

# Vibrating Tables For Industry

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1. CONTROLS FOR TABLES
2. FLAT TOP TABLES
3. GRID TOP TABLES
4. PLATFORM TABLES
5. TEST TABLES

## INSTALLATION

Floor or foundation (especially with grid top tables) where table is to be installed, should be level. Make sure that, in relation to the roller conveyor, it is placed so that the grid top can move freely up and down inside frame and between rollers.

Drill holes for floor bolts through foot pads and fasten in regular manner. Use expansion bolts or grouted-in anchor bolts.

## GENERAL

After table has been placed in it's position, hook up vibrator to power source (either electric or pneumatic). Always make sure the electric vibrator has an overload protection with an on-off switch in the line, and the pneumatic units a shut-off valve.

NOTE: If two vibrators are used on the table, one must turn clockwise and the other, counter-clockwise (remove end covers to be sure of the rotation). To change rotation on 3 phase electric units, interchange black and white lead wires in plug or conduit box. For single phase capacitor start units, interchange wires #5 and #8 in conduit box. For brush type motors and pneumatic ones, remove the one unit and turn it 180°.

## VIBRATOR FORCE

For packing or settling materials, an impact force (centrifugal force) of 1.2 to 2 times larger than the weight of table and material with container is needed.

If the impact force is too great the electric vibrator will start to increase it's amperage draw. Make sure it does not exceed the maximum amperage stamped on the nameplate. If it does, change the force setting on the vibrator (see Change of Impact in service instructions) until amperage draw is below nameplate data.

If the load on the table is high, 1,000 lbs. or more, do not start vibrators until table load is at least 1/3 of total load. If vibrators are started with no load on table, they will draw an excess amount of amperage and the amplitude might be too violent for the shock absorbers which might damage them.

# Vibrating Tables For Industry

## SHOCK ABSORBERS

1. Solid Rubber
2. Inflatable Rubber Donuts

The solid rubber shocks will give 80% to 95% vibration isolation. They are selected according to vibration frequency and table load. If load exceeds the load rating on the shocks, an excess amount of vibration will be transmitted through the shocks into the table stand and floor. The shocks will also fail prematurely. If too small a load is put on the table (especially when total load is over 1,000 lbs.) the amplitude of the shocks will be so large it might start to tear the shocks apart.

The standard #16 inflatable rubber donuts will each take a load variation from 0 to 840 lbs. and still have 100% isolation. This is achieved by changing their air pressure.

## RECOMMENDED AIR PRESSURE

A pressure of 15 psi is generally suitable for most installations. However, the isolation factor of the mounts depends on load and speed of vibrator. Some experimental filling at various pressures may be necessary to determine the best suspension for your particular application. **CAUTION: DO NOT OPERATE TABLE WHEN MOUNTS ARE COMPLETELY WITHOUT AIR. ALSO, DO NOT EXCEED 100 PSI.**

## LEVELING AND HEIGHT CONTROL

With auxiliary valving, the airmount isolators can be regulated by servosystems to control platform heights within .001 of an inch and a surface can be held level to less than 10 seconds of arc. When precise leveling is not essential, the units can be individually inflated to a desired height, or pressure regulators operating on factory air can be employed.

## SPEED CONTROLS

Three different kinds of speed controls used:

1. Rheostat or electronic speed controls for the US and SPR line of vibrators. **NOTE:** For SPR-40, 60 and 80, turn speed control to full voltage to start unit, then turn speed control to desired setting and speed.
2. The SCR line of vibrators use a solid state full wave rectifier and power control for adjusting the speed (see service instructions for SCR).
3. Frequency inverters are used on 3 phase 220 volt heavy duty 2P, 4P, 6P and 8P vibrators. Special instructions are supplied when ordering these. Generally the double, or half of the normal speed of the unit is obtainable. For example, a 4P and 1800 rpm unit can be speed adjustable between 1800 to 3600 or 1800 to 0 rpm. For continuous duty operation, keep speed within 30% of normal unit speed. Above this or below this, operate unit intermittently.

# Vibrating Tables For Industry

## #16 AIRMOUNT ISOLATOR AIRSPRINGS

Airmount Airsprings should be inflated for the proper load, which can be calculated using the following equation:

$$L = \frac{W_T + W_L}{N}$$

where: L = Load per airmount  
W<sub>T</sub> = Weight of table top, including vibrator(s)  
W<sub>L</sub> = Weight of load on table  
N = Number of airmounts

Example:

A 2000 lb. load on a table top weighing 350 lb., using two (2) 4P-2000 vibrators (weighing 98 lb. each), and using four (4) airmounts.

$$L = \frac{548 + 2000}{4} = 637 \text{ lb.}$$

The proper air pressure for each airmount can be obtained from the graphs or charts on the following pages. From the above example, the pressure for each airmount under a 637 lb. load is about 50 psi.

At the proper pressure, the airmounts will provide 98 - 99% isolation. If more isolation is desired, isolator pads can be placed beneath the tables feet.

All airmounts in the system should be inflated and maintained at the same pressure, and periodically checked. The airmounts will loose pressure over a period of time (like an automobile tire) If an airmount seems to be loosing air too quickly, automotive Fix a flat products will usually remedy it.

### REGULATED SYSTEM

All of the airmounts in the system are piped together to a single fill point. Connect the plants compressed air supply through a pressure regulator to the fill port, and set the regulator to the desired pressure. The regulator will maintain the proper air pressure to the airmounts. \*

### TANK VALVE SYSTEM

A tank valve is installed in each airmount port. To inflate airmounts, use a standard air chuck. Use a tire gauge or similar to check the air pressure. Make sure that every airmount is at the same pressure, and arrange for periodic pressure checks and re-inflation of the airmounts as required.

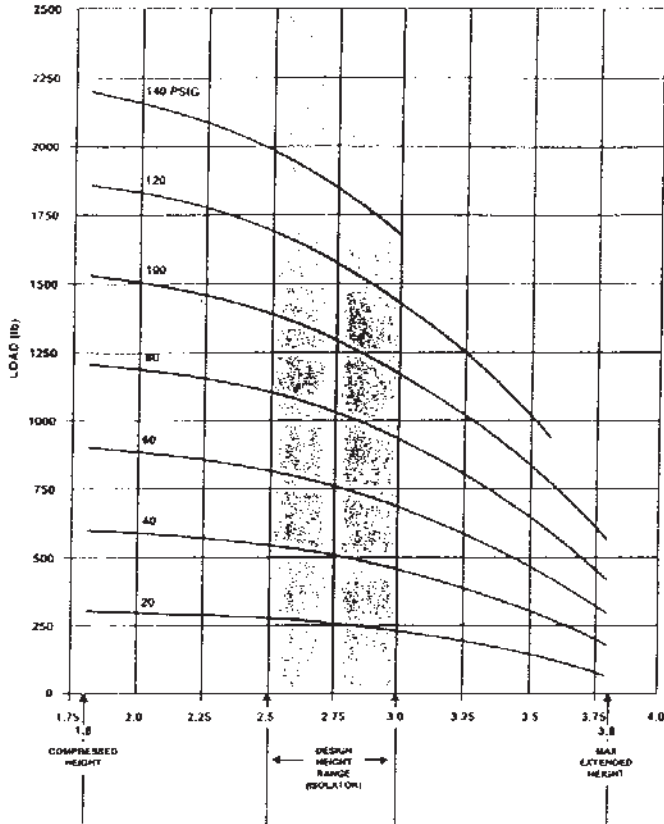
### SINGLE PORT TANK VALVE SYSTEM

All of the airmounts in the system are piped together to a single fill point, and a tank valve is installed in the fill port. To inflate airmounts, use a standard air chuck. Use a tire gauge or similar to check the air pressure. Make sure to arrange for periodic pressure checks and re-inflation of the airmounts as required. \*

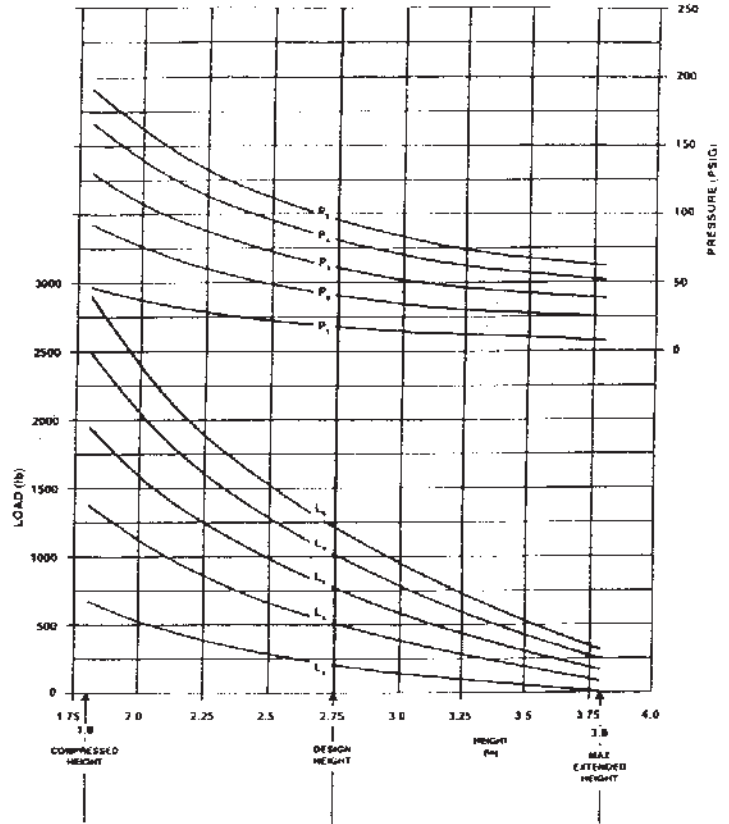
\* NOTE: On single fill port systems, an uneven load can cause the table top to tip off level. If the loads are extremely uneven, the tank valve system should be used.

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LOAD vs. DEFLECTION @ CONSTANT PRESSURE



DYNAMIC DATA AT 2.75 in DESIGN HEIGHT



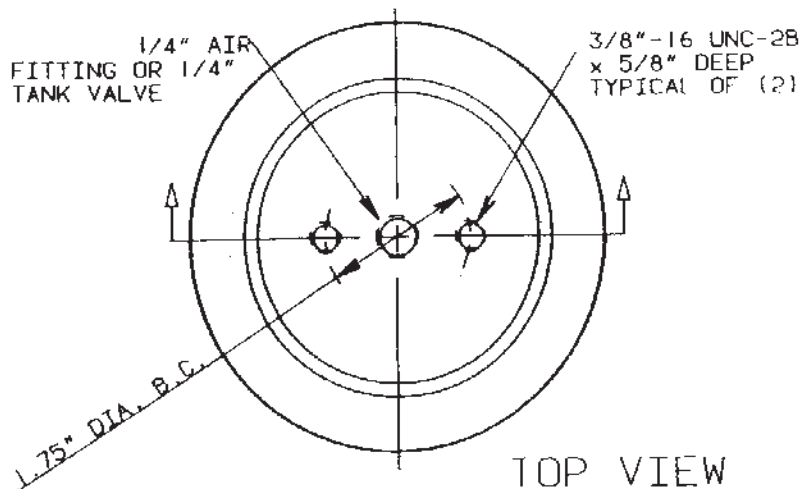
CONSTANT PRESSURE CHARACTERISTICS

Assembly Height (in)	Volume @ 100 PSIG (in <sup>3</sup> )	Force (lb)				
		@ 20 PSIG	40 PSIG	@ 60 PSIG	@ 80 PSIG	@ 100 PSIG
3.8	51	65	175	290	425	570
3.5	48	95	305	470	650	840
3.0	41	220	450	680	920	1170
2.75	37	250	500	755	1020	1290
2.5	33	265	540	800	1095	1370
2.0	26	290	585	880	1190	1500
1.8	24	300	595	900	1210	1525

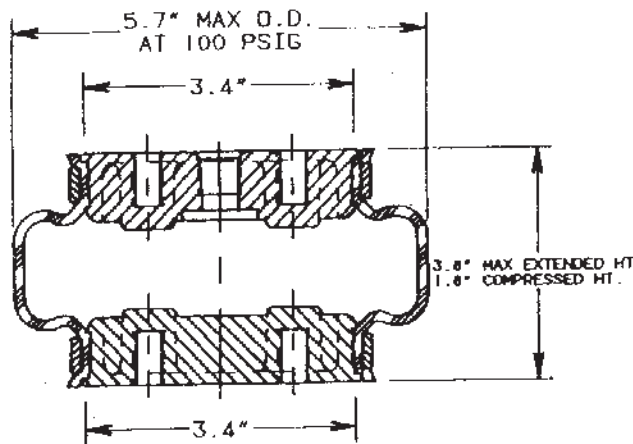
DYNAMIC CHARACTERISTICS

Design Height (in)	Load (lb)	Pressure (PSIG)	Spring Rate (lb/in)	Natural Frequency	
				cpm	Hz
3.0	200	18	275	223	3.71
	500	44	546	195	3.25
	750	64	752	188	3.14
	1000	86	968	184	3.07
	1200	102	1128	182	3.04
2.75	200	16	273	220	3.67
	500	41	533	193	3.22
	750	60	743	186	3.11
	1000	80	948	182	3.04
	1200	94	1095	180	3.00
2.5	200	15	297	228	3.80
	500	37	552	198	3.31
	750	55	765	190	3.16
	1000	74	974	185	3.08
	1200	89	1138	182	3.04

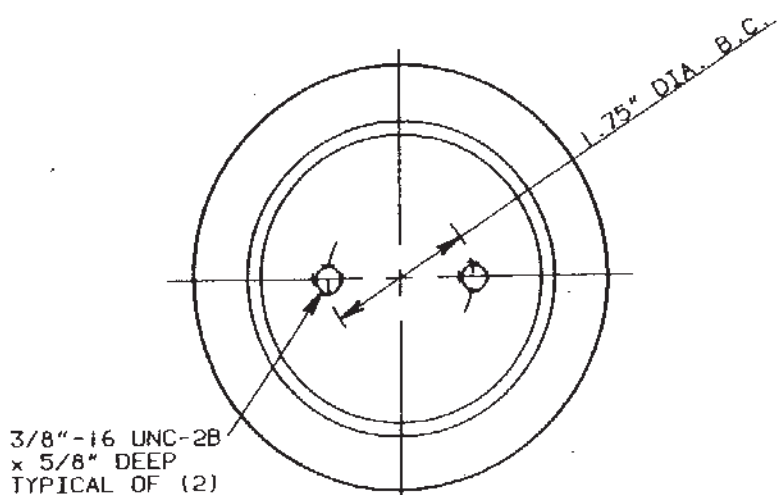
# Vibrating Tables For Industry



TOP VIEW



SIDE VIEW



BOTTOM VIEW

ELASTOMER	AIR FITTING	BUMPER INCLUDED
WINGPRENE	1/4"-18 NPTF	NO

### SPRING FEATURES:

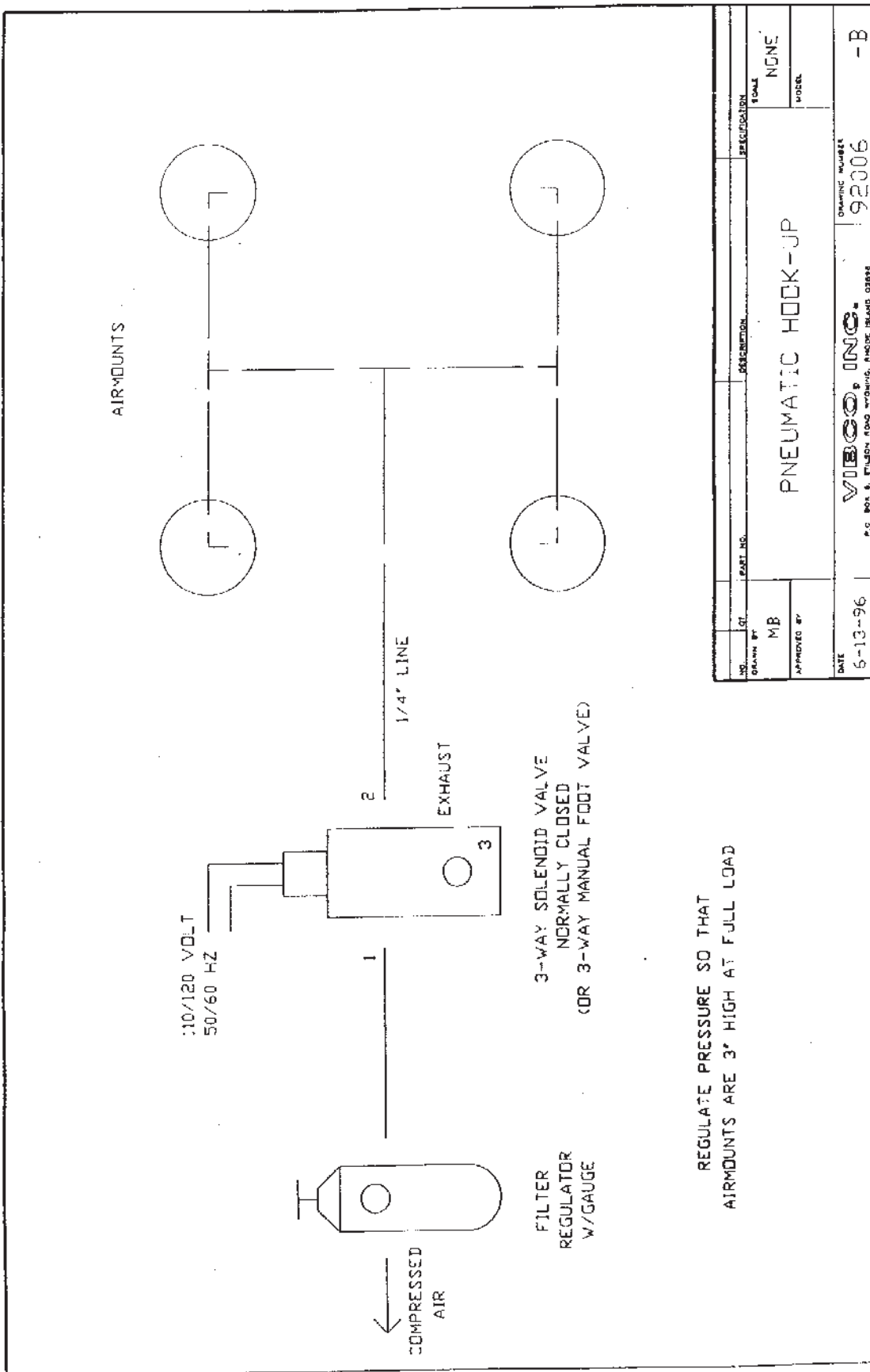
- LOAD RANGE (ISOLATOR).....220-1370 lb
- DESIGN HEIGHT RANGE (ISOLATOR).....2.5-3.0 in
- USEABLE STROKE (ACTUATOR).....2.0 in
- ASSEMBLY WEIGHT.....1.0 lb
- TEMPERATURE RANGE.....-40° TO 210°F
- FORCE TO COMPRESS AT 0 PSIG (APPROX.).....9 lb
- NOMINAL FREE STANDING HT. AT 0 PSIG.....2.5 in

\* NOTE: PRODUCT LIFE MAY BE SHORTENED WHEN OPERATING AT OR NEAR EXTREME TEMPERATURES.

### RECOMMENDED MAX. TORQUE VALUES

3/8"-16 UNC BLIND TAP TYP. OF (4)	1/4"-18 UNC AIR FITTING	3/4"-14 UNC AIR FITTING
240 in-lb 20 ft-lb	240 in-lb 20 ft-lb	240 in-lb 20 ft-lb

# Vibrating Tables For Industry



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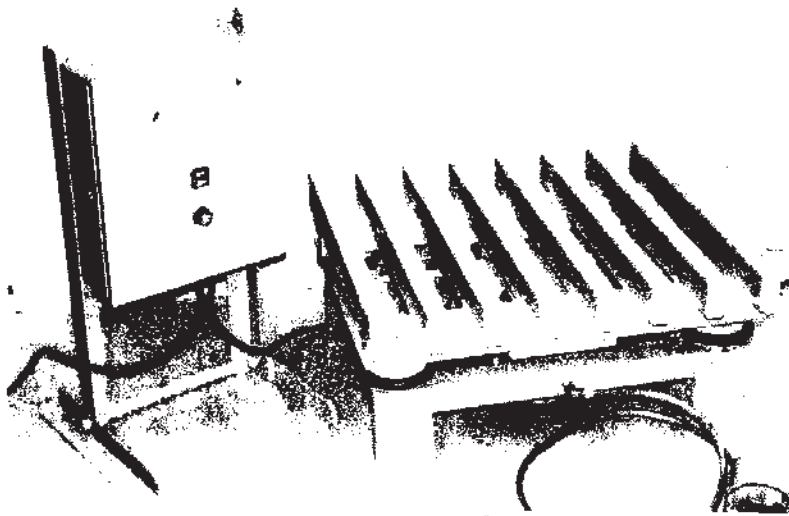
## Controls for Vibrating Tables

Manual or Automatic controls are used to cycle the operation of vibrators. They can be of the simple push-button type, with one "START" and one "STOP" button, or sophisticated fully automatic systems actuated by an impulse from an "electric eye", limit switch or similar device.

For electric motor vibrators the most commonly used

control is a manual motor starter with thermal OL protection. Where remote control is required an electromagnetic starter, with one or more push-button stations, is used.

For some applications a timed vibration cycle is desirable, and in these cases VIBCO can recommend and provide timing devices to fit any particular specification.



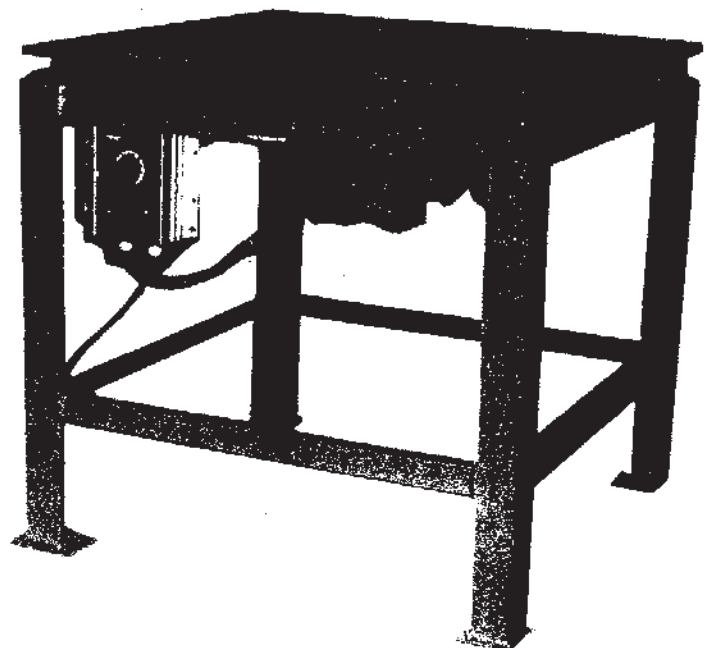
For compaction tables that must handle a variety of loads, from a few hundred lbs. to one ton or more, an adjustable frequency vibrator speed control is very valuable. It extends the working range of the table greatly. This speed control system accepts standard line voltage and converts it to variable voltage DC. The DC output is then supplied to a 3-phase inverter which delivers adjustable frequency AC to the vibrator. In this manner a 4 pole 1800 RPM vibrator can be operated over a speed range from 0 to 3600 RPM.

VIBCO will be pleased to recommend and quote on the proper speed control for your particular compaction table.

## Flat Top Tables

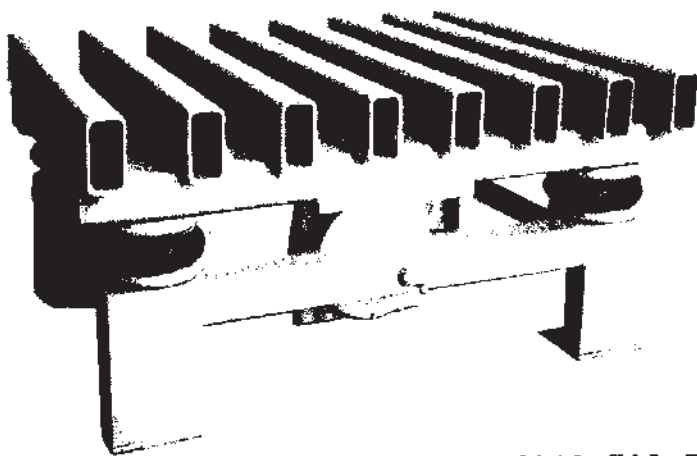
- **HEAVY DUTY**
- **VERSATILE**
- **ECONOMICAL**
- **"AIRMOUNT"**
- **SPRING or ELASTOMER SUPPORTED**

VIBCO's vibratory flat top tables offer a fast, efficient and economical method for compacting a wide variety of materials — powdery, granular or flaky — in boxes, drums or cartons. They are versatile and widely used for industrial applications to package, shock and fatigue test and for densifying refractory blocks, concrete products. They can also be used as shakeouts for some foundry flasks.



# Vibrating Tables For Industry

## Grid Top Tables **To fit in with existing roller conveyor**



### **VIBCO'S GRID TOP TABLES are LIGHTER and STRONGER**

Used in conjunction with roller conveyors for: Compaction of NO-BAKE sand in foundry flasks, casting concrete products, settling granular, flaky or powdery materials in shipping containers, etc. Sizes to fit your particular need will be quoted upon request.

#### GRID TOP TABLES

#### AIR SUPPLY

All grid top tables are supplied with inflatable rubber shock isolator donuts. A 3-way foot valve with a 5' length of 3/8" heavy duty air hose is supplied with the table. Air supply to foot valve is by the customer, and should have a pressure regulator as close as possible to the table. Required pressure is 10 to 35 psi, depending on the load.

#### ADJUSTMENT OF LIMIT SWITCH (IF USED)

The operating arm on the limit switch should be locked on the switch shaft in a position to close the circuit when load is lifted well off conveyor rollers. If maximum load to be vibrated is changed, the operating arm may have to be re-adjusted.

#### OPERATING INSTRUCTIONS

1. An empty container, drum or mold box, is rolled into position over vibrating table.
2. Start filling and when drum or container is about 1/2 to 2/3 full, step on foot valve to inflate airmounts. Foot valve has a latching device that will keep table top elevated until latch is released. Start vibrators.
3. If table has a limit switch, when top elevates, the vibrator will start as soon as load leaves the top of conveyor rollers. Allow vibrator to run until desired compaction is achieved. Stop vibrators, lower load and continue filling process.
4. Release foot valve latch, which will deflate airmounts and set filled drum or container on conveyor rollers ready to be rolled away.

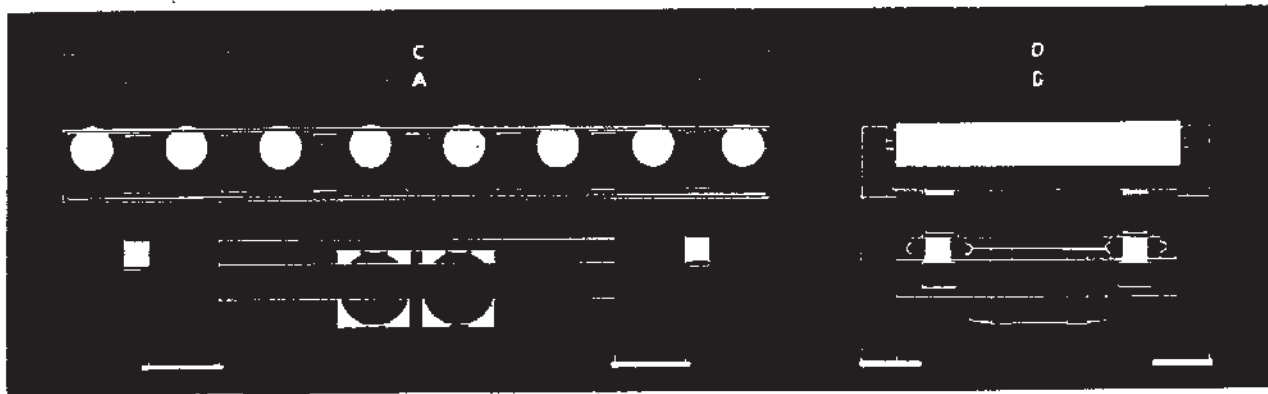


# Vibrating Tables For Industry

## VIBCO Compaction Table Features:

You can select yours from the standard sizes shown on the chart. Custom sizes are also available.

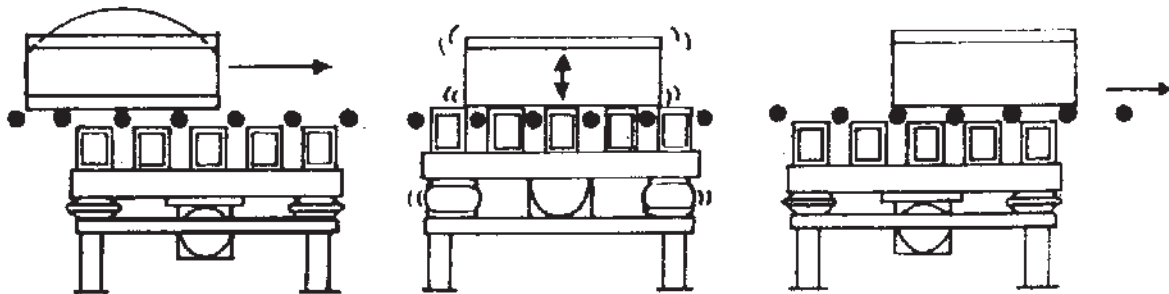
- Includes U.S. built VIBCO Heavy Duty Electric Motor Vibrators for vertical linear vibration.
- Standard vibrators offer adjustable force within a preset frequency. Variable force/speed control is an option.
- Includes Firestone AIRMOUNTS® for lifting mold boxes off the roller conveyor during vibration cycle.
- Heavy duty roller conveyors take any load.



MODEL	HT. to TOP of ROLLERS*	LOAD CAPACITY	O.A. DIMENSIONS, INCHES			
			A	B	C	D
FGT2534	20"	2500 lbs.	34"	25"	44"	29"
FGT3642	20"	2500 lbs.	42"	36"	52"	37"
FGT2550	20"	1-3 tons	50"	25"	60"	29"
FGT3670	20"	1-3 tons	74"	36"	84"	37"
FGT36106	20"	1-5 tons	106"	36"	116"	37"

\*Rollers are 2½" in diameter

Space between rollers is 8 inches, center to center.



VIBCO'S Grid Top Tables incorporate the latest design features. They are functional and sturdy. Installed at the filling station on an in-line conveyor system, the mold or container is rolled into position over the grid while in low position. As the grid is being raised, filling begins and the vibrator is started. After mold or container is filled and densified, air mounts are deflated, placing the load on the

conveyor where it is rolled forward and the next one is moved into filling position.

Although these tables are of a standard shape and size, they can easily be adapted to fit your particular purpose. Vibrators of different frequencies and force output to match any job.

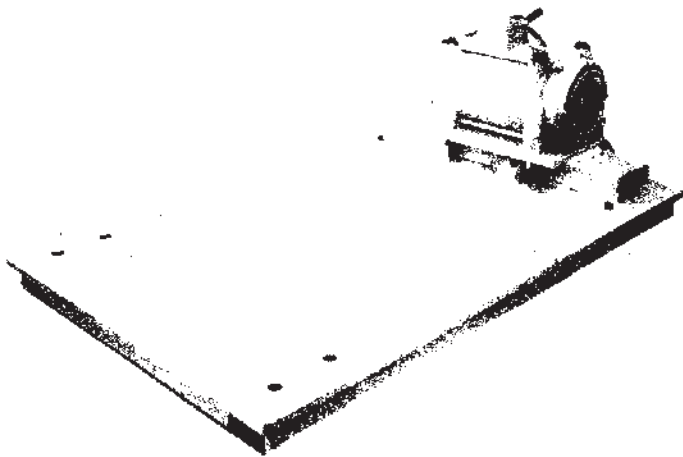
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## Platform Table

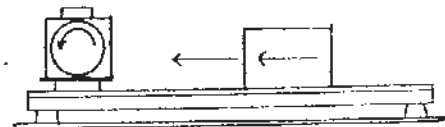
Platform Tables for up to 1,000 lbs. weight have a low working surface of 3" from floor; four larger weight inflatable rubber donuts are used and the working surface is 6" off the floor. The inflatable rubber donuts are easily accessible from the top of the table. The air valves are the same as on a car or bicycle and can be inflated with a bicycle pump. For 500-100 lbs. 20 VSF 1000-2000 lbs. 40 PSI. Adjust the air pressure to the point where no vibration is transmitted to the floor.

The platform table can be used under filling machines, for packing drums, barrels, gay-lords, etc. The low profile eliminates the need for raising machinery or breaking into the floor and makes loading and unloading easier.

For single vibrator tables it is important the rotation of the vibrator is as shown below or barrel or carton will vibrate off the platform.

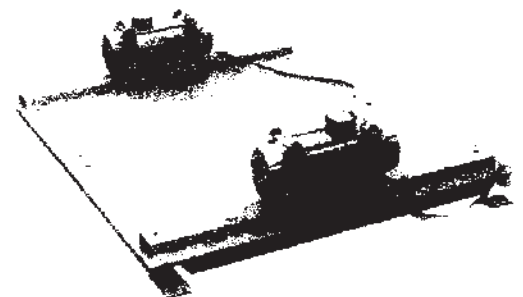


ROTATION OF VIBRATOR MUST BE  
AS SHOWN OTHERWISE BARREL OR  
CARTON WILL VIBRATE OFF.



For dual vibrator tables it is important to have one vibrator turn clockwise and the other counter-clockwise or the product to be vibrated will not pack to capacity and crate, box, etc., will have a tendency to vibrate off the platform.

To change rotation electrically, see Electric Service Instructions; mechanically, turn one vibrator 180°.



**BULK SHIPPING BAG COMPACTOR**

# Vibrating Tables For Industry

## TEST TABLES

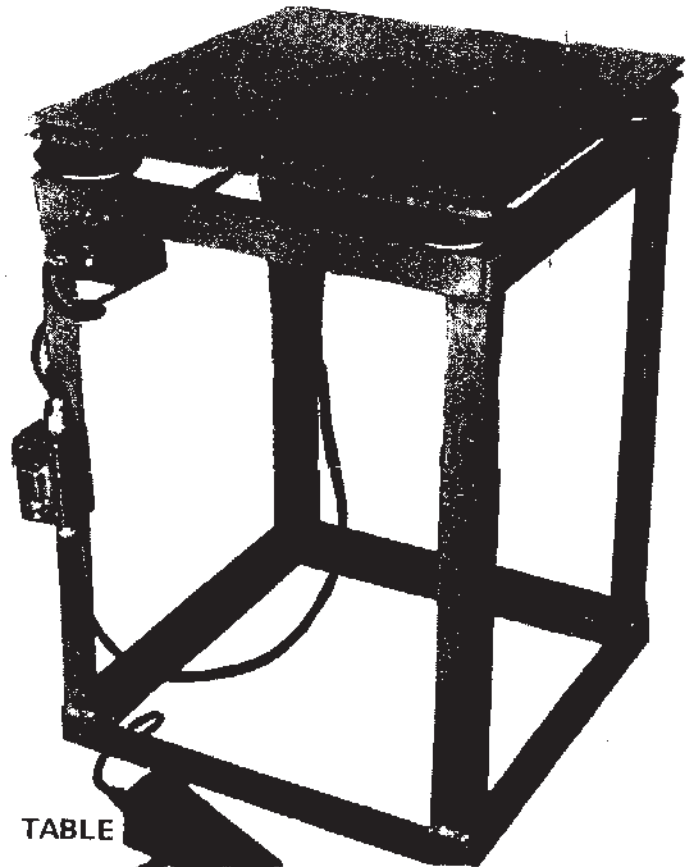
- Simulate Handling & Transportation Shocks
- Verify Integrity of Electric Circuits
- Removes Dangerous Residue
- Detect Marginal Connections
- Stop Costly Field Service Calls
- Handles Both Sub-Assemblies & Complete Chassis
- Safe! No Harm to Sensitive Circuits
- Inexpensive Full Range Control

Vibco's test tables result in savings on manufacturing costs, increased product reliability and greater customer confidence by detecting future failures right in your own plant, prior to shipment. Defective electrical components and connections fail under the induced vibration, helping you to quickly identify the problems. This eliminates embarrassing and costly repair and difficult tracing of circuits in the field. The simulation of transportation and handling shocks, on the Vibco test table give the added advantage of showing up the defective solder joints, marginal connections and faulty components.

Forces generated will not, however, effect components of sound integrity. The vibration also removes potentially harmful residue such as pigtail clippings, solder splashes and other debris lodged in the chassis. Vibco's test tables are also extensively used in fatigue testing of many, varied electronic and space industry products, including: radios, TVs, military hardware, lights, computers, etc.

### LIVE TABLE TOP

Exclusive Vibco design assures full and even vibration in all areas of the table top, guaranteeing the desired frequency and amplitude in every square inch. This enables the quality control station to utilize the full potential of the available working area. Quality Control can now standardize test procedures now that consistency of testing and reliability of results is assured. Vibco's wide choice of variable frequency and constant frequency equipment gives you the ultimate in low cost product liability testing.



TABLE

MODEL US-RD, (24"x24"x36"high)  
(pictured above)

Same as US-SA but with inflatable air mount vibration isolators, giving you additional amplitude control and adjustment for varying loads. Vibration isolation is 100%.

MODEL US-SA, (24"x24"x36"high)

This is the most inexpensive test table available. Consists of: VIBCO's popular US-900 high frequency (9,000 vpm) vibrator with speed adjuster and foot on-off switch. Rubber shocks between "Live Top" deck and stand isolate up to 97% of vibration from legs.

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Most US-SA or US-RD tables are used for verifying integrity of electric circuits, simulating handling and transportation shocks, detecting marginal connections, and removing residue. The vibration time varies from part to part, from a few seconds of vibration to a minute or so.

VIBCO's test tables result in savings on manufacturing costs, increased product reliability and greater customer confidence by detecting future failures right in your own plant, prior to shipment. Defective electrical components and connections fail under the induced vibration, helping you to quickly identify the problems. This eliminates embarrassing and costly repair and difficult tracing of circuits in the field. The simulation of transportation and handling shocks on the VIBCO test table give the added advantage of showing up defective solder joints, marginal connections and faulty components.

Forces generated will not, however, affect components of sound integrity. The vibration also removes potentially harmful residue such as pigtail clippings, solder splashes and other debris lodged in the chassis. VIBCO's test tables are also extensively used in fatigue testing of many varied electronic and space industry products, including radios, TV's, military hardware, lights, computers, etc.

## SUGGESTED TEST PROCEDURE FOR OVER-THE-ROAD TRANSPORT

Depending on the item, over-the-road transport testing is mostly done at 30 hz and at 2.2 to 5 g. We have built several test tables for testing apparatus for the Government and Armed Forces when the request has been 2.2 g. Equipment for automobiles, batteries, etc., are normally tested at 5 g, 30 hz and 2 hours.

Setting up a test program for a particular item for over-the-road transport is normally done as follows.

When desired "g" force has been decided, 2.2 g or 5 g, and the test equipment is theoretically set up to deliver this "g" force, put test model on the table and start the test. Check model every 5 minutes until the first part in the unit breaks. Replace the broken part and continue testing until the next part breaks, repeating this until most or all parts are broken.

By replacing the broken parts as testing continues, you will get a good idea of the variance in quality of this item or if these items break after the same test time, you have to decide either to live with this failure, get another make, or redesign, etc.

By completing a destruction test on one unit, you will not only get to know which pieces are breaking and in which sequence, but also which ones and how many of these items to keep in field service or maintenance stock.

You can, by vibration testing, estimate the time the unit will be in the field before maintenance is necessary. You can also design the unit to last a predetermined length of time. For example, if you have several units in the field and found one piece breaks in three months,

# Vibrating Tables For Industry

you can go back to your destruction test and find out how long this item lasted in your test. If it broke in one hour of testing, you can relate one hour of testing equals three months in the field. If you want the unit to hold up for one year, the unit then must hold up for four hours of testing. When you have changed the marginal parts for better ones, different makes, redesigned the unit, etc., and it holds up for four hours of testing, you can then be reasonably certain it will last for at least one year in the field.

The table when received is ready to plug into your power supply. Fixtures, straps, etc., can be attached to the table top. Holes can be drilled and tapped into it for this purpose. DO NOT secure these bolts, etc., to the bottom plate.

Amplitude, G-value, and frequency can simply be determined by the following diagram.

Simple amplitude meters can be made following either of the two designs below.

Stick the amplitude drawing to the item to be measured. When the vibrator is started, the top and bottom line in the diagram will cross at one point. This point indicates the amplitude in inches.



The formula for amplitude is listed below.

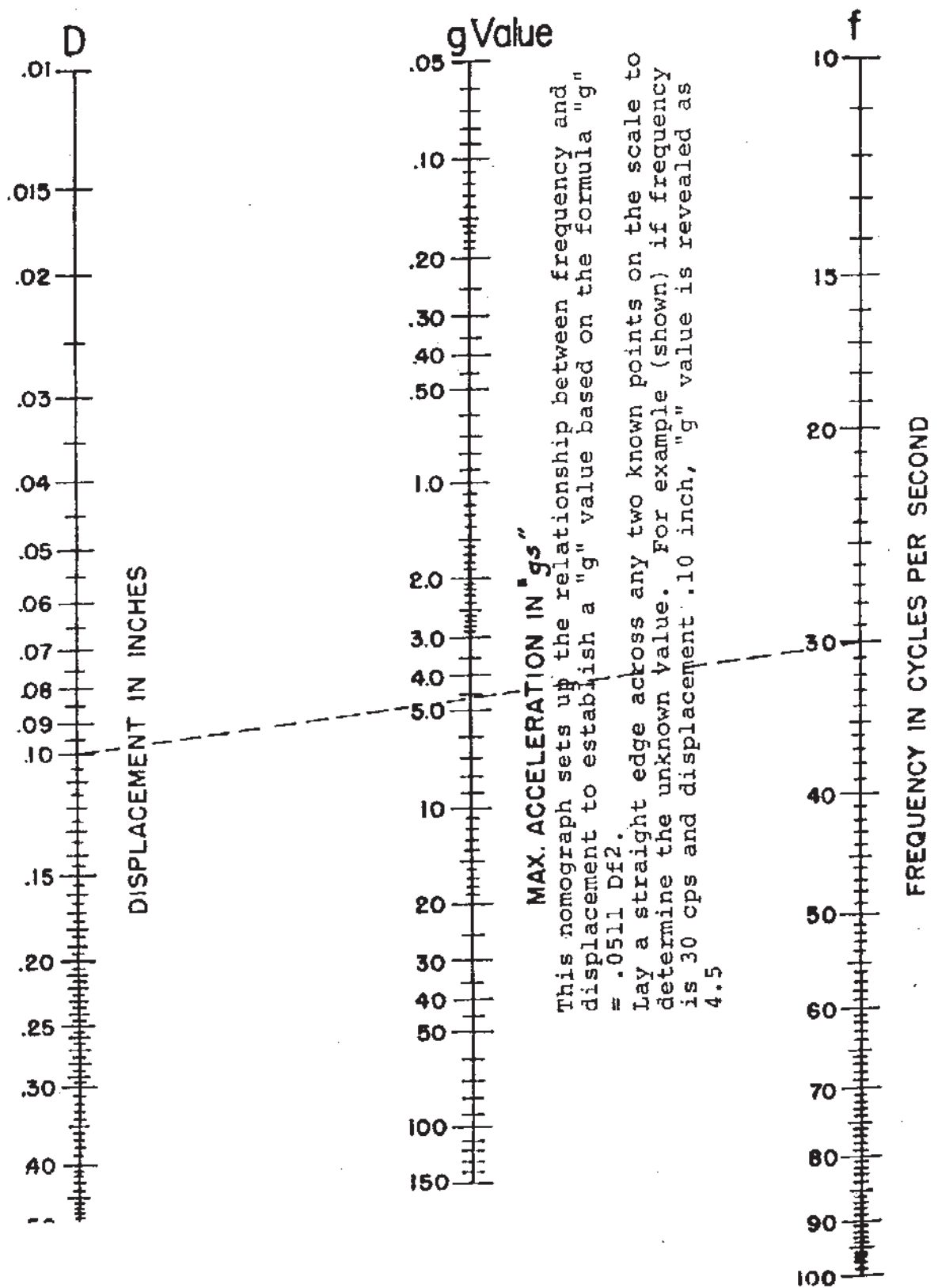
## VIBRATION FATIGUE TESTING

The following standard terms are used in vibration fatigue testing.

1. Frequency ( $f$ ) which is measured in cycles per second or vibrations per second.
2. Amplitude ( $r$ ), or deflection, is the radius from the axis of rotation to the outmost point the particle travels.
3. Displacement ( $d$ ), or excursion or stroke, which is double the amplitude.
4. Acceleration ( $a$ ). In almost all fatigue testing the acceleration is expressed in relation to the acceleration due to gravity or in "g's" which is 32.174 feet per second per second, 386.1 inches per second per second.
5. Angular velocity ( $w$ ), or radians per second.
6. Rotations per minute ( $n$ ).
7. Force ( $p$ ) in pounds.

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NOMOGRAPH FOR CALCULATION OF "g" FORCES, FREQUENCY, AMPLITUDE AND ACCELERATION, BASED ON SIMPLE HANMONIC MOTION



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For a rotating circular motion, the formula for it's acceleration is:

$$a = w^2 \times r \quad w = (2\pi \times f)^2 \quad f = \frac{n}{60} \quad a = r \left( \frac{2\pi \times n}{60} \right)^2$$

and expressed as a g value

$$g \text{ value} = \frac{a}{g} = \frac{r}{386.1} \left( \frac{2\pi \times n}{30} \right)^2 = 2.83 \times 10^{-5} \times r(n)^2 \quad (1)$$

The force (p) required to produce an acceleration of 1 g on a weight of m pounds is:

$$p = \frac{m}{g} \times a \quad \text{or expressed in g value} \quad p = m \times g \text{ value} \quad (2)$$

Consequently, to accelerate a weight with 2 g's, a force twice the weight is necessary; 3 g's, a force three times the weight is necessary and so on.

Let us take an example:

We want to vibrate 51 lbs. at 2 g's and 3000 rpm. What force is needed and what amplitude do we get.

From formula (2) we get  $p = 51 \times 2$   $p = 102$  lbs.

We get the amplitude from formula (1),  $2 = 2.83 \times 10^{-5} \times (3000)^2 \times r$   
 $r = .0078''$

The following chart gives the Volt-Frequency-Impact values for Model US-450, US-900, US-1600 and SCR-1000. NOTE: The chart is for an unloaded vibrator; the values will vary with the loads. We suggest you make up your own charts for your different loads and vibrators. This is easily done by the help of a rheostat and a frequency meter or a stroboscope or a vibration pickup.

To familiarize us with the chart, let us take an example.

We have a component weighing 16 lbs. which we want to test at 5g acceleration. What force is needed and what amplitude do we get.

We now must bring the weight of the table top and the vibrator into our calculations. Since the table top is 8 lbs. and the vibrator (US-450) is 16 lbs., the total weight is 24 lbs.

We use formula (2).  $40 \times 5 = 200$  lbs.

A 200 lb. centrifugal force or impact is needed. We now refer to the chart, and find that the frequency for a 200 lb. force is 6000 rpm, which is gotten by adjusting the rheostat to 80 volt.

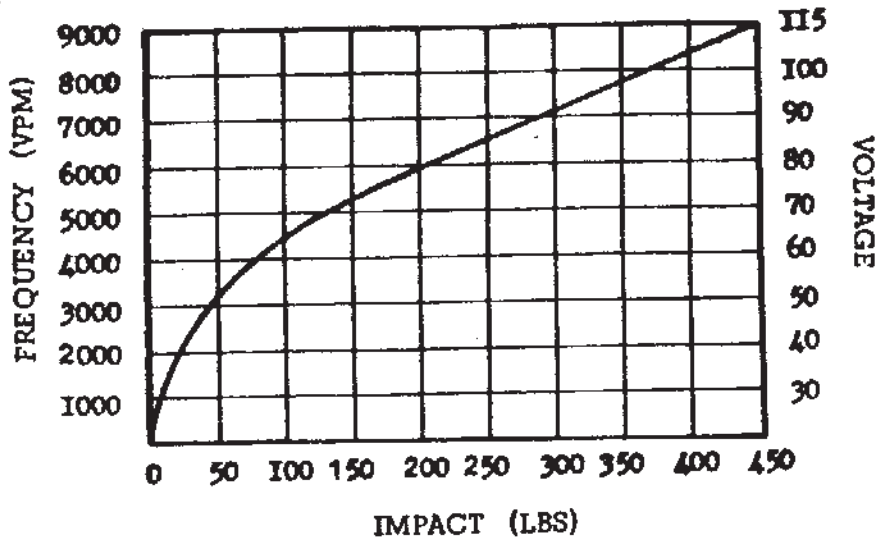
To select the best vibrator for your needs, calculate as follows.  
NOTE: Always use maximum values, since you can always go lower with frequencies and impacts.

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You know at what maximum g's you want your parts or components to be tested. Let us say the maximum is 10 g's, and the maximum weight of the part to be tested is 20 lbs. Estimate the table top (usually 1/4 - 3/8" plate is used) at 9 lbs., and the vibrators weight (let us try Model US-450) is 16 lbs. The total weight of part to be tested, the table top, and the vibrator is then 45 lbs.

Use formula (2).  $45 \times 10 = 450$  lbs. centrifugal force or impact is needed. We then select Model US-450, which will give 450 lbs. impact at 7500 rpm.

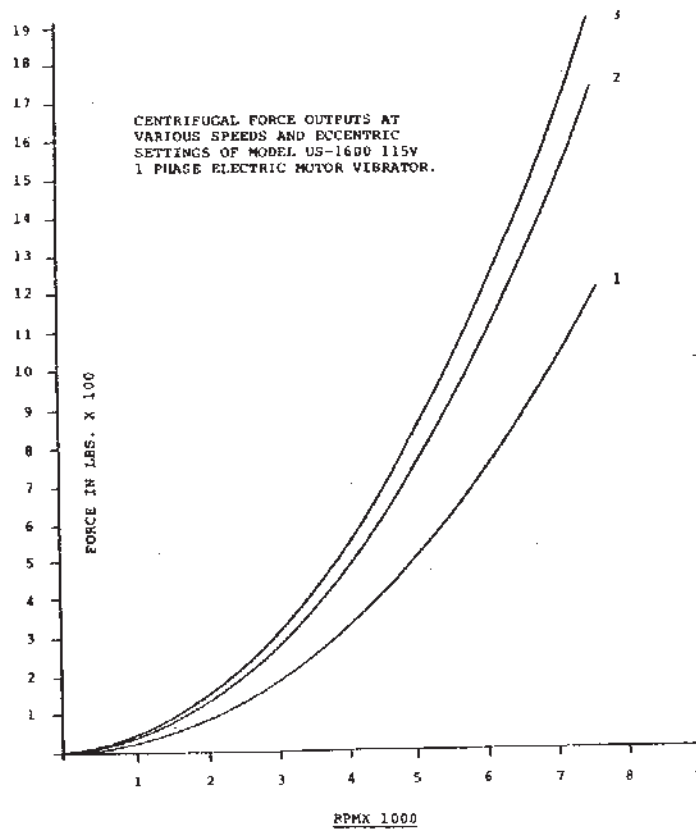
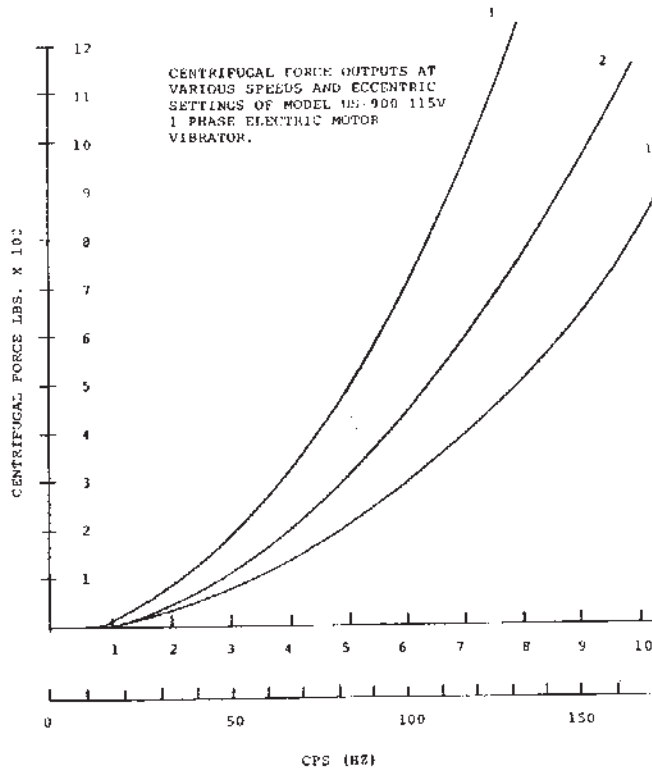
If you need any further information, assistance or help, feel free to contact our Engineering Department at any time. There is no charge or obligation for this service.



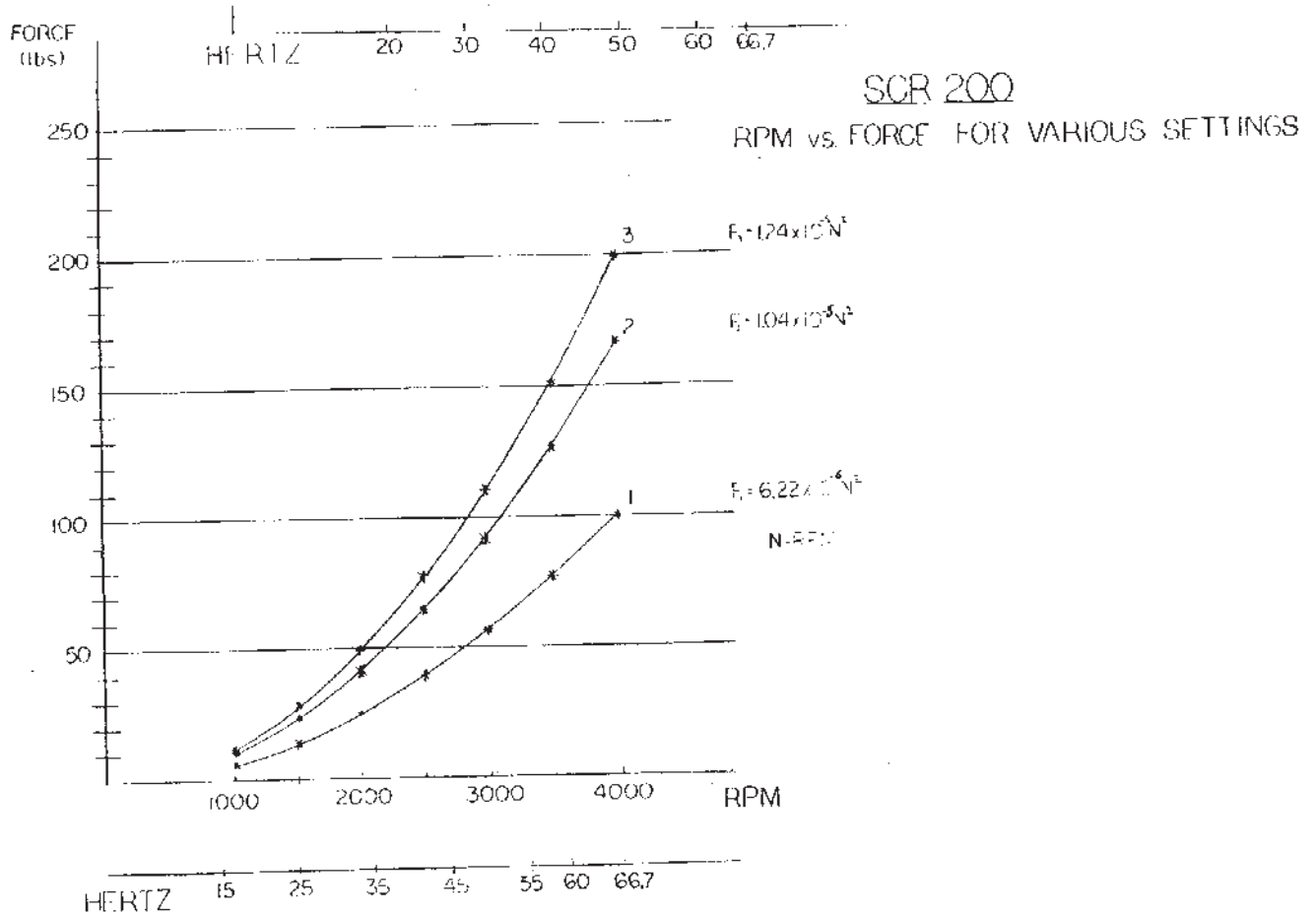
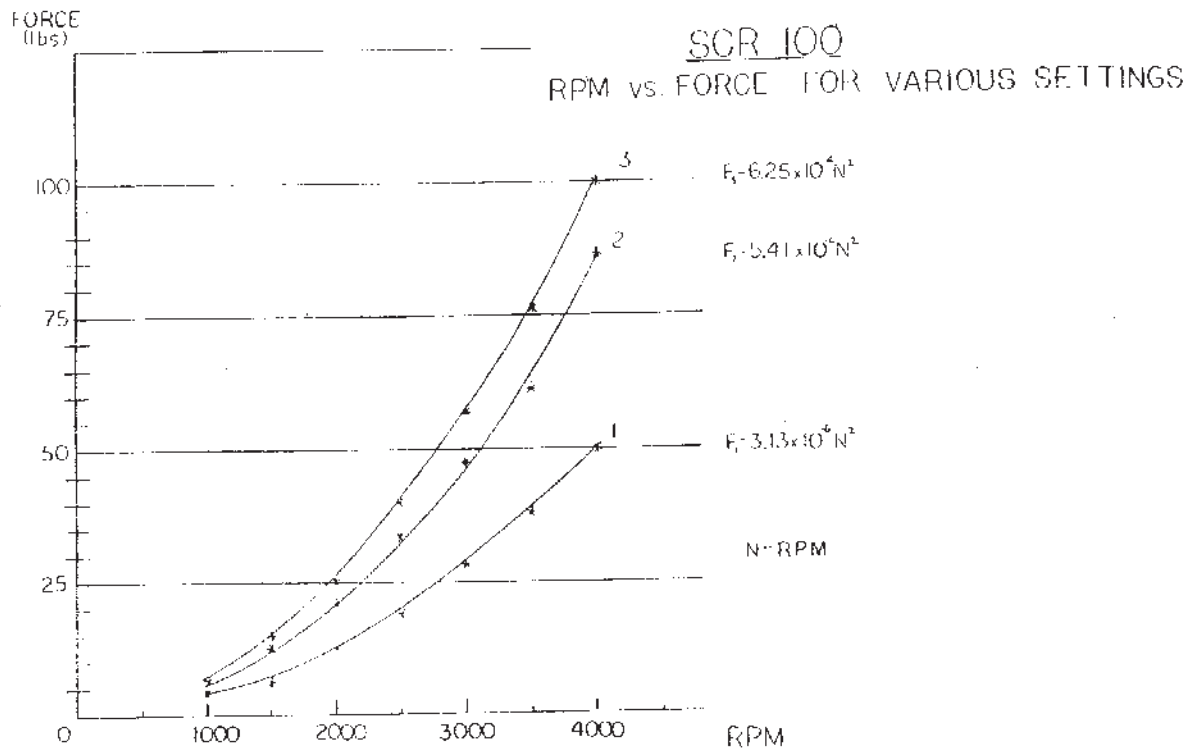
MODEL US-450



# Vibrating Tables For Industry



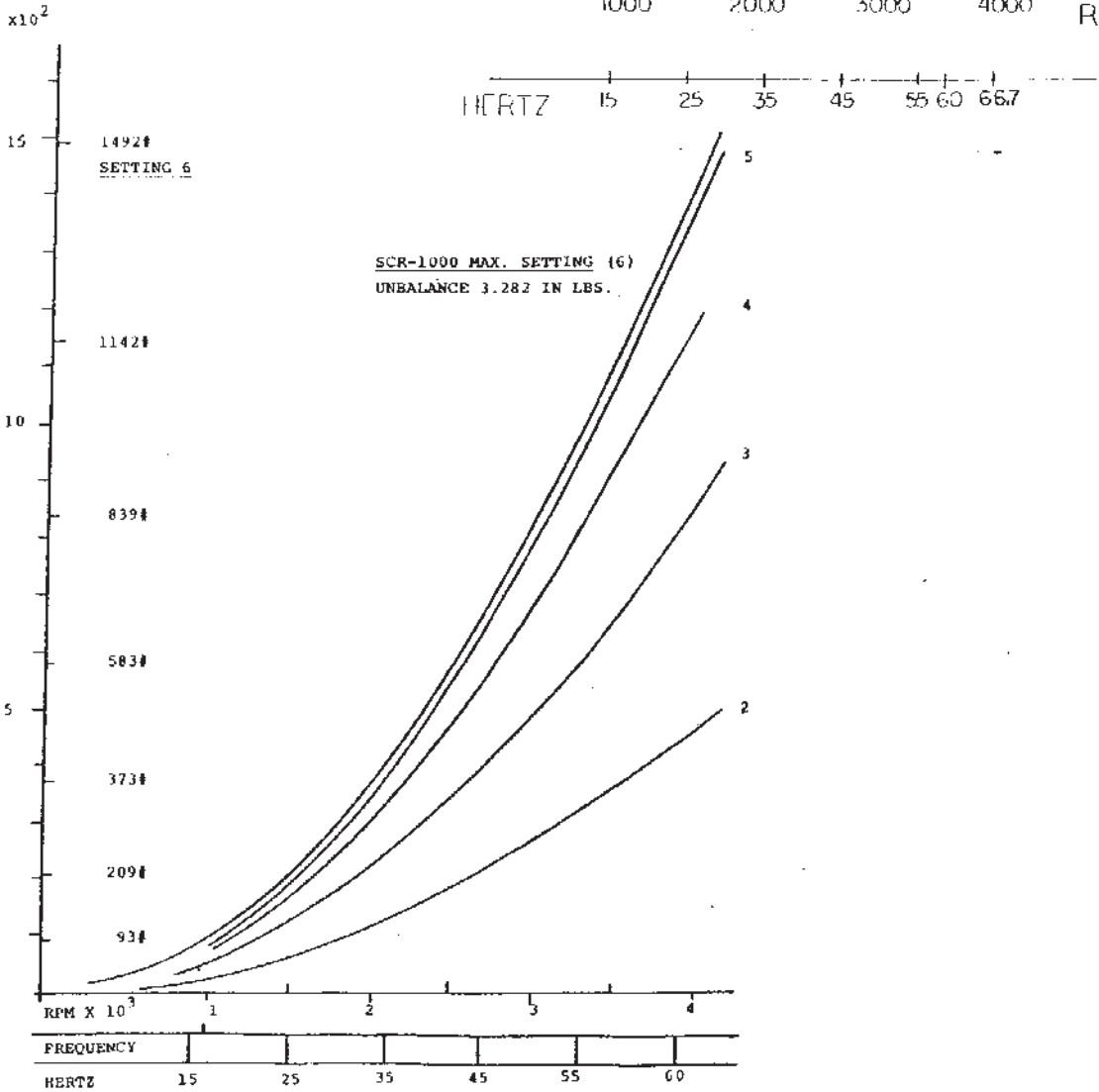
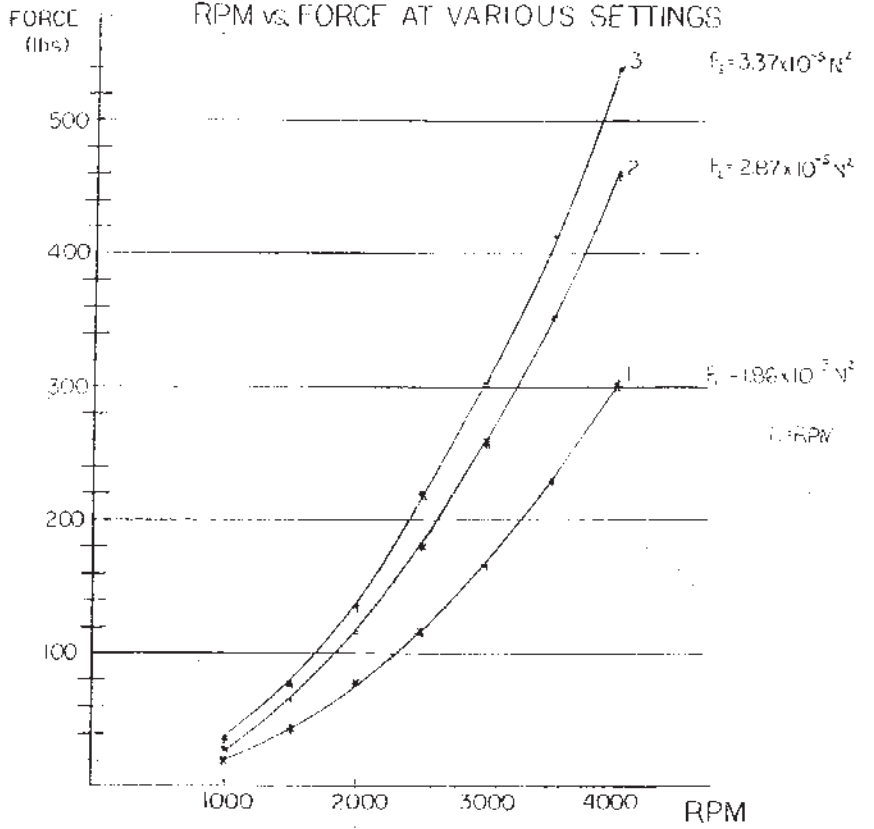
# Vibrating Tables For Industry



# Vibrating Tables For Industry

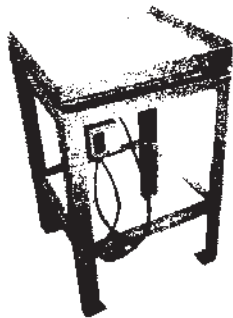
SCR 500

RPM vs FORCE AT VARIOUS SETTINGS

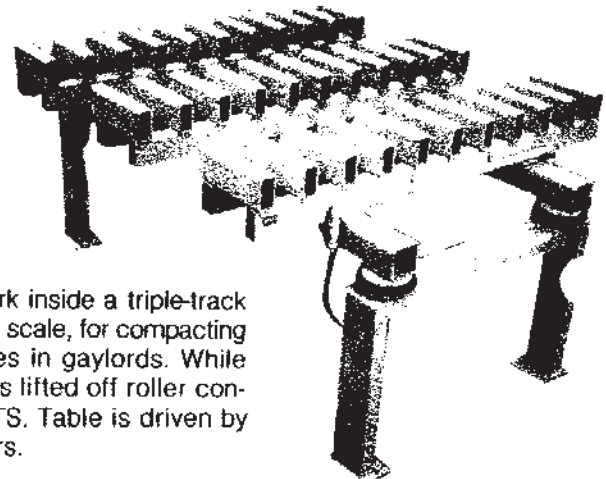


# Vibrating Tables For Industry

## SPECIAL PURPOSE TABLES Cont.



- SMALL PARTS
- SORTING TABLE



This table was designed to work inside a triple-track roller conveyor, and straddling a scale, for compacting 2000 lbs. of frozen cranberries in gaylords. While container is being vibrated it is lifted off roller conveyor by inflating AIR-MOUNTS. Table is driven by 2 Model 4-P-1400 3 ph vibrators.



FT 18" x 18" x 44" table with a variable high frequency vibrator for the making of molds for precision castings used in orthopedic surgery, such as hip joints, etc. Height was determined by a stationary microscope under which the work was done.



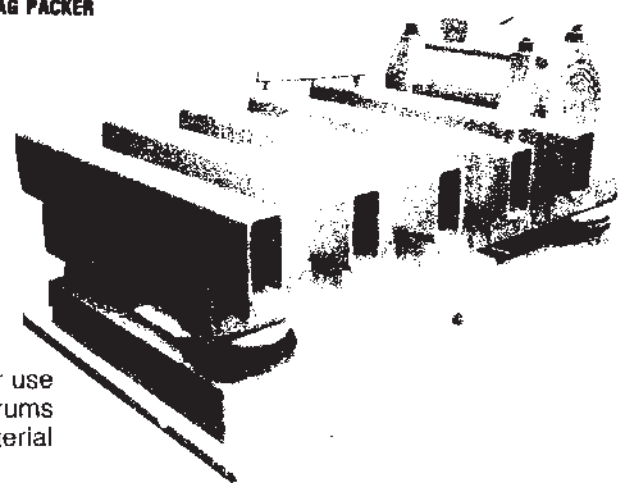
- FERTILIZER
- BAG PACKER



- 8" DUAL TABLE FOR
- MARBLE SINK TOPS



- TABLE FOR 5 TON
- CONCRETE FORM



A.26" x 30" x 12" one-ended grid top table for use at the end of a roller conveyor line. 55 gallon drums on the table are filled with a granular material densified by the Model 4P-1400.



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