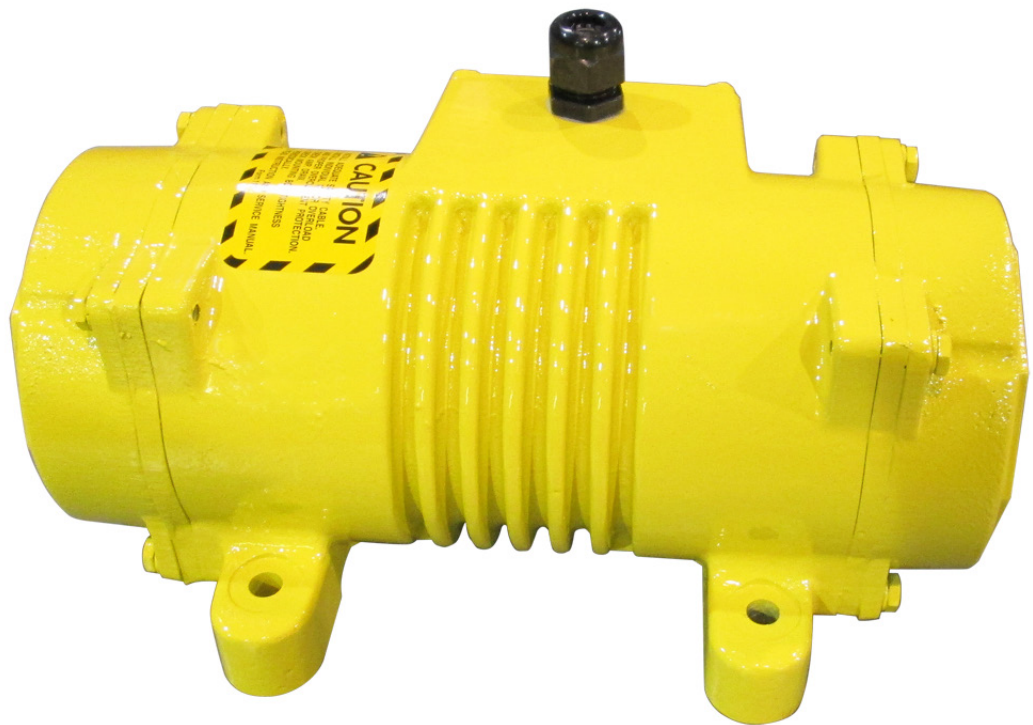




# **Cougar<sup>®</sup> D and U Series Electric Vibrators**

[Go to Cougar<sup>®</sup> D and U Series Electric Vibrators web page](#)



***Operator's Manual***  
**M3933**

# Important

MARTIN ENGINEERING HEREBY DISCLAIMS ANY LIABILITY FOR: DAMAGE DUE TO CONTAMINATION OF THE MATERIAL; USER'S FAILURE TO INSPECT, MAINTAIN AND TAKE REASONABLE CARE OF THE EQUIPMENT; INJURIES OR DAMAGE RESULTING FROM USE OR APPLICATION OF THIS PRODUCT CONTRARY TO INSTRUCTIONS AND SPECIFICATIONS CONTAINED HEREIN. MARTIN ENGINEERING'S LIABILITY SHALL BE LIMITED TO REPAIR OR REPLACEMENT OF EQUIPMENT SHOWN TO BE DEFECTIVE.

Observe all safety rules given herein along with owner and Government standards and regulations. Know and understand lockout/tagout procedures as defined by American National Standards Institute (ANSI) z244.1-1982, *American National Standard for Personnel Protection - Lockout/Tagout of Energy Sources - Minimum Safety Requirements* and Occupational Safety and Health Administration (OSHA) Federal Register, Part IV, 29 CFR Part 1910, *Control of Hazardous Energy Source (Lockout/Tagout); Final Rule*.

The following symbols may be used in this manual:



**Danger:** Immediate hazards that will result in severe personal injury or death.



**Warning:** Hazards or unsafe practices that could result in personal injury.



**Caution:** Hazards or unsafe practices that could result in product or property damages.



**Important:** Instructions that must be followed to ensure proper installation/operation of equipment.



**Note:** General statements to assist the reader.

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## **General**

Cougar<sup>®</sup> Electric Vibrators are designed and manufactured to ensure the best performance and reliability in severe-duty applications. The vibrator motor has a recommended operational ambient temperature and mounting surface temperature range of -22 to 104°F (-30 to 40°C). If operating the motor in environments beyond these temperatures, call Martin Engineering, as the vibrator may require rating reduction, more frequent lubrication, or lubrication substitution.

This manual provides instructions for installation onto steel bins and hoppers only. For installation onto other structures, call Martin Engineering or a representative.

## **References**

The following documents are referenced in this manual:

- *The National Electrical Code (NEC)*, National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy MA 02269-9101.
- American National Standards Institute (ANSI) z244.1-1982, *American National Standard for Personnel Protection - Lockout/Tagout of Energy Sources - Minimum Safety Requirements*, American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018.
- Code of Federal Regulation (CFR) 29, Part 1910, *Control of Hazardous Energy Source (Lockout/Tagout); Final Rule*, Department of Labor, Occupational Safety and Health Administration (OSHA), 32nd Floor, Room 3244, 230 South Dearborn Street, Chicago, IL 60604.
- CFR 29, Part 1910.15, *Occupational Noise Exposure*, Department of Labor, OSHA, 32nd Floor, Room 3244, 230 South Dearborn Street, Chicago, IL 60604.

## **Safety**

All safety rules defined in the above documents and all owner/employer safety rules must be strictly followed when working on the vibrator.

## **Materials required**

In addition to hand tools, the following materials are required to install this equipment:

- Martin<sup>®</sup> Safety Cable Kit, P/N 32271, or equivalent.

## **Storage**

Store vibrator in an ambient temperature not less than 41°F (5°C) with a relative humidity not more than 60%. If the vibrator has been stored for 2 or more years, remove bearings, wash them, and repack them with new grease (see “Maintenance”).

## Before Installing Vibrator

---

### **IMPORTANT**

The delivery service is responsible for damage occurring in transit. Martin Engineering CANNOT enter claims for damages. Contact your transportation agent for more information.

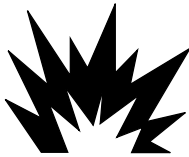
1. Inspect shipping container/pallet for damage. Report damage to delivery service immediately and fill out delivery service's claim form. Keep any damaged goods subject to examination.
2. Remove vibrator from shipping container/pallet.
3. If anything is missing contact Martin Engineering or a representative.



### **WARNING**

Turn off and lock out/tag out all energy sources to conveyor/loading systems to mounting structure.

4. Before installing vibrator, turn off and lock out/tag out all energy sources to conveyor/loading systems to mounting structure according to ANSI standards (see "References").



### **WARNING**

If equipment will be installed in an enclosed area, gas level or dust content must be tested before using a cutting torch or welding. Using a cutting torch or welding in an area with gas or dust may cause an explosion.

5. If using a cutting torch or welding, test atmosphere for gas level or dust content.
6. Mounting surface must be strong and flat, 0.01 in. (0.25 mm) across vibrator feet. (This will minimize internal stress to vibrator casting when tightening mount bolts. Welding in the area of the mounting surface could affect its flatness.)
7. Make sure mounting surface is free of paint and debris and foot of vibrator is clean.

## IMPORTANT

Read entire section before beginning work. This manual provides instructions for installations onto steel bins and hoppers only. For other installations, call Martin Engineering or a representative.

## CAUTION

If installation instructions are not followed, structure and vibrator can be damaged. Abusing or handling vibrator carelessly will accelerate wear and shorten bearing life.

### *Mounting vibrator onto structure*

1. See Figure 1. Locate vibrator in lower 1/4 to 1/3 of structure slope length. If second vibrator is required, mount 180° from first vibrator and halfway up slope.

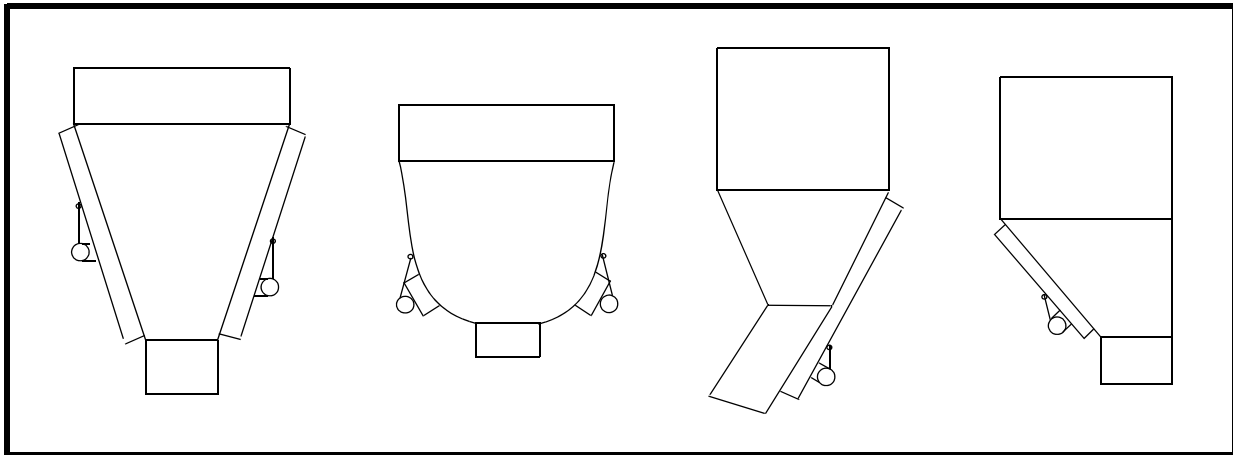


Figure 1. Locating Vibrator on Hoppers

## CAUTION

Never weld structure with vibrator mounted and wired. Welding may cause damage to motor windings and bearings.

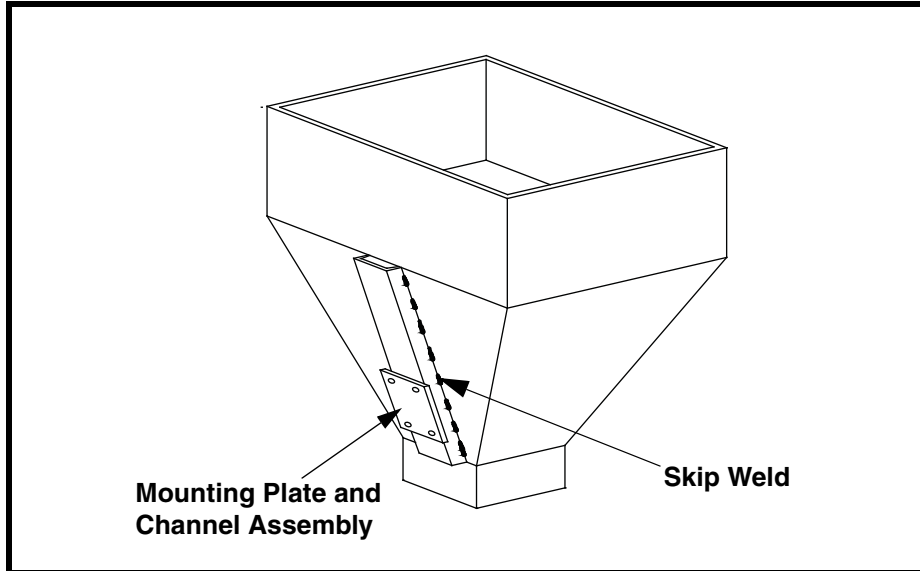
## IMPORTANT

The object of rotary vibration on bins, hoppers, and chutes is to transmit vibration through the wall into the product contained inside. If structure is not made rigid, vibrator may draw high amperage and move material less efficiently.

**Make sure structure is free of paint before mounting vibrator.**

2. If using customer-supplied mounting plate to mount vibrator onto structure, do the following:
  - a. Make sure plate is at least the size of vibrator base.
  - b. Locate plate so that vibrator can be positioned as shown in Figure 1.
  - c. Weld mounting plate onto structure.

3. If using mounting plate and channel assembly to mount vibrator onto structure (see Figure 2), do the following:
  - a. Locate channel so that vibrator can be positioned as shown in Figure 1.
  - b. Extend channel at least 3/4 the length of sloped wall. Cut off end(s) of channel if necessary to fit on structure.
  - c. Skip-weld channel in place: Weld 3 in. (76 mm), then skip 2 in. (51 mm). Repeat for entire perimeter of channel. Do not weld last 1 in. (25 mm) of either end of channel or any corner.
  - d. Install vibrator onto mounting plate.



**Figure 2. Mounting Plate and Channel Assembly**

## **CAUTION**

**Never weld structure with vibrator mounted and wired. Welding may cause damage to motor windings and bearings.**

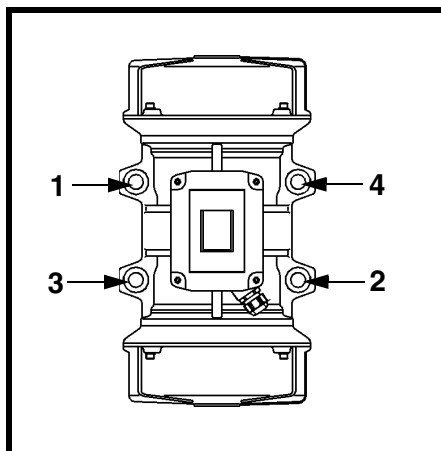
**Use only new Grade 5 bolts and lock nuts to install vibrator. Old fasteners can break and cause damage to vibrator or structure.**

**Do not use split lock washers to install vibrator onto mount. Damage to vibrator could result.**

**Tighten mounting bolts in sequence shown in Figure 3. If not tightened in order, vibrator casting could be damaged.**

4. Before installing vibrator onto mount, apply thread sealing compound to all bolts.
5. Install vibrator onto mount with new lock nuts, compression washers, and bolts according to Table I. Tighten bolts in order given in Figure 3 to avoid damaging vibrator casting. (Contact fastener manufacturer for specific information regarding bolt torque.)





**Figure 3. Mounting Bolt Tightening Sequence**

6. After the vibrator has been operated for 10 to 20 minutes, check bolt torque. Tighten if necessary.

**Table I. Mounting Bolts and Torque Requirements\***

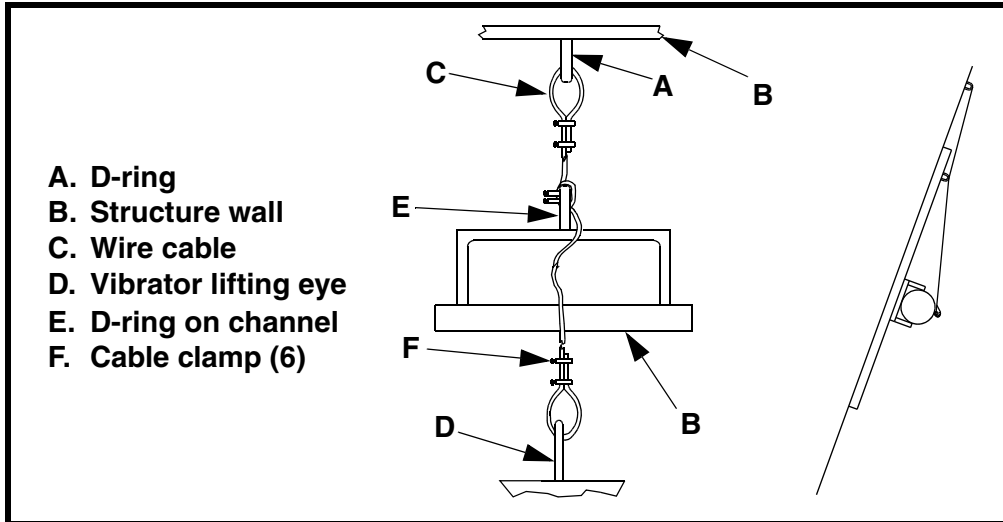
English		Metric	
Bolt Size (Gr 5)	Dry Torque (ft-lb)	Bolt Size	Dry Torque (N•m)
3/8 in. -16NC	31	M10	42
1/2 in. -13NC	75	M12	102
5/8 in. -11NC	150	M16	203
3/4 in. -10NC	265	M20	360
1 in. -8NC	640	M24	868

\*Torque specifications are for reference only. Contact fastener manufacturer for specific information regarding bolt torque.

**▲ WARNING**

**If vibrator is mounted more than 6 in. (152 mm) above ground, install cable securing vibrator to structure. Without cable, vibrator could fall and cause injury.**

7. Secure vibrator to structure by installing Martin® Safety Cable Kit, P/N 32271, or equivalent as follows:



**Figure 4. Installing Restraining Cable**

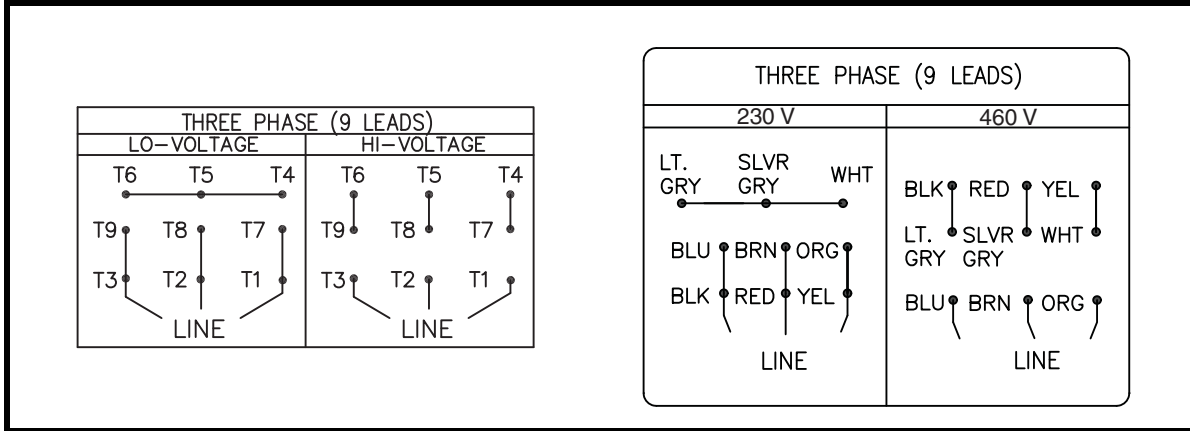
- a. Weld D-ring (A, Figure 4) onto structure wall (B) above vibrator.
- b. Loop 1/4-in. (6 mm) wire cable (C) through vibrator lifting eye (D) and D-ring on structure wall.
- c. If using a mounting plate and channel assembly, also loop cable through D-ring on channel (E) as shown. Take up slack so cable is taut.
- d. Apply thread-sealing compound to nuts on cable clamps (F). Install six cable clamps (two on each end and two on loop around D-ring on channel) to secure cable to vibrator eye and D-rings. Tighten nuts on cable clamps.
- e. Trim loose ends of wire cable.

**Connecting power to vibrator**



**Wire vibrator in accordance with National Electrical Code Article 430. Have wiring installed by a qualified electrician only.**

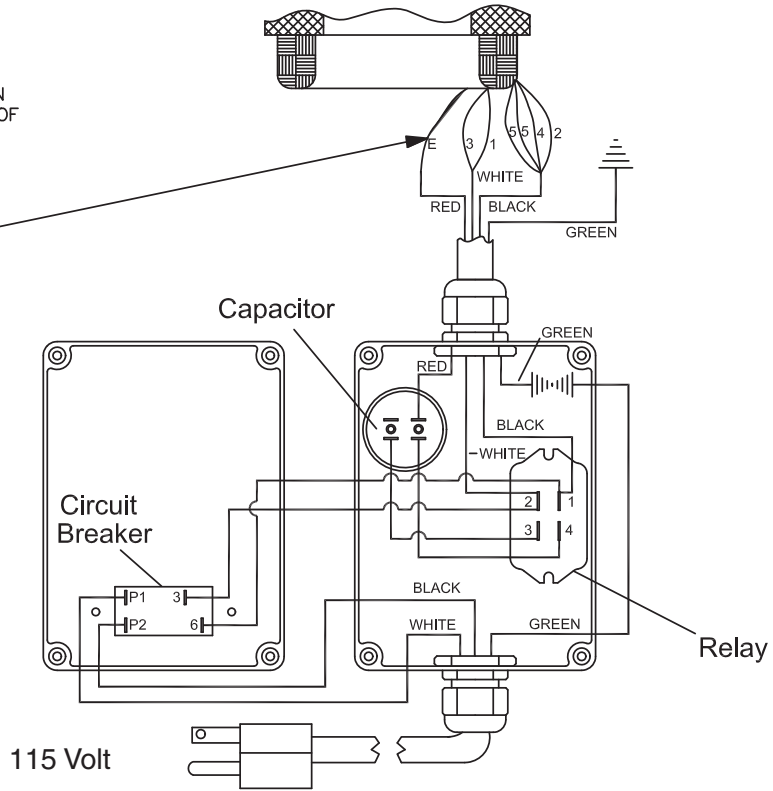
1. Find wiring diagram number for your vibrator on vibrator nameplate or see Figure 5 or 6.



**Figure 5. Three Phase Wiring Diagrams**

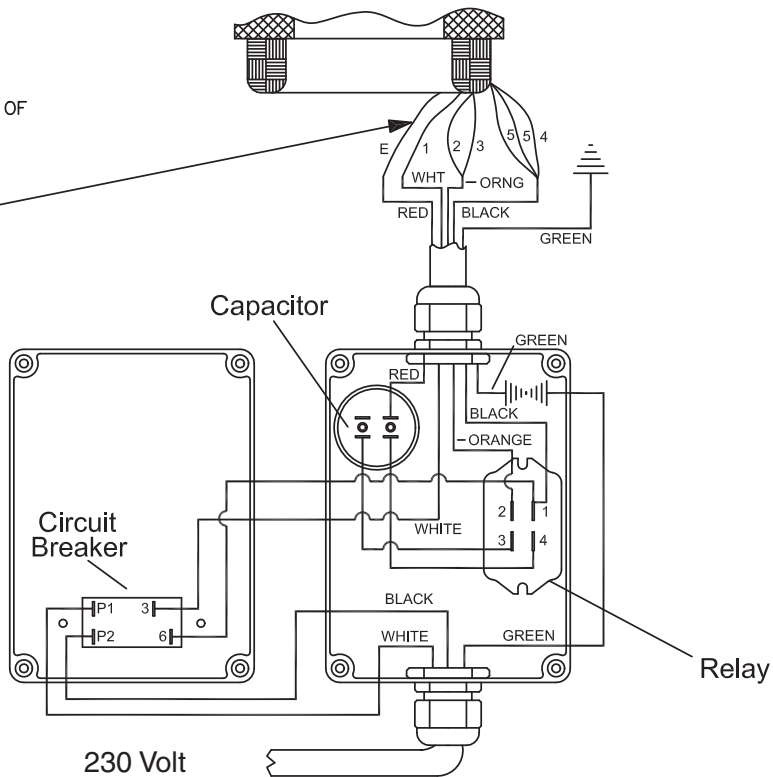
WIRING DIAGRAM GIVES COUNTER-CLOCKWISE ROTATION WHEN LOOKING AT THE CONDUIT BOX END OF THE VIBRATOR.

WIRE COLORS FROM VIBRATOR	
1.	BLUE
2.	WHITE
3.	ORANGE
4.	YELLOW
5.	BLACK
E.	WHITE WITH TAG MARKED "E"



WIRING DIAGRAM GIVES COUNTERCLOCKWISE ROTATION WHEN LOOKING AT THE CONDUIT BOX END OF THE VIBRATOR.

WIRE COLORS FROM VIBRATOR	
1.	BLUE
2.	WHITE
3.	ORANGE
4.	YELLOW
5.	BLACK
E.	WHITE WITH TAG MARKED "E"



**Figure 6. Single Phase Wiring Diagrams**

**⚠ CAUTION**

Before running cord to vibrator, make sure cord voltage rating equals or exceeds the voltage at which you will be operating the vibrator. It must have a minimum temperature rating of 221°F (105°C). If wire is not proper diameter, cord grip will not tighten properly and vibrator could be damaged by moisture or material getting inside wiring compartment. If cord is damaged, it could short power supply or short to ground causing damage to vibrator.

2. The frame size of the electric vibrator will define the size of the cord grip. Each cord grip is designed for a specific cord diameter range.

**IMPORTANT**

The compression nut must be tightened to a position that will provide proper strain relief for the cord. If the compression nut is not tight enough, the electrical connections may be stressed. If the compression nut is too tight, the cord may be damaged.

**IMPORTANT**

When wiring vibrator, leave slack in electrical cable so that cable does not become taut during vibration cycle and cause stress on wire connections. On applications where moisture is present, leave enough slack in power cable to prevent moisture from running down cable into vibrator.

3. Wire vibrator according to appropriate wiring diagram inside terminal box.

**⚠ WARNING**

Vibrator must be grounded using the power supply ground wire (or other if specified in the NEC). Failure to properly ground vibrator can cause severe injury or death.

4. Connect power supply ground wire (or other if specified in the NEC) to ground vibrator terminal.
5. Reassemble wiring cover, o-ring, and rubber compression block(s), taking care not to pinch the o-ring. Tighten cord grip around supply line(s).

## *Installing overload, short-circuit, and ground-fault protection*

### **⚠ CAUTION**

**Install overload protection for vibrator. If vibrator is not protected from overload, vibrator can be destroyed and warranty will be void. Determine size of overload protection according to NEC Article 430 and have it installed by a qualified electrician only.**

1. Determine overload, short-circuit, and ground-fault protection according to NEC Article 430.

### **NOTE**

**All single-phase vibrators are supplied with overload protection.**

2. Have qualified electrician install overload, short-circuit, and ground-fault protection.
3. If overload trips during operation, fix problem before resetting.

### **⚠ CAUTION**

**For vibratory equipment using two vibrators (such as feeders, screens and bin dischargers), the two motors must be electrically interlocked. If using a single contactor, each motor must be provided with separate overload protection. The motor control circuit must be arranged so that if one motor becomes de-energized, the other motor will automatically and immediately become de-energized. Failure to properly interlock motors could result in severe damage to equipment if one vibrator fails.**

4. If using two vibrators, interlock the two vibrator motors and install separate overload protection for each.

## After Installing Vibrator

### Checking shaft rotation

#### CAUTION

DO NOT run vibrator with eccentric weights removed. Running vibrator with eccentric weights removed will damage bearings.

#### WARNING

When checking shaft rotation with weight cover removed, keep hands away from swinging weights. Weights can crush fingers.

1. Remove cap screws, washers, and vibrator weight covers.
2. Start vibrator for one second, then stop.
3. Observe direction of motor rotation. If motor is not rotating in correct direction, lock out/tag out energy source and reverse rotation. To reverse rotation of three-phase vibrator, reverse any two of the three power supply wires.
4. Replace weight cover, taking care not to pinch o-ring.

#### NOTE

All Cougar® Electric Vibrators have one set of eccentric weights on each end of shaft. Eccentric weights are set at 60% at factory.

The percentage increments on the weight or on the weight adjustment disks are percentages of the total force pounds listed on the nameplate. For example, if the nameplate shows 8340 lb, setting the weights to 60% would produce 5004 pounds of force.

#### IMPORTANT

For the most efficient operation, vibrator eccentric weights should be adjusted to the lowest force setting required to move the material. This will increase vibrator life and reduce energy costs.



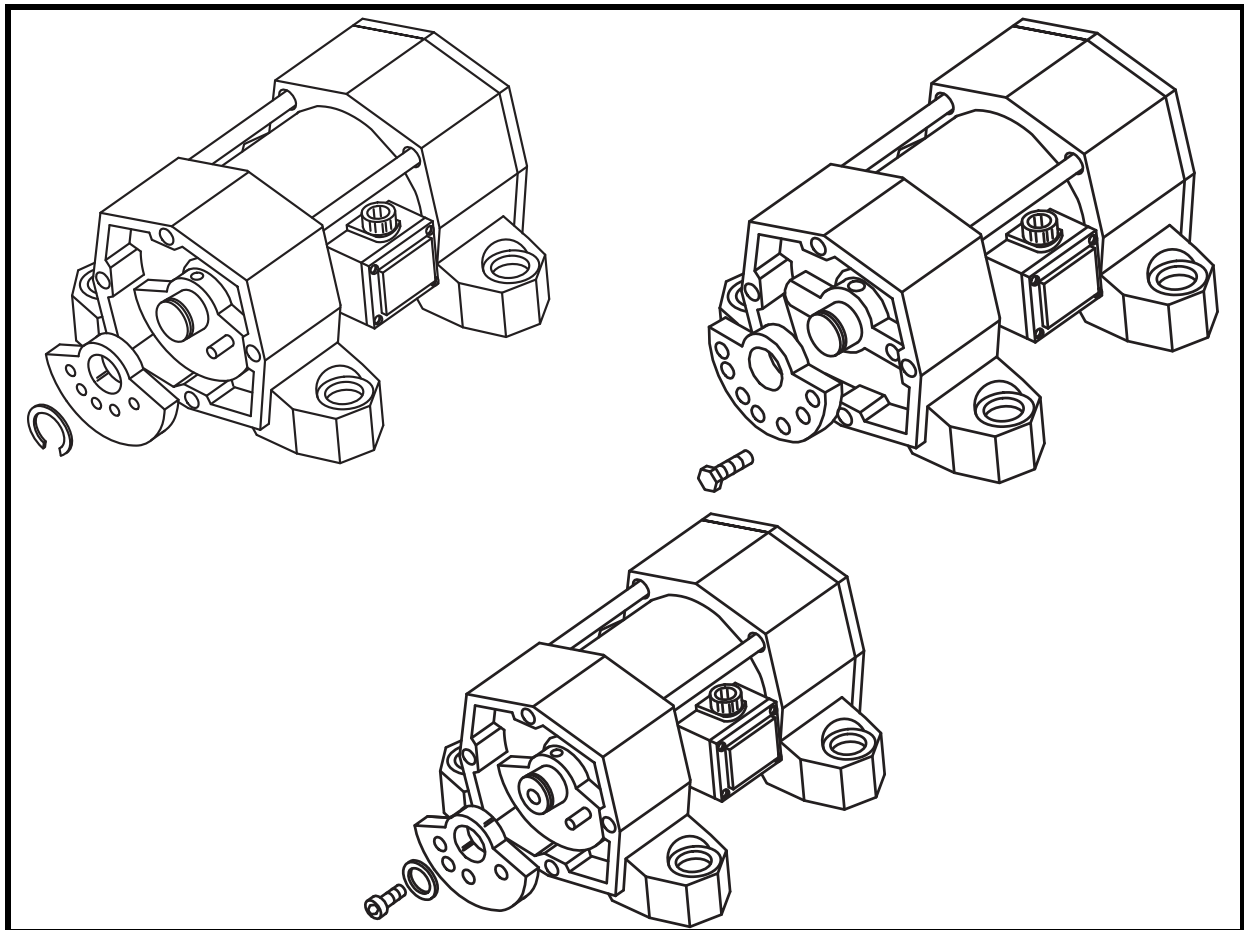
#### WARNING

Before adjusting eccentric weights, turn off and lock out/tag out energy source to vibrator.

#### NOTE

The fixed weight is keyed to the shaft. The adjustable weight rotates around the shaft.

### Adjusting eccentric weights



**Figure 7. Adjusting Eccentric Weights**

1. Turn off and lock out/tag out energy source to vibrator according to ANSI standards (see “References”).
2. Weight adjustment for:
  - a. Model D-950:
    - (1) Remove both end caps.
    - (2) Remove “E” clip and adjust eccentric weights to desired pin location. Make sure both ends of vibrator are set the same.
    - (3) Replace “E” clip and end caps, tightening all screws.
  - b. Model D3-5400:
    - (1) Remove both end caps.
    - (2) Remove hex head bolt from the end of vibrator shaft.
    - (3) Adjust eccentric weights to desired pin location. Make sure both ends of the vibrator are set the same.
    - (4) Replace shaft bolts and end caps, tightening all screws.
  - c. Model D-500, D3-2400, D3-3600, U1-500, and U1-1600:
    - (1) Remove both end caps.
    - (2) Remove adjustment screw from eccentric weight.
    - (3) Rotate eccentric weight to desired setting and reinstall adjustment screw and end caps. Make sure both ends of the vibrator are set the same and tighten all screws.



**⚠ CAUTION**

Adjust both sets of eccentric weights to same setting number (mirror images) or force output will be uneven.

3. Make sure both sets of weights are set to same setting number so they are mirror images, as shown in Figure 8.

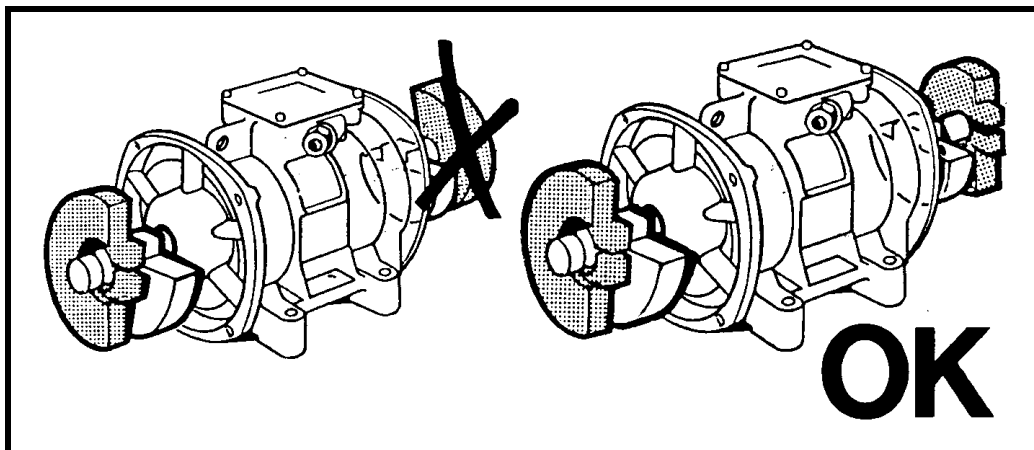


Figure 8. Setting Sets of Eccentric Weights to Mirror Images

***Initial start up/  
checking line  
current***

1. Close power supply disconnect switch and allow motor(s) to operate for 10 to 20 minutes.
2. If vibrator makes unusual or excessive noise, make sure mounting bolts are tight and mount welds are not damaged.

**⚠ WARNING**

Vibrator may produce loud noise during operation when mounted on structure. See OSHA 1910.95 for guidelines. If required, wear ear protection to avoid impairment or loss of hearing.

3. Check decibel level of vibrator noise during operation. See OSHA 1910.95 to determine whether noise exceeds safe limits. If required, wear ear protection to avoid impairment or loss of hearing.

**⚠ CAUTION**

Do not allow motor current to exceed nameplate rating. If vibrator is operated continuously with line current above nameplate rating, vibrator can be damaged.

4. After a few hours of operation, check each line current. If reading is higher than nameplate rating, reduce eccentric weight setting, stiffen vibrator mount, or move vibrator to more rigid location. After making adjustments, check line current again to ensure line current does not exceed nameplate rating.
5. After first 8 hours of use and periodically thereafter, check mounting bolts and tighten if necessary.

*Variable  
frequency inverter*

**⚠ CAUTION**

**All motors can be supplied with a variable frequency inverter. NEVER operate the motor at a frequency higher than that specified on the nameplate. Damage to vibrator can result.**

Do not operate vibrator motor at frequency higher than specified on nameplate. Throughout frequency range, verify that each line current does not exceed current rating on nameplate. If reading is higher than nameplate, consult inverter manual. If necessary, adjust inverter, reduce eccentric weight setting, stiffen vibrator mount location, or move vibrator to more rigid location. After making adjustment, check line current again to ensure line current does not exceed nameplate rating.

## IMPORTANT

Read entire section before beginning work. Allow vibrator to cool to ambient temperature before working on it.



## WARNING

Turn off and lock out/tag out all energy sources to vibrator and conveyor/loading systems before performing maintenance.

### *Lubricating vibrator*

## NOTE

All vibrators are lubricated for life at the factory.

### *Repairing motor and replacing bearings*

## CAUTION

Do not attempt to repair vibrator motor or replace bearings yourself. If you attempt to do so during the warranty period, the warranty may be void.

If vibrator motor needs repair or if bearings need to be replaced, call Martin Engineering at **800-544-2947** for instructions.

### *Inspecting vibrator*

## WARNING

Before inspecting vibrator, turn off and lock out/tag out energy source to vibrator.

1. At least quarterly, inspect vibrator, cable, and connections as follows:
  - a. Turn off and lock out/tag out energy source to vibrator according to ANSI standards (see “References”).
  - b. Inspect weight covers for cracks and check cap screws for tightness.
  - c. Inspect cable for damage including cuts and abrasions. Replace if damaged.
  - d. Inspect ground connection. Make sure ground connection to motor enclosure does not exceed 0.1 ohm. Ensure screw on ground terminal is tightened to proper torque.
  - e. Make sure all wiring connections are tightened properly.

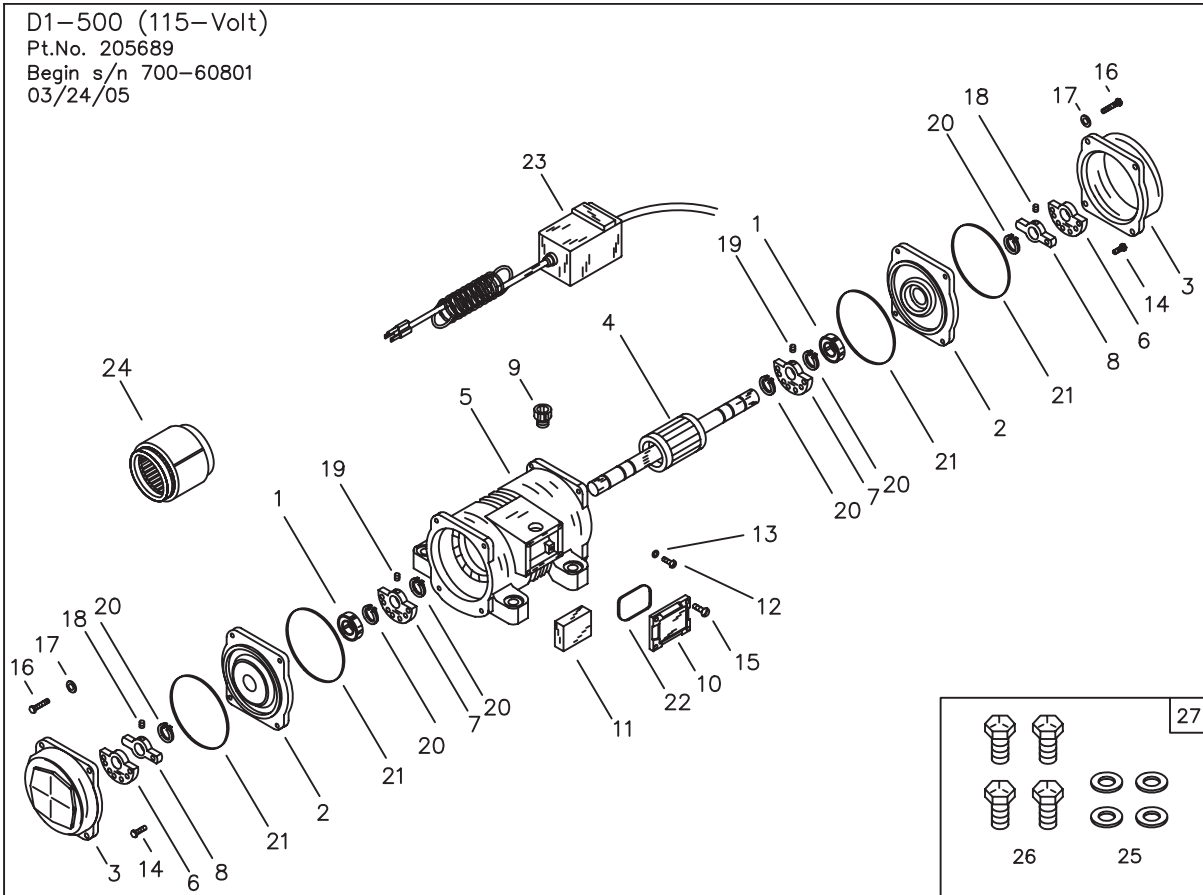
## Part Numbers

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This section provides product names and corresponding part numbers for Cougar<sup>®</sup> Electric Vibrators and related equipment. Please reference part numbers when ordering parts:

**Table II. Cougar<sup>®</sup> Electric Vibrator Model Numbers and Part Numbers**

<b>Model Number</b>	<b>Part Number</b>
D1-500	205689
D1-950	205520
D3-500	205700
D3-950	205236
D3-2400	205310
D3-3600	205296-01
D3-5400	205261
U1-500	205636
U1-1600	205667



Item No.	Part No.	Description	No. Req.	Item No.	Part No.	Description	No. Req.
1.	100107	Bearing	2	23.	19427403	Switch Box 115 V	1
2.	120192	Endbell	2	24.	160220	Stator	1
3.	130215	End Cap	2	25.	517696	Compression washer	4
4.	150384	Rotor ass'y	1	26.	500084	Bolt	4
5.	162006	Housing ass'y	1	27.	221538	Mount Kit	1
6.	170758	Weight	2				
7.	170759	Weight	2				
8.	170763	Adj. Ring	2				
9.	194851	Cord Holder	1				
10.	196509	Box Cover	1				
11.	19655401	Foam Packing	1				
12.	197060	Screw	1				
13.	197061	Washer	1				
14.	500002	Bolt	2				
15.	521477	Screw	4				
16.	500005	Bolt	8				
17.	517798	Lock Washer	8				
18.	519884	Set Screw	2				
19.	519867	Set Screw	2				
20.	530224	Snap ring	6				
21.	603013	"O" ring	4				
22.	603014	"O" ring	1				

Figure 9. Cougar® Electric Vibrator, Model D1-500

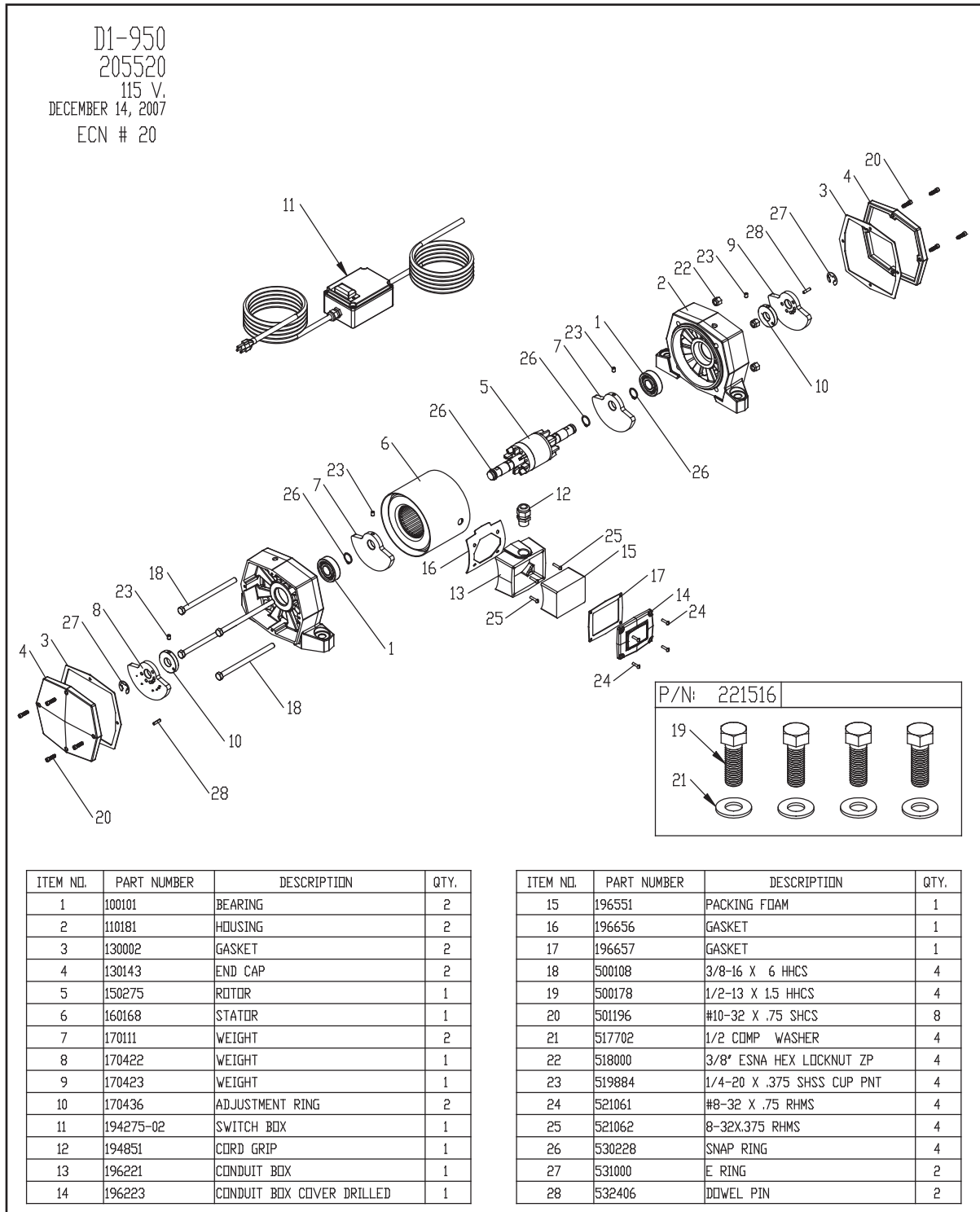
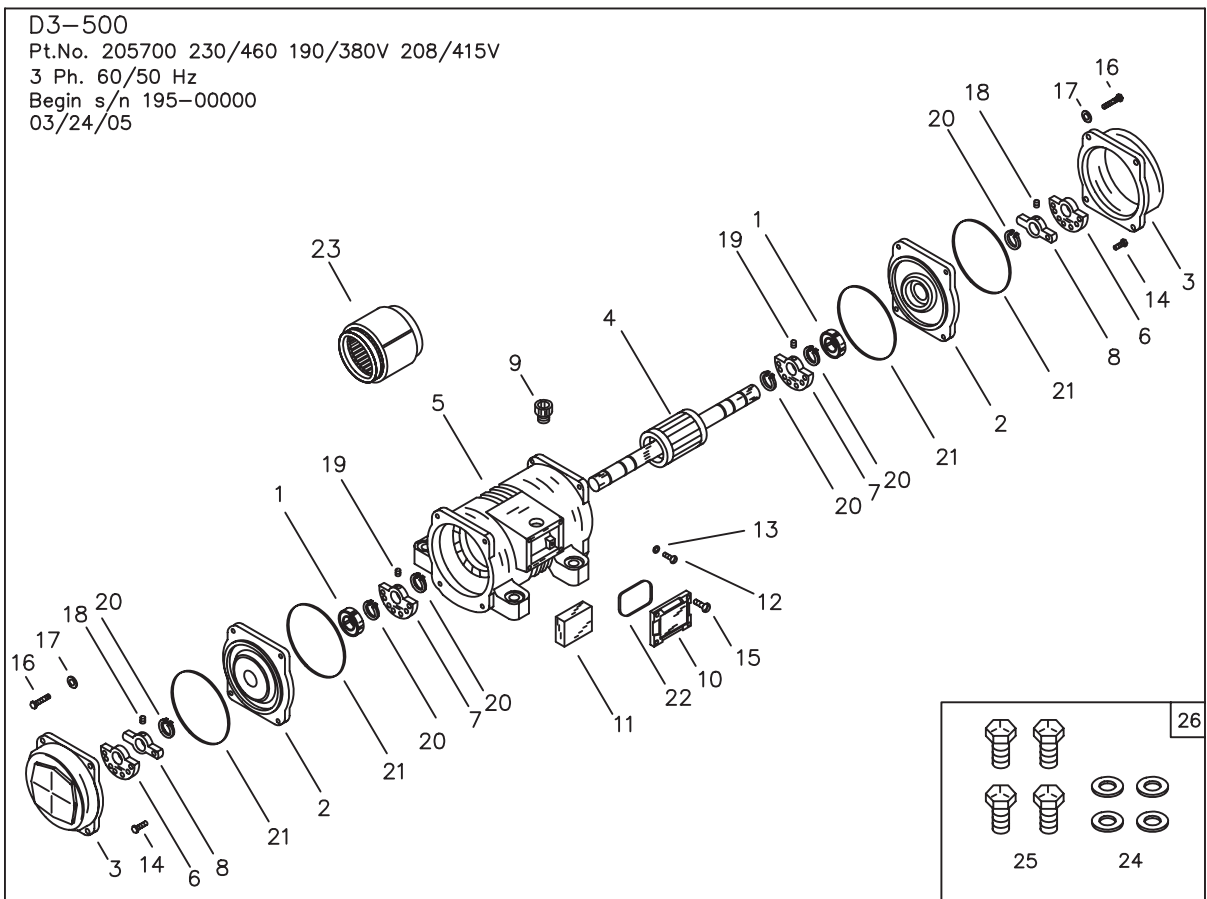


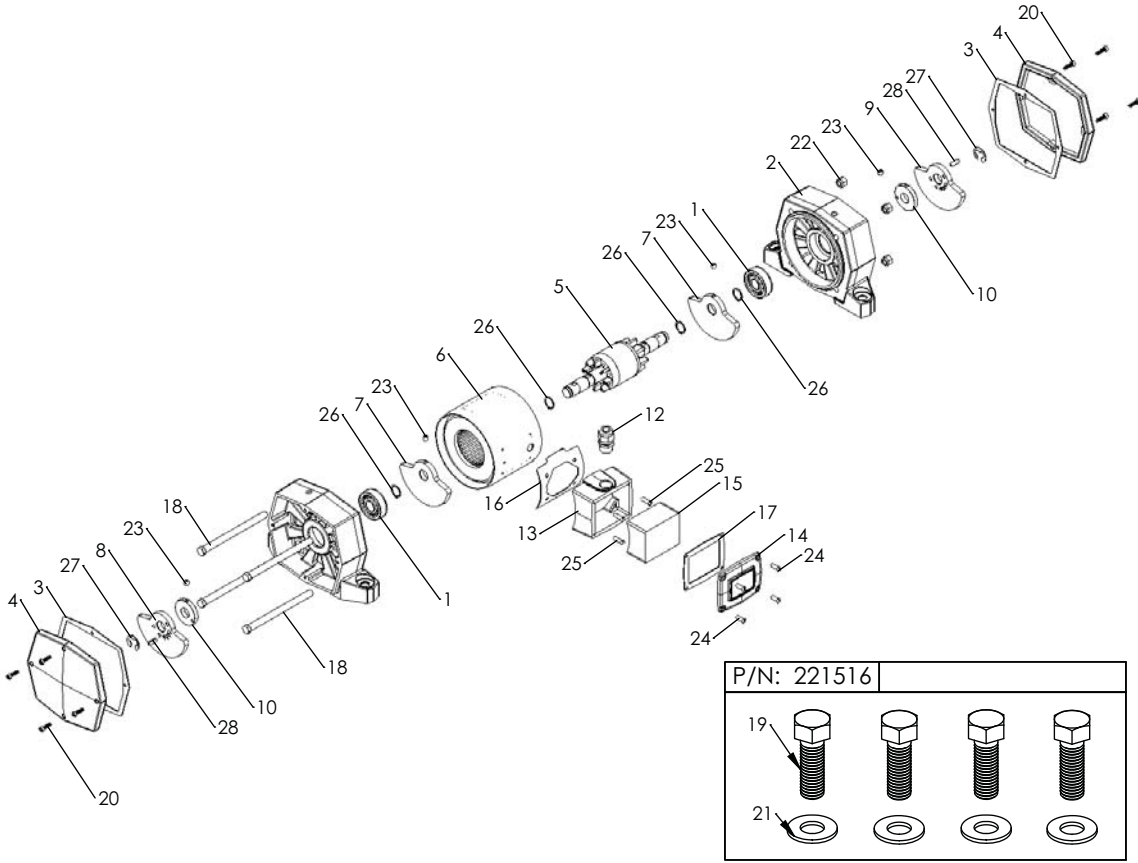
Figure 10. Cougar® Electric Vibrator, Model D1-950



Item No.	Part No.	Description	No. Req.	Item No.	Part No.	Description	No. Req.
1.	100107	Bearing	2	23.	160219	Stator (230/460V)	1
2.	120192	Endbell	2	24.	517696	Compression washer	4
3.	130215	End Cap	2	25.	500084	Bolt	4
4.	150384	Rotor ass'y	1	26.	221538	Mount Kit	1
5.	110324	Housing	1				
6.	170758	Weight	2				
7.	170759	Weight	2				
8.	170763	Adj. Ring	2				
9.	194851	Cord Holder	1				
10.	196509	Box Cover	1				
11.	19655401	Foam Packing	1				
12.	197060	Screw	1				
13.	197061	Washer	1				
14.	500002	Bolt	2				
15.	521477	Screw	4				
16.	500005	Bolt	8				
17.	517798	Lock Washer	8				
18.	519884	Set Screw	2				
19.	519867	Set Screw	2				
20.	530224	Snap ring	6				
21.	603013	"O" ring	4				
22.	603014	"O" ring	1				

**Figure 11. Cougar® Electric Vibrator, Model D3-500**

D3-950  
205236  
230/460 V.  
DECEMBER 13, 2007



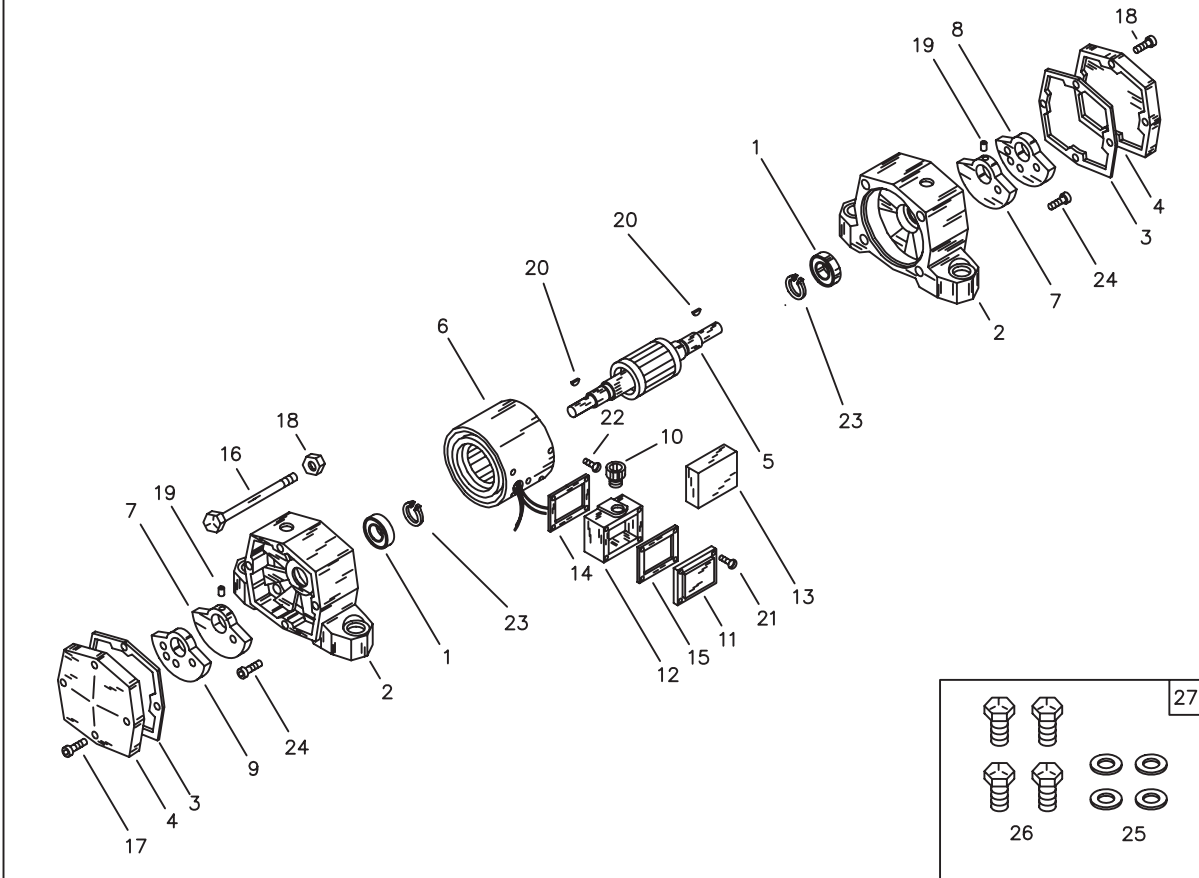
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	100101	BEARING	2
2	110181	HOUSING	2
3	130002	GASKET	2
4	130143	END CAP	2
5	150275	ROTOR	1
6	160167	STATOR	1
7	170111	WEIGHT	2
8	170422	WEIGHT	1
9	170423	WEIGHT	1
10	170436	ADJUSTMENT RING	2
12	194851	CORD GRIP	1
13	196221	CONDUIT BOX	1
14	196223	CONDUIT BOX COVER DRILLED	1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
15	196551	PACKING FOAM	1
16	196656	GASKET	1
17	196657	GASKET	1
18	500108	3/8-16 X 6 HHCS	4
19	500178	1/2-13 X 1.5 HHCS	4
20	501196	#10-32 X .75 SHCS	8
21	517702	1/2 COMP WASHER	4
22	518000	3/8" HEX NUT-NYLOCK	4
23	519884	1/4-20 X .375 SHSS CUP PNT	4
24	521061	#8-32 X .75 RHMS	4
25	521062	8-32X.375 RHMS	4
26	530228	SNAP RING	4
27	531000	E RING	2
28	532406	DOWEL PIN	2

Figure 12. Cougar® Electric Vibrator, Model D3-950



D3-2400  
Pt No. 205310 230/460 V.  
7/27/09

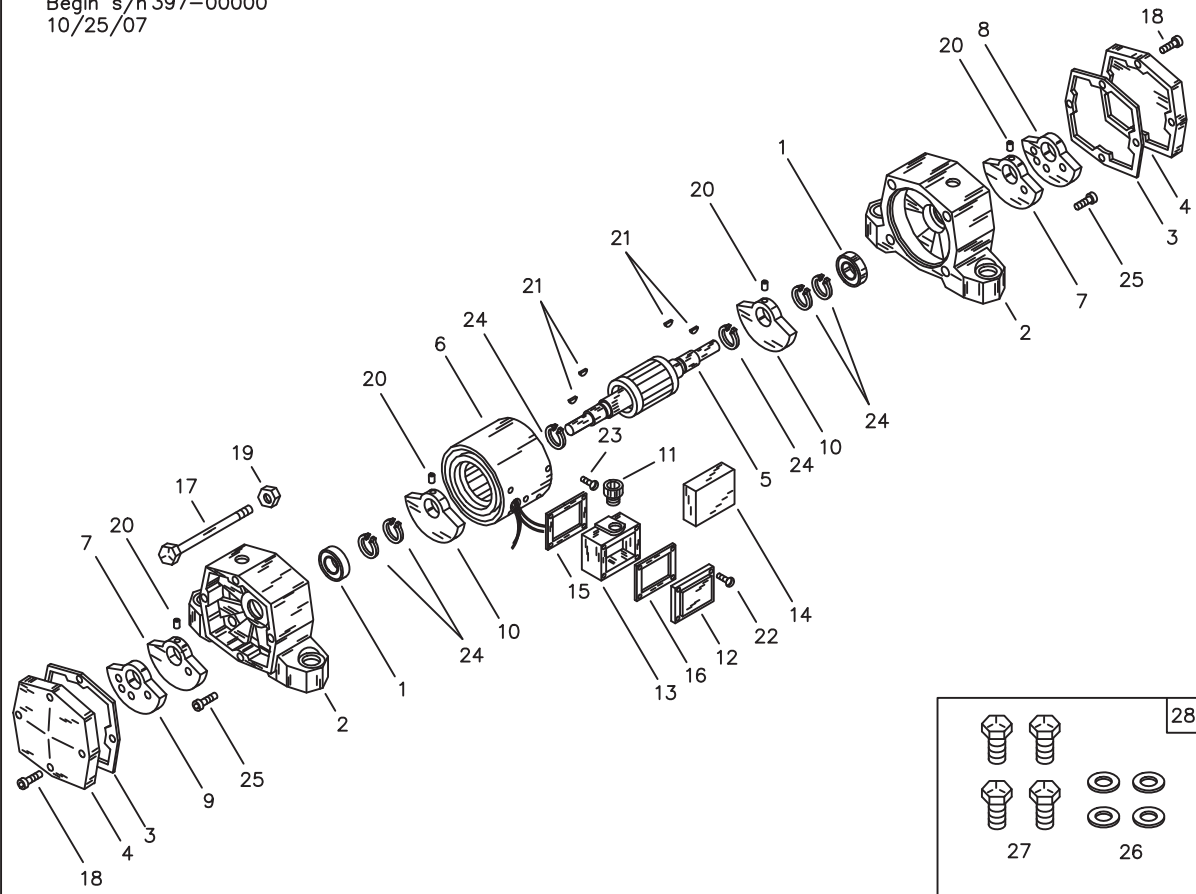


Item No.	Part No.	Description	No. Req.	Item No.	Part No.	Description	No. Req.
1.	100136	Bearing	2	17.	501216	Screw	8
2.	110237	Housing	2	18.	518002	Nut	4
3.	130003	Gasket	2	19.	519884	Set screw	2
4.	130147	End cap	2	20.	520798	Woodruff Key	2
5.	15032301	Rotor	1	21.	521061	Screw	4
6.	160170	Stator (230/460 v.)	1	22.	521062	Screw	4
7.	17041001	Weight	2	23.	530235	Snap ring	2
8.	17041101	Weight	1	24.	501217	Screw	2
9.	17041201	Weight	1	25.	517708	Compression washer	4
10.	194851	Cord holder	1	26.	500308	Bolt	4
11.	196223	Box cover	1	27.	221518	Mount Kit	1
12.	196225	Box	1				
13.	196551	Foam packing	1				
14.	196656	Gasket	1				
15.	196657	Gasket	1				
16.	500203	Bolt	4				
					20020101	Vib. only (230/460 v.)	

**Figure 13. Cougar® Electric Vibrator, Model D3-2400**

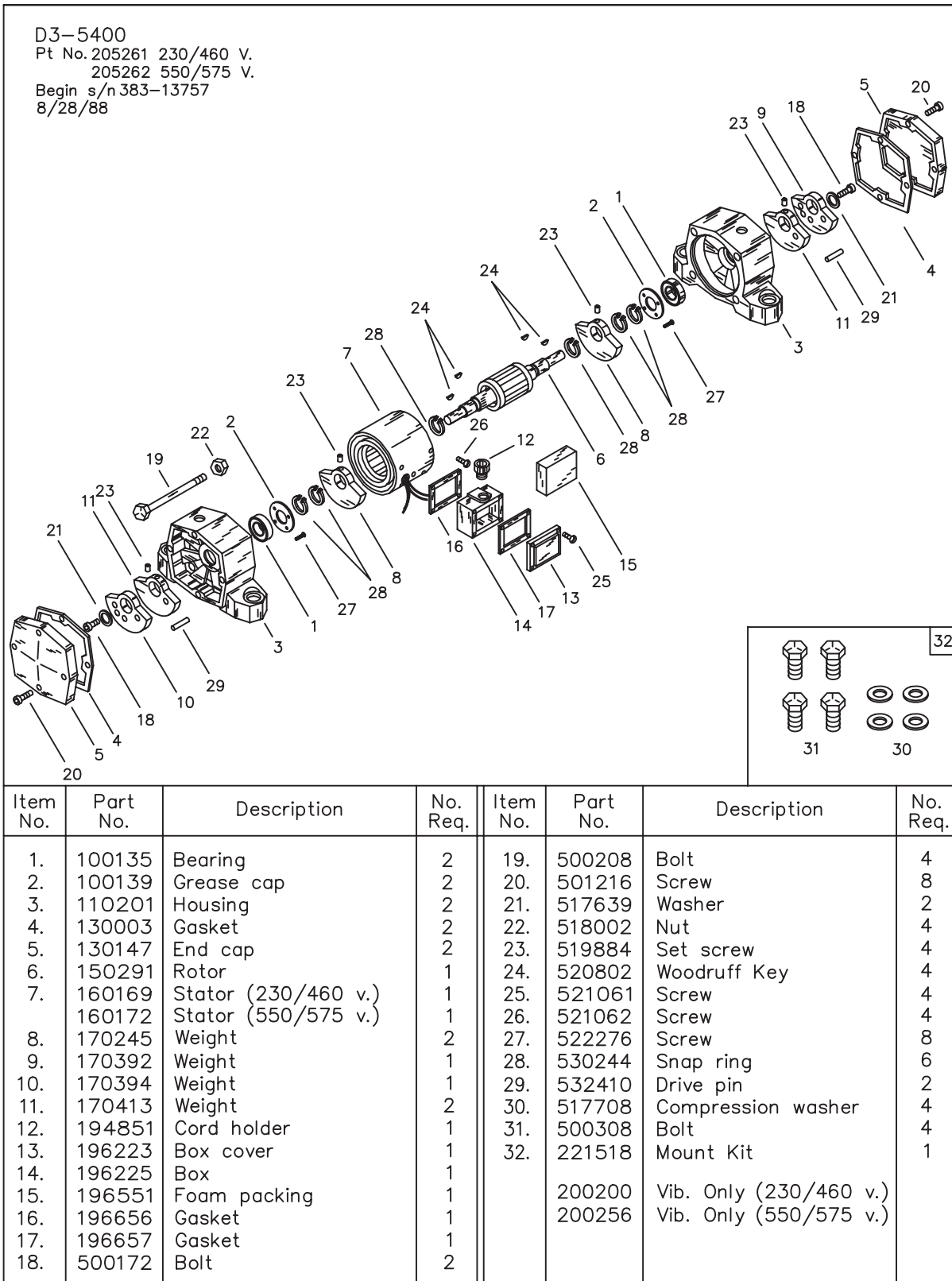
# Part Numbers

D3-3600  
 Pt No. 205296-01 230/460 V.  
 Begin s/n 397-00000  
 10/25/07



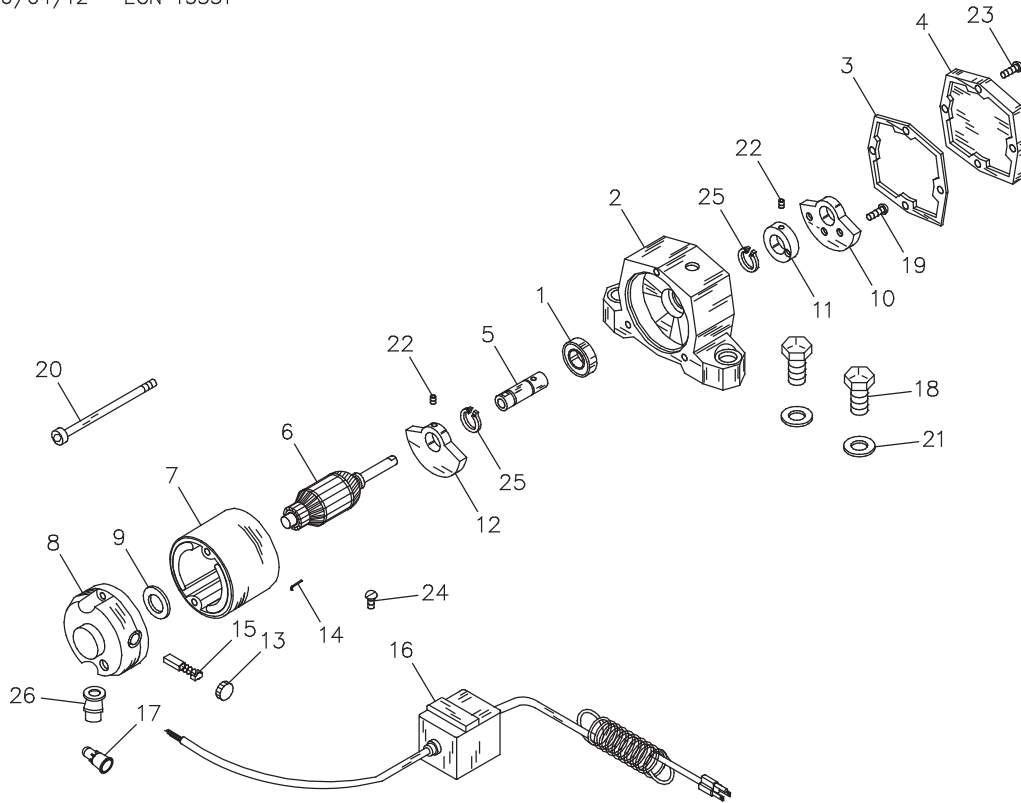
Item No.	Part No.	Description	No. Req.	Item No.	Part No.	Description	No. Req.
1.	100136	Bearing	2	18.	501216	Screw	8
2.	110237	Housing	2	19.	518002	Nut	4
3.	130003	Gasket	2	20.	519884	Set screw	4
4.	130147	End cap	2	21.	520798	Woodruff Key	4
5.	15032301	Rotor	1	22.	521061	Screw	4
6.	160170	Stator (230/460 v.)	1	23.	521062	Screw	4
7.	17041001	Weight	2	24.	530235	Snap ring	6
8.	17041101	Weight	1	25.	501217	Screw	2
9.	17041201	Weight	1	26.	517708	Compression washer	4
10.	170528	Weight	2	27.	500308	Bolt	4
11.	194851	Cord holder	1	28.	221518	Mount Kit	1
12.	196223	Box cover	1				
13.	196225	Box	1				
14.	196551	Foam packing	1				
15.	196656	Gasket	1				
16.	196657	Gasket	1				
17.	500203	Bolt	4				
					20020101	Vib. only (230/460 v.)	

**Figure 14. Cougar® Electric Vibrator, Model D3-3600**



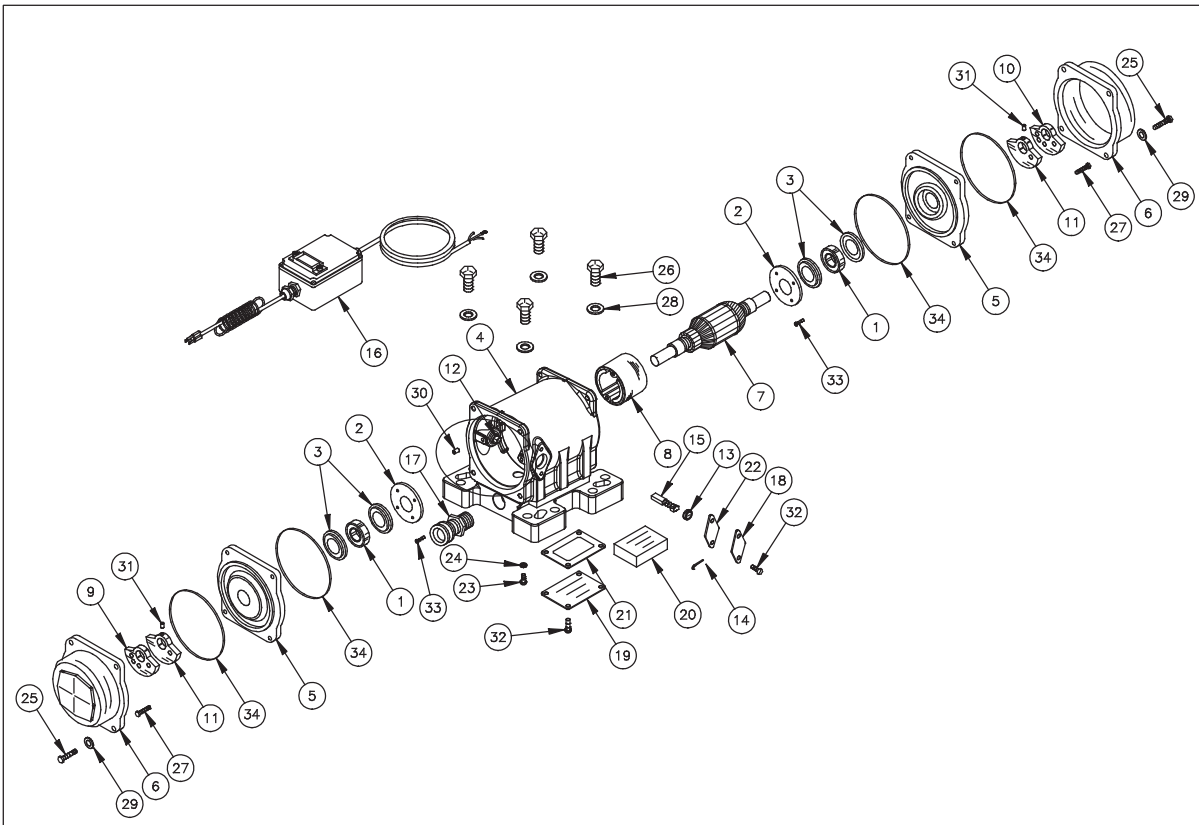
**Figure 15. Cougar® Electric Vibrator, Model D3-5400**

U1-500  
P/N 205636  
06/04/12 ECN 13351



Item No.	Part No.	Description	No. Req.	Item No.	Part No.	Description	No. Req.
1.	CG-100101	Bearing	1	23.	521062	Screw	4
2.	110203	Housing	1	24.	522984	Screw	1
3.	130004	Gasket	1	25.	530228	Retaining Ring	2
4.	130159	End Cap	1	26.	194956	Strain Relief Bushing	1
5.	150365	Sleeve	1	27.	CG-100328-01	Cougar Vibration Label	1
6.	150366	Armature	1	28.	FORM #119	Caution-Electric	1
7.	168041	Field	1	29.	CG-100327	Cougar Vibration Label	1
8.	160137-01	End Bell	1	30.	FORM #131	Instructional Tag	1
9.	160145	Washer	1	31.	FORM #710	Installation Instructions	1
10.	170739	Weight	1				
11.	170740	Adjustment Ring	1				
12.	170744	Weight	1				
13.	190135	Brush Cap	2				
14.	190136	Clip	2				
15.	190144	Brush	2				
16.	194273-02	Switchbox	1				
17.	196701	Splice Cap	1				
18.	CG-500082	Screw	2				
19.	502601	Screw	1				
20.	503994	Screw	2				
21.	CG-517696	Washer Compression	2				
22.	520368	Set Screw	2				

**Figure 16. Cougar® Electric Vibrator, Model U1-500**



ITEM	QTY.	DESCRIPTION	PART NUMBER
1	2	BEARING SINGLE BALL W/NO SHIELDS	CG-100183
2	2	BEARING RETAINERS	CG-100184
3	4	SEAL	CG-100227
4	1	HOUSING, FINISHED	110288-05
5	2	BEARING BELL	120197
6	2	END CAP	130207
7	1	ARMATURE	168517
8	1	FIELD	168519
9	1	WEIGHT	170770
10	1	WEIGHT	170771
11	2	WEIGHT	170772
12	2	BRUSH HOLDER	190132
13	2	BRUSH CAP	190135
14	2	CLIP	190136
15	2	BRUSH	190144
16	1	SWITCH BOX	194295-04
17	1	CORD GRIP	194852
18	2	BRUSH COVER	196505
19	1	CONDUIT BOX COVER	196506
20	.33	POLYFOAM	196551

ITEM	QTY.	DESCRIPTION	PART NUMBER
21	1	GASKET	196659
22	2	GASKET	196660
23	1	GROUND SCREW	197060
24	1	CUP WASHER	197061
25	8	SCREW HHCS 1/4-20 X 1-1/4 GR5 ZP	500007
26	4	SCREW HHCS 3/8-16 X 1-1/2 GR5 ZP	CG-500084
27	2	SCREW SHC 10-32 X 3/4 PF	501196
28	4	WASHER COMPRESSION	CG-517696
29	8	WASHER LOCK SPLIT 1/4 ZP	CG-517798
30	2	SCREW SHSS 8-32 X 3/16	519851
31	2	SCREW SHSS 1/4-20 X 3/8	519884
32	8	SCREW RHMS SLOT 8-32 X 3/8 ZP	521057
33	8	SCREW PHMS SLOT 6-32 X 3/8 ZP	523384
34	4	O-RING	603008
NS 35	2	SPLICE CAPS	196701
36	2	COUGAR VIBRATION LABEL	CG-100328-2
NS 37	1	CAUTION-ELECTRIC	FORM #119
NS 38	1	COUGAR VIBRATION LABEL	CG-100327
NS 39	1	ELECTRIC VIBRATOR INSTRUCTIONAL TAG	FORM #131
NS 40	1	INSTALLATION INSTRUCTIONS	FORM #710

NS = NOT SHOWN

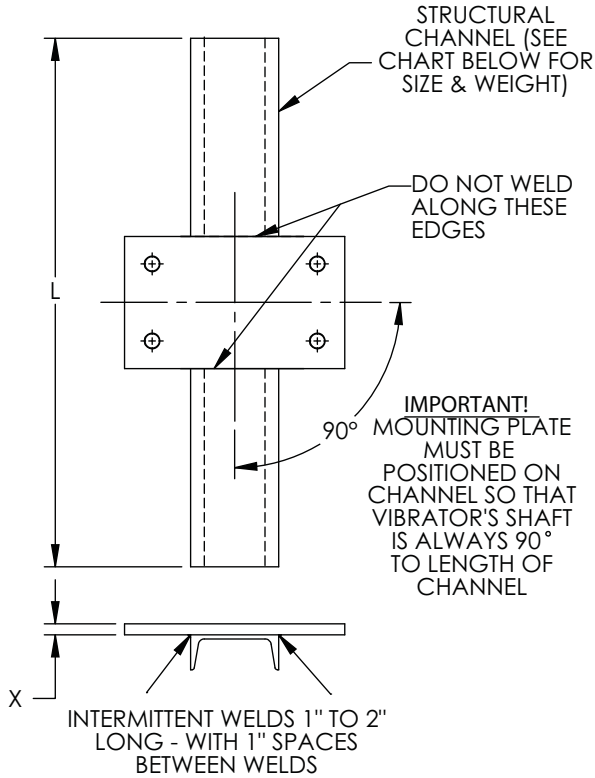
**Figure 17. Cougar® Electric Vibrator, Model U1-1600**



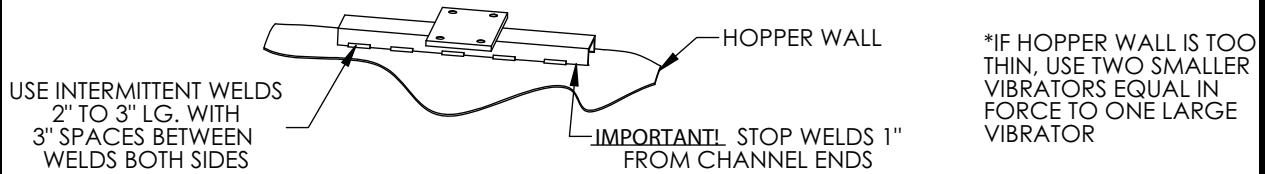
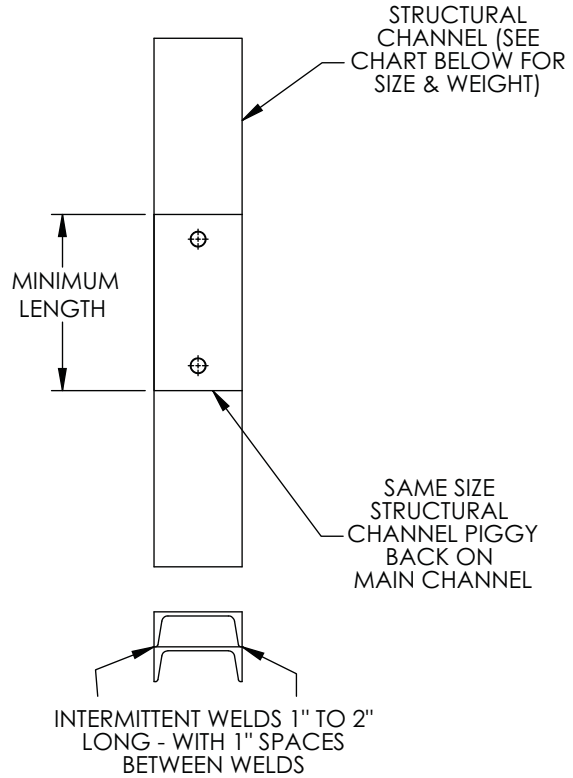
**Appendix**  
**Cougar® Electric Vibrators**  
**Mount Plate and Channel Fabrication Details**

NOTE: ALL WELDING SHOULD BE DONE WITH NORMAL MILD STEEL ROD WHEN ATTACHING MOUNTING ASS'Y. TO MILD STEEL STRUCTURES.  
 THESE SAME STRUCTURAL MILD STEEL CHANNELS CAN BE WELDED TO A STAINLESS STEEL HOPPER WALL BY USING A ROD OF THE SAME TYPE OF STAINLESS STEEL AS THE HOPPER IS.

### 4 BOLT MOUNTING



### 2 BOLT MOUNTING

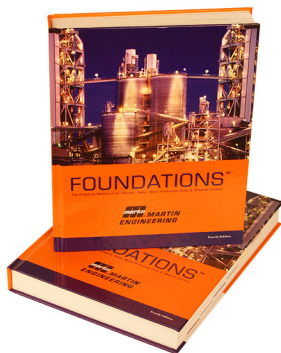


MAXIMUM CENTRIFUGAL FORCE OF VIBRATION	MIN. HOPPER WALL THICKNESS ALLOWABLE *	CHANNEL LENGTH L	MT'G. PLATE THICKNESS X	CHANNEL SIZE AND WEIGHT
200	12 GAUGE	18" - 24"	1/4"	4" C @ 5.4#
500	1/8"	20" - 26"	3/8"	4" C @ 5.4#
700	1/8"	24" - 30"	1/2"	4" C @ 5.4#
900	3/16"	36" - 48"	1/2"	4" C @ 5.4#
1300	3/16"	40" - 50"	3/4"	4" C @ 7.25#
2500	1/4"	54" - 60"	3/4"	6" C @ 10.5#
3500	3/8"	60" - 72"	1"	6" C @ 10.5#
5000	1/2"	72" - 84"	1 1/4"	10" C @ 20#



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