

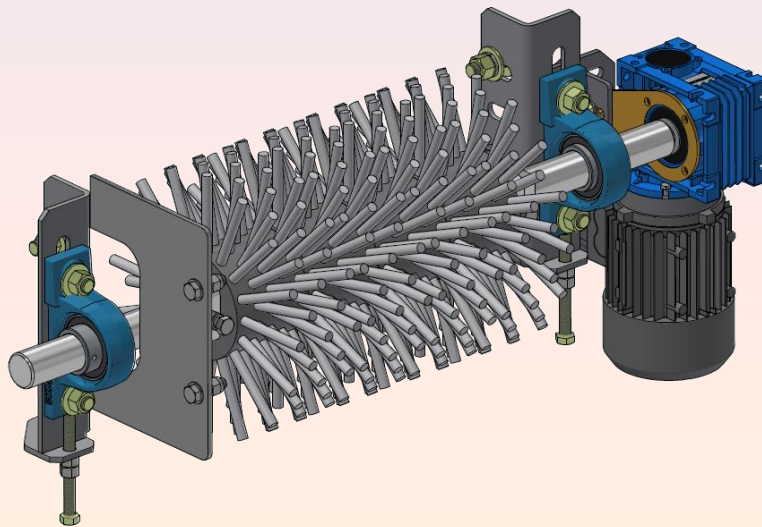


ENGINEERING SERVICES & SUPPLIES PTY LTD

Ph: 1800 074 446 www.esseng.com.au

Compact Brush Cleaner

Installation, Operation & Maintenance Manual





LOCATION	ADDRESS	PHONE & EMAIL
CURRUMBIN	11 – 13 Traders Way PO Box 121 Currumbin QLD 4223	(07) 5589 2000 esscur@esseng.com.au
GLADSTONE	Shed 2, 4 Helen Street PO Box 1475 Clinton QLD 4680	(07) 4972 3759 essgla@esseng.com.au
KALGOORLIE	Unit 1 / 182 Boulder Road Kalgoorlie WA 6430 PO Box 10471 Kalgoorlie WA 6433	(08) 9021 7991 esskal@esseng.com.au
KARRATHA	26 Midas Road Malaga WA 6090	(08) 9248 4111 esskar@esseng.com.au
MACKAY	1 Progress Street Paget, QLD 4740 PO Box 5755 Mackay Mail Centre QLD 4741	(07) 4952 4600 essmac@esseng.com.au
MAITLAND	Unit 2 Barton Court 6 Johnson Street Maitland NSW 2320	(02) 4932 3544 essmai@esseng.com.au
PERTH	26 Midas Road Malaga WA 6090	(08) 9248 4111 essper@esseng.com.au
TOWNSVILLE	Unit 4/ 585 Ingham Rd Mt St John Townsville QLD 4818	(07) 5589 2032 esstow@esseng.com.au
VICTORIA	Unit 4 / 238 Governor Road Braeside VIC 3195	(03) 9587 3979 essvic@esseng.com.au
WOLLONGONG	Unit 1 / 20 Doyle Avenue PO Box 343 Unanderra NSW 2526	(02) 4272 4422 esswol@esseng.com.au

TOLL FREE 1800 074 446 FROM ANYWHERE IN AUSTRALIA



WARRANTY

ESS WARRANTS the **Compact Brush 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 also is subject to the following restrictions:

Installation of the product contrary to the instructions contained in the supplied manual will void such warranty absolutely;

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;

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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ALL RIGHTS RESERVED

Information contained herein is for use in the operation of the **Compact Brush Cleaner**, purchased from **ESS** and cannot be passed on to any other party without express permission, in writing, from **ESS**.



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1. SAFETY

The *ESS Compact Brush Cleaner* Conveyor Belt Cleaner is designed to be quickly and easily serviced by appropriate personnel.

Under no circumstances should servicing or installation of the cleaner be carried out whilst the belt is in operation. Under no circumstances should servicing or maintenance of the cleaner be carried out whilst the **Brush Cleaner** is in operation.

The conveyor must be shut down and locked out before any person enters or reaches into the conveyor enclosure. The *ESS Compact Brush Cleaner* must be shut down and locked out before attempting any maintenance or adjustment.

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

Electrical connections to the *ESS Compact Brush Cleaner* must be carried out by a suitably qualified and licensed electrical tradesperson, and must comply with all appropriate Australian and site electrical and safety standards.

Hazards that may be present when installing this equipment:

	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		

Once hazards have been identified, the installer should undertake and document a comprehensive Job Hazard Analysis according to site requirements and good safe-working practice.

The installer must identify all hazards and apply appropriate controls before proceeding with the installation 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. INTRODUCTION

The *ESS Compact Brush Cleaner* is a motorized rotary brush designed for use as a cleaning device for conveyor belts. It is normally located on the return side of the conveyor belt, as close as possible to the head pulley so that material brushed from the belt is delivered into the conveyor chute.

The *ESS Compact Brush Cleaner* rotates against the direction of belt travel at a speed of approximately 280 rpm.

The *ESS Compact Brush Cleaner* is often used as a secondary cleaner, and is preceded by a primary cleaner such as the *ESS TM, DT or XHD* primary cleaners.



3. 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
 - allow you to plan the installation, reducing installation time.
3. **ASSEMBLE THE NECESSARY TOOLS & SAFETY EQUIPMENT REQUIRED FOR THE INSTALLATION**
4. **OBSERVE THE CONVEYOR WHILE RUNNING AND CONVEYING MATERIAL** -
 - 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. INSTALLATION



Conveyor must be shut down and locked out before installation 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.

Protect belt surface from weld spatter with appropriate shield.

NOTE

For installation on enclosed head pulley chute work, draw all dimension lines on chute wall. In applications where head pulley is not enclosed, use the best available field resources and/or methods to ensure that these critical dimensions are followed for a proper installation.

4.1 INSTALLATION ON OPEN FRAMED CONVEYORS

Where the *ESS Compact Brush Cleaner* is to be installed on an open framed conveyor, or in an area away from the chute enclosure, the following installation steps should be followed:

Step 1

Determine the installation position for the *ESS Compact Brush Cleaner*. This should be on a flat area of the return belt, and preferably in a position where the material removed from the belt will be captured and delivered onto the next conveyor, receiving hopper or the like. Mark the vertical centre line of the brush on the conveyor stringers or structure.

Note: For conveyors that are inclined, the brush centre line is not vertical, but will be perpendicular to the belt line.

Step 2

Measure 12 mm to one side of the brush centre line, and mark another line, which represents the centre line of the closest hole in the mount bracket to the brush. The mount bracket can be either side of the brush – in other words, the mount brackets can be on the leading or trailing side of the brush, but must be the same on both sides of the conveyor.

Step 3

Fabricate suitable brackets to attach the **Brush Cleaner** mounts to the conveyor stringers. The upper surface of the **Brush Cleaner** mounts should be 115 mm above the underside of the conveyor belt. See figure below. The non-drive side brackets must be easily removable (bolted) for future brush replacement.

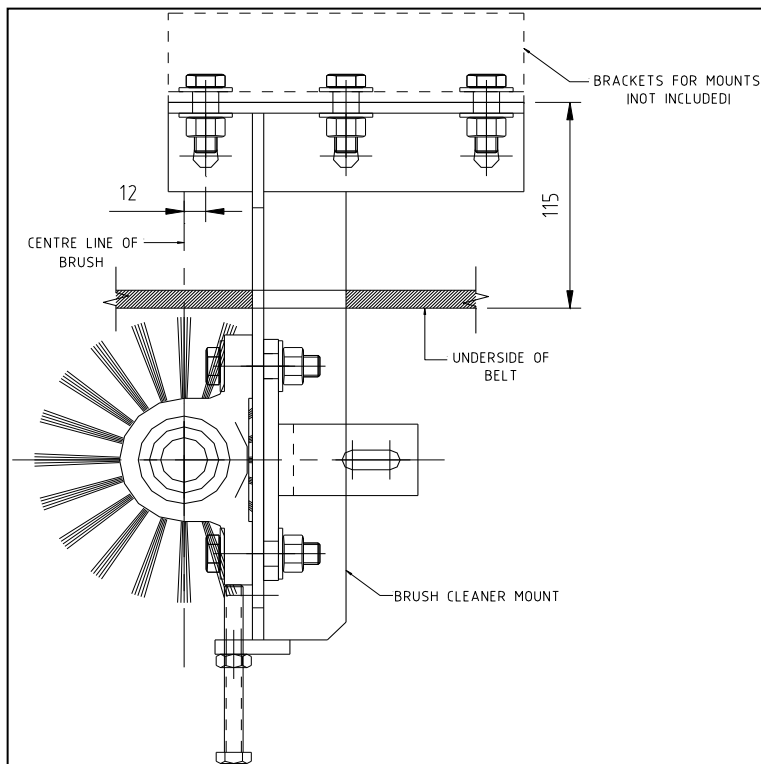


Figure 1 - Brush Cleaner Mounts

Step 4

Attach the **Brush Cleaner** mounts to the fabricated brackets as shown. Ensure that the mounts are perpendicular to the conveyor belt, and that the adjusting screw is at the bottom of the mounts. Tighten the bolts securing the mounts to the brackets.

Step 5

Assemble the brush on to the cleaner mainframe, and fit the lock each side. Centre the brush on the square tube, and secure the locks. Fit the bearing assemblies to each end of the mainframe, with the securing grub screws outwards. Do not tighten the grub screws at this point.

Step 6

Lift the mainframe and brush assembly into place, and attach to the mounts by bolting the bearing housings to the slots in the mounts. Fit the torque arm anchor bracket to the drive side mount, positioning it on the opposite side of the mount bracket to the bearing housing, and sharing the bearing housing fasteners. With the bolts in the bottom of the slots, the top of the brush should be approximately 10 mm clear of the underside of the belt. Lightly tighten the bolts securing the bearing housings. Centre the brush to the belt by sliding the mainframe through the bearings. Tighten the grub screws securing the bearings to the shaft.



Step 7

Fit the geared motor drive unit over the stepped end of the mainframe shaft. Ensure that the key is in place and aligned with the keyway before applying necessary force to fit the drive unit. Ensure that the torque arm is in place and aligned with the anchor bracket for the required motor orientation. The drive can be rotated to several positions, but the torque arm must be first repositioned so that it aligns with the anchor bracket.

Step 8

Depending on the model, the torque arm anchor will be a length of threaded rod, or later a folded steel bracket.

For the rod model, ensure that a nut and washer are fitted each side of the torque arm. Adjust the inner nut until the washer is contacting the torque arm. Adjust the outer nut until the washer contacts the torque arm, and then use spanners to tighten both nuts against the torque arm.

For the steel bracket model, fit the smaller bracket to the slots in the larger bracket using fasteners supplied. Ensure that the smaller bracket is on the inside, or away from the drive unit, and that the hole in the small bracket aligns with the hole in the torque arm. Attach the smaller bracket to the torque arm using the single bolt supplied, and tighten securely. Tighten the bolts securing the smaller bracket to the larger bracket.

The *ESS Compact Brush Cleaner* is now installed and ready for electrical connection

4.2 INSTALLATION ON ENCLOSED CONVEYOR CHUTES

Where the *ESS Compact Brush Cleaner* is to be installed on an enclosed conveyor chute, the following installation steps should be followed:

Step 1

Determine the installation position for the *ESS Compact Brush Cleaner*. This should be on a flat area of the return belt, and preferably in a position where the material removed from the belt will be captured and delivered onto the next conveyor, receiving hopper or the like. Determine, by measuring, the position of the conveyor belt, and mark this on the outside of the conveyor chute enclosure. Mark the vertical centre line of the brush on the conveyor chute enclosure. Repeat both sides of conveyor.

Note: For conveyors that are inclined, the brush centre line is not vertical, but will be perpendicular to the belt line.



Step 2

Using the marked centre lines and belt line, and the figure below, mark out the chute cut-outs. Ensure that the correct cut-out is marked for the Drive and Non-Drive sides of the cleaner. Future maintenance work will be most frequently performed at the Non-Drive side, so this side should have the best access. Ensure there is sufficient room for the drive unit on the side nominated as the Drive side.

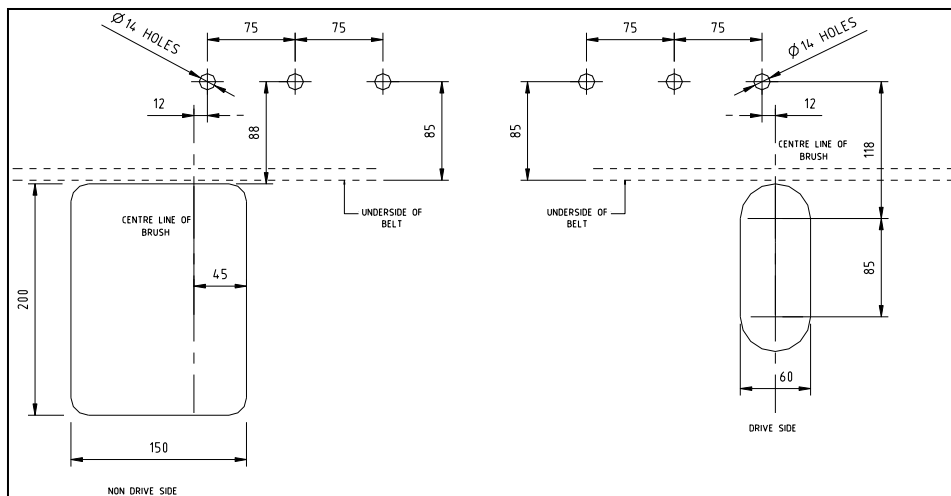


Figure 2 - Installation

Note: The cleaner mounts can be either side (leading or trailing) of the brush, but must be the same both sides.

Step 3

Fit the bearing units to the **Brush Cleaner** mounts using the bolts supplied. Ensure that the grub screws on the bearing hub are outward from the mounts, and that the bearing units are at the adjusting screw end of the slots in the mounts. Fit the Drive side mount and bearing assembly to the chute using the bolts supplied. Ensure that the correct side mount is used, and that the adjusting screw is at the bottom.

Step 4

Assemble the brush to the cleaner mainframe, and fit the lock each side. Centre the brush on the square tube, and securely fasten the Drive side lock only. Remove the Non-Drive side lock and the brush. Insert the shaft and lock stepped end first into the Non-Drive side cut-out, through the Drive side cut-out, and through the bearing on the Drive side mount. Ensure that the stepped end of the shaft is on the Drive side.



Step 5

Supporting the shaft, fit the brush onto the Non-Drive end of the shaft, and push the brush through the chute cut-out – the brush bristles will distort to fit through the opening. Ensure that the brush core is in contact with the Drive side lock. Fit the Non-Drive side lock, and secure.

Fit the Non-Drive side mount and bearing assembly to the shaft, and attach to the chute using the bolts supplied. With the bearing housings positioned in the bottom of the slots in the mounts, the brush bristles should be approximately 10mm clear of the underside of the belt.

Step 6

Remove the nuts securing the Drive side bearing housing and fit the torque arm anchor bracket to the drive side mount, positioning it on the opposite side of the mount bracket to the bearing housing, and sharing the bearing housing fasteners. Re-fit the nuts and lightly secure. Centre the brush to the belt by sliding the mainframe through the bearings. Tighten the grub screws securing the bearings to the shaft.

Step 7

Fit the geared motor drive unit over the stepped end of the mainframe shaft. Ensure that the key is in place and aligned with the keyway before applying necessary force to fit the drive unit. Ensure that the torque arm is in place and aligned with the anchor bracket for the required motor orientation. The drive can be rotated to several positions, but the torque arm must be first repositioned so that it aligns with the anchor bracket.

Step 8

Depending on the model, the torque arm anchor will be length of threaded rod, or later a folded steel bracket.

For the rod model, ensure that a nut and washer are fitted each side of the torque arm. Adjust the inner nut until the washer is contacting the torque arm. Adjust the outer nut until the washer contacts the torque arm, and then use spanners to tighten both nuts.

For the steel bracket model, fit the smaller bracket to the slots in the larger bracket using fasteners supplied. Ensure that the smaller bracket is on the inside, or away from the drive unit, and that the hole in the small bracket aligns with the hole in the torque arm. Attach the smaller bracket to the torque arm using the single bolt supplied, and tighten securely. Tighten the bolts securing the smaller bracket to the larger bracket.



Step 9

If required for containment of dust, or to comply with plant safety rules, a cover may be fabricated and fitted to the chute opening, especially on the non-drive side.

The cover must be easily removable for inspection of the brush, and must allow for vertical adjustment of the brush shaft. A typical cover is shown below.

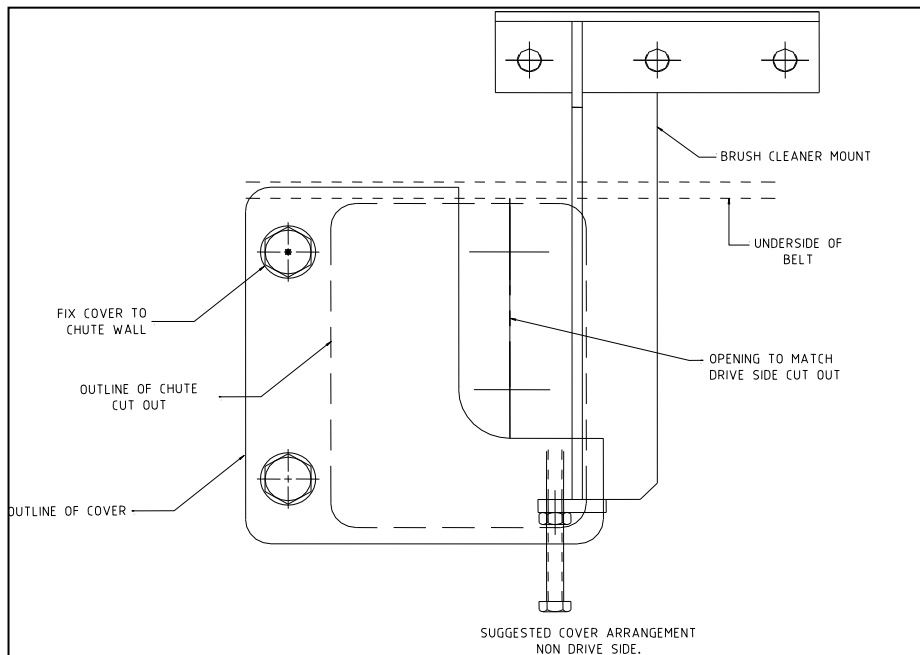


Figure 3 – Brush Cleaner Cover

The *ESS Compact Brush Cleaner* is now installed and ready for electrical connection.



5. ELECTRICAL CONNECTION AND CONTROL

CAUTION

The *ESS Compact Brush Cleaner* is a motorised brush, with the motive power supplied by a 3-phase electric motor. The drive motor must be connected in accordance with all site and statutory regulations, and only by a licensed and appropriately trained electrical tradesperson.

Ensure that all power sources are isolated when working on or connecting exposed electrical cabling.

5.1 CONTROL

The *ESS Compact Brush Cleaner* should rotate against the direction of the conveyor – see figure below. The *ESS Compact Brush Cleaner* should be interlocked with the conveyor drive so that it operates only when the conveyor operates.

A safety isolation switch should be located adjacent to the **Brush Cleaner** drive unit. A conveyor emergency stop or pull wire should be located adjacent to the **Brush Cleaner** on both sides of the conveyor. Stopping the conveyor should automatically stop the *ESS Compact Brush Cleaner*.

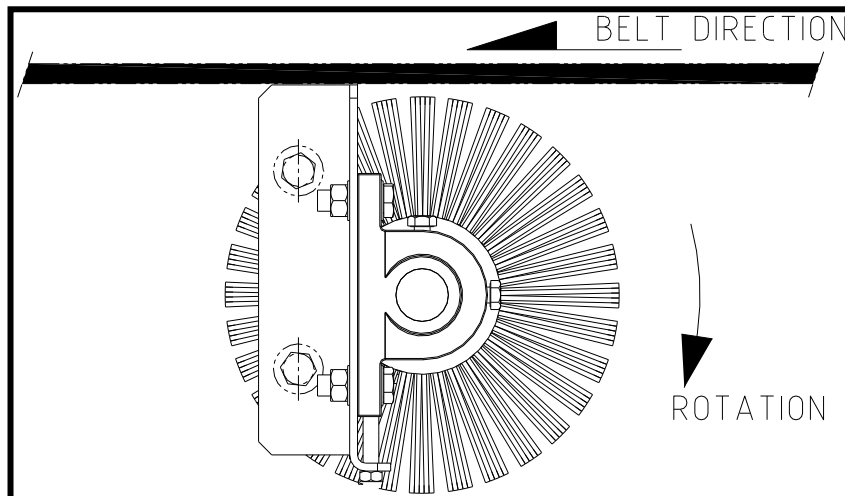


Figure 4 - Brush Cleaner Rotation

Additionally, the *ESS Compact Brush Cleaner* may be connected with a selector switch that allows automatic starting of the cleaner whenever the conveyor starts, but also allows manual starting and stopping of the cleaner for maintenance and adjustment without the conveyor running.

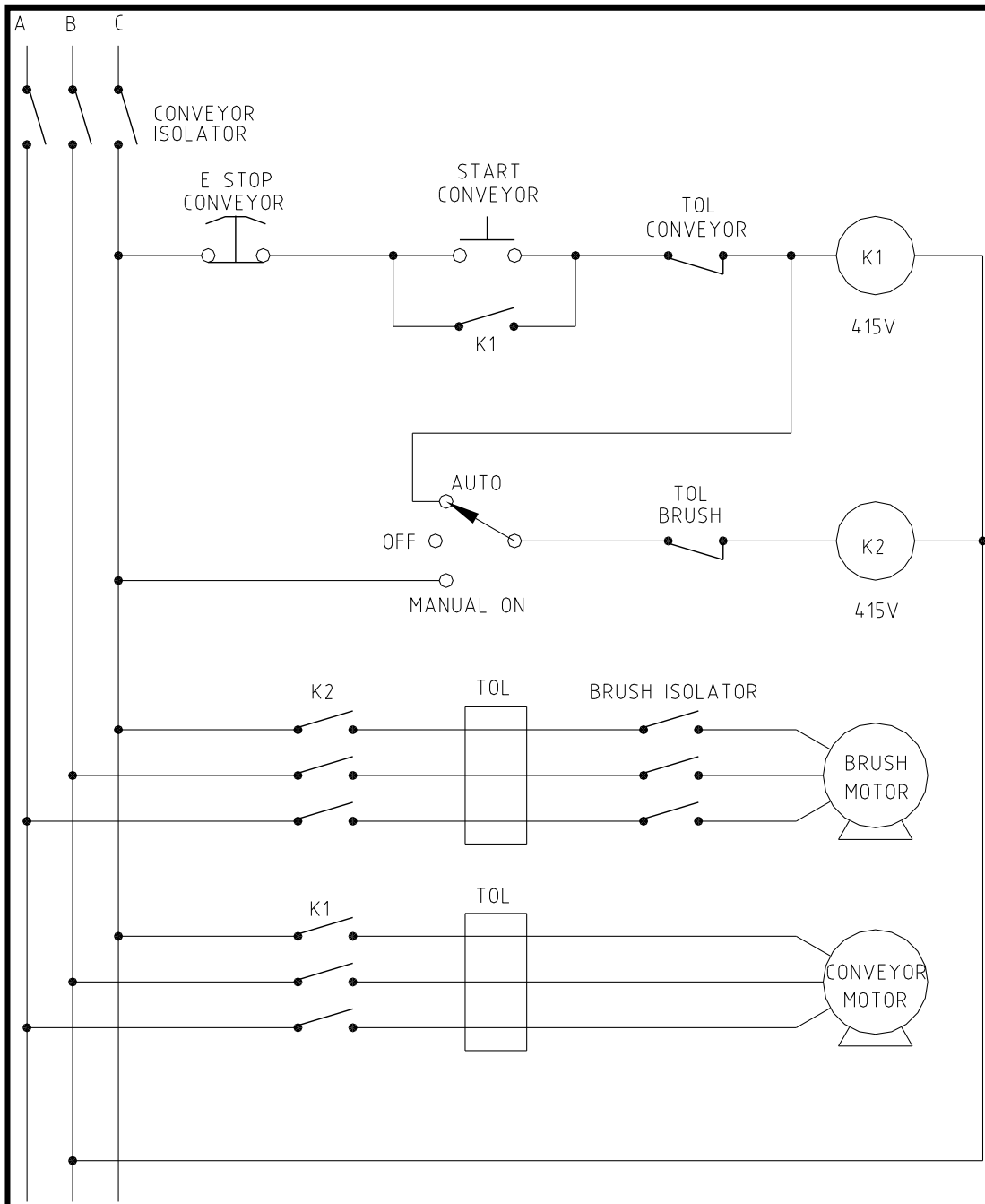


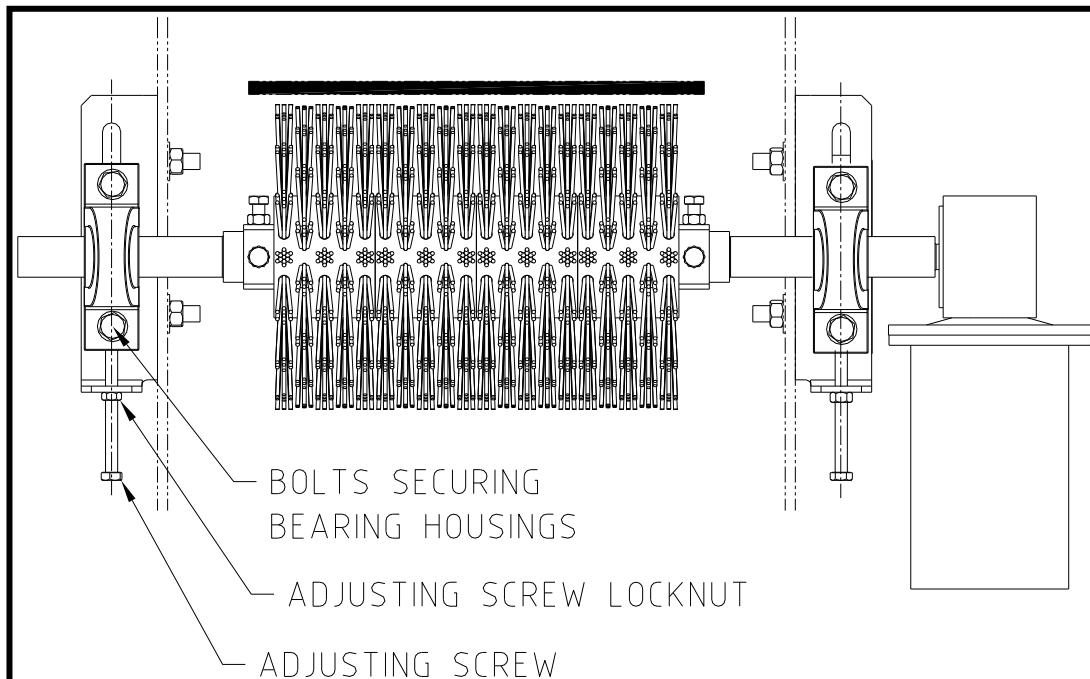
Figure 5 - A Typical Control Circuit



6. COMMISSIONING

6.1 DESCRIPTION

Once the *ESS Compact Brush Cleaner* has been electrically connected and tested, it can be adjusted for service. The *ESS Compact Brush Cleaner* utilises jacking screws to adjust the brush to the belt.



6.2 ADJUSTMENT PROCEDURE

- Slightly loosen the bolts securing the bearing housings to the mounts to just allow the housing to slide. Repeat for both sides. Ensure that the Torque Arm bracket remains in place on the drive side.
- Loosen the locknuts on the adjusting screws at the lower end of each support bracket.
- Turn the adjusting screw (equally on both sides) until the brush bristles are just touching the belt. The drive and torque arm assembly will automatically be adjusted via the anchor bracket.
- Ensure that the bristle contact is equal across the belt – that is, the bristles are just touching across the belt width.
- Continue turning the adjusting screw equally on both sides approximately 3 mm, or two turns. Do not over-adjust – the cleaning is done by the tips of the bristles, and excessive adjustment will result in poor performance and high wear.



- Re-tighten the bolts securing the bearing housings to the mounts, and tighten the locknuts on the adjusting screws.
- Start the conveyor and the **ESS Compact Brush Cleaner** and observe the cleaning action of the brush. Ensure that the brush rotates smoothly against the belt with no vibration.
- Observe the belt surface after the **ESS Compact Brush Cleaner** – is the brush cleaning the full belt area? If the belt surface is excessively worn, and the brush does not make full contact, allow a period of time (say 1 week) for the brush to wear to the belt profile, and then adjust two more turns of the screw.



7. ROUTINE MAINTENANCE AND SERVICE

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

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

BEFORE ATTEMPTING ANY MAINTENANCE OR SERVICE WORK ON THE *ESS COMPACT BRUSH CLEANER*, SHUT DOWN AND LOCKOUT BOTH THE CONVEYOR AND THE *ESS COMPACT BRUSH CLEANER*.

7.1 ROUTINE INSPECTION

The following tasks should be undertaken during a routine inspection.

- Observe the conveyor belt after the *ESS Compact Brush Cleaner*. Is the belt being cleaned uniformly? If the conveyor shows streaking or uneven cleaning, it may indicate that adjustment or brush replacement is required.
- Inspect the *ESS Compact Brush Cleaner* drive unit. Ensure that the shaft is rotating smoothly. Check for noise or vibration.
- Check that all fasteners are secure.
- Check bearings and lubricate if necessary.
- If fitted, and if allowable under site regulations, remove the non-drive side cover plate and visually check the condition of the brush and bristles. Ensure that the bristle tips are making good contact with the belt.
- If any problems are identified with the *ESS Compact Brush Cleaner* operation, adjustment or the condition of the bristles, arrange for the conveyor to be shutdown and service the cleaner as described below.

7.2 RE-ADJUSTMENT PROCEDURE

Once the brush bristles wear, readjustment of the cleaner will be necessary.

To readjust the cleaner, refer to the adjustment procedure in the Commissioning Section 6.2 - Adjustment Procedure.

Begin the re-adjustment by first reversing the adjustment procedure and backing the brush away from the belt by a few millimetres, inspect the bristles, and then follow the adjustment procedure.



7.3 BRUSH REPLACEMENT

Do not attempt service on this cleaner with the belt or the cleaner running. Do not reach into the conveyor enclosure with the belt or cleaner running.

Shut down, lock out and tag the conveyor and the *ESS Compact Brush Cleaner* before attempting any maintenance that requires reaching into the conveyor enclosure.

Step 1 Shut down and lock out the conveyor and the *ESS Compact Brush Cleaner* as per site safety rules.

Step 2 To access the brush, first fully de-adjust the cleaner by reversing the adjustment procedure as described section 6.2 Adjustment Procedure. When adjusting or de-adjusting the cleaners, ensure that this is done evenly on both sides. Alternate sides at each turn of the adjusting rod or use an assistant. If the **Brush Cleaner** is on an enclosed conveyor chute, remove the non-drive side cover (if fitted).

Visually inspect the brush and bristles.

- If bristles are clean, and not excessively worn, re-tension the cleaner and return to service.
- If bristles are excessively worn or damaged, proceed.

Step 3 When fully retracted, loosen the grub screws securing the non-drive side bearing to the shaft. Unbolt non-drive side mount and bearing assembly (and bracket for the open conveyor installation) and remove the complete assembly from the cleaner shaft, taking care to support the end of the shaft.

Step 4 Reach in and remove the non-drive side blade lock, sliding it from the shaft. Slide the brush from the shaft. A worn brush should easily fit through the access cut-out. Clean any material build-up from the shaft.

Step 5 Fit a new brush by sliding onto the cleaner shaft. The bristles of the new brush will easily bend to fit through the access cut-out. Ensure the new brush is in contact with the drive side lock and each other, then refit the non-drive side lock.

Step 6 Refit the non-drive side bearing and mount (and bracket) assembly, and tighten the grub screws securing the bearing to the shaft.

Step 7 Adjust the brush to the belt as described in section 6.2 - Adjustment Procedure. Refit the non-drive side access cover.

Step 8 Return the *ESS Compact Brush Cleaner* and the conveyor to service.



8. TROUBLESHOOTING

PROBLEM - High brush wear rate.

CAUSE	SOLUTION
Cleaner over-tensioned	Re-tension the cleaner as described in section 6.2.
Incorrect brush material	Contact <i>ESS</i> for re-appraisal

PROBLEM - Insufficient cleaning - too much carryback.

CAUSE	SOLUTION
Cleaner under-tensioned	Re-tension cleaner as per section 6.2.
Cleaner not rotating in the correct direction.	The cleaner must rotate against the belt travel direction. If incorrect, have an electrical tradesperson change the drive direction.
Build-up on brush	Remove brush and clean. Contact <i>ESS</i> for alternative brush materials.
Primary Cleaner not functioning correctly	Service the Primary Cleaner
Incorrect Brush Material	Contact <i>ESS</i> for alternative materials
Cleaner overloaded	Add additional cleaner
Cleaner not suitable for product	Brush Cleaners work best on dry powders and stringy dry materials. Excessively wet or sticky materials may cause blinding of the brush and subsequent poor performance. Contact <i>ESS</i> .



9. INSTALLATION ARRANGEMENT DRAWING

F0343 – COMPACT BRUSH CLEANER ASSEMBLY

F0343

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

DIM 'B' MIN/MAX MOUNTS
 BELT WIDTH
 DIM 'A' (BRUSH COVER)

TRIM SHAFT TO SUIT ON INSTALLATION

75
 50
 75
 210 REF
 30
 R
 160

2a
 2b
 2c
 3
 4
 5
 6
 7

SECTION A

PART No's FOLLOWED BY xxx INDICATE THAT THE PART IS AVAILABLE IN ALL STANDARD BELT WIDTHS. SUBSTITUTE xxx WITH BELT WIDTH MEASURED IN CM.

BELT DIM 'A'	DIM 'B'	PART No.
300	270	25005030(\$)
400	370	25005040(\$)
450	420	25005045(\$)
500	470	25005050(\$)
600	570	25005060(\$)
650	620	25005065(\$)
750	720	25005075(\$)
900	870	25005090(\$)

ITEM DESCRIPTION	QTY	DRG.No.	PART No.
1 COMPACT BRUSH CLEANER SHAFT SS	1	D1167	15255xxxS
a COMPACT BRUSH MNT SET C/W BRGS LEFT	1	D1176	09060005LS
b COMPACT BRUSH MNT SET C/W BRGS RIGHT	1	D1176	09060005RS
2.1 BEARING PLUMMER BLOCK P205TBC	2	-	02042035
2.2 BEARING UC205 (Ø25)	2	-	02041035
2.3 BOLT M12X50 HEX 304SS	4	-	02303520S
2.4 SCREW M12X40 HEX SET 304SS	6	-	02315540S
2.5 NUT M12 HEX 304SS	10	-	02311512S
2.6 WASHER M12 304SS	20	-	02319514S
2.7 WASHER M12 SPRING 304SS	10	-	02319514S
2.8 SCREW M10X130 HEX SET 304SS	2	-	02315490S
2.9 NUT M10 HEX 304SS	2	-	02311410
3 COMPACT BRUSH NYLON	1	D1166	25505xxx
4 COMPACT BRUSH CLEANER SHAFT LOCK SS	2	D1168	25505005S
5 MOTOVARIO NMRV40 0.37KW 5:1 IP65, 4POLE ASSY	1	-	25501020
6 TORQUE ARM NMRV40	1	-	25501019
7 TORQUE ARM ANCHOR	1	D1173	25501021
7.1 SCREW M10X40 HEX SET 304SS	1	-	02315440S
7.2 NUT M10 NYLOC 304SS	1	-	02311412S
7.3 WASHER M10 304SS	2	-	02319410S

ESS ENGINEERING SERVICES & SUPPLIES
 CUSTOMER SERVICE No. 1800 074446

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TITLE: COMPACT BRUSH CLEANER ASSEMBLY

CLIENT: LOCATION:

ESS CAD

REV	REVISIONS	BY	CHKD	APP'D	DATE
G	IP65 ADDED TO ITEM 5	EDCR0187	CW	TT	14/12/06
F	MOUNT MODIFIED	EDCR0146	SD	GG	11/04/06
E	ADDED BEARING INFORMATION	EDCR0146	GC	SD	11/04/06
I	ADDED ITEM 2.9	EDCR1257	MK	AM	16/02/06
H	ITZ.B WAS 03091655. MS REMD	EDC1211	SD	SD	30/07/05

ESS ORN
 CLIENT No.
 CLIENT
 MATERIAL
 QUANTITY

VARIOUS

F0172 STANDARD BRUSH CLEANER ARRANGEMENT REFERENCE DRAWINGS

DRAWING No. F0343
 SCALE: 1:5
 DRAWING No. F0343
 DATE: 31/03/06
 APPD:T.T.
 T.T./G.G.
 REV. I



ENGINEERING SERVICES & SUPPLIES PTY LTD
Ph: 1800 074 446 www.esseng.com.au





10. FINAL CHECKLIST

Site: _____ Number: _____ Date: _____

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

Completed By: _____ (Circle Yes or No Below)

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 _____

Was this a standard service inspection installation? _____ Yes/No

If No, WHY _____

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

If No, WHY _____

Is equipment fit for commissioning? _____ Yes/No

If No, WHY _____

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

If No, WHY _____

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

If Yes, WHAT _____

Is equipment performance to Client expectations? _____ Yes/No

If No, WHY _____

ESS Signature: _____

Client Signature: _____

