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INSTRUCTION MANUAL

GS-34 VIBRATION ISOLATED LAB BENCH

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GS-34 VIBRATION ISOLATED LAB BENCH

CHECK FOR SHIPPING DAMAGE

Damage does occur occasionally. Before beginning assembly, please check carefully for any damage that may have occurred in transit. If there is any damage, please CALL NEWPORT IMMEDIATELY.

SAFETY CONSIDERATIONS

The table top is placed on the air mounts without mechanical fasteners. Given enough force, it is possible to push the table top over.

Electrically, the table top is equivalent to a metallic conductive plate. Proper electrical grounding consideration should be given.

If your load has a high center-of-mass, or is particularly heavy, the table top may oscillate. This problem is intrinsic with any soft spring-mass system. Please call Newport. Solutions to this problem are discussed in entry 15 of the instructions.

The maximum operating pressure of the air mounts is rated at 100 psi.

Keep fingers out of the the area between the air mount and the table bottom when the table is floating.

Air Supply

The air mounts should be connected to the air supply when isolation is required. Air is used only when the pressure in the air mounts are automatically adjusted to accommodate load changes. The air supply should be shut off at the end of a day or when one makes extensive changes in the setup.

Use bottled nitrogen, or mechanically compressed air to operate the isolation system. The operating pressure is determined by the total load divided by the diaphragm area, and is typically in the 30-50 psi range.

Air from a mechanical compressor generally contains water and dirt, which will cause the leveling valves to fail. Please use our model ARF regulator/filter for maintenance free operation.

Do not use bottled carbon dioxide, since "icing" may occur during rapid filling of the air mounts.

INSTALLATION PROCEDURE

1. Remove all packing material inside the top of the isolation mounts. Position and orient the air mounts according to Figure (1).

2. Attach the leveling valves by bolting the valve brackets (B) to tab (T) on the legs, as shown in Figure 2. Only three leveling valves are supplied, because a plane is defined by three points. Two of the valves have an elbow connector, and one has a tee connector.

3. Before placing the table top on the legs, it is important that the pneumatic system be relieved of all pressure. If the legs are under pressure, the piston may be twisted and wrinkle the rubber diaphragm. Not only would that degrade the isolation performance, it may even cause the diaphragm to rupture with usage. Use the air line connecting the top and bottom chambers of the air mounts to make sure that the upper chamber moves freely.

4. Position the legs as close to the edge of the table as possible for greater stability. Also, for appearance and safety, the valves should not protrude beyond the sides of the table top.

5. The height sensing blocks (H) are held by a magnet (M) to the bottom of the table. Position the sensing blocks (H) so that the height sensing arms (A) of the leveling valves fit into the slots in (H), as shown in Figure 2. If necessary, the dimension (D) of the height sensing blocks (H) can be adjusted by loosening the screw (S), relocating the magnet (M) and then tightening the screw (S).

6. Connect the air lines as shown in Figure 1. To assure leak-free connection, cut the air lines to length with a sharp razor blade so that the ends are clean and square. Tighten the fitting nuts snuggly, but only thumb tight.

7. CAUTION: Do not cut or alter the existing tubing connecting the two chambers of the legs. Make sure that tubing does not touch the air mounts, and that the top chamber floats freely.

8. Adjust the supply pressure from your air supply to approximately 30 psi.

9. Check for any leaks in the connections.

10. Open each metering valve (V) about <u>one-quarter</u> turn to fill each leg.

11. Slowly increase the air supply pressure until the table floats. Ideally, the supply pressure should be set to 5-10 psi above the pressure reading of any of the leveling valves.

12. The leveling valves are factory adjusted. If necessary, the flatness of the floor can be compensated by adjusting knob (L) of the leveling valves so that the table floats about 1/4 inch above the top of the legs. Adjustment of all three valves may be necessary to raise any one corner.

13. At this point, the table is floating and operational. Push the table top gently to check if the table is floating free both vertically and horizontally.

14. "Hunting" or oscillation would occur for heavy loads or loads with high center-of-mass. This problem is intrinsic with any soft spring-mass system. The solutions evolve around a combination of increasing the leg spacing, decreasing the load, lowering the center of mass, reducing the Q of the feedback system, and by increasing the spring constant. The feedback loop can be stabilized by restricting the air flow by decreasing the air supply pressure and also by closing down the metering valve (V). It is necessary to contact Newport in order to increase the spring constant. Occasionally instability is caused by wrinkles in the diaphragm due to twisting of the pistons during installation. Repositioning the load towards the center of the table also helps stabilizing the system.

15. If the table system continues to hunt or oscillate, try these adjustments:

    a. Adjust the height adjustment knob (L) so the table floats as close as possible to the isolation mounts, approximately 1/8 inch.

    b. Adjust high center of mass loads as close to the center of the table as possible. If an off center load is unavoidable, adjust the load within the triangle transcribed by the three isolation mounts with air control valves mounted (see Figure 1A).

    c. Adjust air supply pressure to 20 or 30 PSI higher than the pressure indicated by the highest reading gage on the isolation mounts.

    d. Adjust the metering valve knob (V) on isolation mount No. 1 (Figure 1A) open 1/16 to 1/8 turn.

       Adjust the metering valve knob (V) on isolation mount No. 2 open 2 1/4 turns.

       Adjust the metering valve knob (V) on isolation mount No. 3 open fully.

FIGURE 1a

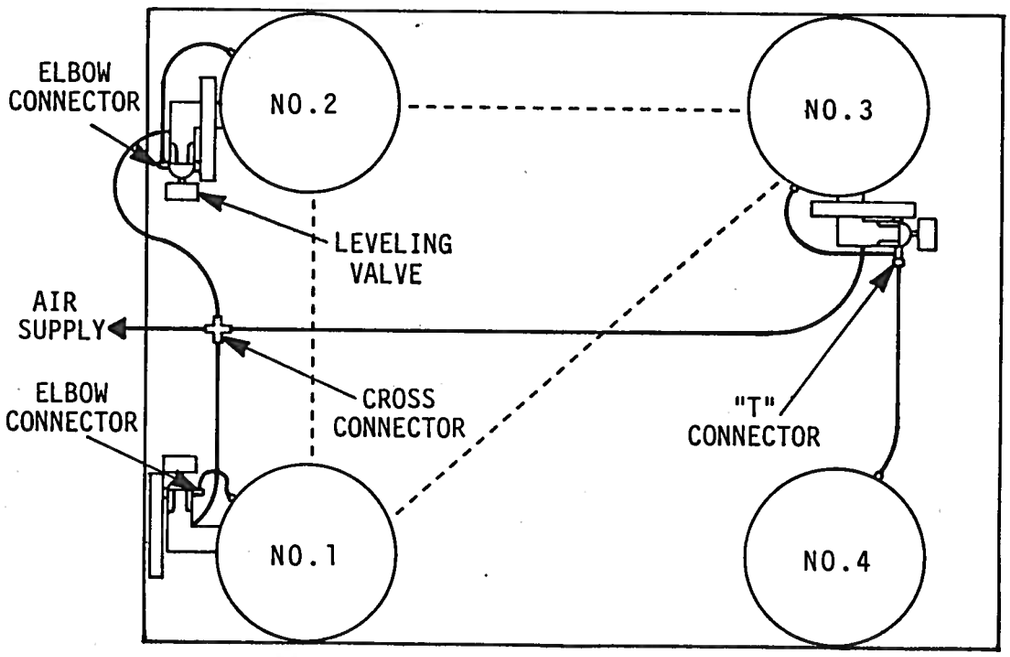

FIGURE 1b

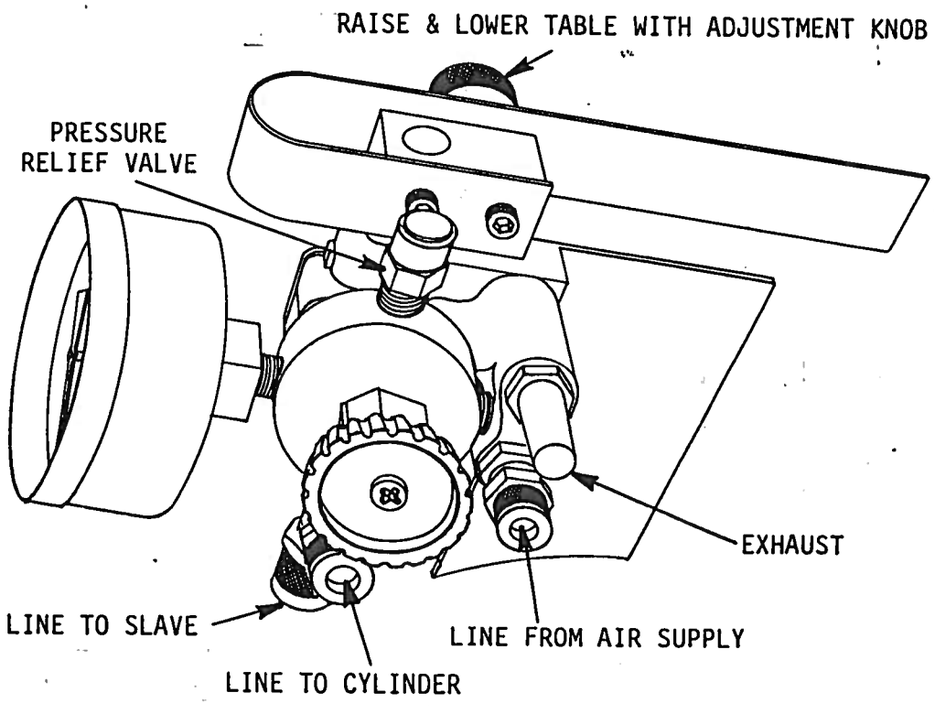

FIGURE 2

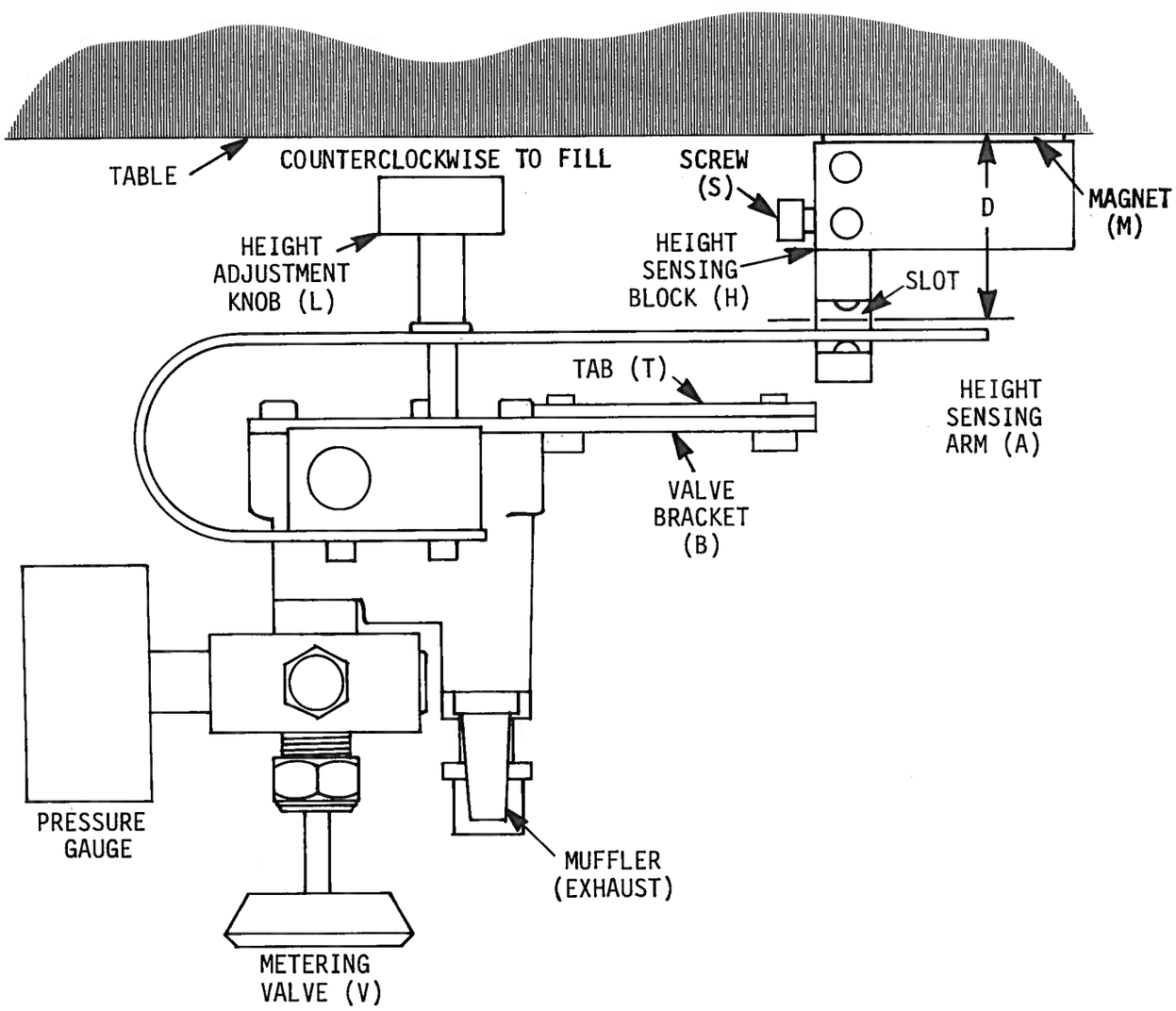
TABLE
COUNTERCLOCKWISE TO FILL
SCREW (S)
D
MAGNET (M)
HEIGHT ADJUSTMENT KNOB (L)
HEIGHT SENSING BLOCK (H)
SLOT
TAB (T)
HEIGHT SENSING ARM (A)
VALVE BRACKET (B)
PRESSURE GAUGE
MUFFLER (EXHAUST)
METERING VALVE (V)

TROUBLESHOOTING

The table does not float

1. The supply pressure should be 5-10 psi above the pressure reading of any of the leveling valves. As the load increases, the supply pressure should be increased.

2. Verify that the valves are connected correctly and the metering valves are open.

3. The leveling valves may be clogged. Always use an air regulator/filter, such as our ARF, when mechanically compressed air is used.

Poor isolation

1. Vibration may be transmitted to the table due to direct physical contact of the equipment mounted to the table top with the surrounding.

2. The diaphragm may be wrinkled, if the piston is twisted during installation.

3. The equipment mounted to the table has very low resonant frequency, due to lack of rigidity, or has some very pronounced resonances to drive critical components that have similar resonant frequencies.

Table top oscillates

This is due to the high-center-of-mass instability problem. Please consult Newport and also refer to entry 15 above. Sometimes this problem can be corrected simply by reducing the pressure of the air supply to only 5-10 psi above the air mount operating pressure.

Air mounts bleed constantly

The leveling valve is defective. Mechanically compressed air contains dirt, which may lodge in the valves to prevent the seals from seating properly. Replacement valves may be ordered from Newport.