



Cougar[®] Thumper[™] Series Timed Impactors and PV Series Piston Vibrators

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Operator's Manual
M3422

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.

Table of Contents

Section	Page
List of Figures	ii
List of Tables	ii
Introduction	1
General	1
References	1
Safety	1
Materials required	1
Before Installing Vibrator/Impactor	2
Installing Vibrator/Impactor	3
Locating vibrator/impactor on structure	4
Installing reinforcing beam onto structure	4
Mounting vibrator/impactor onto structure	6
Connecting air lines	8
After Installing Vibrator/Impactor	10
Weekly Maintenance	11
Troubleshooting	12
Part Numbers	13
Appendix A. Cougar® Thumper™ Series Timed Impactor or PV Series Piston Vibrator Specifications	A-1
Appendix B. Cougar® Thumper™ Series Timed Impactor or PV Series Piston Vibrator Dimensions	B-1

List of Figures

Figure	Title	Page
1	Locating Vibrator/Impactor on Structure	4
2	Channel, Clamp Block, TBM Wedge, and W-Beam Mounts	5
3	Skip Weld	5
4	Mounting Cougar® Thumper™ Series Timed Impactor	6
5	Installing Vibrator/Impactor Safety Cable	8
6	Cougar® Thumper™ Series Timed Impactor Plumbing Detail for Normally-Closed Solenoid Valve	9
7	Cougar® PV Series Piston Vibrator Plumbing Detail for Normally-Closed Solenoid Valve	9
8	Cougar® PV 1-1/4 Piston Vibrator or Thumper™ T-125 Timed Impactor Assemblies.	15
9	Cougar® PV-2 Piston Vibrator or Thumper™ T-200 Timed Impactor Assemblies.	16
10	Cougar® PV 2-1/2 Piston Vibrator with Sleeve or Thumper™ T-250 Timed Impactor Assemblies.	17
11	Cougar® PV-3 Piston Vibrator or Thumper™ T-300 Timed Impactor Assemblies.	18
12	Cougar® PV-4 Piston Vibrator or Thumper™ T-400 Timed Impactor Assemblies.	19
13	Piston Vibrator Warning Label, P/N 29814	20
14	Loud Noise Warning Tag, P/N 34070	20

List of Tables

Table	Title	Page
I	Bolt Sizes and Torque Specifications	7
A-I	Cougar® PV Series Piston Vibrator Specifications	A-2
A-II	Cougar® Thumper™ Series Timed Impactor Specifications	A-2
B-I	Cougar® PV Series Piston Vibrator Dimensions.	B-2
B-II	Cougar® Thumper™ Series Timed Impactor Dimensions	B-3

Introduction

General

Cougar® Thumper™ Series Timed Impactors and PV Series Piston Vibrators provide force to activate the free flow of sticky, coarse, high-moisture materials in bins and hoppers. The vibrators/impactors require no maintenance when used with filtered and lubricated air.

This manual covers installing and operating Cougar® Thumper™ Series Timed Impactors and PV Series Piston Vibrators on bins, hoppers, and chutes. For assistance installing the vibrators/impactors for other applications, call Martin Engineering.

Technical data is provided in Appendix A.

Dimensions for each Cougar® Thumper™ Series Timed Impactor and PV Series Piston Vibrator are provided in Appendix B.

References

The following documents are referenced in this manual:

- 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.
- 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 defined in the above documents, and all owner/employer safety rules, must be strictly followed when working on the Cougar® Thumper™ Series Timed Impactors and PV Series Piston Vibrators.

Materials required

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

- Channel Mount, P/N 29928-XX or equivalent.
- Air Line Kit, P/N 29808 or 29809.

Before Installing Vibrator/Impactor

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.

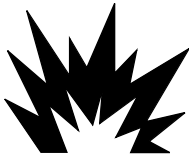
1. Inspect shipping container for damage. Report damage to delivery service immediately and fill out delivery service's claim form. Keep any damaged goods subject to examination.
2. Remove vibrator/impactor from shipping box.
3. If anything is missing, contact Martin Engineering or representative.



WARNING

Before installing equipment, turn off and lock out/tag out energy source.

4. Turn off and lock out/tag out energy source 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. Cover conveyor belt with fire retardant cover.
6. Make sure mounting surface is strong and flat, within 1/16 in. (2 mm) across vibrator/impactor feet. (This will prevent internal stress to vibrator/impactor casting when tightening mount bolts.)
7. Make sure mounting surface and vibrator/impactor are clean and free of debris.

Installing Vibrator/Impactor

IMPORTANT

Read entire section before beginning work.

⚠ CAUTION

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

To install the Cougar® Thumper™ Series Timed Impactor or PV Series Piston Vibrator, follow the procedures corresponding to the following steps:

1. Determine where to locate the vibrator/impactor on the structure.

IMPORTANT

Piston vibrators/impactors produce linear vibration best applied to wet, sticky material adhering to a structure wall. The purpose is to move the wall back and forth to dislodge the material.

2. Install 1- to 3-ft (305- to 914-mm) channel or beam onto sloped section of bin.
3. Install channel mount or equivalent onto structure or beam reinforcement, as applicable.
4. Mount vibrator/impactor onto structure.
5. Connect lubricated air lines to vibrator/impactor.

***Locating vibrator/
impactor on
structure***

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

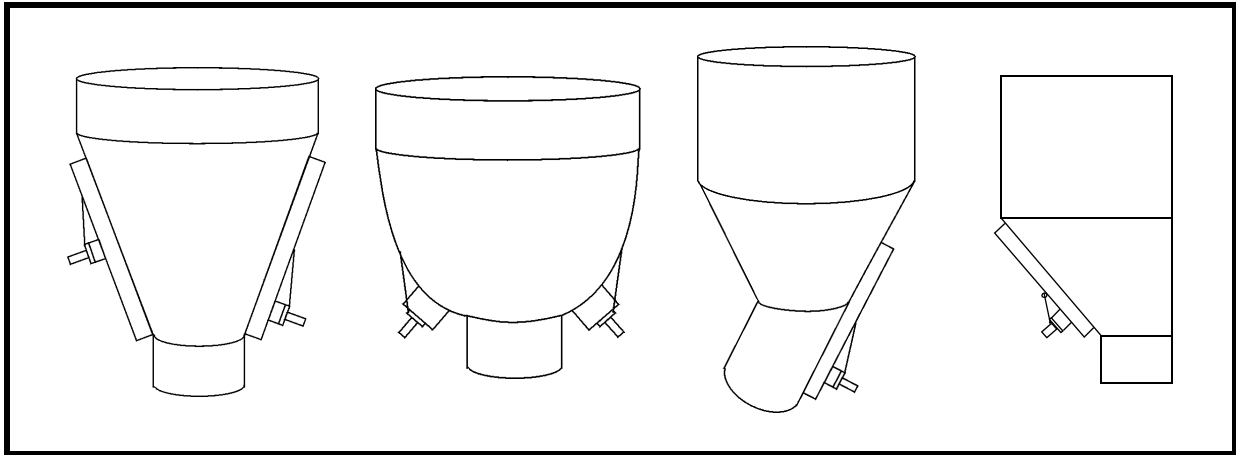


Figure 1. Locating Vibrator/Impactor on Structure

***Installing
reinforcing beam
onto structure***

NOTE

This section provides instructions for installing vibrator/impactor on steel structure. To install vibrator/impactor on concrete structure, contact Martin Engineering for instructions.

1. If using customer-supplied mounting plate to mount vibrator/impactor onto structure, do the following:
 - a. Make sure plate is at least the size of vibrator/impactor base.
 - b. Locate plate so that vibrator/impactor can be positioned as shown in Figure 1.
 - c. Weld mounting plate onto structure.
2. See Figure 2. If using Martin® Channel Mount, W-beam Mount (or equivalent), or T-beam to mount vibrator/impactor onto structure, do the following:
 - a. Locate beam so that vibrator/impactor can be positioned as shown in Figure 1.

IMPORTANT

If material is dry, structure wall should be more rigid so a longer channel or beam should be installed. A channel or beam 3/4 the length of the sloped wall is recommended for movement of dry materials.

- b. Install 1- to 3-ft (305- to 914-mm) channel or beam onto structure wall.

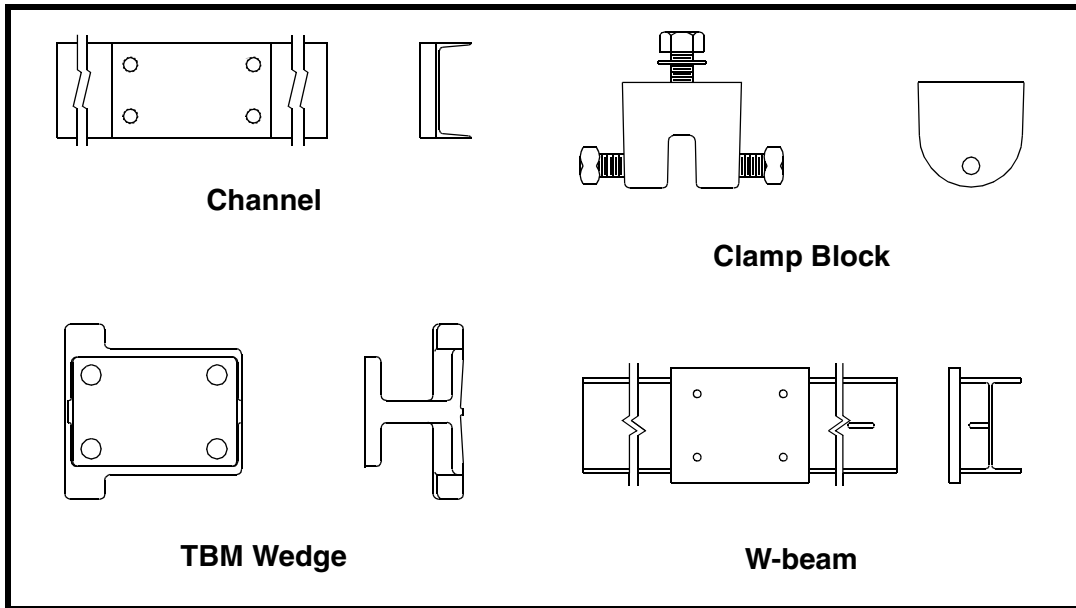


Figure 2. Channel, Clamp Block, TBM Wedge, and W-beam Mounts (Top and Side Views)

- c. See Figure 3. Skip-weld beam in place: Weld 3 in. (76 mm), then skip 2 in. (51 mm). Repeat for entire perimeter of beam. Do not weld last 1 in. (25 mm) of either end of beam or any corner.

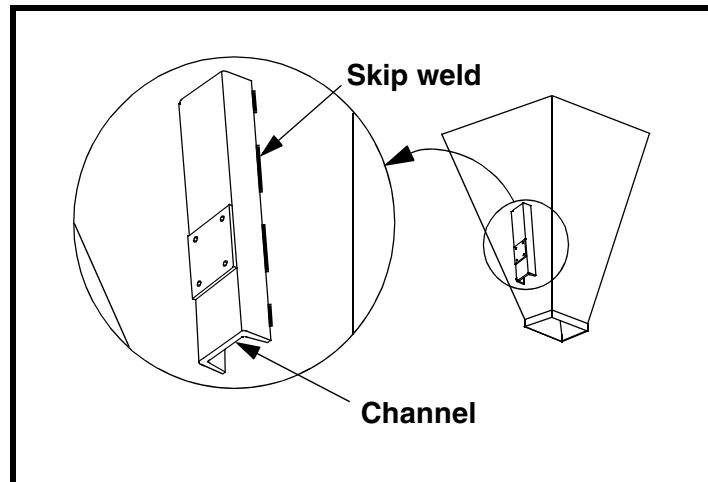


Figure 3. Skip Weld

- d. If installing vibrator/impactor on hopper with wedge mount already in place, use TBM Wedge (see Figure 2) or equivalent to mount vibrator/impactor. Mount female half of wedge rigidly to beam extending at least 3/4 the slope length.

Mounting vibrator/impactor onto structure

▲ WARNING

Move vibrator/impactor into final position carefully. Sudden movements could cause strike plate to fall out of vibrator/impactor body causing damage to strike plate or injury to personnel.

IMPORTANT

If vibrator/impactor has been partially disassembled, make sure strike plate is firmly seated before mounting.

Cougar® Thumper™ Series Timed Impactor must be mounted with a minimum slope of 15° below horizontal. (See Figure 4.)

1. If using Cougar® Thumper™ Series Timed Impactor, ensure mounting location has a minimum slope of 15° below horizontal. (See Figure 4.)

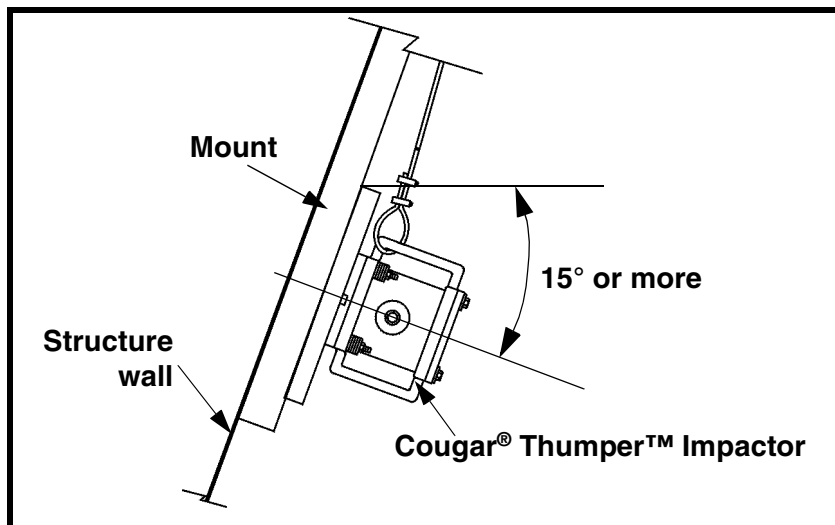


Figure 4. Mounting Cougar® Thumper™ Series Timed Impactor

2. Make sure vibrator/impactor is totally assembled before mounting. If strike plate has come out, press into place making sure o-ring is seated in groove and plate is flush with bottom of vibrator/impactor body.
3. Before installing vibrator/impactor onto mount, apply thread-sealing compound to all bolts.

▲ CAUTION

Use only new bolts, lock nuts, and compression washers to install vibrator/impactor. Old fasteners can break and cause damage to vibrator/impactor or structure.

4. Install vibrator/impactor onto Channel Mount, W-beam Mount, clamp blocks, or TBM wedge (see Figure 2) as follows:
 - a. Align mounting holes in vibrator/impactor with mounting holes in mount.
 - b. Install vibrator/impactor onto mount with four new lock nuts, compression washers, and Grade 5 bolts. See Table I for specific size and torque requirements. Use lock nuts and lock washers same size as bolts.

Table I. Bolt Sizes and Torque Specifications

Model Number	Bolt Size	Torque
PV-1.25, T-125	1/2 -13 NC	75 ft-lb (10 kgm)
PV-2, T-200	5/8 -11 NC	170 ft-lb (23 kgm)
PV-3, PV-4, T-250, T-300, T-400	3/4 -10NC	288 ft-lb (38 kgm)

5. To install clamp block onto structure, do the following:
 - a. Loosen two set screws.
 - b. Slide feet of clamp blocks (with vibrator/impactor attached) onto T-beam or rail on structure.
 - c. Tighten two set screws into clamp block bushings to secure clamp blocks to beam or rail.
6. To install TBM wedge onto structure, do the following:
 - a. Remove hex nut, flat washer, and slide bracket from threaded rod.
 - b. Slide TBM wedge (with vibrator/impactor attached) into mount on structure.
 - c. Install slide bracket, flat washer, and hex nut onto TBM wedge to secure it in mount.

 WARNING

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

7. Secure vibrator/impactor to structure by installing a 1/8-in. (3 mm) diameter cable assembly, P/N 29827, or equivalent as follows:
 - a. Weld D-ring (A, Figure 5) onto structure wall (B) above vibrator/impactor.
 - b. Loop 1/8-in. (3 mm) wire cable (C) through vibrator/impactor handle (D) and D-ring on structure wall.
 - c. Make sure cable is taut and has 3-1/4 in. (83 mm) of turn-back at each end.

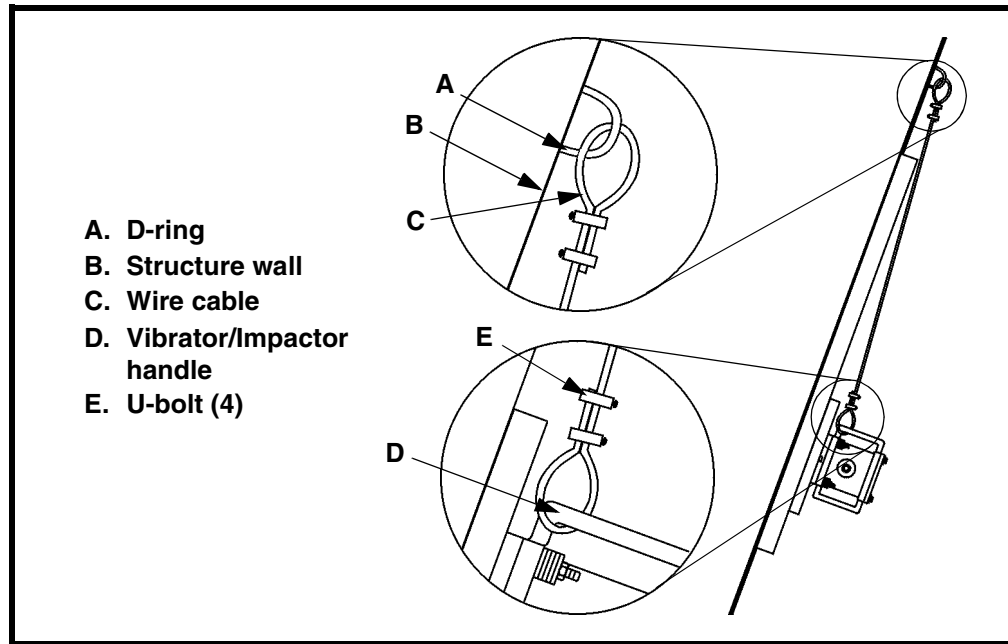


Figure 5. Installing Vibrator/Impactor Safety Cable

- d. Apply thread-sealing compound to threads of nuts on U-bolts (E). Install four cable clamps (two on each end) to secure cable to vibrator/impactor eye and D-ring. Torque nuts to 4.5 ft-lb (0.6 kgm).
- e. Trim loose ends of wire cable.

IMPORTANT

Connecting air lines

At least 20 psi (1.38 bar) is required to operate the Cougar® Thumper™ Series Timed Impactors and PV Series Vibrators. Martin Engineering recommends using an air filter (available from Martin Engineering) on the air line.

Lubricated air must be used to ensure proper operation of the vibrator/impactor.

1. Run a lubricated air line (supplied by the customer) to the intake on the side of the vibrator/impactor body. See Figure 6.
2. Remove plastic plug.
3. Connect air line to vibrator/impactor.

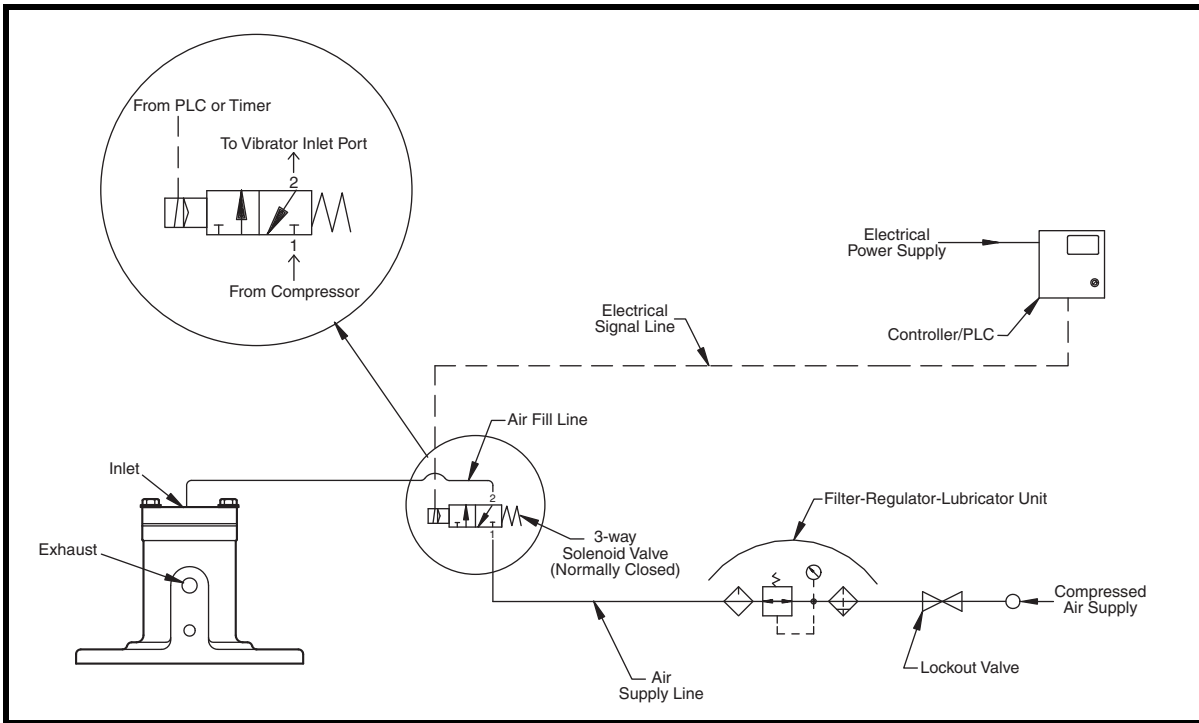


Figure 6. Cougar® Thumper™ Series Timed Impactor Plumbing Detail for Normally-Closed Solenoid Valve

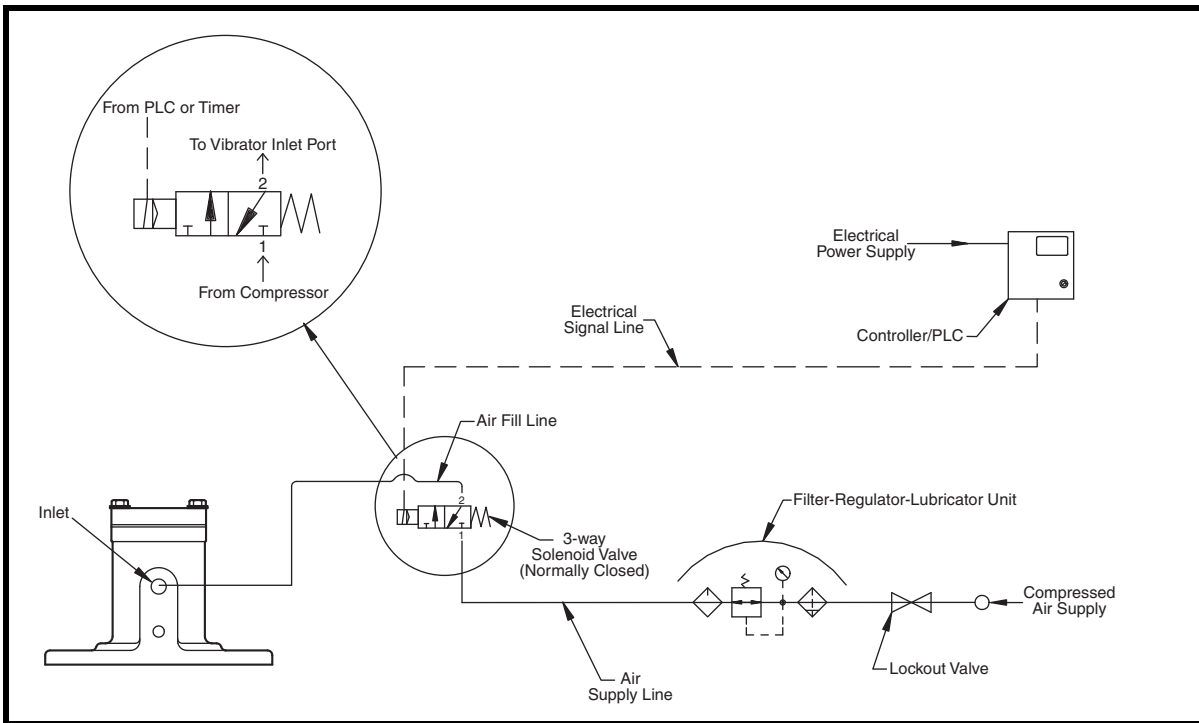


Figure 7. Cougar® PV Piston Vibrator Plumbing Detail for Normally-Closed Solenoid Valve

After Installing Vibrator/Impactor

IMPORTANT

Read entire section before beginning work.

1. Start vibrator/impactor.

▲ WARNING

Piston vibrators/impactors are loud when operating. Use ear protection to avoid impairment or loss of hearing.

2. Observe operation of vibrator/impactor. If there is noticeable movement of the structure wall or mount during operation, add more reinforcement to structure (see “Installing reinforcing beam onto structure”).
3. After 1 hour of operation, tighten mounting bolts while vibrator/impactor is operating to fully seat vibrator/impactor.

IMPORTANT

Read entire section before beginning work.

1. Check vibrator/impactor mounts for structural damage. If structure wall is beginning to tear or if vibrator/impactor is moving, reinforce wall underneath vibrator/impactor mount (see “Installing reinforcing beam onto structure”).
2. Make sure all fasteners are tight. Tighten if necessary.

▲ WARNING

Shut off air pressure before disassembling unit. Servicing vibrator/impactor before air pressure is turned off can cause serious injury.

3. If vibrator/impactor is making unusual noise or is not moving material away from hopper wall, disassemble by doing the following:
 - a. Shut off air pressure to unit.
 - b. Loosen mounting bolts but do not remove.
 - c. Slide shims under vibrator/impactor so it is 3/8 to 1/2 in. (9 to 13 mm) away from mount.
 - d. Tighten mounting bolts to the proper torque (see Table I).

▲ CAUTION

Apply only 10 psi (0.69 bar) air pressure to vibrator/impactor during disassembly. Damage to vibrator/impactor could result if more pressure is used.

- e. Apply 10 psi (0.69 bar) air pressure to vibrator/impactor to dislodge strike plate.
- f. Shut off air supply to vibrator/impactor and remove unit from mount.
- g. Inspect parts for wear (see “Troubleshooting”).

▲ CAUTION

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

4. Reassemble vibrator/impactor. Mount onto structure using new fasteners (see “Mounting vibrator/impactor onto structure”).
5. Wipe all labels clean. If labels are not readable, contact Martin Engineering or representative for replacements.
6. Install safety cable and air line.
7. Restart vibrator/impactor.

Troubleshooting

Troubleshooting

If you are experiencing problems with the Cougar® Thumper™ Series Timed Impactor or PV Series Piston Vibrator, see below.

Symptom	Corrective Action
Vibrator/impactor not moving material	<ul style="list-style-type: none"> • Vibrator/impactor assembled incorrectly. Dismantle vibrator/impactor and assemble correctly. • No air pressure. Make sure air is on and reaching vibrator/impactor.
Vibrator/impactor making unusual noise	<ul style="list-style-type: none"> • Vibrator/impactor assembled incorrectly. Dismantle vibrator/impactor and assemble correctly. • Contaminant has entered vibrator/impactor. Disassemble vibrator/impactor and clean body and piston. If piston shows signs of wear, replace piston.
Structure wall moving or beginning to tear	Wall not rigid enough. Reinforce structure wall or mount.

Part Numbers

This section provides product names and corresponding part numbers for Cougar® Thumper™ Series Timed Impactors and PV Series Piston Vibrators and related equipment. Please reference part numbers when ordering parts.

Cougar® PV Series Piston Vibrators

Cougar® PV 1-1/4 Piston Vibrator Assembly: P/N 12883. See Figure 8.

Cougar® PV 2 Piston Vibrator Assembly: P/N 12889. See Figure 9.

Cougar® PV 2 Piston Vibrator Assembly with Sleeve: P/N 19862.

Cougar® PV 2-1/2 Piston Vibrator Assembly with Sleeve: P/N 18581.
See Figure 10.

Cougar® PV 3 Piston Vibrator Assembly (Wide Base): P/N 21287.
See Figure 11.

Cougar® PV 3 Piston Vibrator Assembly (Wide Base) with Sleeve:
P/N 23990.

Cougar® PV 4 Piston Vibrator Assembly: P/N 17757. See Figure 12.

Cougar® PV 4 Piston Vibrator Assembly with Sleeve: P/N 21035.

Cougar® Thumper™ Series Timed Impactors

Cougar® Thumper™ T-125 Timed Impactor Assembly: P/N 21685.
See Figure 8.

Cougar® Thumper™ T-200 Timed Impactor Assembly: P/N 21682.
See Figure 9.

Cougar® Thumper™ T-250 Timed Impactor Assembly: P/N 19078.
See Figure 10.

Cougar® Thumper™ T-300 Timed Impactor Assembly: P/N 21572.
See Figure 11.

Cougar® Thumper™ T-400 Timed Impactor Assembly: P/N 17589.
See Figure 12.

Vibrator mounts

Channel Mount for P-1.25 Series: P/N 29928-01.

Channel Mount for P-2 Series: P/N 29928-02.

Channel Mount for P-3 Series (excluding railcar models): P/N 29928-03.

Channel Mount for P-4 Series: P/N 29928-04.

P-3R TBM Wedge Bracket (for railcar models [finished]): P/N 30048.

Clamp Block for P-1.25 Series: P/N 12958-03.

Clamp Block for P-3 Series (excluding railcar models): P/N 12958-05.

Mounting Kits

Mounting Kit for P-1.25 Series: P/N 29810.

Mounting Kit for P-2 Series: P/N 29811.

Mounting Kit for P-3 Series (including railcar models): P/N 29812.

Mounting Kit for P-4 Series: P/N 29813.

Miscellaneous

1/2 in. (13 mm) NPT Air Line Filter (120 psi [8.28 bar] max.): P/N 14751.

1/2 in. (13 mm) NPT Brass Regulator (120 psi [8.28 bar] max.):
P/N 14744.

1/2 in. (13 mm) NPT Air Line Lubricator (120 psi [8.28 bar] max.):
P/N 14756.

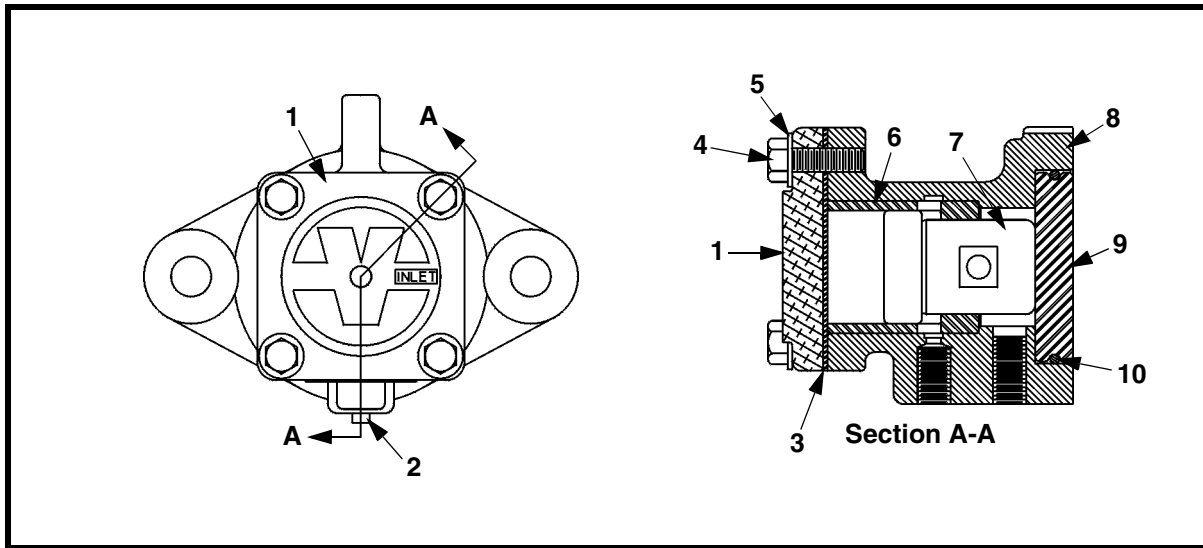
1/2 in. (13 mm) NPT Filter-Regulator-Lubricator (FRL) Kit: P/N 14760.

1/2 in. (13 mm) Bronze Ball Valve: P/N 14824.

1/2 in. (13 mm) NPT Solenoid Valve (120 V 60 Hz): P/N 14736.

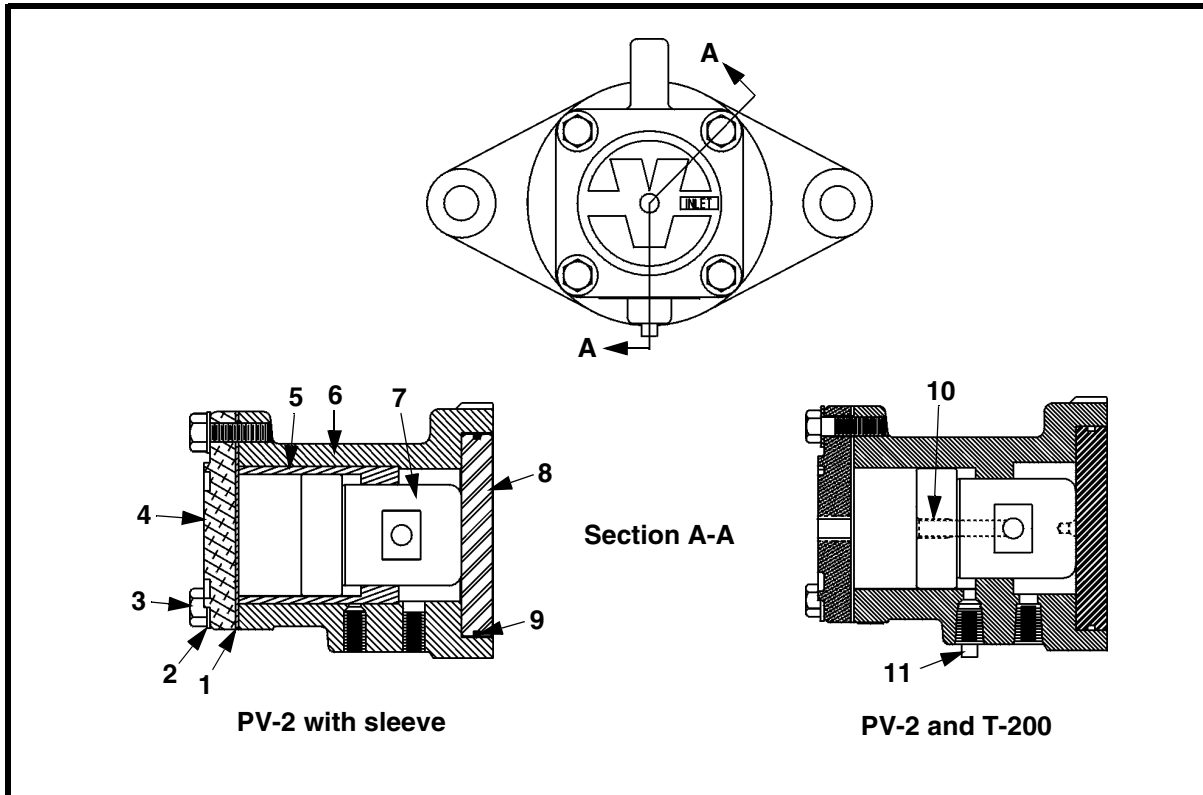
30-Minute Cycle Timer (120 V 60 Hz): P/N 18073.

Martin[®] Controller - single circuit: P/N 38902-20.



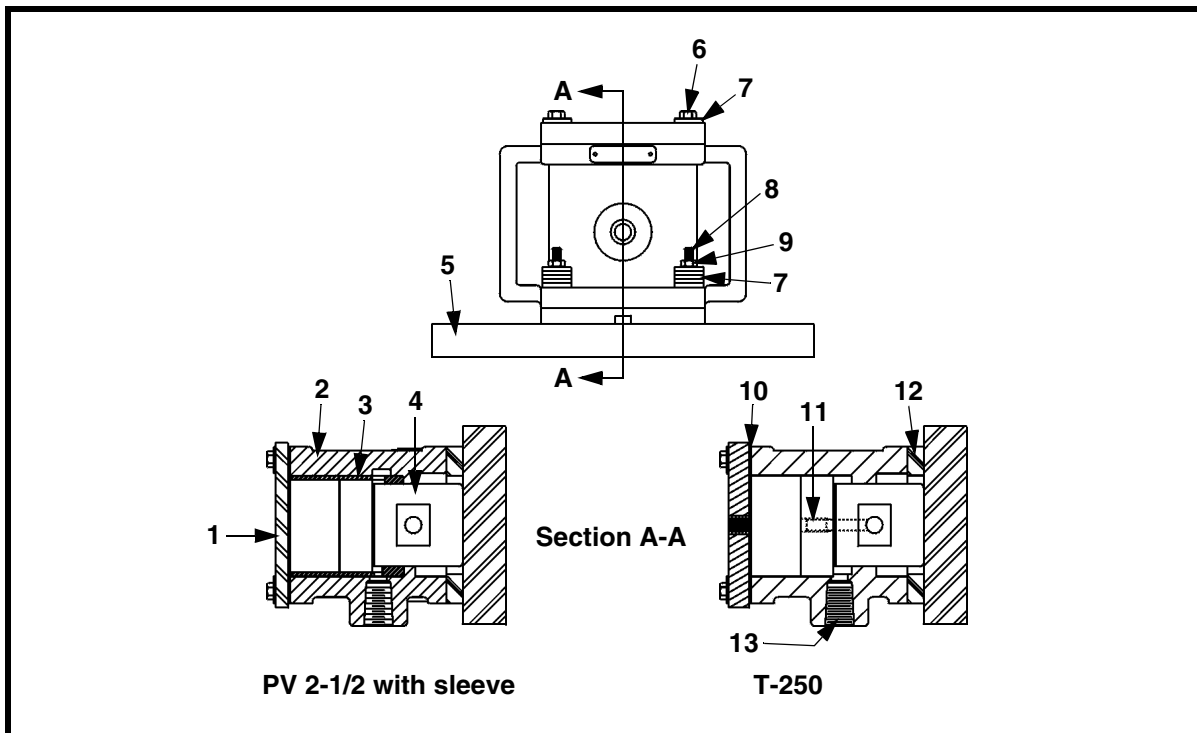
Item	Description	PV 1-1/4 with Sleeve	T-125	Qty
1	End Cap	12833	17523	1
2	Plug Pipe Sq. Head 1/4 -18 NPT		17524	1
3	Gasket	17115	17115	1
4	Screw HHC 5/16 -18NC x 1	32583	32583	4
5	Washer Spring 5/16	11452	11452	4
6	Sleeve	17429	17429	1
7	Piston	12829	24053	1
8	Body PV 1-1/4	17406	17406	1
9	Strike Plate	12882	12882	1
10	O-Ring	14034	14034	1
NS	Washer Compression 1/2	11750	11750	2
Fig. 13	Piston Vibrator Warning Label	29814	29814	1
Fig. 14	Loud Noise Warning Tag	34070	34070	1

Figure 8. Cougar® PV 1-1/4 (P/N 12883) Piston Vibrator or Thumper™ T-125 (P/N 21685) Timed Impactor Assemblies



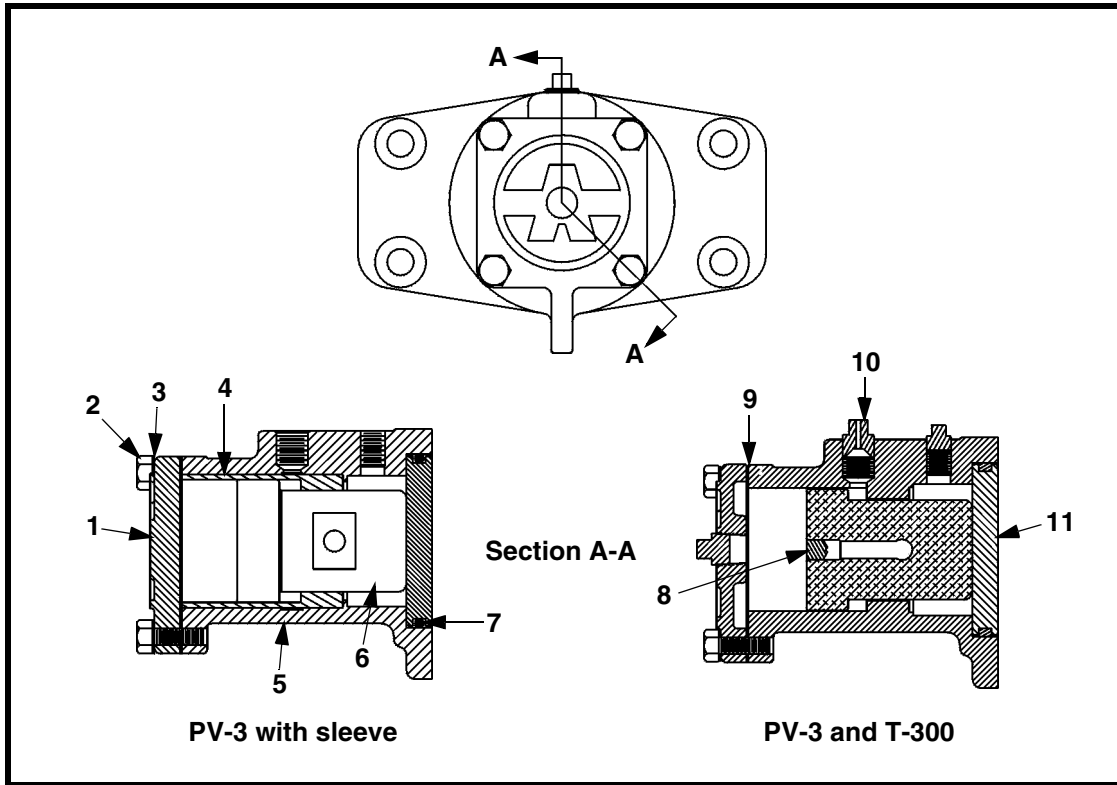
Item	Description	PV-2	PV-2 with Sleeve	T-200	Qty
1	Gasket	17118	17118	17118	1
2	Washer Compression 3/8	11747	11747	11747	4
3	Screw HHC 3/8 -16NC x 1-1/4	12215	12215	12215	4
4	End Cap	12780	12780	17117	1
5	Sleeve		19883		1
6	Body	12777	17455	12777	1
7	Piston	12884	12884	12884	1
8	Strike Plate	12886	12886	12886	1
9	O-Ring	14035	34687	14035	1
10	Screw Soc. Hd. 3/8 -16 x 1/2			12921	1
11	Plug Vent 1/4 -18 NPT			21684	1
NS	Washer Compression 5/8	11752	11752	11752	2
Fig. 13	Piston Vibrator Warning Label	29814	29814	29814	1
Fig. 14	Loud Noise Warning Tag	34070	34070	34070	1

Figure 9. Cougar® PV-2 (P/N 12889 or 19862) Piston Vibrator or Thumper™ T-200 (P/N 21682) Timed Impactor Assemblies



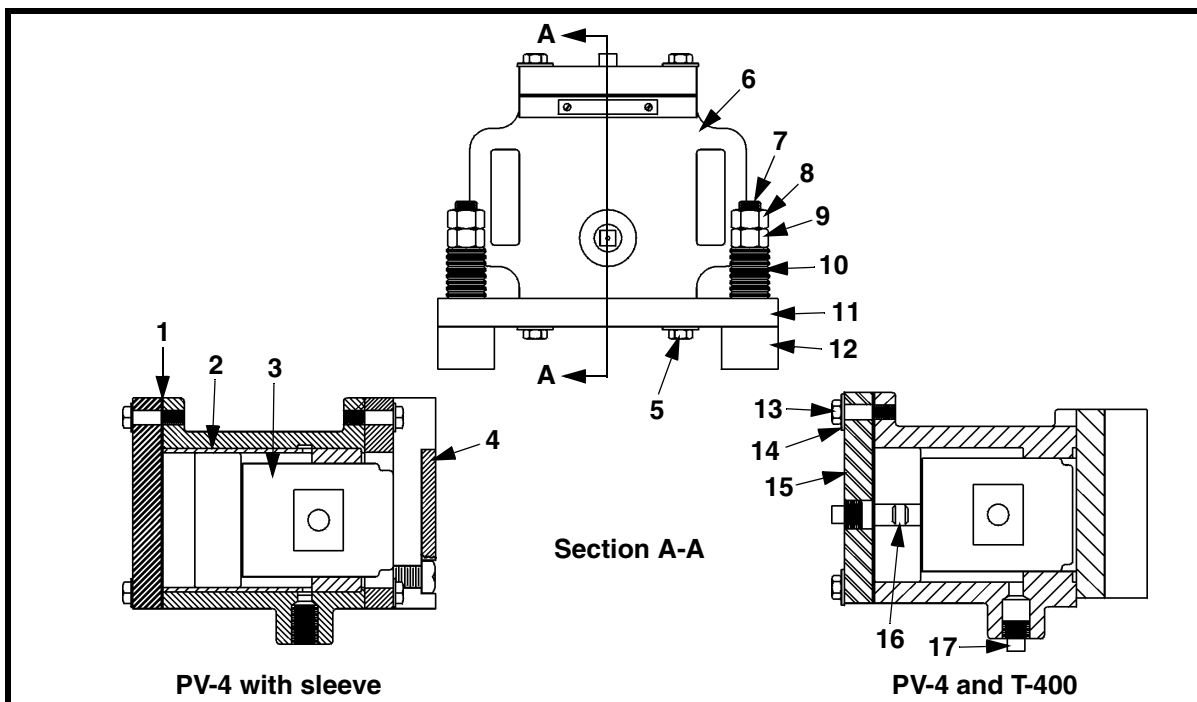
Item	Description	PV 2-1/2 with Sleeve	T-250	Qty
1	Top Cover Plate	18369	19077	1
2	Body	18582	17982	1
3	Sleeve	18580		1
4	Piston	16127	16127	1
5	Strike Plate	18367	18367	1
6	Screw HHC 3/8 -16NC	12215	15673	4
7	Washer Compression 3/8	11747	11747	60
8	Screw SHC 3/8 -16NC x 3-1/2	12922	12922	4
9	Nut Lock 3/8 -16NC	14201	14201	4
10	Gasket	16609	16609	1
11	Screw Socket Set 1/2 -13NC x 3/8		19909	1
12	Mount	22726	18366	1
13	Plug Pipe 1/2 NPT x 3/8		12519	1
NS	Plug Vent Square Head		19910	1
NS	Oil Air Motor Quart		14766	1
NS	Hose Whip	17970	17970	1
Fig. 13	Piston Vibrator Warning Label	29814	29814	1
Fig. 14	Loud Noise Warning Tag	34070	34070	1

Figure 10. Cougar® PV 2-1/2 with Sleeve (P/N 18581) Piston Vibrator or Thumper™ T-250 (P/N 19078) Timed Impactor Assemblies



Item	Description	PV-3	PV-3 with Sleeve	T-300	Qty
1	Top Cover	19993	19993	21571	1
2	Screw HHC 1/2 -13NC x 1-1/2	11763	11763	11763	4
3	Washer Compression 1/2	11750	11750	11750	4
4	Sleeve		18383		1
5	Body	19992	23987	19992	1
6	Piston	16403	16403	16403	1
7	O-Ring	20771	20771	20771	1
8	Screw Set 5/8 -11NC			18290	1
9	Gasket	21288	21288	21288	1
10	Plug 3/4 NPT Vent			18446	1
11	Hammer Plate	19570	19570	19570	1
NS	Pipe Plug 3/4 NPT	12823	12823	12823	1
NS	Pipe Plug 1/2 NPT	12519	12519	12519	1
NS	Oil Air Motor Quart	14766		14766	1
NS	Hose Whip	17971	17971	17971	1
Fig. 13	Piston Vibrator Warning Label	29814	29814	29814	1
Fig. 14	Loud Noise Warning Tag	34070	34070	29814	1

Figure 11. Cougar® PV-3 (P/N 21287 or 23990) Piston Vibrator or Thumper™ T-300 (P/N 21572) Timed Impactor Assemblies



Item	Description	PV-4	PV-4 with Sleeve	T-400	Qty
1	Gasket	16896	16896	16896	1
2	Sleeve		17467		1
3	Piston	16419	16419	16419	1
4	Strike Plate	17763	17763	17763	1
5	Screw HHC 1/2 -13NC x 2	23014	23014	23014	4
6	Body	16421	17464	16421	1
7	Screw HHC 3/4 -10NC x 6	22211	22211	22211	4
8	Nut Hex Elastic Stop 3/4 -10NC	19132	19132	19132	4
9	Nut Hex 3/4 -10NC	11773	11773	11773	4
10	Washer Compression 3/4	11754	11754	11754	64
11	Base Plate	17759	17759	17759	1
12	Mount Block	21789	21789	21789	2
13	Screw HHC 1/2 -13NC x 2	14196	14196	14196	4
14	Washer Compression 1/2	11750	11750	11750	8
15	End Cap	17758	17758	18071	1
16	Screw SS 3/4 -10NC x 3/4			18072	1
17	Plug Vent			18446	1
NS	Pipe Plug 3/4 NPT	12823	12823	12823	1
NS	Oil Air Motor Quart	14766		14766	1
NS	Hose Whip	17971	17971	17971	1
Fig. 13	Piston Vibrator Warning Label	29814	29814	29814	1
Fig. 14	Loud Noise Warning Tag	34070	34070	34070	1

Figure 12. Cougar® PV-4 (P/N 17757 or 21035) Piston Vibrator or Thumper™ T-400 (P/N 17589) Timed Impactor Assemblies



Figure 13. Piston Vibrator Warning Label, P/N 29814

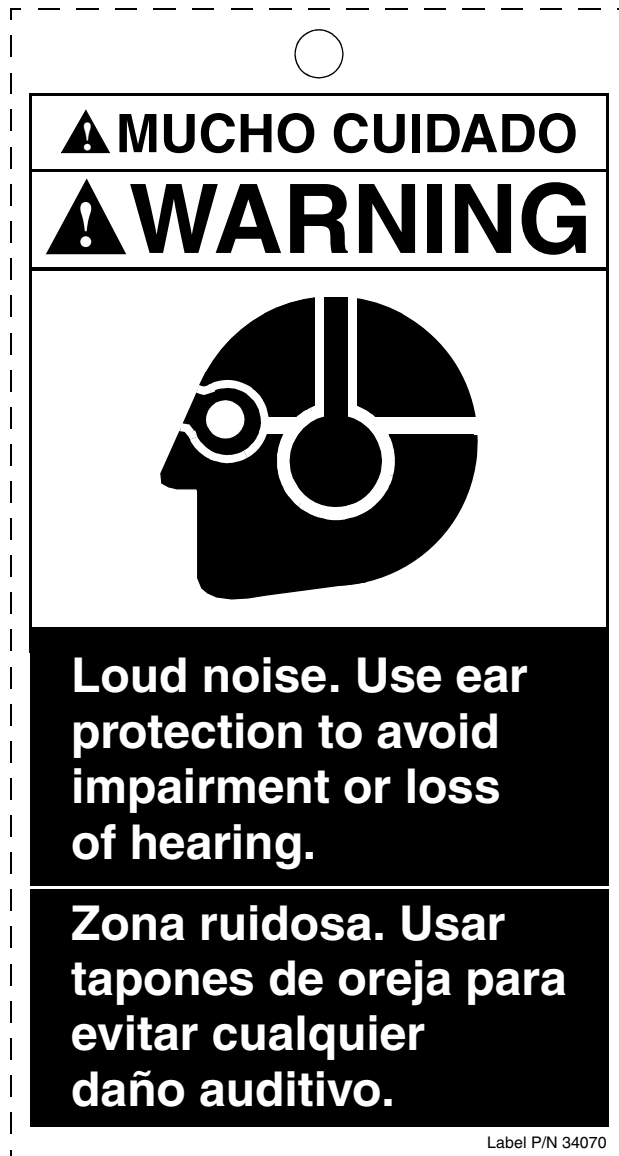


Figure 14. Loud Noise Warning Tag, P/N 34070

Appendix A
Cougar® Thumper™ Series Timed Impactor
and PV Series Piston Vibrator Specifications

Table A-I. Cougar® PV Series Piston Vibrator Specifications

Model	20 psi (1.38 bar)			40 psi (2.76 bar)			60 psi (4.14 bar)			80 psi (5.51 bar)		
	vpm*	cfm** (l/min)	Force lb (kg)	vpm*	cfm** (l/min)	Force lb (kg)	vpm*	cfm** (l/min)	Force lb (kg)	vpm*	cfm** (l/min)	Force lb (kg)
PV-1-1/4	2600	—	35 (16)	3800	—	71 (32)	4600	8 (227)	106 (48)	5400	14 (396)	142 (64)
PV-2	1400	8 (227)	96 (44)	2000	16 (453)	190 (86)	2800	20 (566)	283 (128)	3200	26 (736)	376 (171)
PV-2-1/2	700	9 (255)	147 (67)	1150	21 (595)	288 (131)	1500	34 (963)	430 (195)	1800	58 (1643)	571 (259)
PV-3	575	14 (396)	218 (99)	1000	30 (850)	424 (192)	1300	43 (1218)	630 (286)	1400	70 (1982)	835 (379)
PV-4	450	28 (793)	350 (159)	525	44 (1246)	700 (318)	600	62 (1756)	1000 (454)	700	80 (2266)	1400 (635)

*Vibrations per minute.

**Cubic feet per minute.

Table A-II. Cougar® Thumper™ Series Timed Impactor Specifications

Model	Work ft-lb (kgm)*	Force output lb (kg)*	Air consumption cfm (l/min) at 80 psi (5.51 bar) (one stroke)	Max. weight in sloped section of bin lb (kg)
T-125	4.5 (0.62)	142 (64)	5-10 (142-283)	20000 (9072)
T-200	20 (2.77)	376 (171)	10-15 (283-425)	30000 (13608)
T-250	40 (5.53)	571 (259)	15-20 (425-566)	40000 (18144)
T-300	168 (23.23)	835 (379)	20-40 (566-1133)	60000 (27216)
T-400	200 (27.66)	1400 (635)	40-60 (1133-1699)	100000 (45360)

*Ft-lb (kgm) work and force output is at 80 psi (5.51 bar) for one stroke.

Appendix B
Cougar[®] Thumper[™] Series Timed Impactor
and PV Series Piston Vibrator Dimensions

Appendix B

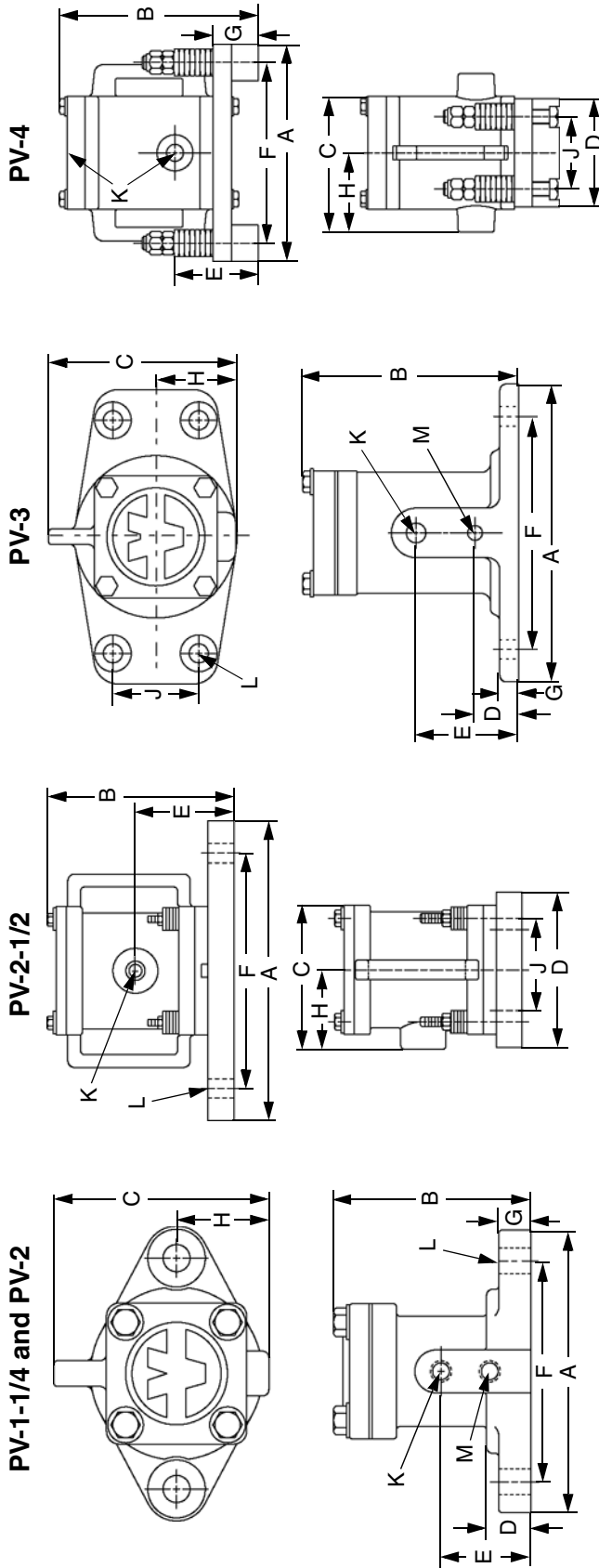
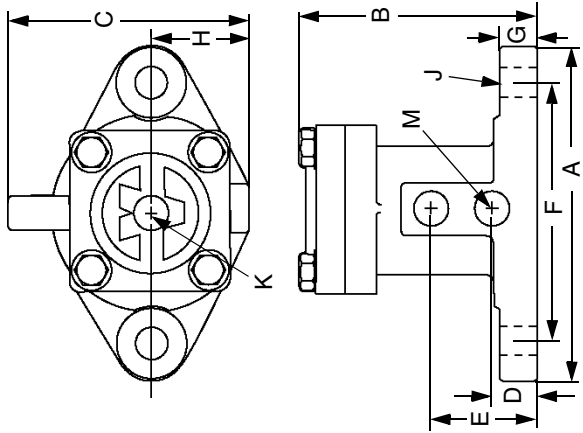


Table B-I. Cougar® PV Series Piston Vibrator Dimensions

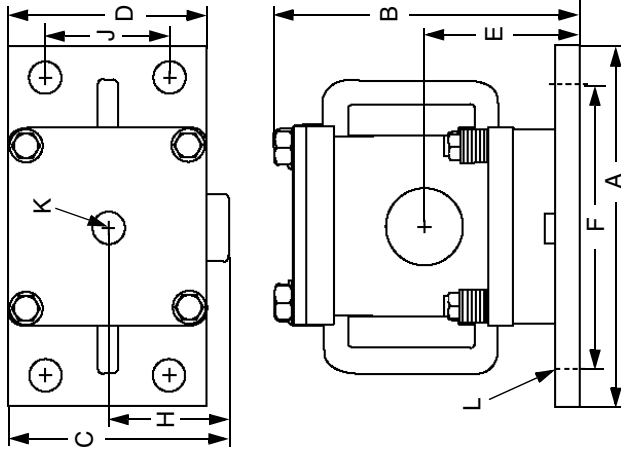
Model	Dimensions in. (mm)											
	A	B	C	D	E	F	G	H	J	K*	L	M**
PV-1-1/4	5.75 (146)	4.00 (102)	4.19 (106)	0.84 (21)	1.84 (147)	4.50 (114)	0.62 (16)	1.69 (43)	—	0.25 (6)	0.50 (13)	0.25 (6)
PV-2	8.87 (225)	6.00 (152)	5.75 (146)	1.56 (40)	2.75 (70)	7.50 (190)	0.75 (19)	2.47 (63)	—	0.25 (6)	0.62 (16)	0.25 (6)
PV-2-1/2	11.62 (295)	7.25 (184)	6.19 (157)	6.00 (152)	3.75 (95)	9.50 (241)	1.00 (25)	3.19 (81)	3.50 (89)	0.50 (13)	0.75 (19)	—
PV-3	12.00 (305)	8.62 (219)	7.69 (195)	1.75 (44)	4.00 (102)	9.50 (241)	0.75 (19)	3.25 (83)	3.50 (89)	0.75 (19)	0.75 (19)	0.50 (13)
PV-4	12.00 (305)	11.88 (301)	7.38 (187)	6.00 (152)	4.25 (108)	10.00 (254)	2.50 (63)	4.40 (112)	4.00 (102)	0.75 (19)	—	—

* Inlet (NPT) ** Exhaust (NPT)

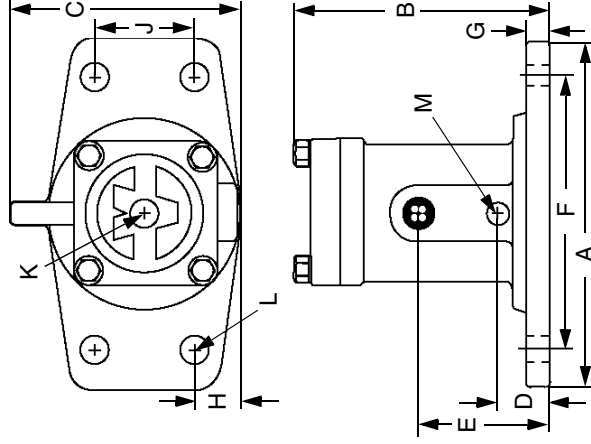
T-125 and T-200



T-250



T-300



T-400

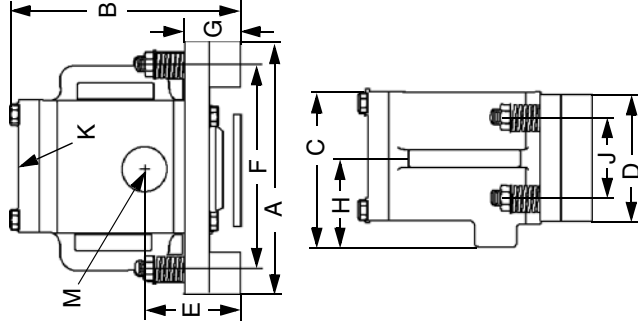


Table B-II. Cougar® Thumper™ Series Timed Impactor Dimensions

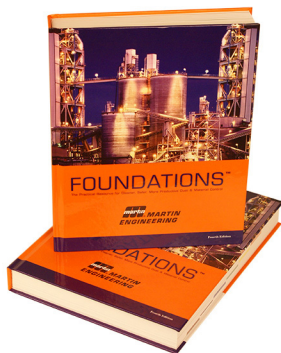
Model	Dimensions in. (mm)											
	A	B	C	D	E	F	G	H	J	K*	L	M**
T-125	5.75 (146)	4.00 (102)	4.19 (106)	0.84 (21)	1.84 (47)	4.50 (114)	0.62 (16)	1.69 (43)	0.50 (13)	0.25 (6)	—	0.25 (6)
T-200	8.87 (225)	6.00 (152)	5.75 (146)	1.56 (40)	2.75 (70)	7.50 (190)	0.75 (19)	2.47 (63)	0.62 (16)	0.50 (13)	—	0.25 (6)
T-250	11.62 (295)	7.25 (184)	6.19 (157)	6.00 (152)	3.75 (95)	9.50 (241)	1.00 (25)	3.19 (81)	3.50 (89)	0.50 (13)	0.75 (19)	—
T-300	12.00 (305)	8.62 (219)	7.69 (195)	1.75 (44)	4.00 (102)	9.50 (241)	0.75 (19)	3.25 (83)	3.50 (89)	0.75 (19)	0.75 (19)	0.50 (13)
T-400	12.00 (305)	11.88 (301)	7.38 (187)	6.00 (152)	4.25 (108)	10.00 (254)	2.50 (63)	4.40 (112)	4.00 (102)	0.75 (19)	—	0.75 (19)

*Inlet (NPT) **Exhaust (NPT)

Notes

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