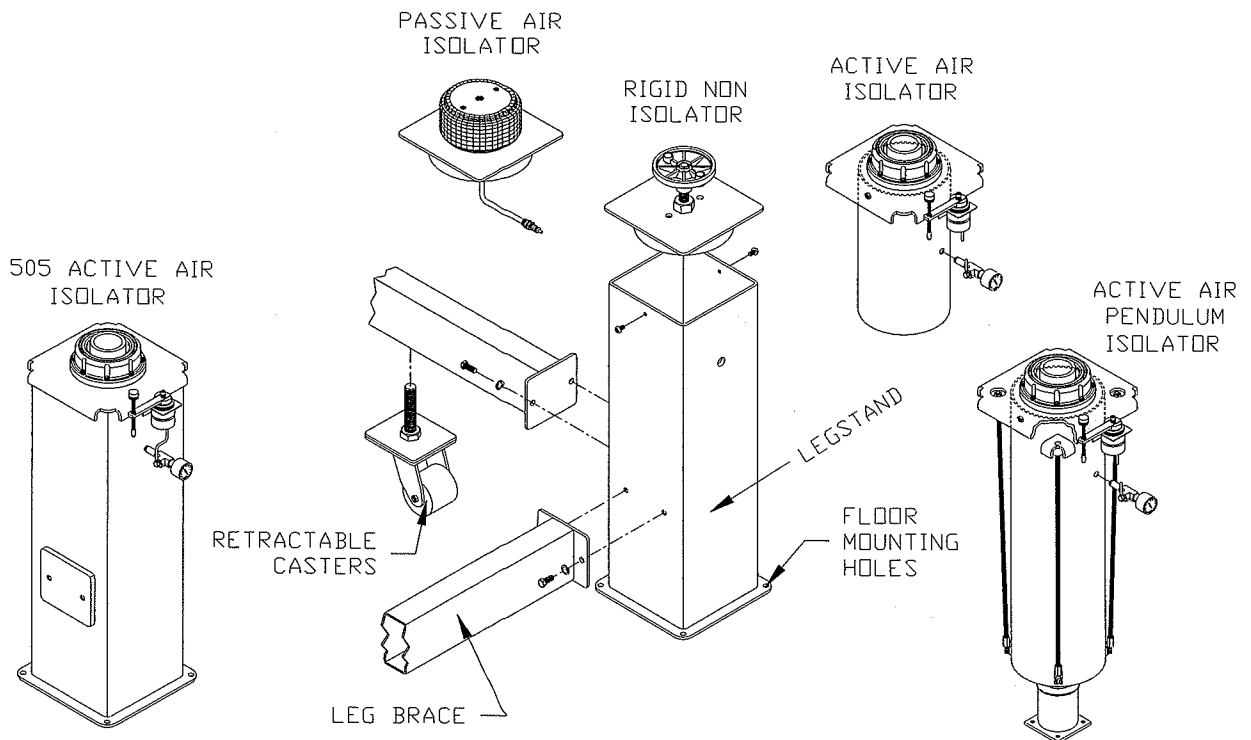
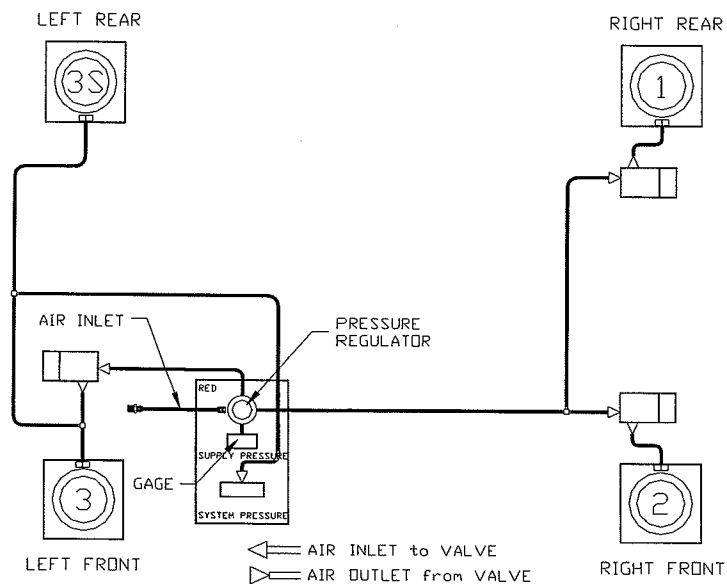


Figure 3. 500 Series Isolation Airmount and Non-Isolated

Section III:

Operation and Set Up Procedure for Isolated:

Active-Air Isolation Support System



1. Connect airlines to Isolators as shown in Figure 4. Tubing should be trimmed to length for smaller tables.
2. Attach the tubing which connects the isolators together to the underside of the tabletop using the tube clips provided.
3. Using the Umbilical Assembly (1/4"OD X 15 ft. polyethylene tubing and 1/4" NPT fitting), connect the pressurized air supply to the inlet of the Filter Regulator (as shown in figure 4). The Polyethylene tubing may be shortened by cutting with a tubing cutter. If additional pipe fittings are required to complete the connection at the pressurized air supply, these must be supplied by the user.
Note: make sure air is turned off.
4. The air inlet Filter Regulator is described in the attached (see page 25).
5. The pressurized air supply should be clean dry air or nitrogen from a regulated line or bottle, with pressure not exceeding 100 PSI.
Caution: Never exceed 90 PSI on system pressure regulator.
6. Turn on the pressurized air supply and adjust the Pressure Regulator supplied with the system to 90 PSI.

7. Be sure the Valve Adjustment screw on each VIBRA-LEVEL Valve Arm is touching the bottom surface of the Tabletop, and that each Valve Arm is slightly below horizontal for in the fill position and 10° above horizontal for neutral position.
8. The Tabletop should begin to “float” within 5 to 10 minutes. If floating does not occur at one or more legs, check the inlet pressure on Filter Regulator and raise if necessary or turn the Valve Adjustment Screw(s) counterclockwise.
9. When the Tabletop is completely “floating” adjust each Valve Adjustment Screw so that the Tabletop is floating approximately $1/4$ to $1/2$ of an inch (as shown in Figure 5).

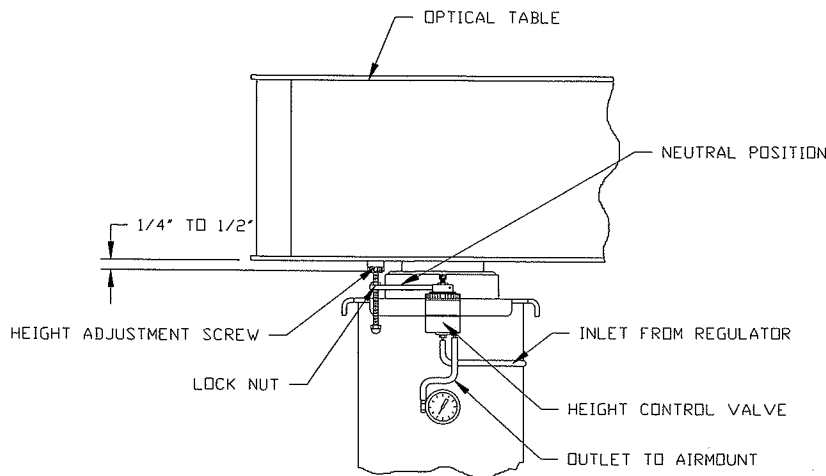


Figure 5. Vibra-Level Valve Adjustment.

10. Tighten the Lock nut on each of the Valve Adjustment Screws.
11. After the Tabletop with your equipment is “floating”, read the pressure on each Isolator gage and adjust the Filter Regulator gage to read approximately 10-15 PSI higher than the isolator gage reading. For example: If the Reference Pressure gauge reads 55 PSI, adjust the Filter Regulator gauge to read 65 to 70 PSI.
12. If more equipment load is added to the Tabletop, you may increase the air pressure at the Filter Regulator gauge to accommodate it. It is recommended not to exceed 80PSI Filter Regulator pressure.
13. If one Isolator has a significantly higher pressure than the others due to a non-symmetrical load, the system might exhibit a rocking instability. This can be corrected by either moving the load such that it is more centrally located, or by the addition of a separate Filter Regulator assembly for that Isolator (Contact KSI for more detailed information on this procedure).

14. Once the Tabletop has been leveled this condition will be automatically maintained as long as the system remains pressurized. If the air pressured is shut off for an extended period of time and then repressurized, the Tabletop will automatically return to its preset height.
15. If it is desired to lock out the Isolation Systems for a short period of time, this can be accomplished by lowering the tabletop onto rubber bumper. The system is lowered by reducing the Filter Regulator pressure to slightly below the system pressure reading. System will automatically bleed down and rest onto rubber bumper, this will maintain most of the compressed air volume in the isolators and thereby reduce the "fill time", when repressurizing.

CAUTION: *Never remove heavy loads from the Tabletop suddenly. Two options are recommended for removal of heavy loads: (1) remove heavy loads gradually to permit controlled pressure reduction in the legs by the VIBR-LEVEL Servo Valves or (2) reduce the pressure in the Filter Regulator gage to below what is required to support the tabletop.*

Braces and Caster Installation:

1. If optional Leg braces and Retractable Caster are supplied with system, then assemble as shown in Figure 6.

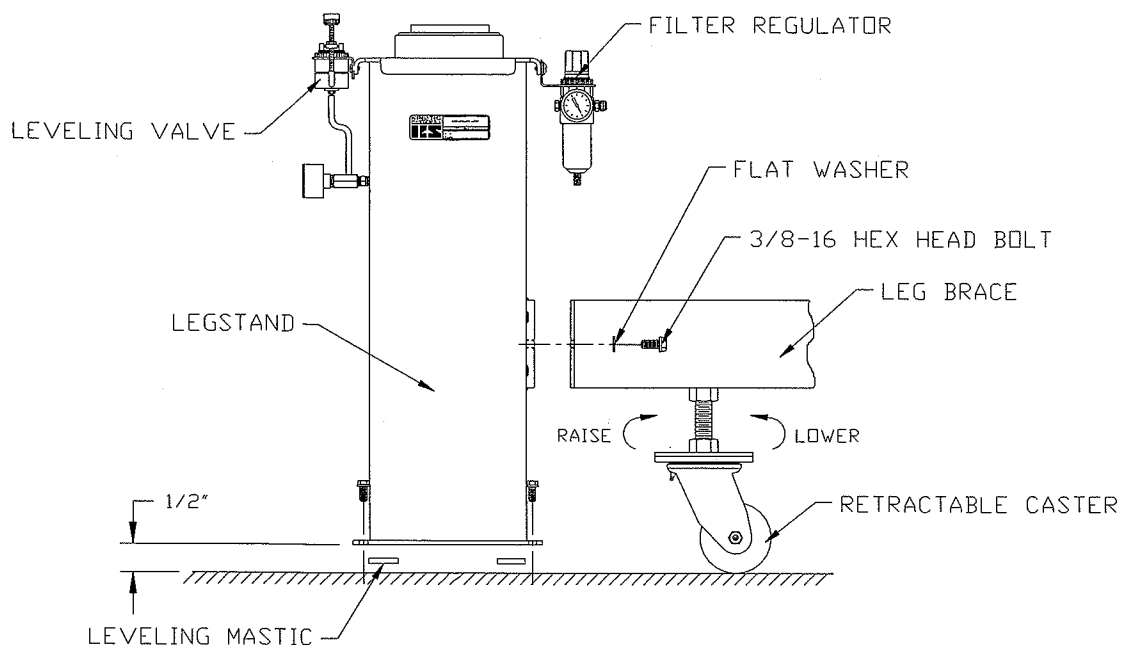


Figure 6. Optional Leg braces and Retractable Caster Installation

2. If the support legs do not have braces place 4 leveling mastic pads under the corners of each individual leg. These pads are provided to compensate for floor imperfections that will cause support legs to rock.
3. Bolt holes are provided in the base plate of each support leg; however, it is not necessary to bolt the legs to the floor.
4. Your VIBRAPLANE Optical Table Support System may have optional Casters for easy movement of the Optical Table. This option required the Support System to be braced together.
5. The Caster option for this Support System is not a retrofit option and must be ordered at the time the Support System is ordered.
6. Bleed any air present in Isolation Support System.
7. For movement of this System, lower each Caster as shown in Figure 6 by turning the threaded portion of the Caster clockwise using a 3/4" wrench until the Support System is raised to approximately 1/2".
8. The Support System is now ready to be moved.

- Once the system is in its desired location the casters should be raised so that the Support Legs rest on the floor. This is done by turning the threaded portion of the Caster Assembly counter-clockwise until it is not touching the floor.

Note: not bleeding air from Isolation system prior to movement may cause damage to system components or equipment being supported.

Rigid/Non-Isolated Support System:

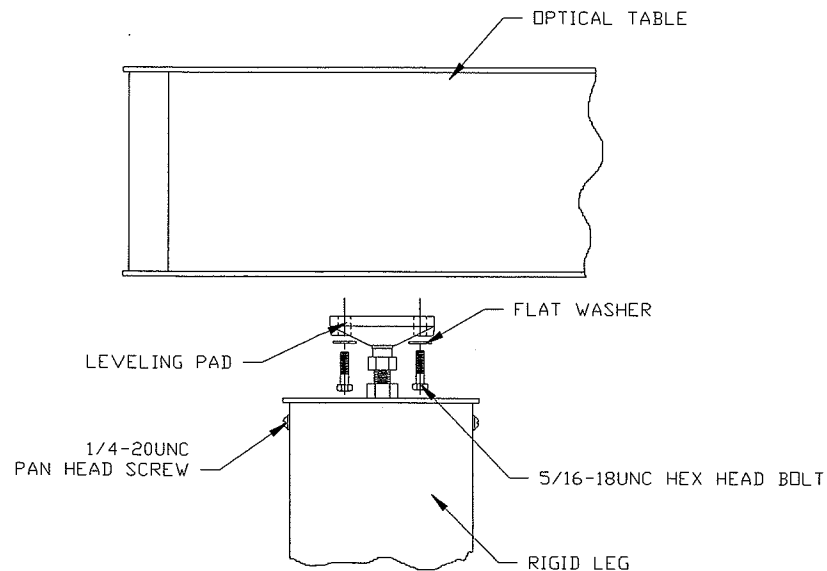


Figure 7. 500R Rigid Leg and Tabletop Connection

- Loosen both 1/4-20UNC Pan Head Screws holding the Rigid Leg top plate.
- Lower Optical Table making sure the holes on the bottom of the table line up with holes in the Leveling Pad on each Rigid Leg.
- Install 5/16-18UNC Bolts and Washers as shown in Figure 7. At this point leave the Bolts approximately 5 threads loose.
- Place a carpenter's level diagonally across the Tabletop and check for level condition (both directions).
- If an out-of-level condition is detected, and adjust the height by turning Leveling Pad clockwise to lower the Tabletop or counter-clockwise to raise the Tabletop.
Note: Adjust leveling pads in 1/4-inch increments.
- Tighten all Bolts.

Passive-Air Isolation System:

Inflate Passive Airmount using either a Hand Pump or compressed air line to height shown in Figure 8.

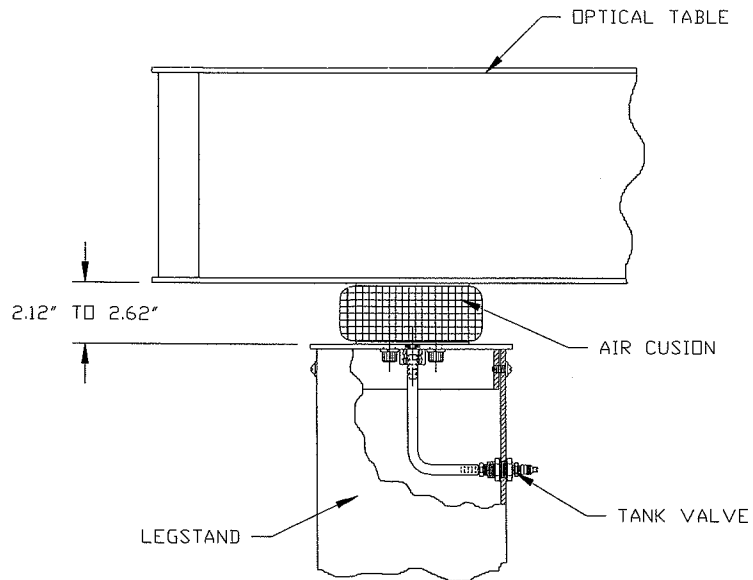


Figure 8. 500P Passive-Air Isolation System Fill Height

Section IV

Optional Splice Kit Installation:

The following instructions explain how to install Splice Kit to two honeycomb tables together using Splice Kit.

Required Material:

- 2 Splice Kit Bottom Plates
- 1 Splice Kit Top Plate
- 8 Spring Washers 3/8"
- 52 Spring Washer 1/4"
- 52 1/4-20UNC X 1.00 Hex Head Bolts
- 4 Hex Plain Nuts 3/8-16UNC
- 4 Splice Rods 3/8-16UNC X 10.50" long

Required Tools:

- Wrench
- Punch (5/16")
- Hammer
- Center Drill
- Drill Bit (.201)
- 1/4-20unc gun tap

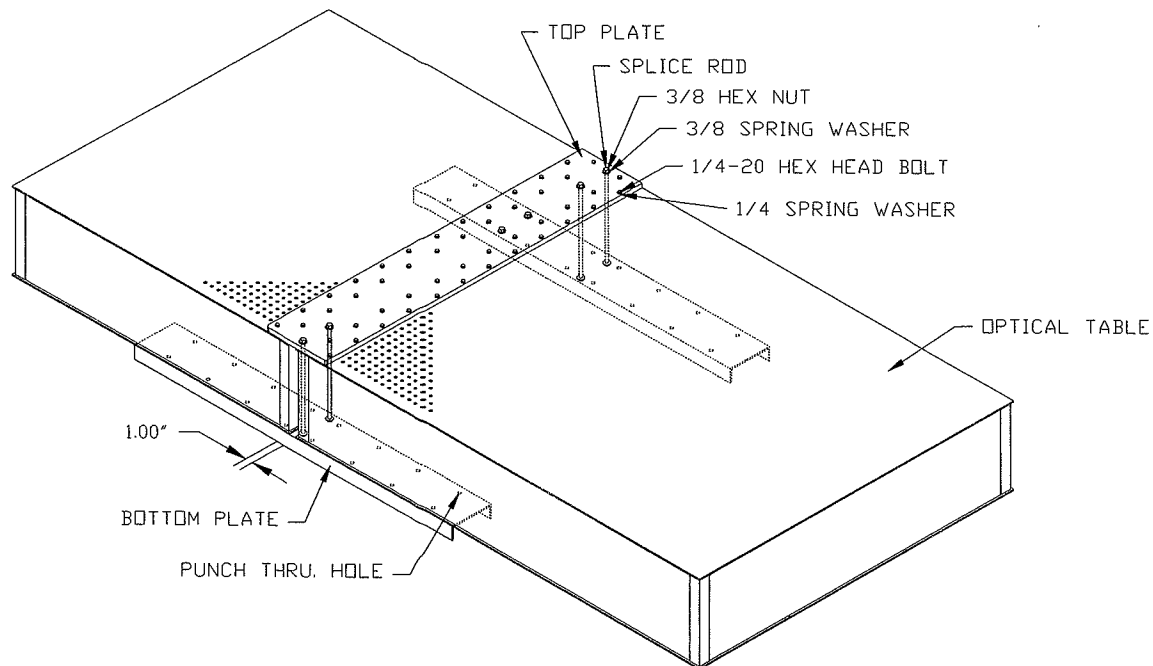


Figure 9. Typical Optical Tabletop Splice Kit Connection

Procedures:

1. Place the two table leave 1" gap between each table as shown in Figure 9.
2. Place Splice Kit top plate on top skin to align with 1/4-20UNC holes.
3. Use 1/4" spring washer and 1/4-20UNC X 1.00" Hex Bolts to fasten splice top plate to top skin.
4. Use 3/8" spring washer, 3/8-16UNC X 10.50" long splice rod, and 3/8-16UNC Hex Nut to connect two splice bottom plates with splice top plate and tighten.
5. Use a punch to transfer splice bottom plate holes to under side of the tables.
6. Use Center Drill for bottom skin.
7. Use #7 (.201) drill and tap 1/4-20UNC through bottom skin
8. Use 1/4" spring washer and 1/4-20UNC X 1.00 Hex Head Bolts to bolt bottom plate and bottom skin together.
9. Customer may required to insert shim depend upon for thickness of the two table.

Optional Splice Table Installation:

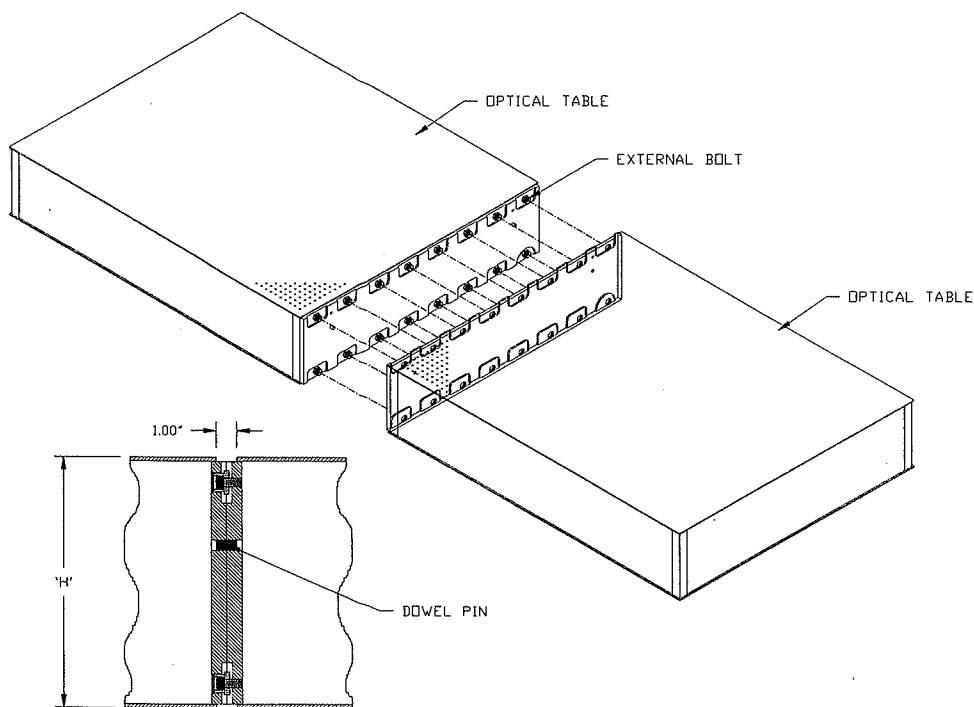


Figure 10. Typical Optical Tabletop Splice Joint Connection

Vibraplane Optical table may be spliced together, end to end, side by side, or in and “L” or “T” configuration to meet your specific requirement. In Figure 10 shows a typical splice joint assembly.

1. In order to assemble the two tabletops as one using the splice connection, both tabletops must be aligned parallel with splice joint plates facing each other.
2. Setup one Tabletop on the Isolation Mounts of Non-Isolator supports provided (as shown in Figure 11 and 12) depending on how many isolators or supports are provided with the system.
3. Using a lifting device, lift the other Tabletop to the same level as the supported Tabletop and move into place aligning the dowel pins in one plate with the mating holes located on the other plate.
4. Bring the two Tabletops together by first screwing the threaded portion of the external bolt into the thread portion of the plate by hand, then one by one moving from top to bottom and from one end to the other, turn each bolt one or two turns clockwise pulling the table together.
5. At this point the remaining Isolation Mounts or Non-Isolator Leg Stand may be placed under the second Tabletop.

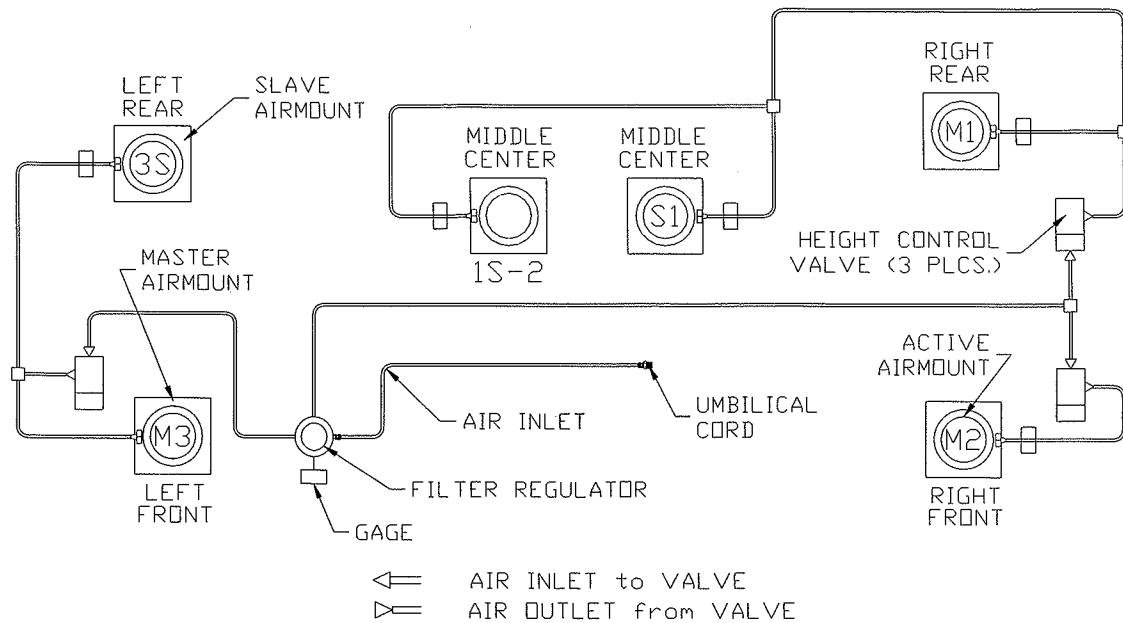


Fig. 11 Mount configuration for 6 Isolator systems with splice connection.

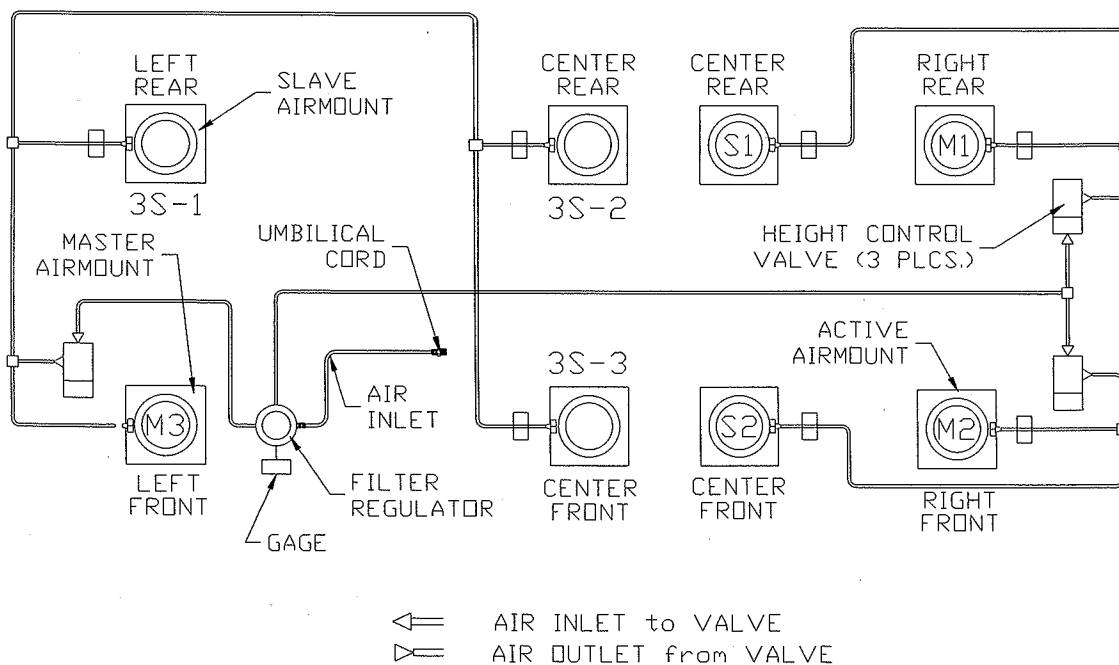


Fig. 12 Mount configuration for 8 Isolator systems with splice connection.

Optional Over Head Monitor Shelf:

Follow the easy assembly instructions to set up your VIBRAPLANE Over Head Monitor Shelf. You will need the following tools to complete these easy to follow instructions. Refer to the assembly drawing in Figure 13.

Required Materials:

- 2 Vertical support post
- 2 Height adjustable post
- 2 ¾" thick shelf
- 2 Side rails
- 4 Pillow blocks
- 1 Hanging shelf (Optional)

Required Tools:

- Carpenter's Level
 - Phillips Head Screwdriver
 - Adjustable Wrench
 - Screwdriver
1. Carefully remove all shipping material (material strapping, cardboard, etc.).
 2. Place Vertical Support Post in approximate location.
 3. Level both Vertical Support Posts individually by adjusting the three Leveling Feet on each of the Post Legs.
 4. Insert the Height Adjustable Support Posts, one on each side.
 5. Raise the Height Adjustable Support Posts to the desired height, lining up the two holes in the Vertical Support Post with the two holes in the Height Adjustable Post and install the 3/8-16X2.75inch Hex head Bolts, Flat Washers, Lock Washers and Nuts.
 6. Tighten the two 1/4-20 Set Screws on each Vertical Support Post. These will prevent the Height Adjustable Support Posts from moving from side to side once at the desired Height.
 7. Join together the two Side Rails using the Cross Member Tie Rod and the 1/4-20X1.50 inch long Flat Head Bolts.
 8. Slide the two Feature Strips into the grooves provided in the Side Rails.

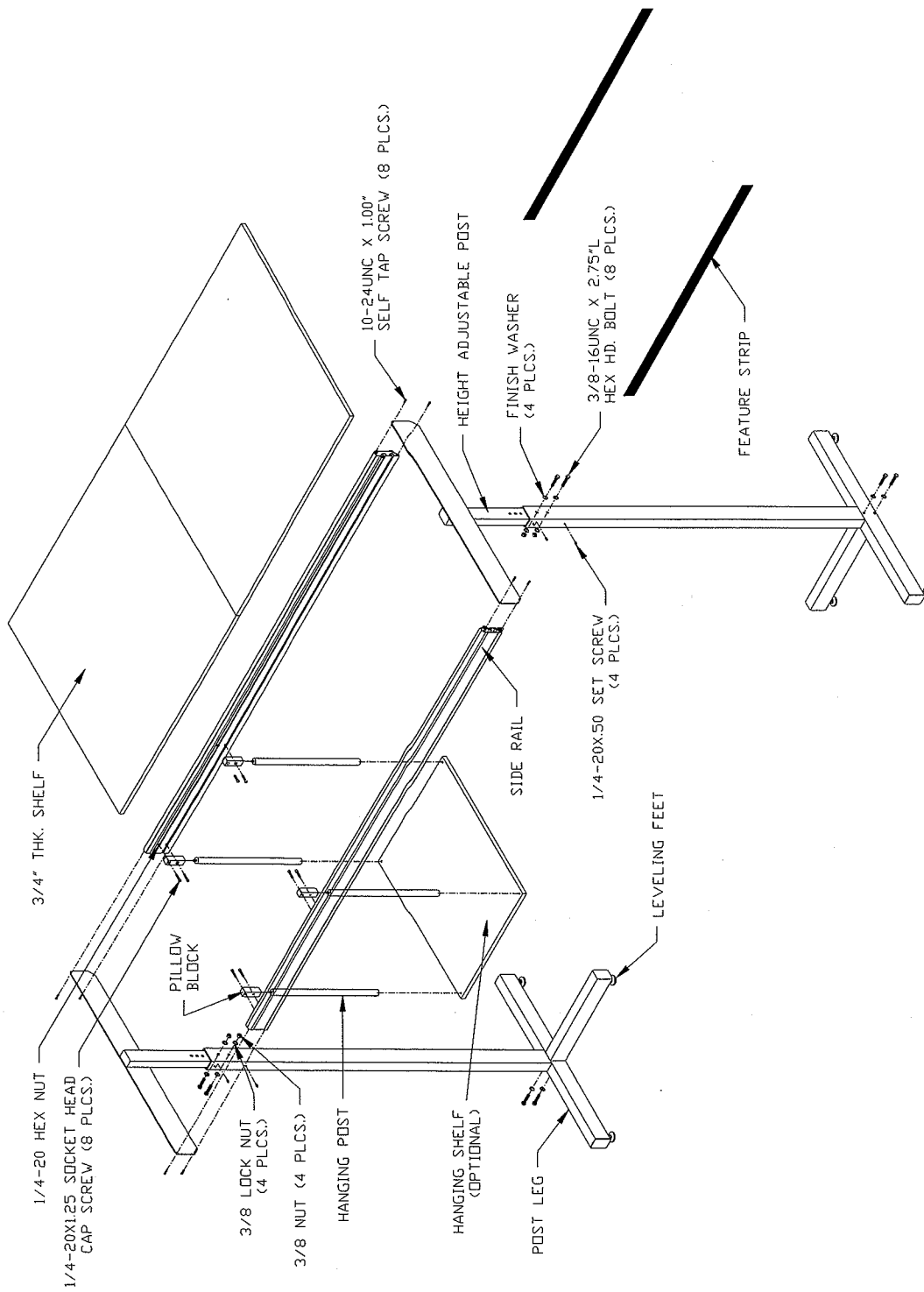


Figure 13. Assembly view of Over Head Monitor Shelf and Optional Hanging Shelf.

9. If you ordered the optional Hanging Shelf, insert the 1/4-20UNC Hex Nuts into the Tee Slots provided in the Side Rails. (4 required each side)
10. Support the Side Rail at each end and align the holes in the Height Adjustable Support Post with the tapped holes on the end of each Side Rail.
11. Screw together the Side Rail and the Height Adjustable Support Post using the 10-24UNC X 1.00 inch long Screws.
12. Place the Shelves into the grooves provided at the top of the Side Rails, and drop into place.

Optional Hanging Shelf:

1. Bolt into place 2 pillow Blocks on each Side Rail using the 1/4-20UNC X 1.25 inch Socket Head Cap Screws and the 1/4 Hex Nuts that should already be placed in the Tee Slots provided in the Side Rails. If the Hex Nuts are not present refer back to step 9 on assembly of the Over Head Monitor shelf and slide them into place.
2. Screw the Hanging Posts into the Pillow Block.
3. Loosen the 1/4-20 Socket Head Cap Screws holding the Pillow Blocks into place and slide them along the tee slots in the Side Rails to the proper spacing to line up with the holes in the Hanging Shelf.
4. Hold into place and attach the Hanging Shelf using the 1/4-20UNC X 1.25 inch Flat Head Screws and Finish Washers.

Optional Tabletop Enclosure Installation:

The following instructions explain how to install the Tabletop Enclosure to Honeycomb table. Refer to the assembly drawing in Figure 14.

Required Materials:

- 2 Sides panel assembly
- 8 Sliding Doors
- 1 Enclosure Top
- 8 Enclosure (Front & Back)
- 1 Enclosure (Middle horizontal support)
- 2 Enclosure (Middle vertical)

Required Tools:

- Screwdriver
- Rubber mallet
- Carpenter's level
- Hammer

Procedures:

1. All connection are made by matching the numbers or letters.
2. Stand the two sides panel assembly on a flat surface.
3. Using a rubber mallet, hammer all the front and rear tube connecting to middle vertical and middle support tube, then connecting the two sides panel assembly connectors (as shown in figure 14).
4. Level your table systems by placing Carpenter's level diagonally across (both direction) and adjusting the table until completely level.
5. Place the enclosure frame onto the tabletop.
6. Mount all the support angle onto tabletop and enclosure frame using 1/4-20X2.50 and #6X3/8 screws provided.
7. Place the 3/4 inch top enclosure on top of enclosure frame into position and secure using the #10X2.00 inch screws and finish washers provided.
8. Slide the all plexi-glass doors into upper track then drop down into the lower track.
9. The Tabletop Enclosure installation is now completed.

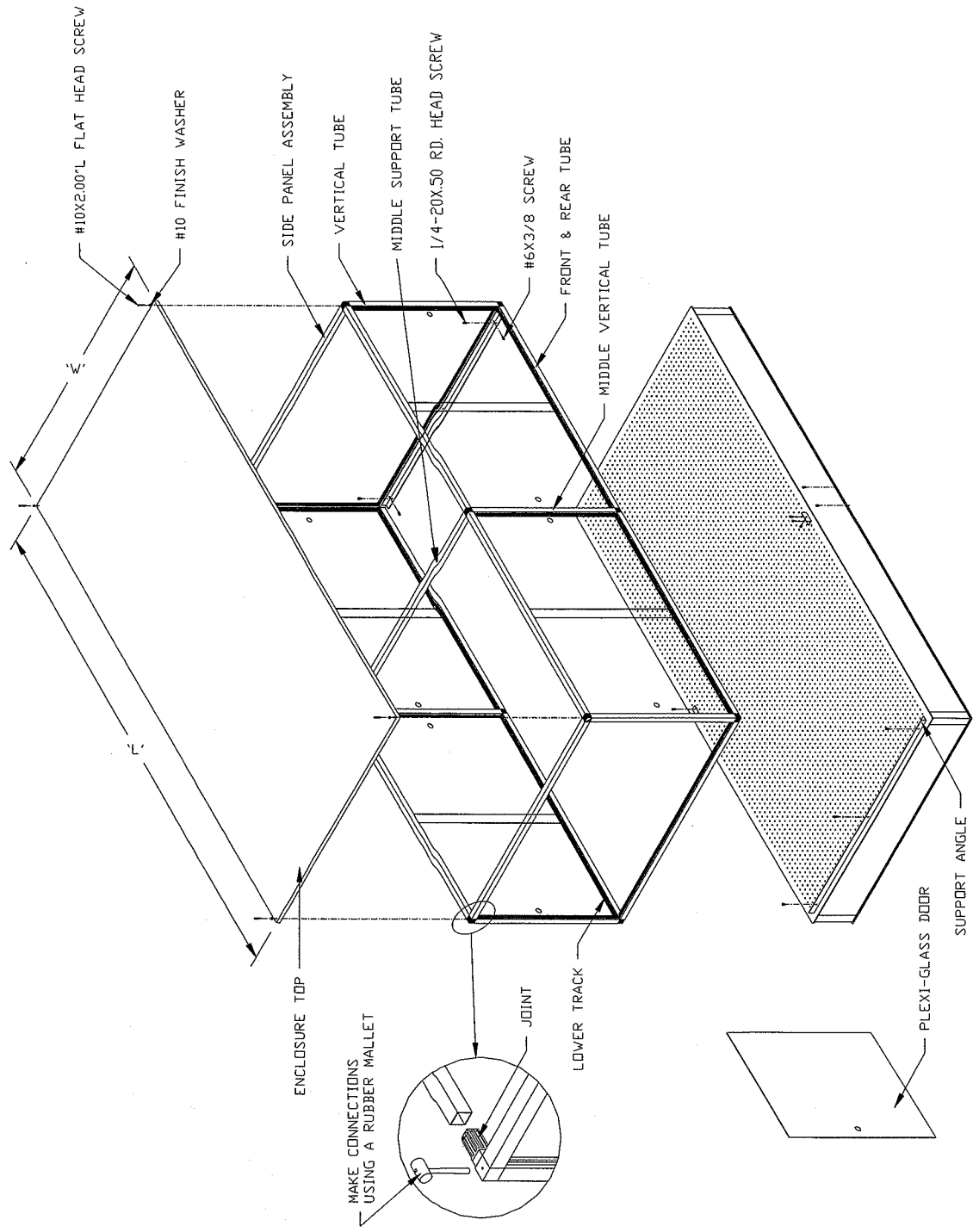


Figure 13. Assembly view of Over Head Monitor Shelf and Optional Hanging Shelf.

Section V

Trouble Shooting:

The purpose of this section is to aid the user in the diagnosis and repair of any minor problems that may occur. If your difficulty persists, call Kinetic Systems, Inc.'s technical support staff for assistance.

Symptom: Tabletop Will Not "Float"	
Possible Causes	Probable Solutions
Supply pressure too low	Increase air supply pressure to 90 PSI
Valve arm set incorrectly	Adjust Valve arm
Supported load too heavy	Reduce load to system capacity
Supported load uneven	Redistribute load evenly
Gross air leak	Locate leak and repair
Air restriction in fitting or tubing	Find restricted fitting or Tube and replace

Symptom: Tabletop "Float" but will not Isolate	
Possible Causes	Probable Solutions
Rubbing between Tabletop and system structure	Reposition Tabletop
Foreign object between Tabletop and system structure	Remove foreign object
Wires or tubing too stiff.	Use more flexible wire or large service loop
One piston too high	Lower the piston by turning the Valve Arm Adjustment Screw CLOCKWISE .
One piston too low	Raise the piston by turning the Valve Arm Adjustment Screw COUNTERCLOCKWISE

Symptom: Tabletop Over Reactive	
Possible Causes	Probable Solutions
Air pressure differential too high (i.e., more than 10-15 psi)	Reduce air pressure differential to 10-15 psi
Equipment on Tabletop has a high center of gravity	Reduce air pressure differential to 5 psi. If symptom persists, call Kinetic Systems, Inc.
VIBRA-LEVEL Servo Valve oscillating	Call Kinetic Systems, Inc. for replacement.

Section VI

Recommended Spare Parts:

While maintenance requirements for the 500A, 500AP, and 505 Vibration Isolation Table are minimal, some parts can be damaged if the system is improperly moved. In order to avoid any inconvenience, Kinetic Systems, Inc. recommended that the user maintain one or two spare parts inventory of possible replacement items. These items are listed below:

MODEL NO.	PART NO.	DESCRIPTION
500A, 500AP, 505	120497-06	H. CG. Leveling Valve
505/500-1000	290300-14	Boot (1000#)
505-2000	290300-15	Boot (2000#)

Section VII

Replacement Isolator Installation:

The following instructions explain how to install a replacement boot for the Series 500A, 500AP and 505 Isolator.

Required Materials:

- Replacement Isolator (as per specification)
- Silicone rubber (RTV 732 or Equivalent)
- Loctite Adhesive

Required Tools:

- No. 5/32 (4 mm) Allen wrench for 10-32 socket head cap screw.

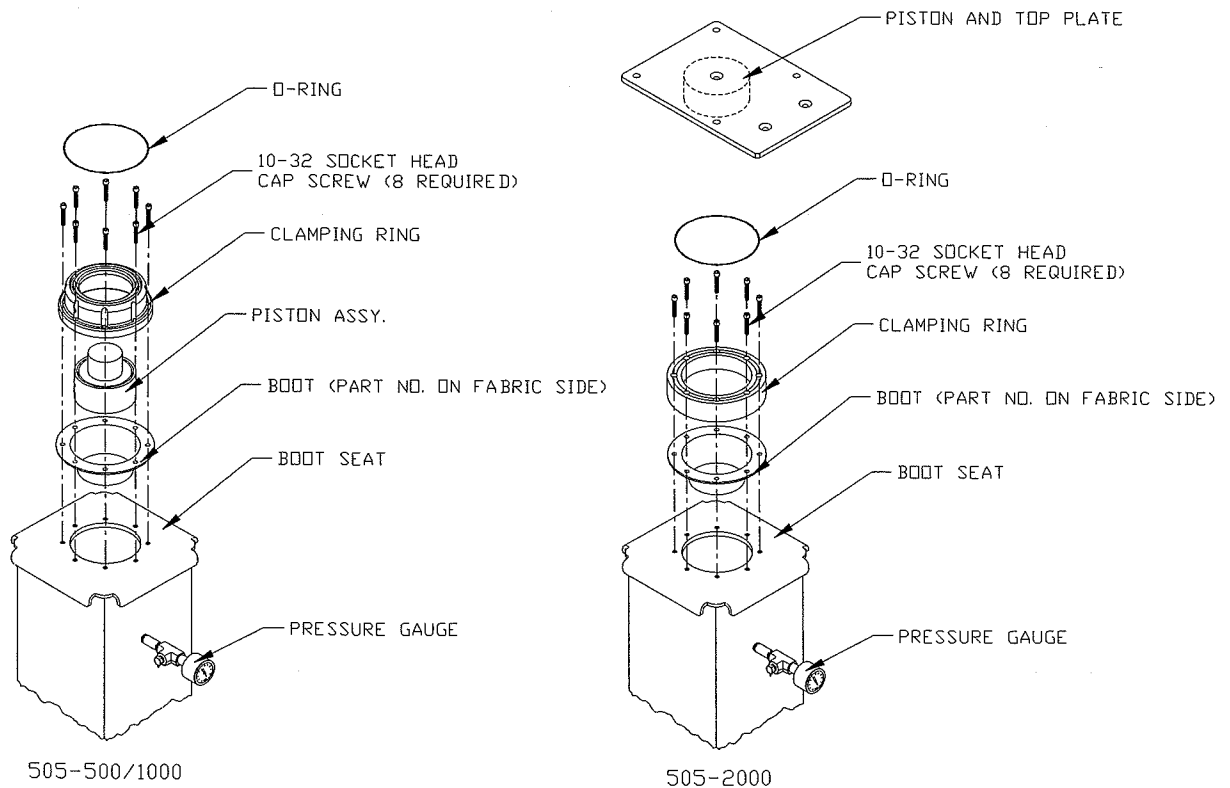


Fig. 15 Replacement Boot Installation

Procedure 505/500-1000 only:

1. Turn off air supply and wait for the pressure gage to read zero (0) PSI.
2. Remove O-Ring from top of Clamping Ring.
3. Using a 5/32 (4 mm) Allen wrench remove 10-32 Socket Head cap screws holding the Clamping Ring in place.
4. Remove Clamping ring and damaged boot.
5. Clean boot seat and apply a thin layer of vacuum grease to the cylinder-mounting flange.
6. Place the new boot on the boot seat with the "Top Hat" down (i.e. part no. on the inside of boot). Match the boot to the flange hole pattern.
7. Place the piston-boot assembly inside the boot.
8. Place the Clamping Ring over the piston-boot assembly matching up the hole patterns. The counterbored holes should be up to provided a recess for the socket head mounting screws.
9. Carefully align and center the Clamping Ring, boot, and flange holes.
10. Apply loctite adhesive to each socket head cap screw before inserting and hand tightening all screws, taking care to keep the boot centered in the Clamping Ring. Tighten all screws, criss cross pattern.
11. Torque all screws to approximately 20-30lbs.
12. Place the O-Ring (rubber bumper) into the groove on the Clamping Ring.
13. Inspect the piston for burrs or debris. Clean if necessary and replace.
14. The replacement Boot installation is now completed.

Procedure 505-2000 only:

1. Turn off air supply and exhaust air from damaged mount by pulling up on the chain connected to the pressure relief valve, wait for the pressure gauge to read zero (0) PSI.
2. Remove the mount from its installation location.
3. Remove Uplimit plate with piston from the airmount.
4. Remove O-ring from top of Clamping Ring.
5. Using a 5/32 (4 mm) Allen wrench remove 10-32 Socket Head cap screws holding the Clamping Ring in place.
6. Remove Clamping ring and damaged boot.
7. Clean boot seat and apply a thin layer of vacuum grease to the cylinder-mounting flange.
8. Place the new boot on the boot seat with the "Top Hat" down (i.e. part no. on the inside of boot). Match the boot to the flange hole pattern.
9. Place the piston-boot assembly inside the boot.
10. Place the Clamping Ring over the piston-boot assembly matching up the hole patterns. The counterbored holes should be up to provided a recess for the socket head mounting screws.
11. Carefully align and center the Clamping Ring, boot, and flange holes.
12. Apply loctite adhesive to each socket head cap screw before inserting and hand tightening all screws, taking care to keep the boot centered in the Clamping Ring. Tighten all screws, criss cross pattern.
13. Torque all screws to approximately 20-30lbs.
14. Place the O-Ring (rubber bumper) into the groove on the Clamping Ring, Piston and Uplimit plate.
15. Inspect the piston for burrs or debris. Clean if necessary and replace.
16. Place the piston inside the boot.
17. The replacement Boot installation is now completed.

Section VIII

Filter Regulator Installation and Operation:

Installation:

Installation vertical position so that air flow is in direction of arrow stamped on body of unit. Before piping-in, blow out line to remove scale and other foreign matter. If pipe compound is used, apply only to male threads and just enough to make tight joints.

Reduced Pressure Adjustment:

To unlock adjustment, pull knob up into forward most position. Turn knob clockwise to increase the reduced or regulated pressure and counter-clockwise to lower pressure. With relieving-type regulators, the reduced pressure follows adjustment of the screw, with non-relieving regulators adjustment for lower reduced pressure will not be obtained until the reduced pressure system is "bled-off" or until air flow starts (Refer to Fig. 14).

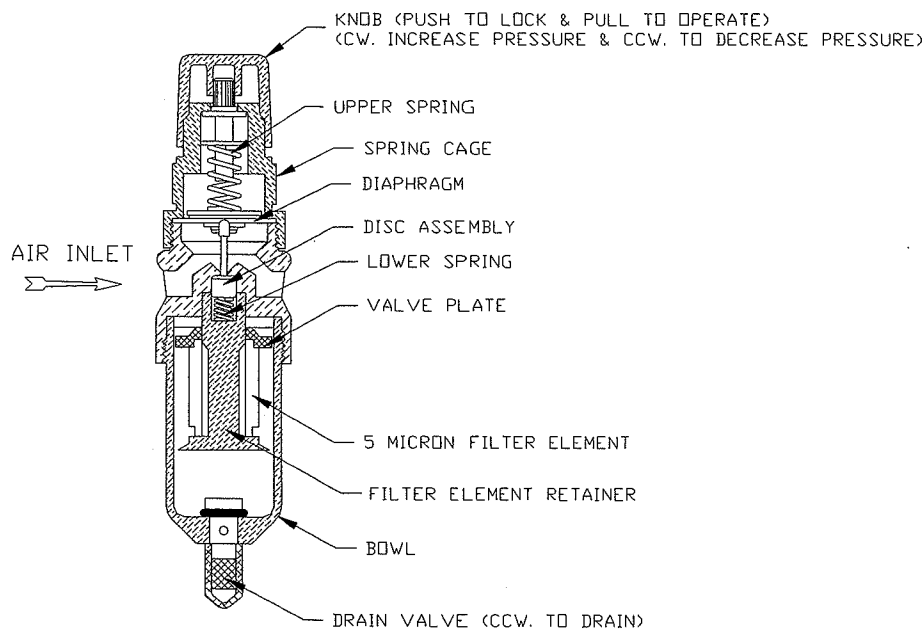


Fig. 14 Filter Regulator.

Maintenance:

To obtain best efficiency and longest periods of trouble-free operation the air supply must be kept clean, as dirt is the most common cause of erratic regulator operation. Only a few parts require occasional replacement-most trouble can be cured and prevented by thorough and careful cleaning procedure. To clean, it is not necessary to remove unit from its piping or line. At the bottom of the bowl is a drain valve which should be periodically opened (turn clockwise) particularly when sediment is visible in bowl.

Disassembly for Cleaning:

Use diagram on reverse as a guide to disassembly. Depressurized the air line, unscrew and remove the bowl. Unscrew the filter element retainer, and let down the vane plate, disc assembly and bottom spring. If the o-ring on the disc assembly appears worn or nicked, it should be replaced. Unscrew the spring cage and remove the diaphragm appears swollen or stiff, it should be replaced. Reassemble the unit in the same order, making sure the disc assembly stem fits into the small hole in the center of the diaphragm. Tighten the spring cage and bowl slightly more than hand tight (up to 50 inch pounds torque).

Cleaning for best results clean parts with alcohol. After cleaning blow out parts including body of unit with compressed air. The filter cone should be blown out from the inside, plugging one end with finger. Plastic bowl must be cleaned with household soap only.

Warranty

Equipment manufactured by Kinetic Systems, Inc. (KSI) is warranted against defective workmanship and materials for one (1) year from date of delivery. Defective material or items will be replaced at no charge. This warranty does not include labor to remove and install the material or item in question. Material returned under Warranty will not be accepted without the prior approval and assignment of a Return Authorization Number by KSI. All returns must be shipped Freight Prepaid unless KSI authorizes otherwise. In those instances where returns must be by Motor Freight (truck), KSI will furnish the proper commodity rate classification for lowest shipping cost.

