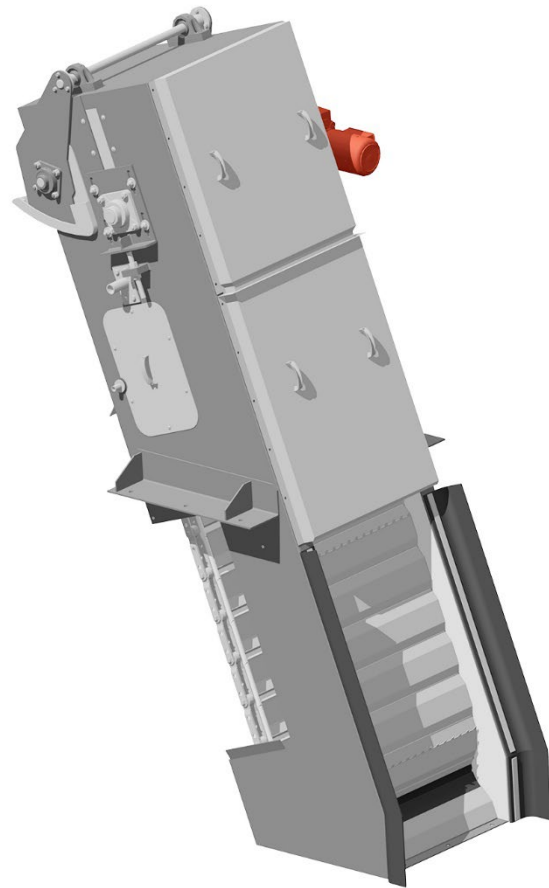


# Installation, Operation & Maintenance Manual For FINEGUARD™ Moving Fine Screen



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# 1.0 INTRODUCTION

## 1.1 GENERAL

We welcome you as a user of FINEGUARD™ screens. Your FINEGUARD™ is a product of careful engineering and skilled workmanship. We believe you have the best FINEGUARD possible for the service intended. With reasonable care and preventive maintenance it will give you long, efficient, trouble-free service.

**Refer to Safety Sheet in section 7.SAFETY.**

This manual is furnished to acquaint you with some of the practical ways to install, operate and maintain this FINEGUARD™. Read it completely before doing any work on your unit and keep it handy for future reference.

All FINEGUARD's™ are built to screen materials upwards of 3mm in size which may be wet, sludgy, uneven and hygienically demanding etc. However every FINEGUARD™ is custom built to give maximum efficiency for the specified material being screened. It is not acceptable to screen any product other than that noted in the Specification Sheets.

Any modification, change or rebuilding of the FINEGUARD™ must be approved in writing by SPIRAC so that machine damage and personal injury are avoided and that documentation is relevant.

Only trained or instructed staff with clearly defined responsibilities for the operation, set up, maintenance or repair on the conveyer should be used.

In the event of any queries please contact your nearest SPIRAC representative.

## 1.2 PRODUCT IDENTIFICATION

There is one identification plate (ID) on each FINEGUARD™. *Figure 1.2a* shows an example of a typical ID plate.

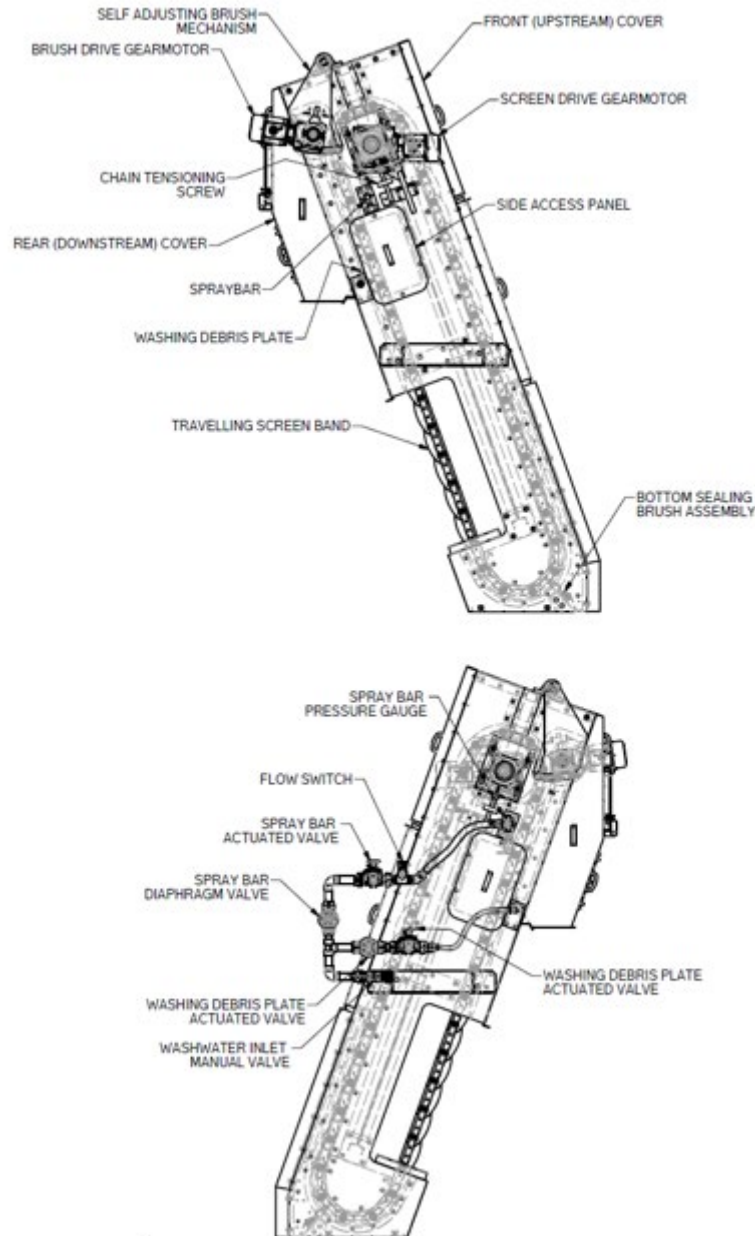


*Figure 1.2a*

Permanent records for this FINEGUARD™ are kept by Serial Number and it must, therefore, be used with all correspondence and spare parts orders. The last sequence of numbers is specific to that FINEGUARD™ and is utilised on orders of more than one FINEGUARD™. This sequence of numbers is also the end users equipment tag numbers

### 1.3 **PRODUCT DESCRIPTION**

The FINEGUARDS™ parts can vary in appearance due to the fact that all SPIRAC FINEGUARDS™ are custom built. The figure below (*Figure 1.3a*) shows the principal parts of the FINEGUARD™. Please refer to the projects general arrangement drawings for specific FINEGUARD™ construction and layout details.



*Figure 1.3a - Principal Parts of the FINEGUARD*

FINEGUARD™ Screens described in this section comprise of a continuous band of perforated screen panels carried within two strands of roller chain, running on guides within the screen structure.

The screen panel band is pulled round via two chain sprockets mounted on a headshaft. A variable speed electric motor acting through a double reduction helical bevel gearbox drives

the head shaft, the shaft runs in two take-up bearings. The take-up on the screen band is achieved by an adjusting screw arrangement.

Water flows through the screen and debris is collected on the outside of the screen panels and is carried up to the head of the screen on the perforated panels and debris elevating plates. On the outside of the screen band is an independently driven rotating brush, which removes any debris from the panels. A single speed electric motor acting through a single reduction gearbox drives the cleaning brush shaft; the shaft runs in two self-lube flanged bearings. Pivoting bearing mounting plates allow adjustment of the shaft to accommodate brush wear.

During the downward travel the panels pass in front of a spray pipe situated within the screen band. From the pipe, water is sprayed through the panels washing the remaining debris from the panel and into the discharge chute.

Sealing between the screen and the screen channel is achieved using Neoprene seals to the sides and a double brush seal at the base.

The screen also has the washing debris plate feature, which is designed to reduce the amount of accumulated debris on the apex of the debris plate, by allowing a flow of water to run down the face of the plate.

#### 1.4 DECLARATION OF CONFORMITY

EC Declaration of Conformity (according to 2006/42/EC, Annex 2A)

**SPIRAC Limited**  
**SPIRAC House, Thorpe Mead**  
**Banbury, OX16 4AB**  
**United Kingdom**

Declares under its own responsibility that the product:

**Equipment Description:** FINEGUARD™  
**Model:** FINEGUARD™  
**Serial Number:** GB220094-01

**Equipment Description:** FINEGUARD™  
**Model:** FINEGUARD™  
**Serial Number:** GB220094-02

**Equipment Description:** FINEGUARD™  
**Model:** FINEGUARD™  
**Serial Number:** GB220094-03

**Equipment Description:** FINEGUARD™  
**Model:** FINEGUARD™  
**Serial Number:** GB220094-04

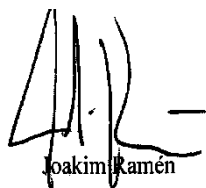
Is in conformity with all relevant provisions of ordinances in Machinery Directive 2006/42/EC.

Furthermore declares that the machinery is in conformity with all relevant provisions of ordinances in the Low Voltage Directive 2006/95/EC and the EMC Directive 2004/108/EC.

Is manufactured according to the following standards:  
EN ISO 12100-1, EN ISO 12100-2, EN 294, EN ISO 60204-1, EN ISO 13850:2006.

Place: SPIRAC Ltd Date: 12.05.2023

Signature:



Joakim Ramén

**2.0                      INSTALLATION**

**2.1            GENERAL**

As a FINEGUARD™ is a bespoke item designed to fit specific site conditions, installation by Spirac or Spirac contracted installation engineers is recommended. If client installation is agreed, a separate set of comprehensive installation instructions will be provided

Should the FINEGUARD™ be supplied for client installation, these instructions must be carried out in the order stated to prevent machine damage and personal injury.

Check FINEGUARD™ for shortages and damage immediately upon arrival (an absolute must !). Prompt reporting to the carriers agent, with notations on the freight bill, will expedite satisfactory adjustment by the carrier.

FINEGUARDS™ are normally shipped from the factory within open sided crates or palletised. Gearboxes may either be completely assembled or packed separately for shipping. When the gearbox has been sent separately, fixing bolts will be packaged in a separate container and shipped with the FINEGUARD™ or attached to the gearbox. Recommended torque settings for the mounting the drive shaft are as follows:

<b>Torque Settings for the Drive Shaft</b>	
A4/70 M12x60	20Nm (oiled thread)
A4/70 M16x70	40Nm (oiled thread)
A4/70 M20x80	80Nm (oiled thread)
A4/70 M24x90	200Nm (oiled thread)

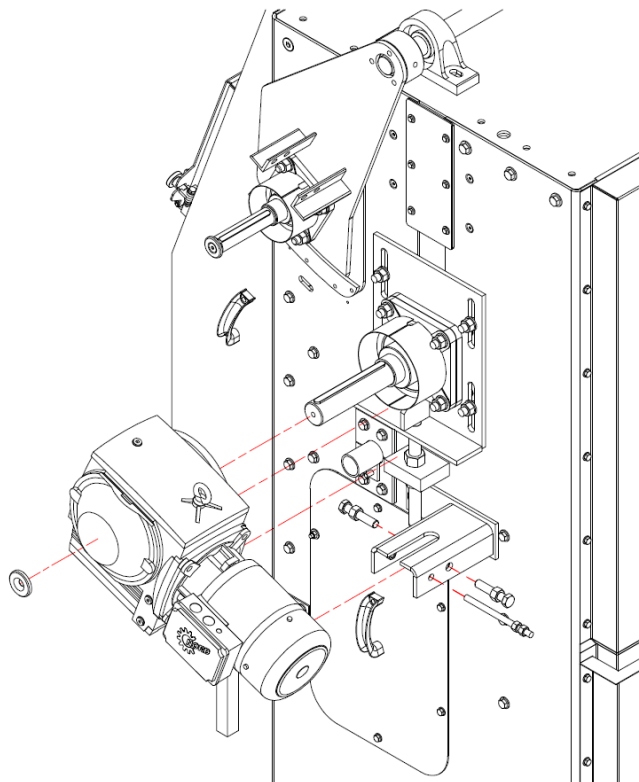
Before the FINEGUARD™ is installed its dimensions must be checked against the dimensions on the installation drawing.

If the FINEGUARD™ is to be installed as a complete unit, it should be positioned and the angle of its outlet chute checked to ensure correct alignment with the conveyor, launder or other screenings handling equipment that it is feeding.

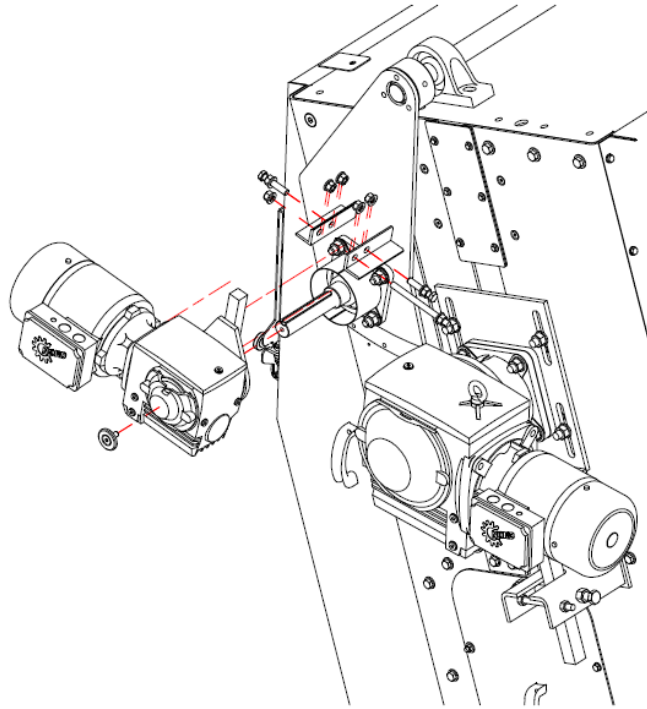
## 2.2 MOUNTING THE DRIVE ASSEMBLIES

Occasionally the Screen and Self Adjusting Brush drive assemblies are delivered not attached to the FINEGUARD™. If your FINEGUARD™ has either or both drive assemblies sent separately, it is delivered ready to be attached. If the FINEGUARD™ is to work in a raised position it may be better to mount the drive unit with the FINEGUARD™ on the ground before lifting into position.

1. Remove any transport locks from the drive shafts.
2. Remove the tape holding the key to the drive shafts.
3. If the drive shaft is not stainless steel it is treated with rust inhibitor. Use degreaser to remove this.
4. Remove the lid from the motors cooling fan so that the drive shaft can be turned using the fan.
5. Turn the drive shaft so that the key-way comes to the right position for the FINEGUARDs™ drive shaft and then push the gearbox onto the drive shaft.
6. The gearboxes will come attached to a torque arm brackets as shown below. The torque arm must be positioned between the two locking screws. Tighten the two locking screws until the torque arm is held centrally and securely between the two locating tabs on the FINEGUARD™ sideplate. Attach the screen drive gearmotor first as shown below.



Following this attach the Self Adjusting Brush drive as shown below.



7. Fasten the locking bolt and retaining washer to the drive shaft in order to fasten the gearboxes onto the drive bore. When the drive shaft is firmly positioned in the drive bore the locking bolt should be tightened to the torque specified (refer Sect. 2.1).
8. Check level of oil in the gearbox (refer to gearbox manufacturer O&M).

### **2.3 CONNECTION TO FOUNDATION/SUPPORT STRUCTURE**

All FINEGUARDs™ are fitted with support brackets attached to each side of the FINEGUARD™ structure. These brackets are pre-drilled and positioned in the factory prior to shipment

If supports are supplied with the FINEGUARD™ –

1. Make sure no one is standing beneath the FINEGUARD™ while it is being lifted or mounted.
2. Lift the FINEGUARD™ so that it assumes its operating position.
3. Fasten the supports to the foundation/support structure utilising the bolts, nuts and washers provided.
4. Make sure the FINEGUARD™ is sufficiently anchored to the floor to withstand any working loads.

### **2.4 ELECTRICAL**

Provision of control panels and wiring can be provided by Spirac but is typically supplied by the client. All control panels and wiring should be manufactured/installed to the relevant end users particular specifications.

Spirac Ltd will supply/free issue a motor protection safety device (power monitor) to the client or their chosen control panel manufacturer for all drives supplied.

The power monitor must be installed within the MCC to protect the motor and associated equipment from mechanical damage. Failure to do so will invalidate the warranty.

Other instrumentation maybe provided depending on the specific project requirements and will be listed on the 'FINEGUARD™ data sheet' see Appendix A for details.

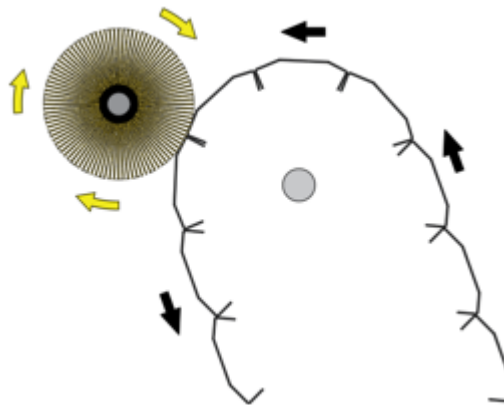
**3.0                      OPERATION**

**3.1            PRE-START CHECKS**

Only persons completely familiar with the safety aspects (as detailed in *Sect. 7.0*) should be permitted to operate the FINEGUARD™. The operator should thoroughly understand these instructions before attempting to use the FINEGUARD™. Failure to follow these precautions may result in serious personal injury or damage to equipment.

Before the initial start-up of the FINEGUARD™, make the following inspections;

1. Check to make sure each gearbox is securely fastened to the BANDGUARD and Self Adjusting Brush drive shaft and the Torque Arms are securely locked in position.
2. Check all connections to the motor and starting device with the wiring diagram. Check the voltage, phase and frequency on motor nameplate.



*Figure 3.1a - Direction of Rotation*

3. Remove motor cooling fan cowling and rotate screen via fan to ensure that it rotates freely. At the same time check direction of rotation ensuring screenings are carried up toward the outlet. Also check for the direction of rotation of the Self Adjusting Brush.

**IT IS ESSENTIAL TO ENSURE THAT THE SELF ADJUSTING BRUSH OPERATES IN THE OPPOSITE DIRECTION TO THE CHAIN BAND (AS SHOWN IN THE DIAGRAM ABOVE) AND THAT THE SELF ADJUSTING BRUSH IS CONFIGURED TO START 2 SECONDS (MINIMUM) BEFORE THE CHAIN DRIVE BEGINS TO START**

NB: it may be necessary to operate the FINEGUARD™ in hand due to the weight of the panels etc

5. Check gearbox lubrication level.
6. Make sure all lids, guards and safety equipment are properly installed.

### **3.2 OPERATIONAL CHECK-LIST**

The following should be used upon initial start-up and after extended shut-down periods.

1. Operate FINEGUARD™ out of influent flow for 10-15mins (with addition of water), making a continuous check for heating of gearbox bearings and noisy operation.
2. Stop and start FINEGUARD™ several times, and allow to operate for several hours.
3. Shut off FINEGUARD™ and lock out power supply. Remove covers and spot-check bolts for tightness.
4. Replace covers.
5. Ensure material is conveyed in the correct direction.
6. Make certain that the FINEGUARD™ controls (e.g. motion sensor, power monitor) are interlocked correctly and functional.

### **3.3 EXTENDED SHUT-DOWN**

If the FINEGUARD™ is to be inoperative for a long period of time, it is advisable to isolate it from the influent flow and permit it to operate for a period of time after the feed has been cut-off in order to discharge as much material as possible from the screen panels. The panels should be cleaned completely after the FINEGUARD™ is shut down and the power locked out.

### **3.4 STORAGE AND HANDLING ON SITE**

In the situation where goods have arrived on site correct lifting considerations need to be made. Some items may be unloaded by forklift while others will require craneage. Soft slings are required for lifting any free FINEGUARD™ sections to avoid damage. Keep FINEGUARD™s in the crates and boxes until ready for use. Items may become lost if separated.

The laydown area should ideally be a dirt free environment. If this is not possible then frequent cleaning of the surfaces may be required to help prevent tea staining. A build up of dirt and moist conditions is likely to lead to this condition. This also applies to installed equipment.

## 4.0 MAINTENANCE

### 4.1 GENERAL

Generally it is necessary to establish routine periodic inspections of the entire FINEGUARD™ to ensure continuous maximum operating performance. Practice good house keeping. Keep the area around the FINEGUARD™ and drive assembly clean and free of obstacles to provide easy access and to avoid interference with the function of the FINEGUARD™ or drive.

Always –

1. Follow the established local regulations and/or procedures for isolation of equipment.

Or-

2. Lock-out power to motor before doing any maintenance work preferably with a padlock on control panel or isolator.
3. Do not remove padlock from control, nor operate FINEGUARD™, until lids and guards are securely in place.

### 4.2 LUBRICATION

#### **Lubricating the Gearbox**

Oil levels are monitored via the site glass (where fitted), refer to appendix A “FINEGUARD™ Data Sheet” for specific grade and quantity.

### 4.3 SURFACE COATING

This section describes how the FINEGUARD™s surfaces should be treated, if made of stainless steel or not. The materials of construction for your particular FINEGUARD™ are specified in the Appendix ‘FINEGUARD™ Data Sheets’.

Operation in sewage treatment plant or damp environments exposes the FINEGUARD™ to air that may contain chemically or biologically corrosive particles. In these cases painted, galvanised and stainless steel surfaces can be damaged. It is therefore important that personnel follow the operating instructions and remedy any corrosion or damage to coatings as soon as they occur.

- **Painted.**

If of mild steel construction, the band screen carcass will be painted to a given (see data sheet and/or GA) specification. If the surface coating is damaged it needs to be treated immediately to prevent further degradation.

Rust may be ground back to bare metal and the surface carefully cleaned before application of a touch up paint. This can be done via brush or spray where applicable. Please contact Spirac to advise on the paint type required and recommended method of application.



- **Stainless Steel.**

The materials used are 304 or 316SS (refer to Appendix 'FINEGUARD™ Data Sheets'). These materials do not need any special treatment but the following should be observed.

Grinding or welding in close vicinity of the FINEGUARD™ must be avoided. Showering sparks onto the stainless steel can cause a rust brown discolouration.

All stainless steel surfaces must be handled so that the corrosive resistance is not impaired. As a minimum the stainless steel should not come into contact with steel of other qualities during transportation or assembly. Wood, cloth or plastic should be used to pad the stainless steel when lifting or transporting the FINEGUARD™.

The heat input during welding leads to the formation of chromium oxides on the steel surface. The underlying material is depleted of chromium, increasing the risk for corrosion. Passivating removes the oxides, scale and slag. The surface is cleaned to bare metal and a thin protective layer, or "passive" layer, is built up. This restores optimal corrosion resistance and ensures that the weld will have the longest possible life

#### **4.4 MAINTENANCE TIME TABLE**

The following checks outlined below are recommendations only. They can be adjusted to suit the operation time of the FINEGUARD™ or incorporated into existing site maintenance procedures. It is important, particularly with all new equipment that it be monitored for performance / potential hazards and as a result specific procedures developed. Specific procedures for use on site need to be developed by the client which capture OHS and site access requirements. These should also be developed according to frequency of use and adapted to individual site process requirements.

<b>PREVENTIVE MAINTENANCE</b>	
<b>PERIOD</b>	<b>ACTIVITY</b>
<b>Weekly</b>	Listen for any abnormal noises, clanks or scraping sounds. If abnormal noises are heard, stop and isolate the screen and investigate.
	Check the gearbox and motors they should be warm without being hot and free from greace or oil leaks.
	Check function of wash water including pressure and leaks from the spray bar.
	Check for excessive screenings down stream – indicates issue with bottom sealing brush
	Check and clean debris plate to avoid carry over.
<b>Monthly</b>	Check rotary cleaning brush condition and clear snags as necessary, ensure no more than 20% of the panel is not being cleaned – indicates worn brush.
	Check gland packing box for leaks, adjust packing ring and regrease as required.
	Run the Screen and check for excess noise and vibration.

<b>Six Monthly</b>	Visually inspect equipment externally and internally for defects, wear and tear, corrosion and damage.
	Check the oil level in the gearbox and its colour. If the oil is heavily emulsified (cream-like) there is water in the oil. Rectify and replace.
	Check all wearing parts e.g. guide plastics, chain, rotary brush. Adjust or replace as required.
	Assess and regrease all bearings and gland packing, check and refill gearbox oil as required.
	Sample check fasteners and ensure all guards, lids etc are secure.
<b>Two Yearly or 6,000 hours</b>	Change gearbox oil.
	Check condition of the bottom sealing brush and replace if necessary.
	Check condition of chain guides, panel side seals and bottoms guides – replace if gap is 4mm+
	Check condition of the panel guide blocks and replace if heavily worn.
	Assess condition of the bearings and where applicable check for end play – regrease or replace as required
	Check condition of sprockets and drive chains – adjust or replace as required
	Repair any damage to paintwork where required.

#### **4.5 SACRIFICIAL ANODES**

Replacing sacrificial anodes on a screen is an important maintenance task to prevent corrosion. Here are step-by-step instructions on how to replace the 2-hole sacrificial anodes:

##### **Tools and Materials Needed:**

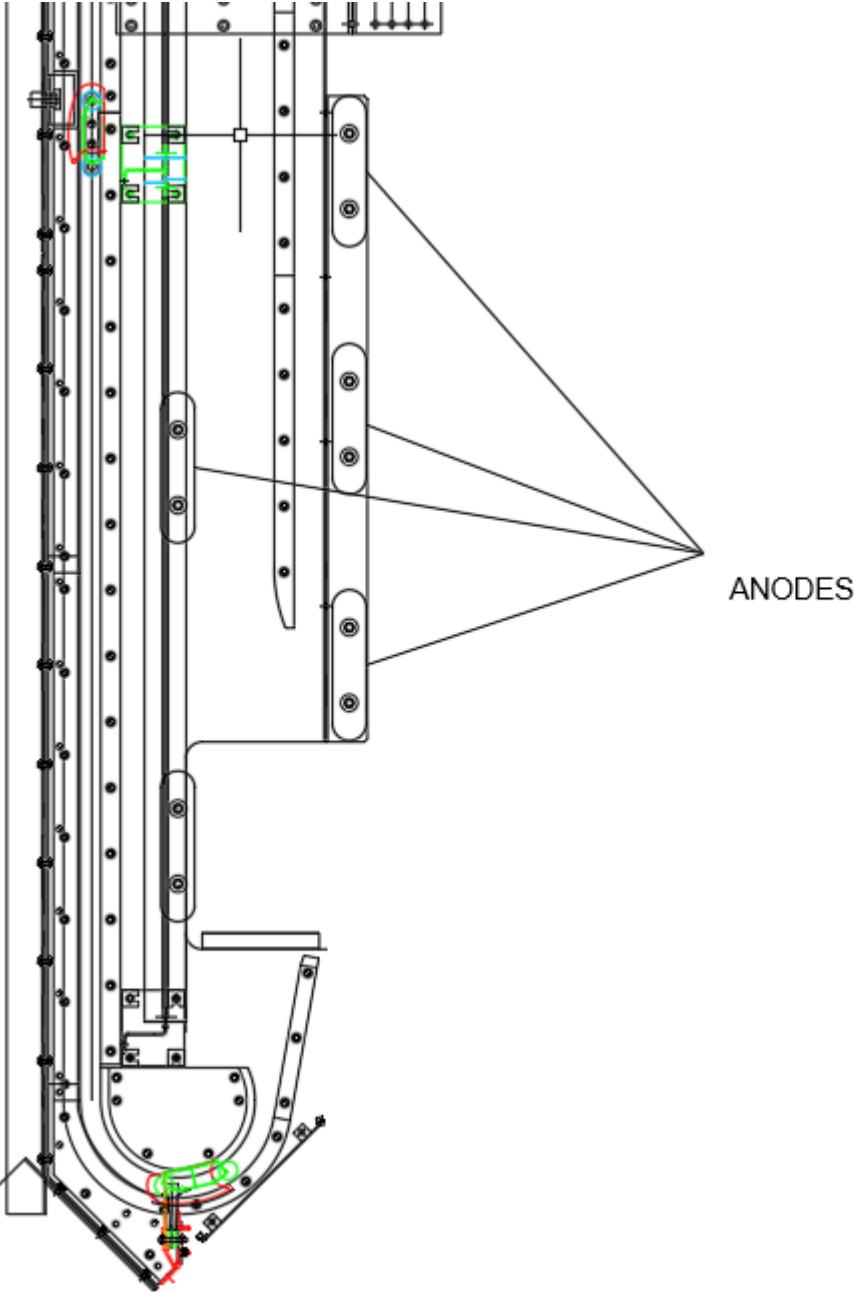
1. New sacrificial anodes (make sure they are compatible with your screen)
2. Wrench or socket set (for M16 bolts)
3. Drainage equipment (if necessary)
4. Safety gear (gloves, eye protection)

##### **Procedure:**

1. **Safety First:** Before you begin, ensure your safety by wearing appropriate protective gear, including gloves and eye protection. If necessary, shut off power to the screen and any associated equipment. Safety should always be the top priority.
2. **Isolate and Drain the Channel:** If the screen has a channel that needs to be isolated and drained, follow these steps:
  - a. Identify the inlet and outlet Penstocks for the channel.
  - b. Close the inlet valve to stop the flow of any liquids or materials into the channel.
  - c. Open the outlet Penstock to allow any existing liquids or materials to drain out. If the screen doesn't have a drainage system, you may need to use a pump or other appropriate equipment to remove the contents from the channel.
3. **Gain Access to the Anodes:** Depending on the design of your screen, access to the anodes may be from the outside or inside. Follow these steps:
  - a. Remove any covers or panels that block access to the anodes.
  - b. If necessary, use any provided access hatches or doors to reach the anodes. In some cases, you may need to partially disassemble the screen to access the anodes.
  - c. In some cases 3 screening panels may require removing and the band requires rotating so the gap is adjacent to the inside anodes
4. **Remove the Old Anodes:** Once you have clear access to the anodes, proceed to remove the old ones:
  - a. Locate the 2 x M16 bolts that secure each anode to the screen side panel.
  - b. Use a wrench or socket set to carefully remove the M16 bolts. Be cautious not to damage the anodes or the surrounding area.
  - c. Carefully detach the old anodes from the screen. Dispose of the old anodes properly according to local regulations.
5. **Replace with New Anodes:** Install the new sacrificial anodes in place of the old ones:
  - a. Position the new anodes in the same location as the old ones.
  - b. Reinsert the 2 x M16 bolts through the anodes and secure them to the screen side panel. Make sure they are tightened securely but not over-tightened, which could damage the anodes or the screen.
6. **Restore Channel and Power (if applicable):** If you had to isolate and drain a channel, reverse the process to reopen the channel for operation. If you turned off power, restore it according to your facility's procedures.
7. **Inspect and Test:** After replacing the anodes, inspect the area for any signs of leaks or issues. Run a test cycle or process to ensure that the screen is functioning correctly.
8. **Record Maintenance:** Maintain a record of the maintenance, including the date of replacement, condition of the old anodes, and any issues encountered.

By following these steps carefully, you can successfully replace the 2-hole sacrificial anodes on your screen, helping to protect it from corrosion and extend its lifespan.

ANODE Location shown below:



## 5.0 SERVICE

### 5.1 REPLACING THE SPRAY NOZZLES

#### Construction

One piece male pipe thread design. Hex body for easy installation which eliminates distortion of orifice during installation.

The spray nozzles are made of Stainless Steel. Spray Characteristics

The nozzle produces a uniform, flat spray pattern without hard edges at pressures of 0.5 bar and up. Tapered edges of spray pattern permit overlapping of patterns with even distribution when desired. Spray impact is greater with narrower spray angles, at a similar flow rate.

Minimum water pressure required is 3 Bar at the spray nozzles. Type 3/8" BSP – JCU 2195 B1

#### Replacement

1. Ensure that the isolator switch is padlocked in the OFF position.
2. Remove the eight bolts that secure the spray pipe and cover assembly to the screen side frame.
3. Unclip the quick release coupling securing the flexible feed hose.
4. Withdraw the pipe assembly from the screen frame, ensuring that the u-blot clamp is left undisturbed on one side to maintain pipe position.
5. Unscrew the faulty nozzle and clean or replace.
6. Replacement is the reverse of items 2 to 4 above.
7. Unlock and switch the isolator to the ON position.

### 5.2 REPLACING THE DRIVE SHAFT

8. Undo the bolts holding the protective cover.
9. Undo the bolts fixing the gearmotor to the FINEGUARD™.
10. Unscrew the locking bolt, spring washer and stepped spacer from the drive shaft, located at the rear of the gearbox (see fig. 5.4a).
11. Remove the gland cover screws from the packing box (see Fig 5.4b).

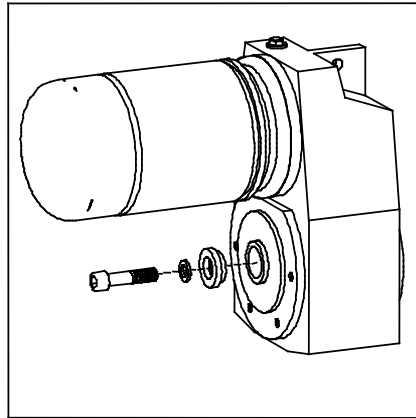


Figure 5.4a - Remove the Locking Bolt, Spring Washer and Stepped Spacer

12. Support the gearmotor with suitable lifting gear.
13. Use an extractor tool to push the drive shaft/pull the gearbox and remove the key from the gearbox keyway before the drive shaft goes through the packing box.

**NOTE - The end of the drive shaft must be protected so that the threads are not damaged. A screw can be threaded into the end of the shaft before this is placed under pressure.**

14. Place the gearmotor on the floor.
15. Remove the old drive shaft from the FINEGUARD™ and lift in the new one.
16. Lift the gearmotor back into position and insert onto the driveshaft.

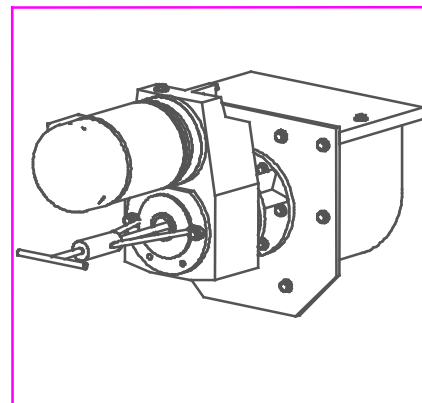


Figure 5.4c - Using an Extractor Tool

17. Turn the gearbox hollow shaft so that the key way is in the correct position in relation to the spirals drive shaft. Push the new drive shaft in so that it takes the place of the old shaft. Place the key in the key way before the drive shaft goes into the gearboxes hollow shaft.
18. Replace all gearmotor fixing hardware and torque correctly.
19. Screw the locking bolt, spring washer and stepped spacer into the new drive shaft.

### 5.3 REPLACING THE BOTTOM SEALING BRUSH

The bottom sealing brush consists of two brush strips. Material H2S Nylon Bristles in an SM 77 extension.

#### Replacement

1. Before carrying out any maintenance on the bottom sealing brushes ensure that the isolator switch is padlocked in the OFF position.
2. Dewater the screen chamber.
3. Check the chamber with the Gas Detector for any gases for a minimum of 10 minutes. If no problems are detected, entry into the chamber may proceed.
4. Remove brush to be replaced.
5. Fit new brush. Check that sealing brush contacts screen panel at all times. Adjust on slots in brush holder to achieve contact.
6. Refill chamber.
7. Unlock isolator switch.
8. Return to duty.

### 5.4 CHAIN ADJUSTMENT

The chain will require checking after 500 hours of use or 3 months whichever is the earliest.

Thereafter check the tension every 6 months.

The need for chain adjustment is more likely to be over the first 3 months of installation when chains and guides are bedding in to each other. The requirement for adjustment is usually detected by an unusual sound. Should adjustment be necessary and providing the chain rollers can be seen entering the bottom guide. Adjust the tension nuts until sufficient tension in the chain lifts the guide rollers clear from the front edge of the bottom chain guide as they enter. Chain tension does not have to be excessively tight or the chains rigid as this pre-load the sprocket bearings and can lead to failure. It is essential that tension is kept equal in both chains and the drive shaft level. When the screen is set to run again after adjustment, ensure that the ammeter readings are the same as those for normal running.

When the screen is set to run again after adjustment, ensure that the ammeter readings are the same as the normal reading.

If after adjusting the chain tension the ammeter readings are significantly higher than the normal readings then the chain tension is too tight and requires backing off further.

Remove the front screen cover and stand well clear and run the screen, visually check

the conditions of the screen panels and seal plates.

## **5.5 REPLACEMENT OF PANEL AND SIDE SEAL PLATES**

In the event of a screening panel or side seal plate becoming damaged, the items can be interchanged by following the instructions as set out below.

Access to the panel band is gained through the two side access covers. Further access can be gained by removal of the top covers to support the panel on removal.

1. Isolate the electricity supply to the drive and brush.
2. Remove the M8 setscrews securing the side access cover at each side of the screen and remove the covers. This will expose the screen band.
3. In inch mode, rotate the Screen to present the panel or side plate centrally in the side access covers.

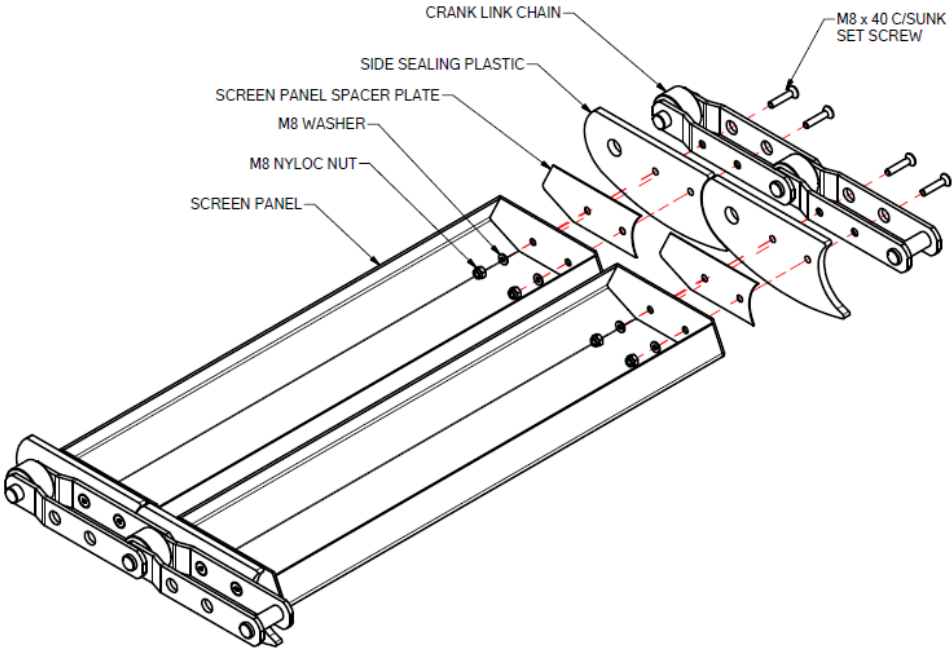
The panels and side plates are supported and fastened to the drive chain at each of the screen. It may also be necessary to loosen the panels either side of the panel/s being replaced to ease the removal/replacement process.

Assembly is as the order below:

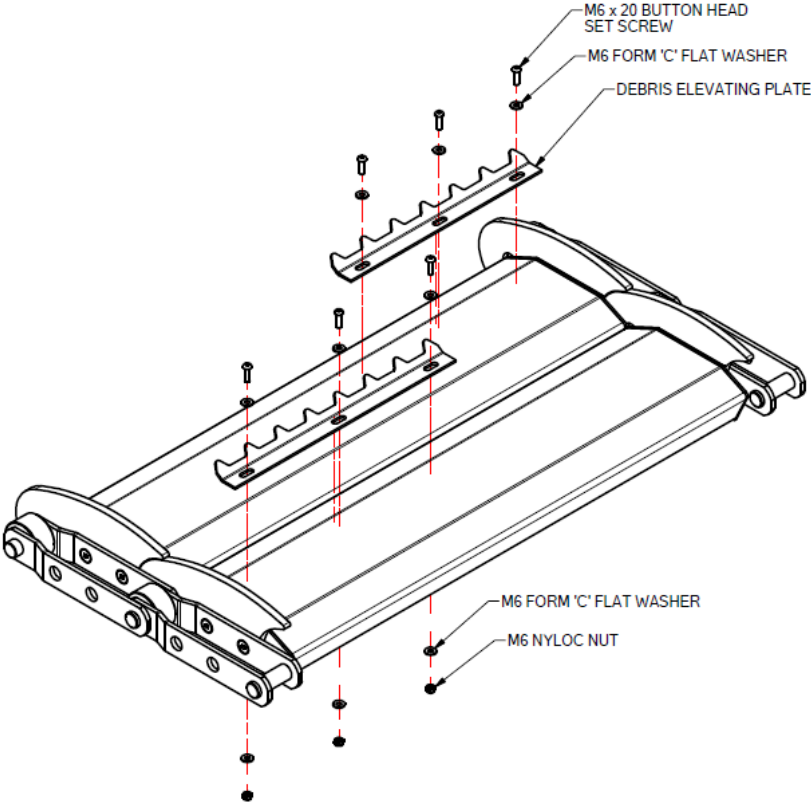
M8 CSK Socket Head Setscrew  
Side Seal Plate  
Screen Panel Spacer Plate  
Screen Panel  
M8 Flat Washer  
M8 Nyloc Nut

4. Remove the two M8 nyloc nuts and washers from one side of the screen panel and withdraw the setscrews. Remove the Screen Panel Spacer Plate and Side Sealing Plastic and set aside.
5. Remove the two M8 nyloc nuts and washers from the other side of the screen panel. Holding the Screen Panel with one hand withdraw the set screws and remove the Screen Panel Spacer Plate and Side Sealing Plastic. Now extract the Screen Panel through the maintenance access hatch. (Note – A two person operation will be required on panels exceeding 1m in length and is also preferential for all sizes where possible)
6. The items can now be interchanged and re-assembled in the order as above.
7. Ensure that the replaced or re-assembled panel is aligned to the correct gap between the panels. This can be determined by observing the adjacent panel gaps.
8. All guards and covers should be replaced and secured before re-connecting the power supply.

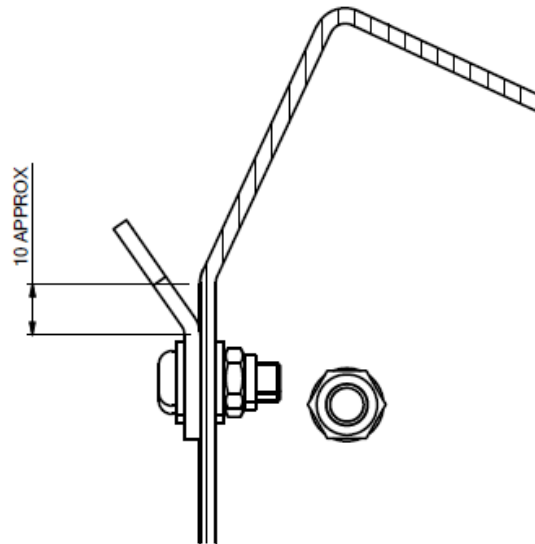
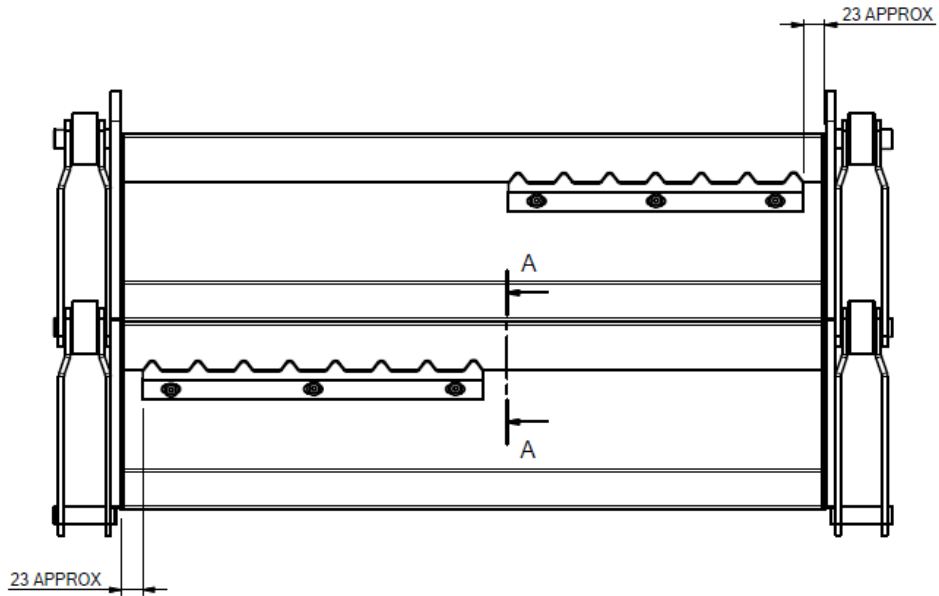
9. Run the screen and check for correct operation.



A certain number of panels in the screen band feature debris elevating plates. If these are present on the panel that is being replaced, then they must be replaced also. See diagram below.



The elevating plates must be positioned as per the panel that has been replaced. Guideline dimensions for their location can be seen in the following diagrams.



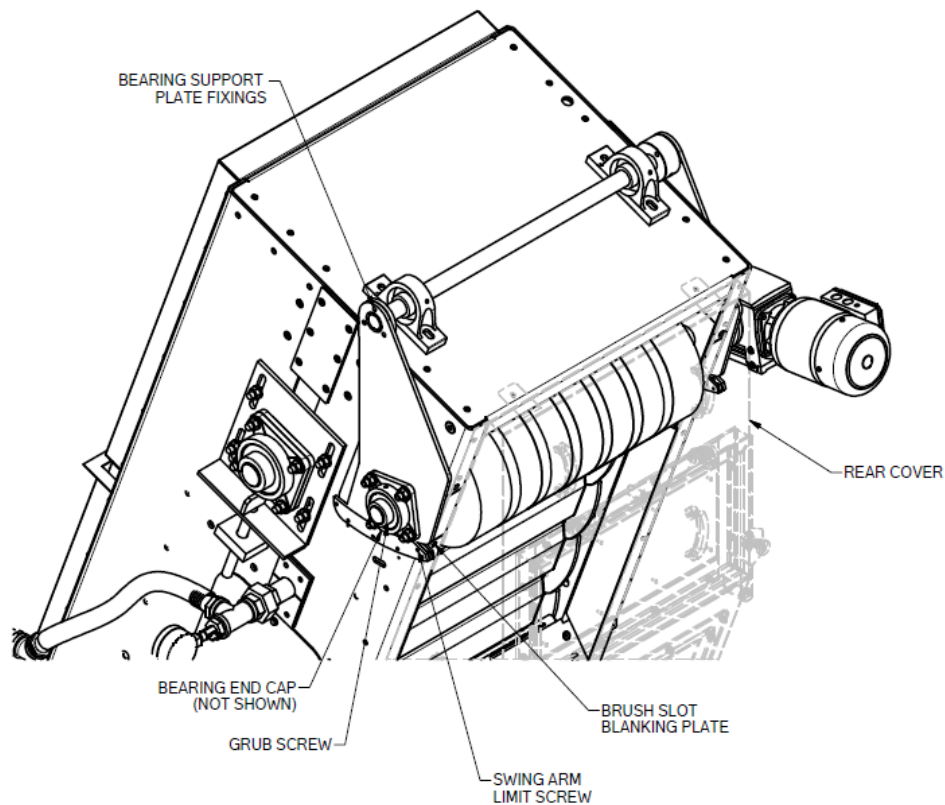
SECTION A-A

## 5.6 SELF ADJUSTING BRUSH REPLACEMENT

In the event of the brush becoming damaged or requiring replacement then the following procedure should be followed.

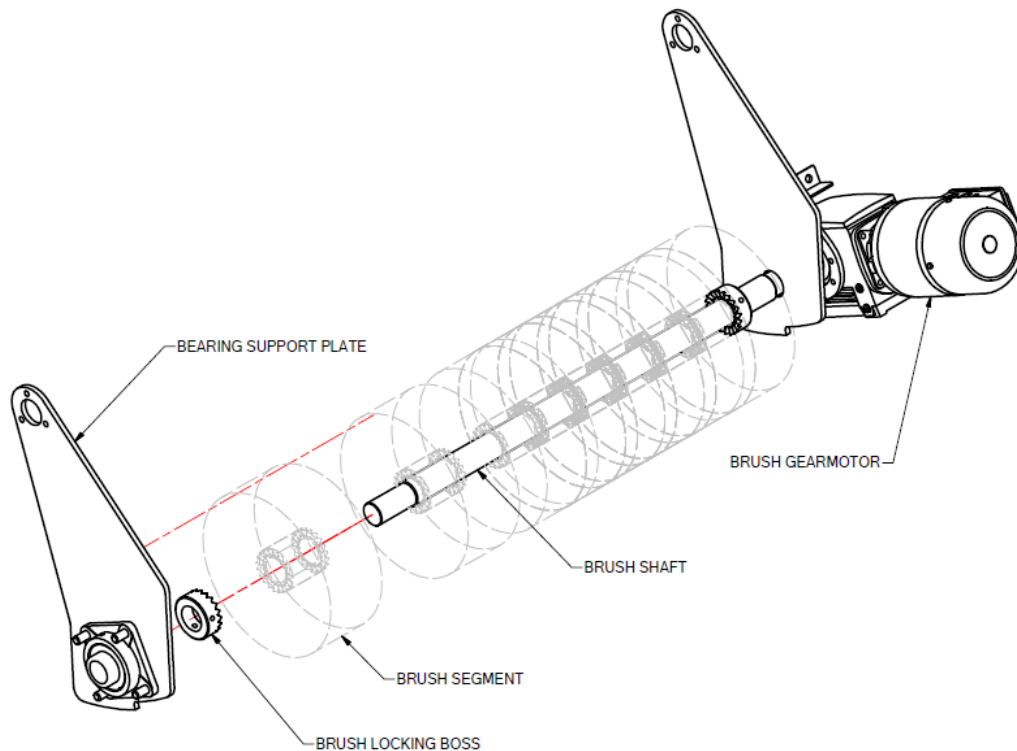
The brushes are to be replaced with ones of 325mm diameter.

1. Isolate the electricity supply to the drive and brush motors
2. Disconnect the motor supply cable. Note that this should be carried out by a qualified electrician.
3. Using a crane, attach lifting chains to rear cover with the lugs if provided. Alternatively, prepare to manually lift with the handles taking all precautions. Remove all fasteners and remove screen cover.
4. Remove the brush slot blanking brackets using a 5 mm hex key (one either side).
5. Remove the swing arm limit screws at the rear of the swinging arm guides.
6. Disconnect the bearing support plate adjusting arm which is held on by M10 bolts at the pivot shaft.



7. The brush assembly is now ready to be lifted from the Screen. Using good lifting practice, extract the brush mechanism from the screen and set down in a safe location.
8. Remove the non drive side bearing from the brush shaft by removing the bearing end cap, loosening the grub screw and withdrawing the bearing and mounting plate complete. This will leave easy access to replace the bush segments.
9. Prior to removing the locking brush collar, mark its location in relation to the shaft by drawing a line across both, using a permanent pen. This will allow the grub screws to mesh with the shaft dimples on reassembly.

10. The brush segments can now be removed by loosening the end collar grub screws and withdrawing the locking collar and segments without removing the motor or gearbox.



11. New segments can be fitted in a similar manor. Make sure that the end collar grub screws mesh with the shaft dimples by aligning the marks made in step
12. Do not over-tighten the grub screws.
13. The unit can be reassembled in the reverse of above. Do not reconnect the power supply until all items are refitted and the rear cover is secured.
14. With the brush shaft fitted the brush should be adjusted and the screen run to observe correct operation and cleaning. (Please refer to routine maintenance section of this manual)

## **5.7 SCREEN MOTOR AND BRUSH MOTOR REPLACEMENT**

### Assembly/Fitting

The drive motor is supplied fitted to the gear unit. In the event of it being removed the following instructions should be observed.

### Fitting the Motor

1. Clean the locating faces of the motor and gearbox flange and the motor shaft.
2. Fit the key provided into the motor shaft.

3. Slide on the geared drive bush provided with the gearbox and when fully in position lock in situ with the grub screw.
4. Offer the motor to the gearbox and align the teeth on the drive bush before sliding into position.
5. Rotate the motor until the terminal box is in the desired position and secure the motor to the gear unit using the four flange bolts, ensuring the bolts are tightened uniformly.

### Electrical Connection

Ensure that the voltage range specified on the motor corresponds to the supply voltage and the wires are connected in accordance with the wiring diagram.

**Note:** The motor is wired for a specific direction of rotation and is clearly marked. Start the motor in hand to check that the direction is correct.

A qualified electrician must make all electrical connections.



**6.0 TROUBLESHOOTING**

**6.1 GENERAL**

Between regular maintenance inspections, be alert for signs of motor or FINEGUARD™ trouble. Common symptoms are listed below.

Correct any trouble immediately and AVOID COSTLY REPAIR AND SHUTDOWN.

Troubleshooting shall be done with the power supply disconnected and locked off, except for those checks which cannot be performed without voltage.

Always make sure there is no one near the FINEGUARD™ when the power supply is turned on. Use the following table as an aid to troubleshooting. It is assumed the FINEGUARD™ and installation have formerly functioned satisfactorily.

**6.2 TROUBLESHOOTING CHART**

<b>PROBLEM</b>	<b>CAUSE</b>	<b>REMEDY</b>
FINEGUARD™ Fails to Start	Blown Fuse	Determine and correct cause of failure and replace fuse
	Motor protection device activated	Reset protective device. Identify and correct cause for failure
	Motor protection device faulty or will not reset	Check protection device for faults
	Motor not connected for proper voltage	Check connection diagram in conduit box lid and correct the wiring.
FINEGUARD™ starts but motor protection device trips immediately	Panel jam from foreign object entering trough.	Remove object and restart
	Gearbox seizure due to no oil	Remove gearbox and service
	Settings on motor protection incorrect	Check and re-set
	Motor improperly connected	Check connection diagram in conduit box lid and correct the wiring
Excessive vibration	Loose drive	Check and re-tighten fixing bolts
	Unstable ground conditions	Rectify
	Loose support/trough connections	Check and re-tighten
FINEGUARD™ output is too low	Worn/damaged panels	Replace panels
	Material being conveyed is not as originally specified	Contact SPIRAC



**TROUBLESHOOTING CHART cont. . . . .**

<b>PROBLEM</b>	<b>CAUSE</b>	<b>REMEDY</b>
Motor overheats	Motor not connected for proper supply voltage	Check connection diagram on conduit box lid and correct wiring
	Insufficient cooling air volume due to obstructed air flow	Provide clearance around fan area
	Motor allowable duty cycle is exceeded. Too many starts per hour	The problem may not be solved by a larger unit. Review with manufacturer
	Single phasing due to break or loose connection in supply line or blown fuse	Repair supply line. Replace fuse
FINEGUARD™ jamming	Excess rag ball jamming between panel and lids	Reduce material inflow. Break up rag ball
	Foreign object in FINEGUARD™	Remove object
FINEGUARD™ runs in wrong direction	Electrical cable leads wired incorrectly	Reconnect two phase wires.
Panels look blinded	No/Low Wash water pressure	Check wash water system and adjust
	Spray nozzles blocked	Clean or replace nozzles
	Brush out of adjustment	Adjust brush
Noisy Screen Band	Incorrect band tension	Check for broken or flattened off rollers on the chain band.
Screen Trips	Blockage in band	Check and remove blockage
	Incorrect band tension	Check for broken or flattened off rollers on the chain band.
	Electrical issue	Check electrical controls and sensors
Carry over	Damaged seals	Check and replace damaged seals

## 7.0 SAFETY

### 7.1 GENERAL

The following instructions should be observed when handling or working with the FINEGUARD™ –

1. SPIRAC equipment is supplied conforming to AS 4024.1 - 2006 - Safeguarding of Machinery and complies providing all guards remain locked in place with the bolts supplied. Any work that necessitates removal of any guarding must be carried out in strict accordance with the SPIRAC Operation and Maintenance manual supplied. However Local work practices and regulations should be applied to the selection of any protective equipment or labeling that may be required.
2. Ensure the FINEGUARD™ is maintained in accordance with section 4. MAINTENANCE of this manual.
3. Any person who will install, operate, service, repair or supervise the operation of this equipment must be trained and informed in accordance with local regulations and legislation.
4. Where local regulations dictate that Work method statements, Safe working practice statements, Job Safety Analysis, Pre-commencement Hazard checks and attendance to tool box meeting be adhered to, it is the responsibility of the owner/operator of this equipment to ensure the forenoted is actioned and recorded.
5. Always isolate the FINEGUARD™ main power source and ensure that the FINEGUARD™ cannot be started before commencing any servicing work.
6. Ensure that all service equipment, such as but not restricted to, chain blocks, slings, staging is well maintained and is in accordance with local regulation and legislation.
7. Never try to lift more than one item at a time i.e. protective lids (or lids).
8. Take care to avoid compression injuries when removing or replacing any element of the FINEGUARD™.
9. Personnel operating or servicing the FINEGUARD™ should be equipped with the correct protective wear should a biological or mechanical hazard be present. Local work practices and regulations should be applied to the selection of the protective equipment.
10. Personnel working frequently in these areas where FINEGUARD™s have remote control or automatic start/stop, must be informed of the operation.
11. On completion of any service work, please refer to this manuals section 3. OPERATION, for the necessary instruction on re-starting.
12. Ensure that no one is working on the FINEGUARD™ before it is started.
13. Never use the FINEGUARD™ for other purposes other than which it is designed or above its given capacity.
14. Personnel should never use the FINEGUARD™ as a walkway/access platform to go to other areas.

### 7.2 NOISE

The equivalent continual A-wave noise level during normal operation is <70dB.

In cases where the equivalent continual A-wave noise level exceeds 70 dB, ear protection must be worn.

**8.0 SPARE PARTS**

**8.1 FINEGUARD™ PARTS DESCRIPTION**

The list of spare parts gives the correct names for the parts of the FINEGUARD™ and therefore eases the ordering of spare parts.

The dimensions and technical data for your FINEGUARD™ are specified on the GA Drawing. Make sure you have the drawing available when ordering parts by telephone. Also refer to Technical Specifications in Appendix A 'FINEGUARD™ Data Sheets'.

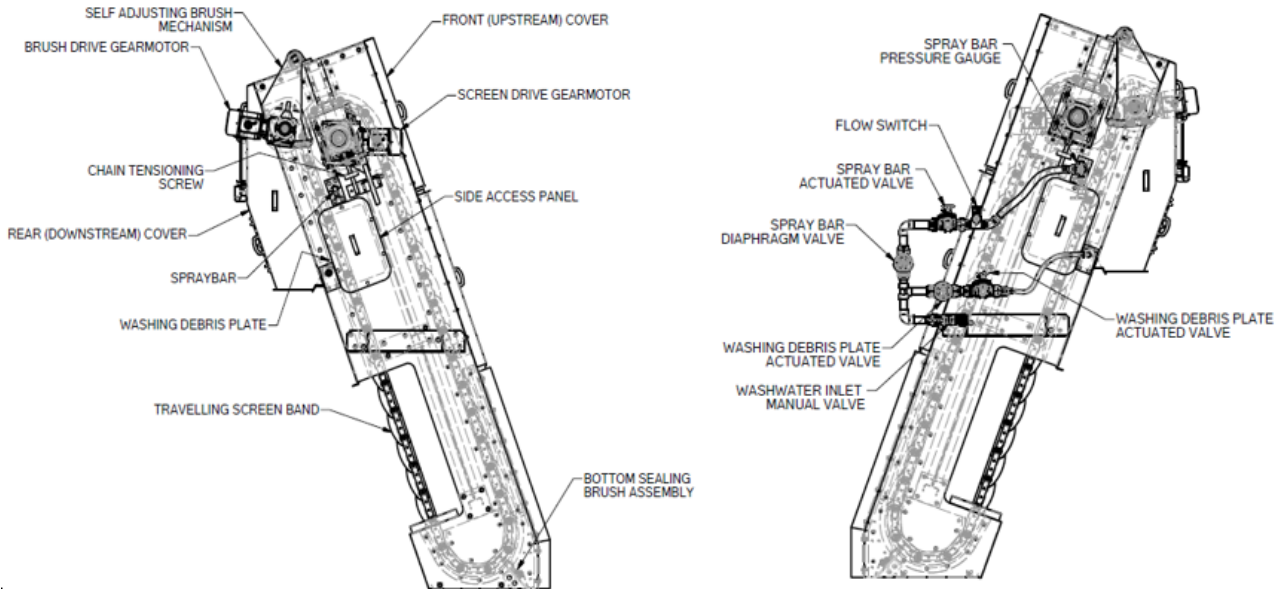


Figure 8-1. FINEGUARD™ Parts

FINEGUARD™ Standard Parts			
	Chains		Rotary brush segments
	Guide plastics		Bottom Sealing brushes
	Sealing plastics		Screening panels
	Brush drive gearmotor		Screen drive gearmotor
	Spraybar		Washwater manual inlet valve
	Spraybar actuated valve		Spraybar pressure guage
	Flow switch		Washing debris actuated valve



**8.2 RECOMMENDED SPARE PARTS**

SPIRAC have endeavoured to provide you with equipment that will give you continued and long-lasting service. However, we recommend that the following wear items be kept as a minimum to ensure uninterrupted service:

<b>Drive Station (rotary brush and screen drive)</b>	<ul style="list-style-type: none"> <li>• Motor</li> <li>• Gearbox</li> <li>• Driveshaft</li> </ul>	1 of each per FINEGUARD™.
<b>FINEGUARD™</b>	<ul style="list-style-type: none"> <li>• Rotary brush set</li> <li>• Screen panel set</li> <li>• Chain set (both sides)</li> <li>• Sealing brush</li> <li>• Guide plastic set</li> <li>• Washwater nozels</li> <li>• Anodes</li> </ul>	1 set of each per FINEGUARD™
<b>Instrumentation (Where applicable)</b>	<ul style="list-style-type: none"> <li>• Wash Water actuator</li> <li>• Spraybar actuated valve</li> <li>• Flow switch</li> </ul>	1 per FINEGUARD™

For actual part numbers and descriptions, please refer to Technical Specifications in Appendix A 'FINEGUARD™ Data Sheet' and the General Arrangement Drawings, also quoting the drawing number.


**8.3 SUPPLIER CONTACT**

SPIRAC has Sales Offices throughout the world. Manufacturing is undertaken in Australia and Sweden. If you are unsure of your Agent, please make your initial contact to –

SPIRAC Limited  
 SPIRAC House, Thorpe Mead  
 Banbury, OX16 4AB  
 United Kingdom  
 Phone : +44 (0) 1295 270335  
 Email : spares@spirac.co.uk

# **APPENDIX A**

**FINEGUARD DATA SHEETS**

	<b>Document Number :</b>		
	<b>Project :</b>		
	<b>SPIRAC Client :</b>		
	<b>FINEGUARD™ Type :</b>		
	<b>SPIRAC FINEGUARD™ Tag :</b>		
	<b>Drawing No :</b>		<b>Rev :</b>
<b>FINEGUARD™ DATA SHEET</b>			

<b>Screen drive - Motor Details</b>	
Manufacturer	
Frame Size / Poles	
Rated Power (kW)	
Rated Current (A)	
Motor Speed (rpm)	
Voltage / Hertz / Phase	
IP Rating	
Finish	

<b>Brush drive - Motor Details</b>	
Manufacturer	
Frame Size / Poles	
Rated Power (kW)	
Rated Current (A)	
Motor Speed (rpm)	
Voltage / Hertz / Phase	
IP Rating	
Finish	

<b>Screen drive - Gearbox Details</b>	
Manufacturer	
Model	
Ratio (i)	
Output Speed (rpm)	
Mounting Position	
Anti-Condensation Heater (230V)	
Oil Level Sight Gauge	
Torque Limiter	
Finish	

<b>Brush drive - Gearbox Details</b>	
Manufacturer	
Model	
Ratio (i)	
Output Speed (rpm)	
Mounting Position	
Anti-Condensation Heater (230V)	
Oil Level Sight Gauge	
Torque Limiter	
Finish	

<b>Application Details</b>	
Material to screen	
Capacity (L/s)	

<b>Lubrication</b>	
Grease	
Packing Gland	
type and capacity: Brush drive	
type and capacity: Screen drive	

<b>Panel Details</b>	
Panel perf size	
Panel width	
Panel height	
Panel thickness	

<b>Construction Details</b>	
Frame / Lid Material	
Panel (Material/Thkness)	
Dry FINEGUARD™ weight (kg)	
Anodes weight (kg)	



**SPIRAC<sup>®</sup>**

**Document Number :**

**Project :**

**SPIRAC Client :**

**FINEGUARD™ Type :**

**SPIRAC FINEGUARD™ Tag :**

**Drawing No :**

**Rev :**

**FINEGUARD™ DATA SHEET**

**Screen drive - Motor Details**

Manufacturer	
Frame Size / Poles	
Rated Power (kW)	
Rated Current (A)	
Motor Speed (rpm)	
Voltage / Hertz / Phase	
IP Rating	
Finish	

**Brush drive - Motor Details**

Manufacturer	
Frame Size / Poles	
Rated Power (kW)	
Rated Current (A)	
Motor Speed (rpm)	
Voltage / Hertz / Phase	
IP Rating	
Finish	

**Screen drive - Gearbox Details**

Manufacturer	
Model	
Ratio (i)	
Output Speed (rpm)	
Mounting Position	
Anti-Condensation Heater (230V)	
Oil Level Sight Gauge	
Torque Limiter	
Finish	

**Brush drive - Gearbox Details**

Manufacturer	
Model	
Ratio (i)	
Output Speed (rpm)	
Mounting Position	
Anti-Condensation Heater (230V)	
Oil Level Sight Gauge	
Torque Limiter	
Finish	

**Application Details**

Material to screen	
Capacity (L/s)	

**Lubrication**

Grease	
Packing Gland	
type and capacity: Brush drive	
type and capacity: Screen drive	


**Panel Details**

Panel perf size	6mm
Panel width	2210mm
Panel height	200mm
Panel thickness	3mm

**Construction Details**

Frame / Lid Material	316SS
Panel (Material/Thkness)	316SS /3mm
Dry FINEGUARD™ weight (kg)	4165kg
Anodes weight (kg)	Aluminium 4.5kgs



	<b>Document Number :</b>			
	<b>Project :</b>			
	<b>SPIRAC Client :</b>			
	<b>FINEGUARD™ Type :</b>			
	<b>SPIRAC FINEGUARD™ Tag :</b>			
	<b>Drawing No :</b>		<b>Rev :</b>	
<b>FINEGUARD™ DATA SHEET</b>				

<b>Screen drive - Motor Details</b>	
Manufacturer	
Frame Size / Poles	
Rated Power (kW)	
Rated Current (A)	
Motor Speed (rpm)	
Voltage / Hertz / Phase	
IP Rating	
Finish	

<b>Brush drive - Motor Details</b>	
Manufacturer	
Frame Size / Poles	
Rated Power (kW)	
Rated Current (A)	
Motor Speed (rpm)	
Voltage / Hertz / Phase	
IP Rating	
Finish	

<b>Screen drive - Gearbox Details</b>	
Manufacturer	
Model	
Ratio (i)	
Output Speed (rpm)	
Mounting Position	
Anti-Condensation Heater (230V)	
Oil Level Sight Gauge	
Torque Limiter	
Finish	

<b>Brush drive - Gearbox Details</b>	
Manufacturer	
Model	
Ratio (i)	
Output Speed (rpm)	
Mounting Position	
Anti-Condensation Heater (230V)	
Oil Level Sight Gauge	
Torque Limiter	
Finish	

<b>Application Details</b>	
Material to screen	
Capacity (L/s)	

<b>Lubrication</b>	
Grease	
Packing Gland	
type and capacity: Brush drive	
type and capacity: Screen drive	

<b>Panel Details</b>	
Panel perf size	
Panel width	
Panel height	
Panel thickness	

<b>Construction Details</b>	
Frame / Lid Material	
Panel (Material/Thkness)	
Dry FINEGUARD™ weight (kg)	
Anodes weight (kg)	

# **APPENDIX B**

**DRAWINGS**

# **APPENDIX C**

## **ANODE INFORMATION**

# **APPENDIX D**

**OTHER EQUIPMENT**