



CleanScrape® CSP-S Cleaner

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Operator's Manual
M4082

Important

MARTIN ENGINEERING HEREBY DISCLAIMS ANY LIABILITY FOR: DAMAGE DUE TO CONTAMINATION OF THE MATERIAL; USER'S FAILURE TO INSPECT, MAINTAIN AND TAKE REASONABLE CARE OF THE EQUIPMENT; INJURIES OR DAMAGE RESULTING FROM USE OR APPLICATION OF THIS PRODUCT CONTRARY TO INSTRUCTIONS AND SPECIFICATIONS CONTAINED HEREIN. MARTIN ENGINEERING'S LIABILITY SHALL BE LIMITED TO REPAIR OR REPLACEMENT OF EQUIPMENT SHOWN TO BE DEFECTIVE.

Observe all safety rules given herein along with owner and Government standards and regulations. Know and understand lockout/tagout procedures as defined by American National Standards Institute (ANSI) z244.1-1982, *American National Standard for Personnel Protection - Lockout/Tagout of Energy Sources - Minimum Safety Requirements* and Occupational Safety and Health Administration (OSHA) Federal Register, Part IV, 29 CFR Part 1910, *Control of Hazardous Energy Source (Lockout/Tagout); Final Rule*.

The following symbols may be used in this manual:



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



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



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



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



Note: General statements to assist the reader.

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General

CleanScape® is a Pre-Cleaner which is installed diagonally across the discharge pulley and forms a three dimensional curve. The cleaner has a matrix of tungsten carbide scrapers incorporated into the main rubber body during the vulcanization process. It is tensioned against the belt at an extremely low contact pressure. 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

Materials required

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

Table I. CleanScrape® Carbide Blade Selection

CARBIDE SELECTION	APPLICATION DESCRIPTION	TYPICAL MATERIALS
TU01	Suitable for all less abrasive materials and low belt speeds. Applicable with mechanical belt splices.	Limestone, Salt, Sugar, Coal
TU02	Suitable for moderately abrasive materials and medium belt speeds. Applicable with mechanical belt splices.	Gravel, Clinker, Sandstone
TU03	Suitable for highly abrasive materials and high belt speeds. Do not use with mechanical belt splices.	Sand, Glass, Ore
TU05	Suitable for conditions similar to TU01 and TU02 with chemical resistance. Applicable with mechanical belt splices.	

Belt Speed	Low Abrasive Material	Moderately Abrasive Material	Highly Abrasive Material	Extremely Abrasive Material	Chemical Resistance
0.5 m/s	TU01	TU01	TU02	TU03	TU05
1.0 m/s	TU01	TU01	TU02	TU03	TU05
1.5 m/s	TU01	TU02	TU02	TU03	TU05
2.0 m/s	TU01	TU02	TU02	TU03	TU05
2.5 m/s	TU01	TU02	TU02	TU03	TU05
3.0 m/s	TU01	TU02	TU02	TU03	TU05
3.5 m/s	TU02	TU02	TU02	TU03	TU05
4.0 m/s	TU02	TU02	TU02	TU03	TU05
4.5 m/s	TU02	TU02	TU03	TU03	
5.0 m/s	TU02	TU02	TU03	TU03	
5.5 m/s	TU02	TU03	TU03	TU03	
6.0 m/s	TU02	TU03	TU03		
6.5 m/s	TU03	TU03	TU03		
7.0 m/s	TU03	TU03	TU03		

Table II. CleanScrape® Conveyor Requirements

Cleaner Type	Head Pulley Diameter		Belt Width	Maximum Belt Speed	
	Min.	Max.		Vulcanized Splice	Mechanical Splice
CSP-S	12 in.	22 in.	12–48 in.	1100 Ft/Min	800 Ft/Min

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.



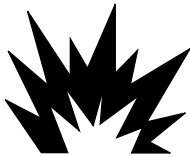
⚠ DANGER

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.



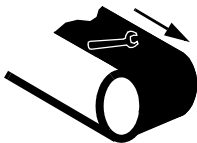
⚠ DANGER

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.



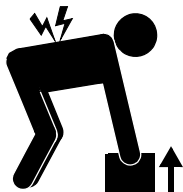
⚠ WARNING

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

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

Before Installing Belt Cleaner

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

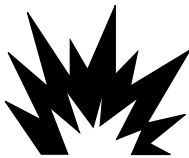


⚠ DANGER

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.

NOTE

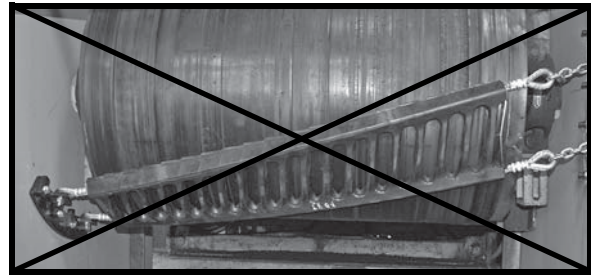
The chute wall that the tensioner will be located on is referred to as the "operator side." The other side of the chute is referred to as the "far side."

NOTE

The installation instructions in this manual are the preferred methods for the most common installations. Contact Martin Engineering for alternative installation options.



Correct Mounting Position



Incorrect Mounting Position

Figure 1. Belt Cleaner Mounting Orientation

IMPORTANT

The CleanScrape® carbide scrapers are molded into the rubber body of the cleaner at a slight angle creating a serrated cleaning edge. For effective cleaning, the cleaner can only be mounted in orientation shown.

6. Inspect belt cleaner mounting area for possible obstructions that could interfere with proper mounting. Refer to following guidelines:
 - a. Make sure cleaner does not lie in path of material unloading from conveyor belt.
 - b. The ideal installation angle is 14–17 degrees.
 - c. Belt width must not exceed a ratio of 3:1 to the head pulley diameter. For example, the maximum belt width for a conveyor with a 24 in. head pulley is 72 in.
 - d. Chute walls must be strong enough to not flex as tension is applied to cleaner. If chute wall flexes inadequate tension may be applied to cleaner resulting in poor cleaning performance. Additional chute wall structure support may be added to prevent chute wall from flexing.
7. Lack of service is the main cause of poor belt cleaning performance. Follow CEMA guidelines for access:
 - (1) Clearance for service outside the chute must be at least equal to the belt width.
 - (2) Cleaners must have service platforms. CEMA recommends cleaners be mounted at least 24 in. (600 mm) above the work platform.
 - (3) If the belt width is 54 in. (1400 mm) or larger consider access doors on both sides of the chute.

Installing Belt Cleaner & Tensioners

Before Installation

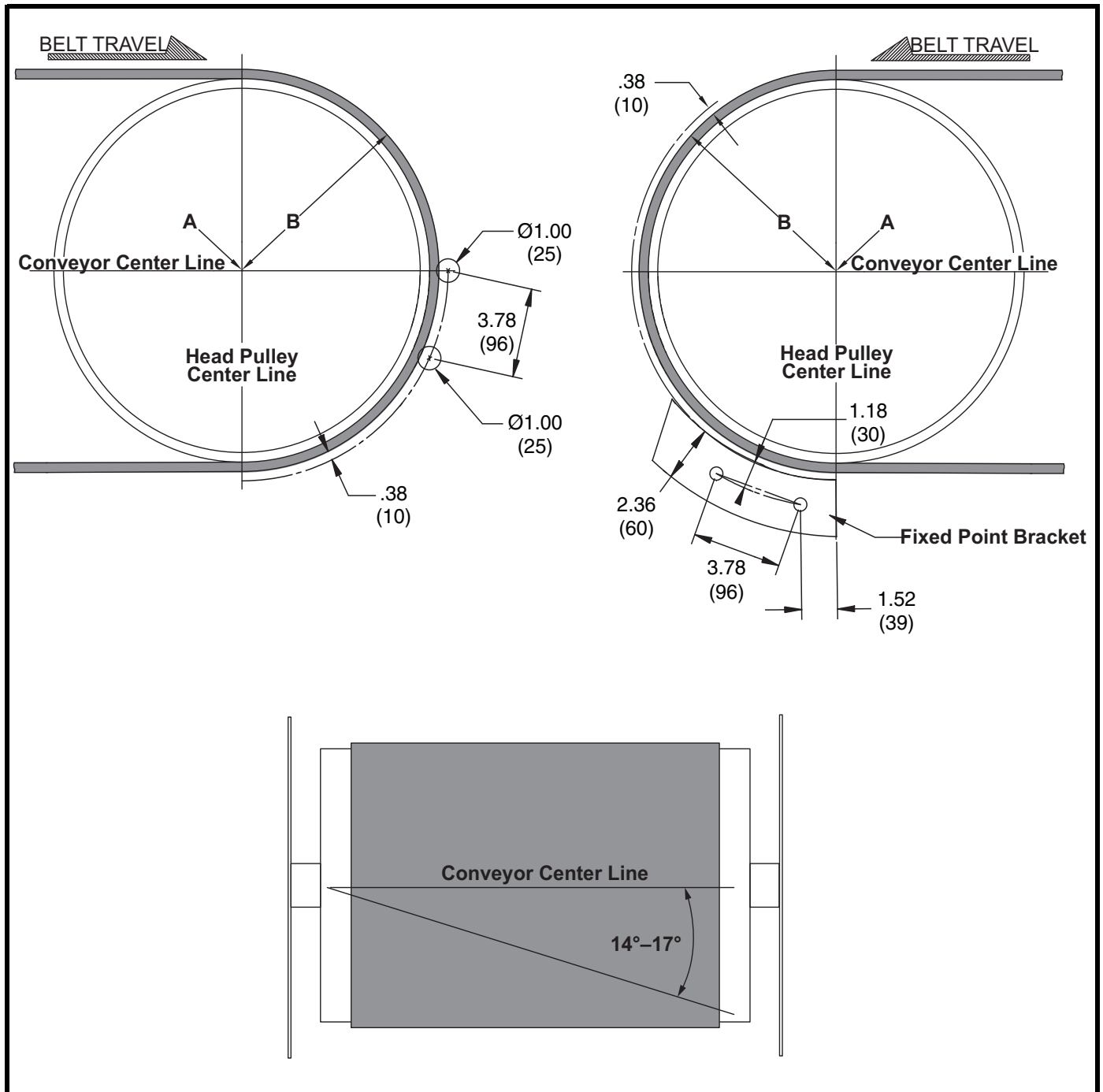


Figure 2. Belt Cleaner Location & Chute Wall Cutouts

Locating belt cleaner

1. On both sides of chute, find pulley center point (A).
2. Measure radius of head pulley including lagging and belt thickness (B). To this dimension, add dimension 3/8 in. from Figure 2.
3. On the far side of chute, start from center point (A), measure the total distance calculated in step 2 ($B + 3/8$ in.), and draw an arc on chute wall.
4. On the operator side of chute, start from center point (A), draw an arc on chute wall with a radius of ($B + 3/8$ in.).

5. On the far side of chute:
 - a. Draw a centerline of the head pulley perpendicular to the conveyor belt line.
 - b. If bolting fixed point bracket to chute wall, do the following:
 - (1) Position fixed point bracket on far side chute wall as shown in Figure 2.
 - (2) Mark bracket hole locations.
 - (3) Drill or cut two 1/2-in. holes for screws in far side chute wall.
 - (4) Mount fixed point bracket to inside of far side chute wall using countersunk screws and nuts.
 - c. If welding fixed point bracket to chute wall, do the following:
 - (1) Position fixed point bracket on far side chute wall as shown in Figure 2.
 - (2) Weld bracket to chute wall. Weld completely around bracket. Do not skip weld.

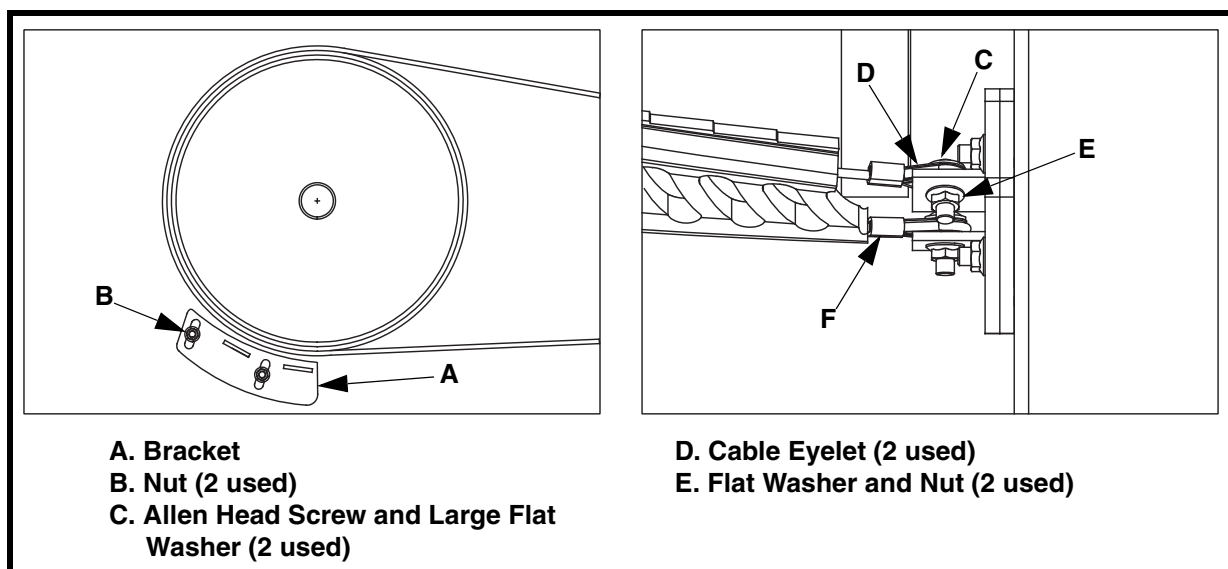


Figure 3. Installing Fixed Point Bracket

- d. Install bracket (A) using nuts (B). Hand tighten nuts.
- e. Attach cleaner to far side bracket by inserting hex head screw and large flat washer (C) through cable eyelet (D) and fastening with flat washer and nut (E). Hand tighten nuts.

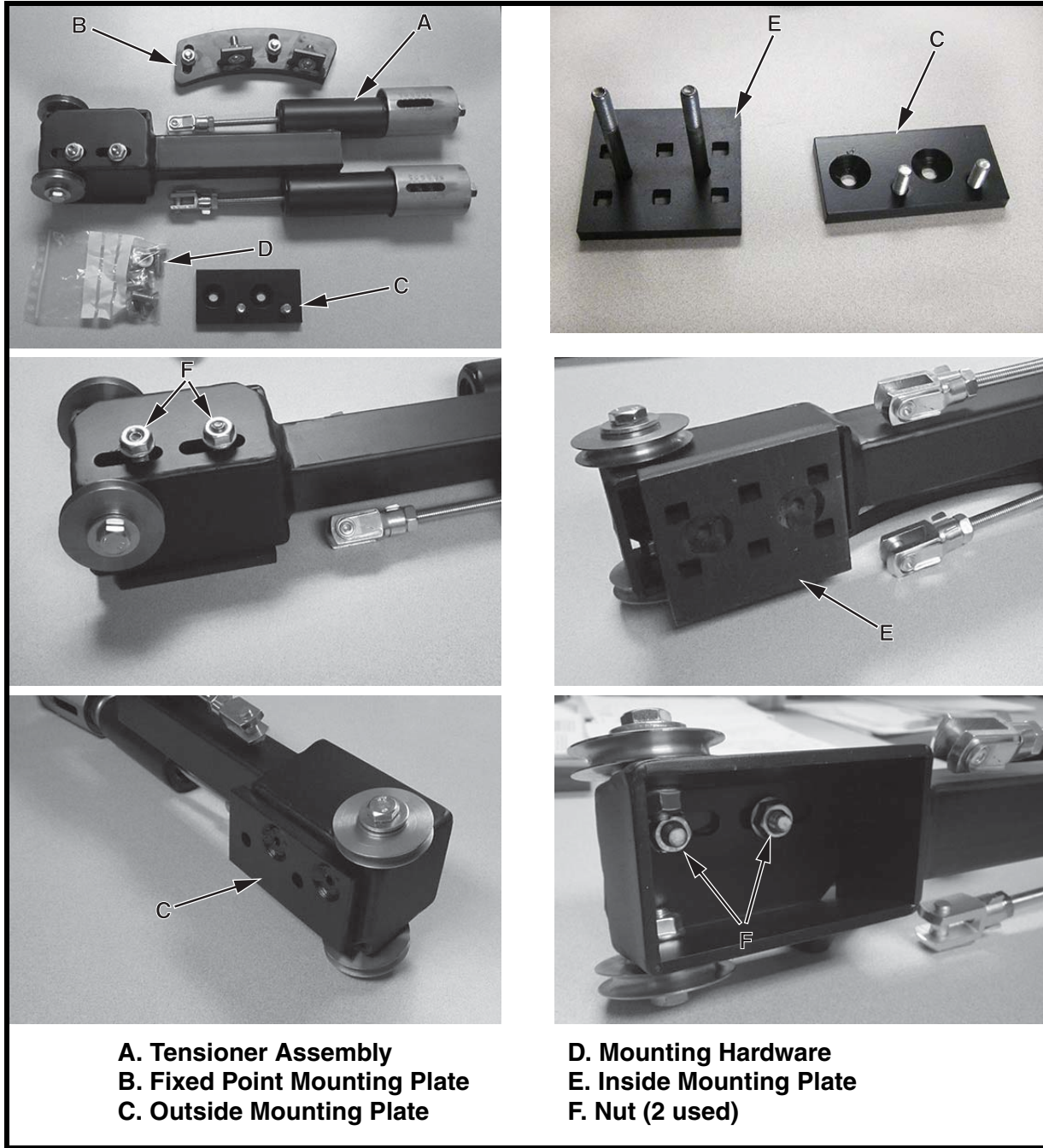


Figure 4. Tensioner Mount Plates

IMPORTANT

Installing tensioner mount plate

Tensioners used with CleanScrape® CSP-S cleaners can be installed on either the inside or the outside of the chute wall. Tensioners are shipped with the inside mounting plate (E) installed. If the application requires tensioners to be mounted on the outside of the chute wall, the outside mounting plate (C) must be used.

1. Determine if tensioner will be mounted on the inside or outside of chute wall.
2. If the tensioner will be installed on the outside of chute wall, the tensioner mount plate must be changed as follows:
 - a. Remove nuts (F).
 - b. Remove inside mounting plate (E) from tensioner assembly (A).
 - c. Install outside mounting plate (C) on tensioner assembly.
 - d. Install and tighten nuts (F).

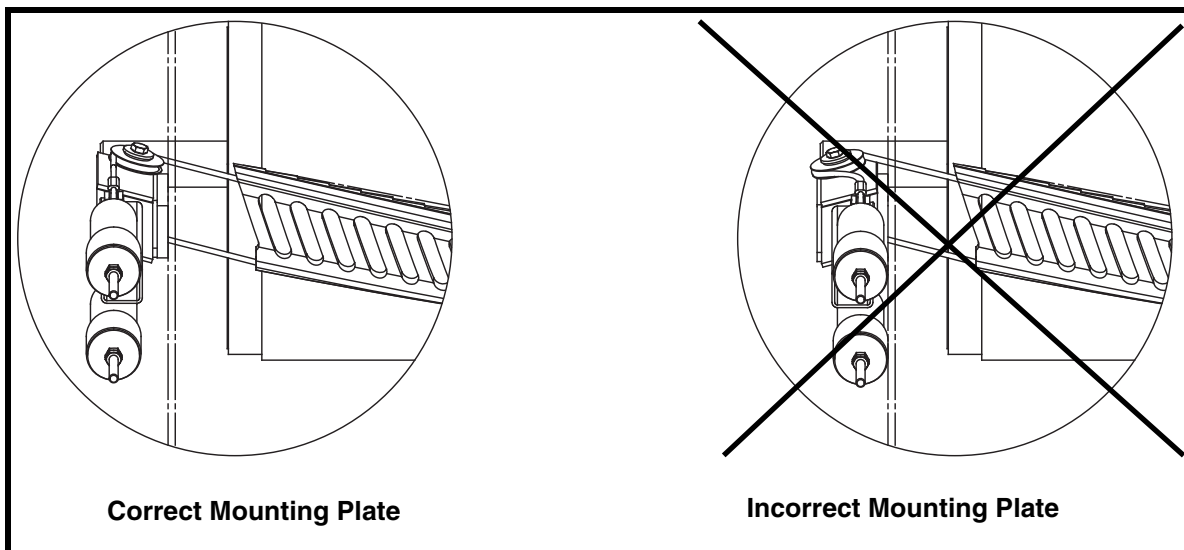


Figure 5. Tensioner Mount Plate Verification

⚠ CAUTION

The correct mounting plate must be used or damage to cleaner will result. Using the incorrect mounting plate results in cable being cut by roller and ultimately cleaner failure.

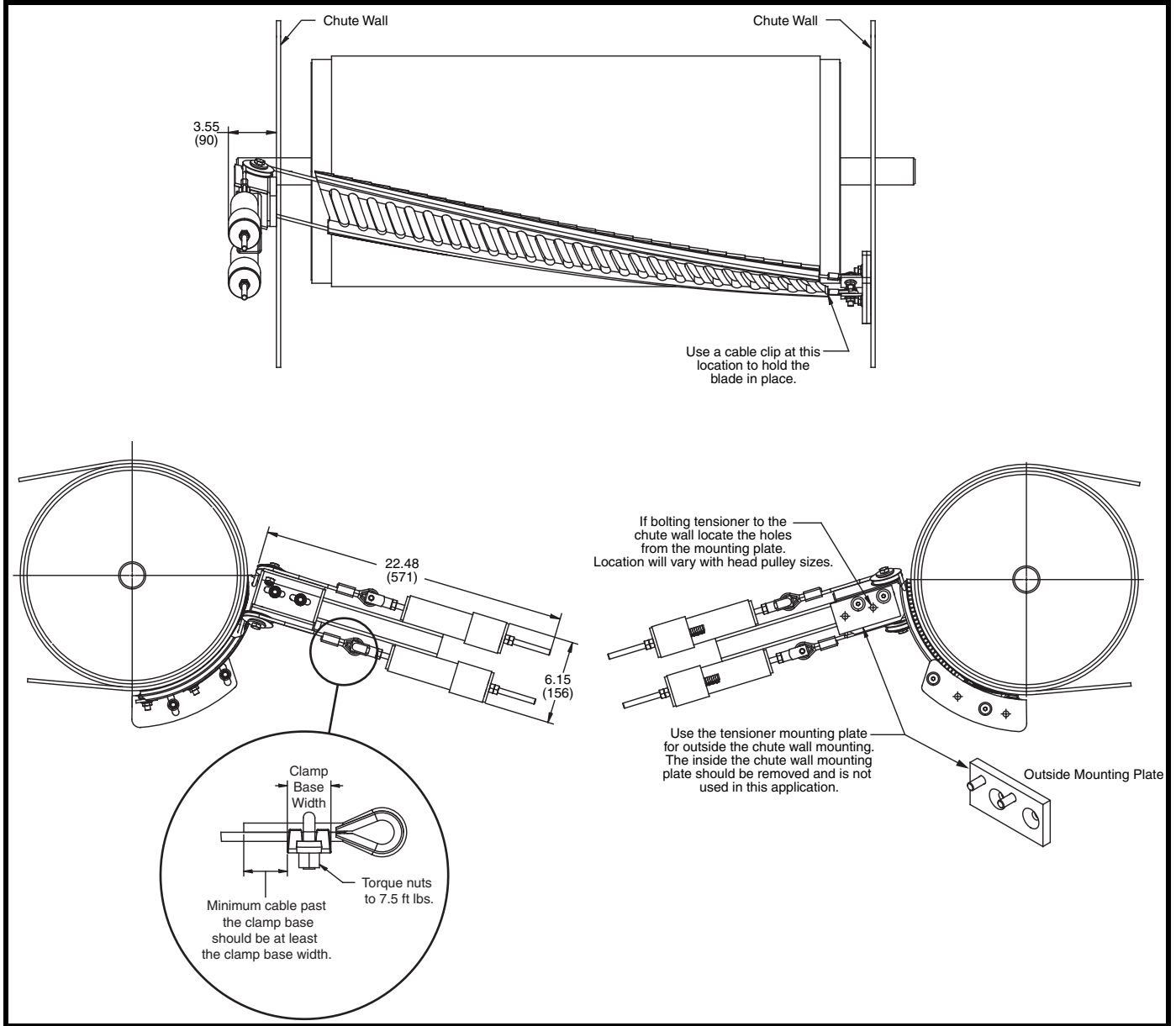


Figure 6. Installing Tensioner on Outside Chute Wall

Installing tensioner on outside chute wall

1. For installations on the outside of the chute wall:
 - a. Draw conveyor centerline parallel to the conveyor belt line.
 - b. Mark chute wall cutouts as shown in Figure 2.
 - c. Cut holes in chute wall. Remove burrs and sharp edges.
 - d. Install outside mounting plate on tensioner. See Figure 4.
 - (1) Remove nuts (F).
 - (2) Remove inside mounting plate (E) from tensioner assembly (A).
 - (3) Install outside mounting plate (C) on tensioner assembly.
 - (4) Install and tighten nuts (F).

- e. Position tensioner in desired location free from obstructions as shown in Figure 6. Make sure cleaner cables will not rub on chute wall cutouts. Reposition tensioner or enlarge cutouts as required.
 - f. Mark location of tensioner mounting plate.
 - g. Remove mounting plate from tensioner.
 - h. Bolt or weld mounting plate in location marked in Step 1.e.
 - i. Install tensioner onto mount plate.
2. Measure approximate cable length required and cut cable.
 3. Assemble cable eyelet and clamp as shown in Figure 6.
 4. Torque nuts on clamp to 7.5 ft lbs.
 5. Attach each cable to tensioner.
 6. Tighten tensioner adjustment nuts until cleaner is held firmly to belt.
 7. Center cleaner on belt and install a cable clamp on the far side lower cleaner cable. This clamp keeps the cleaner centered on the belt.
 8. Adjust fixed point bracket and tensioner bracket, so the outer two elements on each side of cleaner are approximately 1/8 inch away from belt.
 9. Tighten all fasteners on fixed point brackets and tensioner mounts.
 10. Tension cleaner according instructions in *Tensioning cleaner*.

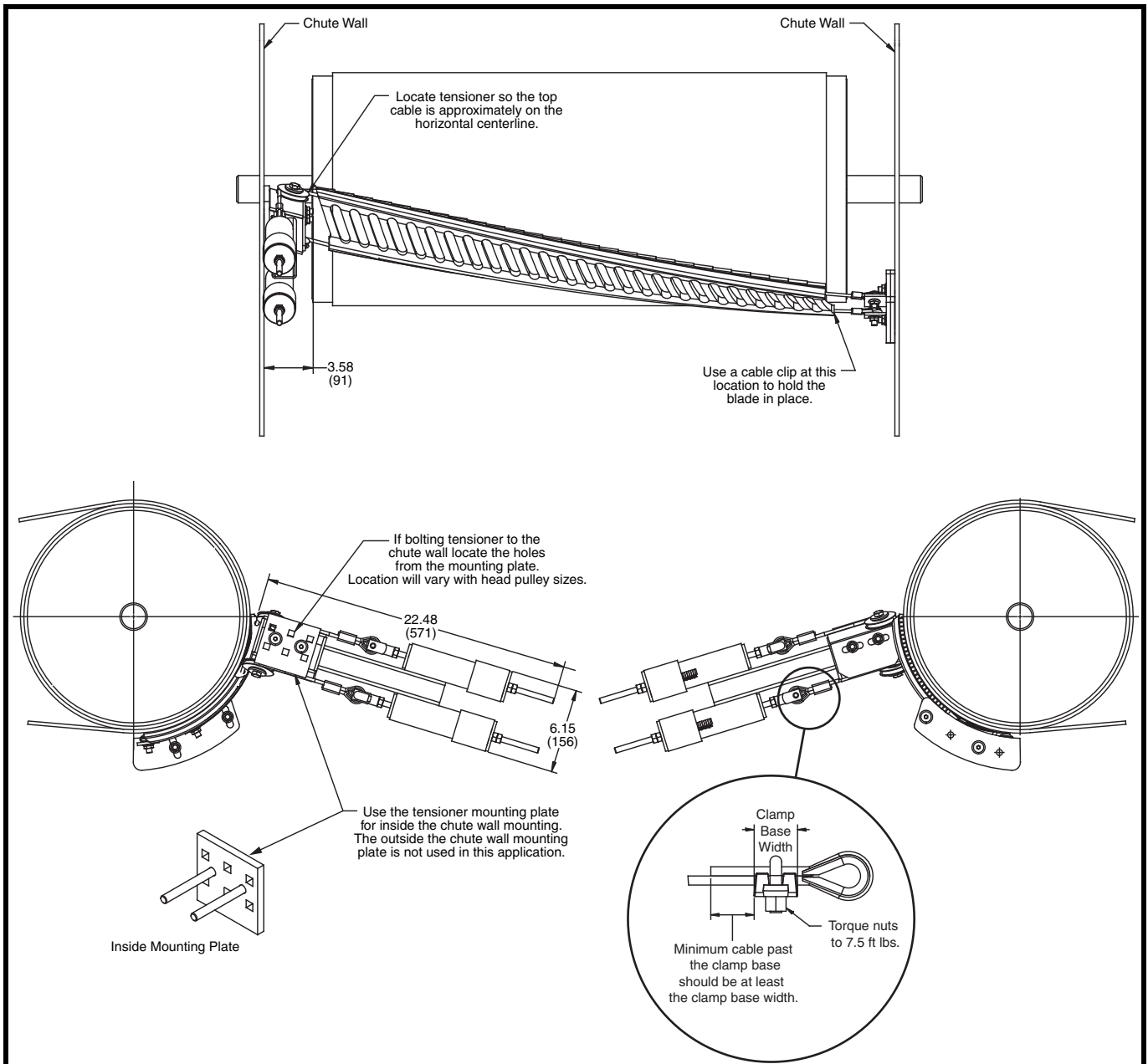


Figure 7. Installing Tensioner on Inside Chute Wall

Installing tensioner on inside chute wall

1. For installations on the inside of the chute wall:
 - a. Draw conveyor centerline parallel to the conveyor belt line.
 - b. The top cleaner cable should be located at approximately this line when installation is complete.
 - c. The inside mounting plate is factory installed on the tensioner.
 - d. Position tensioner in desired location free from obstructions as shown in Figure 7.
 - e. Mark location of tensioner mounting plate.
 - f. Remove mounting plate from tensioner.
 - g. Bolt or weld mounting plate in location marked in Step 1.e.
 - h. Install tensioner onto mount plate.

2. Measure approximate cable length required and cut cable.
3. Assemble cable eyelet and clamp as shown in Figure 7.
4. Torque nuts on clamp to 7.5 ft lbs.
5. Attach each cable to tensioner.
6. Tighten tensioner adjustment nuts until cleaner is held firmly to belt.
7. Center cleaner on belt and install a cable clamp on the far side lower cleaner cable. This clamp keeps the cleaner centered on the belt.
8. Adjust fixed point bracket and tensioner bracket, so the outer two elements on each side of cleaner are approximately 1/8 inch away from belt.
9. Tighten all fasteners on fixed point brackets and tensioner mounts.
10. Tension cleaner according instructions in *Tensioning cleaner*.

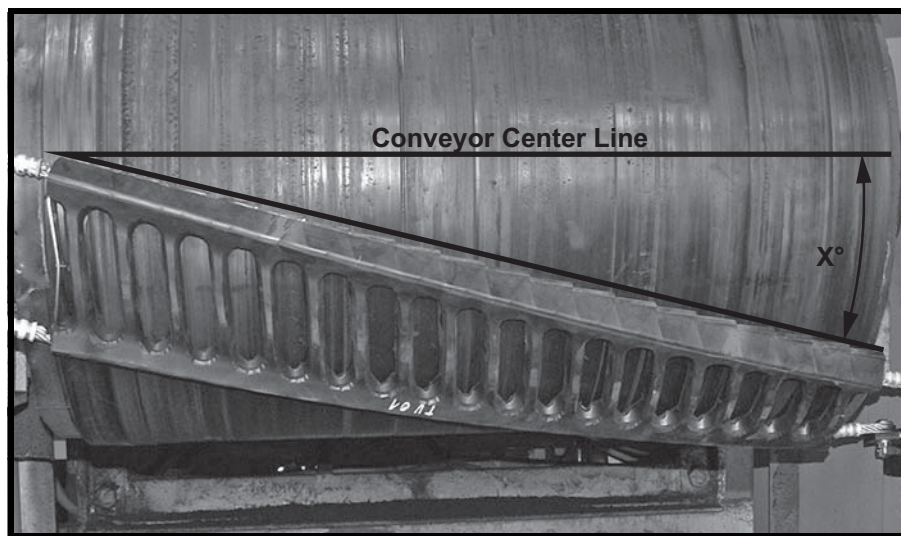


Figure 8. Measure Cleaner Angle

Tensioning cleaner

1. Measure angle of cleaner.
2. Determine tension required according to tensioning chart. Tensioning values shown are for cleaners mounted at 17°. If angle of cleaner is less than 17° tensioning force will need to be increased.
3. Tighten tensioners. Install and tighten jam nut against tensioning nut on each tensioner.
4. Make sure outer two elements on each side are approximately 1/8-in. away from belt.

NOTE

The following charts are initial settings for cleaners installed at 17°. For cleaners installed at an angle greater than 17° force required will be less than shown. For cleaners installed at an angle less than 17° force required will be greater than shown.

Table III. CleanScrape® CSP-S Tensioning Chart

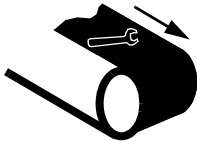
Head Pulley Diameter	Tensioner Type	Upper Rope Force Required	Lower Rope Force Required*
12 in.	Small	0.90 KN	0.81 KN
16 in.	Small	1.00 KN	0.90 KN
20 in.	Small	1.20 KN	1.08 KN
22 in.	Small	1.35 KN	1.22 KN

*Lower rope should have 10% to 15% less force than upper rope.

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 blade if carbide metal wear is greater than 3/16 in.
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

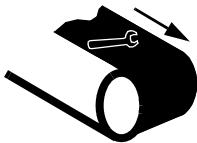
Failure to remove tools from maintenance area and conveyor belt before turning on energy source can cause serious injury to personnel and damage to belt.

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.	Check to see that cleaner is contacting the belt across the front edge of the cleaner.
Belt is cleaner on one side than the other.	Adjust cleaner closer to the belt.
Blade dancing or vibration.	Check tension on tensioner gauge to be sure of proper tension. Reset tension according to tensioning charts.
Cleaner is catching on mechanical splice.	Check that outer 2 elements are off the belt by up to a 1/8 in. to allow for the splice to flow through the cleaner without catching.

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 blade is proper distance from belt surface on both sides of head pulley.
✓ Pre-Cleaner blade tip does not lie in path of material flow.
✓ Blade is centered on belt.

Part Numbers

This section provides product names and corresponding part numbers for CleanScrape® and related equipment. Please reference part numbers when ordering parts:

NOMENCLATURE	CSP-S-	XX	XX	X	X	XXX
<i>P/N 5-Digit Prefix</i>	_____	_____	_____	_____	_____	_____
<i>Belt Width (inches)</i>	_____	_____	_____	_____	_____	_____
<i>No. of Elements in Blade</i>	_____	_____	_____	_____	_____	_____
<i>Blade Carbide Type*</i>	_____	_____	_____	_____	_____	_____
<i>Swage Sleeves</i>	_____	_____	_____	_____	_____	_____
<i>Installation Kit</i>	_____	_____	_____	_____	_____	_____
<i>*See Table I</i>						
SWAGE SLEEVES						
C: Copper						
Blank: Aluminum						
INSTALLATION KIT						
T1: Standard Steel Spring Tensioner						
T1C: Stainless Steel Spring Tensioner						
T2: Multifunctional Steel Spring Tensioner						
T2C: Multifunctional Stainless Steel Spring Tensioner						

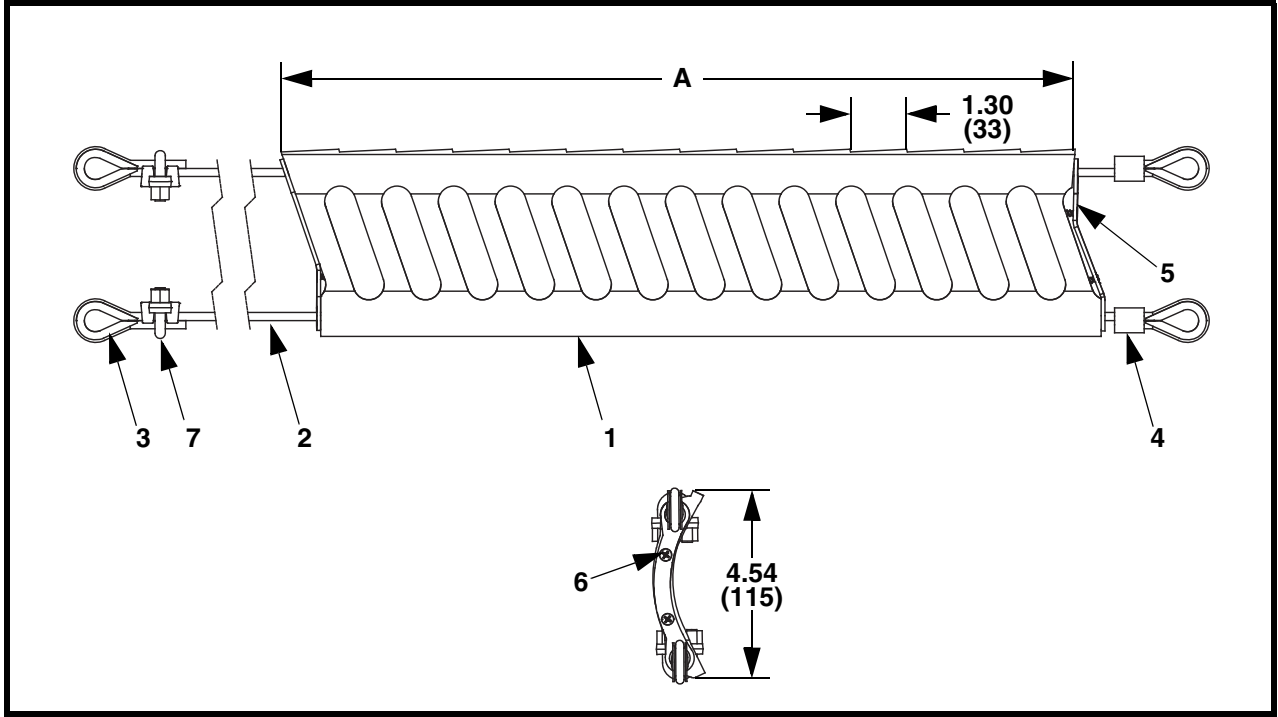


Figure 9. CleanScrape® Assembly, P/N CSP-S-XXXXXX-XXX

Item	Description	Part No.	Qty.
1	Blade 35mm LG Element	Table IV	Tbl IV
2	Wire Rope 5mm SS	CSP-041392	Tbl IV
3	Wire Rope Thimble for 5mm Cable	CSP-039551	4
4	Swage Sleeve for 5mm Cable	Table IV	2
5	End Link – Small	CSP-038136	2
6	Screw Wood #6 x 3/4 316 SS	39367	4
7	Wire Rope Clip 3/16 Galv	32264-02	3
8 (NS)	Installation Kit	Table IV	1
9 (NS)	Label Conveyor Products Warning	23395	2
10 (NS)	Operator's Manual	M4033	1

NS = Not Shown

**Table IV. Part Numbers and Dimensions for CleanScrape® Assembly,
P/N CSP-S-XXXXXX-XXX**

Assembly Part No.	Dim. A in. (mm)	Qty Item 1	Qty Item 2
CSP-S-1209XX-XXX	12.37 (314)	9	7.0
CSP-S-1814XX-XXX	19.26 (489)	14	8.0
CSP-S-2418XX-XXX	24.77 (629)	18	9.0
CSP-S-3023XX-XXX	31.66 (804)	23	10.0
CSP-S-3627XX-XXX	37.17 (944)	27	11.0
CSP-S-4232XX-XXX	44.06 (1119)	32	12.0
CSP-S-4836XX-XXX	49.57 (1259)	36	13.0

Assembly Part No.	Part No. Item 1
CSP-S-XXXX1X-XXX	CSP-S-TU01
CSP-S-XXXX2X-XXX	CSP-S-TU02
CSP-S-XXXX3X-XXX	CSP-S-TU03
CSP-S-XXXX4X-XXX	CSP-S-TU04
CSP-S-XXXX5X-XXX	CSP-S-TU05

Assembly Part No.	Part No. Item 4
CSP-S-XXXXX-XXX	CSP-039474
CSP-S-XXXXXC-XXX	CSP-041571

Assembly Part No.	Part No. Item 8
CSP-S-XXXXXX-T1	CSP-039578
CSP-S-XXXXXX-T1C	CSP-042047
CSP-S-XXXXXX-T2	CSP-042958
CSP-S-XXXXXX-T2C	CSP-042960

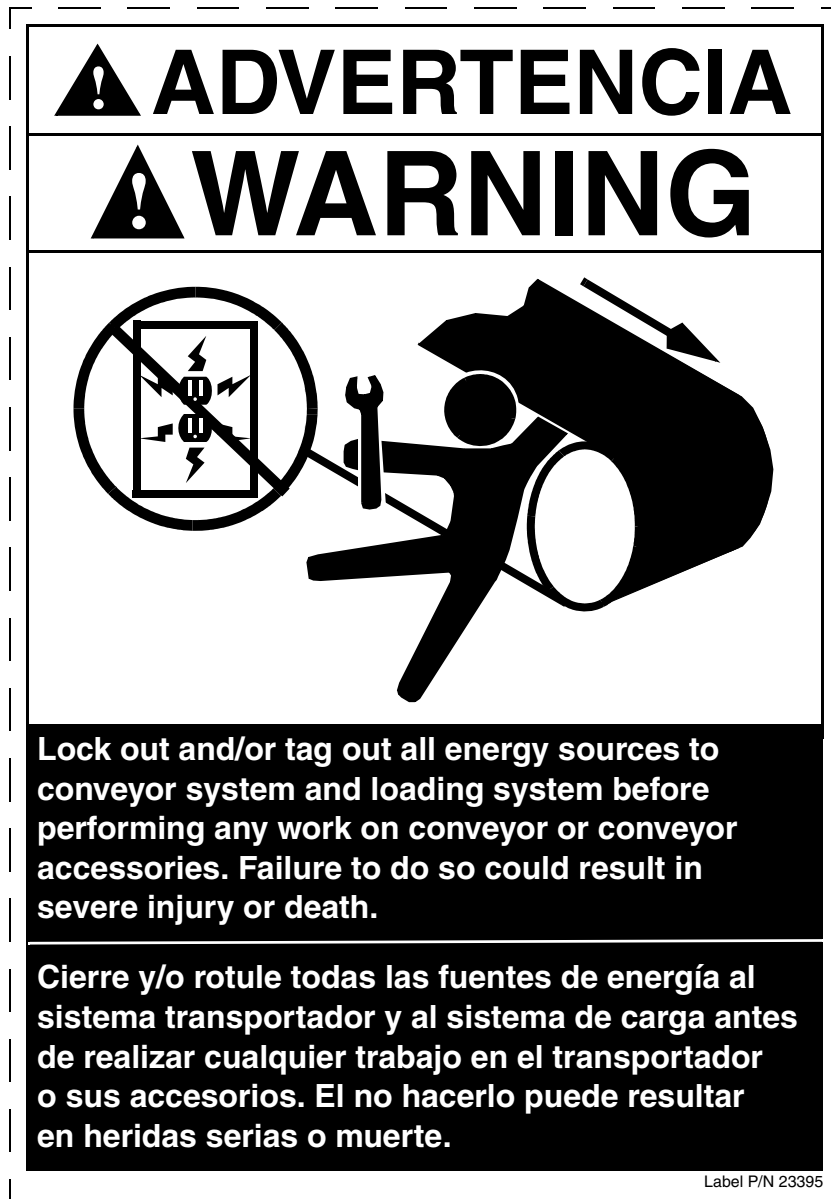
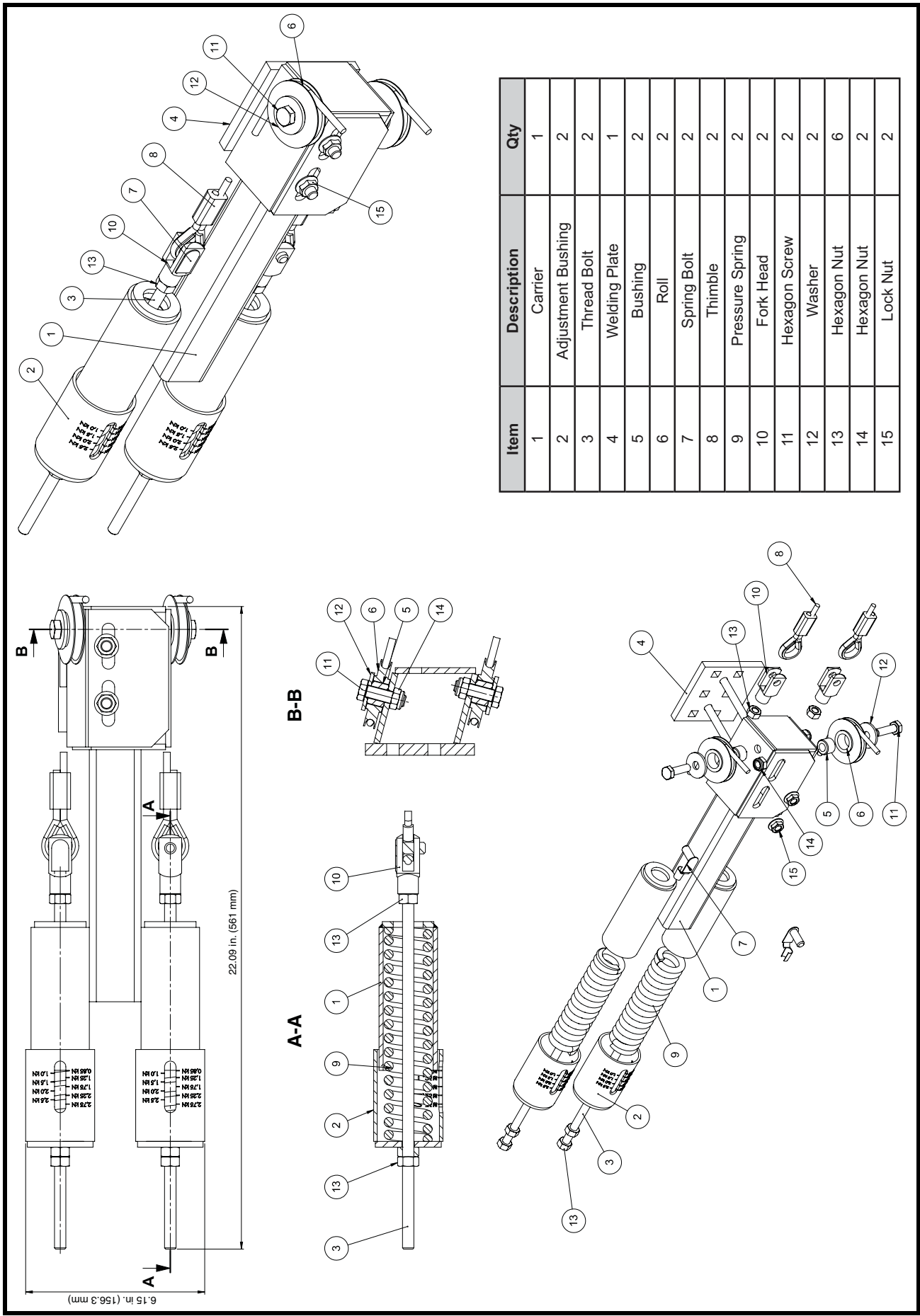


Figure 10. Martin® Conveyor Products Warning Label, P/N 23395

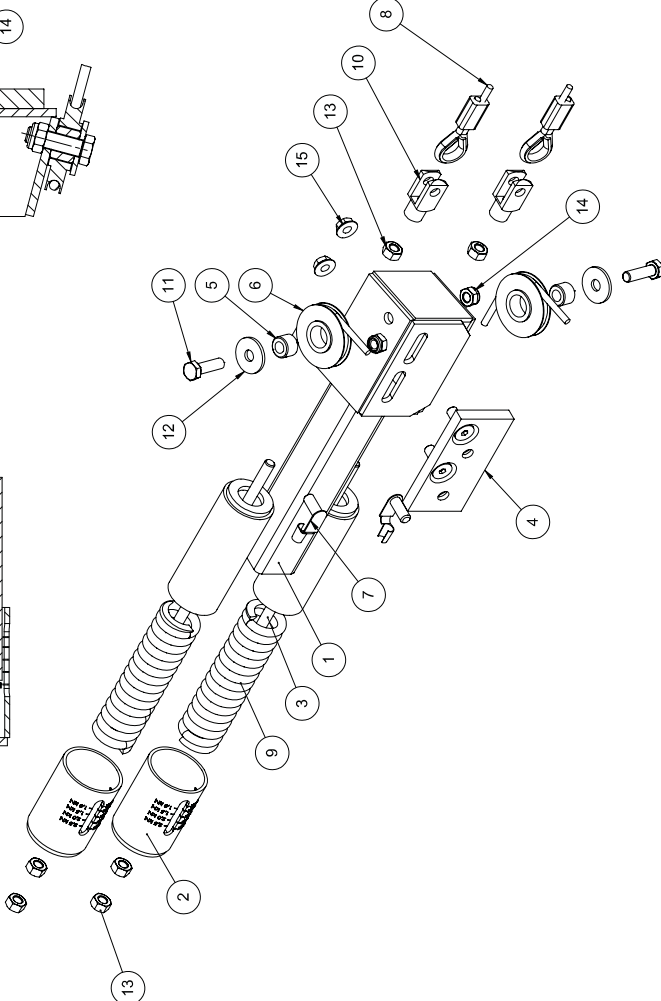
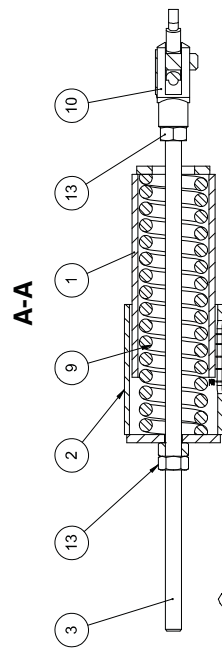
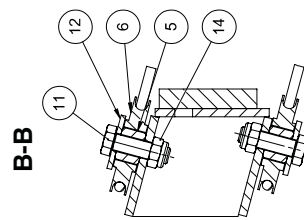
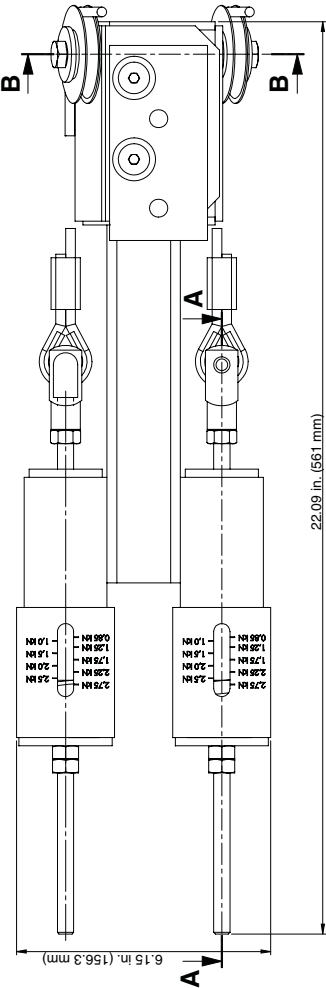
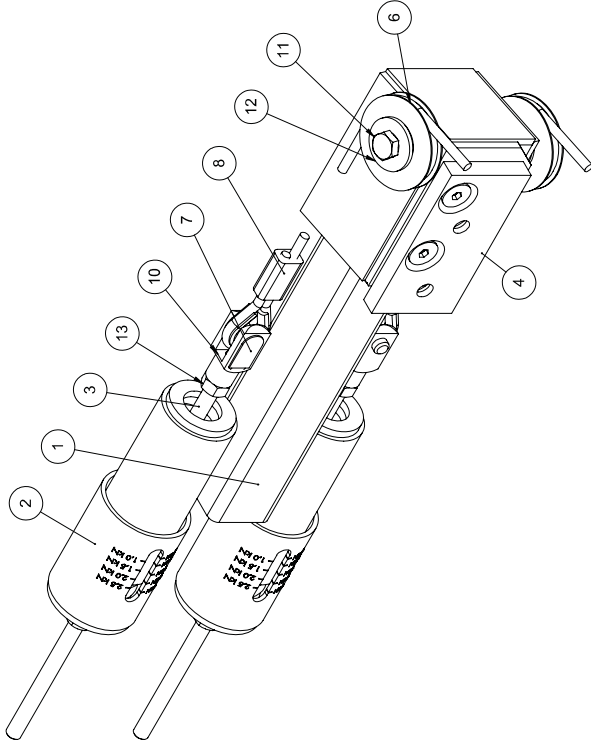
Appendix

CleanScrape[®] CSP-S Tensioner Mounting Configurations



Item	Description	Qty
1	Carrier	1
2	Adjustment Bushing	2
3	Thread Bolt	2
4	Welding Plate	1
5	Bushing	2
6	Roll	2
7	Spring Bolt	2
8	Thimble	2
9	Pressure Spring	2
10	Fork Head	2
11	Hexagon Screw	2
12	Washer	2
13	Hexagon Nut	6
14	Hexagon Nut	2
15	Lock Nut	2

**CleanScrape® CSP-S Tensioner
Outside Chute Wall Mounting Configuration**

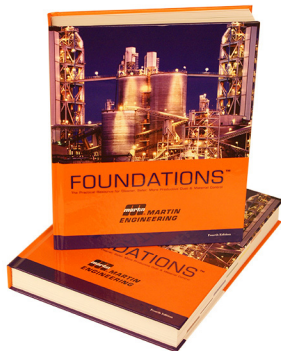


Item	Description	Qty
1	Carrier	1
2	Adjustment Bushing	2
3	Thread Bolt	2
4	Welding Plate	1
5	Bushing	2
6	Roll	2
7	Spring Bolt	2
8	Thimble	2
9	Pressure Spring	2
10	Fork Head	2
11	Hexagon Screw	2
12	Washer	2
13	Hexagon Nut	6
14	Hexagon Nut	2
15	Lock Nut	2

**CleanScape® CSP-S Tensioner
 Inside Chute Wall Mounting Configuration**

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



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