Cougar®
DC Truck Vibrators

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Operator's Manual
M3952

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) ANSI/ASSP z244.1-2016 (R2020), *The Control of Hazardous Energy Lockout, Tagout And Alternative Methods* 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

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

⚠ WARNING

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

⚠ CAUTION

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

IMPORTANT

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

NOTE

Note: General statements to assist the reader.

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Introduction

General

Cougar® DC Truck Vibrators are equipped with motor-driven rotary eccentric weights that are powered by a DC electric motor and deliver rotary vibration. The motor is attached to the head or case assembly containing the eccentric weights and bearings.

Cougar® DC Truck Vibrators are available in 12V and 24V models and are available with permanent mounts.

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/ASSP z244.1-2016 (R2020), *The Control Of Hazardous Energy Lockout, Tagout And Alternative Methods*, American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018.
- Federal Register, Volume 54, Number 169, Part IV, 29 CFR 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.

Safety

All safety rules in the above documents and all owner/employer safety rules must be strictly followed when working with this unit.

Materials required:

Initial Installation: May require welders, cut torches, and grinders along with standard hand tools.

Maintenance and Replacement: Only standard hand tools

Before Installing Vibrator

IMPORTANT

The delivery service is responsible for damage incurred during transportation. Martin Engineering CANNOT enter claims for damage. Contact your transportation agent for information.

1. Inspect shipping container 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.
3. If anything is missing or damaged, contact Martin Engineering or a representative.

⚠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.

4. If using a cutting torch or welding, test atmosphere for gas level or dust content.
5. Make sure mounting surface is strong and flat, within 1/32 in. (1.2 mm) across vibrator feet. (This will prevent internal stress to vibrator casting when tightening mount bolts.)
6. Make sure mounting surface and vibrator are clean and free of debris.

IMPORTANT

The Cougar® DC Truck Vibrator is NOT guaranteed for continuous duty.

The recommended duty cycle for Cougar® DC Truck Vibrators is a maximum of 45 seconds on-time and a minimum of 90 seconds off-time. Operation in excess of the recommended duty cycle could void the warranty.

Installing Vibrator

⚠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. All electrical work must be done to National Electrical Code (NEC) standards.

⚠CAUTION

Truck box must be supported by a device other than the truck lift system (i.e. truck box prop) during vibrator installation. Failure to do so may result in injury or death.

Never weld structure with vibrator mounted and wired. Welding may cause damage to motor components and bearings. Never weld mount plate directly to the wall of the body.

Steel/aluminum truck box reinforcement

NOTE

Always mount vibrator where it will not conflict with truck frame or components mounted on frame when box is lowered.

1. For maximum vibrator efficiency, secure vibrator between the frame rails that run the length of the box. This ensures even distribution of vibration to the entire truck box.
2. This is usually accomplished by positioning a piece of heavy wall channel between the two long frame rails in the front 1/3 of the dump body (refer to Figure 1 or 2). The channel should be a minimum of 6” wide. The channel must be stitch welded to both frame rails.

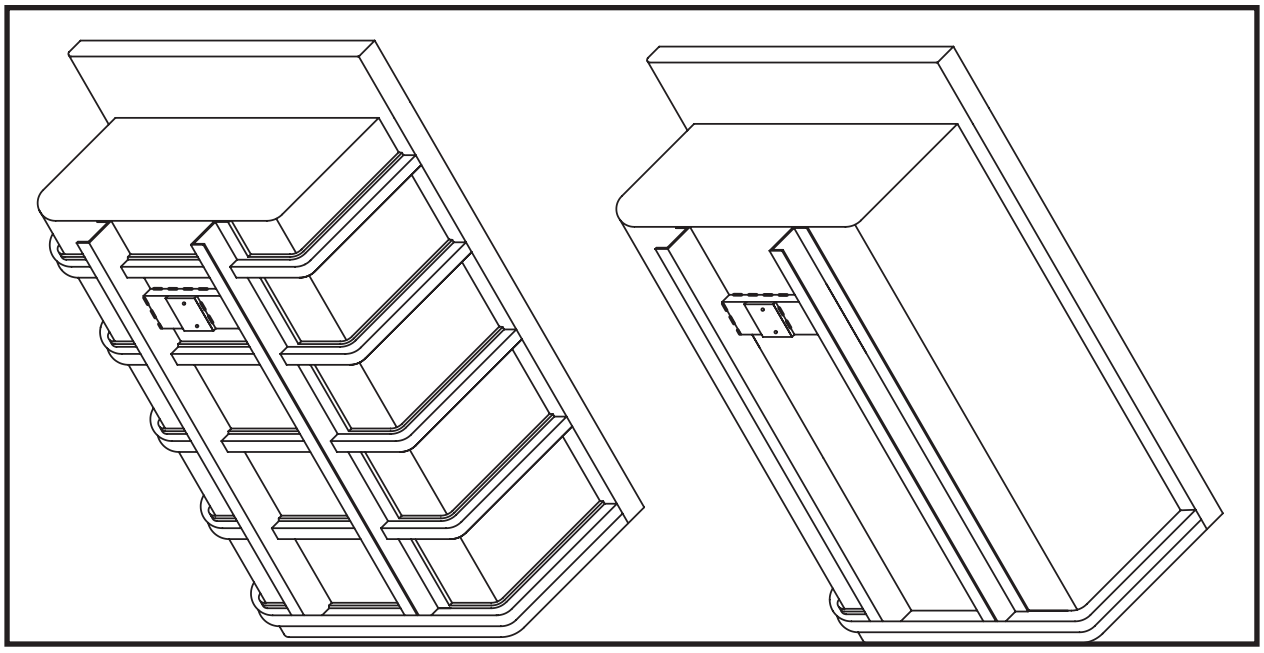

Figure 1. Steel Truck Box Reinforcement and Vibrator Mount

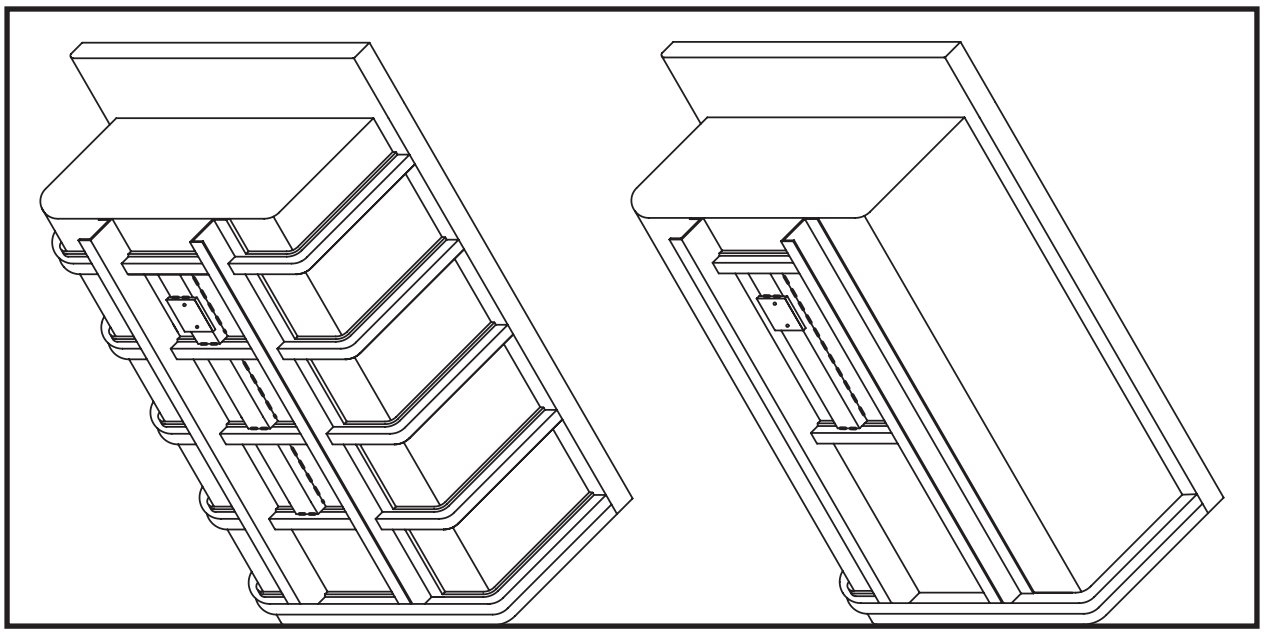

Figure 2. Aluminum Truck Box Reinforcement and Vibrator Mount

3. Cut channel to length and if necessary notch to permit full contact with box and frame members.
4. Position mount plate where vibrator will not interfere with lowering of the truck box.
5. Skip weld mount plate and channnel legs to truck box.

⚠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.

6. Secure vibrator to structure by installing safety cable kit, P/N 32271, or equivalent, weld D-ring onto structure wall above vibrator.

⚠CAUTION

Use only new bolts and compression washers 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.

Make sure mounting surface is flat and free of dirt, grease, paint, and weld slag.

7. Add 1/8” bead of electrical contact grease that is provided alongside the vibrator, a 1/4” from the edge of mounting feet. Split the remaining grease between the two feet and apply the grease in the center of each foot. Install vibrator onto mounting plate with new compression washers and bolts. The threaded mount supplied with kit may also be used. See Table I for specific size and torque requirements. Use liquid thread fastener to help secure bolts.

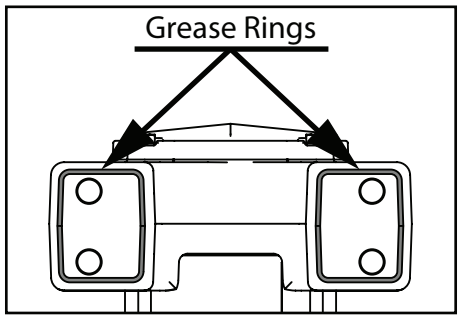

Figure 3. Vibrator Mounting Feet

Table I. Bolt Torque Specifications

Bolt size	Bolt Torque		Bolt Grade
	ft-lbs	N•m	
5/16 in.	15	20	5
3/8 in.	31	42	5
1/2 in.	75	102	5
5/8 in.	150	203	5
3/4 in.	266	361	5
3/4 in.	376	510	8

8. Secure vibrator to structure by installing safety cable kit, P/N 32271, or equivalent, as follows:
   a. Make loop to fit around a 3/8” bolt using the cable and cable clamps supplied with kit. Change out a 3/8 -16 x 1-1/4” long bolt to a 3/8 - 16 x 1-1/4 long bolt and a 3/8” flat washer. Tighten securely, then attach to D-ring on structure wall.
   b. Take up slack within safety restrictions.
   c. Install four cable clamps (two on each) to secure cable to vibrator handle and D-ring. Torque cable clamps to 15-13 ft-lbs (20-40 N•m).

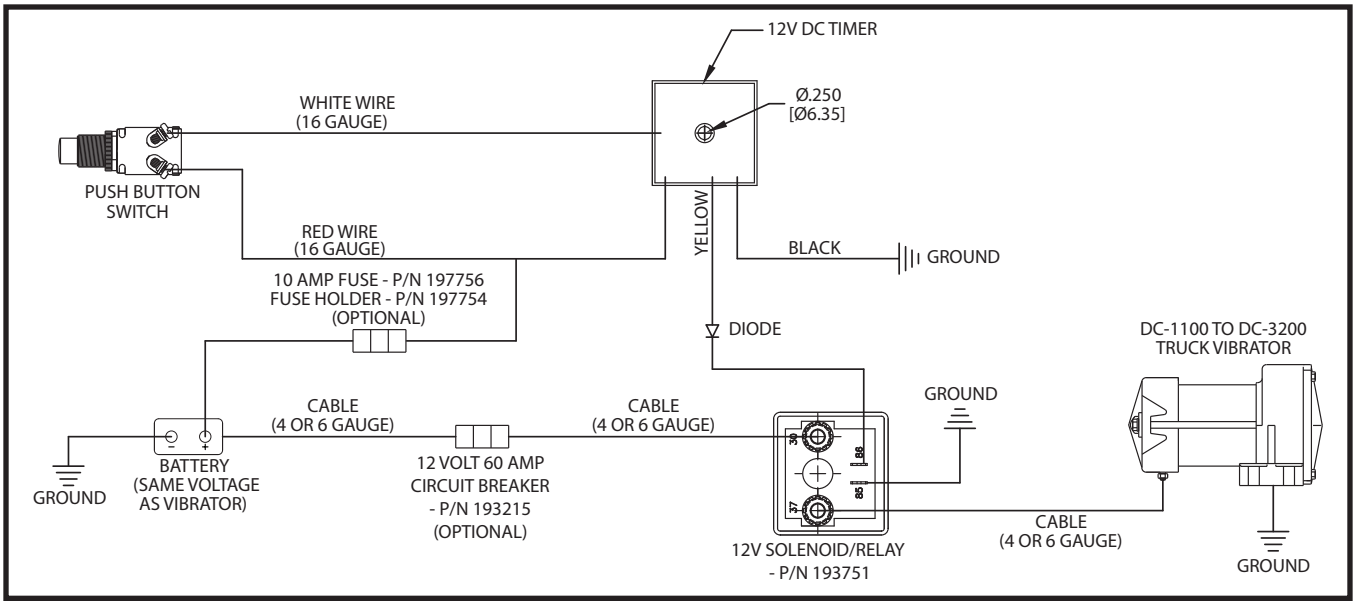

Figure 4. Cougar® DC Electric Vibrators 12 Volt Wiring Diagram

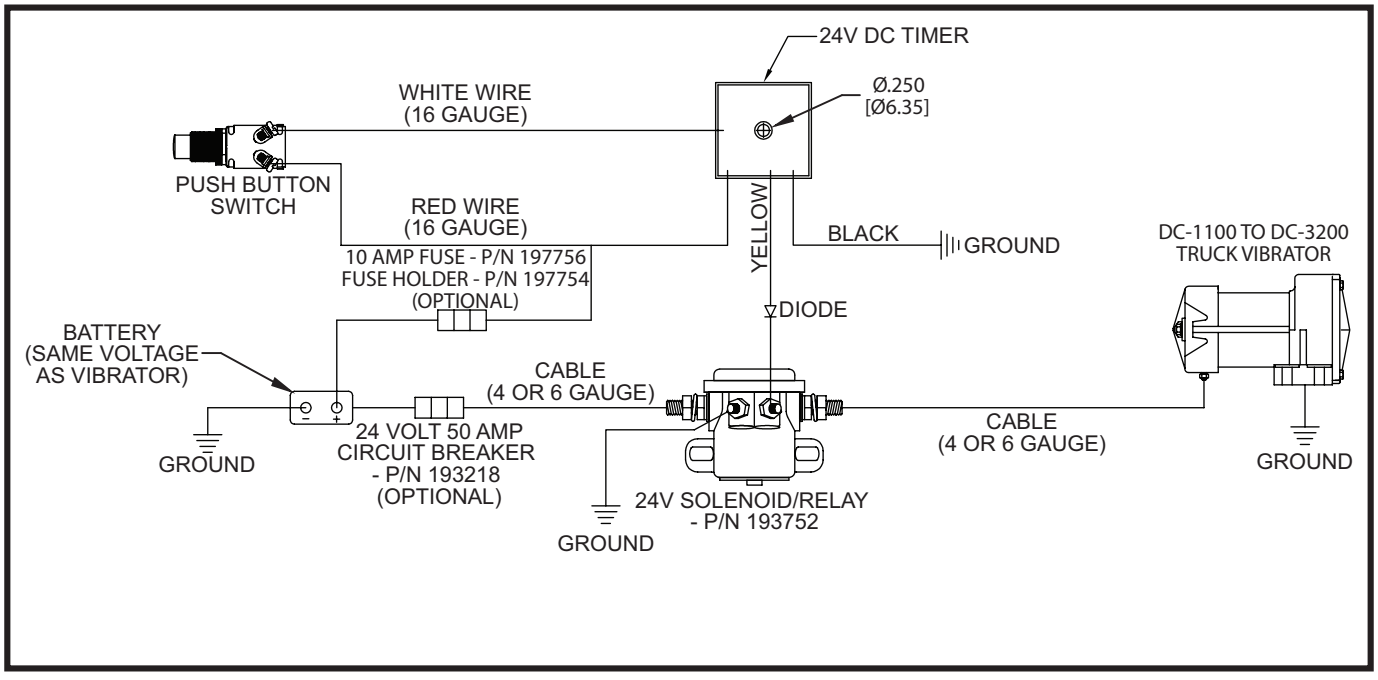

Figure 5. Cougar® DC Electric Vibrators 24 Volt Wiring Diagram

Electrical connections

⚠WARNING

Use DC Voltage Only. Protect all connections from moisture. Do not turn on energy source to vibrator until all steps of this procedure have been peformed.

1. Position the switch on the dashboard of the truck or other location where it will be convenient to operate.
2. Attach solenoid/relay to a grounded surface on the chassis frame, battery box, or a convenient area in the truck's engine compartment. Note: For the 24V solenoid/relay, use one of the two small terminals for ground.

NOTE

If not using a timer (Figure 3) skip to step 7.

3. Mount the timer close to the push button switch.
4. Connect the timer red wire to a positive power source with #16-gauge wire (inline fuse is optional, but recommended).
5. Connect the timer black wire to a grounding source with #16-gauge wire. (Ground source should not be separate from solenoid/relay ground source).
6. Connect the diode assembly to the yellow wire of the timer. The gray line on the diode faces away from the timer. Connect the side of the diode wire assembly to the small terminal on the solenoid/relay with #16 ignition wire.
7. Connect one side of the push button switch to a positive power source with #16-gauge wire (inline fuse is optional, but recommended). If a timer is used, connect the other side of the switch to the white wire of the timer. If no timer is used, connect the wire to the small terminal on the solenoid/relay with #16 ignition wire.
8. Remove 1/2" of insulation from #4 or #6 cable, depending on the length of the cable. Crimp and solder terminal end to cable.
9. Attach cable to the vibrator.

⚠WARNING

Do not remove red isolator or flange nut. Use flange nut to prevent post rotation.

10. Run the cable down the truck box and around the pivot point in a position where the cable will not be pinched or pulled when the box is raised and lowered. (See Figure 3.)
11. Continue running cable from the pivot point along the frame to the solenoid/relay. Cut the cable to proper length; crimp and solder terminal end and connect to solenoid/relay.
12. Clip or wire tie cable in place along the body and frame.
13. Cut a section of #4 or #6 cable long enough to reach from the positive battery terminal to solenoid/relay.
14. Remove 1/2" of cable insulation from each end. Install terminal ends by crimping and soldering.
15. Attach cable to solenoid/relay and route cable to battery.
16. Attach cable to positive battery terminal.
17. Make sure truck box is properly grounded by running a ground strap behind the pivot point and attach to truck frame. This will ensure that the vibrator has the best possible ground.(See Figure 3.) Use #4 wire and ring terminals provided to make a ground strap.

18. Test run vibrator by briefly pushing the “Push Button” switch.
19. Re-torque the vibrator mounting bolts.

NOTE

For positive ground systems, make connections to the negative battery terminal.

NOTE

It is necessary to connect a ground strap from the box to the truck frame using #4 flexible cable. (See Figure 5.)

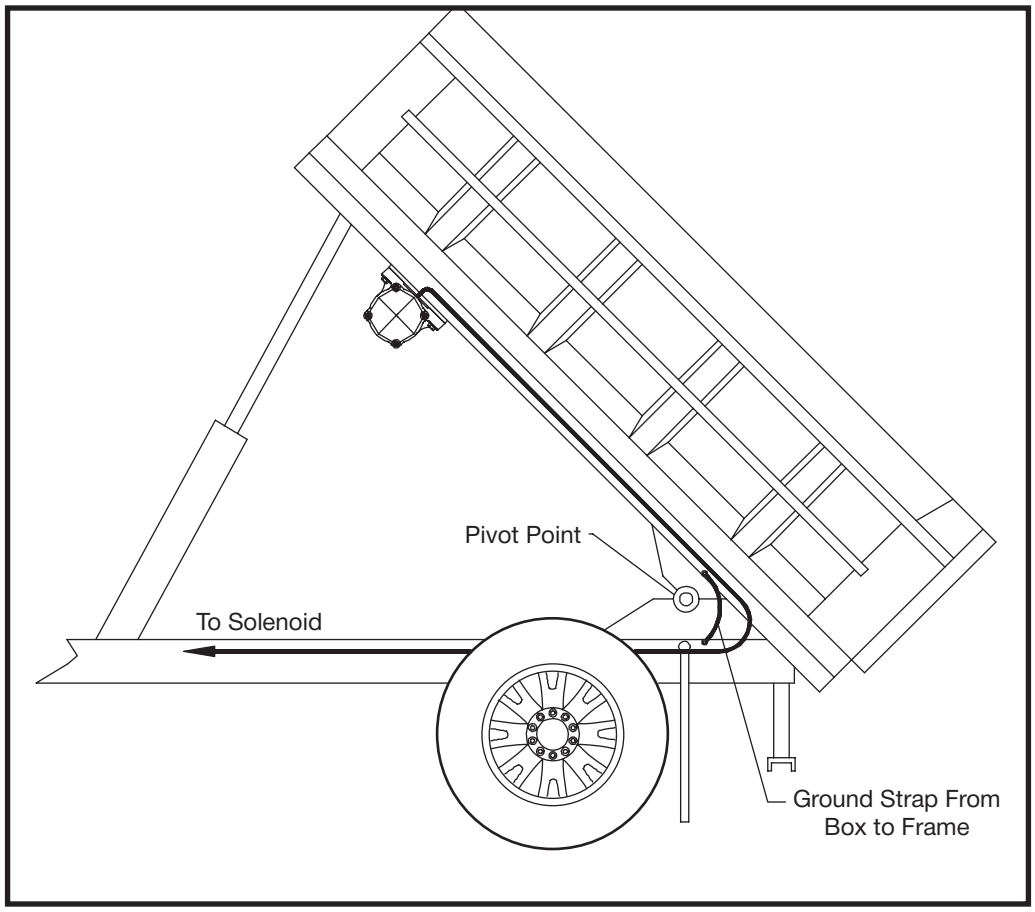

Figure 6. Ground Strap Connections

Starting Cougar® DC Truck Vibrators

IMPORTANT

The Cougar® DC Truck Vibrator is NOT guarenteed for continuous duty. The recommended duty cycle for Cougar® DC Truck Vibrators is a maximum of 45 seconds on-time and a minimum of 90 seconds off-time. Operation in excess of the recommended duty cycle could could void the warranty.

1. Begin unloading truck in the normal manner.
2. Run vibrator briefly (45 seconds or less) when material has stopped flowing during unloading.
3. Run vibrator again to clean truck box at the end of the unloading cycle.

Troubleshooting

Symptom	Corrective Action
Vibrator will not reach required speed.	• Check mount. If damaged, replace mount or stiffen mount by lengthening it or reinforcing structure wall. • Check voltage at motor. If voltage is lower than 12V DC, increase wire size or shorten lead length.
Vibrator will not start.	• Check for blown fuse, failed power supply, loose or improper connections. • If push button or solenoid/relay is not functioning, replace component. • Check for proper grounding.
Vibrator noisy.	• Check for loose mounting bolts and re-torque. • Check mounting assembly and repair any broken welds. • Check for worn motor brushes or bearings. Contact dealer for replacement if necessary.

Maintenance

IMPORTANT

Read entire section before beginning work.

⚠WARNING

Turn off and lock out/ tag out/ blockout/ testout energy source before beginning work on any Cougar® DC Truck Vibrator.

1. Remove back cap on motor and inspect brushes for wear. If worn, replace brushes.

IMPORTANT

Care must be taken when removing bolts, as the field case also will be loose.

2. Inspect electrical cords for cuts or wear. Replace if wiring is showing through cord.
3. Make sure all fasteners are tight.
4. Inspect structure for cracks or fatigue. If found, repair before operating vibrator again.
5. Re-torque mounting bolts after first week of use, and once a month after to ensure efficient vibrator operation.

NOTE

Sealed ball bearings are permanently lubricated. No added lubrication is needed.

Part Numbers

This section provides product names and corresponding part numbers for Cougar® DC Truck Vibrator and related equipment. Please reference part numbers when ordering parts.

NOMENCLATURE **TDC XX XX XX XX XX XX XX X**

P/N Prefix
DC Voltage
Force Output
Mounting Pattern
Color
Mount Kit
Cable Length
Accessory Kit
Protection Kit

DC VOLTAGE
12: 12 Volt
24: 24 Volt

FORCE OUTPUT
11: 1100 Lbs
16: 1600 Lbs
25: 2500 Lbs
27: 2700 Lbs
32: 3200 Lbs

MOUNTING PATTERN
4M: Rectangular Pattern 2.00” x 8.00”
2V: In-line Pattern 8.50” Between Center
2M: In-line Pattern 8.00” Between Center

COLOR (DEFINED AS FIRST & LAST LETTER)
BK: Black
YW: Yellow

MOUNT KIT
MO: No Mount Kit
MA: Aluminum Mount Plate
MS: Steel Mount Plate
MB: Hardware Only

CABLE LENGTH:
CO: No Cord
25: 25 ft
40: 40 ft
50: 50 ft
70: 70 ft
80: 80 ft

ACCESSORY KIT
See “Accessory Kit Nomenclature” (Page 12)

PROTECTION KIT
P: No Protection Kit Included.
C: Protection Kit, Circuit Breaker Only, Voltage Specific, (2 YR Warranty).
1: Protection Kit, 45 Second Timer Only, Voltage Specific, (3 YR Warranty).
2: Protection Kit, 5 Second Timer Only, Voltage Specific, (3 YR Warranty).
3: Protection Kit, Circuit Breaker & 45 Second Timer Included, Voltage Specific, (3 YR Warranty).
4: Protection Kit, Circuit Breaker & 5 Second Timer Included, Voltage Specific, (3 YR Warranty).

ACCESSORY KIT NOMENCLATURE
TDC-KIT-AC-XX-XX-XX-XX-XX

T = Indicates Truck Vibrator
DC = Indicates Drive Power is DC Motor
KIT = Part Number is a Kit
AC = Accessory Kit

NOMENCLATURE **TDC KIT AC XX XX XX XX XX**

P/N Prefix
DC Voltage
Push Button
Solenoid
Ground Strap
Wiring Kit

DC VOLTAGE
12: 12 Volt
24: 24 Volt

PUSH BUTTON
00: No Push Button
PS: Push Button Switch

SOLENOID
00: No Solenoid
SO: Solenoid

GROUND STRAP
00: No Ground Strap

WIRING KIT
00: No Wiring Kit
WK: Wiring Kit

ACCESSORY KIT NOMENCLATURE (FOR USE ON PAGE 11)
-AO: NO ACCESSORY KIT
-01: TDC-KIT-AC-XX-PS-SO-GS-WK
-02: TDC-KIT-AC-XX-PS-SO-GS-00
-03: TDC-KIT-AC-XX-PS-00-GS-WK
-05: TDC-KIT-AC-XX-00-SO-GS-WK
-06: TDC-KIT-AC-XX-PS-SO-00-00
-09: TDC-KIT-AC-XX-00-SO-GS-00
-12: TDC-KIT-AC-XX-00-SO-00-00
The “XX” in the P/N is the DC Voltage

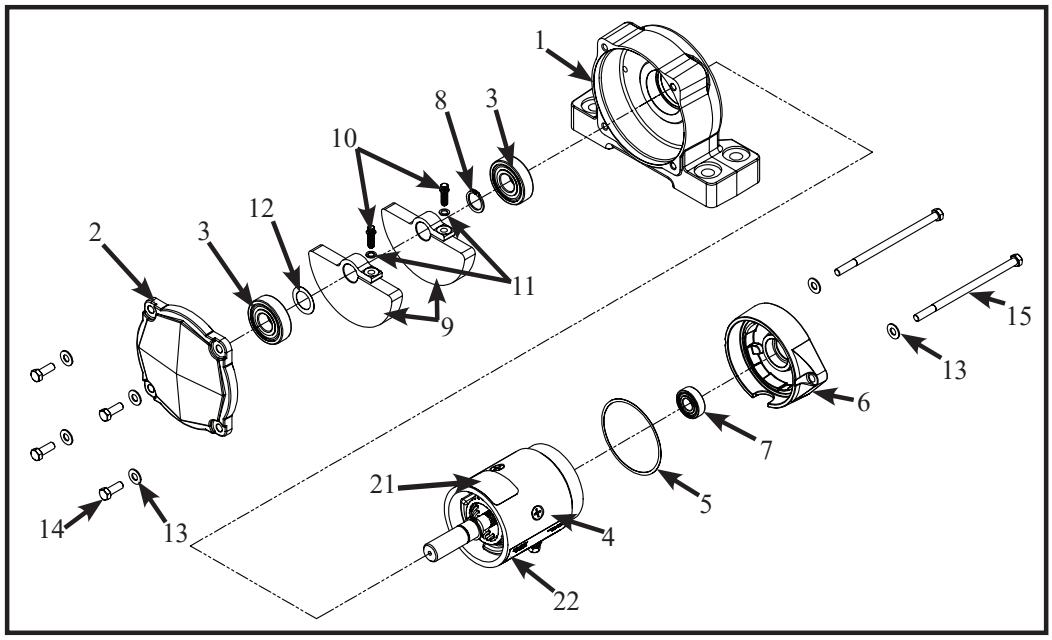

Figure 7. Cougar® DC Truck Vibrator Assembly, P/N TDC XX XX XX XX XX XX X

Item	Description	Part Number	Qty
1	Housing Machined	Table II	1
2	End Bell	120171	1
3	Bearing Ball 6305 2Z C3	CG-100104	2
4	Electric Motor Assembly	167559-XX*	1
5	End Bell Gasket	130006	1
6	End Bell Machined	120195	1
7	Bearing Ball 6203 2Z C3	CG-100107	1
8	Retaining Ring Ext Heavy Duty 1.00 Dia. Shaft	530313	1
9	Weight Eccentric Adjustable	170711	Table II
10	Screw 12-point 5/16-18 x 7/8 Plain	CG-100423	Table II
11	Washer Schnorr D8	513004	Table II
12	Spacer Bearing	CG-100285	Table II
13	Washer Bellevile 3/8; OD .813 THK .060 ZP	CG-517696	6
14	Screw HHC 3/8 - 16 x 1 GR5 ZP	500080	4
15	Screw HHC 3/8 -16 x 7 GR5 ZP	500111	2
(NS) 16	Mounting Kit	Table III	Table III
(NS) 17	Cable Welding	N/A	1
(NS) 18	Accessory Kit	Table IV	Table IV
(NS) 19	Protection Kit	Table V	Table V
(NS) 20	Grease Packet	V-826032	1
21	Label Caution	Form 123	1
22	Label Cougar	CG-100427	1
(NS) 23	Label Warning TDC Post	V-821009	1

* “XX” indicates Volts (12) or (24). Note: Items 1-15 are included in P/N TDCXX-XXXX-XX-XX

Table II. Cougar® DC Truck Vibrator Part Numbers and Quantities

Part No.	Part No. Item 1	Qty Item 9,10,11	Qty Item 12	Weight (lbs)
TDCXX-1100-2M-XX	110533-2M	2	1	23.8
TDCXX-1100-2V-XX	110533-2V	2	1	23.8
TDCXX-1100-4M-XX	110533-4M	2	1	23.7
TDCXX-1600-2M-XX	110533-2M	2	1	23.8
TDCXX-1600-2V-XX	110533-2V	2	1	23.8
TDCXX-1600-4M-XX	110533-4M	2	1	23.7
TDCXX-2500-2M-XX	110533-2M	1	0	20.6
TDCXX-2500-2V-XX	110533-2V	1	0	20.6
TDCXX-2500-4M-XX	110533-4M	1	0	20.6
TDCXX-2700-2M-XX	110533-2M	2	1	23.8
TDCXX-2700-2V-XX	110533-2V	2	1	23.8
TDCXX-2700-4M-XX	110533-4M	2	1	23.7
TDCXX-3200-2V-XX	110533-2V	2	1	23.8
TDCXX-3200-4M-XX	110533-4M	2	1	23.7

Table III. Cougar® DC Truck Vibrator Mounting Kit P/N

Part No.	Part No. Item 16	Qty Item 16
TDCXX-XX-XX-XX-MA-XX-XX-X	TXX-KIT-MNT-MA	1
TDCXX-XX-XX-XX-MB-XX-XX-X	TXX-KIT-HW-MS	1
TDCXX-XX-XX-XX-MS-XX-XX-X	TXX-KIT-MNT-MS	1
TDCXX-XX-XX-XX-M0-XX-XX-X	N/R	1

Table IV. Cougar® DC Truck Vibrator Accessory Kit P/N*

Part No.	Part No. Item 18	Qty Item 18
TDCXX-XX-XX-XX-XX-00-X	N/R	0
TDCXX-XX-XX-XX-XX-01-X	TDC-KIT-AC-XX-PS-S0-GS-WK	1
TDCXX-XX-XX-XX-XX-02-X	TDC-KIT-AC-XX-PS-S0-GS-00	1
TDCXX-XX-XX-XX-XX-03-X	TDC-KIT-AC-XX-PS-00-GS-WK	1
TDCXX-XX-XX-XX-XX-05-X	TDC-KIT-AC-XX-00-S0-GS-WK	1
TDCXX-XX-XX-XX-XX-06-X	TDC-KIT-AC-XX-PS-S0-00-00	1
TDCXX-XX-XX-XX-XX-09-X	TDC-KIT-AC-XX-00-S0-GS-00	1
TDCXX-XX-XX-XX-XX-12-X	TDC-KIT-AC-XX-00-S0-00-00	1

* “XX” After TDC is the DC voltage.

Table V. Cougar® DC Truck Vibrator Protection Kit P/N*

Part No.	Part No. Item 19	Qty Item 19
TDCXX-XX-XX-XX-XX-XX-XX-P	N/R	0
TDCXX-XX-XX-XX-XX-XX-XX-C	TDC-KIT-PRO-XX-1C0	1
TDCXX-XX-XX-XX-XX-XX-XX-3	TDC-KIT-PRO-XX-3CT	1

* "XX" After TDC & in Item 19 is the DC voltage.

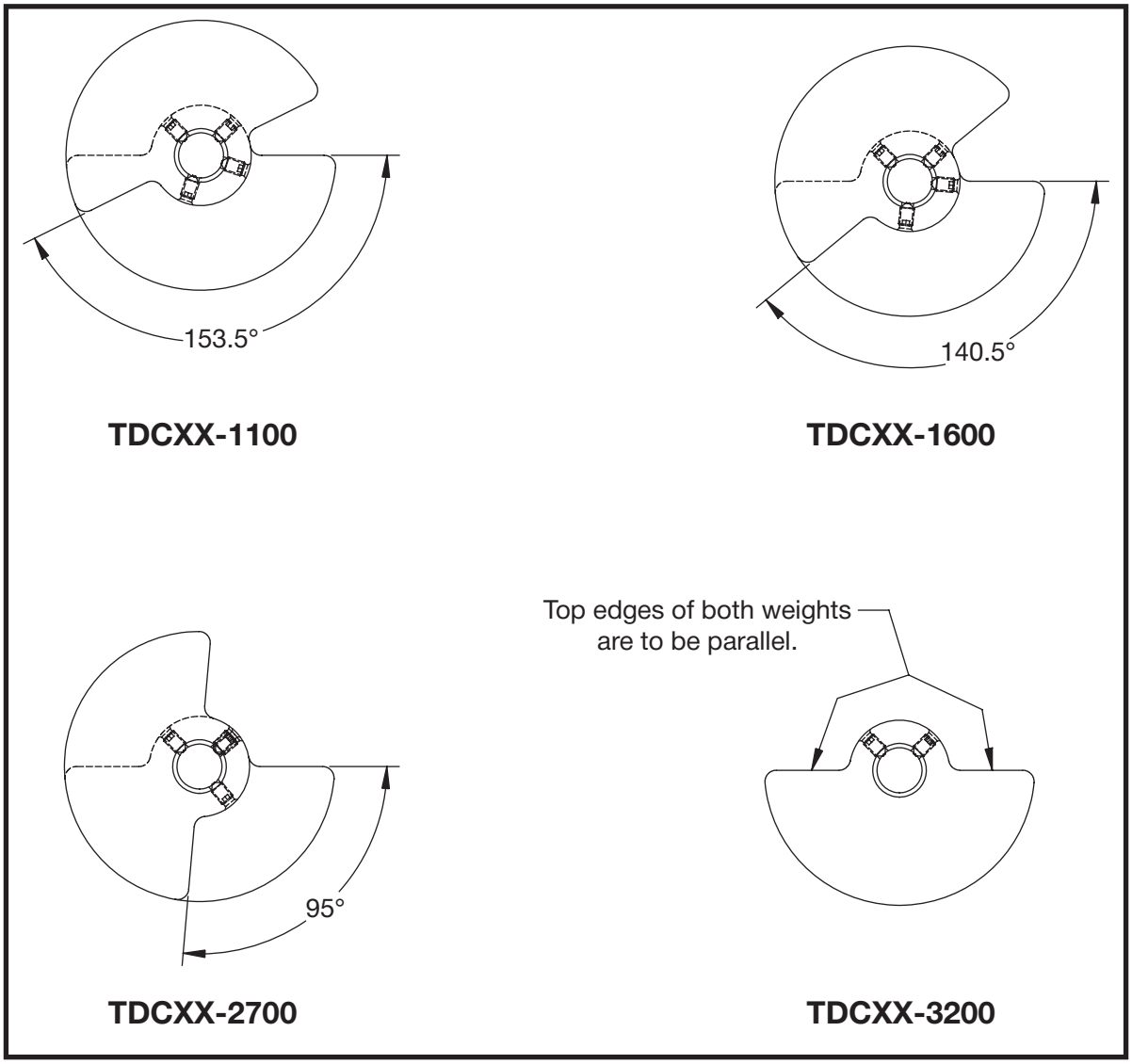

Figure 8. Eccentric Weight Settings

Figure 9. Cougar® DC Truck Vibrator Caution Label, P/N Form #123

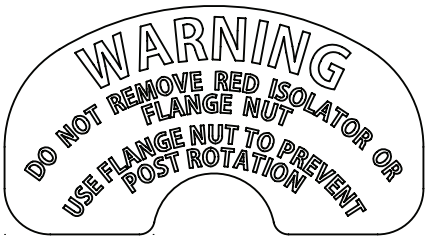

Figure 10. Cougar® DC Truck Vibrator Warning Label, P/N V-821009

Figure 11. Cougar® DC Truck Vibrator Cougar Label, P/N CG-100427

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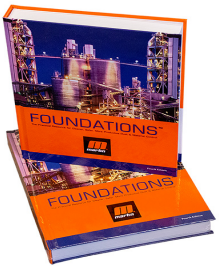

For nearly 30 years, Martin Engineering's Foundations™ Books have taught industry personnel to operate and maintain clean and safe belt conveyors. The Foundations™ Book, fourth edition, focuses on improving belt conveyors by controlling fugitive material. "The Practical Resource for Total Dust and Material Control," is a 576-page hard cover volume that provides information of value to industries where the efficient handling of bulk materials is a key to productivity and profitability.

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