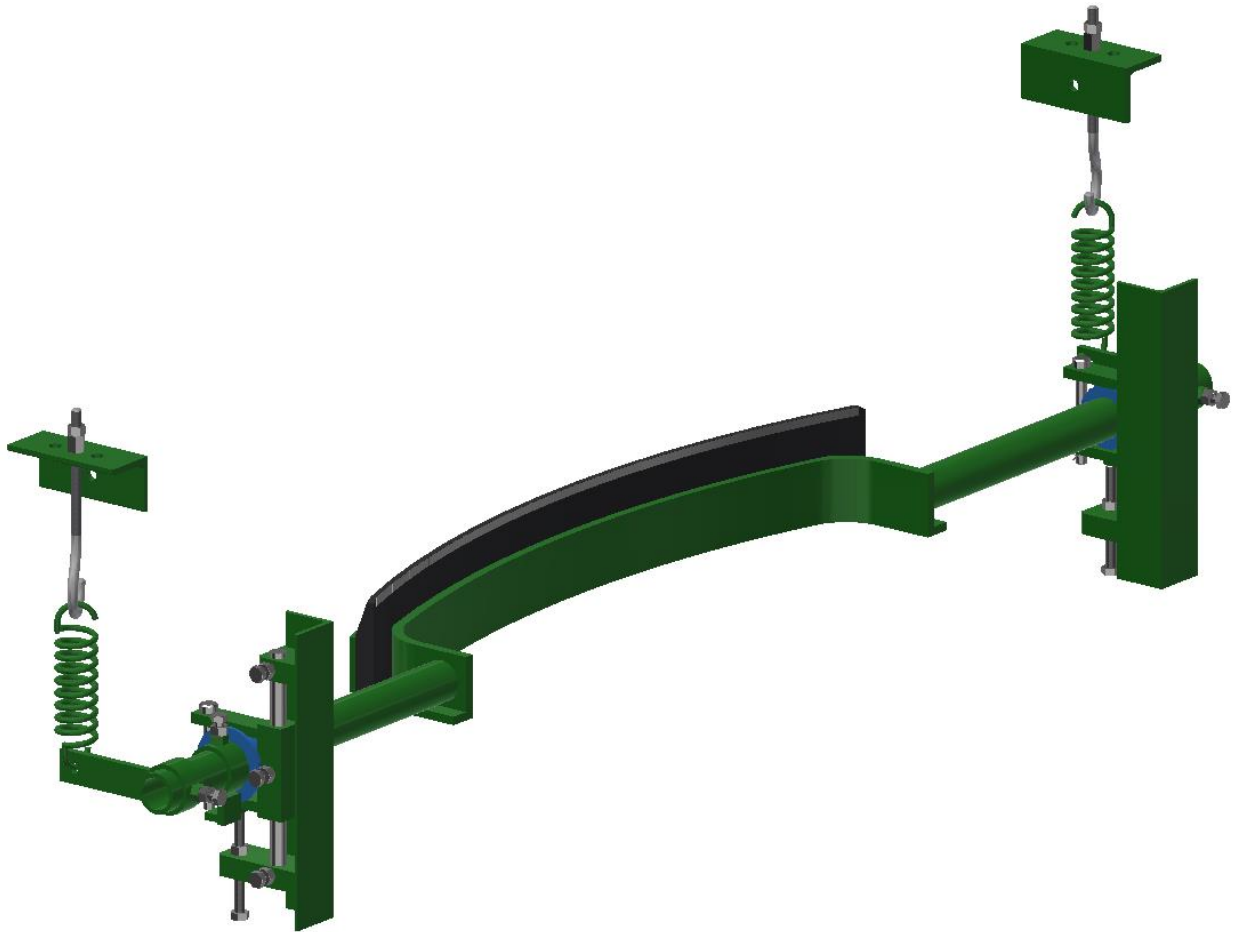


Installation, Operation and Maintenance Manual



U Belt Cleaner

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1 General Information

1.1 Overview

The Belle Banne U Belt Cleaner is designed to be positioned on a flat, stable section of belt, in close proximity to the head pulley or a flat return and/or hold-down roller. It is typically referred to as a “secondary” cleaner, as it is usually installed in conjunction with a “primary” belt cleaner that is located at the material discharge point. The U Belt Cleaner comprises a set of mounting brackets, torque arm assemblies and a pole that holds a single blade, which comprises a series of tungsten elements.

Blade tension is applied by rotating the pole using the torque arm assemblies. For belt widths up to 1050mm the pole is 48mm diameter. For belt widths from 1200mm to 1600mm the pole is 60mm diameter. For belt widths 1800mm and above, the pole is 73mm diameter.

U Belt Cleaners are not designed to handle reversing belt applications.

For more challenging applications, multiple U Belt Cleaners can be installed in close series. Contact Belle Banne Conveyor Products for more information.

1.2 Advantages

Belt cleaners significantly reduce the amount of material build-up on the conveyor belt, known as carryback, which can cause

- material spillage,
- belt tracking problems,
- build up on return idlers,

These issues contribute to unwanted plant downtime, resulting in increased costs.

Installation of appropriate belt cleaning systems (one or more belt cleaners) will minimise these issues.

1.3 Safety

During installation and maintenance of all belt cleaners, ensure all energy sources are isolated in accordance with the relevant site’s procedures.

Ensure all works are conducted by qualified, competent personnel.

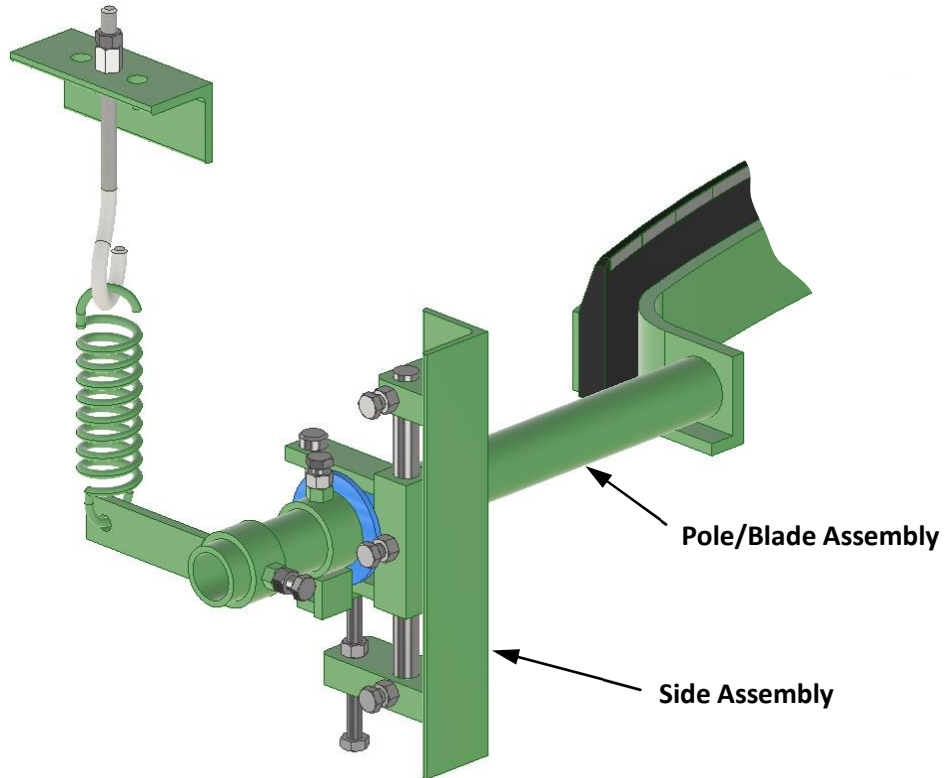
Ensure all personnel utilise appropriate personal protective equipment as required.

1.4 Assistance

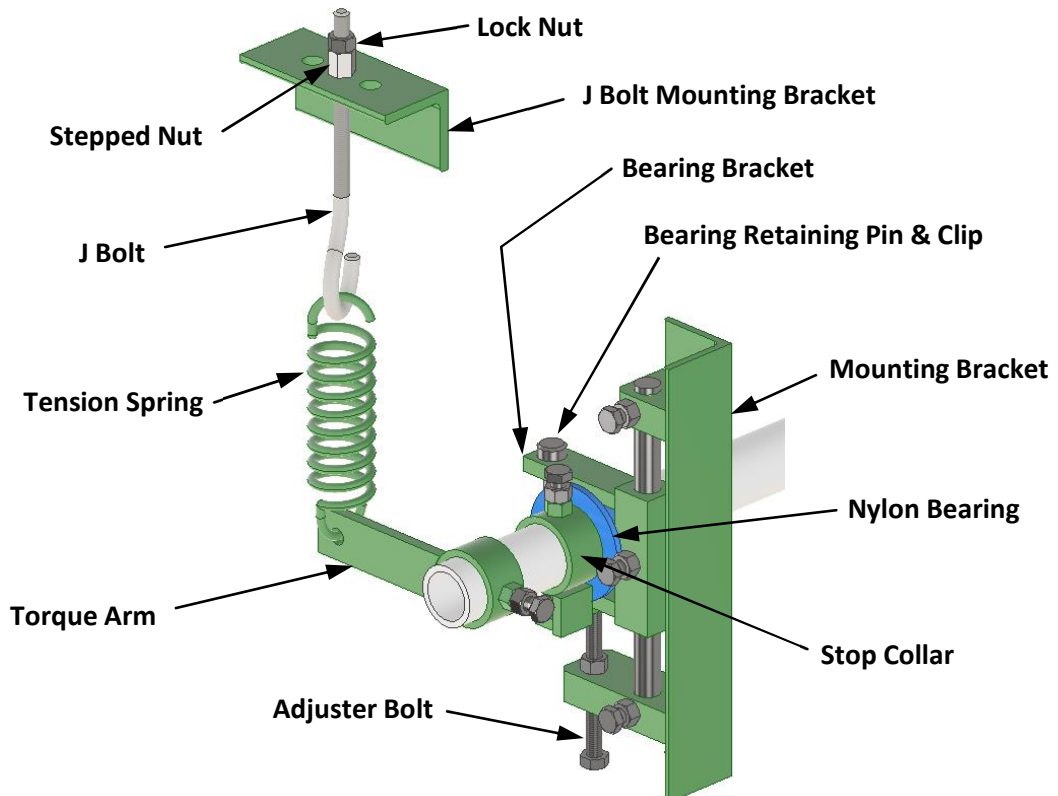
If assistance is required through any stage of the process: belt cleaner selection, design, drafting, installation and/or maintenance, Belle Banne Conveyor Products have personnel that are able to provide support.

2 U Belt Cleaner Components

2.1 Entire Cleaner



2.2 Side Assembly



3 Tools & Equipment

3.1 Installation

The tools and equipment required to install a U Belt Cleaner are:

- Measuring equipment – for marking out frame (pole) location, mounting bracket position, and holes in the chute walls (if required).
- Marking pen or chalk.
- Cutting equipment – for cutting holes in the chute walls (if required).
- Drilling equipment – for drilling holes for the mounting brackets (unless they are being welded to the chute wall or structure).
- Welding equipment – for welding the mounting brackets to the chute walls or structure (unless bolted connections are being used).
- Mechanical lifting aids – for lifting larger (heavier) belt cleaners into position.
- 2 x 19mm spanners (or a socket and a spanner) – for tightening side assembly fasteners:
- U Belt Cleaner spring gauge.
- Anti-seize – recommended for coating on fasteners prior to installation.
- DENSO tape – recommended for covering exposed thread on the mounting bracket fasteners.

3.2 Maintenance

The tools and equipment required to maintain an existing U Belt Cleaner.

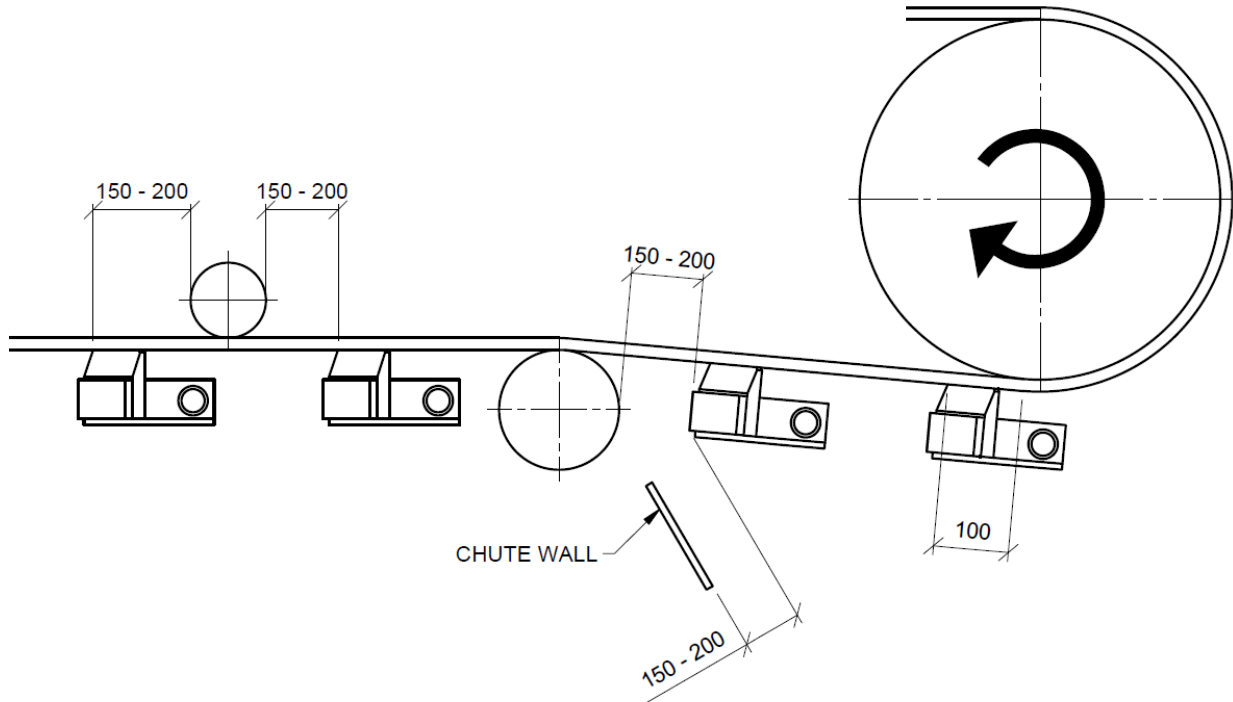
- Paint scraper / wire brush – for cleaning away material build-up.
- 19mm spanners (or a socket and a spanner) – for side assembly fasteners.
- U Belt Cleaner spring gauge.
- Anti-seize – recommended for coating on fasteners prior to installation.
- DENSO tape – recommended for covering exposed thread on the mounting bracket fasteners.

Note: the above tools & equipment are the recommended minimum. Additional tools (adjustable wrench, screw driver, etc.) may also be required.

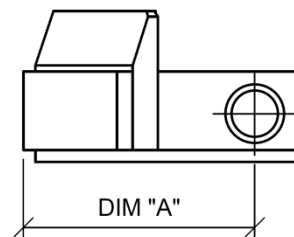
4 Mounting Location and Chute Modifications

4.1 Pole Position

The U Belt Cleaner can be positioned in many locations, and multiple cleaners can be positioned on a conveyor. The diagram below shows some typical installation positions.

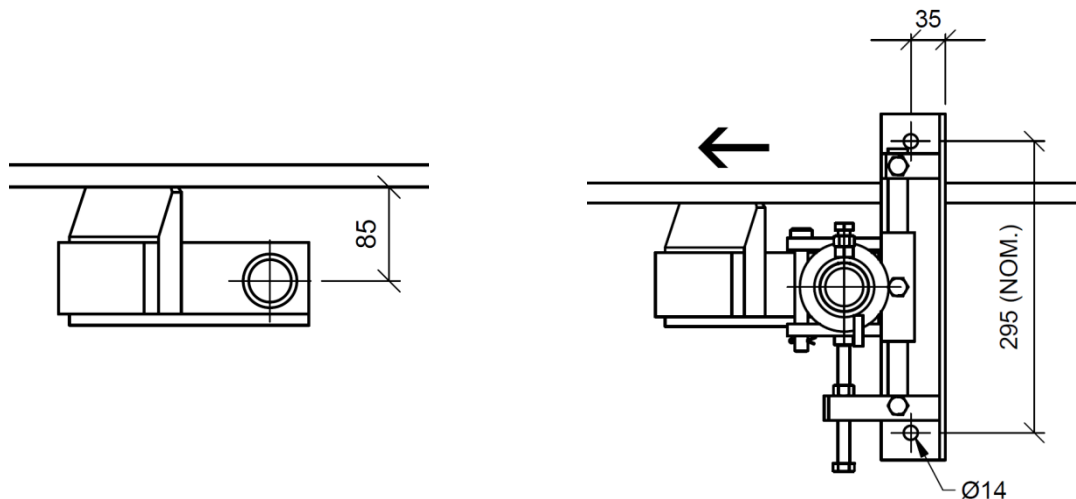


Belt Width	DIM "A"	Belt Width	DIM "A"
450mm	140mm	1500mm	242mm
600mm	166mm	1600mm	261mm
750mm	191mm	1800mm	261mm
900mm	171mm	2000mm	261mm
1050mm	217mm	2100mm	261mm
1200mm	242mm	2400mm	261mm
1400mm	242mm	3000mm	261mm



4.2 Mounting Bracket Position

For installation set-up purposes, the location of the pole is 85mm from the belt, as shown in the LH diagram below. The mounting brackets should be installed in a position so they are “leading” the pole, so the pole trails behind the bracket, as shown in the RH diagram below. If the belt line is on an incline or decline, the mounting bracket can still be installed vertically for ease of installation.



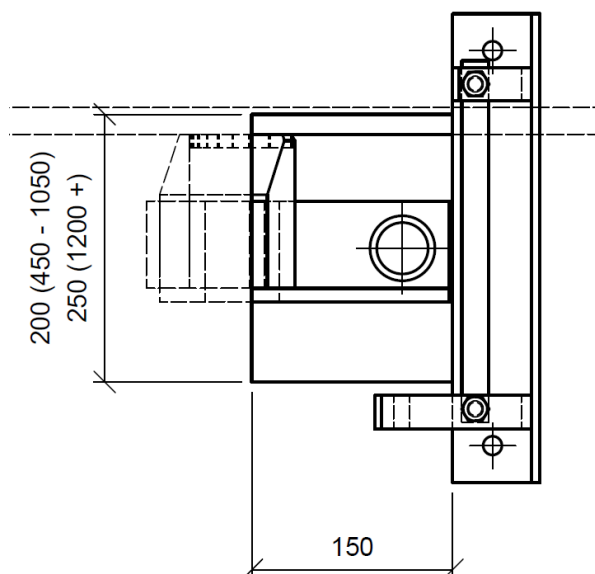
The mounting brackets for 48mm and 60mm poles have two $\text{Ø}14\text{mm}$ holes spaced at 295mm (nominal). These two holes allow the mounting bracket to be bolted to the chute wall or conveyor structure. The holes for mounting brackets for 76mm poles are spaced at 320mm (nominal).

Alternatively the mounting bracket can be welded to the chute wall or suitable structure.

4.3 Chute Wall Modification

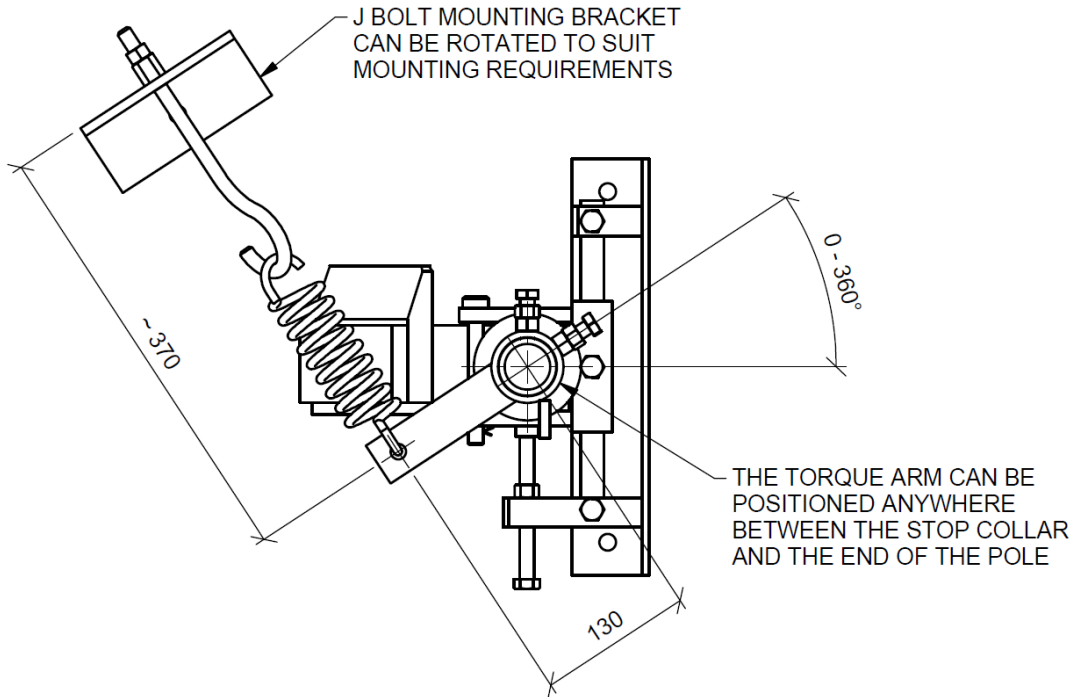
If the belt cleaner needs to be installed through the side of a chute wall, a hole must be cut into the chute wall to allow the belt cleaner to pass through.

The diagram below provides suggested dimensions for the rectangular hole that will enable the entire pole/blade assembly to pass through the chute wall. The hole needs to be 200mm deep for belt widths up to 1050mm and 250mm deep for belt widths 1200mm and above.



4.4 J Bolt Mounting Bracket Position

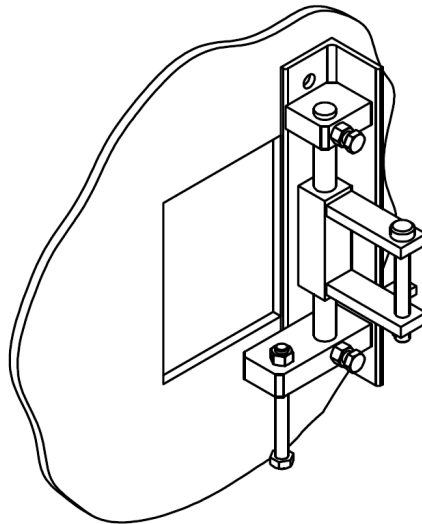
The J Bolt Mounting Bracket can be positioned at any position 360° around the pole. The only requirement is that the bracket is perpendicular to the spring and J bolt centreline. The adjacent diagram provides the main dimensions of the torque arm / spring / J bolt / J bolt mounting bracket assembly for reference.



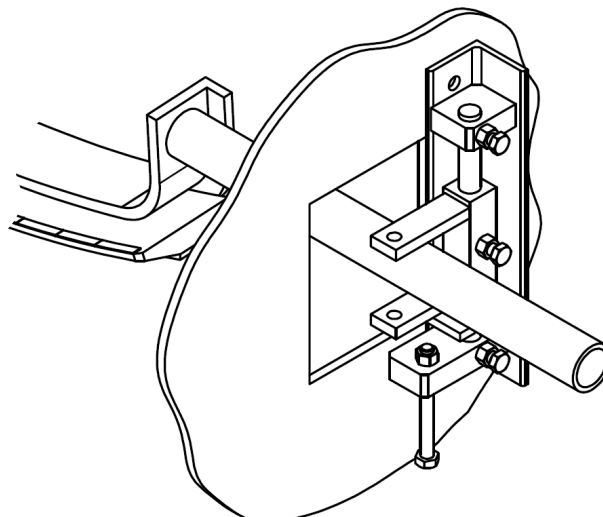
5 Installation

5.1 Installing the Pole/Blade assembly

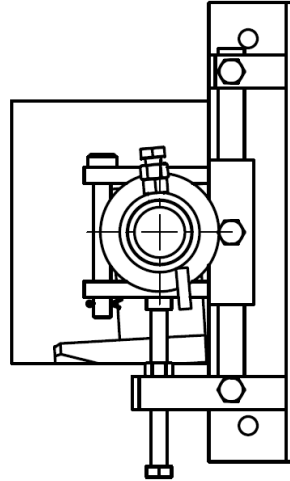
The following steps are required to install a U Belt Cleaner correctly. They are based on the J bolt mounting brackets already being installed, the mounting brackets already being securely fastened to the chute wall or suitable structure by either welded or bolted connection (this rest of this instruction is based on there being holes in the chute walls), with the nylon bushes removed, the adjuster bolts loosened and the bearing brackets pivoted out of the way, as shown in the diagram below. Note: The diagrams in this instruction are of a side assembly for a 48mm pole. The side assembly is the same for a 60mm pole, just the nylon bush is different. The side assembly for a 76mm pole has an adjuster bolt above the pole as well as the standard bolt below the pole. However the installation and setup principals are the same.



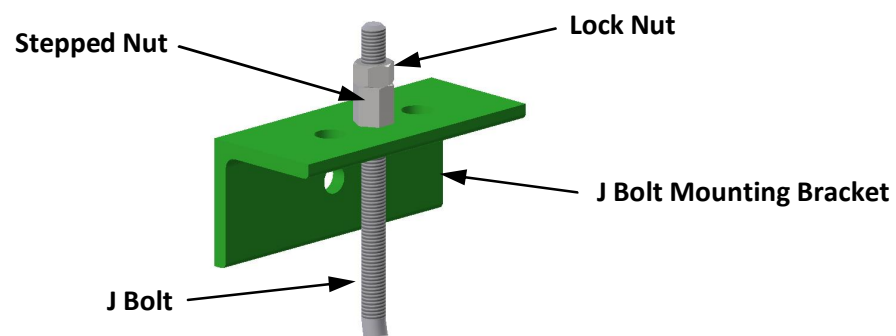
1. Coat all fasteners with anti-seize.
2. Feed the pole/blade assembly through the holes so the pole/blade assembly is resting on the bottom of the holes on each side of the chute.
3. On both mounting brackets, remove the bearing retaining pin, lift the pole and pivot the bearing bracket around so it surrounds the pole, as shown in the following diagram.



4. Reinstall the bearing retaining pin and secure it with the clip. Do up the adjuster bolts so the bearing bracket is resting on the top adjuster bolt. Install the nylon bearing.
5. Ensure the pole is central on the conveyor. Note that the belt may not be central.
6. Slide each stop collar onto the pole, ensuring it is around the right way – see diagram below.



7. Slide each torque arm onto the pole until it is in line with the hole in the J bolt mounting bracket and the arm is in line with the pole/blade assembly. Secure it on the pole using the lock bolts and lock nuts.
8. Connect a spring to each torque arm, and a J bolt to each spring, and feed the J bolt thread through one of the holes in the J bolt mounting bracket. Select the hole that provides the most perpendicular alignment between the J bolt and the torque arm, remembering that the angle may change slightly when tension is applied.
9. Install the stepped nut on each J bolt, and a lock nut on the top of stepped nut, as shown in the diagram below. At this stage the lock nut does not need to be tight.

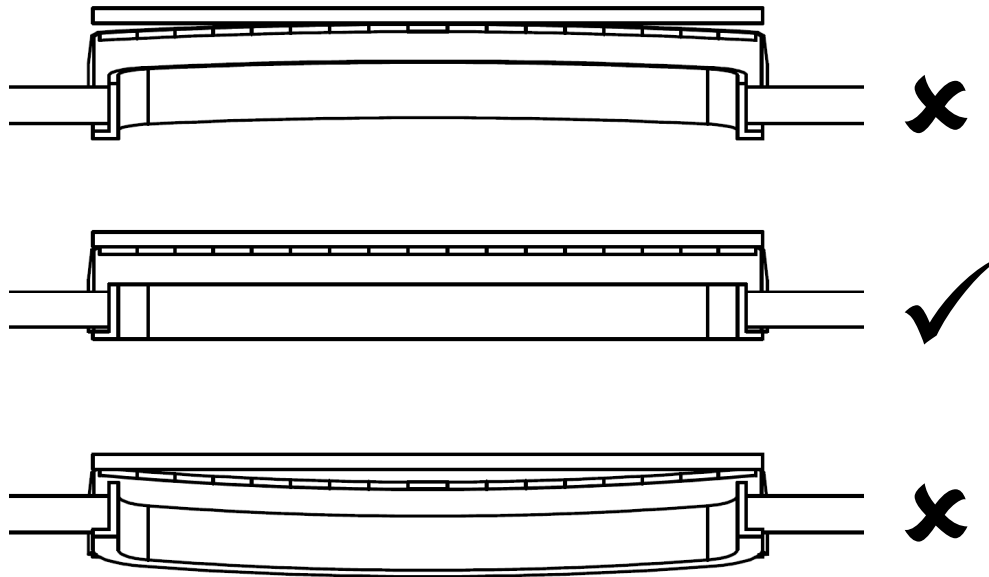


10. Take up tension on one of the J bolts so the blade just contacts the belt.
11. Now that the belt cleaner is loosely installed, the final set up can be done.

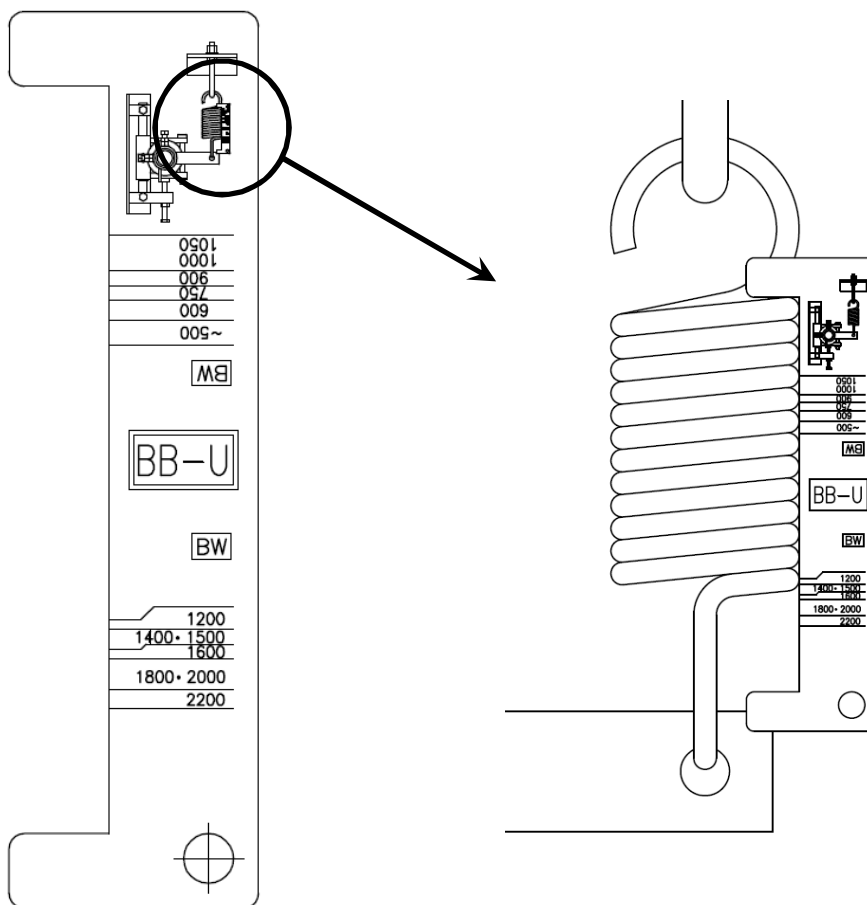
5.2 Set Up

1. Adjust both sides of the pole either up or down to ensure the blade is providing even contact across the belt, as shown in the following diagram. This is done by loosening the bearing bracket lock bolt and using the adjuster bolt to raise or lower the position of the pole.

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2. Once the correct position is achieved, both bearing bracket lock bolts and lock nuts can be tightened.
3. Apply blade tension to the belt by tightening the stepped nuts on the J bolt, until the spring has extended the appropriate length in relation to the belt width. The gauge is shown in the following diagram.



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U Belt Cleaner



4. Position the stop collar hard up against the nylon bush and position the stopper plate so there is a 5mm gap between it and the plate on the bottom of the bearing bracket. Fasten it in place with the stop collar lock bolt and lock nuts. Repeat the process for the other side.
5. Coat all exposed threads nuts and bolts with DENSO tape.
6. The U Belt Cleaner is now ready for operation.
7. Test run the conveyor and observe the belt cleaner for at least 10 minutes, running both empty and conveying material. If required, raise or lower the pole position and/or slightly increase or decrease blade tension if required. Note: this will be a trial and error process that can be influenced by numerous factors.

6 Operation

Once the belt cleaner has been installed and set up correctly, the only operational activities required are regular inspections. The frequency of inspections will depend upon a number of factors including the conveyor duty cycle and the material type. During conveyor operation only a Visual Inspection (looking) can be done. When the conveyor is isolated a Physical Inspection (touching) can be done – refer to Section 7.

6.1 Visual Inspections

Visual Inspections can be done while the conveyor is operating. The following steps are recommended to perform a Visual Inspection on an R Belt Cleaner.

1. Wash away any material build-up on the blade or pole.
2. Check for correct installation (see Section 5).
3. Check blade condition (see Section 7.2).
4. Estimate and record blade wear (see Section 7.2).
5. Check for any side assembly components.
6. Check for dirty strips on the belt, or signs of excess carryback.
7. Check pole for straightness.
8. Check side assembly fasteners are all tight.
9. Record all observations and estimates (eg. blade wear).

7 Maintenance

7.1 Physical Inspections

Physical Inspections can only be done when the conveyor is isolated. The following steps are recommended to perform a physical inspection on an U Belt Cleaner.

1. Follow all plant isolation procedures.
2. Wash away any material build-up on the blade or pole.
3. Confirm correct installation (see Section 5).
4. Check blade alignment (see Section 5.2, Step 1).
5. Check tip condition (see Section 7.2).
6. Measure tip wear (see Section 7.2). Replace the blade if required.
7. Check condition of side assembly components.
8. Check pole for straightness.
9. Check side assembly fasteners are all tight.
10. Record all observations and measurements (eg. blade wear, spring tension tension).

7.2 Evaluating Blade Condition & Wear

U blades comprise R tips comprise a series of steel plates with 10mm x 50mm tungsten element at the top, which are embedded in a vulcanised rubber body. During normal wear the thickness of the tungsten elements (usually in the centre of the blade) will gradually reduce from 10mm to zero. The blade wear is the amount of tungsten remaining at the most worn section of the blade. (e.g. if 3mm has been worn the blade wear is 7mm.)

Tungsten elements may also become chipped. There is no fixed rule on how much chipping is acceptable, rather it needs to be a judgement made based on factors including the condition of the belt, the risk of belt damage, etc.

7.3 Replacing Blades

In order to replace the blade it is usually necessary to remove the entire pole/blade assembly and extract the blade from the pole whilst it is lying on the walkway. Because of the material that has wedged between the blade and the pole, the blade usually needs to be levered out with some force.

The process for removing the pole/blade assembly is basically the reverse of the installation process. Marking the position of the bearing bracket will enable the pole/blade assembly to be reinstated in the correct position.