

Installation, Operation and Maintenance Instructions



UNIT VIBRATOR MODELS 60U AND 70U

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WORLD AUTHORITY IN ADVANCED TECHNOLOGY FOR MAGNETIC, VIBRATORY and INSPECTION APPLICATIONS

Introduction

This manual details the proper steps for installing, operating and maintaining the Eriez Unit Vibrator.

Careful attention to these requirements will assure the most efficient and dependable performance of this equipment.

If there are any questions or comments about the manual, please call Eriez at 814/835-6000 for Unit Vibrator assistance.

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Installation

MOUNTING

The best location for a unit vibrator on a bin hopper depends on many factors. Two general considerations should be borne in mind in selection of mounting location:

- a. The unit vibrator must have a relatively free span of bin or hopper to vibrate.
- b. The vibrator should be so located as to deliver the vibration in the area where it is most effective in promoting flow by its agitation action and tendency to break up bridging and arching.

In view of the above considerations the unit vibrator should be located and mounted as follows:

1. Select a face of the hopper or bin that is not stiffened or obstructed by braces, supports, etc. In general, a sloping face of the hopper is to be preferred.
2. Mount the unit on the center line of the selected hopper wall approximately 1/4 of the distance up from the hopper discharge opening. Attachment to the hopper wall may be made by means of bolts with lock nuts or by welding suitable studs to the bin wall. Welded studs should be avoided unless experienced welders are available to provide perfect welds. In the case of thin walled hoppers, a mounting plate of suitable size may be bolted or welded to the bin wall and the vibrator attached to this plate by bolts or studs welded thereto. Where two units are used on the same bin, the units should preferably be located on opposite faces. **BE SURE THE VIBRATOR IS TIGHTLY ATTACHED TO THE BIN WALL.** Two or more units on one bin wall (or on opposite walls) must be properly "phased" to provide coordinated action for best movement of the material. This may be done by simply reversing the power line connections to one or more units.

ELECTRICAL CONNECTIONS

Check the specifications of the power line to be certain that it is the same as that shown on the name plate of the vibrator (or control, if used).

Where no Eriez control is used, connections are as shown in Figure 1. Where Eriez control is used, connections are as shown in Figure 2. Ground connections should always be used as shown. A GATE INTERLOCK SWITCH SHOULD BE PROVIDED SO THAT THE UNIT VIBRATOR IS OFF WHEN THE DISCHARGE OPENING IS CLOSED.

Eriez unit vibrators cannot be operated by direct current.

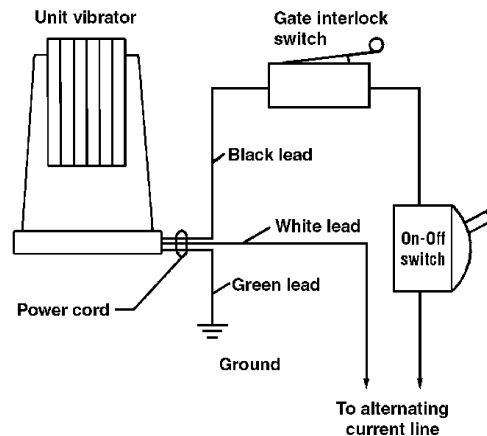


FIGURE 1

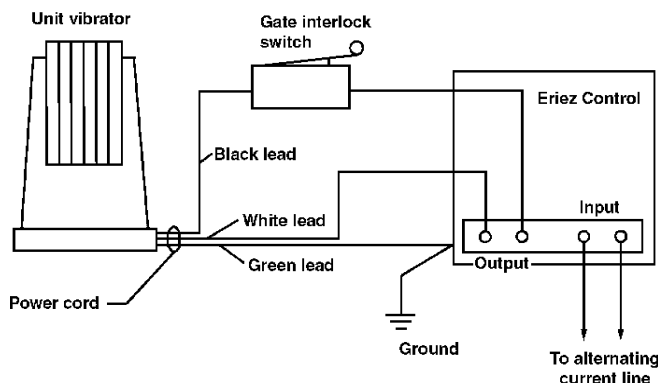


FIGURE 2

YOU ARE NOW READY TO OPERATE YOUR UNIT VIBRATOR.

Operation and Maintenance

To start in operation after all connections have been made, turn the switch (see Figure 3) to the "on" position and open the bin discharge gate. No warm-up period is required. If an Eriez controller is used, with the switch "on" and the discharge gate open, adjust the variable auto-transformer to the desired vibration output level. As the control knob is rotated clockwise, the vibration output will increase.

Eriez unit vibrators are operated by an alternating current electromagnet energized directly from any single phase AC source of the correct voltage and frequency. No intermediate rectification equipment is required. The Eriez control box may be used to reduce the vibration output to the desired level.

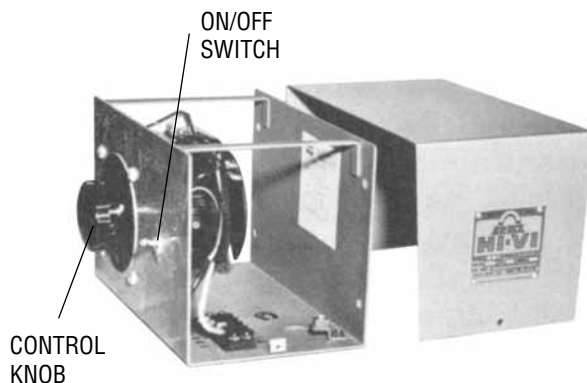


FIGURE 3

ROUTINE MAINTENANCE AND CHECKING

In normal operation with the unit properly installed and the cover in place, the unit will operate with a dull but solid hammering sound. This steady hammering sound is a necessary by-product of the metal-to-elastomer impacting action of this type of vibrator.

Spurious rattling or tinny noises should not be in evidence. Such noises indicate loose or resonant parts in the system.

For inspection and checking purposes, units may be operated temporarily with the cover removed. In checking the total armature displacement, the width of the blurred bar at the top or bottom of the hammer may be measured with a scale, or an Eriez total displacement sticker may be used (see Figure 4).

THESE UNITS ARE DESIGNED TO HAVE A TOTAL HAMMER DISPLACEMENT OF 3/32" (2.4 mm) TO 7/64" (2.8 mm) DEPENDING UPON THE MODEL, ADJUSTMENT, AND APPLICATION.

For best performance, the air gaps between the pole pieces and the E-Frame legs (see Figure 4) should be equal and uniform in width from side to side. For adjustment of these gaps use a spacer of approximately the same thickness as the air gap and preferably of non-magnetic material. Adjust the gaps by shifting the E-Frame after loosening the E-Frame fasteners.

The mounting bolts, as well as all fasteners in the vibratory assembly, should be checked frequently for tightness. Loose fasteners anywhere in the assembly or mounting may result in a loss of efficiency.

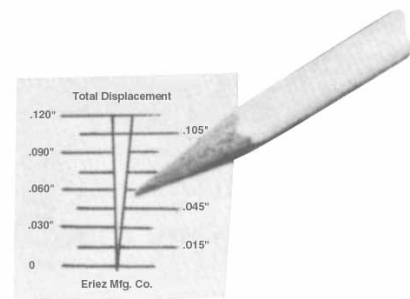
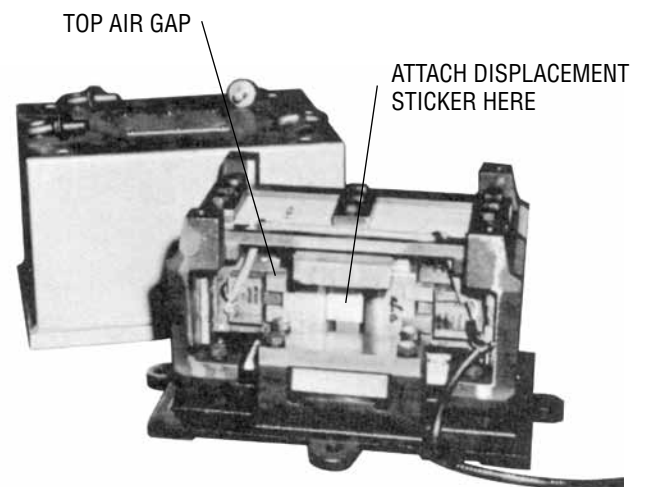


FIGURE 4



Repairs

Foreign material, if allowed to accumulate on the E-Frame and moving assembly or on the base, may also result in loss of efficiency. Such foreign material may be blown out with an air hose.

These vibrators do not require lubrication of any kind.

For possible troubles and their remedies, refer to the Unit Vibrator Service Chart at the back of this instruction material.

SPRING REPLACEMENT

Although spring failure will rarely occur if the unit is operated within its limitations, a spring may eventually fail. Such failure will show up in the unit's gradually becoming weak or inoperative. A faulty spring will be indicated by irregular white areas adjacent to the spring clamps, or as excessively worn areas under the edges of the clamps. Refer to the Parts List and order a new spring from the factory. Be sure to include the serial number of the unit when ordering.

To check or replace the bottom spring, leave the top spring in place and remove the entire E-Frame Spring Hammer assembly by first removing the bolts holding the end supports and strike bars to the base, making sure that the shims under these parts are not disturbed (see Figure 5).

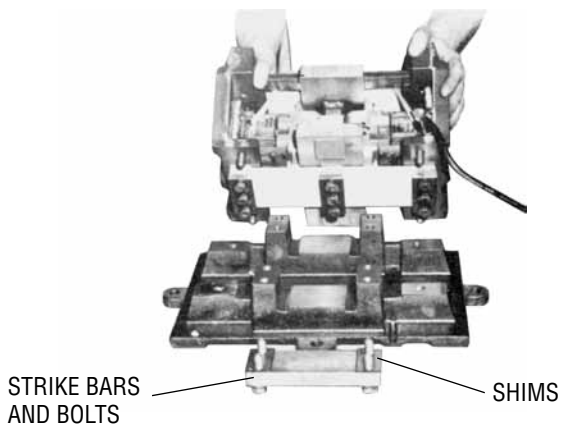


FIGURE 5

Check the underside of the bottom spring and replace the spring if necessary. Return all spacers to their original positions.

Reinstall the E-Frame Spring Hammer assembly and the strike bars, then check and, if necessary, replace the top spring. Check and, if necessary, readjust the E-Frame air gaps. Be sure all bolts are tight.

If after installation of a new spring or springs, the vibrator does not produce bin displacement equal to the original, the gaps between the impact pads and the strike bar base assembly should be adjusted for best effect by adding or removing strike bar or end support shims. See "Load Adjustment".

COIL REPLACEMENT

Since the coils are permanently embedded on the center legs of the E-Frame, a coil and E-Frame must be replaced as a unit. In removing an old coil and E-Frame, disconnect the old coil by cutting the leads on the coil side of the crimp connectors leaving stubs long enough to properly connect the new coil. Note that coils are wired in parallel in 115 and 230 V units. While in the 460 and 575 V units, they are connected in series. Then remove the four bolts securing the E-Frame and slide the E-Frame out sideways (see Figure 6). Before fastening the new E-Frame in place, the gaps should be adjusted in accordance with instructions previously given.

When ordering a new E-Frame assembly **be sure to include the vibrator nameplate voltage.**

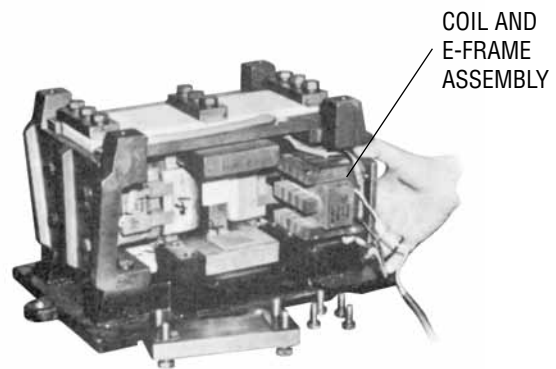


FIGURE 6

IMPACT PADS

Although made of an exceptionally rugged elastomer, the impact pads may eventually wear out and require replacement. To replace the pads, first remove the strike bars and the E-Frame Spring Hammer assembly as a unit. Then remove the old pads with a sharp edged instrument (a sharp wood chisel is ideal), scrape the metal surfaces clean, and roughen with sandpaper or emery cloth. Using the adhesive kit furnished with each set of replacement pads (See Parts List), and carefully following the directions provided with the kit, bond the new pads in place. Reinstall the E-Frame Spring Hammer assembly and the strike bars, and tighten all bolts securely.

If after installation of new impact pads, the vibrator does not produce bin displacement equal to the original, the gaps between the pads and the strike bar-base assembly should be adjusted for best effect by adding or removing strike bar or end support shims. See "Load Adjustment".

LOAD ADJUSTMENT

A means is provided for adjusting the vibrator to heavier or lighter loads within the application range of the vibrator. This adjustment consists of spacer shims which may be used as required to vary and equalize the gaps between the impact pads and the strike bar base assembly, and thus provide the best impacting condition for the particular application. These steel shims, of different types for the strike bar and the end support, are placed between those parts and the base to vary and equalize the gaps.

All vibrators are shimmed for the normal operating condition (rated bin wall thickness, etc.). When they leave the factory additional shims are provided in an envelope shipped with the unit. The following is a guide for use in adjustment to abnormally heavy or light loads.

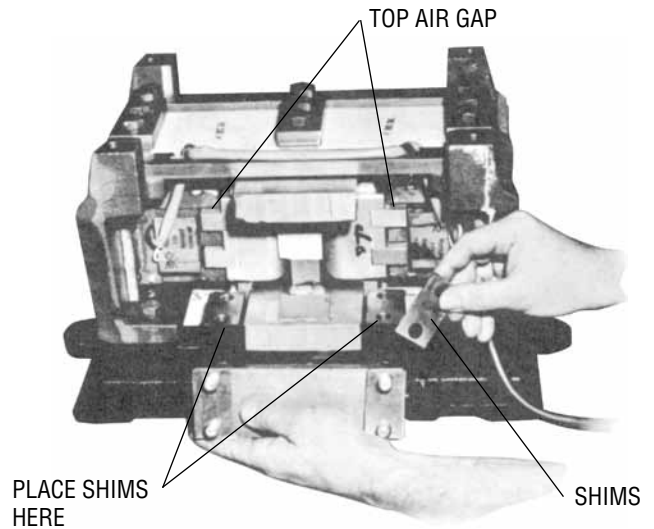


FIGURE 7

1. Heavy load condition
(rigid surfaces, heavy masses).

Under this condition, if the impact pads are worn, the hammer may vibrate excessively and produce striking at the interfaces between the pole pieces and the E-Frame legs. Such striking, evidenced by a pronounced metallic hammering sound, may result in damage to the unit if allowed to continue. Eliminate the striking and adjust for best performance by removing shims.

2. Light load condition
(resilient surfaces, light masses).

Under this condition, the hammer may not vibrate and impact sufficiently to move the load as much as desired. In this case, the performance can often be improved by adding or removing shims. Which method will be the most successful depends entirely upon the characteristics of the load.

NOTE: All four air gaps should be as nearly alike as possible. For Model 60U use a .090" (2.3 mm) gap gauge. For Model 70U use a .63" (1.6 mm) gap gauge.

Troubleshooting

TABLE 1. SERVICE CHART

NATURE OF PROBLEM		Incorrect Voltage	Loose Fastenings	Foreign Material Inside of Unit	Faulty Controls or Wiring	Incorrect Factory Adjustment	Blown Fuse or Circuit Breaker	Line Voltage Variation	Coil Failure	Incorrect Air Gap Adjustment	Spring Failure	Product or Volume Variation	Loose or Broken Cover	Broken Base or Other Casting	Extreme Heat over 120°F	Rubber covered Anvil or Impact Pads Worn (30S)
Initial Installation	Reduced or Low Output	1	2	3	4	5								13	14	
	Noisy but Output Okay		2	3		5							12	13		
	Noisy Certain Periods Only		2					7								
Develop After Satisfactory Initial Operation	Completely Inoperative				4		6		8	9	10			13		
	Operating but Reduced Output	1	2	3	4					9	10			13		
	Output Okay Too Much Noise			3						9	10		12	13		15
	Gradual Fading			3	4				8		10					
	Inconsistent Output			3	4			7				11				

Numbered Squares indicate possible sources of trouble.

IMPORTANT - Be sure the power supply (voltage and cycle) matches that shown on the name plates. Unit vibrators will not operate on direct current.

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| <ol style="list-style-type: none"> 1. Incorrect Voltage
Check nameplate specifications and line voltage. 2. Loose Fastenings
Remove cover and check all bolts - make certain that bolts to bin are tight. 3. Foreign Material Inside of Unit
Foreign matter inside of unit - remove cover and clean with air hose. 4. Faulty Controls or Wiring
Faulty controls or wiring - check and replace if necessary. 5. Incorrect Factory Adjustment
Incorrect factory adjustment - adjust air gap (see maintenance instructions). 6. Blown Fuse or Circuit Breaker
Blown fuse or circuit breaker - check and correct - check all wiring for short circuits. 7. Line Voltage Variation
Line voltage variation - check and install voltage regulator if necessary. 8. Coil Failure
Coil failure - check - remove and install new coil (see maintenance instructions). | <ol style="list-style-type: none"> 9. Incorrect Air Gap Adjustment
Incorrect air gap adjustment - check and readjust (see maintenance instructions). 10. Spring Failure
Spring failure - check and replace - order new from factory. Follow maintenance instructions. 11. Product or Volume Variation
Product or volume variation - possibly incurable - customer to decide and correct if practical. 12. Loose or Broken Cover
Loose or broken cover - if broken cover, order new and tighten screws. All models have cover gaskets. 13. Broken Base or Other Casting
Broken base casting - check - return to factory for repairs. 14. Extreme Heat over 120°F
Extreme heat - ambient temperature exceeding 120°F (50°C). 15. Rubber covered Anvil or Impact Pads Worn
Rubber covered anvil or impact pads worn - install replacement anvil or pads - (see maintenance instructions). |
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