

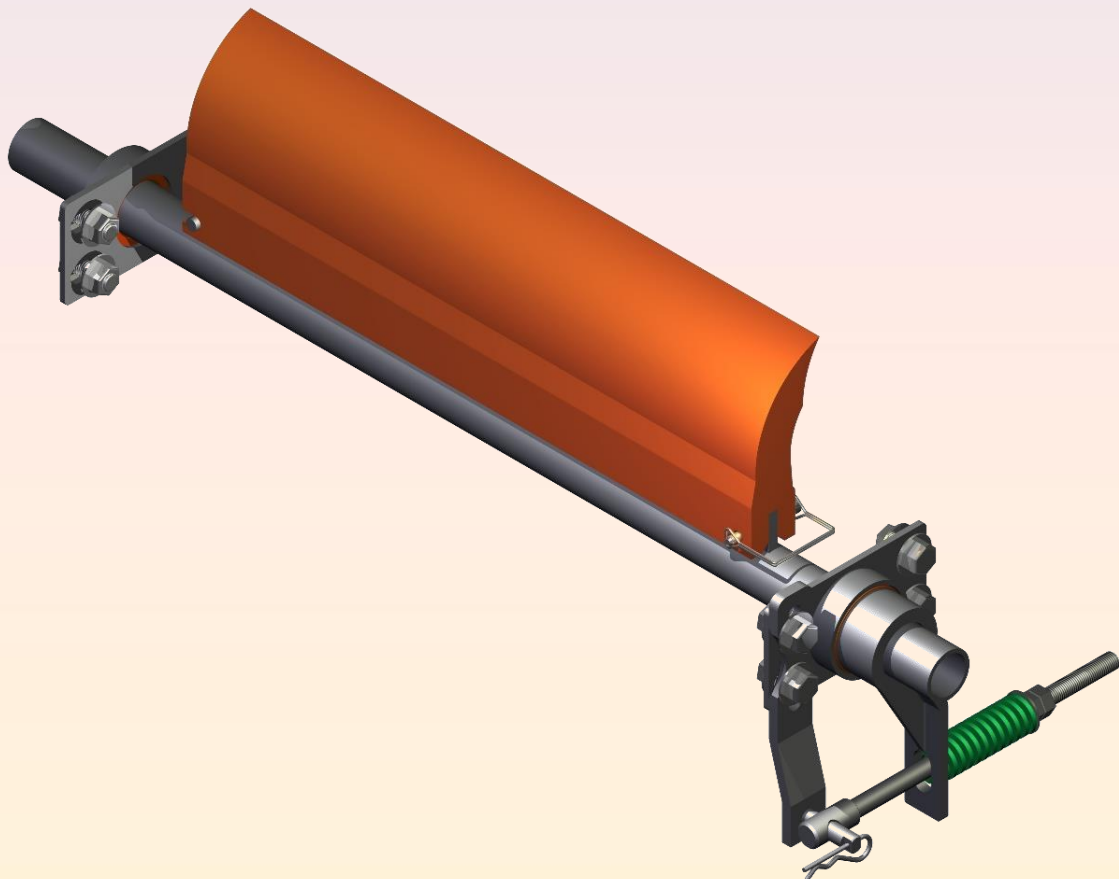


ENGINEERING SERVICES & SUPPLIES PTY LTD

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SPB (Single Piece Blade) Primary Cleaner

Installation, Operation & Maintenance Manual





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WARRANTY

ESS warrants the **SPB Primary Cleaner** to be free of defects both in materials and workmanship for a period of 12 months from the date of despatch of the product from the ESS factory. The warranty given by ESS in this regard will extend only to replacing or repairing product shown to be defective.

The warranty is also subject to the following restrictions:

- a) Installation of the product contrary to the instructions contained in the supplied manual will void such warranty absolutely;
- b) The warranty will not extend to any liability for injuries incurred and which result from the use of the product contrary to the instructions in the manual;
- c) Save as prescribed by law, ESS will not be liable for any damage sustained by a purchaser or a third party by way of consequential loss arising out of defects in the product.

You are asked to note that ESS offers purchasers a service whereby either:

It will install the product and certify the correctness of such installation, or

Certify the correctness or otherwise of the installation of the product by third parties.

This certification service is designed to ensure that you obtain the full benefit of the ESS warranty hereby provided. If you would like to take advantage of the installation certification service provided, please contact ESS regarding the service.

Refer to the Final Checklist at the back of this manual.

Visit the ESS website www.esseng.com.au to register your product warranty.

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1.0 SAFETY

All equipment installed on or around a conveyor belt must comply with AS 1755 – 2000 Conveyors – Safety requirements.

Ensure that only suitably qualified and trained personnel install and service this product, and that all site and statutory safety procedures are followed.

The **SPB Primary Cleaner** is designed to be quickly and easily serviced by appropriate personnel, however under no circumstances should any personnel attempt installation or service of this equipment whilst the conveyor belt is running.

The conveyor belt drive and any associated equipment must be shut down and locked out according to plant safety procedures before attempting work requiring access to or opening of the chute or conveyor enclosure. **Contact with a moving conveyor belt and its drive components can result in serious injury or death.**

The SPB mainframe and blade assembly can be heavy and can require installation in awkward positions. Ensure that adequate personnel are available to safely lift the cleaner during installation, or use appropriate lifting gear.

The cleaner may be inspected or the tension adjusted with the belt running as long as suitable visual access is available, but the service person should never reach into or enter the conveyor enclosure. No other service work is able to be carried out with the conveyor running. Shut down and lock out the conveyor for any work requiring any part of the body to enter the conveyor enclosure, or be exposed to moving components.

The following are some of the hazards that may be present when installing this equipment:

Table 1 - Hazard Checklist

	Hazard	Hazard
X	Moving Conveyor - ISOLATE	Other:
	Hot Work	Other:
	Working at Heights	Other:
	Heavy Lift	Other:
	Persons Working Overhead	Other:
	Persons Working Below	Other:
	Electrical & Cabling	Other:
	Pinch Points	Other:
	Trip Hazards	Other:

Once hazards have been identified, the installer should undertake and document a comprehensive Job Hazard Analysis (JHA) according to site requirements and good safe working practice. The installer must identify all hazards and apply appropriate controls before proceeding with the installation or servicing of this equipment.



1.1 SAFETY LABELS

Pictograph labels are used to show graphically where potential safety hazards exist around this product. These labels do not represent every possible hazard. They are not intended to be a substitute for safe work practices and good judgment. These labels and *ESS* technical manuals use specific words to identify the severity of the hazard. They are described below. Take time to read and understand the meaning of these words and symbols.



Danger labels call attention to imminently hazardous situations that will result in serious personal injury or death if not avoided. Injury from these hazards is immediate in nature and has a high probability of resulting in a serious or fatal accident if proper precautions are not followed.



Warning labels call attention to potentially hazardous situations that could result in serious personal injury or death if not avoided. Injury from these hazards is usually serious in nature, and a severe or fatal accident can occur if proper precautions are not followed.



Caution labels call attention to potentially hazardous situations that may result in minor or moderate personal injury if not avoided. Injury from these hazards is normally less serious than those from Danger or Warning hazards. However, there is still the potential for an accident resulting in serious injury if proper precautions are not followed.



2.0 INTRODUCTION

The SPB Primary Cleaner is normally mounted on the face of the conveyor head pulley and is designed to peel off the thick layer of loosely adhering material which often accounts for 80-90% of carryback.

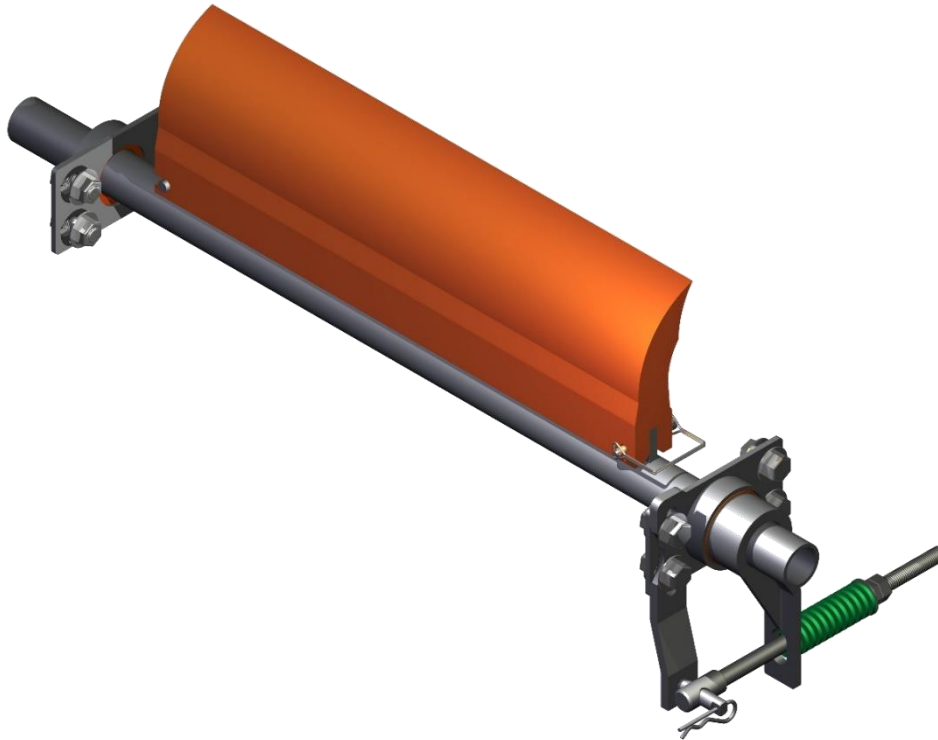


Figure 1 - Complete Single Tensioner Assembly

This primary cleaning system is generally used in conjunction with at least one secondary cleaner, such as the ESS Inline Premium Secondary Cleaner, often with a water spray system to further increase the removal of carryback. The one piece blade is made of cast urethane, with an aluminium extrusion insert for locating to the cleaner mainframe. The blade is secured to the mainframe with one fixed and one removable pin. Blade replacement is quick and easy.

Before Installation, the following points should be considered:

- The cleaner is directional - it will only clean a belt travelling in the design direction - however, the cleaner will not be damaged or affected by belt direction reversal.
- The cleaner is suitable for use on crowned head pulleys and damaged or grooved belts. The urethane blades quickly conform to the belt profile.
- For slow moving belts, the cleaner should be positioned lower on the head pulley to ensure the blades are clear of the main material flow.
- For belts greater than 1500mm wide a tensioner is required on both sides to ensure equal pressure across the cleaning face.
- For belts greater than 1800mm wide, or for certain heavy duty applications, a mainframe stiffener is required.



3.0 PREPARATION FOR INSTALLATION

1. Check installation drawings

Ensure that you have the correct drawings and equipment for your conveyor(s).

2. Pre-assemble the cleaner(s) and mounts

Do this in your workshop or similar free area, rather than at the conveyor. This will enable you to:

- ✓ Verify all required equipment is present.
- ✓ Familiarise yourself with the cleaner assembly.
- ✓ Plan the installation and reduce installation time.

3. Assemble the necessary tools & safety equipment required For the installation

4. Observe the conveyor while running and conveying material

- ✓ Observe the material trajectory.
- ✓ Observe the belt direction - does it reverse or roll back?
- ✓ Observe the belt splice condition.
- ✓ Does the belt run true, or track off to one side?
- ✓ Is the head pulley out-of-round?

Consult *ESS* if any UNUSUAL conditions are observed in the above. These conditions may result in recommendation of a different installation position or even a different cleaner.



4.0 INSTALLATION



CONVEYORS MUST BE SHUT DOWN AND LOCKED OUT BEFORE ANY INSTALLATION OR SERVICE WORK IS PERFORMED.



IF INSTALLATION IS TO BE DONE IN AN ENCLOSED AREA, TEST ATMOSPHERE FOR GAS LEVEL OR DUST CONTENT. FOLLOW ALL WELDING AND SAFETY GUIDELINES.

For original equipment installation, where cleaner cutouts and brackets have been fabricated into the chute during construction, ignore Steps 1 and 2.

For installation on enclosed head pulley chutework, draw all dimension lines on the chute wall. In applications where head pulley is not enclosed, custom designed brackets are necessary to ensure correct cleaner position.

Step 1 Locating mainframe's centreline

Measure 75mm radially from the face of the belt. From this point draw an arc using the pulley's centreline as the centre point. The centreline of the mainframe can be located anywhere along the radius as long as the blades do not lie in the material trajectory. The optimum position for the blade tips is between 0° and 15° below the horizontal centreline. If the pulley diameter is smaller than 450mm contact ESS for offset value.

Note

-Material trajectory is defined as the path of the material being discharged from the belt.

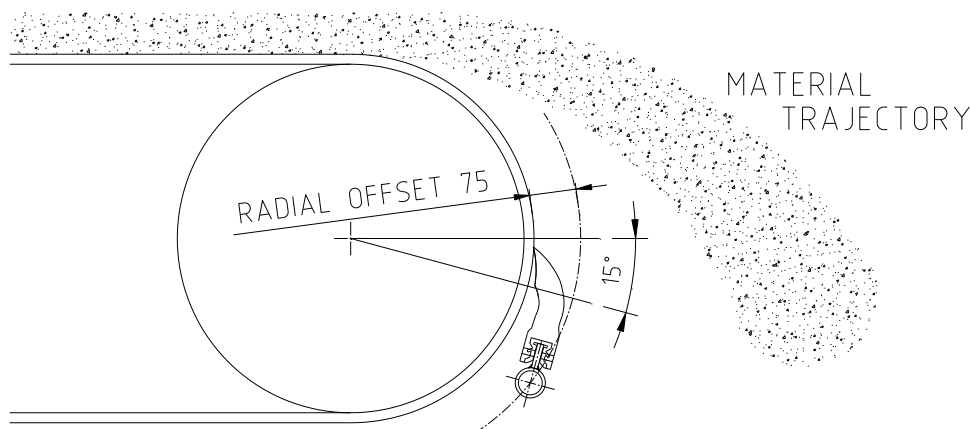


Figure 2 - Mainframe Setout Details

**Step 2 Verify mainframe position**

Position the mainframe assembly over the centreline marks. Verify that the mounts fit, and that adequate room is available to tension the cleaner. Position the access door frame to ensure it fits (where applicable). If the mounts or door frame interfere with structural members, it may be necessary to locate the cleaner elsewhere on the offset radius. In the case where only the tensioner interferes the tensioner can be rotated to several different mounting positions.

Step 3 Marking/cutting the mounting holes

At the nominated mainframe mounting position, mark out and cut the mainframe and mount fastener holes (if required) in each side of the chute. For further details, refer to the installation drawing at the back of this manual.

If an access door is to be installed, proceed as per the following section. While cutting the door hole, ensure that the marked centre lines of the cleaner are not totally removed as these will be required to position the mainframe.

Step 4 Insert the mainframe

The SPB Primary Cleaner Mainframe is a fabricated member comprising a length of DN40 steel pipe, with a steel flat bar for attachment of the blade. On wider belts, an additional flat bar stiffener is added.

Remove the blade from the mainframe. Do this by removing the lock pin, then sliding the blade clear of the fixed pin at the opposite end. The blade will then come free of the mainframe.

Insert the mainframe without the blade through the mount or door cutout in the operator side of the chute and continue until the far end of the mainframe passes through the far side mount cutout. Ensure that the removable pin end of the mainframe is toward the operator side of the chute. Be careful not to lose the lanyard and lock pin from the mainframe.

Step 5 Position the Mainframe

Slide the operator and far side mounts on to the mainframe ends, then clamp or loosely bolt the mounts to the chute walls. If a stand-off bracket is to be used over a Combi-Safe door, and the cutout has been made, fit the operator side mount to the appropriate stand-off bracket, and clamp or bolt the stand-off bracket in the desired position. Position the mainframe so that the blade mounting flat bar is centred on the belt.

Step 6 Check position of the mainframe

- Is the centreline of the mainframe positioned the correct distance from the belt face?



- Is the mainframe level, or equal to the pulley shaft?

Fit the blade to the mainframe by locating it on the flat bar, then sliding until the far end of the blade engages on the fixed pin. Fit the removable pin to the operator end of the blade / flat bar interface. Rotate the mainframe until the blade contacts the belt.

- Do the blade tips all touch the belt at the same time?

Note

Slight inconsistencies in belt thickness, and blade shape which cause small gaps between blade and belt that will quickly be taken up by blade flexure on tensioning.

- For crowned head pulleys, ensure that the outside blades on each side are an equal distance from the belt, whilst the centre blade is touching. Again, these gaps will quickly close on tensioning.

If any questions above have been answered “NO”, take appropriate action to correct the installation. If all questions are answered “YES”, proceed.

Step 7

Attach mounts, brackets and door frame

Weld or bolt the cleaner mounts, brackets and access door frame to the chute wall. If not already done, fit the tensioner assembly(ies) to the mount(s). Centre the blades on the belt. All ESS cleaners are designed to clean an area narrower than the actual belt width. This is to allow for a small amount of lateral movement of the belt and to protect the edge of the belt from possible damage. Loosen the lock screws on the bottom of the track and adjust the telescoping pipe ends to the required length. Firmly tighten the lock screws.

Lateral movement of the mainframe is prevented by the tensioner’s locking hubs, or a lock collar on the far side mount when only a single tensioner is used(i.e. on belt widths less than 1500mm). Lock these items in position, allowing about 1-2mm of end float in the cleaner mainframe.

Step 8

Install access door

If a Combi-Safe Door is used, refer to the next section of this manual.



4.1 MAINTENANCE PROCEDURES AND ADVANTAGES

Visual Inspection

The Combi-Safe door allows inspection access by simply lifting and removing the outer cover plate. At this stage the inner mesh cover prevents contact with moving parts inside the chute, but will allow the service technician to visually inspect the belt cleaner or any other object within the line of sight.



TO PROCEED BEYOND THIS LEVEL OF ACCESS, THE CONVEYOR BELT MUST BE SHUT DOWN AND LOCKED OUT. ENSURE THAT ALL SAFETY PROCEDURES ARE FOLLOWED BEFORE ACCESSING THE AREA INSIDE THE CONVEYOR ENCLOSURE.

Maintenance Access

Remove the lock or fasteners from the top of the inner cover and lift the cover off the door frame. The cleaner blades are now able to be removed through the opening in the frame. If using genuine *ESS* blades with Keysafe feature, the blades may be removed safely, one at a time and with little effort. The Combi Safe door has been designed specifically to allow use of the Keysafe tool with no interferences.



WHEN THE LOCKSCREWS ARE LOOSENEED, THE CLEANER MAINFRAME MAY SPIN. KEEP FINGERS CLEAR OF ANY PINCH POINTS.

WHEN WITHDRAWING THE TENSIONER, TAKE CARE THAT THE INDIVIDUAL PARTS OF THE TENSIONER ARE SUPPORTED. THE PARTS MAY RELAX / FALL WHEN COMING CLEAR AND COULD CAUSE IMPACT INJURY.

Lift the end of the cleaner mainframe and remove the lower seal. This will allow the mainframe to rest on the Combi-Safe frame at any time during withdrawal. Do not forget to re-fit the lower seal when re-installing the cleaner.

On completion of maintenance, re-fit the inner mesh cover and secure with the designated locking system. Set the tensioner(s) to the required setting and check the blade contact with the belt. Fit the outer cover, and remove locks or tags so that the conveyor can be returned to service.



5.0 TENSIONER SYSTEMS

ESS Primary Cleaners can be operated via a compression spring or pneumatic tensioning system.

5.1 SPRING TENSIONER

The **40 NB Spring Tensioner** is a simple, robust and reliable blade tensioning unit.



Figure 3 - Spring Tensioner Assembly

The Spring Tensioner can be assembled to tension in either the clockwise or anti-clockwise direction and has multiple mounting positions for each direction.

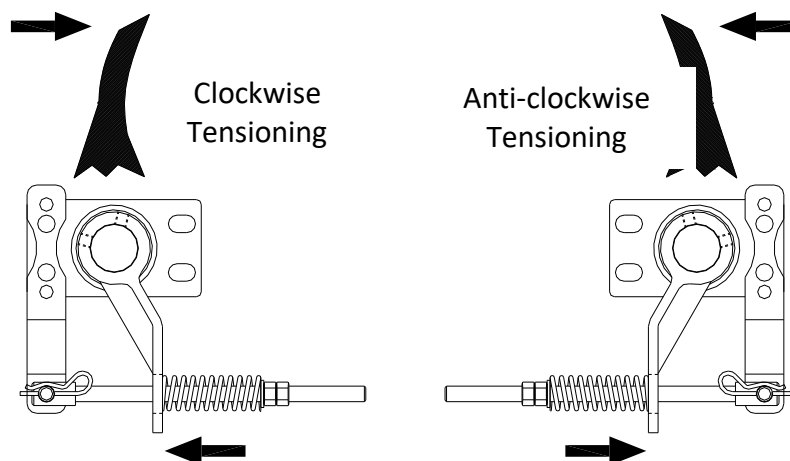


Figure 4 – Spring Tensioning Directions

The Spring Tensioner assembly is available in two variations:

- Part number 09010301s. Complete spring tensioner kit.
- Part number 09010310s. Spring tensioner kit without flex mount.

Adding an “S” as a suffix to the above part numbers denotes a stainless steel model. Both types are available as a set with the mounts included. Where a complete cleaner is ordered, it would normally be supplied with the Flex Mounts as the lower cost option.



5.1.1 SHOCK MOUNT SPRING TENSIONER INSTALLATION

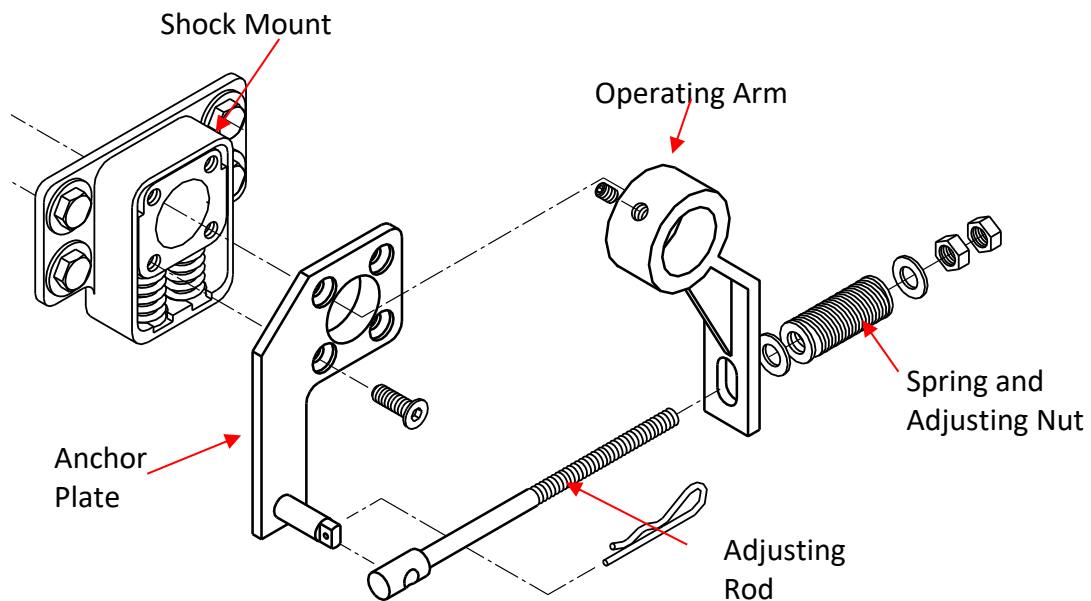


Figure 5 – Shock Mount Spring Tensioner Parts

Step 1 Fit anchor plate

Fit the anchor plate to the mount using the four countersunk head screws. Ensure that the plate is in the correct orientation for the desired tensioning direction. The anchor plate can be flipped over for the opposite direction, but the anchor pin must be removed and installed on the other side. The anchor plate and the tensioner assembly can also be rotated to four different angles through 360° to suit site restrictions.

Step 2 Fit operating arm

Slide the operating arm onto the cleaner mainframe, again ensuring that it is in the correct orientation for the desired tensioning direction.

Step 3 Fit adjusting rod

Insert the threaded end of the adjusting rod through the operating arm slot, with the clevis end toward the anchor plate. Fit the adjusting rod clevis onto the pivot plate pin and secure with clip provided.

Step 4 Fit spring and adjusting/lock nuts

Fit spring, nut and locknut to the threaded end of the adjusting rod. Only run the adjusting nut a few turns onto the adjusting rod. Do not try to adjust or compress the spring yet.

Step 5 Position components

Using a pipe wrench or similar, rotate the cleaner until the blade tips are lightly touching the belt. With the operating arm fully retracted against the spring, lock the operating arm onto the cleaner mainframe by tightening the



two lock screws. Ensure that the operating arm hub is 1-2mm clear of the mount to allow free rotation without excessive lateral movement of the mainframe.

Step 6 Adjust spring/nut

Whilst still supporting the cleaner with the pipe wrench, adjust the nut (not locknut) against the spring until the spring just begins to compress. Release the pipe wrench.

Step 7 Dual tensioners (where applicable)

For belts 1500mm and wider, tensioners are fitted to both sides. Repeat above procedure for other side. For cleaners with one tensioner only, fit the locking collar onto the far end of the cleaner mainframe, again locking it into position 1-2mm clear of the mount.



5.1.2 FLEX MOUNT SPRING TENSIONER INSTALLATION

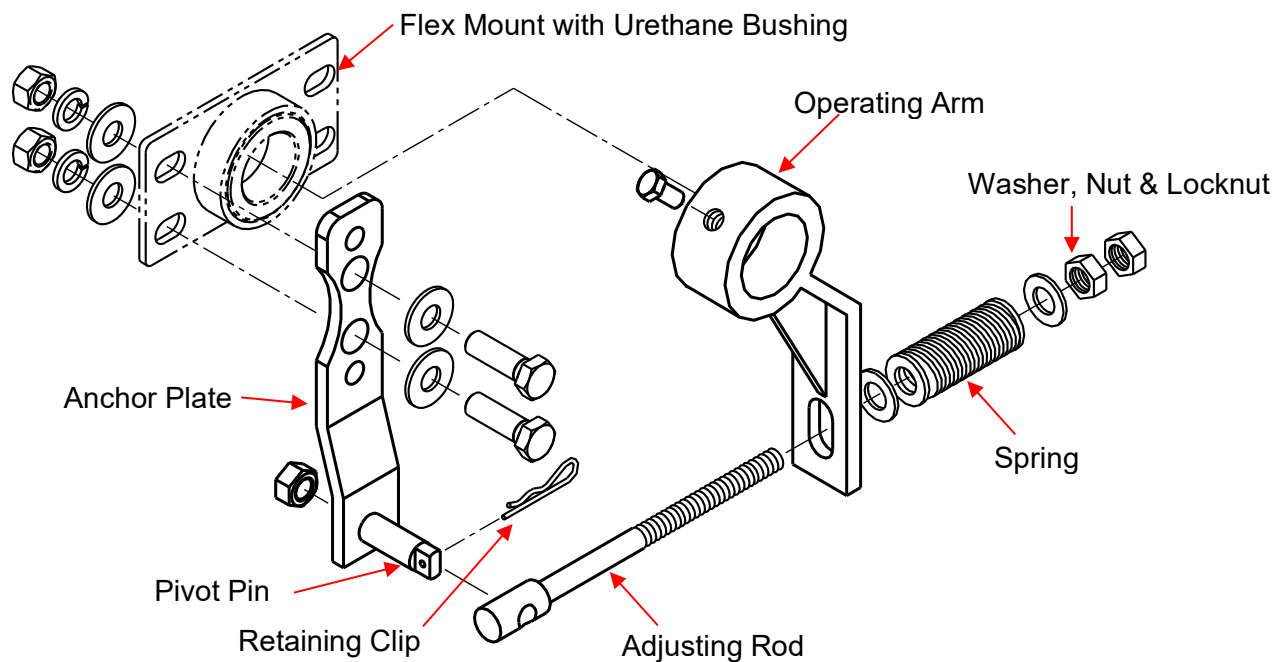


Figure 6 - Spring Tensioner Parts

Step 1 Fit anchor plate

Fit the Anchor Plate to the Flex Mount using two of the existing mount bolts. There are M16 bolt holes provided for the Primary Flex Mount and M12 bolt holes for the Secondary Flex Mount. Ensure that the plate is in the correct orientation for the desired tensioning direction. The Anchor Plate can be installed on the opposite side mount holes for tensioning in the opposite direction. The anchor plate and tensioner assembly can also be turned upwards to suit site restrictions.

Step 2 Fit operating arm

Slide the operating arm onto the cleaner mainframe, again ensuring that it is in the correct orientation for the desired tensioning direction.

Step 3 Fit adjusting rod

Insert the threaded end of the adjusting rod through the operating arm slot, with the clevis end toward the anchor plate. Fit the adjusting rod clevis onto the pivot plate pin and secure with clip provided.

Step 4 Fit spring and adjusting/lock nuts

Fit spring, nut and locknut to the threaded end of the adjusting rod. Only run the adjusting nut a few turns onto the adjusting rod. Do not try to adjust or compress the spring yet.



Step 5 Position components

Using a pipe wrench or similar, rotate the cleaner until the blade tips are lightly touching the belt. With the operating arm fully retracted against the spring, lock the operating arm onto the cleaner mainframe by tightening the two lock screws. Ensure that the operating arm hub is 1-2mm clear of the mount to allow free rotation without excessive lateral movement of the mainframe.

Step 6 Adjust spring/nut

Whilst still supporting the cleaner with the pipe wrench, adjust the nut (not locknut) against the spring until the spring just begins to compress. Release the pipe wrench.

Step 7 Dual tensioners (where applicable)

For belts 1500mm and wider, tensioners are fitted to both sides. Repeat above procedure for other side. For cleaners with one tensioner only, fit the locking collar onto the far end of the cleaner mainframe, again locking it into position 1-2mm clear of the mount.

5.1.3 SPRING TENSIONER ADJUSTMENT

Note

The Spring Tensioner is mounted externally to the conveyor chute, and as such is normally able to be adjusted with the conveyor in service. **Under no circumstances should any person reach into or enter a conveyor enclosure while the belt is running.** For any conveyor belt cleaner service, maintenance or adjustment that requires entry to the conveyor enclosure by any part of the body, first ensure that the conveyor is shut down and locked out to site safety procedures.



**CONTACT WITH MOVING CONVEYOR COMPONENTS CAN
RESULT IN SEVERE INJURY OR DEATH**

To adjust the Spring Tensioner:

1. Loosen the locknut away from the adjusting nut on the adjusting rod.
2. Turn the adjusting nut until the cleaner blades are pressed against the belt, and the spring begins to compress.
3. Continue until the spring is compressed to the height shown in the following table. Ensure that the correct height is used for the appropriate belt cleaner and belt width. If in doubt, contact ESS.
4. Once the correct spring compression is achieved, run the locknut up against the adjusting nut, and use two wrenches to tighten the nuts together.
5. For cleaners with dual tensioners, repeat this procedure on the opposite side.



Table 2 - Spring Tensioner Adjustment Values

Belt Width	Compressed Spring Length
mm	mm
450	96
600	95
750	94
900	92
1050	90
1200	89
1350	87
**1500	**85
**1600	**92
**1800	**90

** Cleaners for belts 1500mm and wider have dual tensioners. The settings shown are for each spring/tensioner.



5.2 AIR TENSIONER

The Air Tensioner is a robust tensioner capable of delivering very precise blade to belt contact force, whilst allowing the cleaner to respond and absorb belt or pulley irregularities.



Figure 7 - Air Tensioning Assembly

The Air Tensioner can be assembled to tension in either direction and can be rotated to several positions through 360° to overcome site restrictions. Ensure that the tensioner is assembled to operate in the desired direction before mounting onto the mainframe.

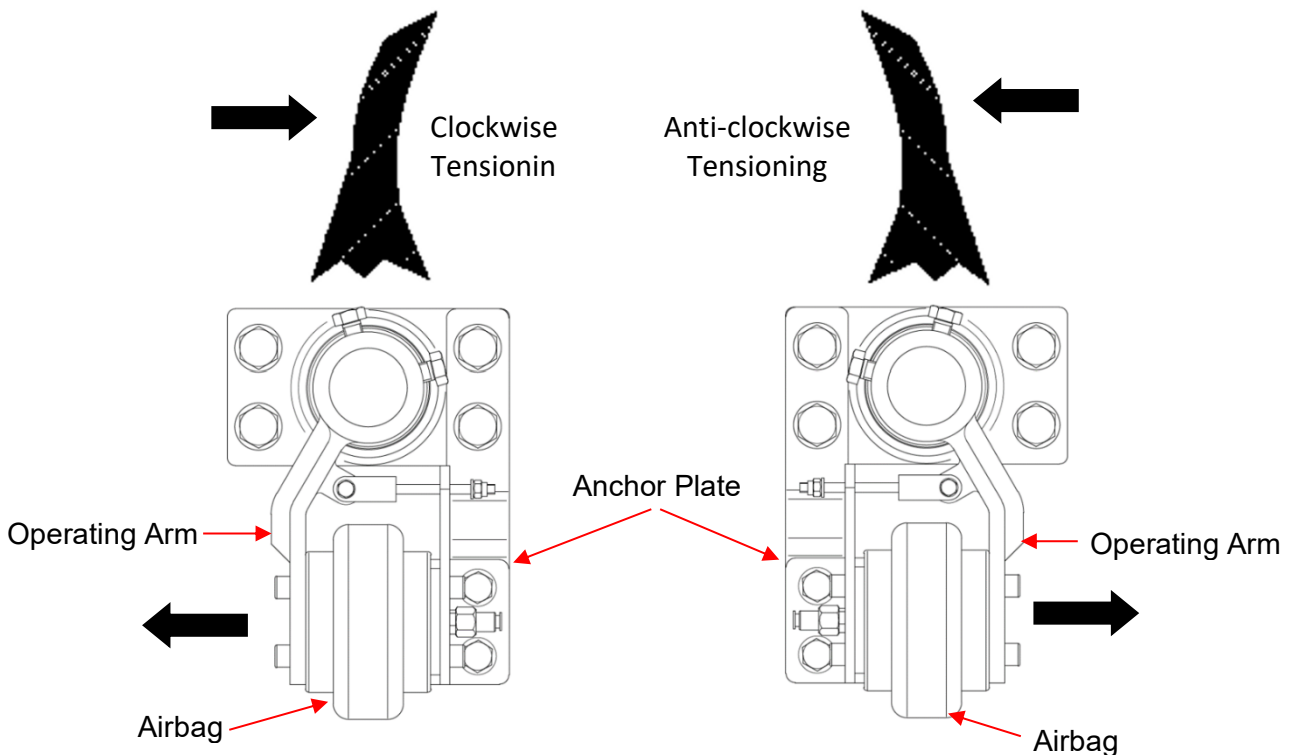




Figure 8 - Airbag Tensioning Directions

5.2.1 AIR TENSIONER INSTALLATION

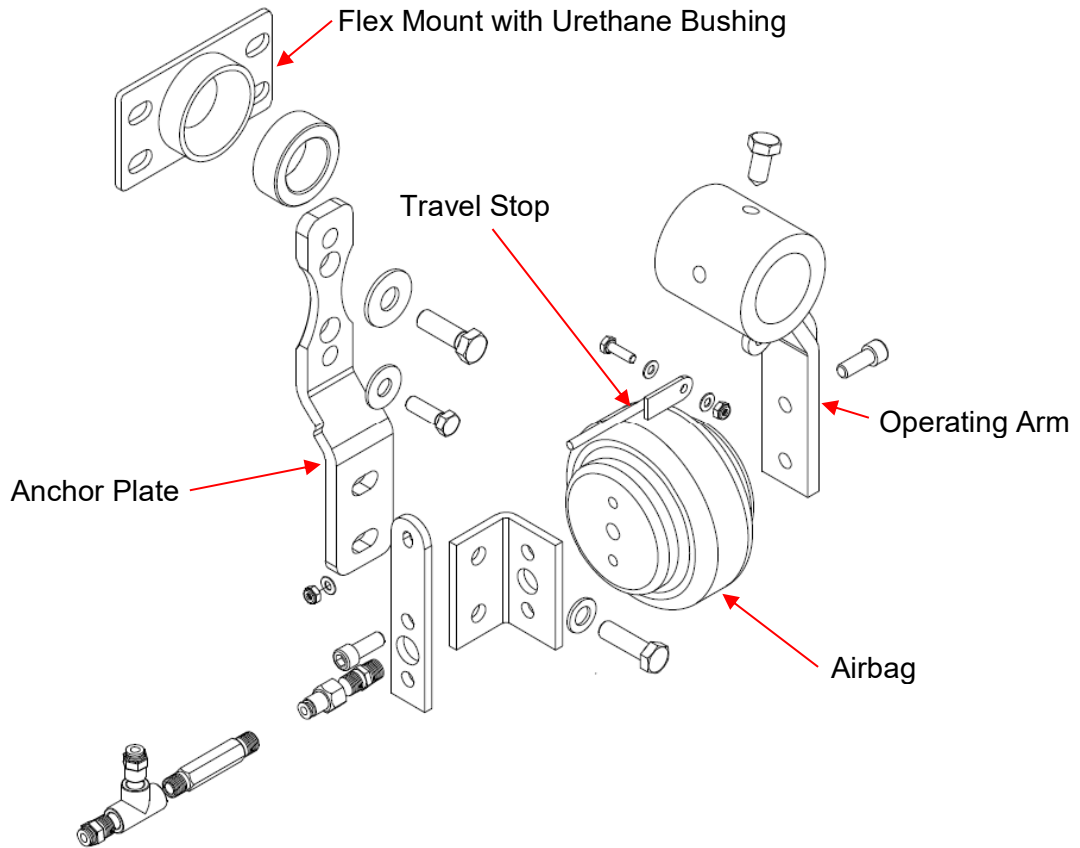


Figure 9 - Air Tensioner Parts

The Air Tensioner assembly is normally despatched from the factory fully assembled and may only require the installer to slide the assembly onto the mainframe and secure the Air Tensioner bracket to the Flex Mount using 2 hex head screws. Disassembly will only be required if the tensioner is set-up to tension in the wrong direction.

Step 1 Fit tensioner

Fit the air tensioner bracket to the Flex Mount using the 2 hex head screws.

Step 2 Attach airbag

Attach the airbag bracket to the air tensioner bracket. Bolt the blank end of the airbag to the operating arm. Slide the operating arm onto the mainframe with the airbag towards the airbag bracket side of the mount. Attach the open end of the airbag (this end has 3 tapped holes) to the airbag bracket.

Step 3 Position mainframe

No air supply fittings should be connected at this point. Using a pipe wrench or similar, rotate the cleaner mainframe until the blade tips lightly touch the



belt surface at the cleaning position. With the airbag fully compressed, secure the operating arm to the cleaner using the locking screws. Allow 1-2mm clearance between the operating arm and the Flex Mount to enable free rotation whilst minimising lateral movement.

Step 4 Dual tensioners (where applicable)

For cleaners on belts 1500mm or wider, repeat the above for the far side. For belts less than 1500mm, simply fit the lock collar onto the far side of the cleaner, again allowing 1-2mm lateral clearance.

Step 5 Connect air supply

The cleaner is now ready for attachment of the air supply system. Connect all air fittings using a high quality liquid compound or gas seal thread tape.

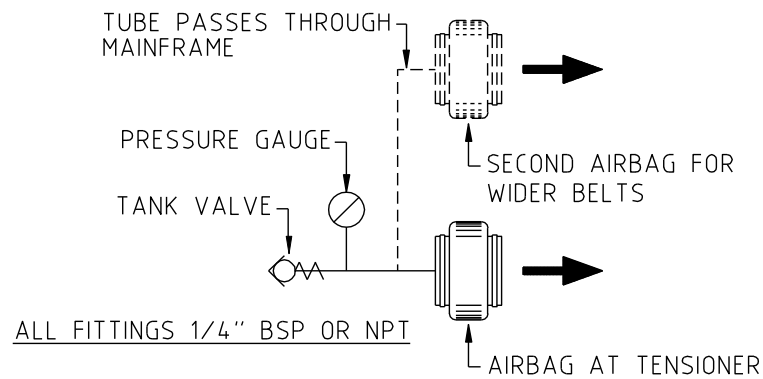


Figure 10 – Air System 1 – No Plant Air Available

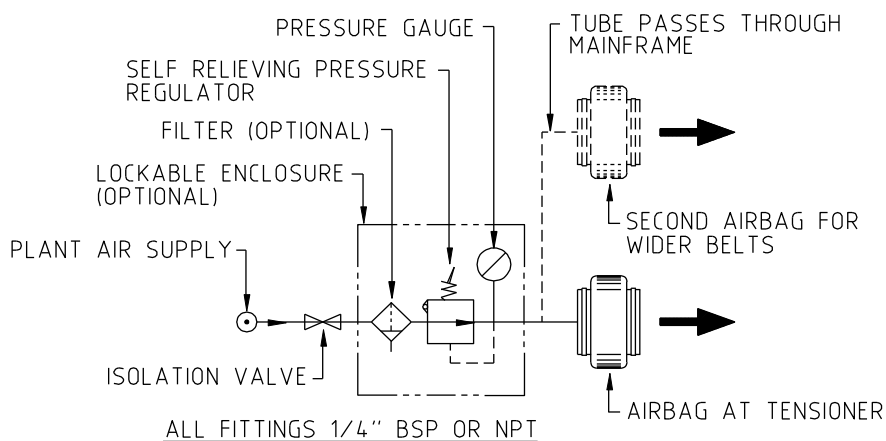


Figure 11 - Air System 2 - Plant Air Available

Step 6 Pressurize tensioner

Once all fittings are connected and secured, the air tensioner may be pressurised. Pressures are indicated in the following table.



5.2.2 AIR SUPPLY CONNECTION

The Air Tensioner Assembly is supplied with a ¼" BSP / 6mm push fit tube connector. This fitting is simply screwed into the air bag, and the 6mm air supply tube pushed into the fitting.

For cleaners with dual tensioners, additional fittings are supplied to allow the air supply to be connected to both air bags via a tee. The 6mm tube is passed through the cleaner mainframe to provide air to the far side airbag.

Connect all air fittings using a good quality liquid compound or gas seal thread tape.

5.2.3 AIR SUPPLY CONTROLS

ESS recommends the use of an ESS Air Tensioner Control Box to deliver the correct air pressure to the tensioner(s). A number of models are available. Refer to the ESS Air Tensioner Control Box manual for further installation and operation details.

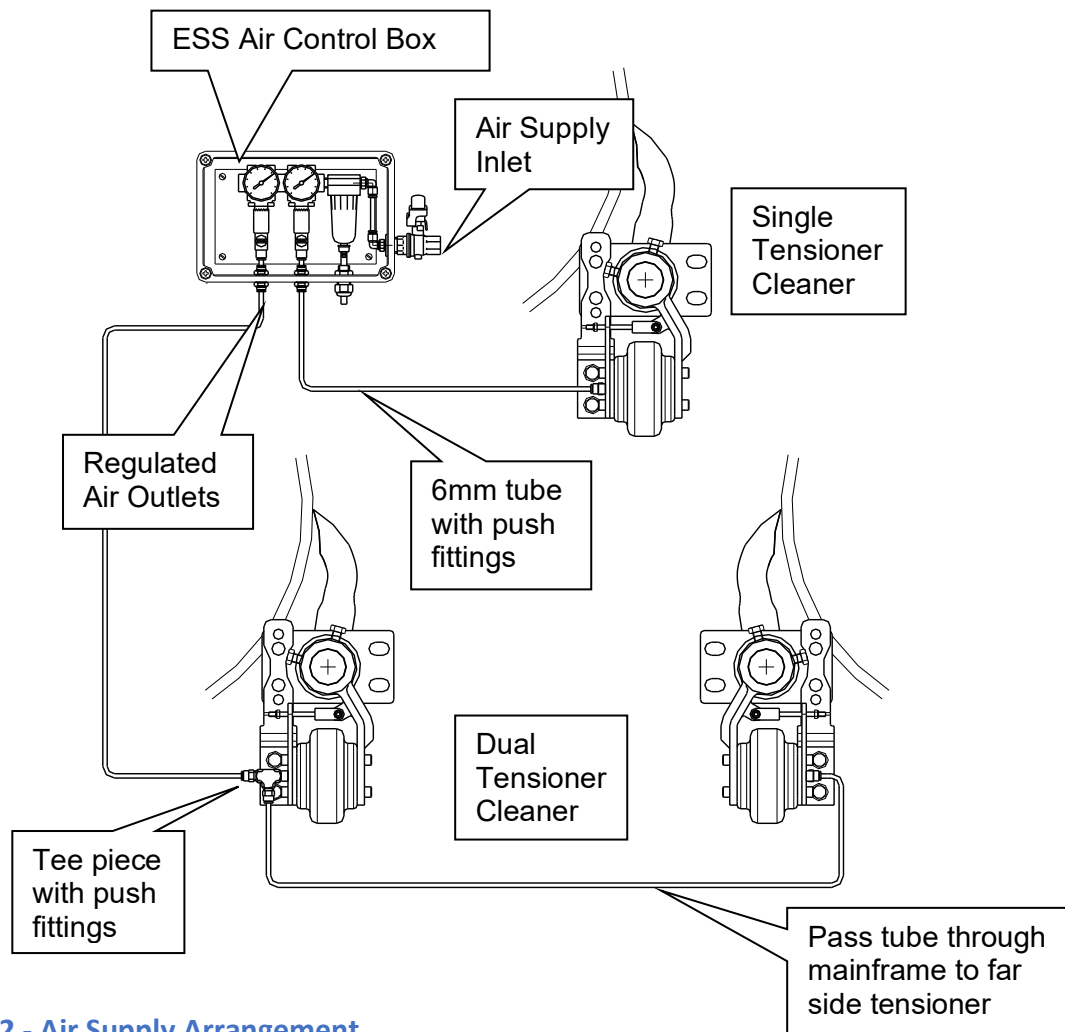


Figure 12 - Air Supply Arrangement



Table 3 - Control Box Part Numbers

Part Number	Description	Enclosure Material
09000123M	Air Ten Compact Control Box – 1 Cleaner	Plastic
09000124M	Air Ten Compact Control Box – 2 Cleaners	Plastic
09000125M	Air Ten Compact Control Box – 3 Cleaners	Plastic
09000126M	Air Ten Compact Control Box – 4 Cleaners	Plastic
09000115M	Air Ten Control Box – 1 Cleaner	Stainless Steel
09000116M	Air Ten Control Box – 2 Cleaners	Stainless Steel
09000117M	Air Ten Control Box – 3 Cleaners	Stainless Steel
09000118M	Air Ten Control Box – 4 Cleaners	Stainless Steel

5.2.4 AIR TENSIONER ADJUSTMENT

Once the fittings are connected and secured, the air tensioner may be pressurised. Pressures are indicated in the following table.

On completion, pressure check all fittings and connections using soapy water or equivalent to ensure no leaks are present. Rectify any leaks found – compressed air losses can account for substantial plant running costs.

Note

Use these inflation pressures as a rough guide only. Belt speed, material, number of cleaners on belt and acceptable blade wear should be taken into account when setting pressures. DO NOT EXCEED 275 kPa (40 psi).

IF YOU HAVE NEED OF ASSISTANCE, CONTACT YOUR LOCAL ESS OFFICE.

Table 4 - Airbag Tensioner Pressures

Belt Width	Pressure	
	KPa	PSI
mm		
450	34	5
600	48	7
750	55	8
900	69	10
1050	83	12
1200	83	12
1350	90	13
**1500	**55	**8
**1600	**55	**9
**1800	**62	**10

**Dual tensioners fitted - pressure per tensioner given (Generally connected by balance tube).



6.0 COMMISSIONING

Step 1 **Back the cleaner away from the belt**

Double check the items in previous sections, Safety, Preparation and Installation.

Step 2 **Is the belt empty?**

Make sure there are no foreign objects such as tools or clean-up debris left on the belt as they may damage the belt cleaners or clog up the conveyor systems.

Step 3 **Place conveyed product on the belt**

Place some material on the belt before starting up system. This helps to quickly “wear in” the blade and reduce the initial friction between the belt and the blade. Handfuls of conveyed material spaced along the belt will do. The belt may also be moistened with water.

Step 4 **Start the conveyor**

Follow the established safety rules.

Step 5 **Adjust Primary Cleaner evenly onto the belt**

Adjust the cleaner so that the blade is touching the belt with even pressure - DO NOT OVER-ADJUST. The blade should be in contact and flexing back and forth with the irregularities of the belt surface. The blade is designed to lightly ride on the surface of the belt and remove a large percentage of the carryback. Excessive pressure unnecessarily reduces the life of the blade without any increase in cleaner efficiency.

Step 6 **Observe the cleaning action**

Using a light, observe the belt and the action of the cleaner. Place material on the belt. Run for 5 minutes to get a good idea of the action and the effect of the splices on the belt cleaner.

Step 7 **Demonstrate the system to the operating supervisors and crew**

Call the supervisors responsible for maintenance and operation to the site. Make a short run of the system, putting material on the belt. Show the operator how to adjust and operate the system.

Step 8 **Secure the system for production**

Follow plant procedure to secure the conveyor for actual production.



7.0 OPERATOR TRAINING

The decision to purchase *ESS* cleaning equipment has put within easy reach the reality of a clean plant. The last step is the correct training of personnel to maintain and service the equipment or employ *ESS* on a contract basis to maintain the cleaners so that they remain at optimum efficiency.

The benefits of efficient cleaners outweigh the cost of maintaining the cleaners many times.

If you wish to have your cleaning system maintained on a regular contract basis, contact *ESS*. If not, train your own personnel as follows:

1. **Ensure that personnel working around conveyors are thoroughly trained to recognise existing and potential hazards involved, and that a Job Safety Analysis is conducted to identify and control those hazards.**
2. **Ensure personnel are trained in correct equipment isolation and lock-out procedures.**
3. **Ensure that personnel have all required safety equipment and are thoroughly trained in the use of that equipment.**
4. **Ensure that all appropriate permits are in place, and that personnel involved are qualified to undertake the required work.**
5. Provide the trainee with a copy of this manual and ensure that they read and understand the contents.
6. Provide the trainee with all relevant conveyor data, such as belt speed, width and material handled, and ensure that they understand the required belt cleaner settings and adjustments that pertain to the conveyor.
7. Instruct the trainee to look for problems existing or developing in the belt cleaning system, such as increasing carryback, irregular or excessive blade wear, blade vibration and the like. Encourage them to **safely** observe and try to determine the cause of the problem.
8. Ensure that the trainee is given hands-on instruction in maintenance procedures during down-time, in the company of an experienced service technician.
9. Ensure that the trainee is provided additional support and instruction at regular future intervals to ensure that all information has been understood and retained.
10. Encourage the trainee to look for and report other problems developing on the conveyor system such as excessive belt tracking, belt damage, seized idlers, missing bolts and the like.



8.0 MAINTENANCE

Regular inspection and servicing is the key to effective conveyor belt cleaning. It is recommended that the cleaner be inspected once per week. Actual service intervals will vary considerably from plant to plant.



DO NOT REACH INSIDE THE CONVEYOR CHUTE UNDER ANY CIRCUMSTANCES WHILST THE CONVEYOR IS RUNNING

8.1 INSPECTION & TENSIONING

Step 1 Inspect the condition of the cleaner

Open the inspection door (if fitted) and observe the condition and action of the blades and cleaner.

Step 2 Clean blades and mainframe

If necessary (and if plant rules allow it), hose any material build-up from the blades or mainframe - DO NOT REACH INTO THE CHUTE WHILST CONVEYOR IS RUNNING.

Step 3 Re-tension

If necessary, re-tension the cleaner - refer to Section 5.

8.2 BLADE SERVICING

Step 1 Shut down and lock out the conveyor. Never try to replace the blade on an SPB Primary Cleaner with the conveyor running. Severe injury or death can result from contact with a moving conveyor belt.

Step 2 Release the tension and back blades away from the belt. For the Spring Tensioner, release the adjusting nut. For the Air Tensioner, close the isolation valve for the cleaner in the air control box.

Step 3 Remove the Combi-Safe screen to access the cleaner. Remove the cleaner blade by removing the lock pin and withdrawing the blade from the mainframe.

Step 4 Clean and inspect the blade – if worn excessively or otherwise damaged, replace with new blade.

Step 5 Install (new) blade onto cleaner, followed by lock pin. If the tensioner setting prevents the new blade from fitting to the belt, reset the tensioner.



- Step 6** Re-tension cleaner onto the belt as previously described in Section 5.
- Step 7** Remove all tools or debris from belt. Replace all access screens and guards.
- Step 8** Remove locks or tags and restart belt. Observe cleaner action and blade effectiveness. Replace Combi-Safe Door if installed. Clean up work area.



9.0 TROUBLE SHOOTING

PROBLEM	CAUSE	SOLUTION
Blades fold through on start-up	Incorrect angle of attack / installation dimensions	Relocate mounts so that the shaft is the correct radial distance from the belt face on the head pulley
	Excessive tension	Relax blade tension to maximum tension recommended in installation instructions
	Belt running dry	Always place material on the belt for start-up or a little water if material is unavailable
	Poor belt condition	Repair belt, dress splices to smooth contour
	New belt with sticky surface	Fit low friction blades – contact ESS for assistance.
Mounts do not fit	Structural members in the way	Relocate the cleaner elsewhere on the offset radial. Consult ESS if unsure. Modify structural members only as a last resort, and only with plant engineer approval
	Obstructions prevent mounting to chute wall	Provide gussets or spacers to secure mounts away from obstructions
Mainframe bent	Mainframe undersized	Stiffened mainframe required. Contact ESS for assistance
	Excessive tension	Relax blade tension to maximum tension recommended in installation instructions
	Blades folded through	See above
	Material build-up between blades/ mainframe and belt	Increase frequency of inspection and service once a week
	Normal deflection	A small amount of deflection is considered normal. Contact ESS if excessive deflection occurs
Poor blade life	Cleaner over-tensioned	Tension cleaner enough to clean the belt only
	Incorrect blade material	Contact ESS for re-appraisal
Insufficient cleaning (excessive carryback)	Cleaner under-tensioned	Re-tension cleaner
	Build-up on blade	Rap blades against belt. Increase service frequency
	Cleaner overloaded	Add additional secondary cleaner
	Secondary cleaner not functioning correctly	Service the secondary cleaner



F0492 C/W FLEX MOUNT & AIR TENSIONER

NOTES

- THE OPTIMUM INSTALLATION OF THE SPB PRIMARY CLEANER IS WITH ITS TIP BETWEEN 0° & 15° BELOW THE HORIZONTAL & OF THE HEAD PULLEY. MAINTAIN THE 75mm RADIAL OFFSET DIMENSION AND ENSURE THE CLEANER IS CLEAR OF MATERIAL FLOW.
- FOR HEAD PULLEYS SMALLER THAN Ø450, THE RADIAL OFFSET WILL BE INCREASED. CONTACT ESS FOR DETAILS.
- OPTIONAL ESS STAND-OFF BRACKET AND CYA912 ACCESS DOOR ALLOW FOR EASY INSPECTION AND BLADE REPLACEMENT ON ENCLOSED HEAD CHUTES.
- FOR BELTS UP TO 1500mm WIDE, THE FAR SIDE MOUNT IS COUPLED WITH A SIMPLE LOCK COLLAR TO PREVENT AXIAL MOVEMENT.
- BELTS 1500mm AND WIDER REQUIRE TENSIONERS ON BOTH SIDES.

AIRBAG NOTES

- WHERE DUAL AIR TENSIONERS ARE USED (1500 BELTS AND WIDER) A BALANCE TUBE PASSED THROUGH THE PIPE FRAME JOINS THE AIRBAGS TO ALLOW INFLATION FROM ONE POINT AND ENSURE EQUAL PRESSURE.
- OPTIONAL CONTROL BOX CAN BE SUPPLIED.

DO NOT SCALE. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED. REMOVE ALL BURRS AND SHARP CORNERS

MAX. FRAME LENGTH
BELT WIDTH
FAR SIDE
3 NOM. CLEAR
FLEX MOUNT
LOCK COLLAR (SEE NOTE 4)
ONE PIECE POLYURETHANE BLADE
OPERATOR SIDE
REMOVABLE LOCK PIN WITH LANYARD
BLADE COVER
STIFFENER IF REQ'D

SECTION A-A
CHUTE CUTOUT DETAIL FOR ENCLOSED CHUTES AND WHERE A CYA DOOR IS NOT USED
*CUT OUT IF STIFFENER IS REQUIRED

VIEW ON ARROW 'A'

BELT WIDTH	450	500	600	750	900	1050	1200	1350	1500	1800
BLADE COVER	350	400	500	650	800	950	1100	1250	1400	1700
FRAME LENGTH	1250	1250	1400	1600	1800	1800	1950	2100	2300	2450
STIFFENER LENGTH	-	-	-	-	-	-	-	1375	1600	1750

PART NUMBER: 33303xxx
SUBSTITUTE xxx WITH BELT WIDTH MEASURED IN cm.
ADD A SUFFIX 'S' IF REQUIRED IN STAINLESS STEEL

CLIENT:	ESS				
LOCATION:	QLD				
ESS CAD					
REV	DESCRIPTION	BY	CHKD	APP'D	DATE
D	WAS PV-36108	KD	JF	MH	ZJL/R
C	NAME CHGD WAS PVT VIPER	TT	GG	CW	TRW/S
B	WAS SHOCK MOUNT ISSUED	SD	RED	RED	33/S
A		RED	KR	RED	BA/S
REV	REVISIONS	REF	DOCS		

ESS ENGINEERING SERVICES & SUPPLIES
CUSTOMER SERVICE No. 1800 074446

TITLE:
SPB PRIMARY CLEANER
C/W FLEX MOUNT & AIR TENSIONER
INSTALLATION ARRANGEMENT

DRAWN BY: RED
SCALE: NTS
DATE: 17.6.14

CHKD:SD
APPD:RED
DRAWING No. F0492
REV. D

JOB No. ART 3984
ESS CAD
ESS



11.0 SPARE PARTS

11.1 SPRING TENSIONER VERSION

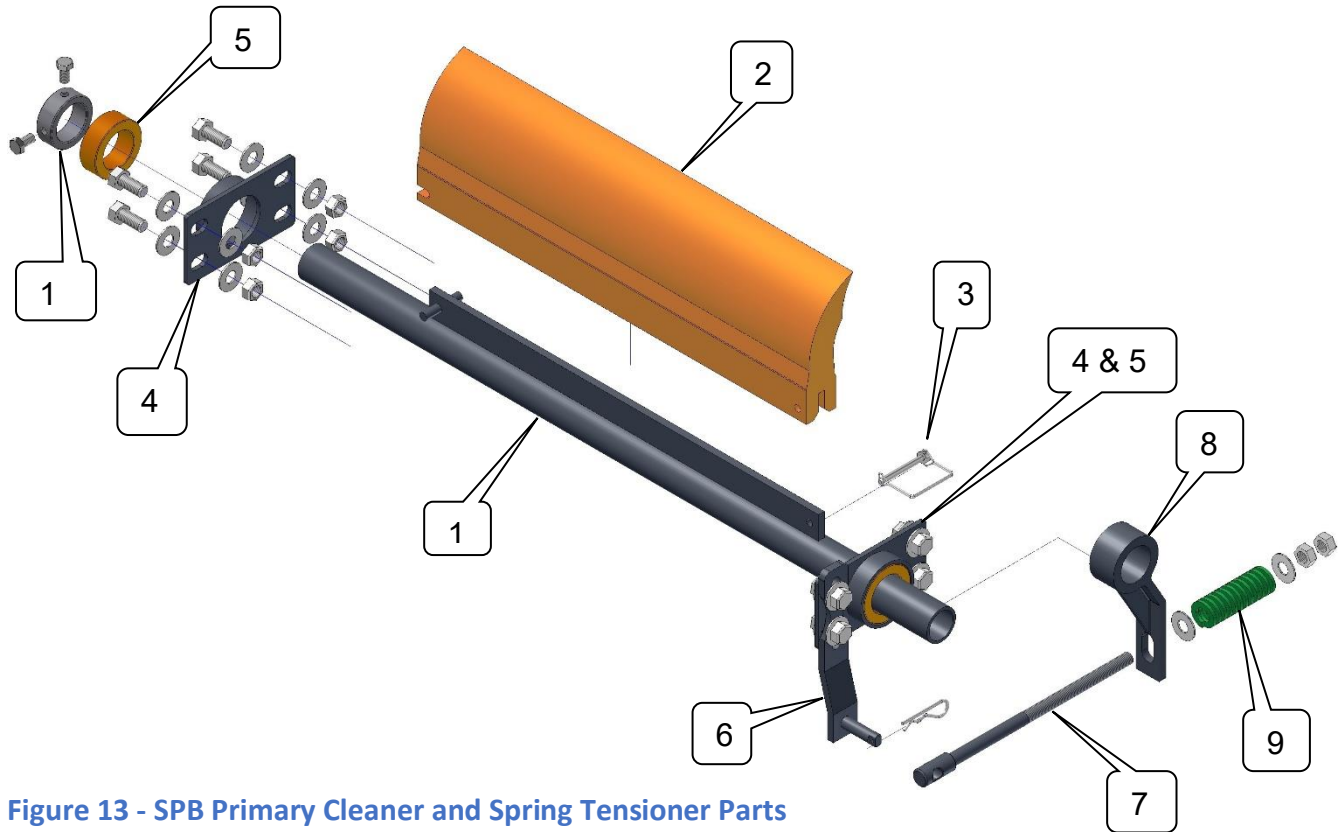


Figure 13 - SPB Primary Cleaner and Spring Tensioner Parts

Table 5 - SPB Primary Cleaner and Spring Tensioner Part List

Item	Description	No. Req'd	Part Number
1	SPB Mainframe	1	15330XXX
2	SPB Blade Orange	1	33900XXX
3	SPB Blade Retaining Lock Pin	1	33900001
4	Flex Mount c/w fasteners	2	09010057
5	Flex Bush	2	09010055
6	Spring Tensioner Anchor Plate	1 (2)	09010334
7	Spring Tensioner Adjusting Rod c/w Nuts	1 (2)	09010331
8	Spring Tensioner Operating Arm c/w screws	1 (2)	09010330
9	Spring Tensioner Spring	1 (2)	09010335
10	Lock Collar	1 (0)	09010041

Notes

- Items 1 and 2 – Part Number XXX denotes belt width in cm. Example: for 750 belt, use 075.
- Items 1,4,6,7,8,10. Add "S" suffix to part number for stainless steel.
- Item 5 is available in a number of materials – contact ESS for further details.
- Cleaners for belts over 1500 wide use dual tensioners. Items 3-10 show quantities for dual tensioners in brackets.



11.2 OPTIONAL AIR TENSIONER

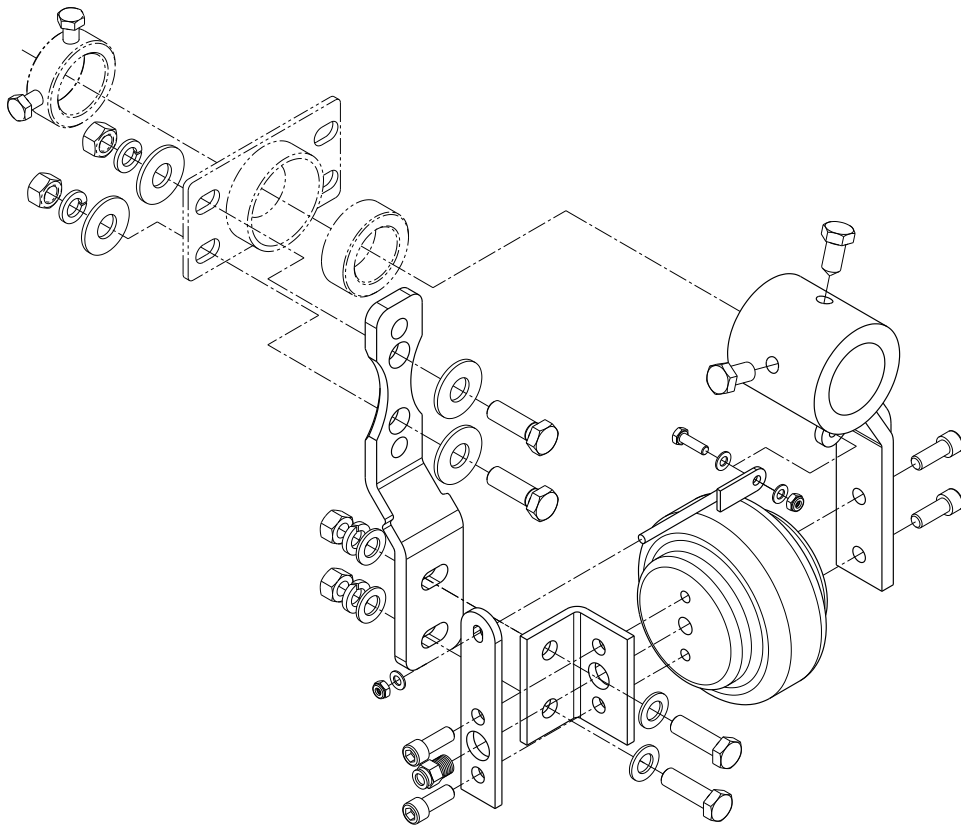


Figure 14 - Air Tensioner Parts

Table 6 - SPB Primary Cleaner Air Tensioner Part List

Item	Description	No. Req'd	Part Number
1	Flex Mount c/w Fasteners	2	09010057
2	Flex Bush	2	09010066
3	Air Tensioner Bracket	1 (2)	09010134
4	Lock Collar	1 (0)	09010041
5	Operating Arm c/w Screws	1 (2)	09010133
6	Travel Stop Rod c/w Fasteners	1 (2)	09010136
7	Air Bag Bracket	1 (2)	09010131
8	Stop Bracket	1 (2)	09010135
9	Air Bag Goodyear 1B5-510	1 (2)	09000131
10	Screw 3/8" UNF x 1" Socket Head Cap	4 (8)	02316276

Notes

1. Items 1,3,4,5,6,7,8,10. Add "S" suffix to part number for stainless steel.
2. Item 2 is available in a number of materials – contact ESS for further details.
3. Cleaners for belts over 1500 wide use dual tensioners. Items 3-10 show quantities for dual tensioners in brackets.



12.0 FINAL CHECKLIST

Site: _____ Number: _____ Date: _____

Site Equipment No./Location: _____ Site Contact: _____

Completed By: _____ (Circle Yes or No Below)

1. Was equipment to ESS Specification? _____ Yes/No

Drawing No. Ref: _____ Attached? Yes/No

If No, WHY _____

Will this affect performance? Yes/No

If Yes, WHY _____

2. Was this a standard service inspection installation? Yes/No

If No, WHY _____

3. Was work carried out as per procedure and JSA? Yes/No

If No, WHY _____

4. Is equipment fit for commissioning? Yes/No

If No, WHY _____

5. Was a final inspection carried out while plant was running? Yes/No

If No, WHY _____

6. Has anything changed from previous service / inspection / installation? Yes/No

If Yes, WHAT _____

7. Is equipment performance to Client expectations? Yes/No

If No, WHY _____

ESS Signature: _____ Client Signature: _____

