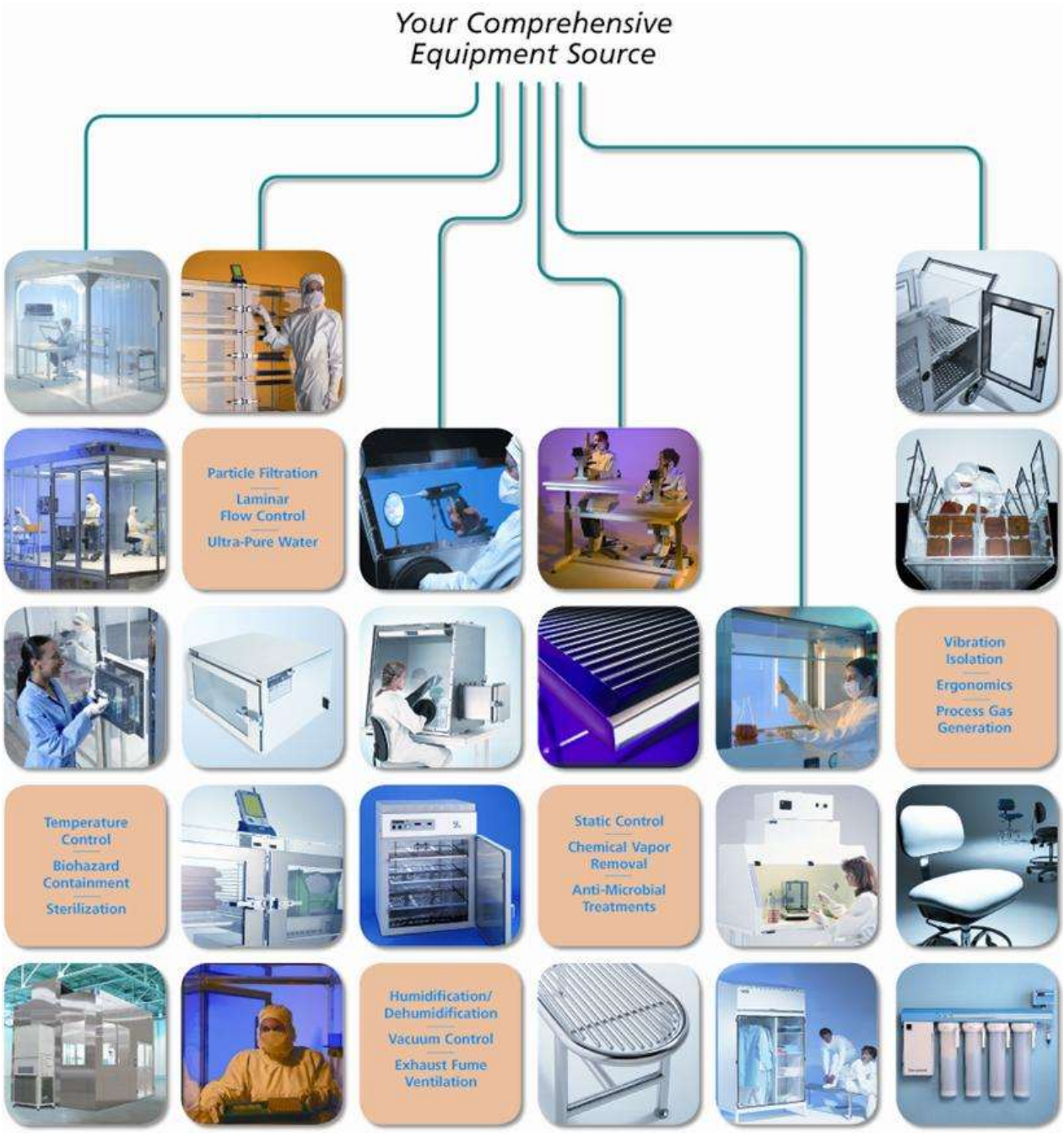
TERRA UNIVERSAL.COM
Critical Environment Solutions

Quick-Start Operating Guide *Document No. 1800-62*

Vibration-Free Work Station



Quick-Start Operating Guide

Vibration-Free Work Station

Proprietary Notice

This manual pertains to proprietary devices manufactured by Terra Universal, Inc. Neither this document nor any portion of it may be reproduced in any way without prior written permission from Terra Universal.

Terra Universal makes no warranties applying to information contained in this manual or its suitability for any implied or inferred purpose. Terra Universal shall not be held liable for any errors this manual contains or for any damages that result from its use.

Safety Notice

A thorough familiarity with all operating guidelines is essential to safe operation of the product. Failure to observe safety precautions could result in poor performance, damage to the system or other property, or serious bodily injury or death.

The following symbols are intended to call your attention to two levels of hazard involved in operation:

CAUTION — **Cautions are used when failure to observe instructions could result in significant damage to equipment.**

WARNING — **Warnings are used when failure to observe instructions or precautions could result in injury or death.**

The information presented here is subject to change without notice.

1.0 Introduction

This manual provides information on installing and operating your Terra Universal Vibration-Free Work Station.

By studying this document carefully, you can be assured of a long, efficient service life from the unit.

2.0 Description

Terra Universal's Vibration-Free Work Station isolates up to 90% of typical building vibrations in both the vertical and horizontal directions. It consists of the top, the reinforcing undertop (top and undertop are combined in stainless steel models), pneumatic mounts, a regulator and gauge for each mount, a safety regulator, and a telescoping frame. Optional drawers and shock bumpers are also available.

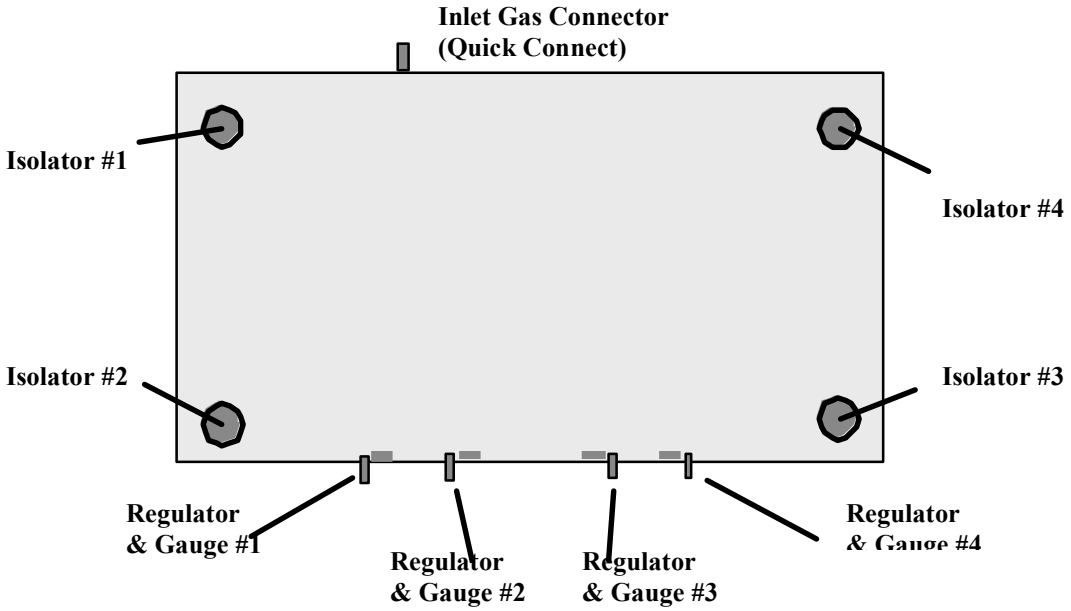
The adjustable legs are made of heavy-gauge 1 3/4" square telescopic tubing adjustable in height from 25" to 35". Legs are adjusted by means of set screws.

Top Board (Laminated Stations only)

The top board is constructed of high-grade thermosetting plastic laminate bonded to a 3/4" high-density particle board substrate. A frame of 3/4" high-density particle board is also bonded under the periphery of the top to provide additional reinforcement. The station can accommodate 550lbs. without sagging, yet its ergonomic, low- profile design affords all of the comfort and convenience of a standard bench. Backing sheet is laminated to the underside to meet cleanroom requirements.

A static-dissipative top is also available for ESD control. For complete static dissipation, this top is equipped with a grounding connector and two banana plug receptacles to receive the operator wrist strap. Conductive laminate meets MIL-B-81705-B specifications. Standard color of the top is non-glare (texture finish) ivory.

CAUTION: To protect the static-dissipative properties of the material, do not clean with alcohol or strong cleaning agents. USE ONLY clean, lukewarm water (or a mild detergent) and a clean, nonabrasive wipe. Do not use wax or other coatings.



Undertop (Laminated Stations only)

A thick gauge steel plate provides optimum reinforcement and prevents sagging of the laminate top boards under heavy loads. This undertop is encased in the recessed underside of the top board and fastened to it, forming a two-piece floating work station. It is securely set on four vibration-free mounts, isolating the work surface from any possible shocks or vibrations. The undertop also comes with fasteners that allow incremental weight plates to be added to the bench. These weights increase the vibration-absorbing efficiency of the bench with lighter loads.

Optional Shock Bumper

A rigid-panel bar mounted on the frame protects the front of the isolated top board against an operator accidentally bumping the board. This shock bumper can also serve as an adjustable arm rest.

Pneumatic Vibration-Absorbing Mounts

These four mounts are designed for applications that require exceptionally high vibration isolation, with a natural frequency down to 2-4 Hz. The vibration-absorbing system offers high deflection and a horizontal to vertical stillness ratio of one-to-one. This ensures excellent stability without the need for lateral restraints; the system isolates up to 90% of typical building vibrations. By varying the air input supplied to the pneumatic mounts while a load is applied, the floating work surface can be adjusted in height for leveling within ± 1/16".

In-house air supply, bottled air, CO_2, or nitrogen can be used for pressurizing mounts. No gauges, filters, regulators, or special tools are required if the air supply is 100 psi or less. For very light loads, you may add an optional plate weight to the underside of the bench top to provide the weight necessary to maintain an effectively level vibration-free surface.

CAUTION: Terra Universal strongly recommends continuous in-line inflation. (i.e. keep the supply gas source connected to the table.)

The Vibration-Free Work Station comes complete with laminate top, reinforcing undertop (combined in stainless steel models), four pneumatic mounts, regulators, gauges, adjustable legs, and right/left drawer unit mounting brackets. Drawer Unit and Shock Bumper are optional. See TerraUniversal.com for additional information.

3.0 Installation

Carefully unpack all system components and check for missing or damaged parts. Any damage should be reported immediately to the shipping company.

The Vibration-Free Work Station is factory-adapted to suit particular application requirements. The internal safety regulator is set at 60 psi to ensure proper gas distribution to each of the station's vibration isolators, and plate weight(s) are installed underneath the station in accord with the anticipated load requirements.

To set up the station,

1. Connect your in-house gas supply to the quick-connect inlet located on the rear of the station (see illustration above). To make this connection, simply remove the collar from the end of the quick-connect fitting, press it onto the gas line, and then screw it back onto the fitting. This fitting can then be pressed onto the connector on the station.

Note: The feed gas line should be externally regulated at 100 psi.

2. Make sure that the regulators controlling gas pressure in the vibration mounts are fully closed (counter clockwise rotation closes each regulator, each of the pressure gauges on the front panel should read "0").

3. Place your load, including all process equipment, on top of the work station.

4. Slowly open each of the regulators until the table top rises about 1/2" above the undertop on all sides. Typically, this will require 30 - 40 psi of pressure (check each of the gauges as you adjust the regulators).

This work station accepts one or two 39-lb. plate weights (attached to the underside of the undertop.) The precise load you should maintain depends on your operating variables, including the frequency of vibration that must be dampened and allowable vibration levels. If damping is not adequate at the frequency you are experiencing, add additional weight(s) to lower the natural frequency and thus provide additional attenuation at the experienced frequency above the natural frequency.

In most applications, you will need one 39-lb. weight (mounted with the two center screws on the bottom of the bench). If you need two weights (if your load is very light), mount them side by side under the bench (using all four mounting screws).

Each vibration isolator is rated for a net load of 100 pounds; with both weights installed, the load placed atop the table should not exceed 270 pounds. With both weights removed, this load should not exceed 300 lbs.

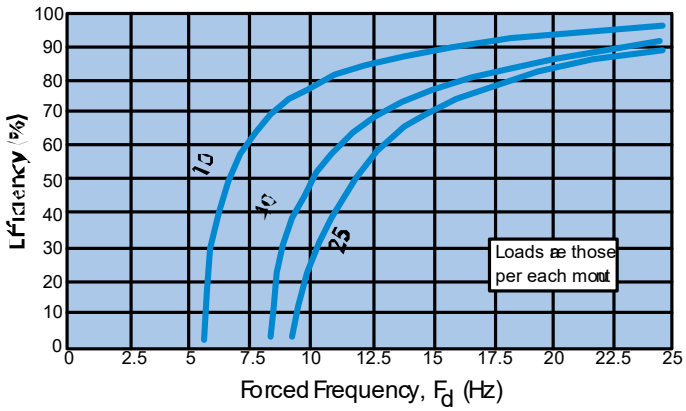
CAUTION: If you must alter the plate weights, be sure to deflate the isolators before removing the load. Keep in mind that you must re-level the platform if you reposition the load. Never allow the safety regulator to exceed 60 PSI, or damage to the isolators could result.

If the table top fails to rise, then your load is too heavy. In this case, you must remove one or more of the plate weights located beneath the table top to reduce the net load of the unit.

If the platform inflates completely with very little pressure, or the system doesn't deliver adequate vibration damping of the frequency you are experiencing, then your load is too light. To compensate, you need to add additional weight, which will provide more effective attenuation of the vibration frequency to which your system is exposed.

5. To achieve a level work surface, you can make fine adjustments to the pressure levels at each regulator (refer to illustration above). Pressure levels to each of the isolators may vary somewhat, depending on load weight and distribution. Once you make the correct setting, lock the regulators in place (by pressing the knob into the unit). You may need to rebalance the system if your load shifts.

Work Surface Dimensions (W" x D")	Number of Isolators	Maximum Load * (lbs.)
48 x 30	4	350
60 x 30	4	350
72 x 30	6	550
84 x 30	6	550
96 x 30	6	550
48 x 34	4	350
60 x 34	4	350
72 x 34	6	550
84 x 34	6	550
96 x 34	6	530



*** Maximum loads with plate weights removed.**

CAUTION:

- **The Vibration-Free Work Station operates at maximum efficiency when loaded to near-maximum capacity (300 lbs. net, excluding the weights of the table itself and any plate weights installed underneath).**
- **When inflating the isolators, never expose the unit to line pressure greater than 100 psi.**
- **If your net load exceeds 300 lbs., you should remove the plate weight(s) installed beneath the table top (each of these plates weighs 39 lbs.). Under no circumstances should the total load (net load plus plate weights) exceed 300 lbs.**
- **Always deflate the table top (by closing the pressure regulators, counter clockwise rotation) before adding or removing weight.**
- **For best results, Terra recommends that the Vibration-Free Work Station be operated under continuous line pressure. The pressures to which the isolators are exposed can lead to minute leaks over time. Although the system will automatically balance the load to compensate for a slow leak in one isolator, in time the system will lose some of its vibration-dampening ability if disconnected from the feed gas line. By maintaining the gas line connection during operation, you preclude this possibility.**

Vibration-Free Work Stations:

Top: Available in static-dissipative, standard and electropolished stainless steel, and nonconductive tops.

Maximum Allowable Load: See chart above.

Plate Weights: 38 lbs each (chrome plated with electropolished stations).

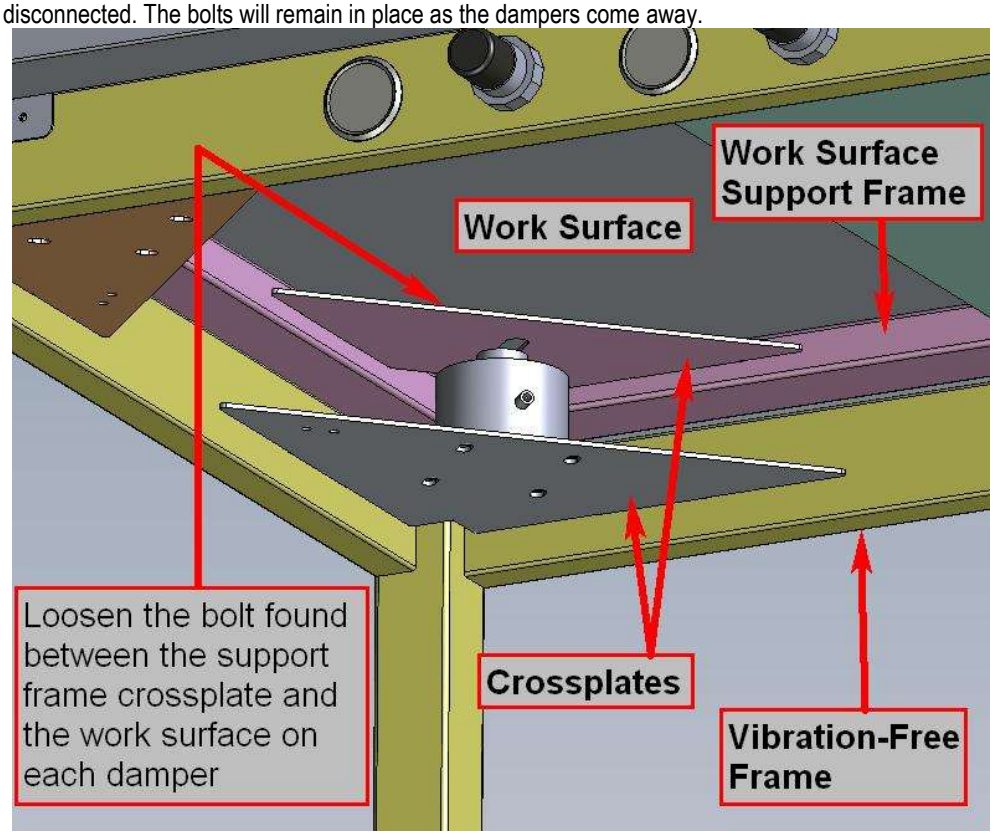
Options: Shock Bumper, Clean Room Drawer Unit, Plate Weights, ErgoHeight, Electropolishing

4.0 Maintenance

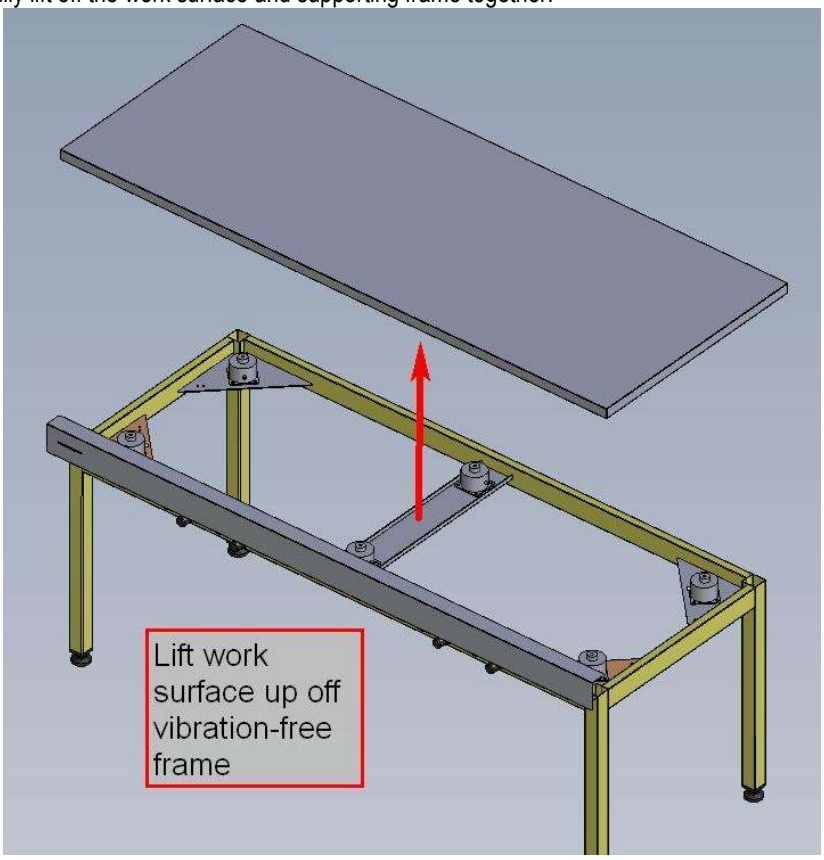
Over time, the pneumatic rubber damper/isolators in the work station may need to be replaced. The procedure for this is as follows:

To replace the rubber dampers,

1. Ensure the system is depressurized and powered off.
2. Between the dampers and the work surface are bolts. Loosen the bolts from each damper until they are all disconnected. The bolts will remain in place as the dampers come away.

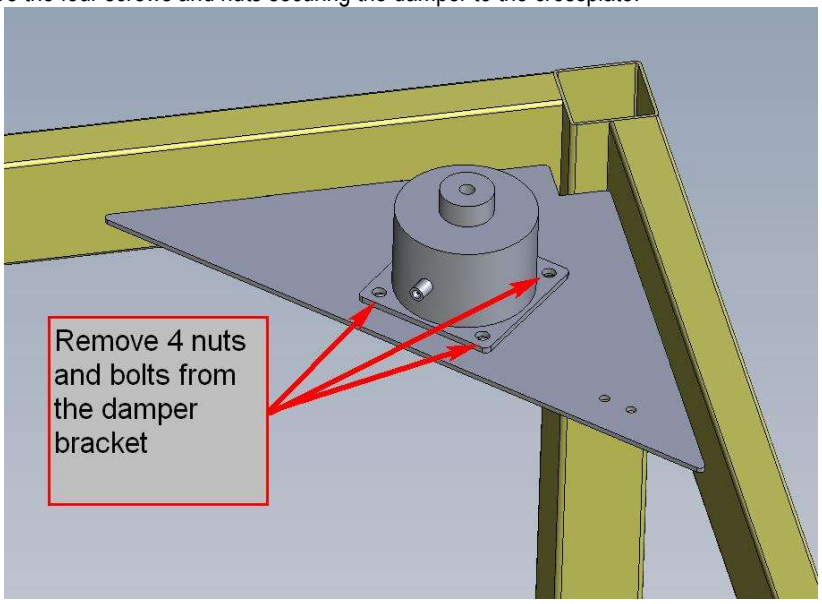


3. Carefully lift off the work surface and supporting frame together.



4. Disconnect the pneumatic tube linked to the damper.

5. Remove the four screws and nuts securing the damper to the crossplate.

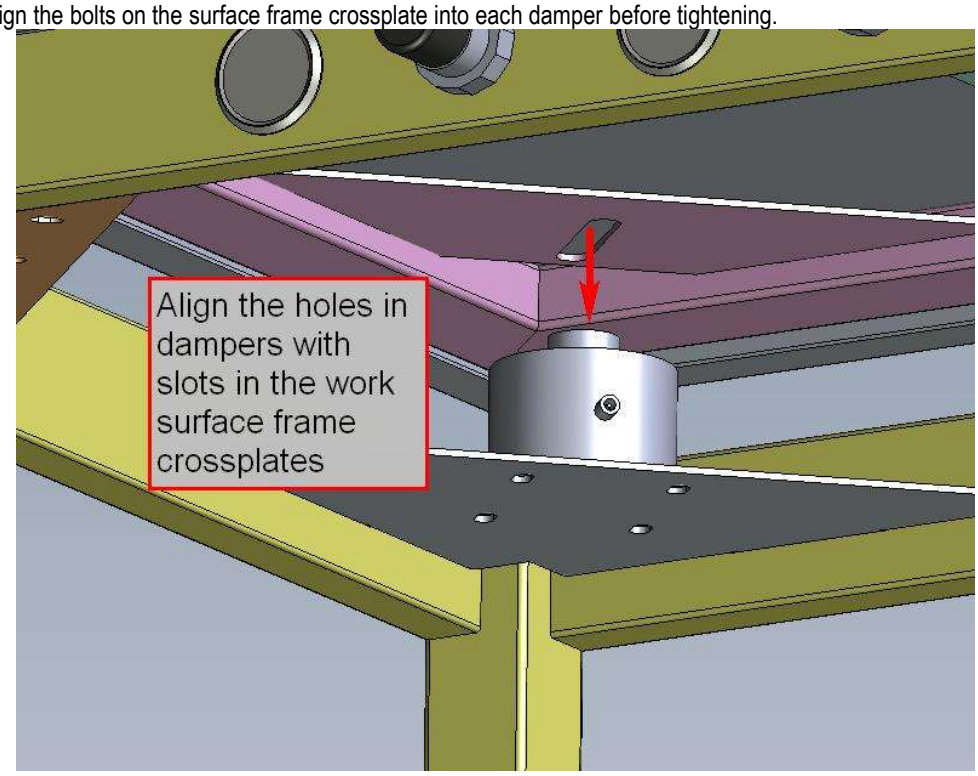


6. Remove and replace the damper with the replacement unit, fastening it back onto the frame with the nuts and bolts.

7. Reconnect the pneumatic line.

8. Replace the work surface on top of the vibration-free frame.

9. Align the bolts on the surface frame crossplate into each damper before tightening.



5.0 Warranty

Thank you for ordering from Terra Universal!