



# VIBRATION SOLUTIONS

ENHANCING THE FLOW OF MATERIAL

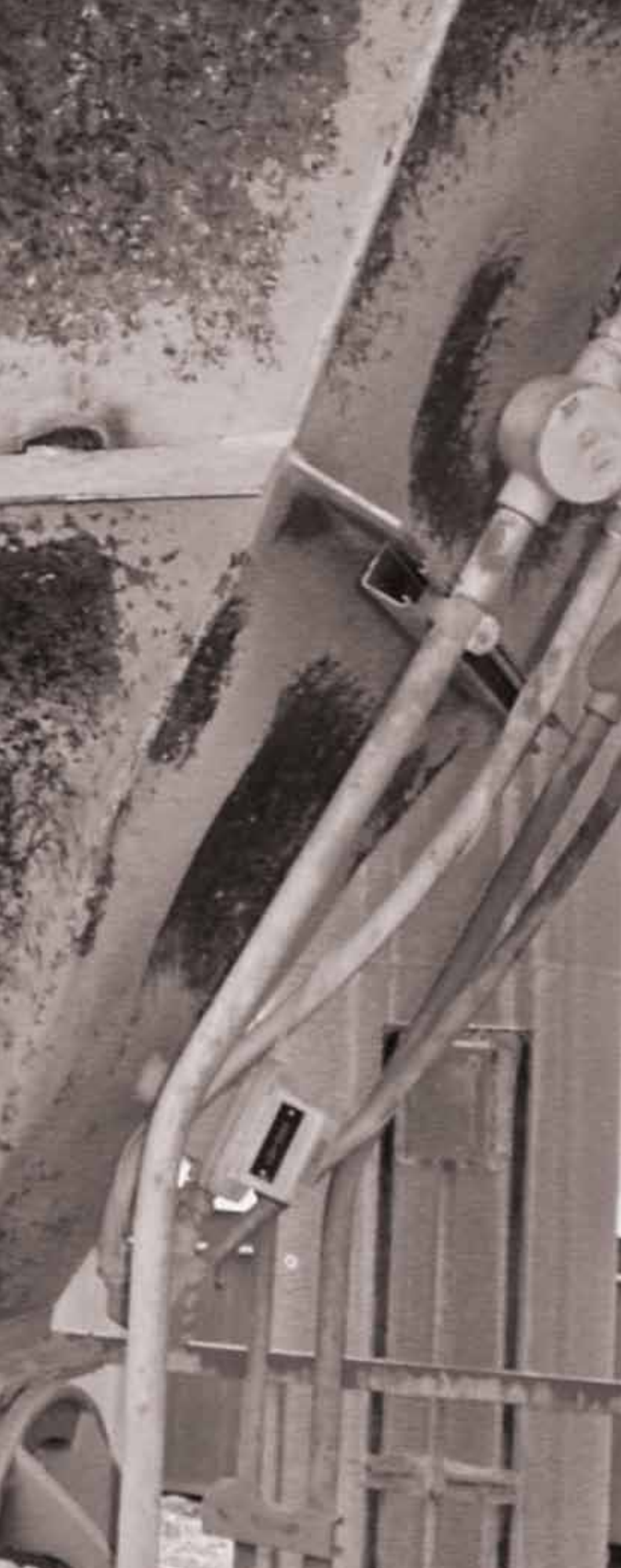
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# PROBLEM



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## **APPLIED VIBRATION TECHNOLOGY**

Using the power of applied vibration, Martin Engineering Vibration Technologies energize material, reducing friction against container walls as well as internal particle-to-particle cohesion. The material moves more freely, feeds more effectively, sorts more consistently, compacts more efficiently and handles more easily.

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# SOLVED

The relationship between the bulk material and the frequency of vibration best suited to stimulate that material is proportional to particle size. As a general rule, the smaller the particle, the better it responds to higher vibration frequencies.

The relationship between amplitude of vibration and the bulk material is based on cohesive and adhesive forces. As the particle size increases, the amplitude required to cause the bulk material to move increases.

Particles that are fine and free flowing (low cohesive) tend to respond well to small amplitudes of vibration; free-flowing particles that are larger respond better to larger amplitudes.

Particles that are sticky tend to build up in solid masses that respond well to low-frequency high-amplitude vibration.

Generally, the direction of the rotation or the stroke of the vibrator's mass should be in the direction of desired flow of the material.

## AIR OR ELECTRIC?

### CHOOSE BETWEEN AIR- OR ELECTRIC-POWERED VIBRATION

#### INITIAL COST

Initial purchase price for electric vibrators is typically greater than for air vibrators.

#### OPERATION COST

Electricity is less expensive than air, therefore long-term operating costs will typically be lower for electric vibrators.

#### NOISE LEVEL

Electric vibrators are quieter than air vibrators; rotary is quieter than linear.

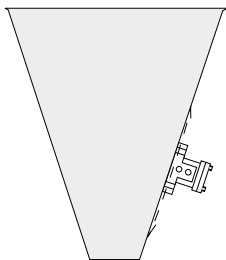
#### POWER SOURCE AVAILABLE

Availability of compressed air or electricity may dictate choice.

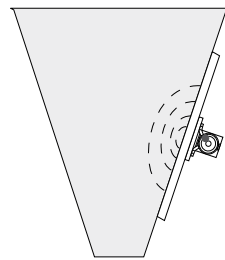


## WHAT TYPE OF VIBRATION SHOULD BE APPLIED?

### DETERMINE WHETHER THE MATERIAL IS WET/STICKY OR DRY



Linear vibrators activate the material inside a chute or bin by using heavy blows on the outside of the structure's steel walls. Suitable for wet products.



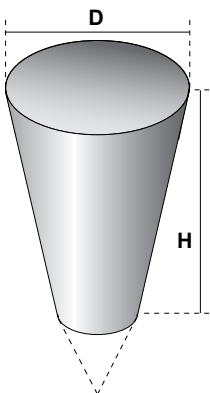
Rotary vibrators create a vibratory force through the rotation of an eccentric weight. Suitable for dry products.

## WHAT'S THE SLOPE VOLUME?

### CALCULATE VOLUME OF SLOPED SECTION OF BIN

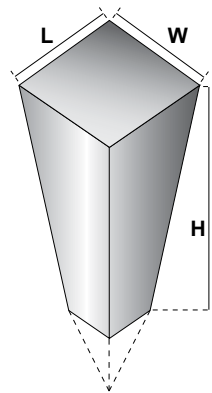
ROUND CONE:

$$V = 1/3 \cdot 3.14 \cdot r^2 \cdot H$$



SQUARE/RECTANGLE:

$$V = 1/3 \cdot L \cdot W \cdot H$$



## HOW MUCH DOES IT WEIGH?

### CALCULATE WEIGHT OF THE MATERIAL IN SLOPED SECTION OF BIN

$$\text{Material Weight} = V \cdot d$$

(Note: d = material density)

## HOW MUCH FORCE?

### DETERMINE FORCE OUTPUT REQUIRED

Dry Material:

$$\text{Force} = \text{Material Weight} / 15$$

Wet/Sticky Material:

$$\text{Force} = \text{Material Weight} / 10$$

# ELECTRIC VIBRATORS

## ELECTRIC POWER / ROTATIONAL FORCE



B3-10000-5-8  
3-Phase 8-Pole

### COUGAR® HEAVY DUTY ELECTRIC VIBRATOR B-SERIES

Cougar® Heavy Duty Electric Vibrator B-Series are manufactured with U.L. recognized components.

Units available for 850-, 1170-, 1750-, 3450- and 3600-rpm. Centrifugal force output ranges from 70 to 16500 lbs.

Dust-tight/water-tight construction with TENV motor and high-temperature Class H windings to extend performance life.



B3X-1000-1A-4

### COUGAR® HAZARDOUS LOCATION VIBRATOR B-SERIES

Engineered for applications in hazardous environments, including exposure to explosive dust.

- UL listed for Class II, Group E, F, & G, Division 1 & 2
- Ductile iron bearing housings
- 1000 force lbs, 1750-rpm
- 230/460-volt 3-phase
- High-temperature Class H windings



## NECESSARY MOTOR SPECIFICATIONS PER APPLICATION

Application	Frequency (rpm)	Acceleration (force)	Amplitude
Conveying or Feeding	900 - 1800	2.0 - 5.0	High
Screening	900 - 1800	5.0 - 7.0	High
Draining or Dewatering	1800 - 3600	3.0 - 5.0	Medium
Bin/Hopper and Chute Evacuation	1800 - 3600	0.05 - 0.15*	Medium
Compaction of Bulk Materials	1800 - 7200	2.0 - 4.0	Low
Consolidation of Concrete	3600 - 10800	0.8 - 1.5	Very Low
Testing of Parts or Assemblies	450 - 7200	0.5 - 5.0	High to Low

\* Material Weight in Sloped Section



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# CONCRETE FORM VIBRATORS

## CONCRETE CONSOLIDATION SOLUTIONS



*B3-3000-2 Concrete Form*

### COUGAR® CONCRETE FORM VIBRATOR

- Interchanges with Bosch 18-120 & Iskco EVL-35
- 3000 force lbs, 3450-rpm
- 230/460-volt 3-phase
- Roller bearings designed for vibration
- Ductile iron bearing housings
- High-temperature Class H windings
- Adjustable Eccentrics 0–100%



*U1-1600 Single-Phase*

### COUGAR® HEAVY DUTY ROTARY ELECTRIC VIBRATOR SERIES

Units available for 1745-, 3200-, 3450- and 9000-rpm.

Centrifugal force output ranges from 15 to 5400 lbs.

- Triple-dipped shock-resistant windings
- Sealed units for outdoor environment
- Oversized bearings lubricated for life
- Single-phase unit includes overload/current protection

### VIBROTOR™ HIGH-FREQUENCY PNEUMATIC VIBRATORS

“Roller-inside-a-roller” design generates multiple vibrations on each orbit to activate material.



*CCR-5500*

Light weight and built-in handle improves portability. Rugged construction and bearing-free design extends service life and minimizes service requirements.

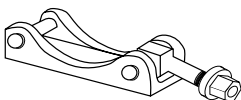
### WHIRLWIND™ HIGH-FREQUENCY TURBINE VIBRATOR

Larger unbalance creates greater force output to move your material.

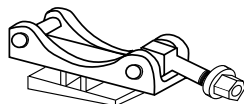


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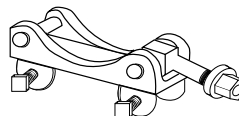
Units mount easily to a cradle lug bracket or cast-iron railcar wedge. Urethane-encapsulated turbine and sealed bearing provide quiet operation with low maintenance.



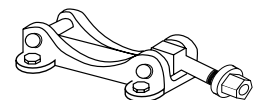
*Standard Mount*



*Wedge Mount*



*Clamp Mount*



*Bolt-On Mount*



Designed to protect personnel from hazards and risks.

# OEM VIBRATORS



## MARTIN® SCREEN VIBRATORS



Martin® Screen Vibrators provide up to 16500 pounds (7484 kg) of centrifugal force for efficient material separation. Sturdy design is proven in rugged testing and in field applications and is covered by Martin's unsurpassed 3-year warranty.

Explosion-proof model ETL/cETL/ATEX/IECex certified for hazardous duty (non-explosion proof models also available).

Can be used with Variable Frequency Drive in ordinary and hazardous atmospheres.

Long-life bearings produce less noise than oil bath bearings. Bearing lubrication needed only every 2000 operating hours.

Dual-voltage units provide flexibility with differing power supplies.

Bolt it in, wire it up and turn it on; "direct" replacement needs no adapter mount to fit Derrick® Vibrating Screens.

Eccentric weights are adjustable with hand tools.

## MARTIN® MM SERIES ELECTRIC VIBRATORS



Only USA manufacturer of continuous-duty, high-output / low-frequency industrial vibrators guaranteed for 3 years.

Fast delivery from domestic manufacturer of any electrical rating. Worldwide support and service.

Engineered for continuous duty. C4 clearance roller bearings. Drives are fully interchangeable with other major manufacturers.

Dust-tight, water-tight: O-ring seals and machined surfaces provide an IP 66 enclosure rating to protect against the entry of dust and water.

## MARTIN® HYDRAULIC VIBRATORS



Same mounting bolt patterns as Martin® Electric Vibrators.

Bearing lubrication needed only every 2000 operating hours.

Works in portable screen applications where no electricity is available.

Up to 8300 pounds of centrifugal force. Quiet operation.

Worldwide tech support and service. Unsurpassed 3-year warranty.





# VIBRATING TABLES

## COMPACTION SOLUTIONS



### COUGAR® VIBRATING TABLES

Cougar® Vibrating Tables are designed to settle and compact numerous materials in a wide variety of applications. All tables are equipped with Cougar® Electric Vibrators.

Vibrating tables are designed to be used in the compaction of prepackaged products. Available with a low working height, sound dampening contact plate, and pneumatic isolation the table can compact a variety of bulk solids of different densities and particle sizes.

Vibrating tables can also be used in the manufacturing of precast countertops, architectural panels, pavers, and other concrete products. Tables can be equipped with a pair of counter rotating vibrators and pneumatic isolation for quiet and efficient operation.

Vibrating tables are also designed to be used in testing of product durability. Product tests can be performed consistently and uniformly to ensure quality.

Air bags are adjustable for a wide variety of applications.

A single regulator makes adjustments easy and ensures equal pressure in each air bag.

Includes a frequency drive with digital readout for consistent vibrating cycles.

Lip on sides of table can be adjusted up and down or removed.

### Applications

Precast concrete products

Urethane molding

Packaging

Life testing products



# PNEUMATIC BALL VIBRATORS

## **PNEUMATIC POWER / ROTATIONAL FORCE**

Simple, strong, durable design provides highest ratio of force to physical weight in the industry.

One moving part—a chrome steel ball rolling in hardened steel races—eliminates service requirements.

Mufflers, tapped exhaust and o-ring seal reduce noise levels and eliminate external contamination.

Three mounting and port configurations available. Interchangeable with other manufacturers.

### **ABL-SERIES BALL VIBRATORS**

Delivers slight-to-moderate force. Dual-mount bracket allows simple, one-bolt installation in two positions. Ideal for small hoppers, chutes, match plates, light sifting or feeding and lab testing.



*COUGAR®  
ABL-13 & ABL-25*

### **ABF-/ABU-SERIES BALL VIBRATORS**

Built for operation in the toughest conditions. Withstands moisture, exposure to material and extreme temperatures.



*COUGAR® ABF-51 & ABF-25*



*COUGAR® ABU-38 & ABU-25*



# PNEUMATIC RING VIBRATORS

## PNEUMATIC POWER / ROTATIONAL FORCE

Powerful forces for bin or railcar evacuation, or movement through a bin, hopper, chute or screen.

One moving part—ring on a hardened steel shaft—requires no lubrication.

Excellent power to weight ratio, delivering higher force output than comparable air vibrators.

Conserves energy and requires the lowest air consumption of any rotary air vibrator.

## UCVR-/NP-SERIES RING VIBRATORS

### VIBROLLER™ UCVR SERIES

Available in four sizes. Tapped inlet and exhaust for complete air control. Highest output.

### COUGAR® NP SERIES

Available in four sizes. Muffler standard. 650°F temperature rating.



UCVR-4-.05 & NP-55

## CVR-SERIES RING VIBRATORS

*For vessels holding up to 5400 lbs of material in their sloped portion.*

### VIBROLLER™ CVR SERIES

Available in two sizes with two-hole mount. High output and low air consumption.



CVR-19

## BDR-SERIES RING VIBRATORS

*For vessels holding 2000+ lbs of material in their sloped portion.*

### VIBROLLER™ BDR SERIES

Available in three sizes. Compact, lightweight dual-mount design. Tapped exhaust.



BDR-16



# PNEUMATIC VIBRATORS

**PNEUMATIC POWER / ROTATIONAL FORCE**

## COUGAR® PNEUMATIC & HYDRAULIC VIBRATOR SERIES

Adjustable eccentrics on many models tune output to your needs. Long service in challenging applications with minimal power consumption. Stepless adjustment allows precise regulation of material flow.



CCV4



DV6



CC2.8



CV2.8

# TURBINE VIBRATORS

**PNEUMATIC POWER / ROTATIONAL FORCE**

## COUGAR® TURBINE VIBRATORS



ATU-62



ATU-42



ATU-21

Optional speed muffler allows precision control of force and speed (regular muffler comes standard).

Lower air consumption than comparable air vibrator.

Low 62-78 dBA noise level is well below OSHA standards.

Excellent power to weight ratio with a 350°F temperature rating.

Durable anodized aluminum finish provides a tough exterior.

No lubrication required.

2-bolt slotted base allows easy upgrade when upgrading from ball-,

ring- and roller-type vibrators.

Direct interchange with competitors' models.



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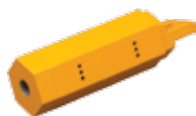
# PISTON VIBRATORS

## PNEUMATIC POWER / LINEAR FORCE

### COUGAR® PNEUMATIC PISTON VIBRATORS

Reduce manual labor and prevent vessel damage from pounding or prodding and maintain consistent material flow to improve efficiency and reduce bottlenecks. Piston vibrators offer control of force and frequency to meet a variety of conditions.

All Cougar® Piston Vibrators feature alloy steel bodies and hardened pistons to provide long operational life and minimal maintenance.



#### 2000 SERIES

Broad application range. High-frequency and high-impact energy. Five piston sizes from 0.75- to 2-inches available. Options include manifold/muffler for quiet operation and air-cushioned, non-impacting action.



#### LI SERIES

High amplitude delivers low impact but high reciprocating momentum action necessary for the movement of dry, low-density materials covering large surfaces. Four piston sizes from 1.25- to 4-inches available.



#### 5000 SERIES

Efficient air consumption. Four piston sizes from 1.5- to 4-inches available. Options include internal spring for positive starting, manifold/muffler for quiet operation, air-cushioned, non-impacting action and universal mount.



P-2

#### P SERIES

The economical answer to sticky, coarse or high-moisture material. These maintenance-free units never need service when used with filtered/ lubricated air. Available in four sizes with options.



PV-1.25

#### PV SERIES

Powerful linear force activates stubborn material from bins, hoppers, chutes or railcars. Four sizes supply consistent performance in moving material from vessels without manual labor or damage.



T-300

#### THUMPER™ TIMED PNEUMATIC IMPACTORS

Controlled by a timer, Thumper™ Impactors deliver powerful yet controlled blows at rates from one to sixty impacts per minute to keep production flow on target.



# TRUCK VIBRATORS

## MOBILE VIBRATION SOLUTIONS

### COUGAR® DC TRUCK VIBRATOR SERIES

DC vibrators from Cougar Vibration improve the speed and control of material flow from dump trucks and other self-powered heavy equipment.

Small size and light weight with high-speed, low-amp electric motors. Sealed against dirt, dust

and water for long life in extreme conditions.

Shielded, oversized, permanently-lubricated ball bearings assure exceptional service life. Easy, low-cost installation.



#### DC-3200/-2500/-1100

1000-3200 force-lbs  
at 4000-5000 vpm



#### DC1-400

410 force-lbs at 3800 vpm



#### DC-80/-200

80-200 force-lbs at  
4000-4500 vpm

### HYDRAULIC TRUCK VIBRATOR



#### NHD 110

2726 force-lbs at 4000 vpm



#### 5016

2600-4100 vpm at 40-80 psi

### TURBINE TRUCK VIBRATOR



#### ATU-43

11700 vpm at 60 psi and  
13000 vpm at 80 psi



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## NECESSARY MOTOR SPECIFICATIONS PER TRUCK APPLICATION

Model	Dump Truck				Spreaders				Concrete Pumper	Sanitation, Pumper & Vacuum Trucks	Volumetric Mixers	Mixer Trucks
	Standard			Tandem Live Bottom	Slide- In	Mount- ed	Tailgate or ATV					
	1-5 yards	5-10 yards	10-15 yards	15-30 yards	5-10 yards	5-10 yards	.2-2 yards	2-4 yards				
DC 3200			X	X		X				X		
DC 2500		X			X	X				X		
DC 1100	X											
DC1-400									X			
DC 200								X				
DC 80							X					X
NHD-110				X						X		
5016											X	
ATU-43												X

# RAILCAR VIBRATORS

## MOBILE VIBRATION SOLUTIONS

Powerful pneumatic vibrators prove their value in the toughest applications—the evacuation of stubborn materials from railcars and large storage vessels. Models are available with pneumatic or hydraulic power for permanent or portable mounting.

### 4432 4-INCH RAILCAR PISTON VIBRATOR



4432 4400 Series

### COUGAR® IMPACTING RAILCAR VIBRATOR

Compact vibrator and mount assembly provides plenty of power to unload the most stubborn materials

Vibrator and wedge system weighs only 48 lbs (21 kg), reducing strain and risk of injury





#### GLOBAL LOCATIONS

 UNITED STATES

 AUSTRALIA

 BRAZIL

 CHINA

 FRANCE


 GERMANY

 INDIA

 INDONESIA

 MEXICO

 PERU

 SPAIN

 SOUTH AFRICA

 TURKEY

 UNITED KINGDOM

Authorized representatives in over 32 additional countries

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