

## Design Series

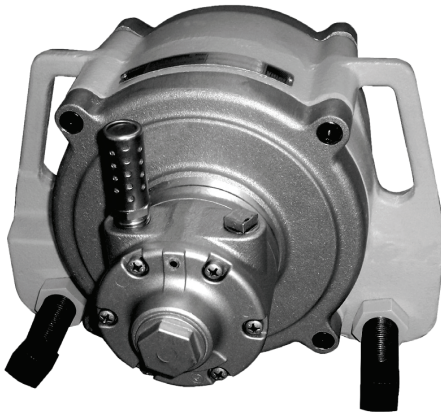
*Operating Instructions*

### Global® Pneumatic Vibrators

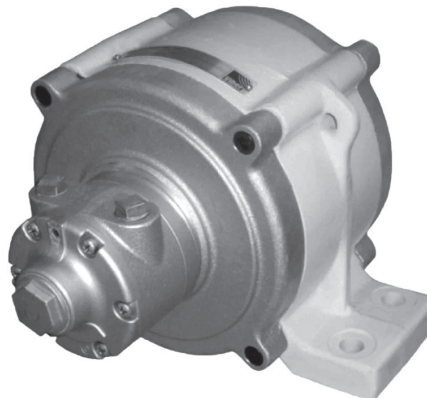
#### Models

CC4.5-6-4AC  
CC4.5-8-4AC  
CC4.5-10-4AC  
CC4.5-10A-4AC

D4.5-6-4AC  
D4.5-8-4AC  
D4.5-10-4AC  
D4.5-10A-4AC



**CC4.5 Series  
Portable  
Mount  
Clamp-On**



**D4.5 Series  
Permanent  
Mount**

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## I. Introduction

For optimum performance, cycle the vibrator on and off. The vibrator acts as a friction reducer and once the bulk solid is set into motion, gravity should do the rest. Do not operate the vibrator on an empty hopper as this may cause structural damage to the hopper.

Vibrators should be operated only when discharge gates are open. Operating the vibrator with the discharge gate closed will cause the material inside the structure to compact.

Vibration has two important elements – Frequency and Amplitude. Frequency is the speed (RPM) or the number of vibrations per minute. It is controlled by the oil flow to a hydraulic vibrator or the air flow to a pneumatic vibrator. Amplitude is the unbalance or amount of force produced by the eccentric weight. The faster the eccentric weights turn the more force output generated. Force and frequency work together. It is not necessary to use a lot of force when you have the frequency.



## SAFETY PRECAUTIONS

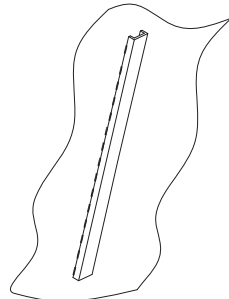
- Follow all mounting instructions.
- Always use a safety cable or chain for support.
- Do not operate vibrators when structure is empty.
- Do not operate vibrators when gate is closed or conveyor is stopped unless consolidation of material is desired.
- Wear ear protection for 90+ decibel levels.
- Do not operate vibrators without side covers.
- Do not operate the pneumatic vibrators above 100 psi.
- To prevent explosive hazard, do not use combustible gases to drive the pneumatic motor.
- Always operate pneumatic vibrator with a regulator, filter, and lubricator.
- Always disconnect air line before maintenance.

## II. Installation Procedures

### ⚠ Caution!

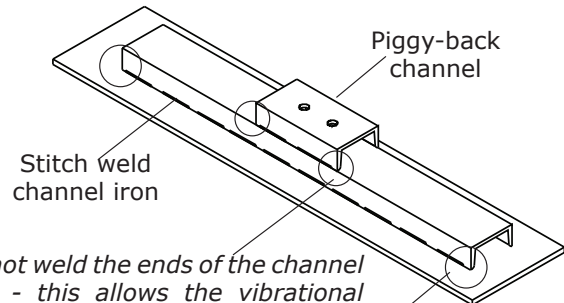
Do not mount the vibrator directly to the structure wall. Use a channel iron stiffener for proper mount rigidity and as the transducer of the vibrational energy.

The key to successful vibration is a proper mount because rotary vibration resonates the material inside the structure, when the vibrator is mounted correctly. The vibrator should appear motionless. There should not be a large amount of motion or noise.



**Stitch Weld the Channel Iron**

**Attach the vibrator to the channel iron.** Stitch weld nuts to the back of the channel iron or the channel iron may be drilled and tapped to accept the mounting bolts. An alternate method is to cut a second channel iron slightly longer than the footprint of the vibrator. Stitch weld the second channel iron to the first. Do not weld the ends. Mount the vibrator to the second channel iron.



*Do not weld the ends of the channel iron - this allows the vibrational force to "escape". Solid welded ends trap the force which can cause stress cracks.*

## Channel Irons - Size & Mounting

### Important!

The channel iron should be at least two-thirds of the height of the sloped portion of the hopper but no greater than 10 feet (3 m).

The channel iron should be at least two-thirds the height of the sloped portion of the hopper, but not less than 6 feet (1.83 m) in length. The channel iron width should not be less than the base width of the vibrator. See chart below for recommended channel sizes. DO NOT install more than one vibrator on the same channel iron or use a channel iron shorter than the recommended length. A short channel may flex the bin wall.

### Channel Iron Size:

Model	Channel Iron Size	Minimum length
All D4.5 Models	C8" x 18.7 lb/ft	72"
	200 x 27.9 kg/m	1829 mm

**Stitch weld the channel iron vertically to the sloped portion of the bin wall.** Weld 3 inches (7.5 cm), skip 1 inch (2.5 cm), weld 3 inches (7.5 cm), etc... Leave 1 inch (2.5 cm) un-welded on the ends and corners. This allows the vibration to dissipate out the ends of channel without causing stress cracks to the hopper or bin. By doing so, should the weld fail, the entire mount will not fall off. Do not mount the channel iron horizontally.

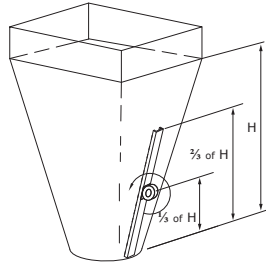
**Secure the vibrator to the channel iron with SAE coarse thread grade 8 plated bolts with lock washers or an adhesive such as Loctite® 262.** Tighten bolts in a sequential process. At least two passes are required in most situations. Give all bolts the same torque value. Grade 8 bolts can handle more torque than standard bolts. If Loctite® is not used, retorque the bolt after the vibrator has operated for a few minutes and check tightness often. If Loctite® is used do not retorque the bolts as this will break the Loctite® bond.

Attach a safety cable to a stronghold (not the channel iron mount), which is higher than the mounted vibrator and capable of holding the vibrator's weight.

### III. Mounting Locations

#### Single Vibrator

Install a channel iron stiffener on the outside of the sloping wall 1/3 the distance above the discharge opening.

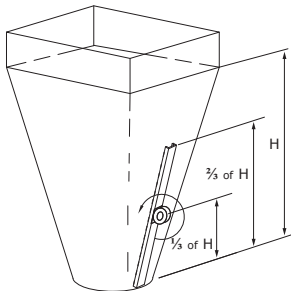


#### Multiple Vibrators

Use more than one vibrator when the diameter or width of any wall is greater than 12 feet (3.66 m). Always mount the vibrators on different planes.

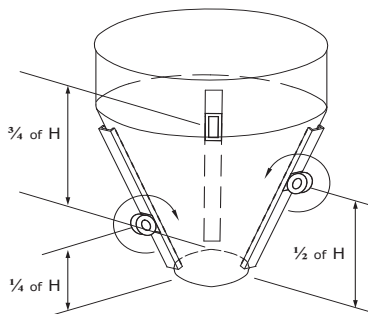
#### Two Vibrators on Round or Square Hoppers

Install channel iron stiffeners 180° apart. Install one vibrator on the outside of the sloping wall 1/3 the distance above the discharge opening. Install the second vibrator on the outside of the opposite sloping wall 2/3 the distance above the discharge opening.



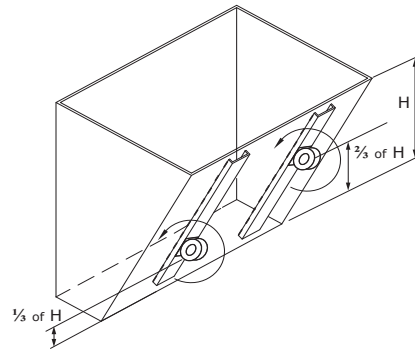
#### Three Vibrators

Install channel iron stiffeners mounted 120° apart. Install the first vibrator on the outside of the sloping wall 1/4 the distance above the discharge opening. Install the second vibrator on a separate channel iron at 1/2 the distance above the discharge opening. Install the third vibrator on the remaining channel iron at 3/4 the distance above the discharge opening.



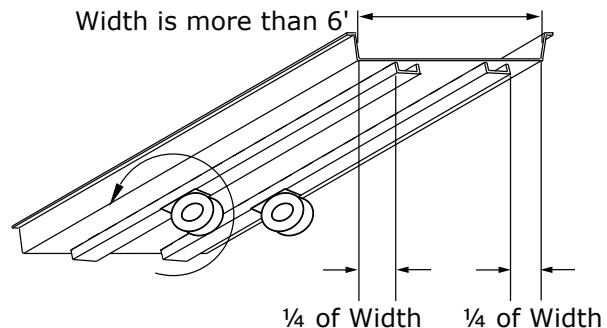
#### Two Vibrators on Rectangular Hoppers

Install channel iron stiffeners on opposite sides of the long walls. Install one vibrator on the outside of the sloping wall 1/3 the distance from the discharge opening. Install the second vibrator on the outside of the opposite sloping wall 2/3 the distance above the discharge opening. When only one wall slopes, mount both stiffeners on it. Equally space the stiffeners on the wall. Place one vibrator 1/3 above the discharge opening on one channel iron and the other vibrator 2/3 above the bin's discharge opening on the second channel.



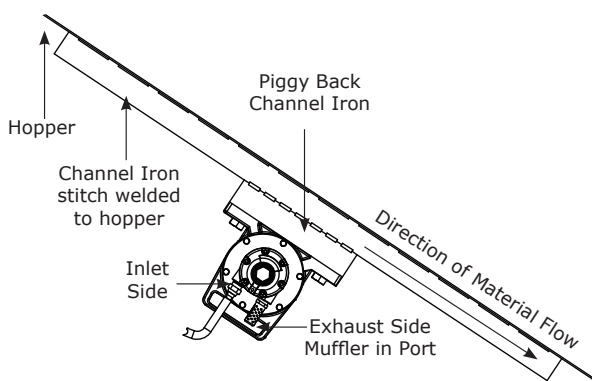
#### Installation on Chutes and Flow Pipes

Mount channel iron stiffeners vertically or in the direction of material flow. Center the channel if the chute is less than 6 feet (1.83 m) in width. If the chute is greater than 6 feet in width, use two vibrators on separate channel irons. To maximize each's radius of influence; center each channel iron in each half of the chute. Each channel iron should be located 1/4 of the chute width from the edge and 1/2 of the chute width apart. (e.g. – for a chute 8' wide, the channel iron locations would be 2' from each edge and 4' apart.) When wall thickness is less than 1/8", additional reinforcement may be required.



## Placement on Channel Iron

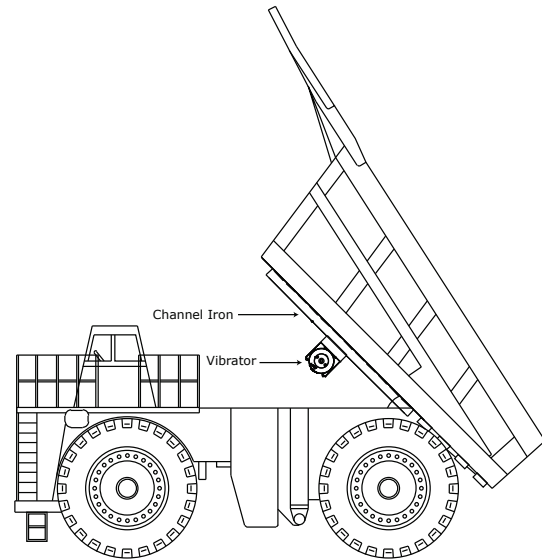
The axis of rotation of the eccentric weights for all rotary vibrators should be oriented in the direction of material flow. The shaft of the vibrator should ideally be in a horizontal position to prolong bearing life.



*The vibrator in the above illustration is a C3 Pneumatic vibrator. Follow the same mounting configuration for your D4.5 Pneumatic vibrator.*

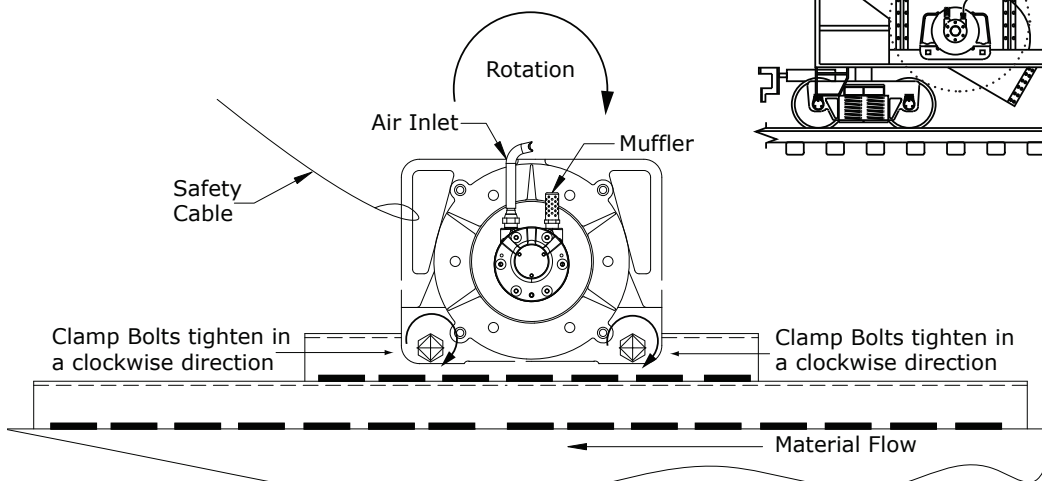
## Mounting on Truck Bed

Mount each vibrator on an independent channel iron. Locate the channel iron as close as possible to the material flow problem area. The most common problem areas are in the corners of the dump body.



## Direction of Rotation - CC4.5 Series

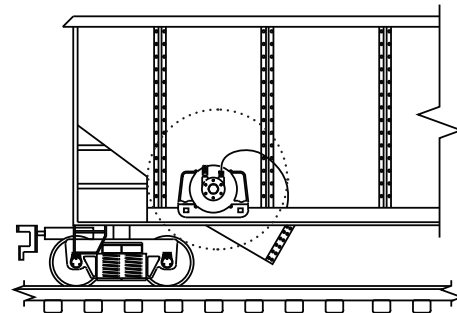
The eccentric weights of the vibrator must rotate in the same direction as the tightening of the clamp bolts. See illustration below. The clamp bolts turn (tighten) in a clockwise direction. Facing the motor side of the vibrator, install the inlet on the left side of hydraulic motor. If the inlet and outlet are reversed it will cause the clamp bolts to loosen upon vibration.



*The vibrator in the above illustration is a CC7 pneumatic vibrator. Follow the same mounting configuration for your CC4.5 pneumatic vibrator.*

## Installation on Railcars

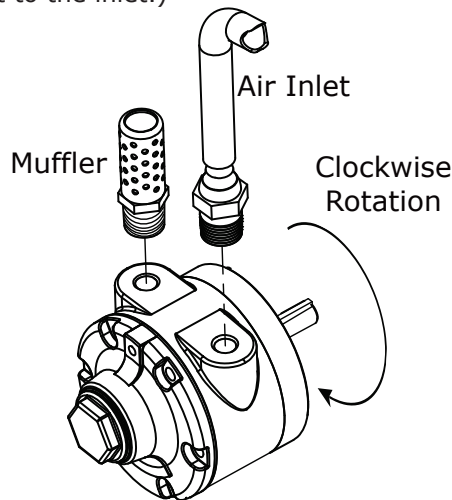
Install clamp-on CC4.5 model vibrators on the center beam of car or on a corner of the car near the hopper body as shown.



## IV. Operation

### Bidirectional Motors

The motors of the Design Series vibrators are bidirectional; therefore the eccentric weight rotation can be reversed by changing the hose connections. (Change the inlet to the outlet and the outlet to the inlet.)



### Pipes & Hose Sizes

Use an air hose that is the same size or larger in diameter as the inlet port ( $\frac{1}{2}$ " - 14 NPT) of the vibrator. Use short, flexible hose between the vibrator and the main air line if the main line is metal to avoid strain on the vibrator motor ports. Allow a loose bend of 9" to 16" (23 cm to 41 cm) to be formed by the hose to prevent cracking it from vibration.

### Important!

Operate vibrator with a muffler on the exhaust port. The muffler will prevent contaminants from entering into the motor.

### Air Connection & Operation Guidelines

Connect air line to the highest port, as shown on page 5. Use a muffler to keep contaminants out of the vibrator, especially when vibrator is turned off. The exhaust air may be hosed away from the vibrator to reduce the noise and contamination. The exhaust hose should be at least one size larger than the inlet hose. Install a filter, regulator, gauge, and lubricator in the air line within 10 to 12 feet (3 - 3.7 m).

The air supply must be clean and relatively dry. An air line filter, regulator and lubricator of adequate size should be used and located before the vibrator. Control valves should be located as close as possible to the vibrator. All air lines should be at least the same size as the ports on the motor. Air lines longer than 6 feet (2 m) use larger size lines.

The vibrator may run continuously at speeds up to the rated running conditions shown in our performance data. The vibrator should be operated with a pressure regulator or needle valve to control the air flow, which controls the speed. A ball valve or solenoid valve should be used to turn the vibrator on and off. A regulator provides constant speed control even as the plant air pressure varies. Alternatively, a needle valve will control the speed as long as the plant air pressure does not change. Do not connect the vibrator directly to plant air.

Use a 64 micron filter. The airline filter should be drained regularly and the element examined for signs of clogging. The airline lubricator should be replenished as required and set to give the following drop rate minimum. Will operate in temperatures of 32° F (0° C) to 250° F (120° C).

Airline Lubricator Drop Rate		
Motor	Continuous Operation	Intermittent Operation
4AG	4 - 5 per minute	8 - 12 per minute

### Recommended Lubricants

Shell: Tellus 37  
 B.P.: Energol HL65  
 Castrol: Hyspin 70  
 Mobil: Alma oil No 1

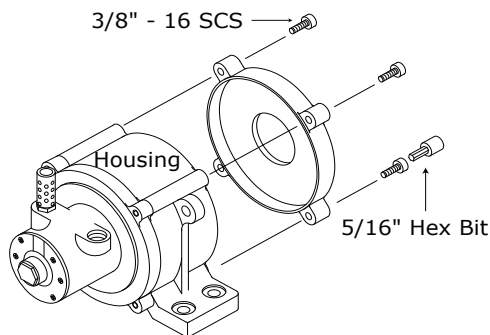


## V. Repairing 4.5 Series Vibrator

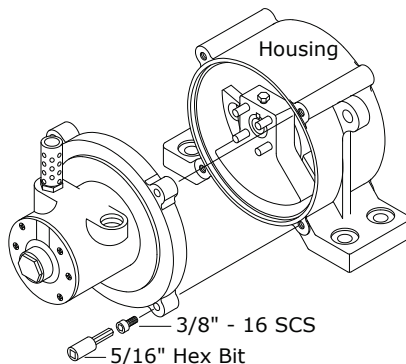
### Tools Required:

1. Arbor press
2. Press Ring - 3" O.D. x 6" long pipe
3. Press Rod - 3/4" O.D. x 6" long rod
4. Torque wrench - 3/8" drive 50 ft-lb capacity
5. 9/16" socket - 3/8" drive
6. hex bit - 5/16" or 3/8" drive
7. 5/16" hex key
8. 1/8" hex key
9. 3/16" hex key
10. 9/16" wrench
11. Retaining ring pliers - internal and external to fit medium retaining rings
12. Thread locking adhesive

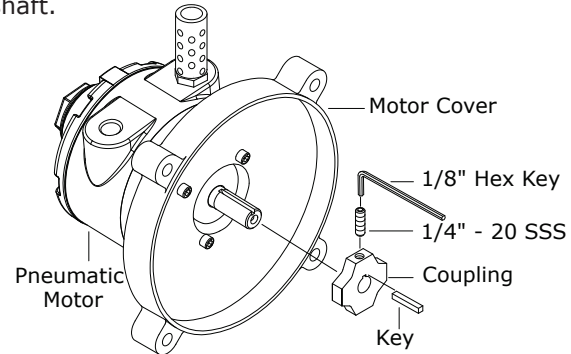
1. Shut off air to vibrator.
2. Disconnect pneumatic lines from vibrator. Note and mark the high pressure line and return to the same port on motor to maintain directional integrity.
3. Dismount vibrator.
4. Remove the four screws from the back cover with a 5/16" hex bit. Remove back cover. This may require gently prying the cover off with a light pry bar.



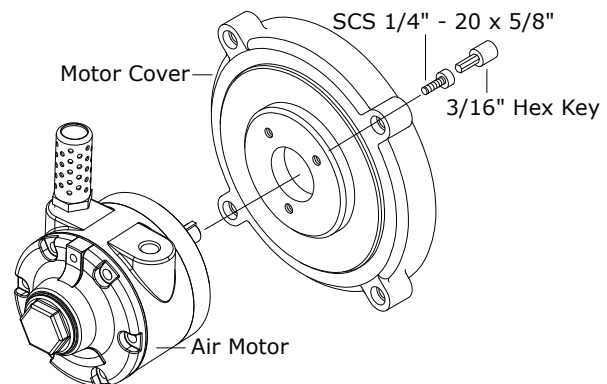
5. Remove the three screws from the motor cover. Follow instructions in step 4 to remove motor cover.



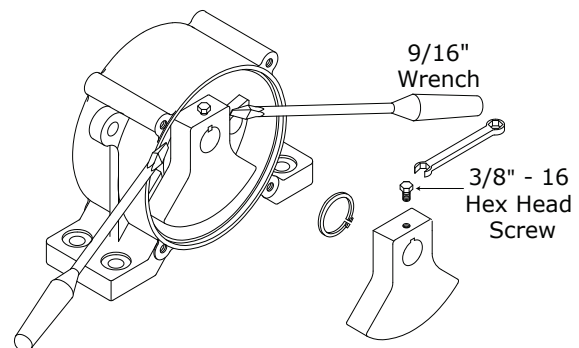
6. Remove the set screw from the coupling with a 1/8" hex key. Slide the coupling from the motor shaft.



7. If motor repair is necessary remove the three motor screws that mount the motor to the motor cover with a 3/16" hex key. Remove motor for repair.



8. **For models with fixed weights** remove the screw from the driven weight (the weight without drive pins) with a 9/16" wrench. Pry the weight off the shaft with two pry bars as shown in the drawing. Remove the shaft retaining ring now exposed. Repeat the procedure for the drive weight on the motor side. Remove the exposed keys from the shaft.

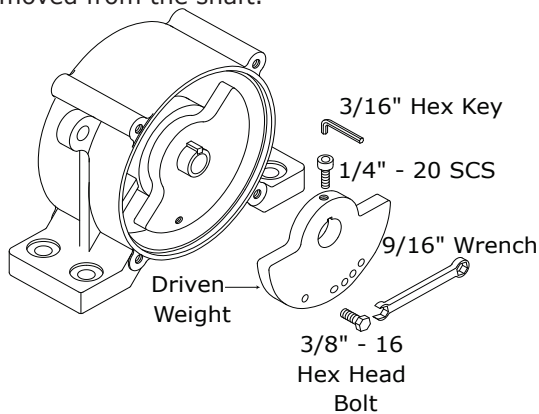


9. **For models with adjustable weights** remove the adjustment screws locking the weights together. Note screw location in adjusting hole for replacement.

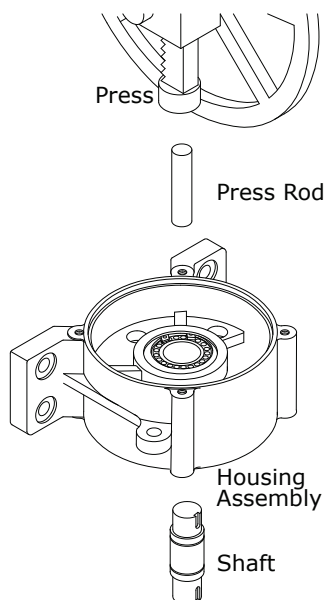
Remove the screw from the top of the driven weight

(no drive pins) with a  $\frac{3}{16}$ " hex key. Pry the weights off the shaft. Remove the exposed retaining ring from the shaft.

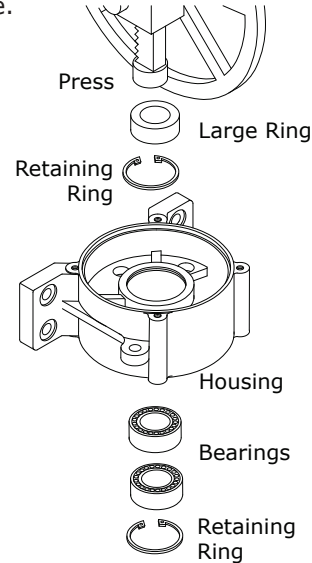
Repeat the steps to remove the drive weight from the motor side. The square keys can now be removed from the shaft.



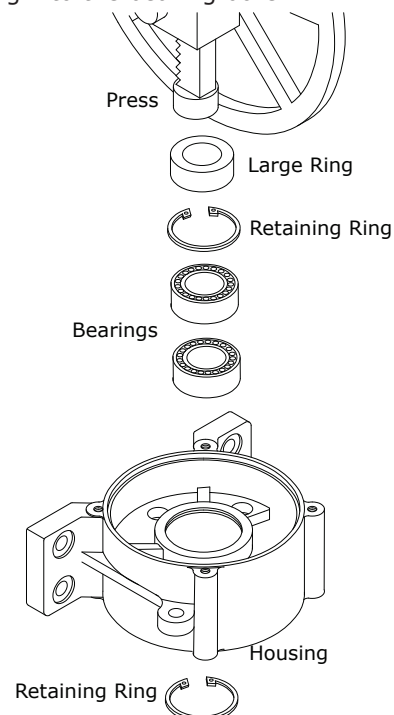
10. Slide the shaft out of the bearings. This may require a light press and press rod. **Do NOT use a hammer** as it will damage the end of the shaft and also the bearings if they are to be reused.



11. Remove the housing retaining rings. Using the press ring press the bearings from the housing. Do NOT press on any surface of the bearing but the outer race.

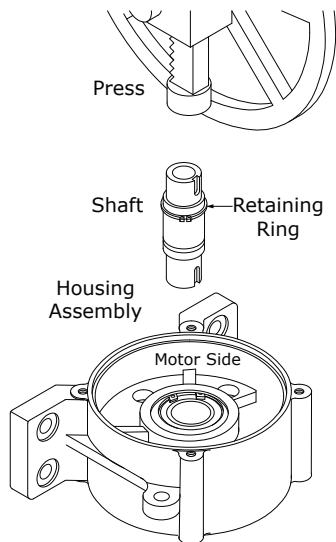


12. Install one of the large retaining rings into the bearing bore. Spread a small quantity of oil on the outer race of the bearing. Using the press ring, press the bearing into the bearing bore until it contacts the inner face of the retaining ring. Press the remaining bearing into the bore until it rests against the first bearing. Install the remaining retaining ring into the bearing bore.

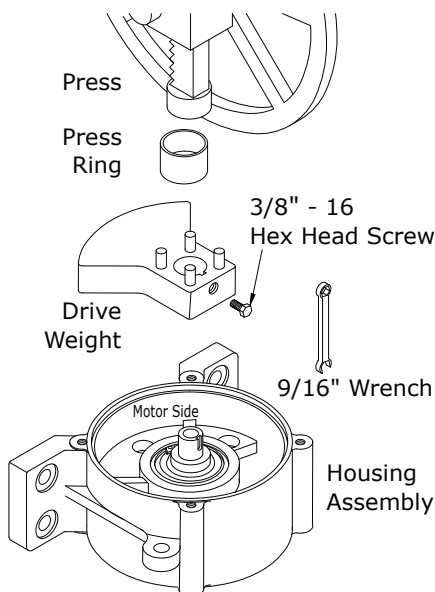




13. Turn the housing so the "motor side" is facing up. Install a retaining ring in the shaft. Place the ring in the shaft retaining ring groove closest to the drilled end of the shaft. Slide the shaft into the bearings (from motor side) until the retaining ring contacts the inner race of the bearing; this may require a slight press. **Do NOT use a hammer to install the shaft** as this will damage the bearings. Once the shaft is in place the retaining ring may be installed on the opposite side shaft groove.



14. **For models with fixed weights** slide the drive weight (the weight with four pins) onto the shaft until it seats against the shoulder stop. **Do support the shaft on the opposite end to prevent damage to the bearings.** This procedure

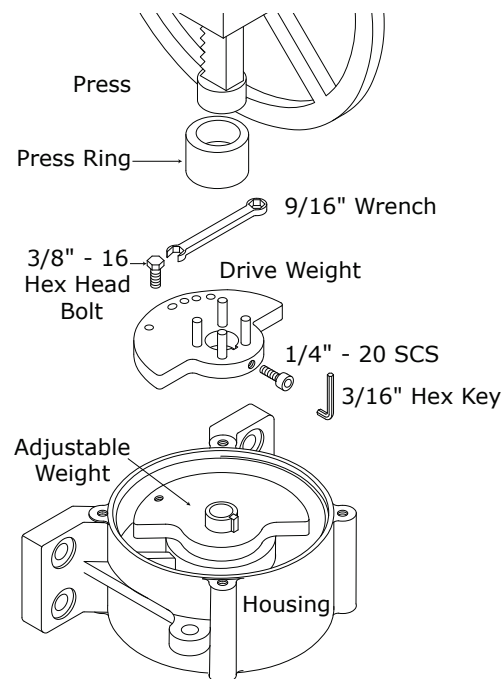


may require a light press. Do NOT use a hammer - it may damage the bearing. Place a drop of liquid thread locking adhesive on the threads of the 3/8" - 16 x 1 1/4" hex head set screw. Install the set screw into the weight and torque to 33 ft-lb (45 N-m). Repeat procedure to install the driven weight on the opposite side of the housing.

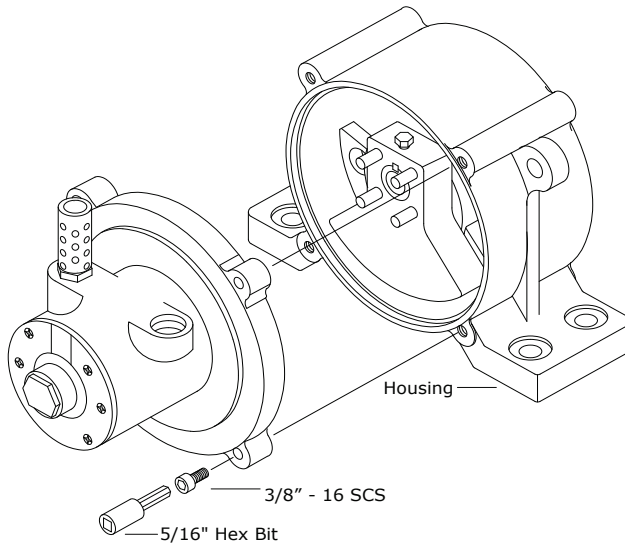
15. **For models with adjustable weights** slide the adjustable weight (no pins) onto the shaft until it seats against the shoulder stop. This may require a light press. **Do support the shaft on the opposite end to prevent damage to the bearings.** Do NOT use a hammer - it may damage the bearings. Replace the square key in the shaft. Slide the drive weight over the shaft aligning the weight keyway with the key in the shaft. Rotate the adjustable weight until the bolt hole is in the correct position in relation to the drive weight. Place a drop of thread locking adhesive on the threads of the 3/8" - 16 hex bolt and install through the drive weight and adjustable weight. Tighten securely.

Place a drop of thread locking adhesive on the threads of the 1/4" - 20 socket cap screw and install in set screw hole in drive weight. Tighten the set screw securely.

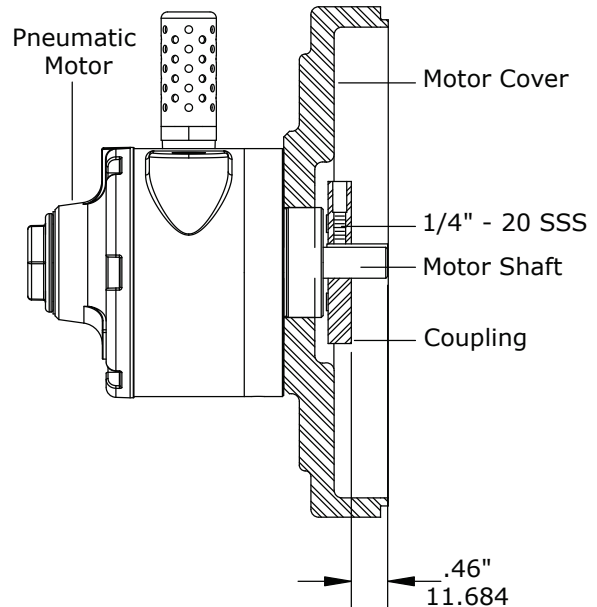
Repeat this procedure to install driven weights on opposite end of the shaft.



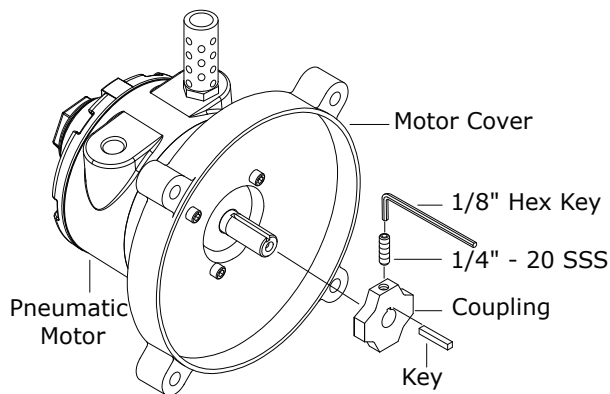
16. If removed, place the pneumatic motor on the motor cover. Place a drop of thread locking adhesive on the threads of the three  $\frac{1}{4} \times 20 \times \frac{5}{8}$ " SCS. Slide the bolts through the motor cover and into the motor. Tighten in stages in a crisscross pattern until tight.



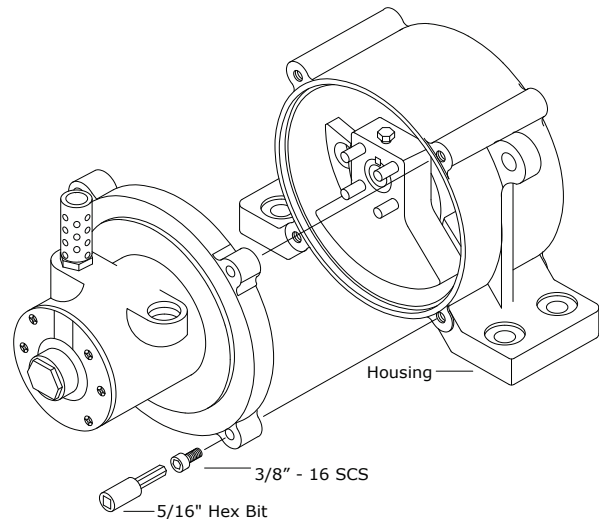
Place a drop of thread locking adhesive on the threads of the  $\frac{1}{4}$ " - 20 set screw. Tighten the set screw in the coupler until it seats very securely against the key in the motor shaft.



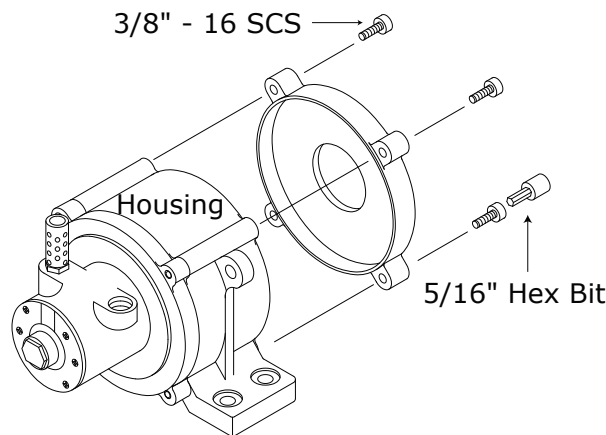
17. Slide the coupling onto the motor shaft until the outer face of the coupling is flush with the end of the motor shaft. Push the  $\frac{1}{8}$ " square key into the key slot between the coupling and motor shaft. Continue sliding the coupler/key combination down the motor shaft until the shaft end extends .46" past the coupler. **Do not place the key in the shaft first as the coupler may carry the end of the key into the motor seal, causing a leak.**



18. Place the cover and motor assembly near the motor side of the housing. Rotate the coupling until the valleys in the coupling align with the pins on the weight, then place the motor assembly on the housing. Place a drop of thread locking adhesive on the threads of four  $\frac{3}{8}$ " - 16 x  $1 \frac{1}{4}$ " socket head cap screws. Initially, turn screws through the cover and into the housing just far enough to seat heads against the cover, then tighten in a crisscross pattern. Torque screw to 44 ft-lb (60 N-m).

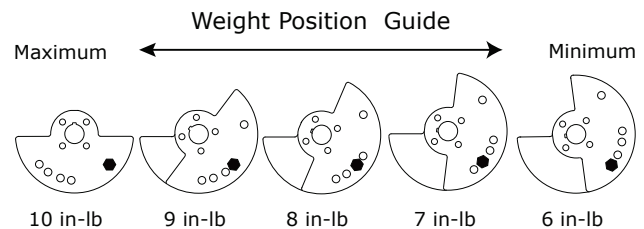


19. Spin the weight assembly on the exposed side to assure the weights rotate without binding. If there is evidence of binding, remove the motor cover and move the coupler in an additional  $\frac{1}{16}$ " (1.6 mm) and reinstall cover. The weights should spin freely with only bearing seal and motor drag. Place the back cover on the housing. Place a drop of thread locking adhesive on the threads of the remaining socket head screws and install. Torque bolts evenly to 44 ft-lb (60 N-m).



## Important!

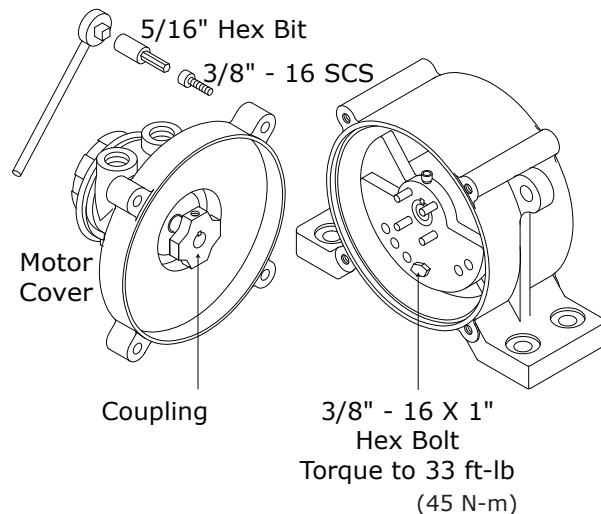
Weights must be set exactly the same on each side of the vibrator shaft.



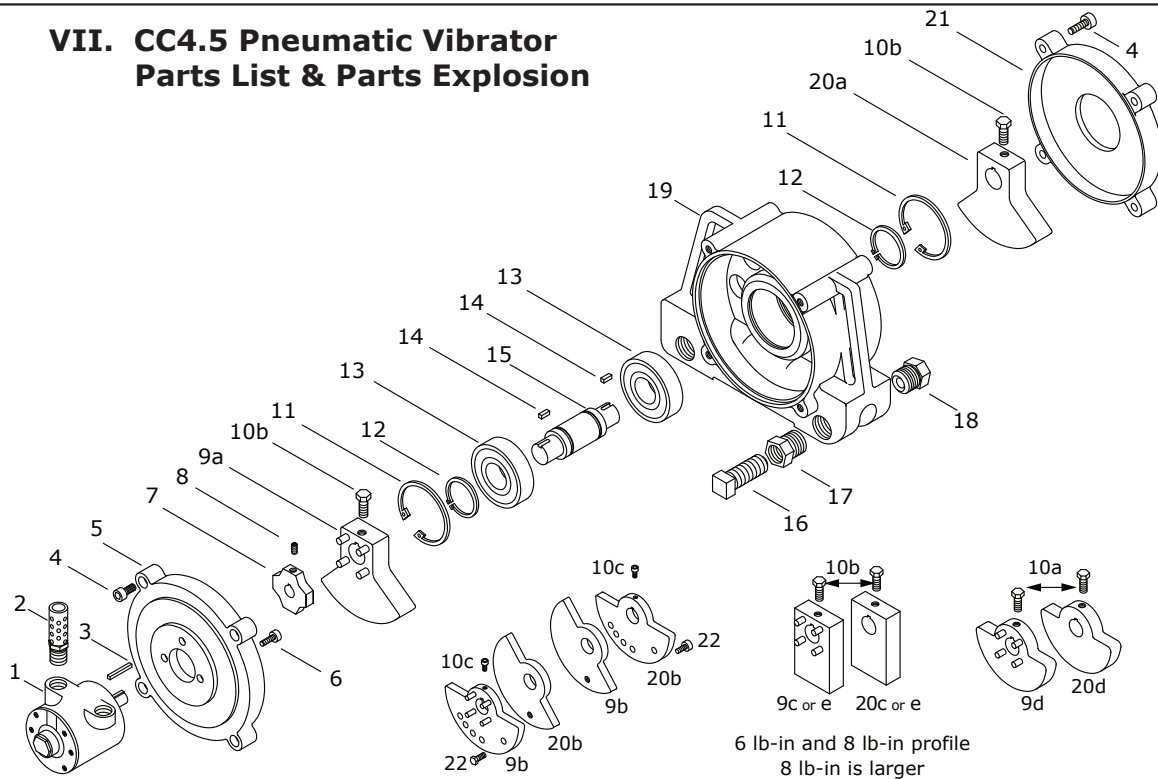
## VI. Adjusting the Adjustable Weights

Vibrators with a "10A" in the model number, such as, D4.5-**10A**-4AC, have adjustable weights. **All 10A models will leave our facility with weights in the 8 in-lb position unless requested otherwise.** To change the amount of vibration (the force output), the weights are repositioned on the shaft.

To adjust the weights, the front and back covers must be removed. There are two weights on *each* end of the vibrator shaft. Each set of weights has an inside and an outside weight. The outside weight is fixed to the shaft with a socket cap screw and a key. The inside weight, the adjustable weight, is attached to the outside weight with a single hex head bolt. By removing this bolt, the inside weight is free to rotate on the shaft. Rotate the inside weight until the tapped hole lines up under the desired bolt hole of the outside weight and reinstall the bolt. **It is important the weights on both sides are set the same.** There is no need to ever loosen the socket cap screw on the outside weight. After securing the inside weight to the outside weight, align the pins on the weight to rest between the flat V-shape cutout of the coupling. Bolt the covers onto the vibrator using 44 ft-lb (60 N-m) of torque. The vibrator is now ready for operation.



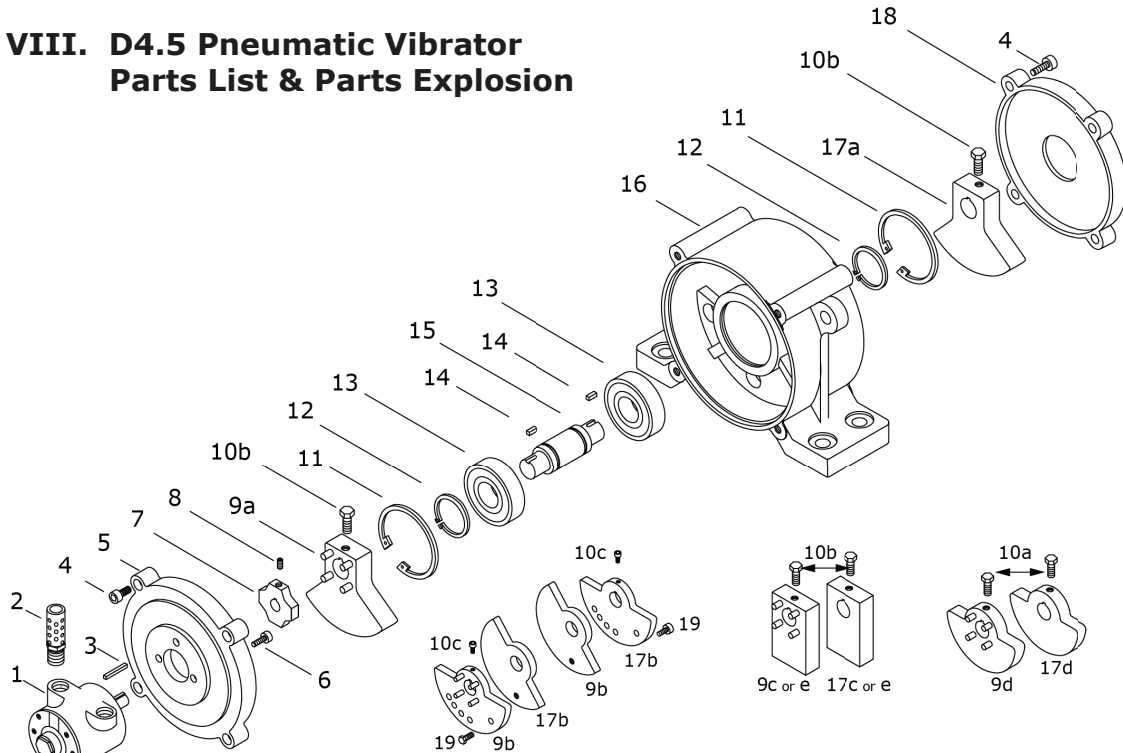
## VII. CC4.5 Pneumatic Vibrator Parts List & Parts Explosion



### Parts List for CC4.5 Pneumatic Vibrator

CC4.5-6-4AC (pn 554006) CC4.5-8-4AC (pn 554008)				CC4.5-10-4AC (pn 554010) CC4.5-10a-4AC (pn 554011)			
#	Description	Part #	Qty	#	Description	Part #	Qty
1	Motor 4AG	240440	1	12	Retaining Ring 5160-137	349237	2
2	Muffler ½"	270008	1	13	Bearing 6307 2RS	380307	2
3	Key - ⅛" Sq. X ¾" Long (see below)	(1)	1	14	Key - ⅜" Sq. X ½" Long	345803	2
4	SCS ⅜ - 16 X 1 ¼"	337112	8	15	Shaft	200445	1
5	Motor Cover	114445	1	16	Bolt, Clamp	333516	2
6	SCS ¼-20 X ⅝"	336906	3	17	Bolt, Bushing	333501	2
7	Coupling	203045	1	18	Bolt, Static	333503	2
8	SSS ¼ - 20 X ½"	336105	1	19	Housing	143045	1
9a	Drive Weight - 10 lb-in	194210	1	20a	Driven Weight - 10 lb-in	194310	1
9b	Drive Weight - 10A lb-in	194610	1	20b	Driven Weight - 10A lb-in	194710	1
9c	Drive Weight - 8 lb-in	193280	1	20c	Driven Weight - 8 lb-in	193380	1
9d	Drive Weight - 6 lb-in	194206	1	20d	Driven Weight - 6 lb-in	194306	1
9e	Drive Weight - 6 lb-in	193260	1	20e	Driven Weight - 6 lb-in	193360	1
10a	Bolt Hex ⅜ - 16 X 1"	330210	2	21	Cover	112445	1
10b	Bolt Hex ⅜ - 16 X ¾"	330207	2	22	Hex Bolt ⅜ - 16 x 1"	330210	2
10c	SCS ¼ - 20 x ¾"	336907	2	(1)	Key included with replacement motor. Keys purchased separately are pn 257400 - ⅛" Sq x 1"	257400	1
11	Retaining Ring N5000-315	347315	2				

## VIII. D4.5 Pneumatic Vibrator Parts List & Parts Explosion

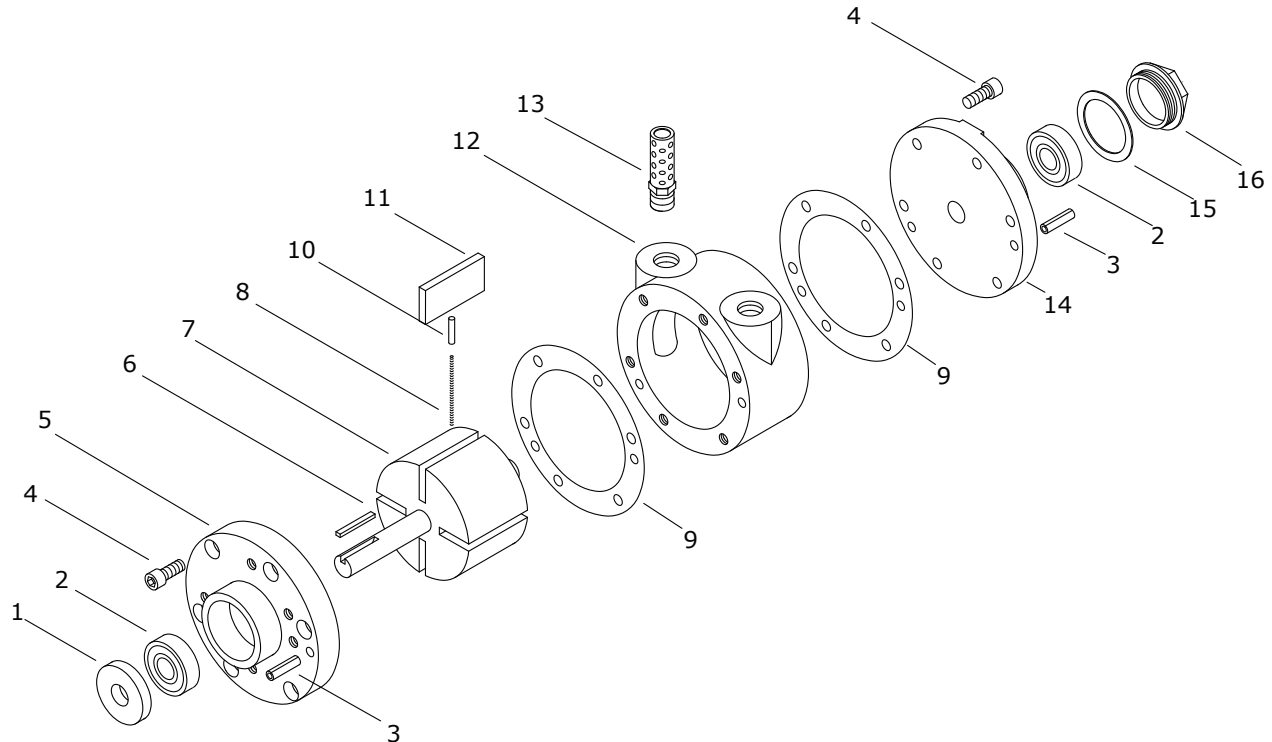


**Parts List for D4.5 Pneumatic Vibrator**

D4.5-6-4AC (pn 544006) D4.5-8-4AC (pn 544008)				D4.5-10-4AC (pn 544010) D4.5-10A-4AC (pn 544011)			
#	Description	Part #	Qty	#	Description	Part #	Qty
1	Motor 4AG	240440	1	10b	Bolt Hex $\frac{3}{8}$ - 16 X $\frac{3}{4}$ "	330207	2
2	Muffler $\frac{1}{2}$ "	270008	1	10c	SCS $\frac{1}{4}$ - 20 x $\frac{3}{4}$ "	336907	2
3	Key - $\frac{1}{8}$ " Sq. X $\frac{3}{4}$ " Long (see below)	(1)	1	11	Retaining Ring N5000-315	347315	2
4	SCS $\frac{3}{8}$ - 16 X $1\frac{1}{4}$ "	337112	8	12	Retaining Ring 5160-137	349237	2
5	Motor Cover	114445	1	13	Bearing 6307 2RS	380307	2
6	SCS $\frac{1}{4}$ - 20 X $\frac{5}{8}$ "	336906	3	14	Key - $\frac{3}{16}$ " Sq. X $\frac{1}{2}$ " Long	345803	2
7	Coupling	203045	1	15	Shaft	200445	1
8	SSS $\frac{1}{4}$ - 20 X $\frac{1}{2}$ "	336105	1	16	Housing	144045	1
9a	Drive Weight - 10 lb-in	194210	1	17a	Driven Weight - 10 lb-in	194310	1
9b	Drive Weight - 10A lb-in	194610	1	17b	Driven Weight - 10A lb-in	194710	1
9c	Drive Weight - 8 lb-in	193280	1	17c	Driven Weight - 8 lb-in	193380	1
9d	Drive Weight - 6 lb-in	194206	1	17d	Driven Weight - 6 lb-in	194306	1
9e	Drive Weight - 6 lb-in	193260	1	17e	Driven Weight - 6 lb-in	193360	1
10a	Bolt Hex $\frac{3}{8}$ - 16 X 1"	330210	2	18	Cover	112445	1
(1)	Key included with replacement motor. Keys purchased separately are pn 257400 - $\frac{1}{8}$ " Sq x 1"	257400	1	19	Hex Bolt $\frac{3}{8}$ - 16 x 1"	330210	2



## IX. 4AG Pneumatic Motor Parts List & Parts Explosion



**4AG Pneumatic Motor Parts List - Part Number 240440**

#	Description	Part #	Qty	#	Description	Part #	Qty
1	Shaft Seal	(1)	1	9	Body Gasket	(1)	2
2	Bearing, Drive & Dead	(1)	2	10	Push Pin	(1)	4
3	Dowel Pin 1/4" Diameter	NA	4	11	Vane	(1)	4
4	SCS 14 - 20 x 5/8"	NA	12	12	Body	NA	1
5	End Plate, Drive	NA	1	13	Muffler 1/2"	NA	1
6	Key - 404 Woodruff	NA	1	14	End Plate, Dead	NA	1
7	Rotor Assembly	NA	1	15	End Cap, Gasket	(1)	1
8	Vane Spring	(1)	2	16	End Cap, Dead	NA	1

Note: (1) Parts included in repair kit #240940.

## X. Performance Charts - Vibrator and Pneumatic Motor

CC4.5 & D4.5 Pneumatic Design Series Vibrator Performance Data											
			40 psi			60 psi			80 psi		
			2.8 bar			4.1 bar			5.5 bar		
Model	Unbalance lb-in	Start psi	Speed RPM	Flow SCFM	Force Pounds	Speed	Flow SCFM	Force Pounds	Speed	Flow SCFM	Force Pounds
	Unbalance kg-MM	Start bar		LPM	kN		LPM	kN		LPM	kN
D4.5-6-4AC CC4.5-6-4AC	6.0	18	3,950	35	2,660	4,250	57	3,080	4,500	65	3,450
	691	1.24		991	11.8		1,614	13.7		1,841	15.3
D4.5-8-4AC CC4.4-8-4AC	8.0	18	3,600	30	2,940	3,960	48	3,460	4,300	64	4,200
	922	1.24		850	13.1		1,359	15.4		1,812	18.7
D4.5-10-4AC CC4.5-10-4AC	10.0	18	3,350	32	3,190	3,700	47	3,890	3,900	62	4,320
	1,152	1.24		906	14.2		1,331	17.3		1,756	19.2

The table above represents the vibrator's performance at various speeds. It is important to note that with any rotary vibrator the load on the bearings increases as the speed increases therefore, the life of the bearings is very sensitive to the speed. Increasing the speed by just 10% will cut the bearing life in half. Likewise, reducing the speed 10% will double the bearing life. Please remember that the speed is controlled by the flow or volume of air (SCFM) in relation to the pressure (PSI). The pressure across the motor will vary according to the rigidity of the vibrator mount and the type of material being resonated.

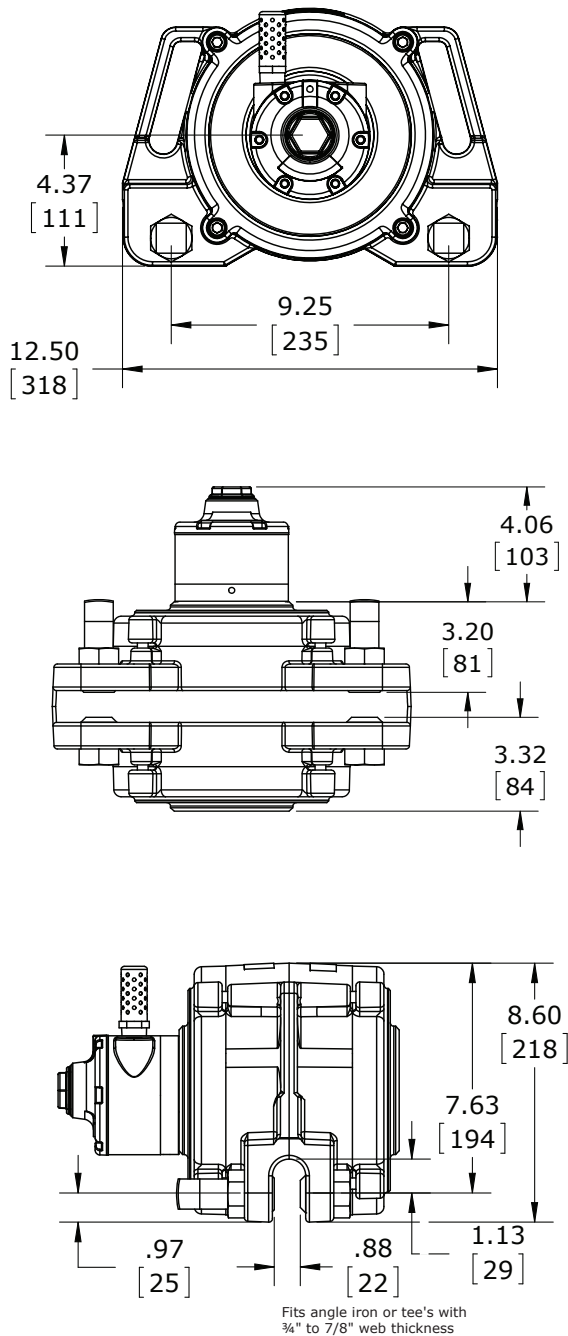
Pneumatic Motor Performance Data					
Port Size Inlet and Outlet	Minimum Hose Size	Maximum Continuous Speed RPM	Maximum Intermittent Speed RPM	Maximum Pressure	Maximum Flow
½" - 14 NPT	½" I.D.	4,000	5,000	100 psi	150 SCFM
				6.9 bar	207 BAR

Pneumatic Motor Filter & Lubrication Requirements		
Filtration Required	Lubrication Required for Continuous Operation	Lubrication Required for Intermittent Operation
64 Micron	4 - 5 Drops per Minute 5 Weight Oil	8 - 12 Drops per Minute 5 Weight Oil

## XI. Vibrator Dimensions - inches [millimeters]

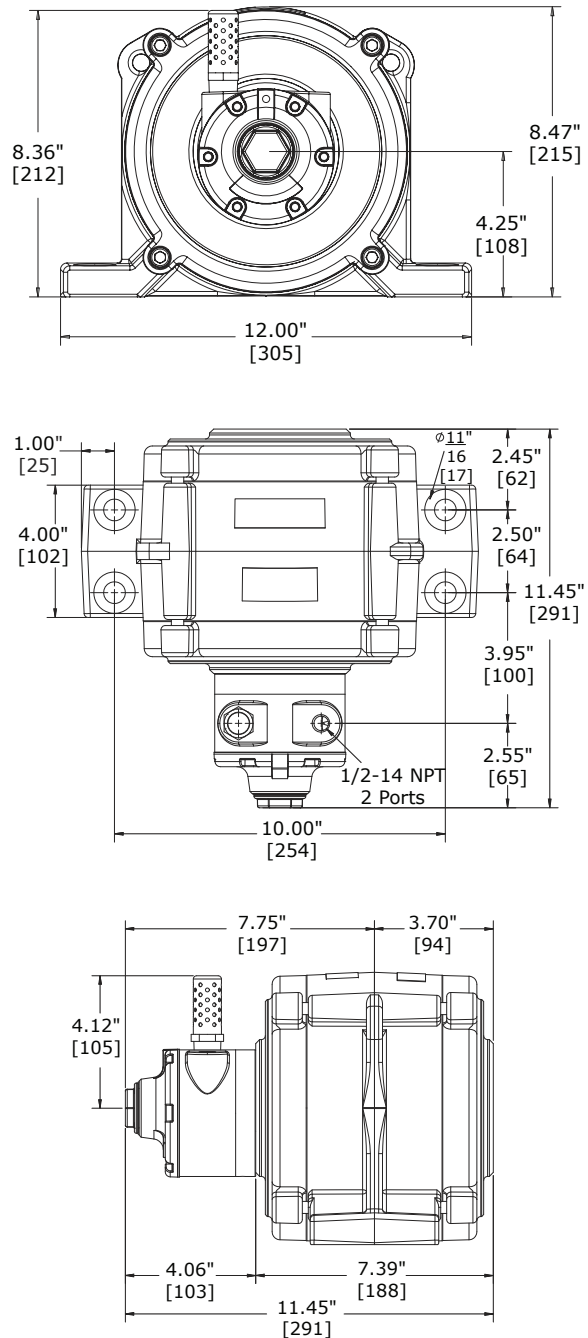
### CC4.5 Series

Mount with Clamp Bolts supplied with unit.  
Torque to 893 ft-lbs (1210 N-m).  
Vibrator weighs approximately 58 lb (25 kg).



### D4.5 Series

Mount with 5/8" - 11unc Grade 8 plated bolts.  
Torque to 159 ft-lbs (216 N-m).  
Vibrator weighs approximately 47 lb (21 kg).



## XII. Troubleshooting

Problem	Probable Cause	Solution
<b>Vibrator will not operate</b>	Air line blocked	Locate obstruction and remove. Check for kinked air line. Check filter.
	Inadequate air supply	Increase regulator setting or reduce number of units in use at same time. Check capacity of compressor.
	Air line too small for distance used	Use larger air line.
	Contamination in vibrator motor	Disassemble and clean motor. Check filter element.
	Faulty valve or air line couplings	Clean, repair, or replace.
	Clogged filter	Clean or replace filter.
<b>Excessive noise</b>	Bearing failure (squealing sound)	Replace the bearings.
	Insufficient mount	Replace with stronger mounting apparatus.
	Damaged housing or covers	Replace the housing or covers.
<b>Vibrator operates slowly</b>	Air line leaking or constricted	Replace air line, valve, or filter.
	Air line too small for distance used	Replace air line with larger size air line.
	Filter or muffler clogged	Clean, repair, or replace.
	Contamination in vibrator	Disassemble and clean.
	Lubricant too thick in cold weather	Use a lighter weight lubricant.
<b>Premature bearing failure</b>	Operating the vibrator too fast	Reduce speed by reducing psi and CFM.