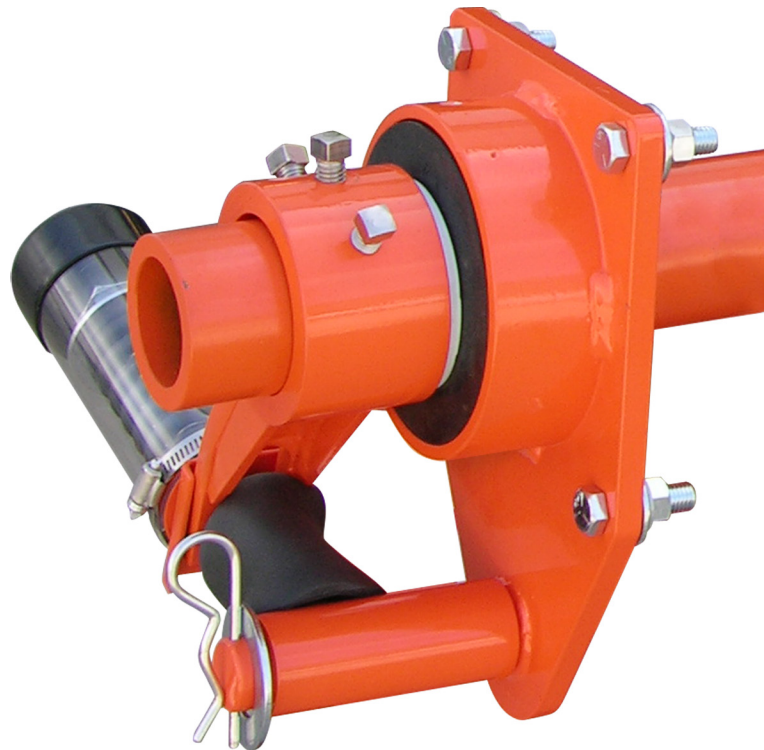




Martin® Universal Spring Tensioner XHD, HD Max and PD

[Go to Martin® Universal Spring Tensioner XHD, HD Max and PD web page](#)



***Operator's Manual
M3512***

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

To introduce product back into the product flow, a Pre-Cleaner is installed on the face of the head pulley. On a dual-cleaner system, a Secondary Cleaner is installed immediately following the Pre-Cleaner to remove stubborn material left on the conveyor belt. If a Pre-Cleaner cannot be used because of space limitations, Secondary Cleaners can be installed alone. Multiple Pre-Cleaners and/or Secondary Cleaners may be required to clean the belt. If the material-handling process or product could be affected by contamination from the use of these belt cleaners, the user is responsible for taking the necessary steps to prevent contamination. Consult Martin Engineering or a representative for alternate belt cleaners or belt cleaner locations to use where contamination may be an issue.

Installations without chutework

These procedures were written for equipment that is being installed on enclosed pulley chutework. If the pulley is not enclosed, the equipment should be installed using the best available field resources and methods to ensure that the critical dimensions are followed for proper installation.

Belt cleaner inspection access

If the belt cleaner is installed on enclosed pulley chutework, at least one Martin® Inspection Door should be installed. Martin® Inspection Doors are available from Martin Engineering or a representative.

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.
- Martin® *Inspection Door Operator's Manual*, P/N M3891
- Martin® *QCI™ Cleaner XHD Operator's Manual*, P/N M3504
- Martin® *QCI™ Cleaner HD Max Operator's Manual*, P/N M3886

Materials required

Installation of this equipment requires the use of standard hand tools, grinder, welder, and cutting torch.

Safety

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



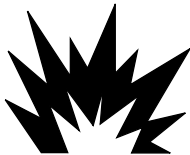
⚠ DANGER

Do not touch or go near the conveyor belt or conveyor accessories when the belt is running. Your body or clothing can get caught and you can be pulled into the conveyor, resulting in severe injury or death.



⚠ DANGER

Before installing, servicing, or adjusting the belt cleaner, turn off and lockout / tagout / blockout / testout all energy sources to the conveyor and conveyor accessories according to ANSI standards. Failure to do so could result in serious injury or death.



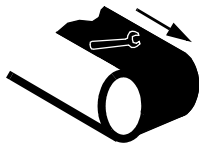
⚠ DANGER

If this equipment will be installed in an enclosed area, test the gas level or dust content before using a cutting torch or welding. Using a torch or welding in an area with gas or dust may cause an explosion resulting in serious injury or death. Follow local confined space procedures.



⚠ WARNING

Before using a cutting torch or welding the chute wall, cover the conveyor belt with a fire retardant cover. Failure to do so can allow the belt to catch fire. Follow local fire watch procedures.



⚠ WARNING

Remove all tools from the installation area and conveyor belt before turning on the conveyor. Failure to do so can cause serious injury to personnel or damage to the belt and conveyor.



⚠ WARNING

Mainframe with blade can be heavy and may require two people to lift. Attempting to lift the belt cleaner without assistance could result in injury.

Before Installing Tensioner

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 tensioner assembly from shipping container.
3. If anything is missing contact Martin Engineering or a representative.



⚠ DANGER

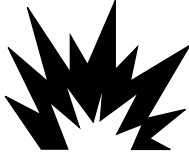
Before installing, servicing, or adjusting the belt cleaner, turn off and lockout / tagout / blockout / testout all energy sources to the conveyor and conveyor accessories according to ANSI standards. Failure to do so could result in serious injury or death.

4. Turn off and lockout / tagout / blockout / testout energy source according to ANSI standards (see "References").

⚠ DANGER

If this equipment will be installed in an enclosed area, test the gas level or dust content before using a cutting torch or welding. Using a torch or welding in an area with gas or dust may cause an explosion resulting in serious injury or death. Follow local confined space procedures.

5. If using a cutting torch or welding, test atmosphere for gas level or dust content. Cover conveyor belt with fire retardant cover.



IMPORTANT

Center the belt cleaner blades to clean an area narrower than the conveyor belt width. This allows for side-to-side movement of the belt and prevents damage to the belt edge.

NOTE

The chute wall that the tensioner will be located on is referred to as the "operator side." The other side of the chute is referred to as the "far side." (If installing dual tensioners, side that is most accessible is "operator side.")

6. Determine which side of chute is easiest to access. Locate the tensioner on the most accessible chute wall.

Installing Tensioner

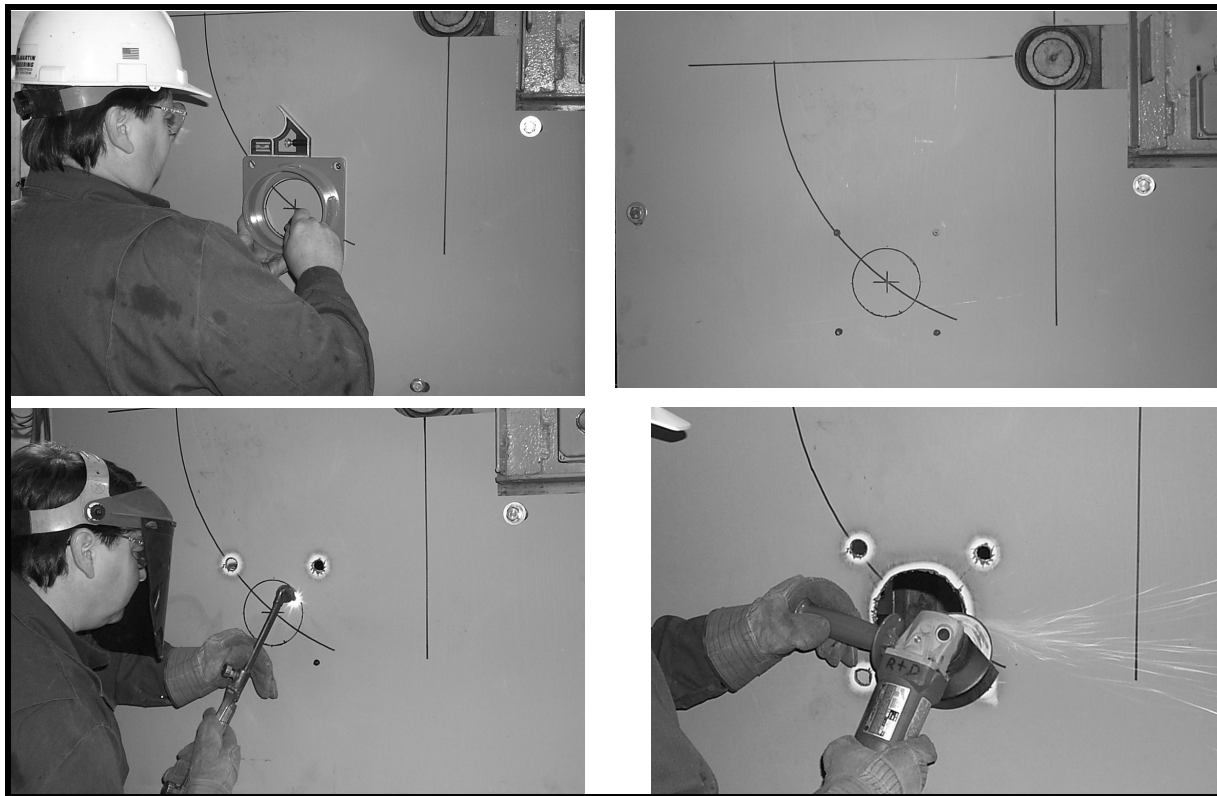


Figure 1. Belt Cleaner Mainframe Location & Chute Wall Cutouts

Installing mounting plates

1. Locate, mark, and cut chute wall cutouts according to applicable belt cleaner operator's manual.

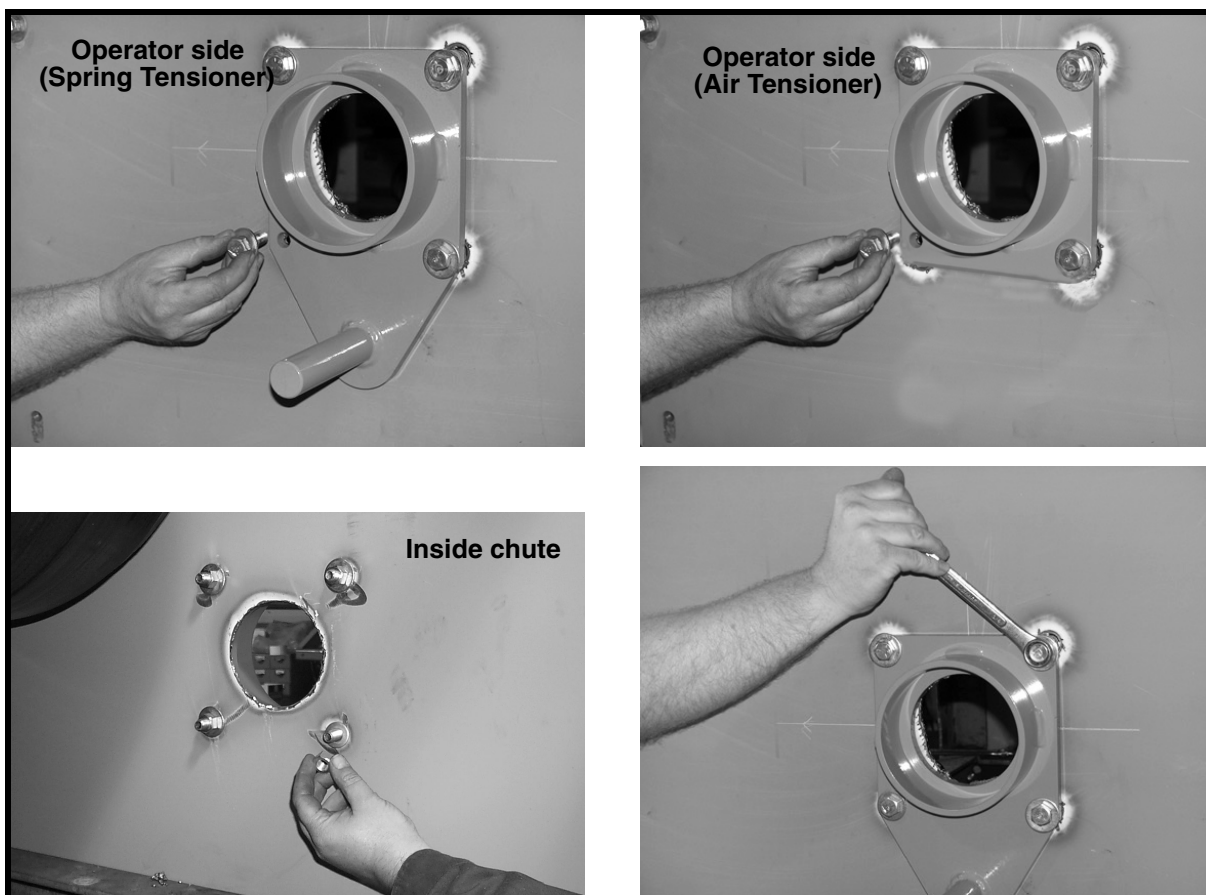


Figure 2. Installing Mount Plates

NOTE

Tensioner may be bolted or welded to chute wall. Martin Engineering recommends bolting for ease of maintenance and accessibility.

2. Install tensioner mount plate as shown in Figure 2.
3. For cleaners with single tensioner, install far side mount plate. For cleaners with dual tensioners, install another tensioner mount plate on far side.



Figure 3. Installing Mainframe

Installing Belt Cleaner

1. Insert pipe end weldment through operator side tensioner mount plate.
2. Make sure lock pin lanyard is installed on mainframe.
3. Slide mainframe onto pipe end weldment.
4. Insert other pipe end weldment through far side mount plate and into mainframe.



Figure 4. Installing Blade

5. Position blade on mainframe with blade curve facing conveyor belt. Push far side end of blade against stationary pin until it locks.
6. Insert lock pin in mainframe and blade.



Figure 5. Installing Shock Rings

7. Install shock rings into tensioner bracket(s) and/or far side mount bracket.

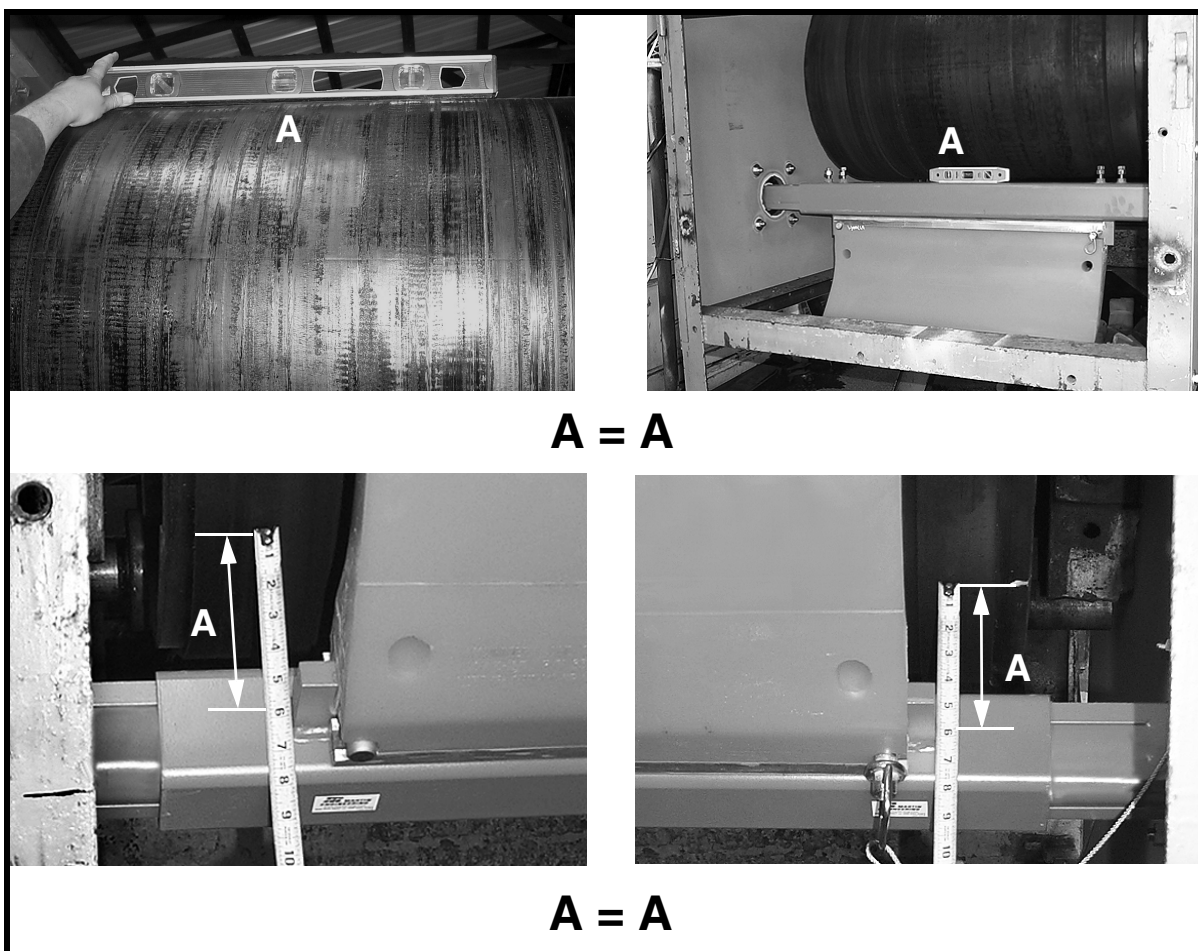


Figure 6. Verify Mainframe Location

8. Make sure mainframe is parallel to head pulley.
9. Make sure mainframe is equidistant from head pulley.
10. Verify final mounting dimensions with applicable belt cleaner operator's manual.

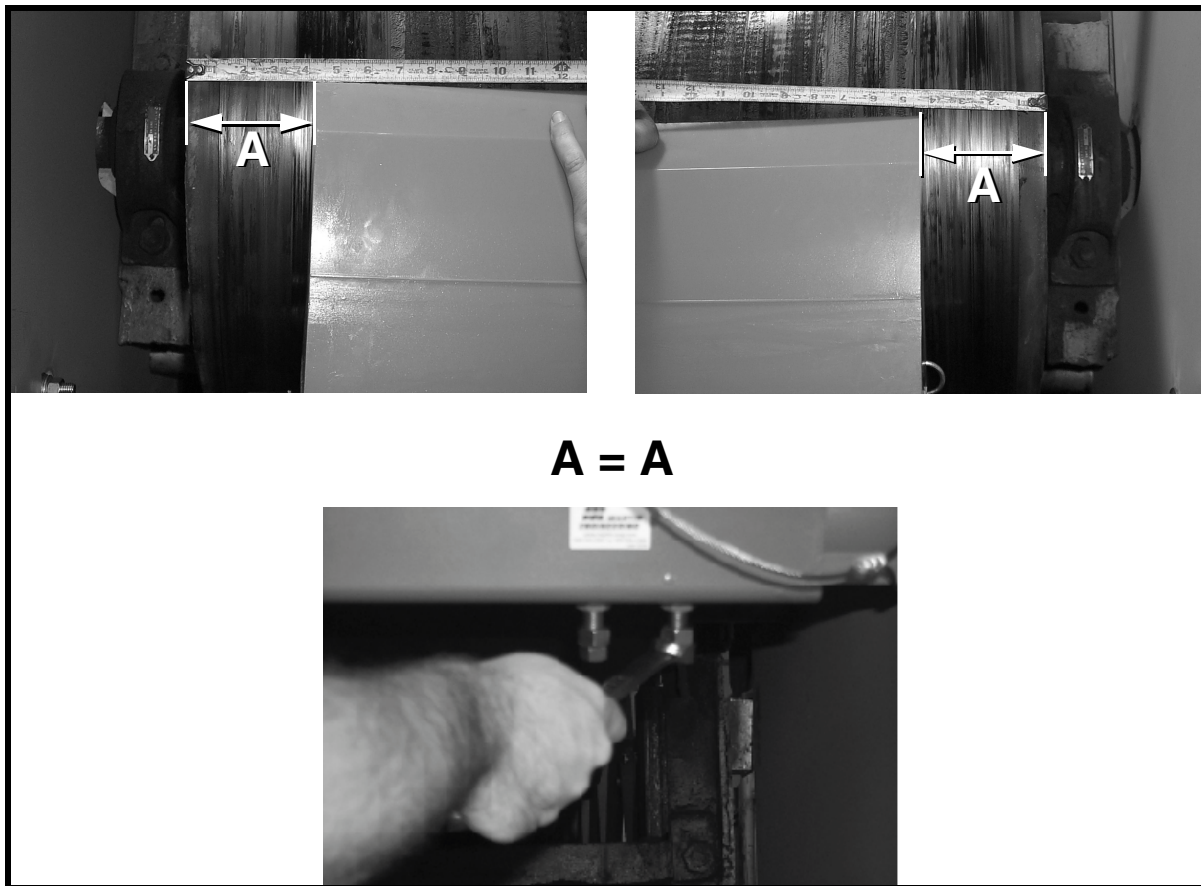


Figure 7. Position Blade

11. Center blade on belt.
12. Make sure each pipe end weldment extends at least 6 inches outside of chute wall.
13. Tighten set screws and jam nuts on mainframe.

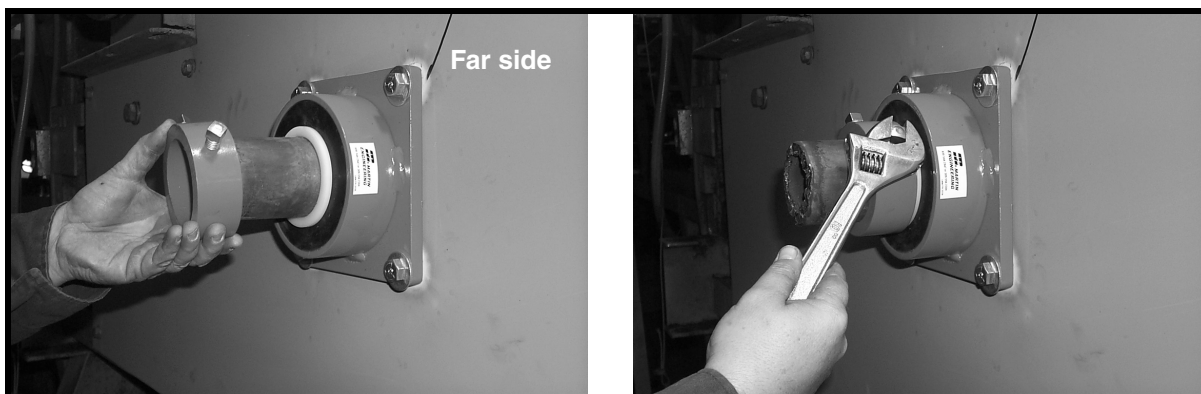


Figure 8. Installing Far Side Lock Collar

14. For cleaners with single tensioner, install far side lock collar and tighten set screws.

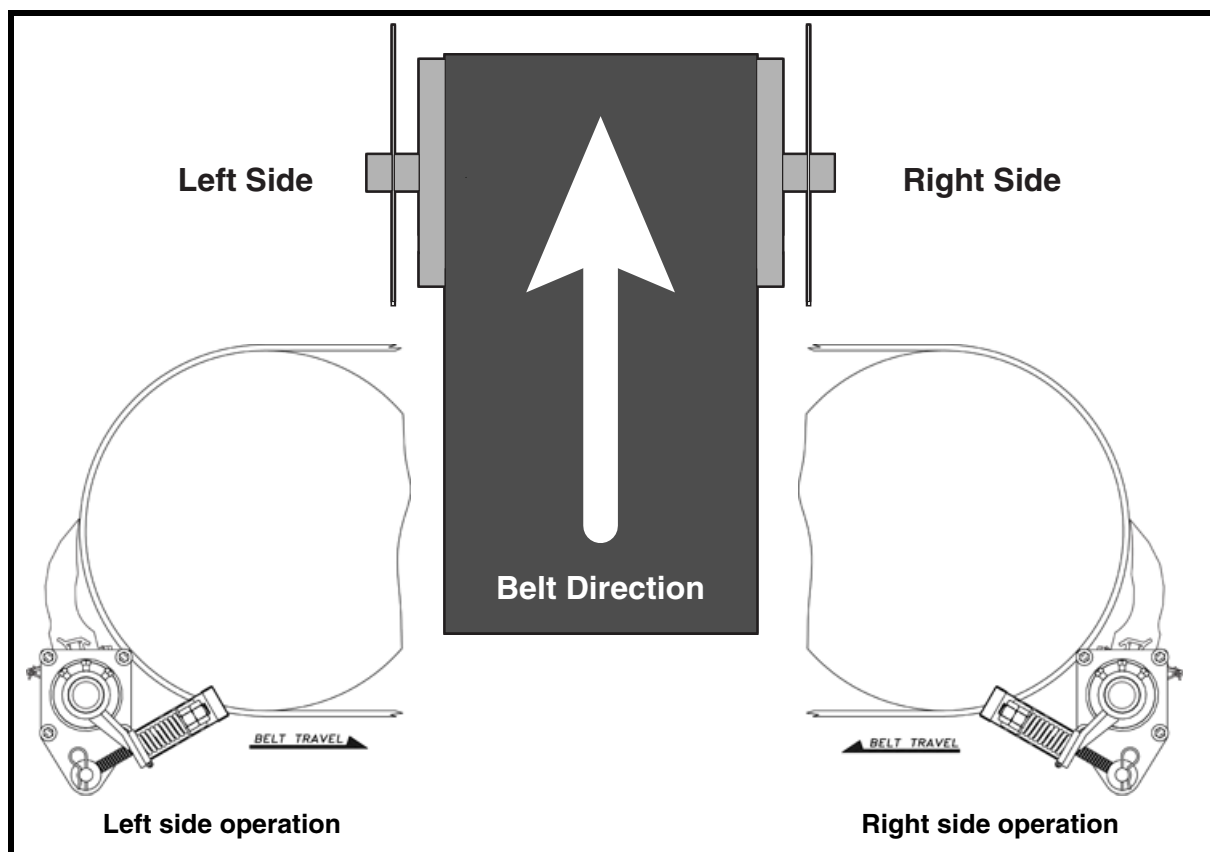


Figure 9. Tensioner Orientation

Installing Spring Tensioner Assembly

1. Determine the direction to install the lever arm on the tensioner depending on the belt direction, as shown in Figure 9. Then install the lever arm assembly as required for your application.

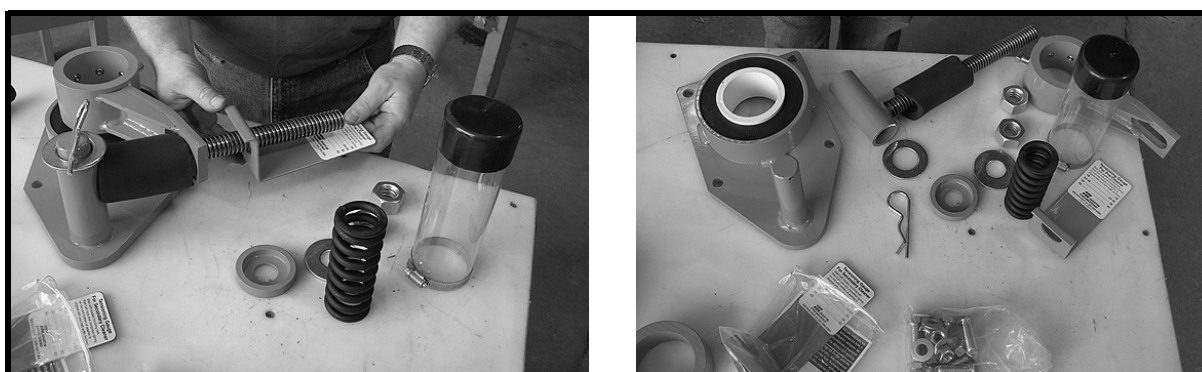


Figure 10. Tensioner Assembly

2. Determine appropriate spring and label that matches belt cleaner being installed (refer to Figure 19). Spring color must match label color. Attach label to bracket, making sure top edge of label aligns with bracket.

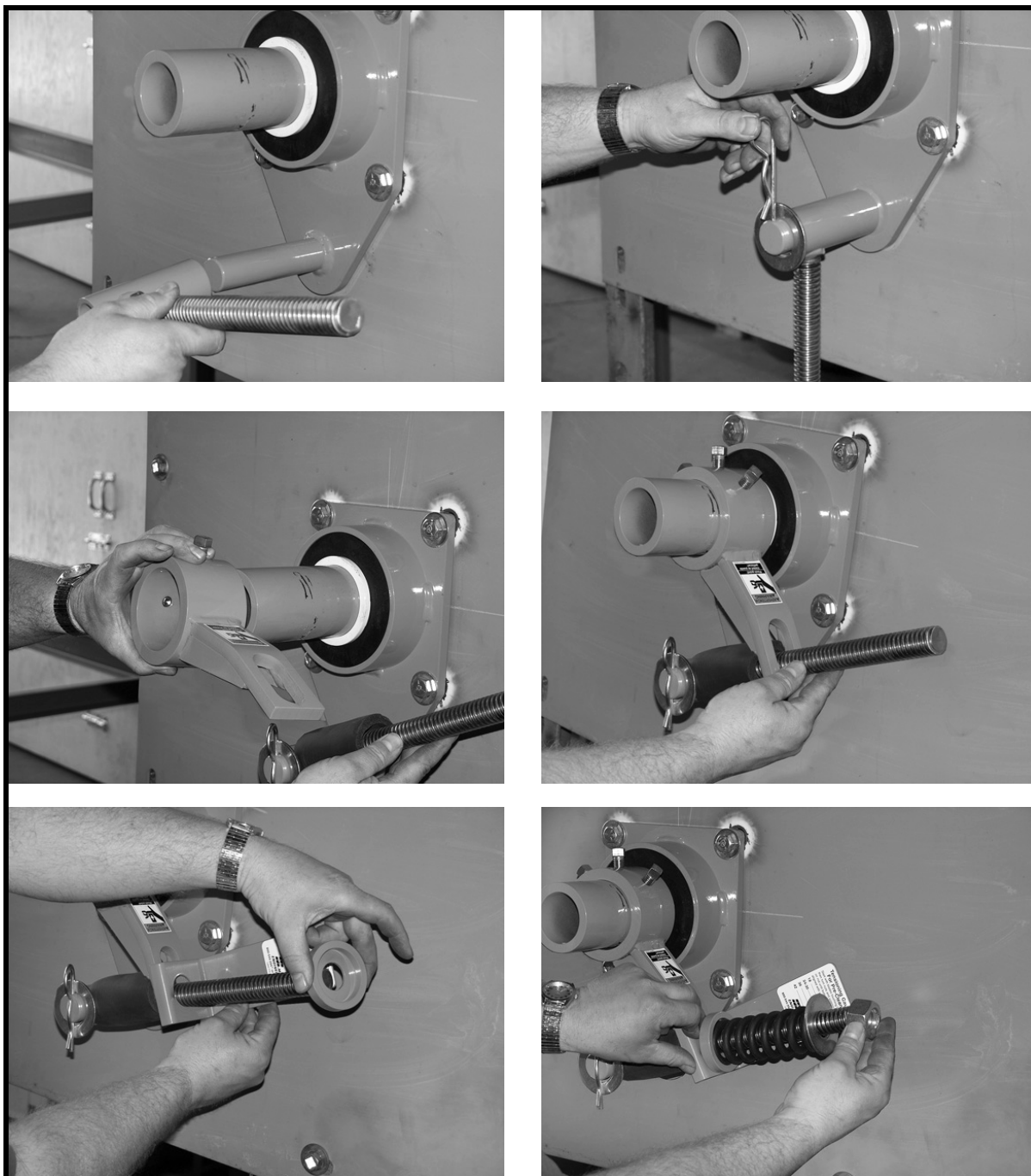


Figure 11. Installing Tensioner Components

3. Install tensioner components as shown in Figure 11.

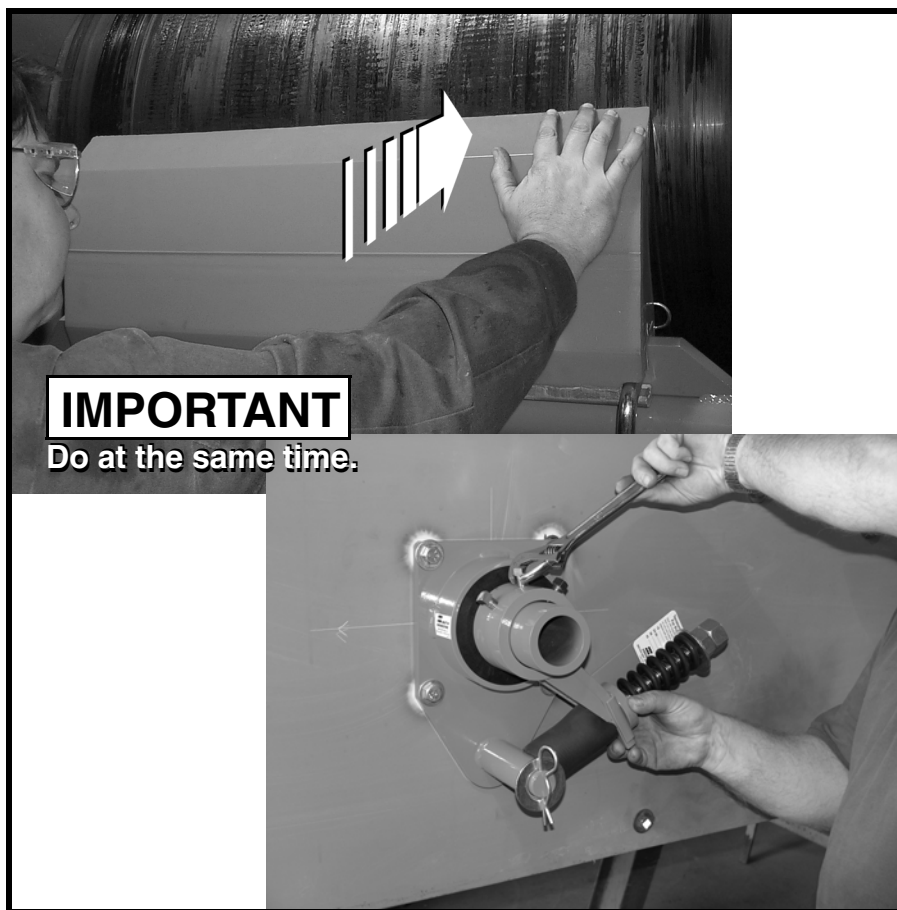


Figure 12. Positioning Tensioner Lever Arm

***Tensioning Belt
Cleaner with
Spring Tensioner***

1. Hold blade firmly against head pulley.
2. Rotate tensioner arm firmly against spring and tighten set screws.

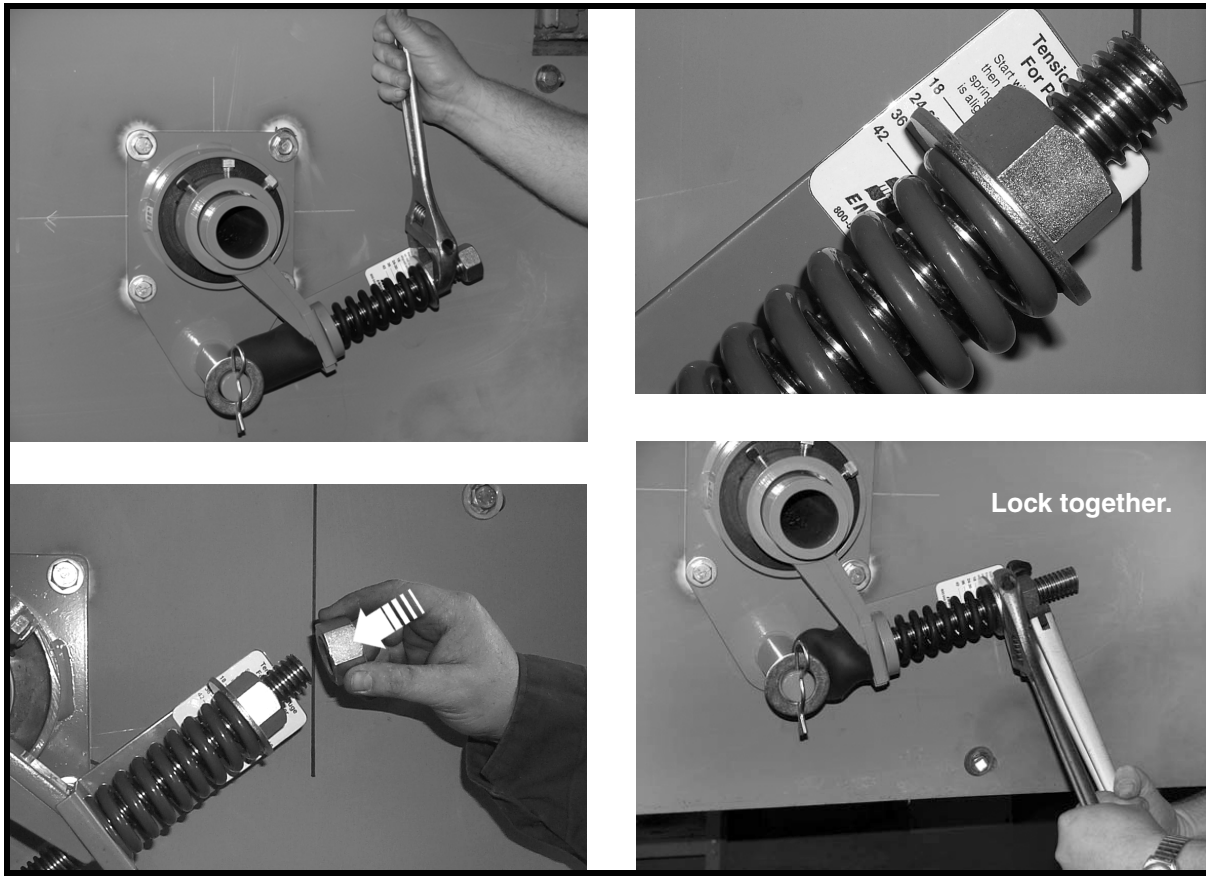


Figure 13. Tensioning Cleaner

3. Tighten tensioning nut to compress spring to desired setting.
4. Install jam nut.
5. Lock tensioning nut and jam nut together.

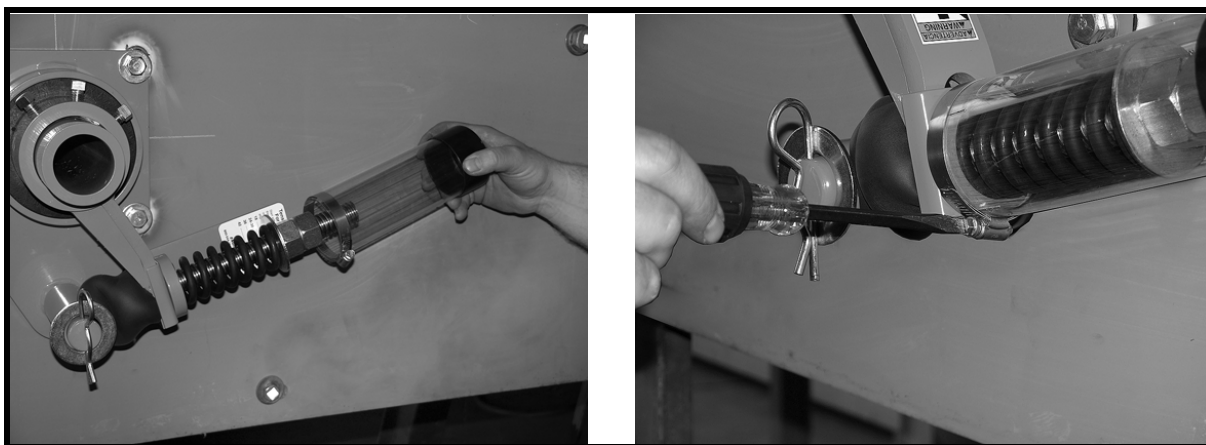


Figure 14. Installing Spring Cover

6. Install spring cover and tighten clamp.
7. For cleaners with dual tensioners, repeat steps 3 through 6 on far side.

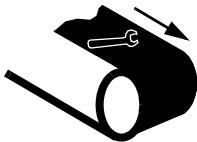
After Installing Belt Cleaner



1. Thoroughly wipe chute wall clean above tensioner.
2. Place Conveyor Products Warning Label (P/N 23395) on outside chute wall visible to belt cleaner operator.
3. Additional safety labels are available from CEMA. For more information regarding CEMA safety labels visit www.cemanet.org.

WARNING

Failure to remove tools from installation area and conveyor belt before turning on energy source can cause serious injury to personnel and damage to belt.



DANGER

Do not touch or go near conveyor belt or conveyor accessories when conveyor belt is running. Body or clothing can get caught and pull body into conveyor belt, causing severe injury or death.



4. Turn on conveyor belt for 1 hour, then turn off.

DANGER

Before installing, servicing, or adjusting the belt cleaner, turn off and lockout / tagout / blockout / testout all energy sources to the conveyor and conveyor accessories according to ANSI standards. Failure to do so could result in serious injury or death.



- a. Make sure all fasteners are tight. Tighten if necessary.
- b. Inspect belt cleaner for the following:
 - (1) Wear. (A small amount of “break-in” wear may be found. This will stop once blades wear to conveyor belt contour.)
 - (2) Material buildup. (No material between blades and return side of conveyor belt should be found.)
- c. If wear, material buildup, or some other problem exists, see “Troubleshooting.”

Weekly Maintenance

IMPORTANT

Read entire section before beginning work.

NOTE

Maintenance inspection should be performed no less than weekly. Some applications may require more frequent maintenance inspections.



⚠ DANGER

Before installing, servicing, or adjusting the belt cleaner, turn off and lockout / tagout / blockout / testout all energy sources to the conveyor and conveyor accessories according to ANSI standards. Failure to do so could result in serious injury or death.

1. Remove any material from belt cleaner.
2. Make sure all fasteners are tight. Tighten if necessary.
3. Check tension on cleaner. Re-tension if necessary.
4. Wipe all labels clean. If labels are not readable, contact Martin Engineering or a representative for replacements.
5. Check blades for excessive wear. Replace if necessary.
6. Remove equipment from service if there is any indication it is not functioning properly. Call Martin Engineering or a representative for assistance. Do NOT return equipment to operation until the cause of the problem has been identified and corrected.

⚠ WARNING

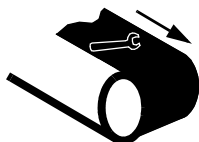
Failure to remove tools from maintenance area and conveyor belt before turning on energy source can cause serious injury to personnel and damage to belt.

7. Remove all tools from maintenance area.

⚠ DANGER

Do not touch or go near conveyor belt or conveyor accessories when conveyor belt is running. Body or clothing can get caught and pull body into conveyor belt, causing severe injury or death.

8. Start conveyor belt. Observe belt cleaner operation for several revolutions of the belt. Service or adjust belt cleaner as necessary to ensure proper belt cleaner operation.



Troubleshooting

Symptom	Corrective Action
Insufficient cleaning and carryback.	<ul style="list-style-type: none"> • Tension of cleaner on belt is set too low or too high. Increase or decrease tensioner setting. • Blades are worn. Check blades and replace if necessary.
Blade wears only in the center.	<ul style="list-style-type: none"> • Use a segmented style blade for crown pulleys. • Consider narrowing the blade width to clean the middle of the belt.
Noise or vibration.	Tension is not sufficient or is set too high. Correct tension as necessary. If this does not correct problem, blade urethane may not match application. Contact Martin Engineering or representative.
High blade wear rate.	Tension of cleaner on belt is set too high. Reduce tensioner setting.
Unusual wear or damage to blades.	Check belt splice(s) and repair as necessary.
Bent or broken mainframe or support frame due to blade slipping through.	If blades are worn to or past the wear line, replace blades. If blades are not worn, check mainframe location.
Corrosion or chemical degradation.	Blade urethane may not match application. Contact Martin Engineering or a representative.

NOTE

Conveyor equipment such as conveyor belt cleaners are subject to a wide variety of bulk materials characteristics and often have to perform under extreme operating or environmental conditions. It is not possible to predict all circumstances that may require troubleshooting. Contact Martin Engineering or a representative if you are experiencing problems other than those listed in the “Troubleshooting” chart above. Do not return the equipment to operation until the problem has been identified and corrected.

Installation checklist

If after taking the corrective actions suggested under “Troubleshooting” you are still experiencing problems, check for the following:

Installation Checklist
✓ Pre-Cleaner mainframe is proper distance from belt surface on both ends of mainframe and parallel to the pulley shaft.
✓ Pre-Cleaner blade tip does not lie in path of material flow.
✓ Blades are centered on belt.

Notes

Part Numbers

This section provides product names and corresponding part numbers for Martin® XHD, HD Max and PD Tensioners and related equipment. Please reference part numbers when ordering parts:

Martin® Universal Spring Tensioner

Martin® Universal Spring Tensioner Assembly: P/N 38003-X.
See Figure 15.

Dual Martin® Universal Spring Tensioner Assemblies: P/N 38003-2-X.
See Figure 16.

Mounts and brackets

Martin® Flange Hanger Mount Assembly: P/N 27382-SL.

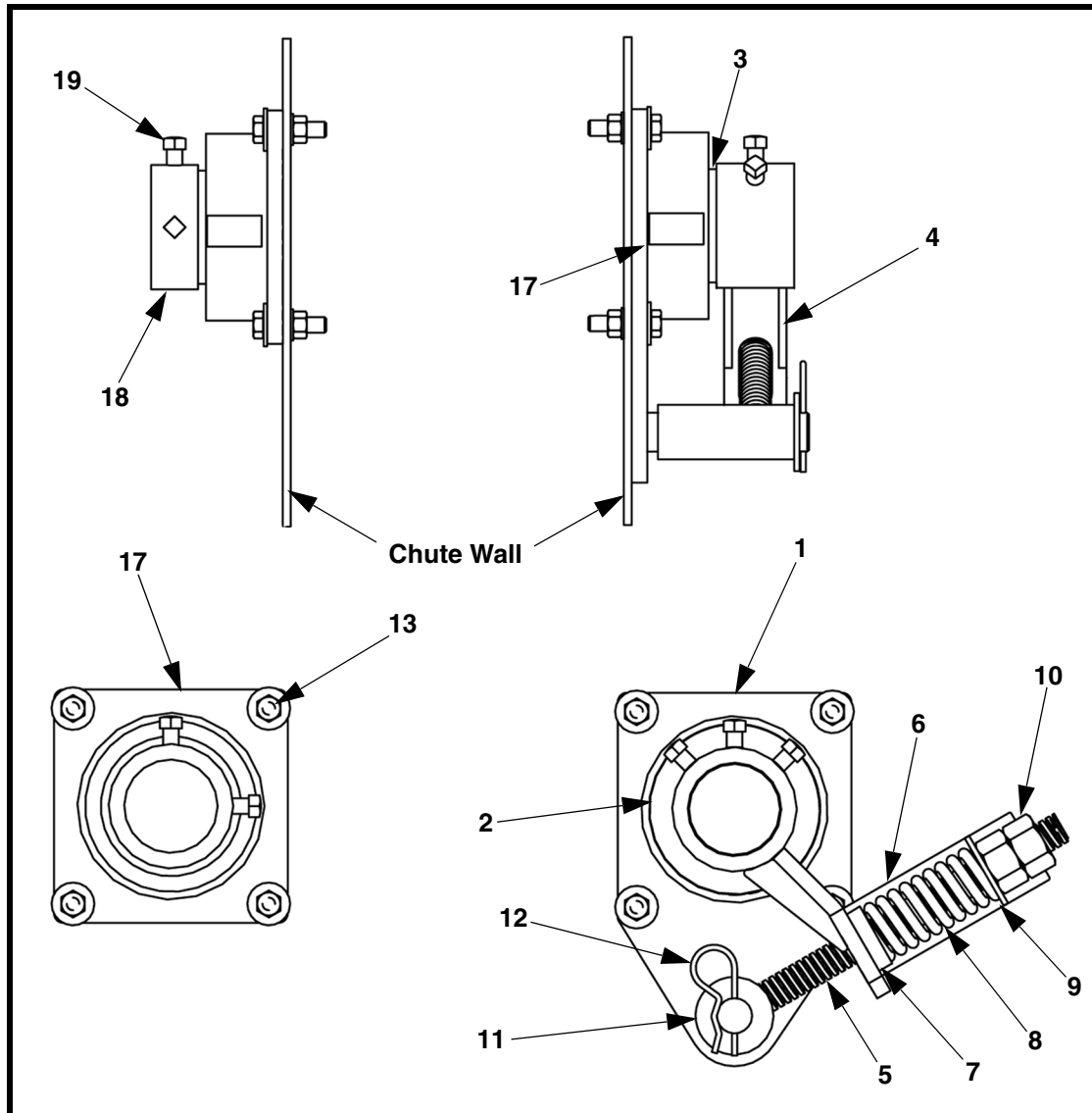


Figure 15. Martin® Universal Spring Tensioner Assembly, P/N 38003-X

Item	Description	Part No.	Qty
1	Mount Plate Weldment	38001	1
2	Shock Ring	32322	2
3	Nylon Bushing	34306	2
4	Lever Arm Weldment	37855	1
5	Rod Weldment with SS Rod	38002	1
6	Tensioning Gauge	36051	1
7	Bushing Spring Cover Mount	36119	1
8	Spring Die 2.00 x 5.00	35127	1
9	Washer Flat 1 Regular ZP	32315	1
10	Nut Hex 1-5 Acme ZP	32311	2
11	Washer Flat 1-1/4 Narrow ZP	34672	1
12	Hairpin Cotter 0.18 x 3.56 ZP	35171	1
13	Mounting Hardware Kit	34498	1
14 (NS)	Tube Clear	34063-08S	1
15 (NS)	Clamp Hose 2.06 Min. x 3.00 Max.	20339-11	1
16 (NS)	Spring Cover	32245-04	1
17	Far Side Mount Weldment	32342	1
18	Locking Collar	32341	1
19	Screw SHS 1/2 - 13 NC x 1.55	22763-03	5
Fig. 19	Label Universal Spring Tensioner	C1QCA1008L	1
21 (NS)	Label Martin Products	32238	2
Fig. 17	Label Pinch Point Warning	30528	1
Fig. 18	Label Conveyor Products Warning	23395	2
24 (NS)	Manual Operator's	M3512	1
25 (NS)	Spring Die 2.00 x 5.00 – 275lb/in.	C1QCA1008	1
26 (NS)	Spring Die 2.00 x 5.00 – 400lb/in.	C1QCA1009	1

NS = Not Shown

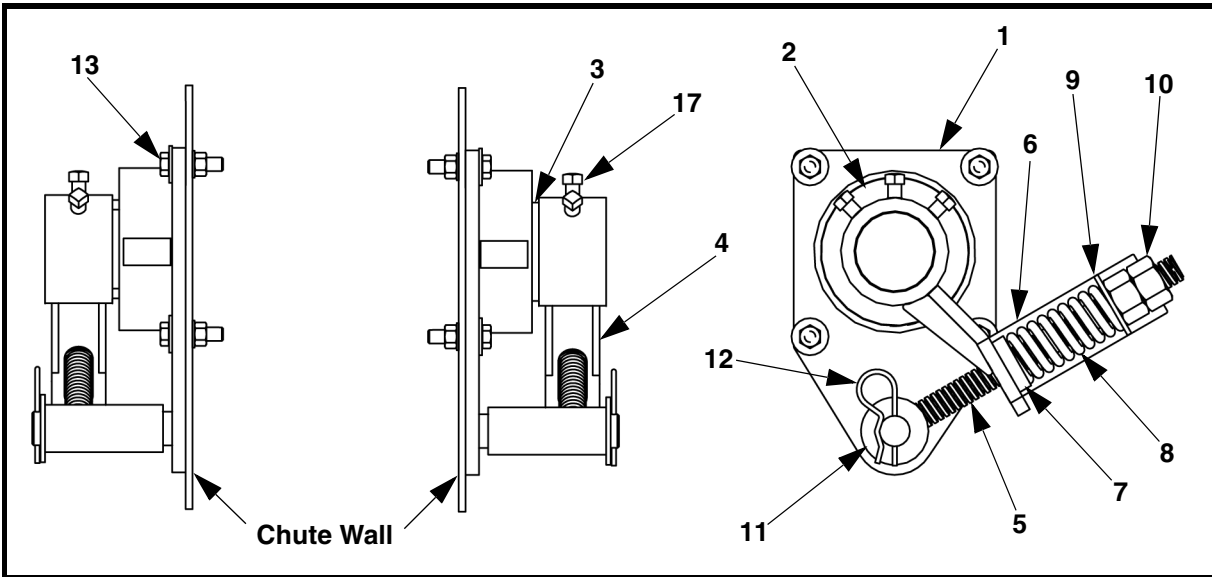


Figure 16. Dual Martin® Universal Spring Tensioner Assemblies, P/N 38003-2-X

Item	Description	Part No.	Qty
1	Mount Plate Weldment	38001	2
2	Shock Ring	32322	2
3	Nylon Bushing	34306	2
4	Lever Arm Weldment	37855	2
5	Rod Weldment with SS Rod	38002	2
6	Tensioning Gauge	36051	2
7	Bushing Spring Cover Mount	36119	2
8	Spring Die 2.00 x 5.00	35127	2
9	Washer Flat 1 Regular ZP	32315	2
10	Nut Hex 1-5 Acme ZP	32311	4
11	Washer Flat 1-1/4 Narrow ZP	34672	2
12	Hairpin Cotter 0.18 x 3.56 ZP	35171	2
13	Mounting Hardware Kit	34498	1
14 (NS)	Tube Clear	34063-08S	2
15 (NS)	Clamp Hose 2.06 Min. x 3.00 Max.	20339-11	2
16 (NS)	Spring Cover	32245-04	2
17	Screw SHS 1/2 - 13 NC x 1.55	22763-03	6
Fig. 19	Label Universal Spring Tensioner	C1QCA1008L	1
19 (NS)	Label Martin Products	32238	2
Fig. 17	Label Pinch Point Warning	30528	2
Fig. 18	Label Conveyor Products Warning	23395	2
22 (NS)	Manual Operator's	M3512	1
23 (NS)	Spring Die 2.00 x 5.00 – 275lb/in.	C1QCA1008	1
24 (NS)	Spring Die 2.00 x 5.00 – 400lb/in.	C1QCA1009	1

NS = Not Shown



Figure 17. Pinch Point Warning Label, P/N 30528

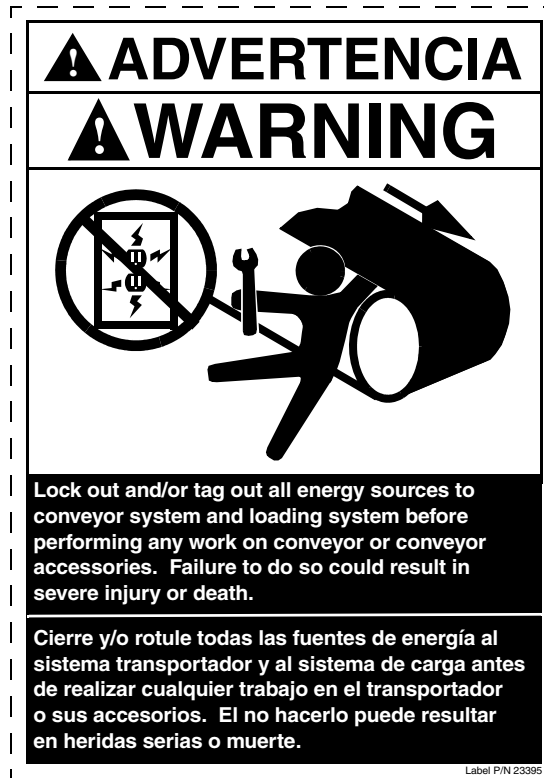


Figure 18. Conveyor Products Warning Label, P/N 23395

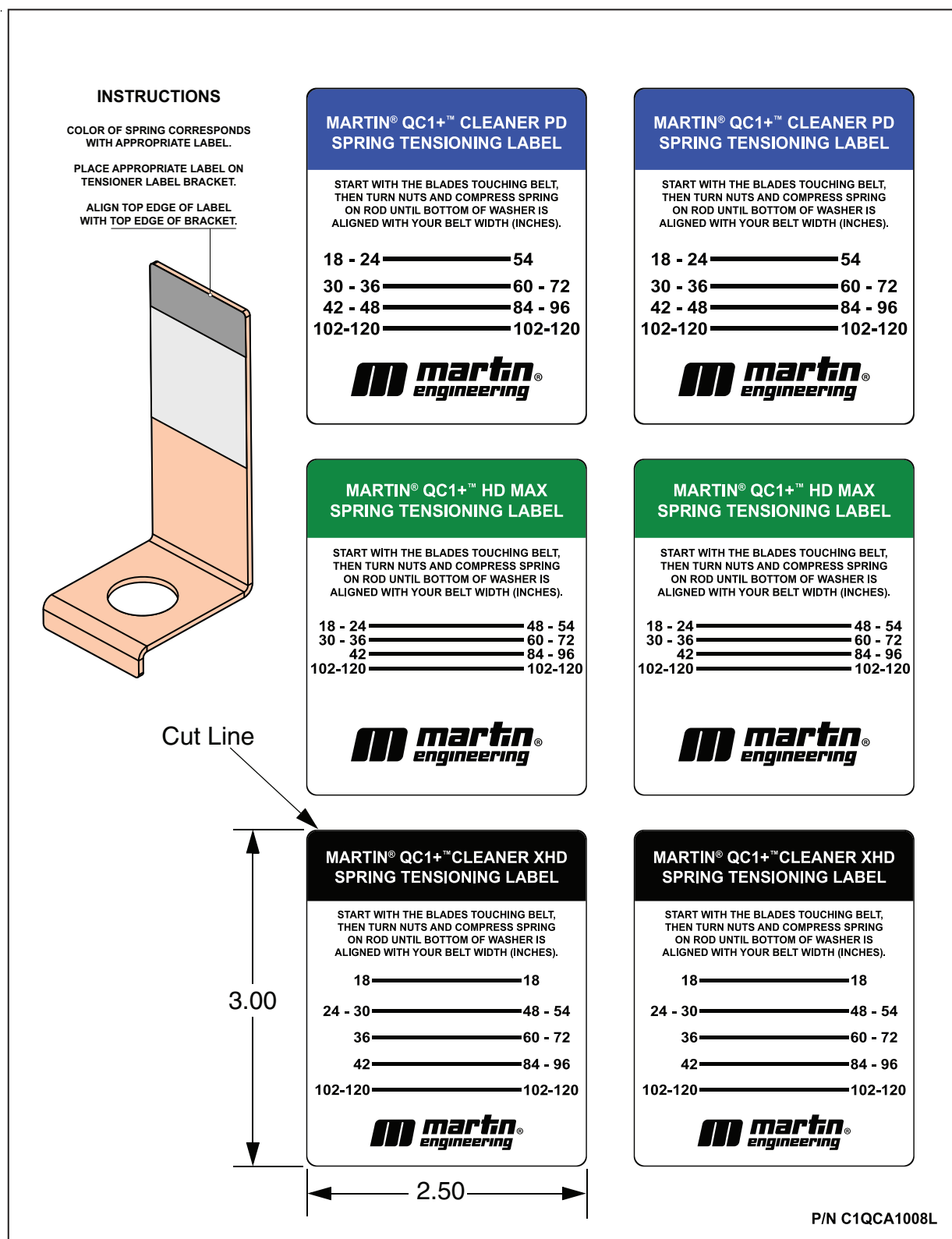
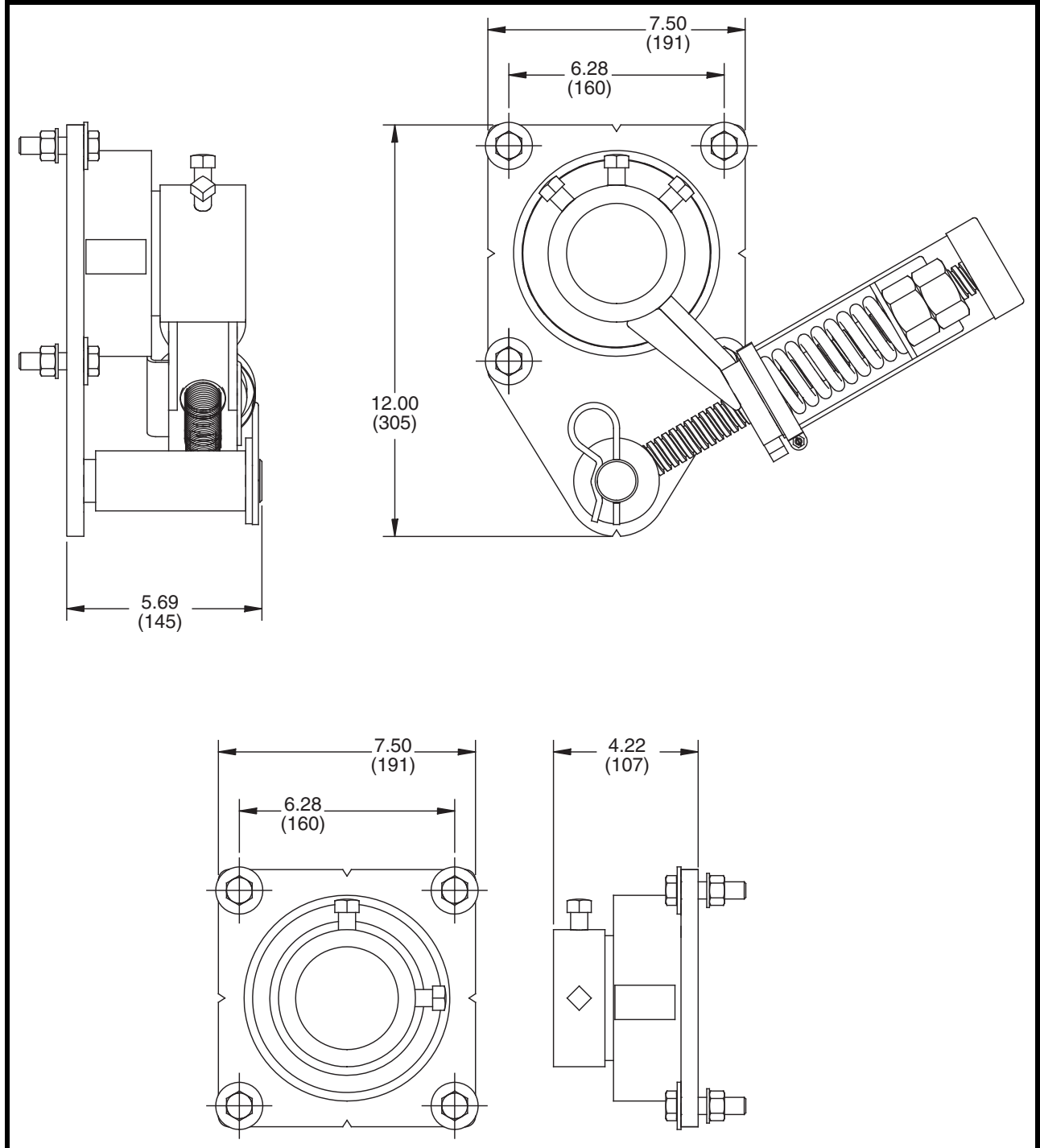


Figure 19. Martin® Universal Spring Tensioner Label, P/N C1QCA1008L

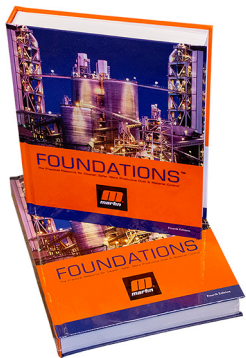
Appendix **Martin® Universal Spring Tensioner Dimensions**



Martin® Universal Spring Tensioner

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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.

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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