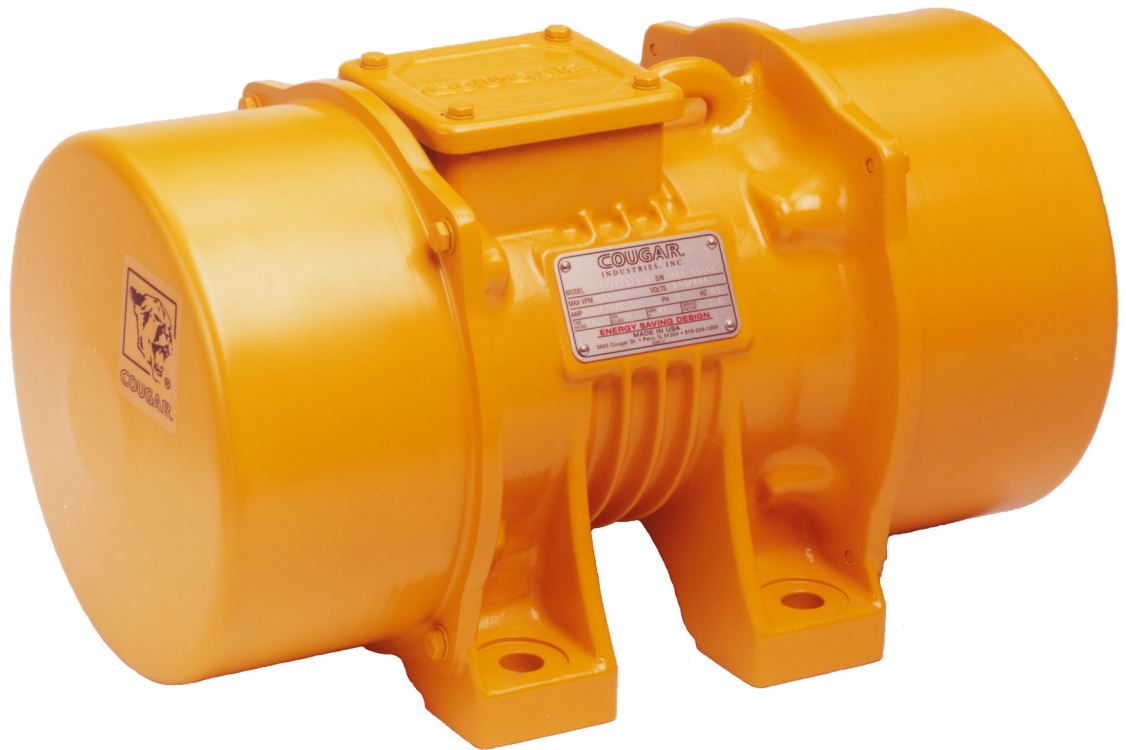




Cougar[®] B Series Electric Vibrators 2A Frame

[Go to Cougar[®] B Series Electric Vibrators web page](#)



Operator's Manual
M3928

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[®] 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:

- Mounting plate and channel assembly , P/N 32401-B2.
- Martin[®] 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.

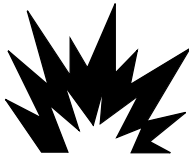
1. Inspect shipping container/pallet for damage. Report damage to delivery service immediately and fill out delivery service's claim form. Keep any damaged goods subject to examination.
2. Remove vibrator from shipping container/pallet.
3. If anything is missing contact Martin Engineering or a representative.



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.

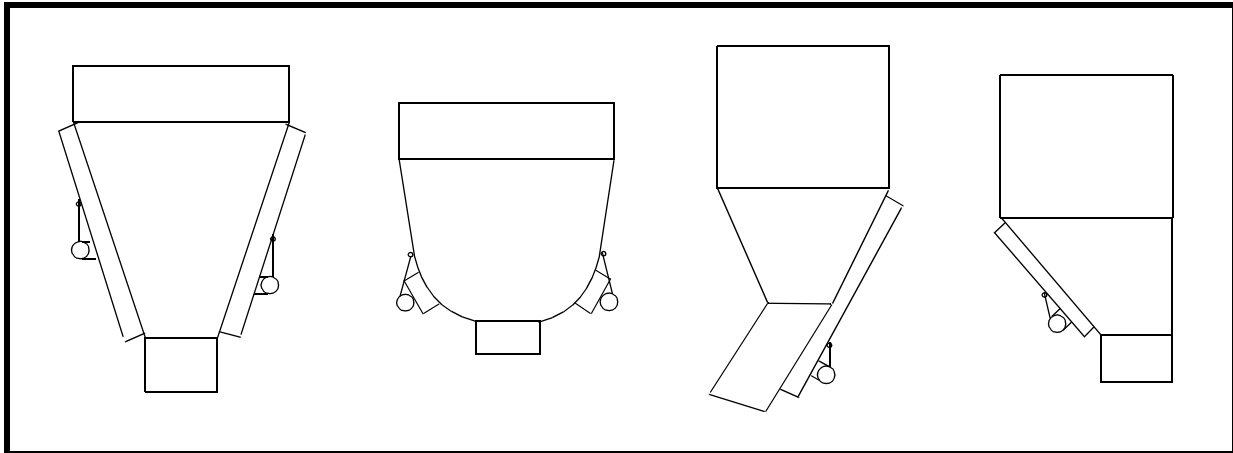


Figure 1. Locating Vibrator on Hoppers

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.

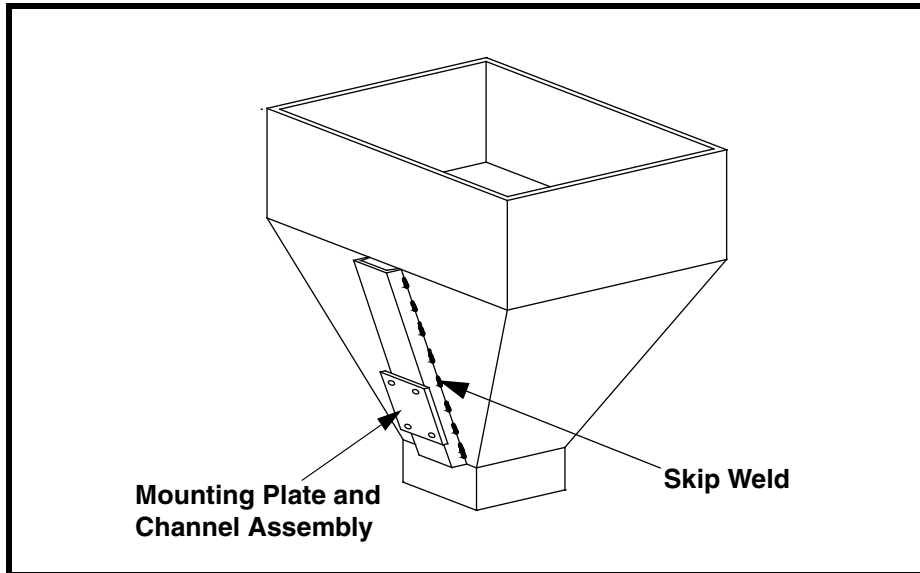


Figure 2. Mounting Plate and Channel Assembly

⚠ 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.)

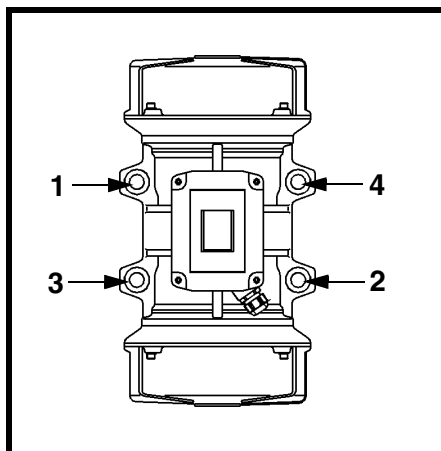


Figure 3. Mounting Bolt Tightening Sequence

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:

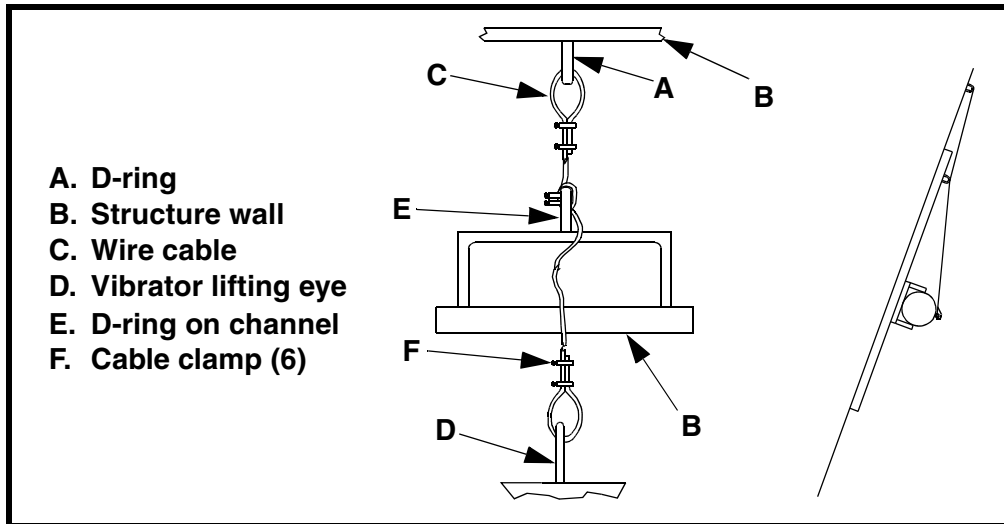


Figure 4. Installing Restraining Cable

- Weld D-ring (A, Figure 4) onto structure wall (B) above vibrator.
- Loop 1/4-in. (6 mm) wire cable (C) through vibrator lifting eye (D) and D-ring on structure wall.
- 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.
- 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.
- 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.

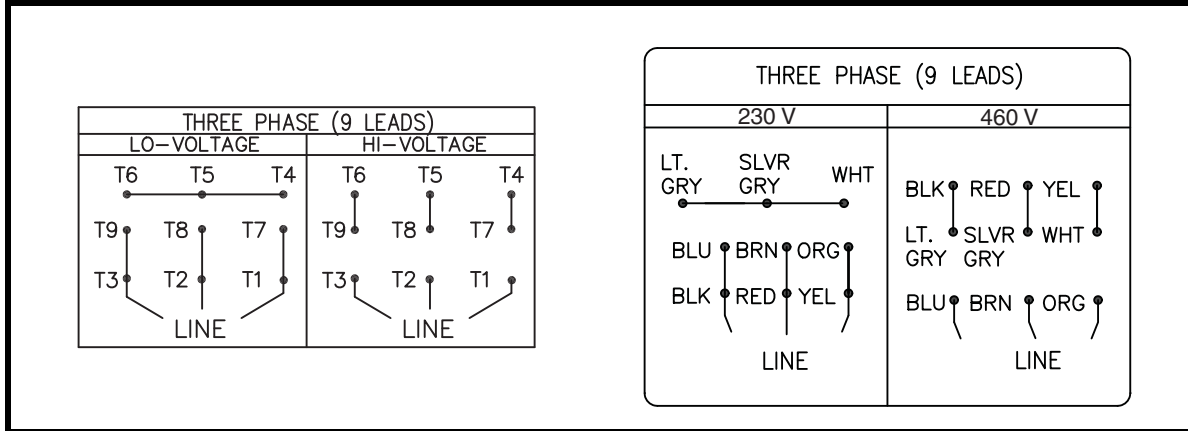


Figure 5. Three Phase Wiring Diagrams

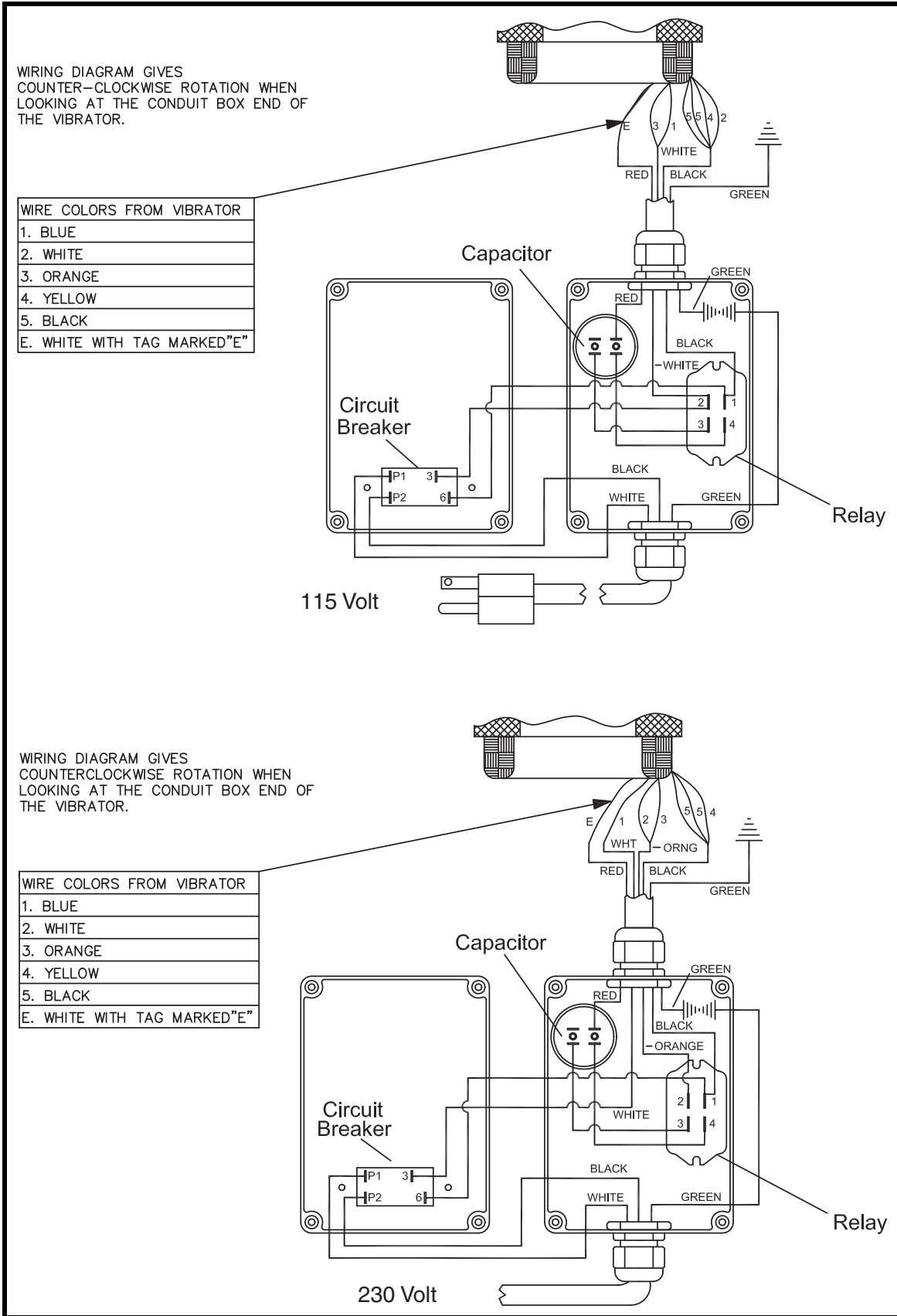


Figure 6. Single Phase Wiring Diagrams

⚠ 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

1. Turn off and lock out/tag out energy source to vibrator according to ANSI standards (see “References”).
2. Remove weight cover.
3. Loosen screw (A, Figure 7) so adjustable weight (B) will rotate around shaft (C).

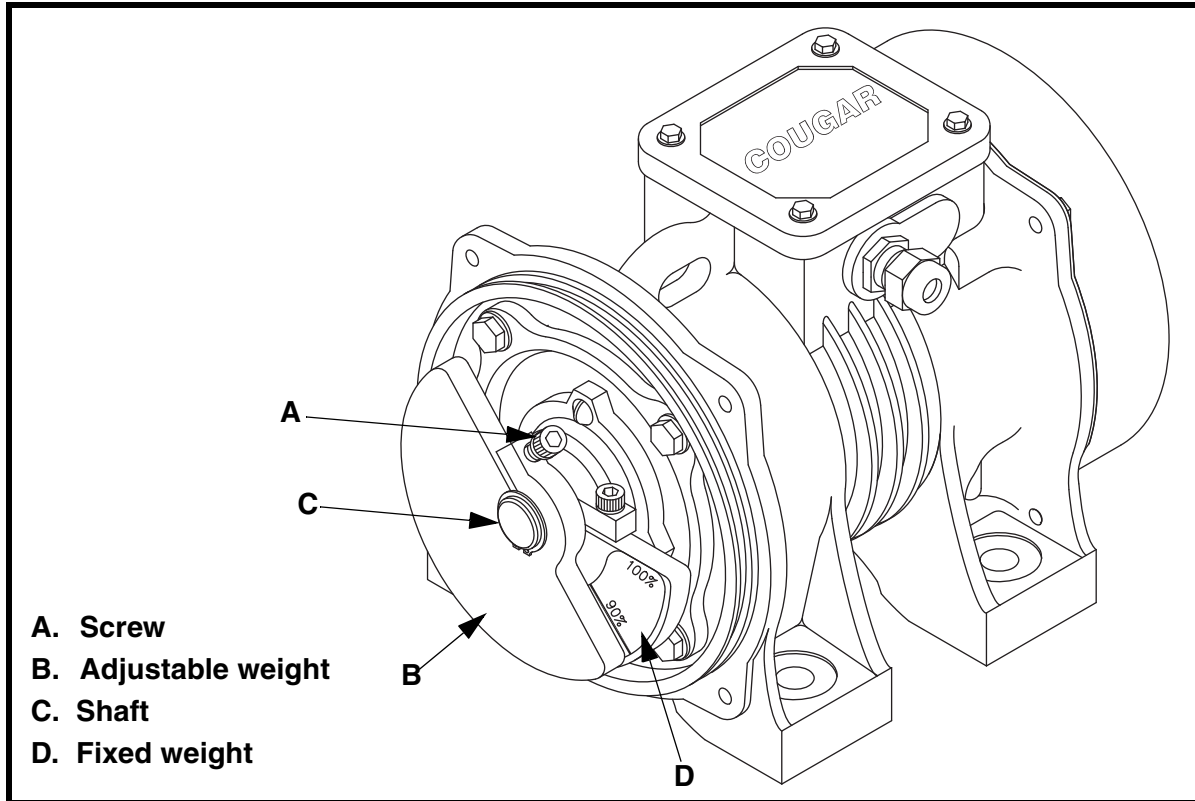


Figure 7. Adjusting Eccentric Weights

4. Rotate adjustable eccentric weight to proper setting. To produce more force, move weight to higher setting (i.e., higher number). When set, tighten screw.
5. Check o-rings for damage. Replace if damaged.

⚠ CAUTION

Do not operate vibrator with weight covers removed. Dust accumulating around vibrator shaft could cause unit to fail.

6. Replace weight covers.

⚠ CAUTION

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

7. Repeat steps 1 through 6 for second set of weights. Set both sets of weights to same setting number so they are mirror images, as shown in Figure 8.

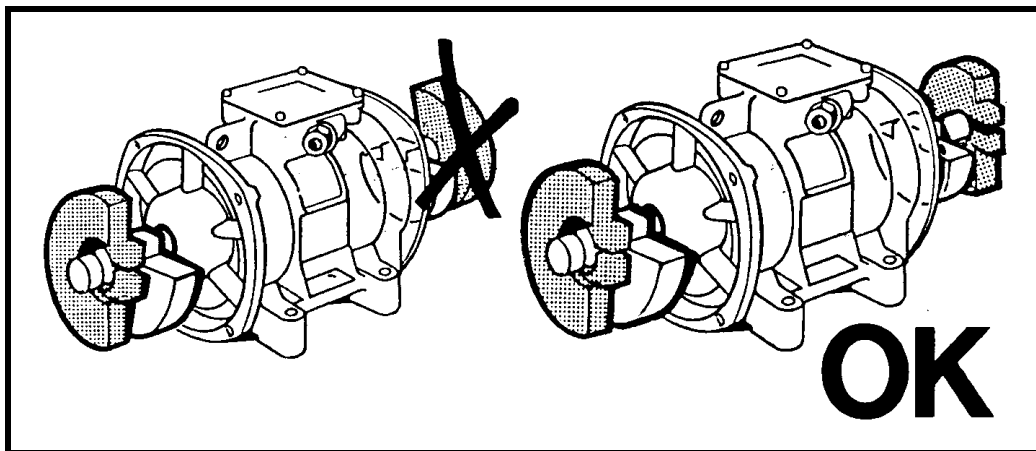


Figure 8. Setting Sets of Eccentric Weights to Mirror Images

***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.

*Variable
frequency inverter*

5. After first 8 hours of use and periodically thereafter, check mounting bolts and tighten if necessary.

▲ 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.

⚠ CAUTION

Use only prescribed grease in vibrator. If a different grease is used, vibrator can be damaged and warranty will be void.

Use only prescribed amount of grease to lubricate vibrator. Too much grease will cause bearings to overheat and result in premature bearing failure.

Lubricating vibrator

NOTE

All vibrators are lubricated at the factory.

1. See Table II for lubrication schedule and amount of grease required for your vibrator.

Table II. Lubrication Schedule

Model	Grease Amount per Bearing	Interval (hours)
B1-2500-2A-2	4.1 g (0.15 oz)	380
B3-2500-2A-2	4.1 g (0.15 oz)	380
B3-3500-2A-2	4.1 g (0.15 oz)	380
B3-2300-2A-4	4.1 g (0.15 oz)	770
B1-1680-2A-2	4.1 g (0.15 oz)	380
B3-1680-2A-2	4.1 g (0.15 oz)	380

Model	Grease Amount per Bearing	Interval (hours)
B1-500-2A-6	Lubricated for Life	
B3-500-2A-6	Lubricated for Life	
B3-550-2A-8	Lubricated for Life	
B3-900-2A-8	Lubricated for Life	
B3-1000-2A-6	4.1 g (0.15 oz)	380

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***



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.

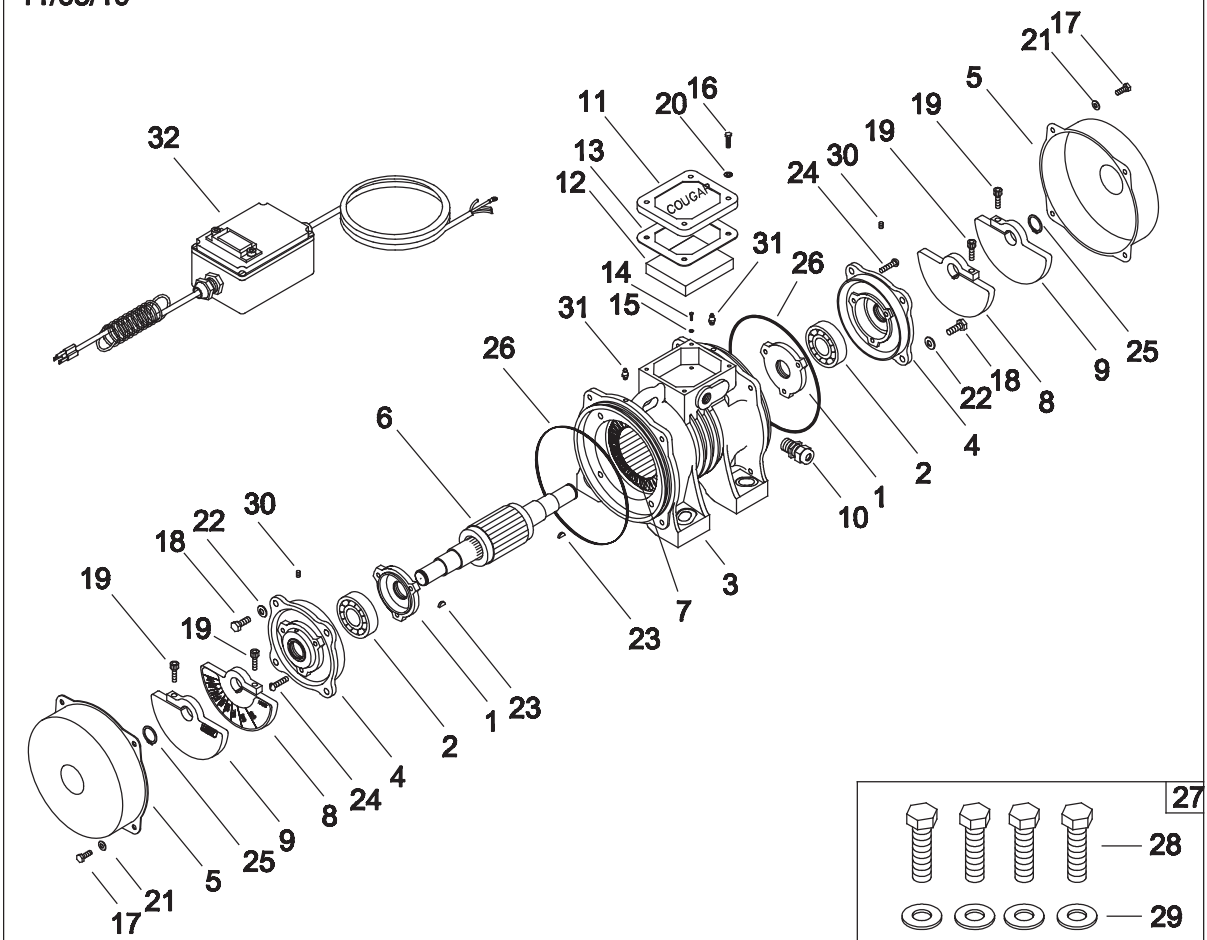
Part Numbers

This section provides product names and corresponding part numbers for Cougar[®] Electric Vibrators and related equipment. Please reference part numbers when ordering parts:

Table III. Cougar[®] Electric Vibrator Model Numbers and Part Numbers

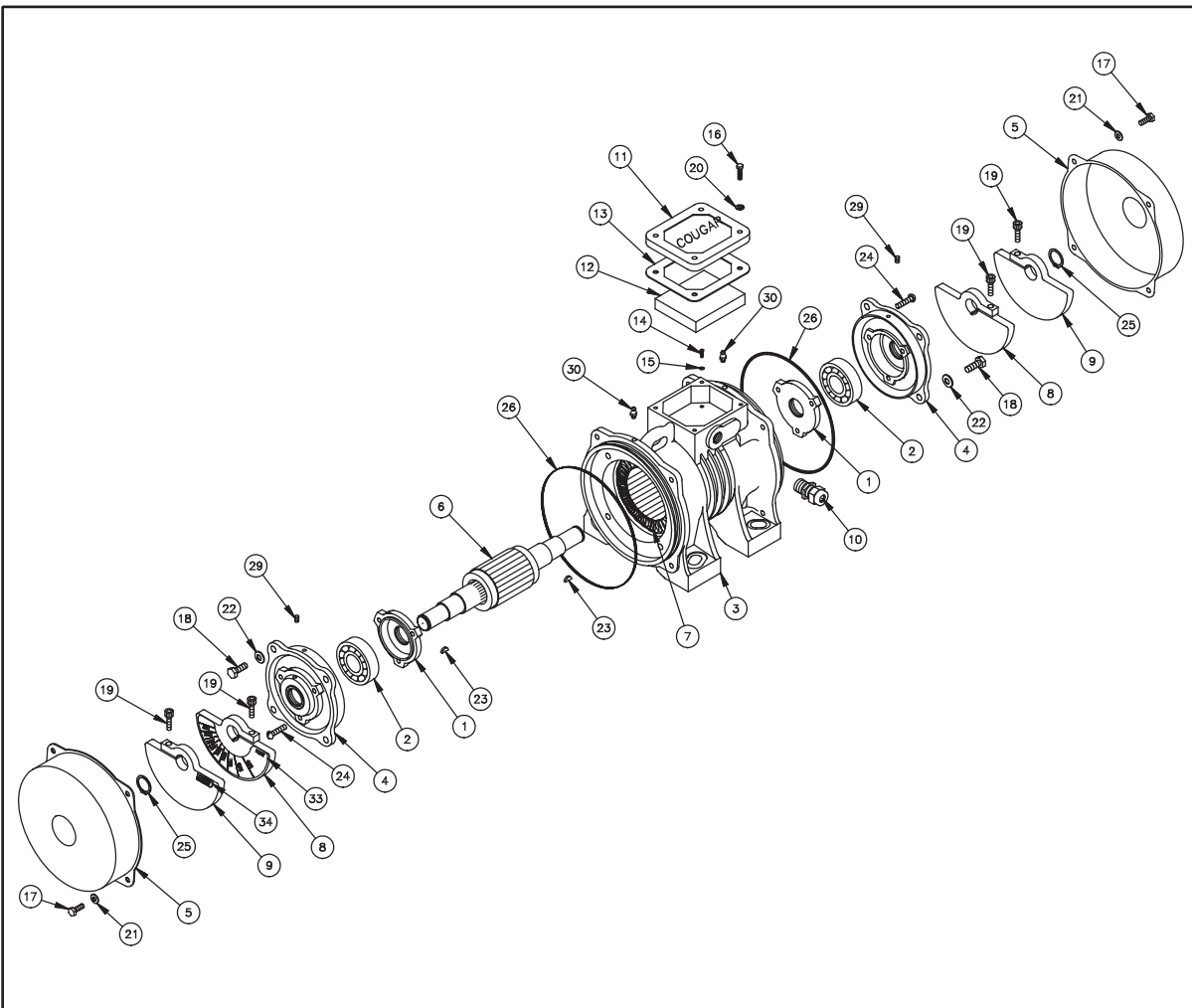
Model Number	Part Number
B1-1680-2A-2	206206
B3-1680-2A-2	206205
B1-2500-2A-2	206045-21
B3-2500-2A-2	206049-20
B3-3500-2A-2	206051-20
B1-2300-2A-4	206047-20
B3-2300-2A-4	206048-20
B1-500-2A-6	206040-20
B3-500-2A-6	206041-10
B3-1000-2A-6	206044-20
B3-2300-2A-6	206059-20
B3-550-2A-8	206042-10
B3-900-2A-8	206043-10

B1-1680-2A-2
 Part No. 206206
 11/05/10



Item No.	Part Number	Description	Qty.	Item No.	Part Number	Description	Qty.
1.	100245-00	Bearing Cap	2	18.	500080-00	3/8-16 X 1 Bolt	8
2.	100248-00	Bearing	2	19.	501245-00	5/16-18 X 7/8 SHCS	4
3.	110330-14	Housing	1	20.	517690-00	1/4" Washer	4
4.	120204-01	Bearing Bell	2	21.	517694-00	5/16" Washer	8
5.	130227-00	End Cap	2	22.	517696-00	3/8" Washer	8
6.	150687-20	Shaft Assembly	1	23.	520798-00	# 404 Woodruff Key	2
7.	160282-20	Stator	1	24.	521139-00	R.H.M.S.	6
8.	171015-00	Stationary Weight	2	25.	530231-00	Snap Ring	2
9.	171016-00	Adjustment Weight	2	26.	603017-00	O - Ring	2
10.	194851-00	Cord Grip	1	27.	221551-00	Mounting Kit	1
11.	196511-01	Conduit Box Cover	1	28.	500263-00	5/8-11 X 2 Bolt	4
12.	196551-00	Foam Packing	1	29.	517705-00	5/8" Washer	4
13.	196661-00	Gasket	1	30.	520380-00	1/4-28 S.H.S.S.	2
14.	197060-00	Ground Screw	1	31.	532302-00	Grease Zerk	2
15.	197061-00	Washer	1	32.	194308-00	Switch Box	1
16.	500003-00	1/4-20 X 3/4 Bolt	4		FORM-152	L.H. Adj. Decal	1
17.	500036-00	5/16-18 X 1/2 Bolt	8		FORM-151	R.H. Adj. Decal	1
					FORM-150	Weight Edge Decal	2

Figure 9. Cougar® Electric Vibrator, Model B1-1680-2A-2



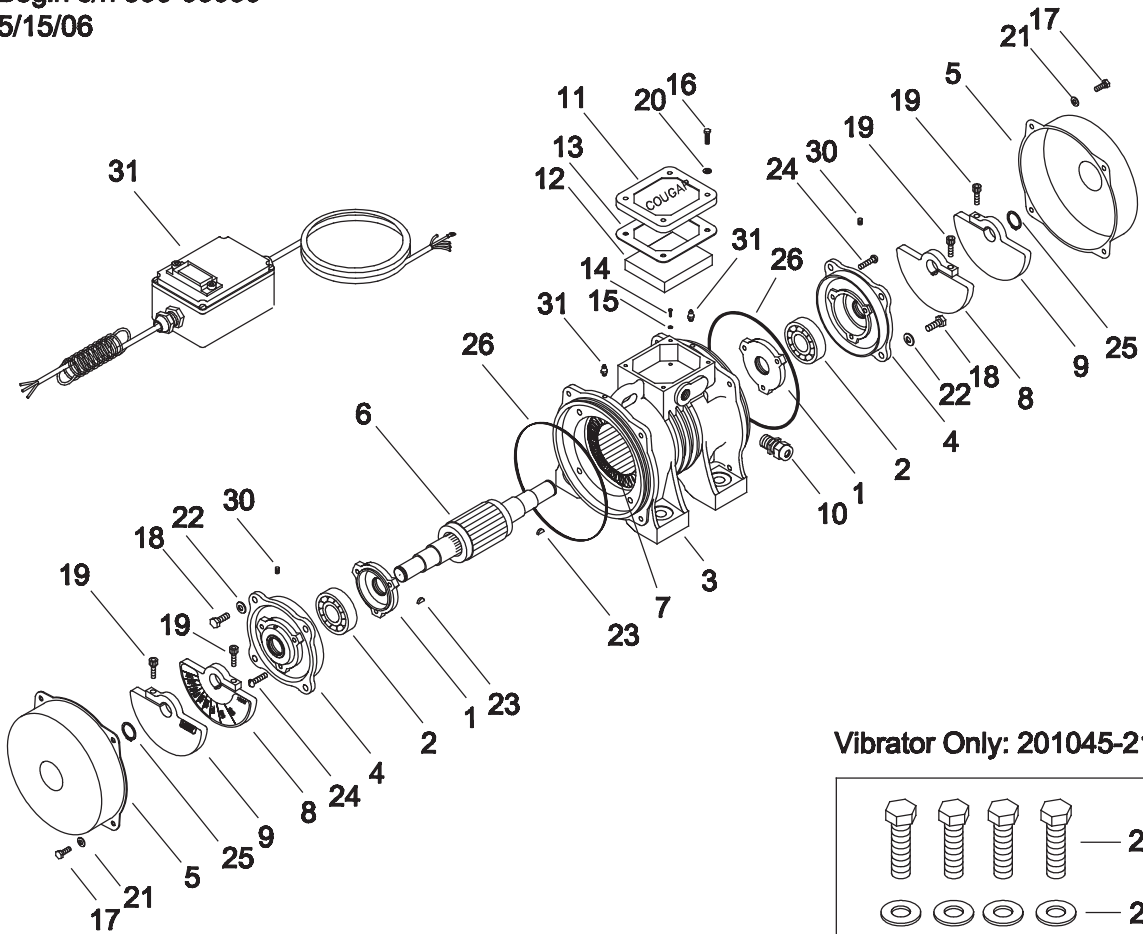
ITEM	QTY.	DESCRIPTION	PART NO.
1	2	BEARING CAP	CG-100245
2	2	BEARING	CG-100248
3	1	HOUSING	110330-14
4	2	BEARING BELL	120204-01
5	2	END CAP	130227
6	1	SHAFT ASSY.	150617-20
7	1	STATOR	160241-20
8	2	STATIONARY WEIGHT	171015
9	2	ADJUSTMENT WEIGHT	171016
10	1	CORD GRIP	194851
11	1	CONDUIT BOX COVER	196511
12	1	FOAM PACKING	196551
13	1	GASKET	196661
14	1	GROUND SCREW	197060
15	1	CUP WASHER	197061
16	4	SCREW HHCS 1/4-20 X 3/4 GR5 ZP	500003
17	8	SCREW HHCS 5/16-18 X 1/2 ZP	CG-500036
18	8	SCREW HHCS 3/8-16 X 1 GR5 ZP	500080

ITEM	QTY.	DESCRIPTION	PART NO.
19	4	SCREW SHC 5/16-18NC X 7/8 PF	501245
20	4	WASHER COMPRESSION 1/4 ZP	CG-517690
21	8	WASHER COMPRESSION 5/16 ZP	CG-517694
22	8	WASHER COMPRESSION 3/8 ZP	CG-517696
23	2	KEY WOODRUFF 1/8 X 1/2 #404	520798
24	6	SCREW RHMS 1/4-20 X 1-1/4 ZP	521139
25	2	RETAINING RING	530231
26	2	O-RING #367 7-1/2 ID X 7-7/8 OD	603017
NS 27	4	SCREW HHCS 5/8-11 X 2 GR5 ZP	500263
NS 28	4	WASHER COMPRESSION 5/8 ZP	CG-517705
29	2	SCREW SHSS 1/4-28 X 1/4 CP PF	520380
30	2	GREASE ZERK 1/4-28 STRAIGHT	532302
NS 31	4	DRIVE SCREW	532400
NS 32	1	L.H ADJ DECAL	FORM #151
NS 33	1	R.H ADJ DECAL	FORM #152
34	2	WEIGHT EDGE DECAL	FORM #150
35	2	COUGAR VIBRATION LABEL	CG-100328-5
NS 36	1	CAUTION - ELECTRIC	FORM #119
NS 37	1	ELECTRIC VIBRATOR INSTRUCTIONAL TAG	FORM #131
38	1	COUGAR VIBRATION B-SERIES NAMEPLATE	CG-100338

NS = NOT SHOWN

Figure 10. Cougar® Electric Vibrator, Model B3-1680-2A-2

B1-2500-2A-2 (230-Volt)
 Part No. 206045-21
 Begin s/n 506-00000
 5/15/06

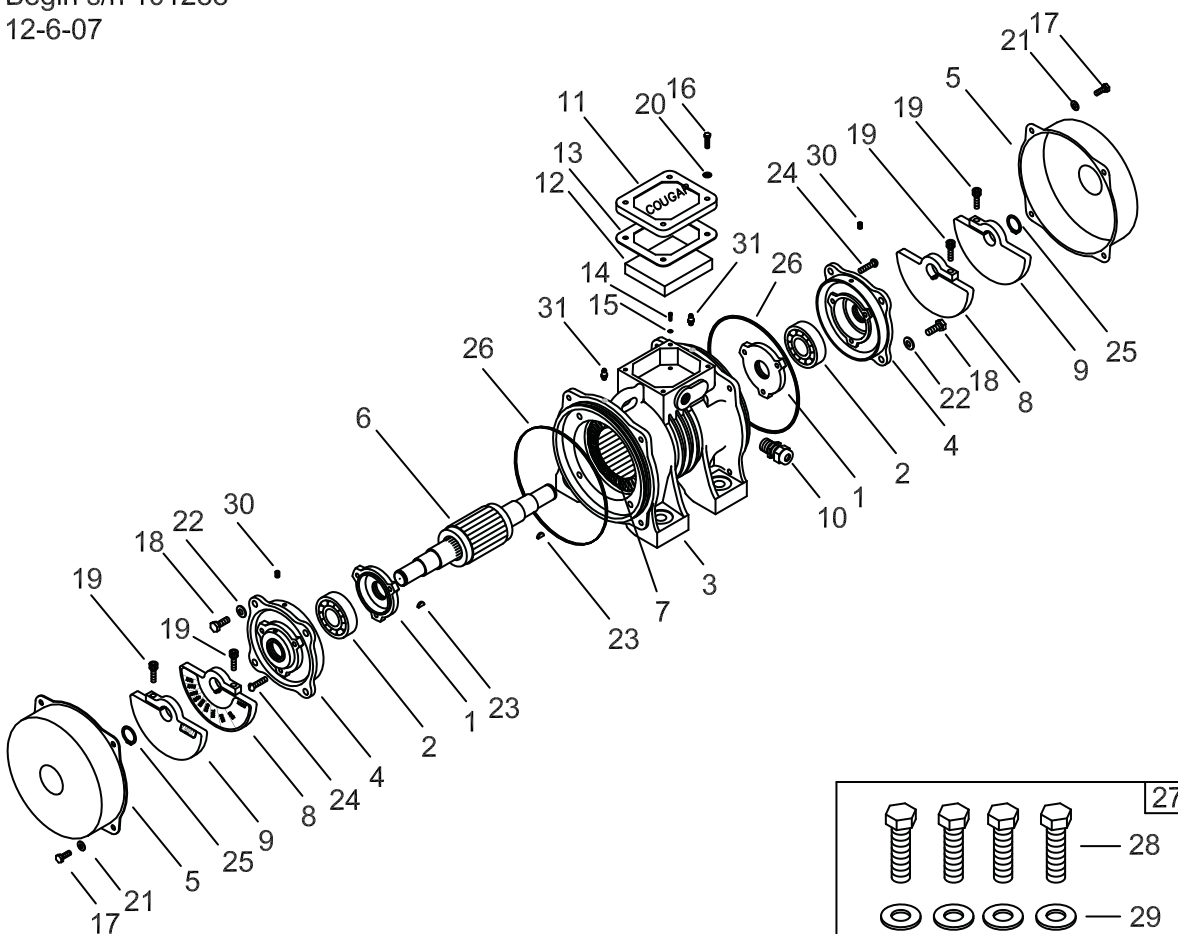


Vibrator Only: 201045-21

Item No.	Part Number	Description	Qty.	Item No.	Part Number	Description	Qty.
1.	100245-00	Bearing Cap	2	18.	500080-00	3/8-16 X 1 Bolt	8
2.	100248-00	Bearing	2	19.	501245-00	5/16-18 X 7/8 SHCS	4
3.	110330-11	Housing	1	20.	517690-00	1/4" Washer	4
4.	120204-01	Bearing Bell	2	21.	517694-00	5/16" Washer	8
5.	130227-00	End Cap	2	22.	517696-00	3/8" Washer	8
6.	150687-20	Shaft Assembly	1	23.	520798-00	# 404 Woodruff Key	2
7.	160282-20	Stator	1	24.	521139-00	R.H.M.S.	6
8.	170787-00	Stationary Weight	2	25.	530231-00	Snap Ring	2
9.	170788-00	Adjustment Weight	2	26.	603017-00	O - Ring	2
10.	194864-00	Cord Grip	1	27.	221551-00	Mounting Kit	1
11.	196511-01	Conduit Box Cover	1	28.	500263-00	5/8-11 X 2 Bolt	4
12.	196551-00	Foam Packing	1	29.	517705-00	5/8" Washer	4
13.	196661-00	Gasket	1	30.	520380-00	1/4-28 S.H.S.S.	2
14.	197060-00	Ground Screw	1	31.	532302-00	Grease Zerk	2
15.	197061-00	Washer	1	32.	194309-00	Switch Box	1
16.	500003-00	1/4-20 X 3/4 Bolt	4		FORM-152	L.H. Adj. Decal	1
17.	500036-00	5/16-18 X 1/2 Bolt	8		FORM-151	R.H. Adj. Decal	1
					FORM-150	Weight Edge Decal	2

Figure 11. Cougar® Electric Vibrator, Model B1-2500-2A-2

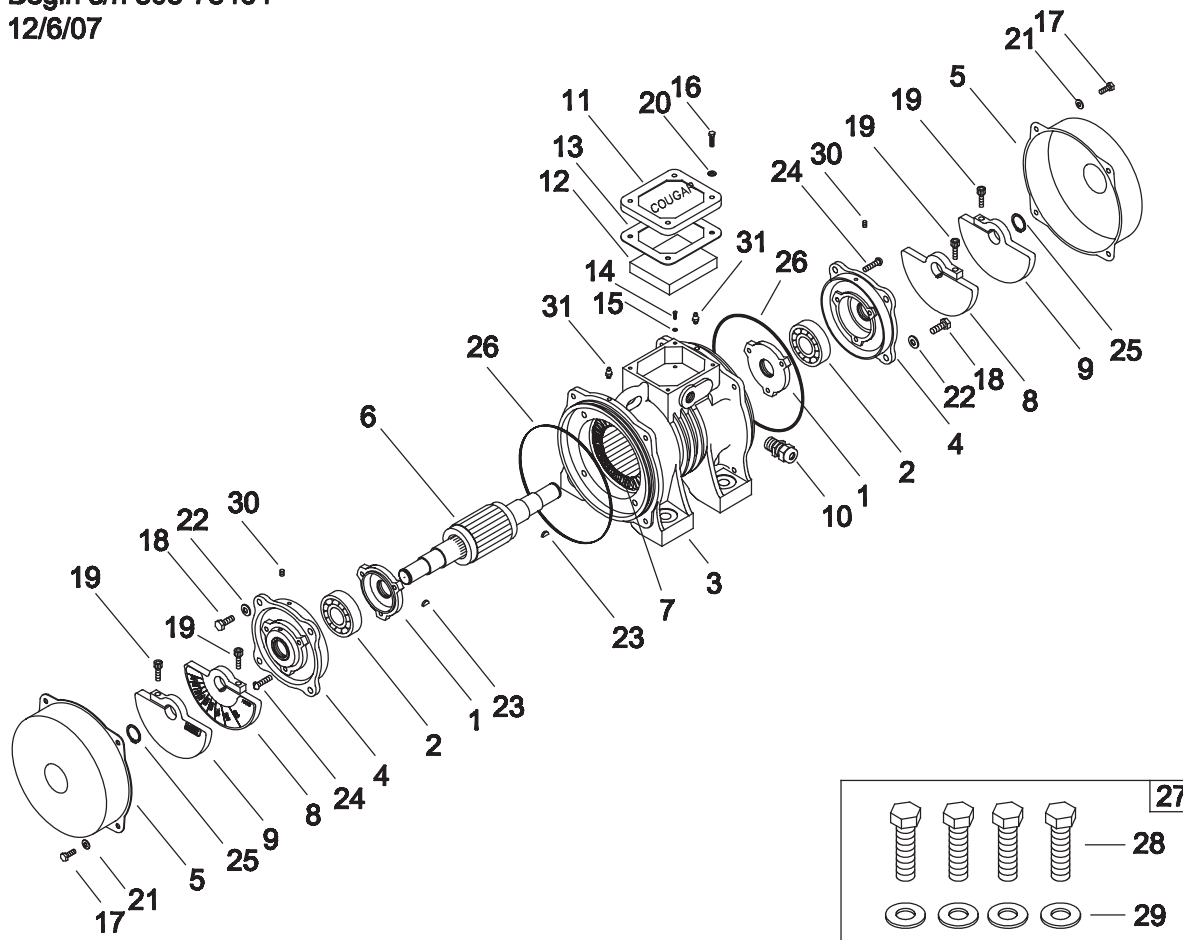
B3-2500-2A-2
 Part No. 206049-20
 Begin s/n 101288
 12-6-07



Item No.	Part Number	Description	Qty.	Item No.	Part Number	Description	Qty.
1.	100245-00	Bearing Cap	2	18.	500080-00	3/8-16 X 1 Bolt	8
2.	100248-00	Bearing	2	19.	501245-00	5/16-18 X 7/8 SHCS	4
3.	110330-11	Housing	1	20.	517690-00	1/4" Washer	4
4.	120204-01	Bearing Bell	2	21.	517694-00	5/16" Washer	8
5.	130227-00	End Cap	2	22.	517696-00	3/8" Washer	8
6.	150617-20	Shaft Assembly	1	23.	520798-00	# 404 Woodruff Key	2
7.	160241-20	Stator	1	24.	521139-00	R.H.M.S.	6
8.	170787-00	Stationary Weight	2	25.	530231-00	Snap Ring	2
9.	170788-00	Adjustment Weight	2	26.	603017-00	O - Ring	2
10.	194851-00	Cord Grip	1	27.	221551-00	Mounting Kit	1
11.	196511-01	Conduit Box Cover	1	28.	500263-00	5/8-11 X 2 Bolt	4
12.	196551-00	Foam Packing	1	29.	517705-00	5/8" Washer	4
13.	196661-00	Gasket	1	30.	520380-00	1/4-28 S.H.S.S.	2
14.	197060-00	Ground Screw	1	31.	532302-00	Grease Zerk	2
15.	197061-00	Washer	1		FORM-151	L.H. Adj. Decal	1
16.	500003-00	1/4-20 X 3/4 Bolt	4		FORM-152	R.H. Adj. Decal	1
17.	500036-00	5/16-18 X 1/2 Bolt	8		FORM-150	Weight Edge Decal	2
					201049-20	Vibrator Only	

Figure 12. Cougar® Electric Vibrator, Model B3-2500-2A-2

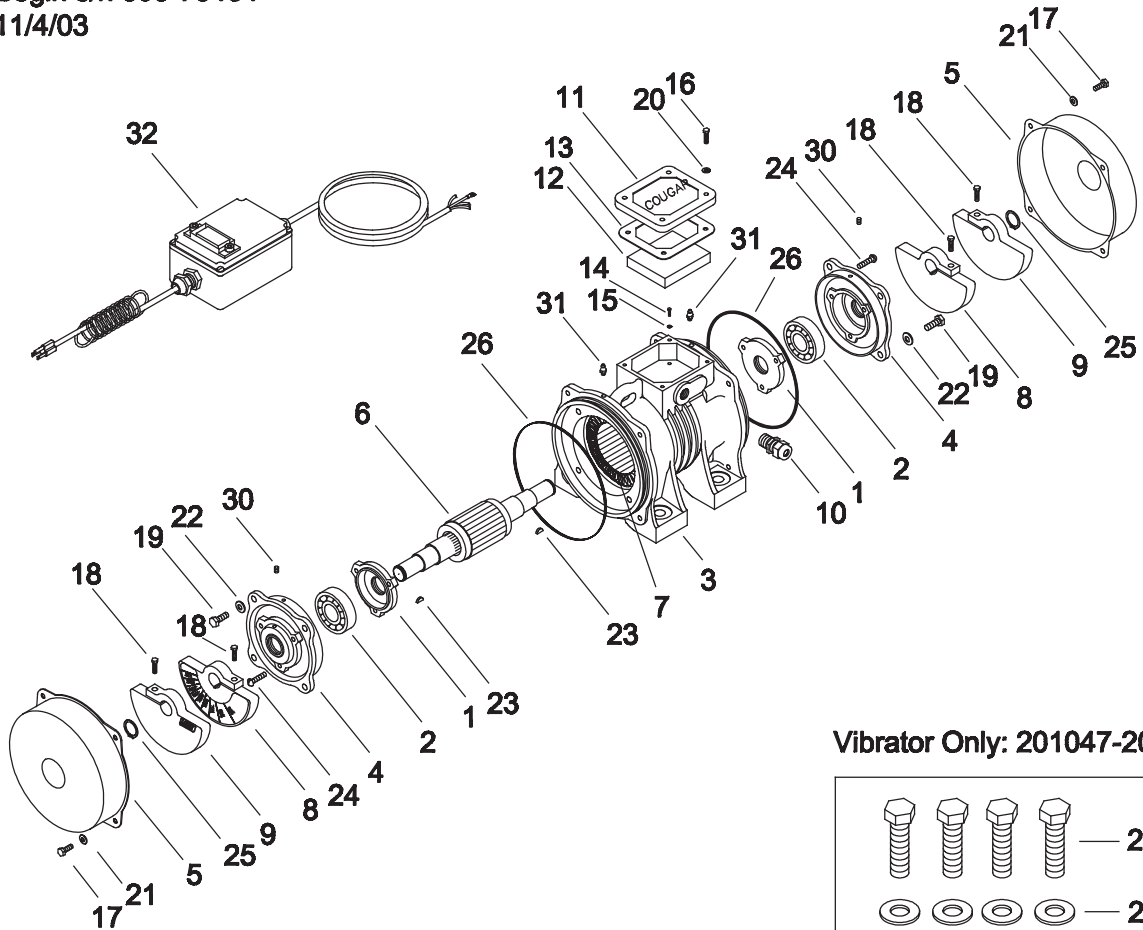
B3-3500-2A-2
 Part No. 206051-20
 Begin s/n 803-73464
 12/6/07



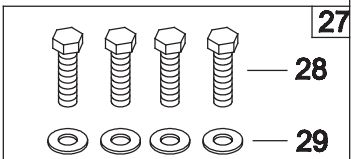
Item No.	Part Number	Description	Qty.	Item No.	Part Number	Description	Qty.
1.	100245-00	Bearing Cap	2	18.	500080-00	3/8-16 X 1 Bolt	8
2.	100248-00	Bearing	2	19.	501245-00	5/16-18 X 7/8 SHCS	4
3.	110330-11	Housing	1	20.	517690-00	1/4" Washer	4
4.	120204-01	Bearing Bell	2	21.	517694-00	5/16" Washer	8
5.	130227-00	End Cap	2	22.	517696-00	3/8" Washer	8
6.	150617-20	Shaft Assembly	1	23.	520798-00	# 404 Woodruff Key	2
7.	160241-20	Stator	1	24.	521139-00	R.H.M.S.	6
8.	170822-00	Stationary Weight	2	25.	530231-00	Snap Ring	2
9.	170823-00	Adjustment Weight	2	26.	603017-00	O - Ring	2
10.	194851-00	Cord Grip	1	27.	221551-00	Mounting Kit	1
11.	196511-01	Conduit Box Cover	1	28.	500263-00	5/8-11 X 2 Bolt	4
12.	196551-00	Foam Packing	1	29.	517705-00	5/8" Washer	4
13.	196661-00	Gasket	1	30.	520380-00	1/4-28 S.H.S.S.	2
14.	197060-00	Ground Screw	1	31.	532302-00	Grease Zerk	2
15.	197061-00	Washer	1		FORM-148	L.H. Adj. Decal	1
16.	500003-00	1/4-20 X 3/4 Bolt	4		FORM-149	R.H. Adj. Decal	1
17.	500036-00	5/16-18 X 1/2 Bolt	8		FORM-150	Weight Edge Decal	2
					201051-20	Vibrator Only	

Figure 13. Cougar® Electric Vibrator, Model B3-3500-2A-2

B1-2300-2A-4
 Part No. 206047-20
 Begin s/n 803-73464
 11/4/03



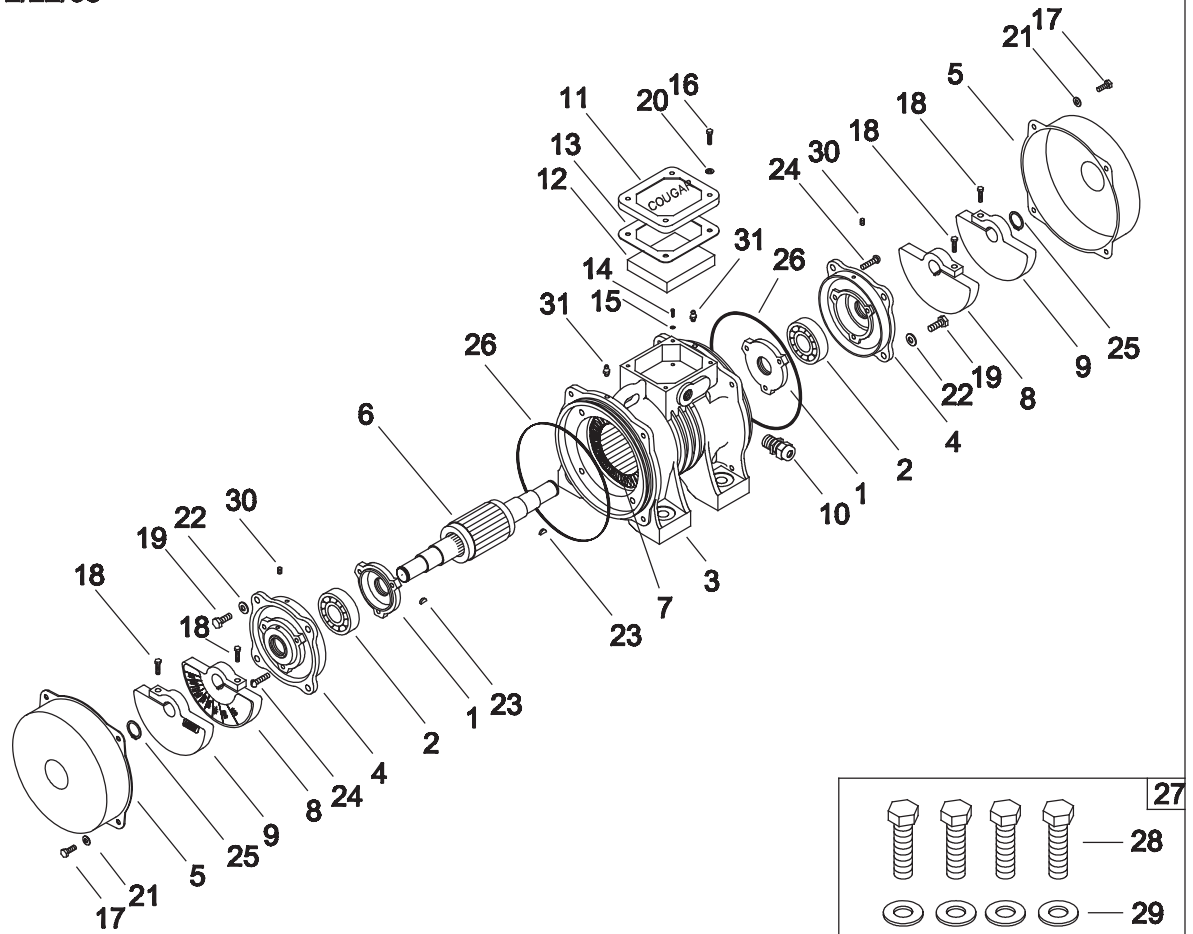
Vibrator Only: 201047-20



Item No.	Part Number	Description	Qty.	Item No.	Part Number	Description	Qty.
1.	100245-00	Bearing Cap	2	19.	500080-00	3/8-16 X 1 Bolt	8
2.	100248-00	Bearing	2	20.	517690-00	1/4" Washer	4
3.	110330-11	Housing	1	21.	517694-00	5/16" Washer	8
4.	120204-01	Bearing Bell	2	22.	517696-00	3/8" Washer	8
5.	130228-00	End Cap	2	23.	520798-00	# 404 Woodruff Key	2
6.	150688-20	Shaft Assembly	1	24.	521139-00	R.H.M.S.	6
7.	160283-20	Stator	1	25.	530231-00	Snap Ring	2
8.	170814-00	Stationary Weight	2	26.	603017-00	O - Ring	2
9.	170815-00	Adjustment Weight	2	27.	221551-00	Mounting Kit	1
10.	194851-00	Cord Grip	1	28.	500263-00	5/8-11 X 2 Bolt	4
11.	196511-01	Conduit Box Cover	1	29.	517705-00	5/8" Washer	4
12.	196551-00	Foam Packing	1	30.	520380-00	1/4-28 S.H.S.S.	2
13.	196661-00	Gasket	1	31.	532302-00	Grease Zerk	2
14.	197060-00	Ground Screw	1	32.	194306-00	Switch Box	1
15.	197061-00	Washer	1		FORM-148	L.H. Adj. Decal	1
16.	500003-00	1/4-20 X 3/4 Bolt	4		FORM-149	R.H. Adj. Decal	1
17.	500036-00	5/16-18 X 1/2 Bolt	8		FORM-150	Weight Edge Decal	2
18.	500079-00	3/8-16 X 7/8 Bolt	4				

Figure 14. Cougar® Electric Vibrator, Model B1-2300-2A-4

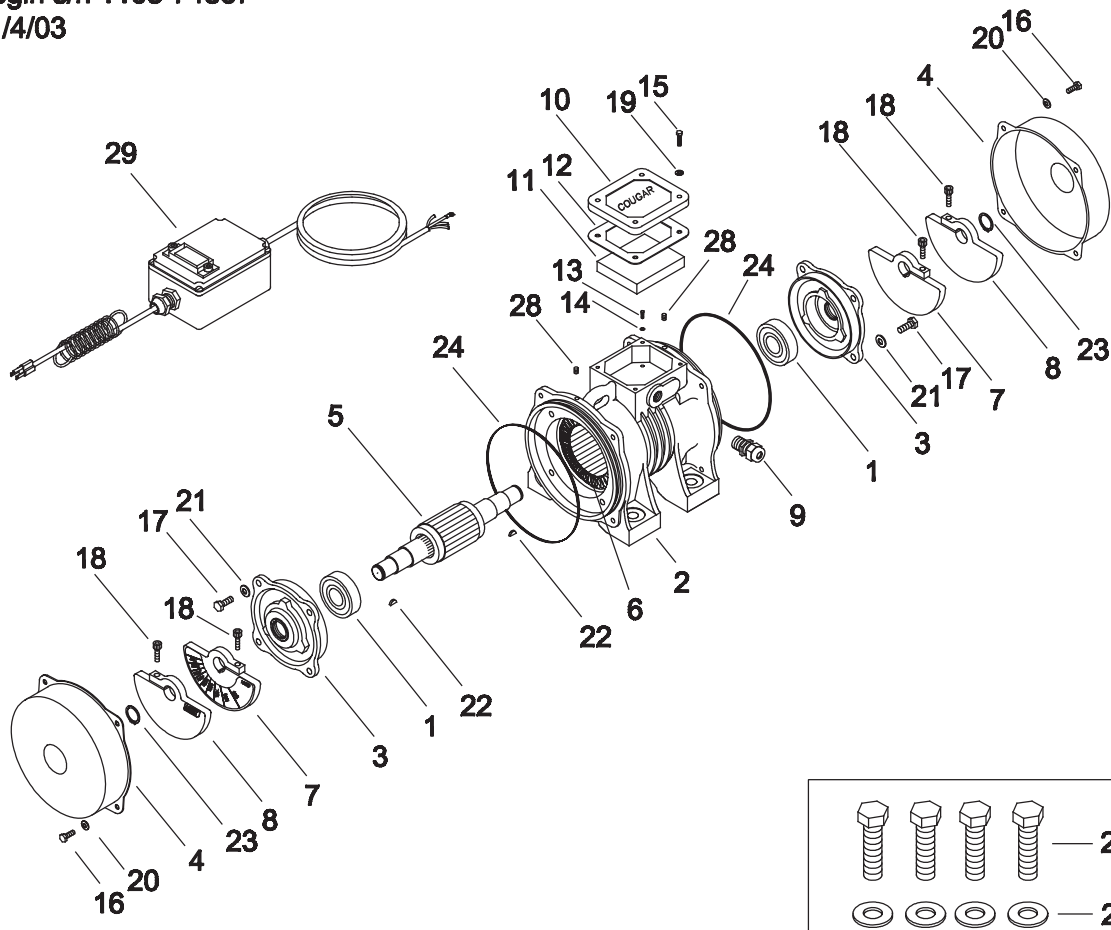
B3-2300-2A-4
 Part No. 206048-20
 2/22/08



Item No.	Part Number	Description	Qty.	Item No.	Part Number	Description	Qty.
1.	100245-00	Bearing Cap	2	18.	500079-00	3/8-16 X 7/8 Bolt	4
2.	100248-00	Bearing	2	19.	500080-00	3/8-16 X 1 Bolt	8
3.	110330-11	Housing	1	20.	517690-00	1/4" Washer	4
4.	120204-01	Bearing Bell	2	21.	517694-00	5/16" Washer	8
5.	130228-00	End Cap	2	22.	517696-00	3/8" Washer	8
6.	150616-20	Shaft Assembly	1	23.	520798-00	# 404 Woodruff Key	2
7.	160240-20	Stator	1	24.	521139-00	R.H.M.S.	6
8.	170814-00	Stationary Weight	2	25.	530231-00	Snap Ring	2
9.	170815-00	Adjustment Weight	2	26.	603017-00	O - Ring	2
10.	194851-00	Cord Grip	1	27.	221551-00	Mounting Kit	1
11.	196511-01	Conduit Box Cover	1	28.	500263-00	5/8-11 X 2 Bolt	4
12.	196551-00	Foam Packing	1	29.	517705-00	5/8" Washer	4
13.	196661-00	Gasket	1	30.	520380-00	1/4-28 S.H.S.S.	2
14.	197060-00	Ground Screw	1	31.	532302-00	Grease Zerk	2
15.	197061-00	Washer	1		FORM-148	L.H. Adj. Decal	1
16.	500003-00	1/4-20 X 3/4 Bolt	4		FORM-149	R.H. Adj. Decal	1
17.	500036-00	5/16-18 X 1/2 Bolt	8		FORM-150	Weight Edge Decal	2
					201048-10	Vibrator Only	

Figure 15. Cougar® Electric Vibrator, Model B3-2300-2A-4

B1-500-2A-6
 Part No. 206040-20
 Begin s/n 1103-74867
 11/4/03

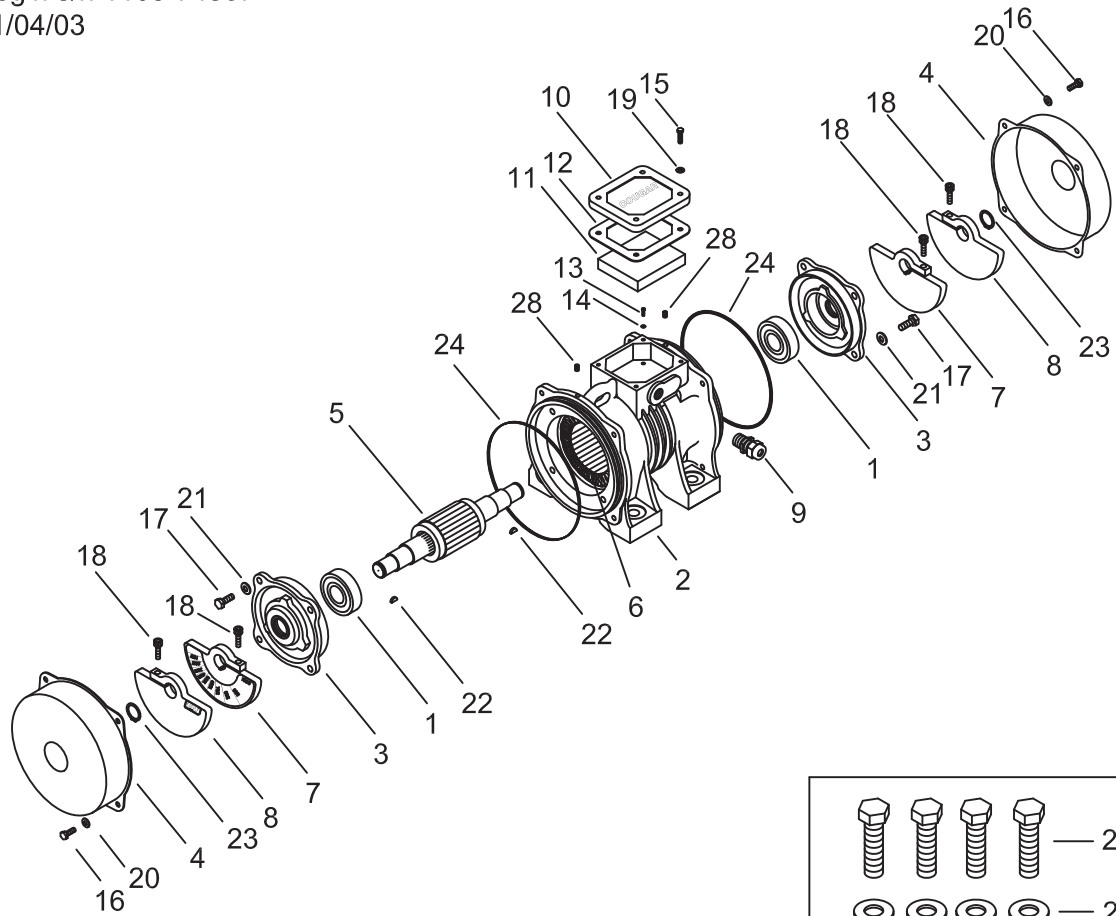


Part Numbers

Item No.	Part Number	Description	Qty.	Item No.	Part Number	Description	Qty.
1.	100100-00	Bearing	2	18.	501245-00	5/16-18 X 7/8 SHCS	4
2.	110330-11	Housing	1	19.	517690-00	1/4" Washer	4
3.	120217-00	Bearing Bell	2	20.	517694-00	5/16" Washer	8
4.	130227-00	End Cap	2	21.	517696-00	3/8" Washer	8
5.	150685-20	Shaft Assembly	1	22.	520798-00	# 404 Woodruff Key	2
6.	160280-20	Stator	1	23.	530231-00	Snap Ring	2
7.	170817-00	Stationary Weight	2	24.	603017-00	O - Ring	2
8.	170818-00	Adjustment Weight	2	25.	221551-00	Mounting Kit	1
9.	194851-00	Cord Grip	1	26.	500263-00	5/8-11 X 2 HHCS	4
10.	196511-01	Conduit Box Cover	1	27.	517705-00	5/8" Washer	4
11.	196551-00	Foam Packing	1	28.	520380-00	1/4-28 S.H.S.S.	2
12.	196661-00	Gasket	1	29.	194304-00	Switch Box	1
13.	197060-00	Ground Screw	1		FORM-148	L.H. Adjust. Decal	1
14.	197061-00	Washer	1		FORM-149	R.H. Adjust. Decal	1
15.	500003-00	1/4-20 X 3/4 HHCS	4		FORM-150	Weight Edge Decal	2
16.	500036-00	5/16-18 X 1/2 HHCS	8		201040-20	Vibrator Only	
17.	500080-00	3/8-16 X 1 HHCS	8				

Figure 16. Cougar® Electric Vibrator, Model B1-500-2A-6

B3-500-2A-6
 Part No. 206041-10
 Begin s/n 1103-74867
 11/04/03



Item No.	Part Number	Description	Qty.	Item No.	Part Number	Description	Qty.
1.	100100-00	Bearing	2	18.	501245-00	5/16-18 X 7/8 SHCS	4
2.	110330-11	Housing	1	19.	517690-00	1/4" Washer	4
3.	120217-00	Bearing Bell	2	20.	517694-00	5/16" Washer	8
4.	130227-00	End Cap	2	21.	517696-00	3/8" Washer	8
5.	150610-10	Shaft Assembly	1	22.	520798-00	# 404 Woodruff Key	2
6.	160234-10	Stator	1	23.	530231-00	Snap Ring	2
7.	170817-00	Stationary Weight	1	24.	603017-00	O - Ring	2
8.	170818-00	Adjustment Weight	2	25.	221551-00	Mounting Kit	1
9.	194851-00	Cord Grip	2	26.	500263-00	5/8-11 X 2 HHCS	4
10.	196511-01	Conduit Box Cover	1	27.	517705-00	5/8" Washer	4
11.	196551-00	Foam Packing	1	28.	520380-00	1/4-28 S.H.S.S.	2
12.	196661-00	Gasket	1		FORM-148	L.H. Adjust. Decal	1
13.	197060-00	Ground Screw	1		FORM-149	R.H. Adjust. Decal	1
14.	197061-00	Washer	1		FORM-150	Weight Edge Decal	2
15.	500003-00	1/4-20 X 3/4 HHCS	4		201041-10	Vibrator Only	
16.	500036-00	5/16-18 X 1/2 HHCS	8				
17.	500080-00	3/8-16 X 1 HHCS	8				

Figure 17. Cougar® Electric Vibrator, Model B3-500-2A-6

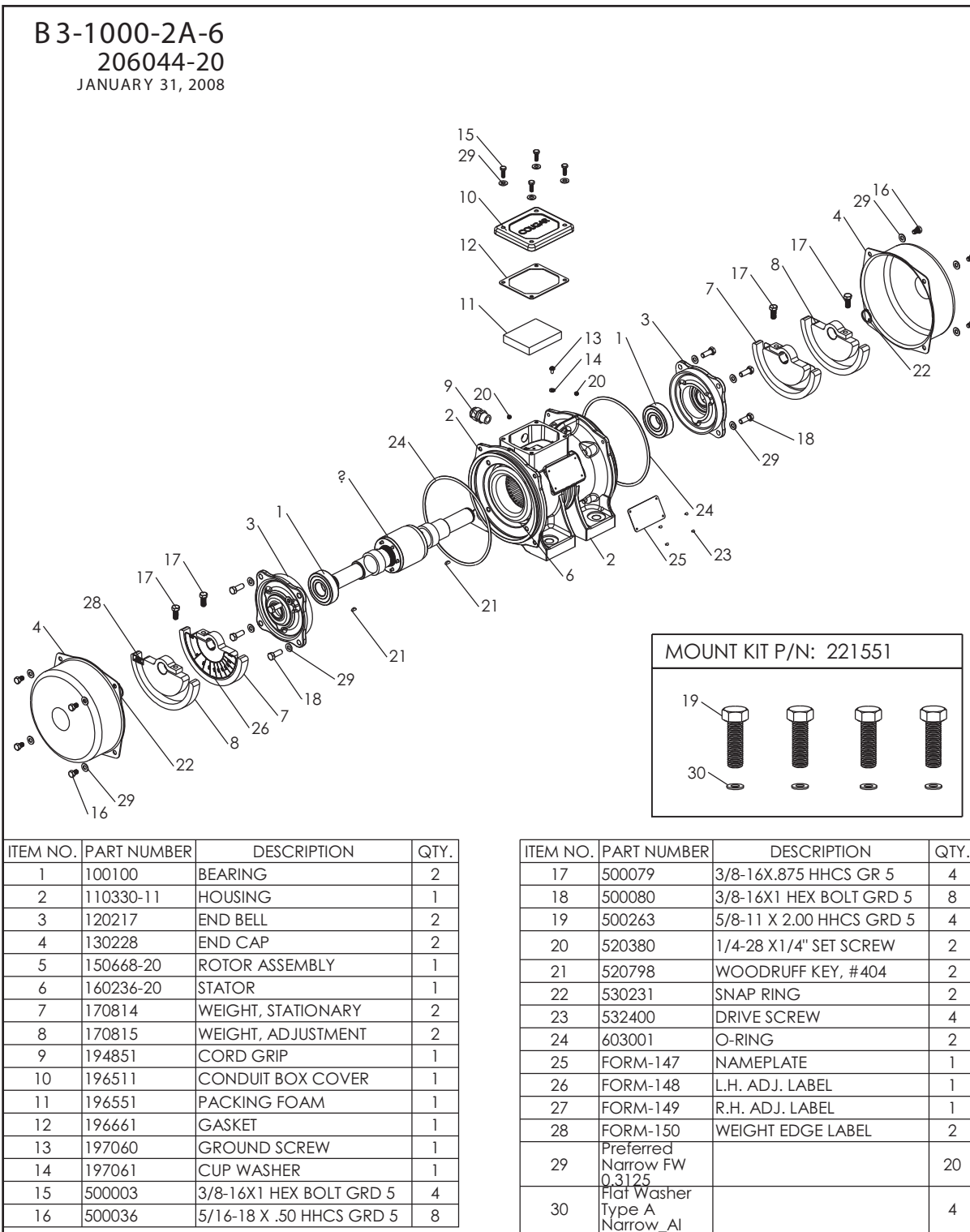
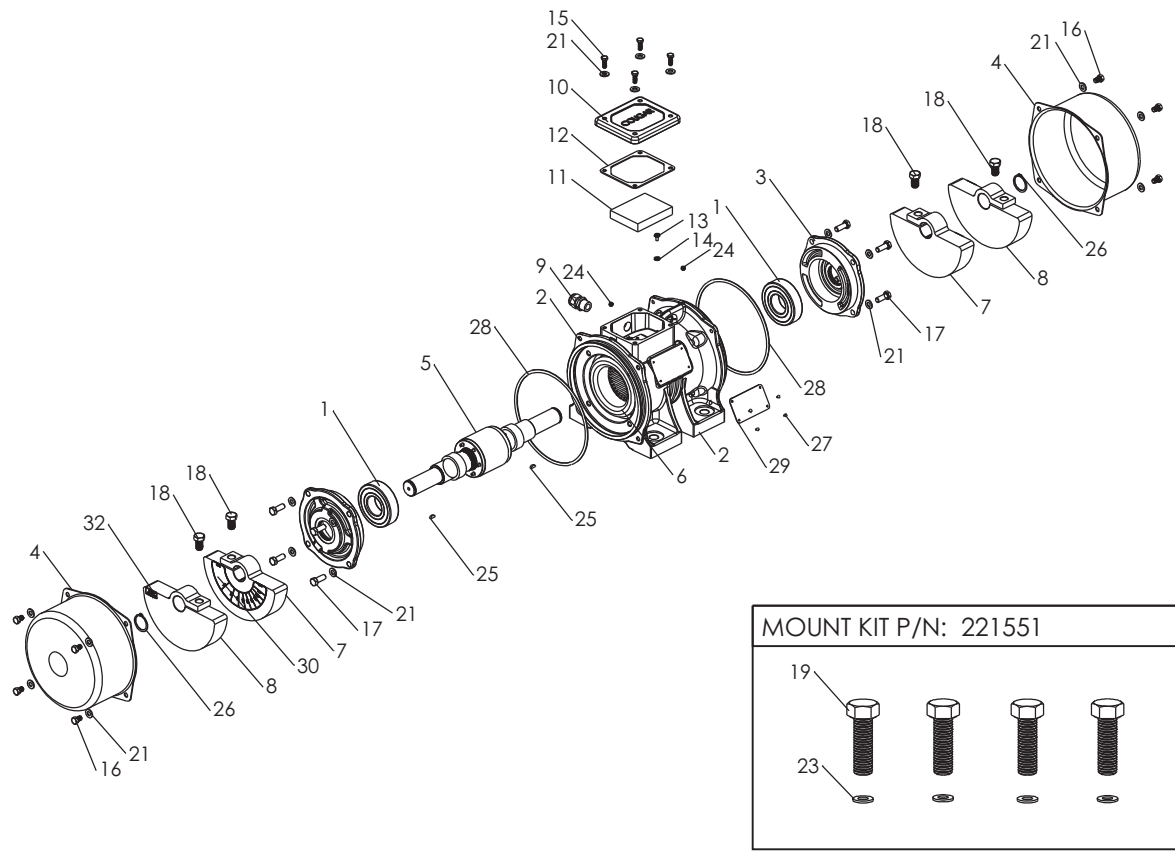


Figure 18. Cougar® Electric Vibrator, Model B3-1000-2A-6

B3-2300-2A-6
206059-20
NOVEMBER 3, 2008

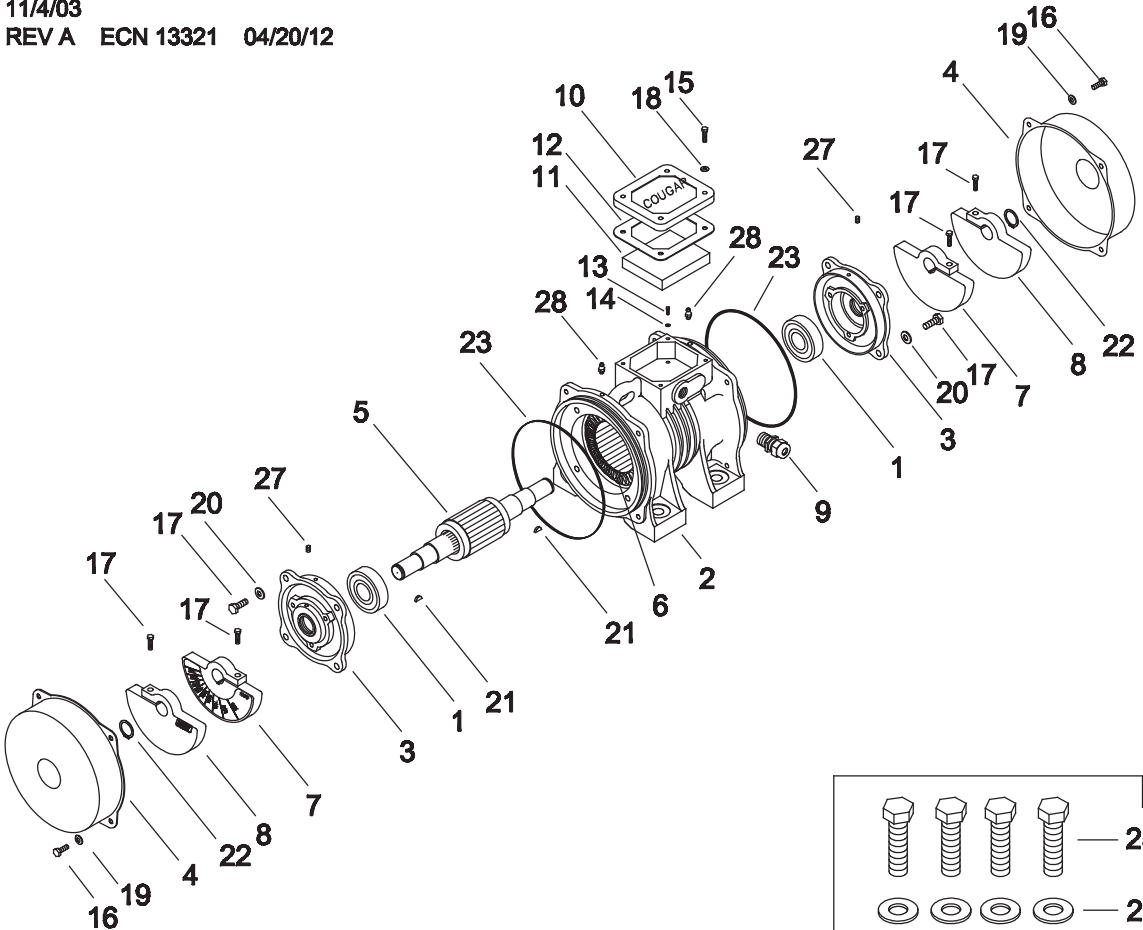


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	100228	BEARING	2
2	110330-11	HOUSING	1
3	120246	END BELL	2
4	130229	END CAP, FINISHED	2
5	150668-20	ROTOR ASSEMBLY	1
6	160236-20	STATOR	1
7	170981	WEIGHT, STATIONARY	2
8	170982	WEIGHT, ADJUSTMENT	2
9	194851	CORD GRIP	1
10	196511	CONDUIT BOX COVER	1
11	196551	PACKING FOAM	1
12	196661	GASKET	1
13	197060	GROUND SCREW	1
14	197061	CUP WASHER	1
15	500003	1/4-20X3/4 HHCS GRD 5	4
16	500036	5/16-18 X .50 HHCS GRD 5	8

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
17	500080	3/8-16X1 HHCS GRD 5	8
18	500173	1/2-13 X .875 HHCS GRD 5	4
19	500263	5/8-11 X 2.00 HHCS GRD 5	4
20	517690	1/4" COMP. WASHER ZP	4
21	517694	5/16" COMP. WASHER	8
22	517696	3/8 COMP. WASHER ZP	8
23	517705	5/8 COMP. WASHER ZP	4
24	520380	1/4-28 X 1/4" SHSS CUP PNT	2
25	520798	WOODRUFF KEY, #404	2
26	530236	SNAP RING	2
27	532400	DRIVE SCREW	4
28	603017	O-RING	2
29	FORM-147	NAMEPLATE	1
30	FORM-148	L.H. ADJ. LABEL	1
31	FORM-149	R.H. ADJ. LABEL	1
32	FORM-150	WEIGHT EDGE LABEL	2

Figure 19. Cougar® Electric Vibrator, Model B3-2300-2A-6

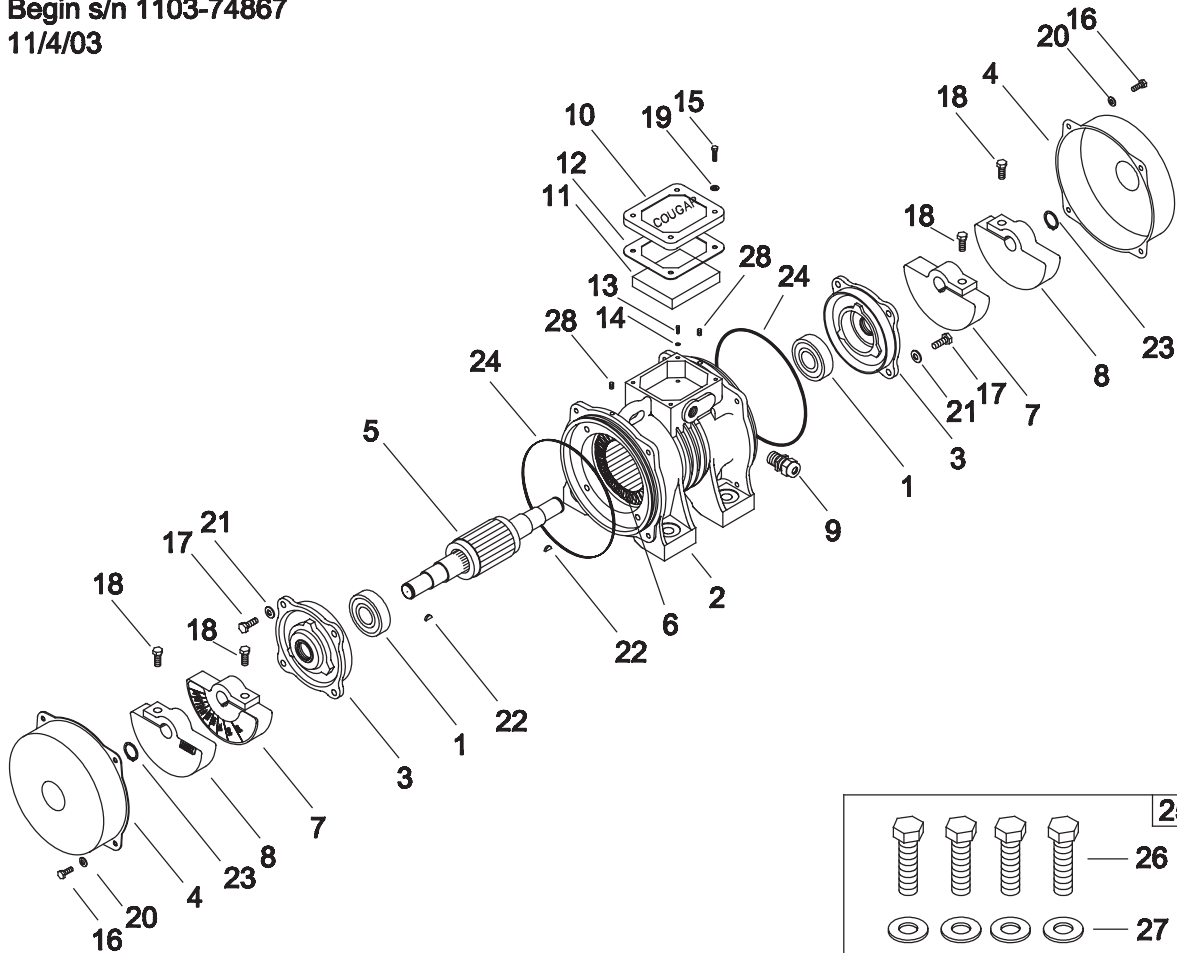
B3-550-2A-8
 Part No. 206042-10
 Begin s/n 1103-74867
 11/4/03
 REV A ECN 13321 04/20/12



Item No.	Part Number	Description	Qty.	Item No.	Part Number	Description	Qty.
1.	CG-100100	Bearing	2	18.	CG-517690	1/4" Washer	4
2.	110330-11	Housing	1	19.	CG-517694	5/16" Washer	8
△ 3.	120204-01	Bearing Bell	2	20.	CG-517696	3/8" Washer	8
4.	130228	End Cap	2	21.	520798	# 404 Woodruff Key	2
5.	150613-10	Shaft Assembly	1	22.	530231	Snap Ring	2
6.	160237-10	Stator	1	23.	603017	O - Ring	2
7.	170814	Stationary Weight	2	24.	221551-00	Mounting Kit	1
8.	170815	Adjustment Weight	2	25.	500263	5/8-11 X 2 Bolt	4
9.	194851	Cord Grip	1	26.	CG-517705	5/8" Washer	4
10.	196511	Conduit Box Cover	1	27.	520380	1/4-28 S.H.S.S.	2
11.	196551	Foam Packing	1	△ 28.	532302	Grease Zerk	2
12.	196661	Gasket	1	△	FORM-151	L.H. Adj. Decal	1
13.	197060	Ground Screw	1	△	FORM-152	R.H. Adj. Decal	1
14.	197061	Washer	1		FORM-150	Weight Edge Decal	2
15.	500003	1/4-20 X 3/4 Bolt	4		201042-10	Vibrator Only	
16.	CG-500036	5/16-18 X 1/2 Bolt	8				
17.	500080	3/8-16 X 1 Bolt	12				

Figure 20. Cougar® Electric Vibrator, Model B3-550-2A-8

B3-900-2A-8
 Part No. 206043-10
 Begin s/n 1103-74867
 11/4/03



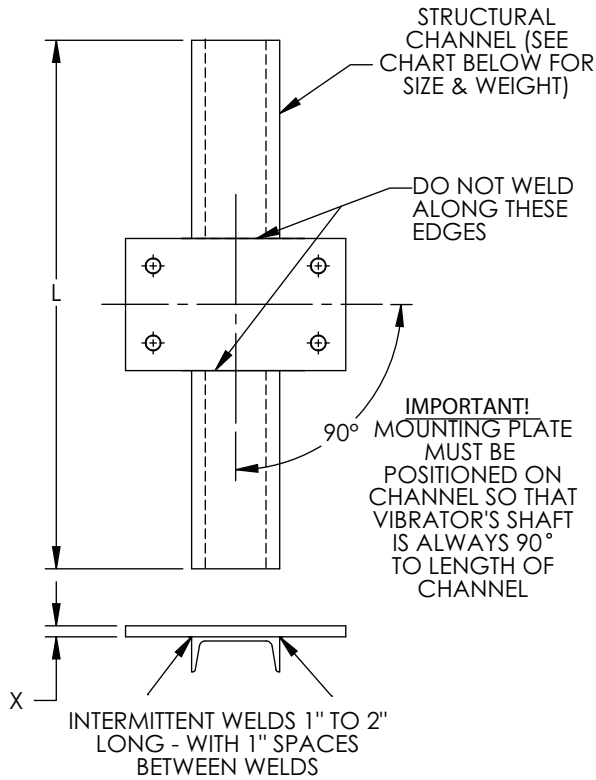
Item No.	Part Number	Description	Qty.	Item No.	Part Number	Description	Qty.
1.	100100-00	Bearing	2	18.	500174-00	1/2-13 X 1 Bolt	4
2.	110330-11	Housing	1	19.	517690-00	1/4" Washer	4
3.	120217-00	Bearing Bell	2	20.	517694-00	5/16" Washer	8
4.	130229-00	End Cap	2	21.	517696-00	3/8" Washer	8
5.	150614-10	Shaft Assembly	1	22.	520798-00	# 404 Woodruff Key	2
6.	160237-10	Stator	1	23.	530231-00	Snap Ring	2
7.	170820-00	Stationary Weight	2	24.	603017-00	O - Ring	2
8.	170821-00	Adjustment Weight	2	25.	221551-00	Mounting Kit	1
9.	194851-00	Cord Grip	1	26.	500263-00	5/8-11 X 2 Bolt	4
10.	196511-01	Conduit Box Cover	1	27.	517705-00	5/8" Washer	4
11.	196551-00	Foam Packing	1	28.	520380-00	1/4-28 S.H.S.S.	2
12.	196661-00	Gasket	1		FORM-148	L.H. Adj. Decal	1
13.	197060-00	Ground Screw	1		FORM-149	R.H. Adj. Decal	1
14.	197061-00	Washer	1		FORM-150	Weight Edge Decal	2
15.	500003-00	1/4-20 X 3/4 Bolt	4		201043-10	Vibrator Only	
16.	500036-00	5/16-18 X 1/2 Bolt	8				
17.	500080-00	3/8-16 X 1 Bolt	8				

Figure 21. Cougar® Electric Vibrator, Model B3-900-2A-8

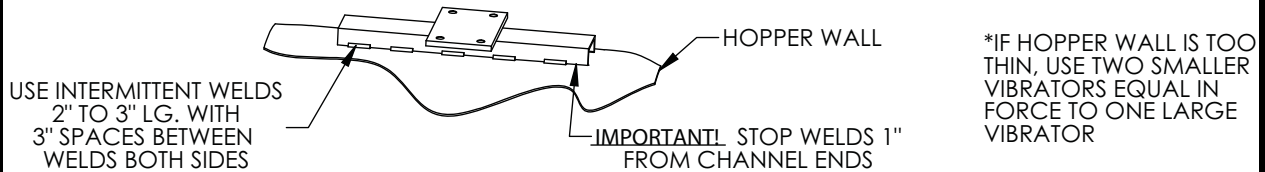
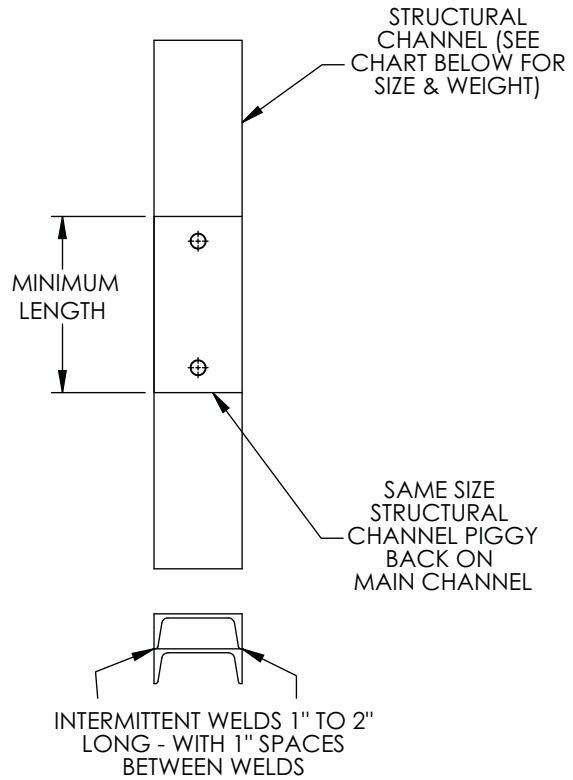
Appendix
Cougar® Electric Vibrators
Mount Plate and Channel Fabrication Details

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

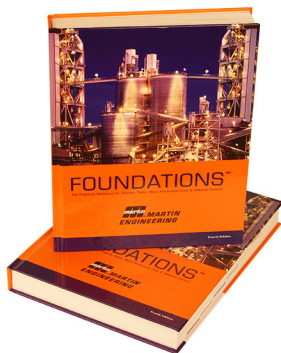


*IF HOPPER WALL IS TOO THIN, USE TWO SMALLER VIBRATORS EQUAL IN FORCE TO ONE LARGE VIBRATOR

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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Expanding upon the book, our Foundations™ Training Program addresses the design and development of more productive belt conveyors, and is offered in three customizable seminars. Attendees gain a better understanding of conveyor safety and performance, helping to justify upgrade investments and increase profitability.



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