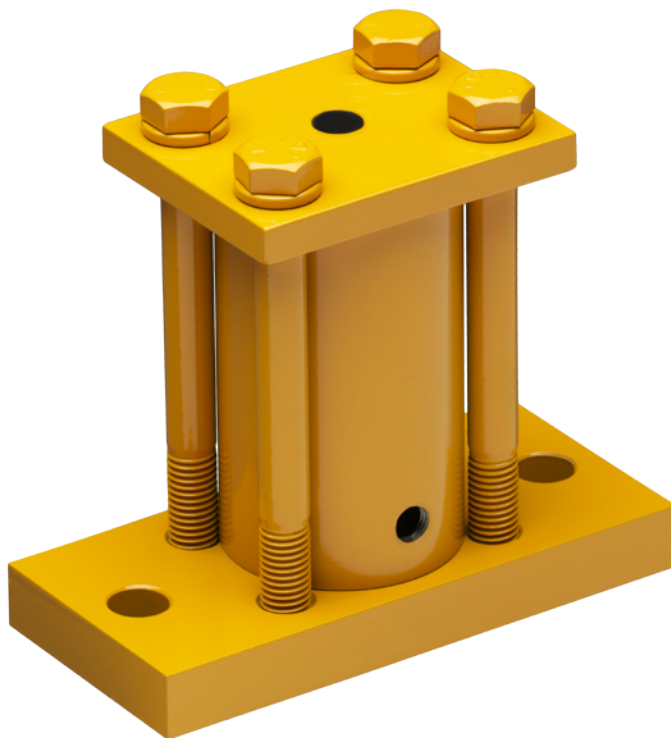




Cougar[®]
LI Series
Timed Impactors



Operator's Manual
M3946

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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Introduction

General

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

This manual covers installing and operating Cougar® LI Series Timed Impactors on bins, hoppers, and chutes. For assistance installing the impactors for other applications, call Martin Engineering.

Technical data is provided in Appendix A.

Dimensions for each Cougar® LI Series Timed Impactor 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® LI Series Timed Impactors.

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 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 impactor from shipping box.
3. If anything is missing, contact Martin Engineering or representative.

⚠ WARNING

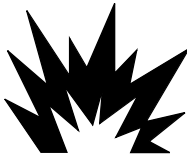
Before installing equipment, turn off and lock out/tag out energy source.

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 impactor feet. (This will prevent internal stress to impactor casting when tightening mount bolts.)
7. Make sure mounting surface and impactor are clean and free of debris.



Installing Impactor

IMPORTANT

Read entire section before beginning work.

CAUTION

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

To install the Cougar® LI Series Timed Impactor, follow the procedures corresponding to the following steps:

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

IMPORTANT

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 onto sloped section of bin.
3. Install channel mount or equivalent onto structure or beam reinforcement, as applicable.
4. Mount impactor onto structure.
5. Connect lubricated air lines to impactor.

Locating impactor on structure

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

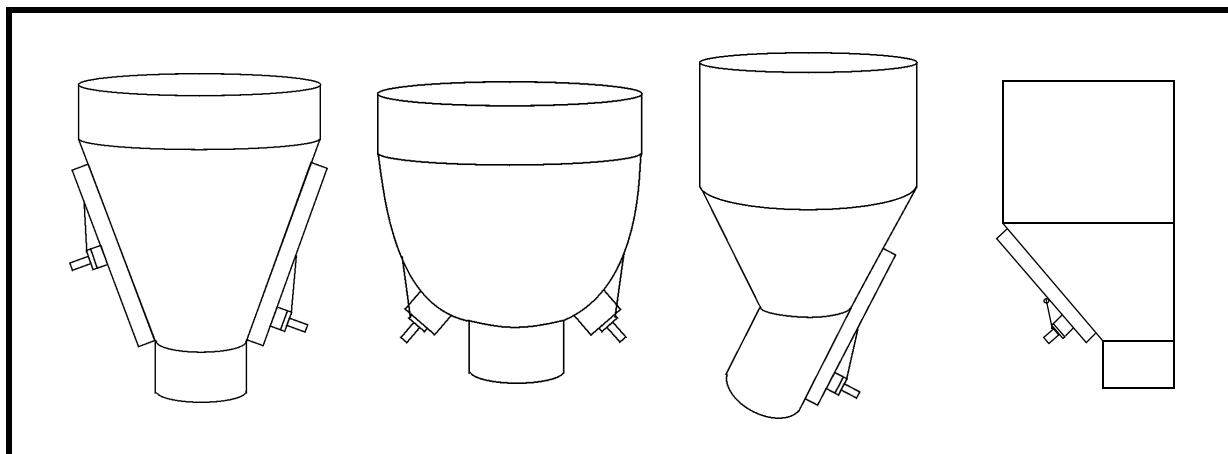


Figure 1. Locating Impactor on Structure

Installing reinforcing beam onto structure

NOTE

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

1. If using customer-supplied mounting plate to mount impactor onto structure, do the following:
 - a. Make sure plate is at least the size of impactor base.
 - b. Locate plate so that impactor can be positioned as shown in Figure 1.
 - c. Weld mounting plate onto structure.
2. See Figure 2. If using Martin® Channel Mount to mount impactor onto structure, do the following:
 - a. Locate channel so that 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 $\frac{3}{4}$ the length of the sloped wall is recommended for movement of dry materials.

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

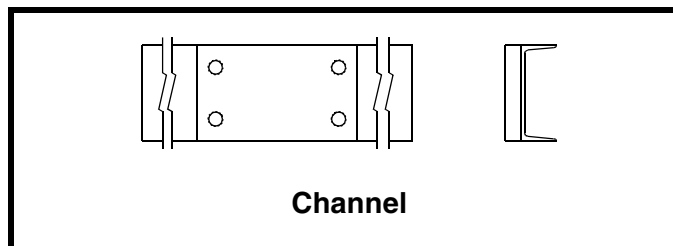


Figure 2. Channel Mount (Top and Side Views)

- 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.

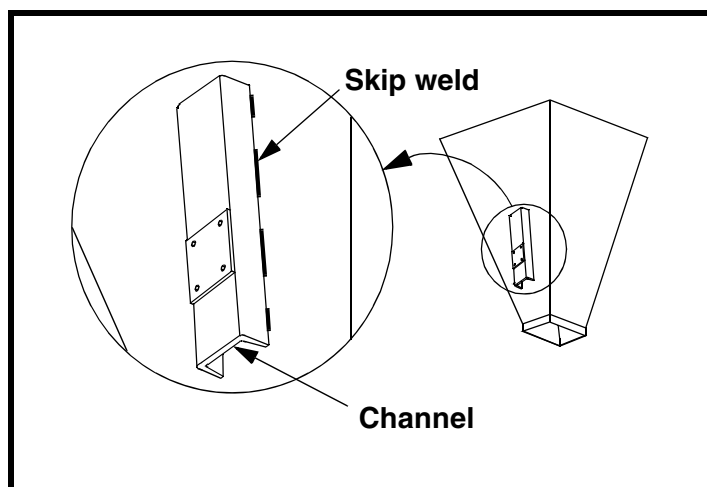


Figure 3. Skip Weld

*Mounting
impactor onto
structure*

⚠ WARNING

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

IMPORTANT

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

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

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

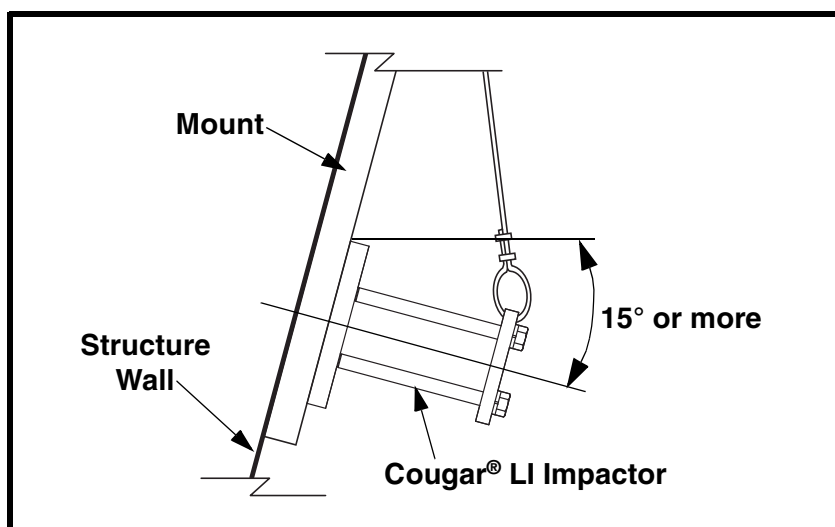


Figure 4. Mounting Cougar® LI Series Timed Impactor

2. Make sure 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 impactor body.
3. Before installing impactor onto mount, apply thread-sealing compound to all bolts.

⚠ CAUTION

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

4. Install impactor onto Channel Mount (see Figure 2) as follows:
 - a. Align mounting holes in impactor with mounting holes in mount.
 - b. Install 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
LI-16, LI-24	5/8 -11 NC	170 ft-lb (23 kgm)
LI-32	7/8 -9 NC	400 ft-lb (55 kgm)

⚠ WARNING

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

5. Secure 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 impactor.
 - b. Loop 1/8-in. (3 mm) wire cable (C) through hole in impactor top plate (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.

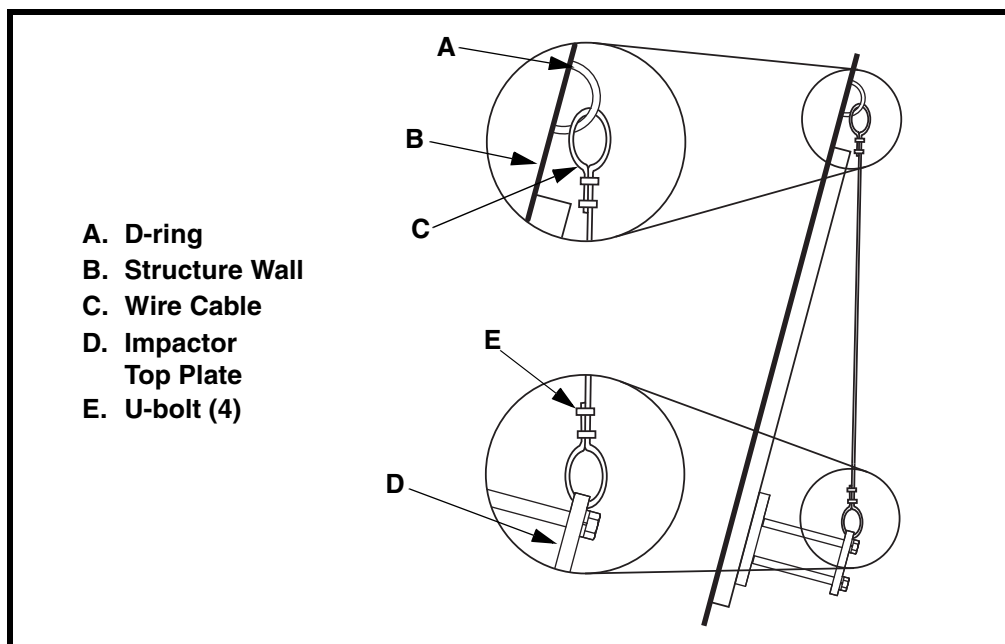


Figure 5. Installing Impactor Safety Cable

- 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 impactor eye and D-ring. Torque nuts to 4.5 ft-lb (0.6 kgm).
- e. Trim loose ends of wire cable.

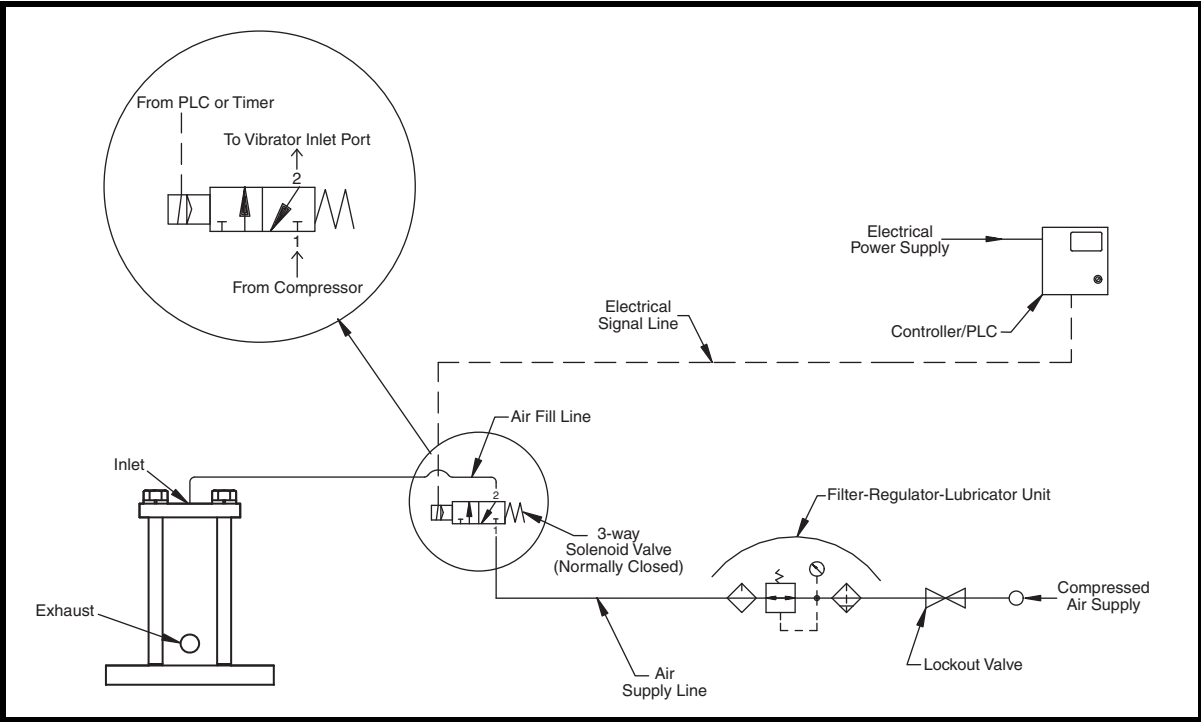
IMPORTANT

Connecting air lines

At least 20 psi (1.38 bar) is required to operate the Cougar® LI Series Timed Impactors. 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 impactor.

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



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

After Installing Impactor

IMPORTANT

Read entire section before beginning work.

1. Start impactor.

⚠ WARNING

Impactors are loud when operating. Use ear protection to avoid impairment or loss of hearing.

2. Observe operation of 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 impactor is operating to fully seat impactor.

Troubleshooting

Troubleshooting If you are experiencing problems with the Cougar® LI Series Timed Impactor, see below.

Symptom	Corrective Action
Impactor not moving material	<ul style="list-style-type: none">• Impactor assembled incorrectly. Dismantle impactor and assemble correctly.• No air pressure. Make sure air is on and reaching impactor.
Impactor making unusual noise	<ul style="list-style-type: none">• Impactor assembled incorrectly. Dismantle impactor and assemble correctly.• Contaminant has entered impactor. Disassemble 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® LI Series Timed Impactors and related equipment. Please reference part numbers when ordering parts.

Cougar® LI Series Timed Impactors

Cougar® LI-16 Timed Impactor Assembly: P/N 893101.

Cougar® LI-24 Timed Impactor Assembly: P/N 893102.

Cougar® LI-32 Timed Impactor Assembly: P/N 893103.

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.

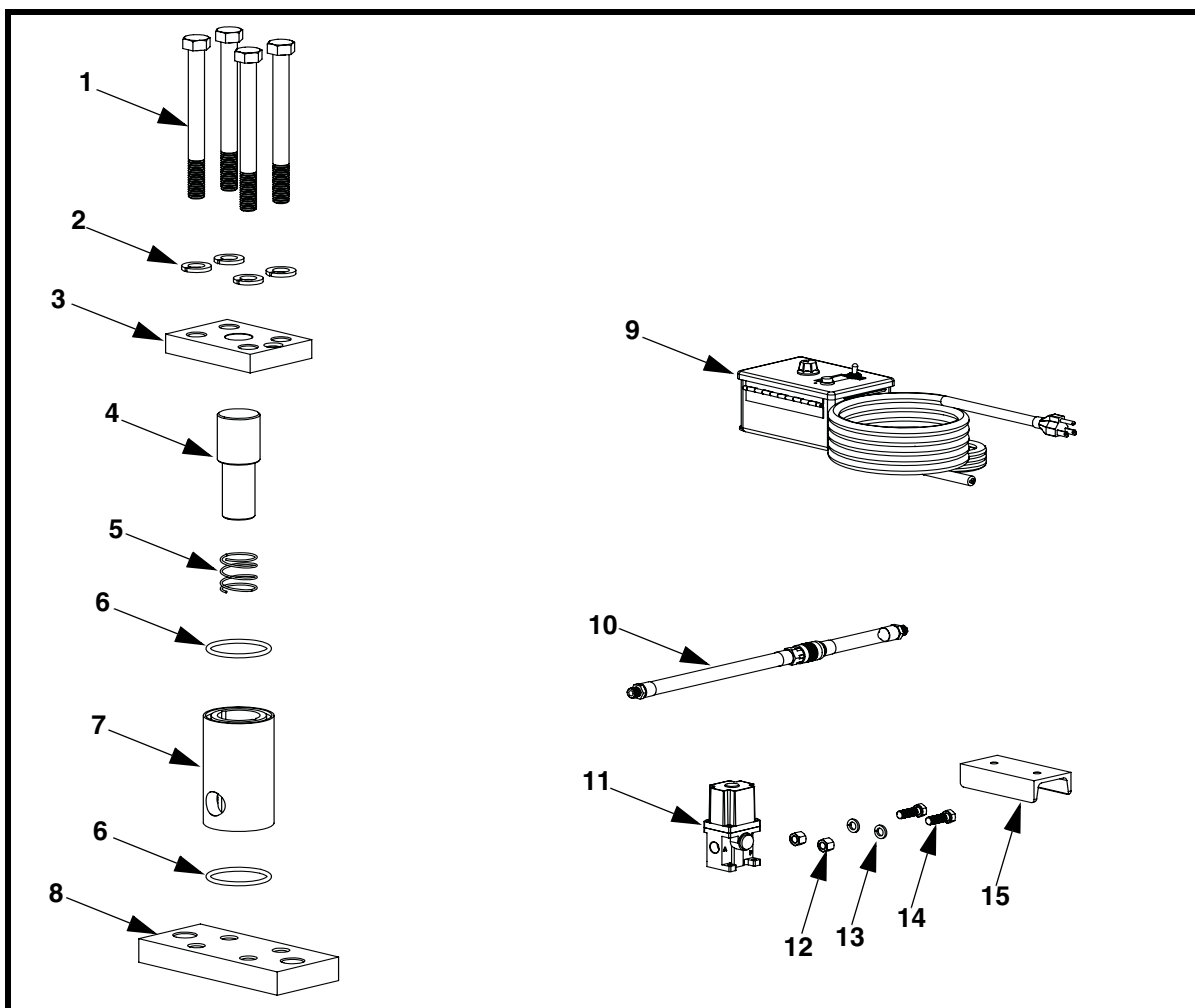
1/2 in. (13 mm) NPT Filter-Regulator-Lubricator (FRL) Kit: P/N 14760.

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	Qty	LI-16	LI-24	LI-32
1	Bolt, HHCS Grade 5	4	897463	897485	897485
2	Lock Washer	4	517804	517805	517805
3	Top Plate	1	896221	896222	896223
4	Piston	1	894763	894765	894767
5	Spring	1	897217	897218	897219
6	O-ring	2	897154	897156	897158
7	Body	1	894311	894312	894313
8	Base Plate	1	895301	894960	894990
9	Timer	4	891500	891500	891500
10	Hose Assembly	4	891301	891301	891301
11	Solenoid	1	891201	891201	891201
12	Hex Nut	*	518801	518801	518803
13	Lock Washer	*	517804	517804	517806
14	Bolt, HHCS Grade 5	*	500263	500263	500355
15	Mount Channel	1	891122	891123	891124

*Model LI-16 requires quantity 2. Models LI-24 & LI-32 require quantity 4.

Figure 7. Cougar® LI Series Timed Impactor Assemblies

Notes

Appendix A
Cougar® LI Series Timed Impactor
Specifications

Table A-I. Cougar® LI Series Timed Impactor Specifications

Model	Piston Size in.	Kinetic Energy	Pulse Rate	MAX 80 PSI
		Ft lbs @ 80 PSI	Min/Max	Cu. Ft/Stroke
LI-16	2	48	14/172	0.019
LI-24	3	98	14/172	0.049
LI-32	4	252	14/172	0.110

Appendix B
Cougar® LI Series Timed Impactor
Dimensions

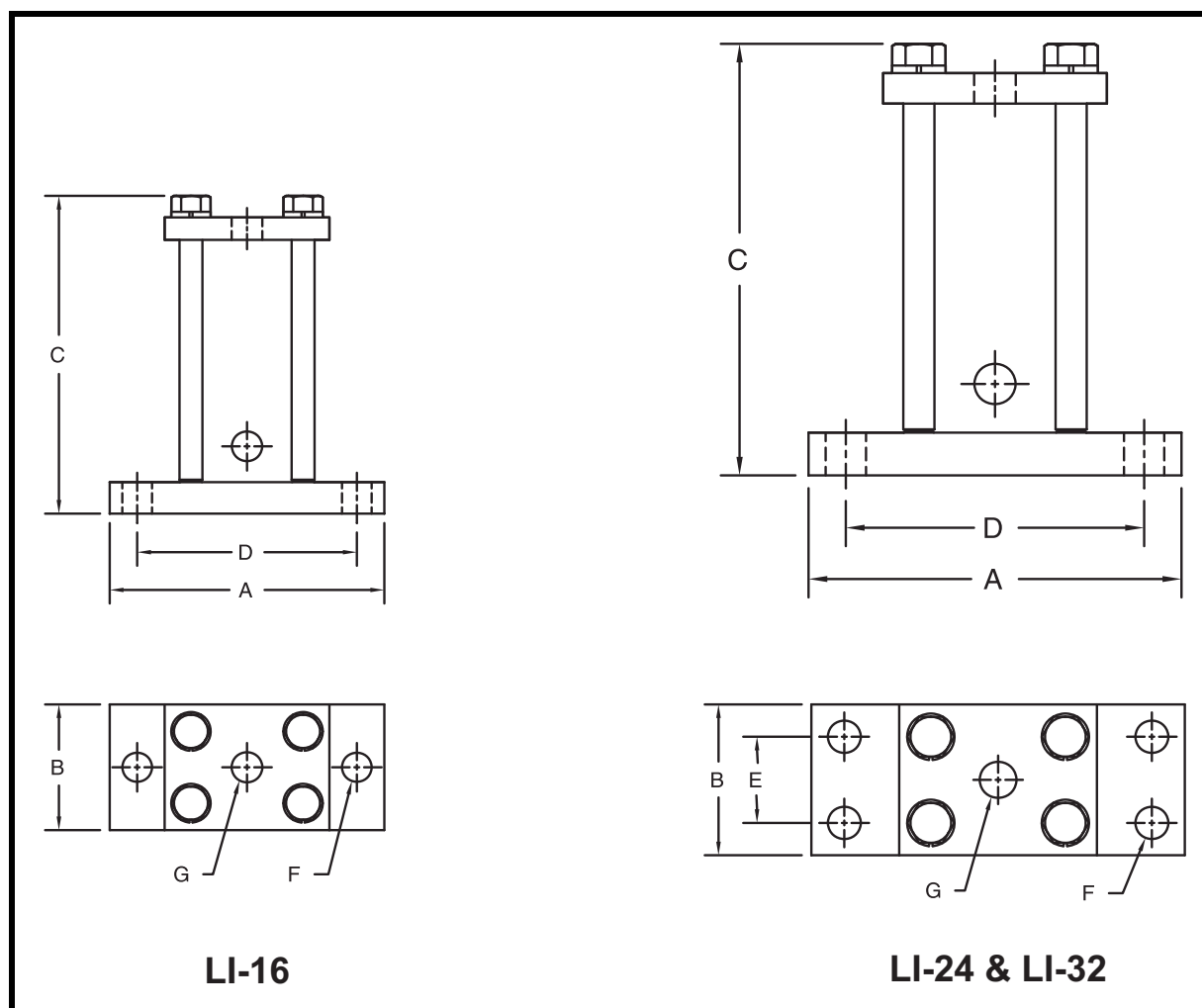


Table B-I. Cougar® LI Series Timed Impactor Dimensions

Model	A	B	C	Bolt Pattern		Bolt Size	Port NPT	Weight lbs
				D	E			
LI-16	7.5	3.5	8.875	6	—	5/8	1/2	24
LI-24	10.5	4.5	13.250	8-7/16	2-1/2	5/8	1/2	58
LI-32	10.5	5.5	13.250	8-7/16	2-1/2	7/8	1/2	74