

**The  
HAMILTON DRUM SEEDER**

Digital Stepper Motor Model

Operator's Manual

Issue 8

10/07

**HAMILTON DESIGN LTD**

Green Lane, Littlewick Green, Maidenhead, Berks. SL6 3RH England.

Tel: +44 (0)1628 826747 Fax: +44 (0)1628 822284

E-mail: [support@hamilton-design.co.uk](mailto:support@hamilton-design.co.uk)

Website: [www.hamilton-design.co.uk](http://www.hamilton-design.co.uk)



# INDEX

## SECTION 0

- 0.0 Registration Form
- 0.1 Safety Notes

## SECTION 1 - CHANGING TRAYS

- 1.0 Step by Step Instructions for Changing Trays
  - 1.1 Preparation & Drum Removal
  - 1.2 Drum Fitting Duplex Drum Instructions
    - 1.3.1 Changing Rows
    - 1.3.2 Timing Marks
  - 1.4 Adjusting Seeder Height
  - 1.5 Setting Guide Width
  - 1.6 Setting First Row Position
  - 1.7 Setting the Row Pre-set Counter
    - 1.7.1 Adjusting the Pitch
  - 1.8 Cleaning the Drum
    - 1.8.1 Cleaning Passageways
  - 1.9 Fitting the Seed Valley End Seals

## SECTION 2 - SETTING UP FOR SEEDING

- 2.0 Step by Step Instructions for Changing Seed
  - 2.1 Hopper Selection/Preparation
  - 2.2 Setting Curtain Air
  - 2.3 Setting Cleaning Air
  - 2.4 Setting Release Air
  - 2.5 Vacuum Control
  - 2.6 Dry Run
  - 2.7 Tray Counter
  - 2.8 Vacuum Cleaner

## SECTION 3 - MAINTENANCE, TROUBLESHOOTING & DESCRIPTION OF CONTROLS

- 3.1 Maintenance
  - 3.1.1 Scraper Blades
  - 3.1.2 Emitters & Receivers
  - 3.1.3 Tensioning & Tracking
- 3.2 Lubrication
  - 3.2.1 Conveyor Lubrication
  - 3.2.2 Seeder Lubrication
  - 3.2.3 Vacuum Pump Filters
- 3.5 Troubleshooting
- 3.6 Description of Controls
- 3.7 Other Controls
- 3.8 Air Jets

## SECTION 4 - SPARES KIT LISTS

- 4.1 Spares Kit for Assembled Drum Seeder
- 4.2 Spares Kit for Crated Drum Seeder

## SECTION 5 - FINAL ASSEMBLY INSTRUCTIONS

## SECTION 6 - ACCESSORIES

- 6.1 Vermiculite Coverer
- 6.2 Roller Dibblers
- 6.3 Oscillating Seed Tray

## **TABLES AND FIGURES**

### **TABLES:**

- TABLE 1** Standard Tray Settings  
**TABLE 2** Table of Pressure and Vacuum Settings

### **FIGURES:**

- FIGS 1-12** Instruction Photographs  
**FIG 13** Lubrication Diagram  
**FIG 14** Wiring Diagram for Drum Seeder  
**FIG 15** Wiring Diagram for Coverer

### **Exploded Views & Parts Lists**

Throughout this manual, numbers shown in square brackets [ ] refer to the appropriate figure.

## 0.0 REGISTRATION FORM

In order to keep up to date with latest developments, please fill in and return the form below:



Name:	
Company:	
Address:	
Country:	
Seeder Serial Number:	
Telephone:	Fax:

Please return to:

HAMILTON DESIGN LTD,  
GREEN LANE,  
LITTLEWICK GREEN,  
MAIDENHEAD,  
BERKSHIRE SL6 3RH,  
ENGLAND

## **0.1 SAFETY NOTES**

### **READ THIS FIRST**

As with all our products, great care has been taken in the design of this machine to ensure safety to operators. However, the following points should be noted, and explained to all operators by the person responsible for safety in your organisation:

- 1) During all maintenance, dismantling, and adjustment, disconnect the mains air and electricity supplies (where appropriate) from the machine.
- 2) The machine should never be operated without all guards and covers being securely fixed in position.
- 3) Do not tamper with any air or electrical connections inside or outside control panels. If you feel uneasy carrying out maintenance work, have a qualified engineer or electrician do it for you.
- 4) This machine is designed for the specific purpose of sowing seeds, and should not be put to any other use.

## **SECTION 1 - CHANGING TRAYS**

### **1.0 - Step by Step Instructions for Changing Trays**

- 1) Change drum (1.1, 1.2, & 1.3)
- 2) Adjust Seeder height if necessary (1.4)
- 3) Set guide width if necessary (1.5)
- 4) Adjust first row position (1.6)
- 5) Set row pre-set counter (1.7)
- 6) Set tray pitch (1.7.1)
- 7) Set up for seed (Section 2)
- 8) Try a dry run (2.6)

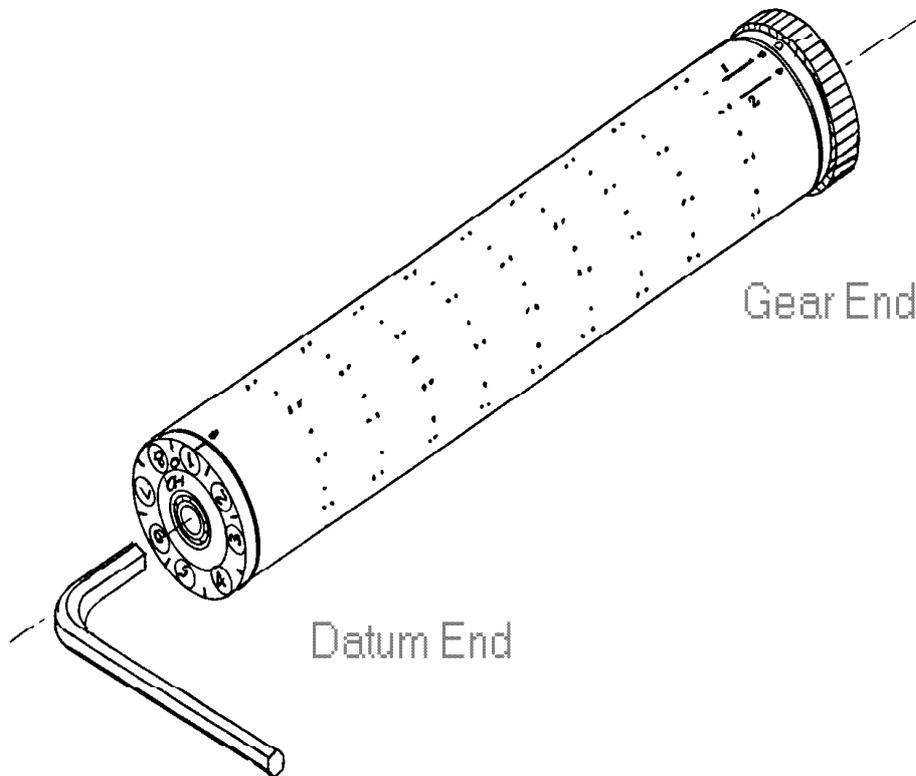
### **1.1 - Preparation & Drum Removal [Figs 2, 3, 4 & 7]**

- i) Remove the brushes, catch tray and the seed hopper.
- ii) Undo the clamp screws from the curtain tubes and draw curtain tubes out from the outboard end plate.
- iii) Withdraw the tension spring wire from the tensioner shaft.
- iv) The roller should now swivel down away from the drum.
- v) Remove the bottom scraper blade by undoing the three screws.
- vi) Undo the two retaining screws and withdraw the outer drum mounting post, whilst supporting the drum with the other hand.
- vii) Carefully withdraw the drum from the front of the seeder. Check that the 'O' ring seals are in position at the inboard end of the drum (gear end).

### **1.2 - Drum Fitting [Figs 2, 4, 7 & 8]**

- i) Select the required drum and curtain tubes. Ensure that the 'O' ring seals and location peg are correctly fitted to the inboard end of the drum. Also check that the bearings are fitted into each end of the drum.
- ii) Slide the drum into the front of the seeder (gear end first), making sure that the drum location peg engages with the correct hole in the rotary valve.
- iii) Line up the outer drum mounting post and engage in the outer end of the drum. Note that pressure is required to overcome spring forces before the drum mounting post will seat flush with the outer end plate.
- iv) Fit the two screws to the mounting post and tighten.
- v) Refit the bottom scraper plate and three fixing screws.
- vi) Raise the roller into contact with the drum and refit the tension wire to the end of the tensioner shaft. Hook the tensioner wire over the drum mounting post.
- vii) Identify the curtain tubes. The one with two rows of holes fits in the lower position in the end plate, and the one with one row fits into the upper position in the end plate.
- viii) Slide the curtain tubes into position and connect to the air pipes at the inboard end.
- iv) Refit the curtain tube clamps and fit the screws finger tight. The indicating pins should be pointing radially outwards from the centreline of the drum mounting post. Tighten the screws.

### 1.3 - Duplex Drums



#### 1.3.1 - To change rows

- i) Locate 5mm A/F hex key in the datum end of the drum as indicated, and loosen the cap head screw one turn only.
- ii) Align the mark at the gear end with the line on the drum surface to connect the appropriate line of holes, and tighten the cap head screw.

#### 1.3.2 - Timing Marks

The timing marks on the datum end of the drum numbered 1 to 8 correspond to the primary line of holes (as indicated on line 1 of the drawing). When the secondary holes (line 2) are used, the timing marks between the numbers should be used.

### 1.4 - Adjusting Seeder Height

Adjust the knurled lock nuts on the seeder mounting studs so that the drum is about 1/4" (6mm) above the tray. Make sure that the seeder is level in both directions before tightening upper locknuts. If the top surface of the trays are brushed clean, then seed placement will be more accurate if the clearance is reduced to 1/8" (3mm).

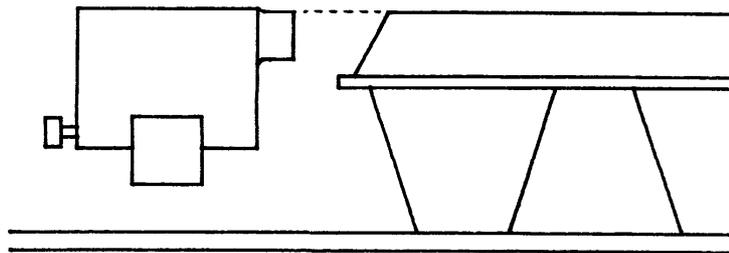
### 1.5 - Setting Guide Width

The tray guides should be adjusted so that the tray is guided centrally and squarely past the drum. Make sure that the tray pockets line up with the pickup holes in the drum. It is best to allow about 0.04" (1mm) side float for the trays.

Make sure that any variation in tray width does not cause trays to stick between the guides.

### 1.6 - Setting Beam [Fig 5]

- i) Set the position of the beam as in the sketch below, so that the beam is broken by the top portion of the tray. The top of the beam housing should be flush with the top of the tray.
- ii) Set the beams longitudinally according to Table 2.



### 1.7 - Setting the Row Pre-set Counter [Fig 6]

This is set on the Drum Control Box to the number of rows in your tray. When the beam is broken the drum will start to rotate, and it will stop after the number of rows you have set have been sown.

#### 1.7.1 - Adjusting the Belt/Drum Speed to give the Correct Pitch [Fig 6]

Look up the settings for the tray you are using in Table 1, and make adjustments to the first row and pitch controls. If there are any discrepancies in the settings, or the trays you are using are not listed, then take the following steps:

- i) Mark the side of a tray with lines that correspond to the centre of the cells.
- ii) Select a pitch from Table 1, which is similar to the trays you are using.
- iii) Start the conveyor at a slow speed, and load the tray on the belt.
- iv) Look at the datum end of the drum and watch the timing marks as the tray passes through. If the drum moves too slowly relative to the tray, increase the pitch control number. If it moves too fast, reduce the number.
- v) An adjustment may also be necessary to the first row position. Setting this control to a higher number will give a longer delay before the first row is dropped. Setting to a lower number will give a shorter delay.
- vi) When you have reached the exact setting, write it down for future reference!

### 1.8 - Cleaning the Outer Surface of the Drum

- i) It is important that the drum surface and holes are clean. Any oily or dusty deposits will cause seed to stick to the surface and impair performance.

Dirt in the holes picked up during storage of the drum will also cause problems with pickup.

- ii) Using an oil free spirit (methylated spirit or pure alcohol are suggested) on paper towelling, wipe the surfaces of both the roller and the drum. This is best achieved whilst the machine is running, without seed. Use the manual override button to rotate the mechanism with the conveyor running slowly. Allow excess spirit time to evaporate.
- iii) Stop the drum and clean out the holes with the cleaning wire provided.
- iv) Blow off the whole machine with a pipe attached to the vacuum cleaner outlet on the control box.

#### **1.8.1 - Cleaning the Internal Passageways of the Drum**

The internal galleries of the drum can be cleaned by removing the drum ends completely. Undo the screw in the datum end 10 turns, and loosen the datum end by pushing on the gear end. Undo the screw completely, remove the datum end, and withdraw the gear end and tie rod.

The galleries can now be cleaned with a cleaning brush. The gear end ports can be cleaned with a cotton bud.

When reassembling the drum, take care to align the number 1 timing mark with the dimple on the drum surface. See figure in section 1.3.

#### **1.9 - Fitting the Seed Valley End Seals [Fig 9]**

- i) The purpose of these seals is to contain the seed within the pickup area (i.e.between the outermost holes of the drum).
- ii) Clip the seals to the curtain tubes as shown, and make sure they fit snugly into the seed valley. Always remove them after sowing to prevent the clip arms losing tension.
- iii) The Air Jets blow gently onto the seals to prevent seeds creeping under them. See section 3.8 for a description of this control.

## **SECTION 2 - SETTING UP FOR SEEDING**

### **2.0 - Step by Step Instructions for Changing Seed**

- 1) Change the drum if necessary (Section 1)
- 2) Change the hopper if necessary (2.1)
- 3) Set curtain air (2.2)
- 4) Set cleaning air (2.3)
- 5) Set release air (2.4)
- 6) Set vacuum (2.5)
- 7) Try a dry run (2.6)

### **2.1 - Hopper Selection and Preparation [Fig 1]**

- i) Several spare hoppers are provided with the seeder for you to custom fit as required.
- ii) The rate and amount of seed fed from the hopper is determined by the size of the cut-outs in the sides of the spout, and the height at which the spout is held above the seed valley. Increasing both of these will effect an increase in feed rate and amount of seed into and along the valley. When usage of seed is very high (i.e. multi sowing of vegetable seeds) more than one hopper can be used.
- iii) In practice, one should aim to have a very small amount of seed reaching the sealing brushes with the machine operating at full speed. This will obviously be different when the machine is seeding, compared with when the drum is running with seed but without vacuum. Aim for the reservoir of seed to be held in the hopper, and not in the valley.
- iv) Bearing these points in mind, testing with old unwanted seed if possible, adjust the size of cut-out to suit the seed you are using.
- v) One hopper will already have been prepared for pansy seed (for test purposes) and you can use this for comparisons.
- vi) If the seed tends to flow to one end of the valley faster than to the other, position the hopper mounting clamp further away from that end. Make sure the hopper does not knock off seed which has been picked up.
- vii) For very small seeds (petunia, lobelia etc.) use the funnel reducers supplied.

### **2.2 - Setting Curtain Air [Fig 10]**

Air holes in the curtain tubes provide jets of air which are directed onto the passing seeds to help singulate any multiple pickups. The force of these jets is adjusted by the pressure regulator on the control panel. To start with, set this pressure as given in Table 2. Adjustments may be necessary depending on variety to be sown. Adjust this setting taking care not to blow off any single pickups.

### **2.3 - Setting Cleaning Air [Fig 10]**

This is the air which purges the hole after the seed discharge. It is normally set to 40 psi (2.7 bar) but may be increased if very dirty seed is used.

### **2.4 - Setting Release Air [Fig 10]**

This air releases the seed from the drum at around bottom dead centre (the 6 o'clock position). This should be set according to Table 3. If too high a pressure is used, misplacement of the seed on the growing medium could occur. Too low a pressure will result in the seed being scraped off by the lower scraper blade and this could result in seed damage. The setting has to be made at operating speed.

### **2.5 - Vacuum Control [Figs 10 & 11]**

The vacuum is regulated by the valve on the side of the control box.

Turning the red adjustment knob clockwise increases vacuum, turning it anticlockwise reduces vacuum.

### **2.6 - Dry Run and Beam Adjustment [Fig 5]**

When all the settings have been made try a dry run using a white test tray if possible. If this is not possible lay wet white paper onto an empty tray and run this through the machine, having made sure that the paper will not touch the underside of the drum. With the conveyor set to slow, observe the seed falling onto the test tray. If the first row is released too early, increase the first row position setting. If it falls too late, reduce it. Check the seed is falling into the centre of each cell. If the pitch is incorrect, make adjustments to the pitch control.

Always leave a 35cm (1½") gap between trays to allow beam to reset and pick up on the leading edge of the following tray.

### **2.7 - Tray Counter [Fig 6]**

The tray counter is positioned on the front of the control panel. This counts the trays as they pass under the seeder. A reset button is positioned below it to zero the display. The display is only lit while the conveyor is running.

### **2.8 - Vacuum Cleaner [Fig 12]**

This is connected to the adapter in the side of the control box and is controlled by the switch valve. With the compressor connected, seed can be vacuumed from the seed valley into the glass jar. When small quantities of seed are left in the valley, they should be swept to one end with an artists paint brush, and collected. Setting the control switch to manual, and pressing the manual test button to rotate the drum, will help to remove the last remains of seed.

## **SECTION 3 - MAINTENANCE, TROUBLESHOOTING AND A DESCRIPTION OF CONTROLS**

### **3.1 - Maintenance**

#### **3.1.1 Scraper Blades**

The two thin Tufnol plates have several purposes. One acts as a part of the seed hopper and the other as a deflector plate to prevent the jets of hole cleaning air from disturbing the peat in the trays passing under the machine. Both Tufnol plates also act as scrapers to prevent pieces of seed and other debris, which may become attached to the face of the drum, passing between the two rollers and being crushed. Should the scraped debris contain pieces of grit which become embedded in the Tufnol, they may damage the thin hard surface of the drum if they are left in for a long time. Periodically the Tufnol plates should be removed and the leading edges cleaned. Check that any grit is removed.

#### **3.1.2 Emitters & Receivers**

Clean the beam emitter and receiver regularly to prevent a build up of soil and dust on the lenses. Blow out with a pipe connected to the vacuum cleaner outlet to remove the majority of the dirt, and finish by using a cotton swab or paper tissue to polish the lenses.

#### **3.1.3 Conveyor Belt Tensioning and Tracking**

The conveyor belt tensioning and tracking is set at the factory. Belt tensioning should not be required, but the tracking may require adjustment after a long period of running in order to make it run exactly central on the rollers.

Tracking adjustments are made on the tray entry end roller - NOT the end near the motor as this will effect the chain drive tension. Slacken the roller mounting plate screws. The jacking screws on the inside faces of the conveyor body make the adjustment. Loosening the locknut and screwing in the adjusting screw will have the effect of making the belt track away from the adjusted side. Make adjustments half a turn at a time and allow the belt to settle down for a few hours use before readjusting. Don't forget to tighten the four roller mounting plate screws after each adjustment.

### **3.2 - Lubrication**

#### **3.2.1 Lubrication of Conveyor (Refer to Figure 13)**

The only items to be lubricated on the underside of the conveyor are the chains and sprockets (A), which should not be allowed to become dry. When the machine is in regular use, monthly visual inspection is suggested. Use a light grease or engine oil. All other conveyor shafts are fitted with sealed ball bearings which require no lubrication.

### 3.2.2 Lubrication of Seeder (Refer to Figure 13)

The seeder drum and drive shaft are fitted with ball races and require no lubrication. The rotating part (red disc) of the rotary valve is made of low friction material but requires cleaning and a trace of oil wiped onto the valve face once a month or so, dependant on use. Check weekly that the two belt support idler rollers (B), underneath the conveyor, are free from a build-up of peat or vermiculite which may be transferred from the belt. If there is too much on the rollers to rub off easily, remove them from the machine, scrape off build-up, wipe clean, apply a drop of oil into each end of the rollers, and ensure that they rotate very freely, before re-assembling.

### 3.2.3 Vacuum Pump Filters

Over a period of time dust and dirt accumulate in the vacuum pump filters. The two internal filters can be removed and cleaned in warm soapy water, allowed to dry, and replaced. The external exhaust filter is not serviceable, and should be replaced if pump performance deteriorates.

## 3.5 - Troubleshooting

### 3.5.1 Drum stops and fault light comes on

The control system has a fault. Switch power off and try again. If fault persists, check that the encoder is turning freely. This 'fault' will also occur if the manual test button is pressed without the conveyor running.

## 3.6 - Description of Controls (Refer to figure 6)

**First Row Position** - Determines the position that the first row of seed is dropped. Increasing this setting will drop the seed later, or closer to the rear of the tray.

**Pitch** - This is the setting for the longitudinal pitch of the tray. Increasing this setting will drop the seeds closer together.

**Row Pre-set** - This should be set to the number of cells in the length of the tray. If you are double sowing into the tray, this should be set to twice the number.

**Excess Speed Light** - When flashing, shows that you are trying to run the conveyor too fast for the pitch setting you are using. Reduce the belt speed.

**Fault Light** - When lit, shows that a fault has occurred. Switch off the power to reset the system. If the fault recurs, contact your dealer.

**In-Lock** - When lit without flashing, shows that the system is operating correctly and that belt and drum are synchronised.

**Beam** - Shows the state of the beam. When lit, beam is established. When off, beam is broken.

**Row Count** - Flashes for each row that is sown. It's purpose is mainly for fault finding.

**Auto/Manual** - In the Auto position the drum is linked to the belt speed. In the manual position it is linked to the manual speed control. **Note that the drum will not run when a tray passes under the seeder if the switch is set to manual.**

**Manual Speed** - Sets the speed of the drum when the manual switch is selected, and the test button is pressed on the seeder. Useful for setting up the vacuum, etc., and for emptying the seed with the vacuum cleaner. Don't forget to switch it back to Auto when seeding!

**Tray Count** - Displays the amount of trays that have passed under the seeder.

**Reset** - Resets the tray counter to zero.

### 3.7 - Other Controls

**Emergency Stop** - The Emergency Stop Button on the front of the main control box cuts off all power to the machine. Press to stop - twist to reset.

**Air Shut Off** - The shut-off valve is on the air filter at the back of the main control box. Twist the knob to turn off the air to the system when carrying out maintenance work and adjustments.

### 3.8 - Air Jets

These provide a gentle stream of air onto the seed valley end seals to prevent small seeds from passing underneath. The on/off switch and regulator are on the side of the control cabinet (see figure 12). The holes in the jets are marked, and should be pointed directly at the seals, with the tips of the jets almost touching the drum.

To set the jets, turn the flow regulator counter-clockwise to the fully open position, and then screw the adjuster clockwise four and a half turns. Open the switch valve and place some seed in the seed valley and rotate the drum. It is surprising how little air is required to flow under the seals to keep seeds from passing through any small gaps. Small adjustments may be necessary, after which the brass nut on the flow regulator can be tightened to lock the flow rate. Use the switch valve to stop the air escaping when removing the seals or changing seed.

## SECTION 4 - SPARES KIT LISTS

### 4.1 - Spares Kit for Assembled Drum Seeder

- 4 Hoppers
- 2 Hopper Reducers
- 1pr Seed Valley End Seals
- 1 Vacuum Cleaner
- 1 3mm Ball Driver
- 1 4mm Ball Driver
- 1 5mm Ball Driver
- 1 Cleaning Wires & Pin Vice Holder
- 1 Instruction Manual

### 4.2 - Spares Kit for Crated Drum Seeder

- 4 Hoppers
- 2 Hopper Reducers
- 1 Catch Tray
- 1pr Seed Valley End Seals
- 1 Vacuum Cleaner
- 1 3mm Ball Driver
- 1 4mm Ball Driver
- 1 5mm Ball Driver
- 1 Cleaning Wires & Pin Vice Holder
- 1 Instruction Manual
- 1 Control Box & Filter (inside)
- 1 Leg brace/Pump mount
- 4 Wheel Assemblies
- 1 Digital Control Box
- 1 Pressure Pipe to Compressor (8'x 5/16" O/D)
- 8 M8 x 16 Socket Head Cap Screws
- 8 M8 Nuts
- 1 Chain Guard (Aluminium angle)
- 6 Cable Ties
- 8 M6 x 40 Hex Head Screws
- 4 M6 Wing nuts
- 5 Black threaded load spreading nut plates
- 8 M6 Washers
- 4 M5 x 65 Socket Head Cap Screws
- 4 M5 x 16 Socket Head Cap Screws
- 4 M5 Large Washers
- 8 M5 Nuts
- 4 Clips for Wiring Harnesses (5/16")
- 1 Gast Rotary Vane Vacuum Pump

## SECTION 5 - FINAL ASSEMBLY INSTRUCTIONS FOR DRUM SEEDER AND CONVEYOR

- 1) Slide the castor assemblies into the leg frames and fit one M6x40 hex head bolt and wing nut through each. Various holes are available in leg and castor post to give a variety of height positions.
- 2) Bolt the leg assemblies to the underside of the conveyor body using the M8 hex head screws and nuts provided. The aluminium chain guard clamps between one leg and the conveyor body.
- 3) Fit the leg brace between the leg assemblies using M6x40 hex bolts and the special black load spreading plates. The plate for mounting the vacuum pump should be at the same end as the control cabinet (see figures 11 & 12).
- 4) Take the grey key from the spares kit and open the control box door. Remove the air filter and fit to the back of the cabinet. Using the holes in the back of the control box, mount the control box to the conveyor body and leg using M6 hex head screws, nuts and washers. (See figures 11 & 12).
- 5) Connect the conveyor motor wiring harness from the control box to the motor with the bullet connectors. Make sure these are pressed together tightly and that the insulation of the sockets completely covers the plugs. Secure the cable to the leg using cable ties.
- 6) Bolt the vane pump assembly to the leg brace behind the control cabinet. Feed the cable through one of the smaller grommet holes in the end of the control box.
- 7) Connect the vane pump cable to the terminal strip inside the control box. The terminals are colour coded as follows, working from left to right:

		<b>240v</b>	<b>110v</b>
1) Red	Conveyor Motor	(Armature)	(Armature)
2) Red	Conveyor Motor	(Armature)	(Armature)
3) White	Conveyor Motor	(Field)	(Field)
4) White	Conveyor Motor	(Field)	(Field)
5) Brown	Vac. Pump	(Line)	(L1)
6) Green/Yellow	Vac. Pump	(Earth)	(Ground)
7) Blue	Vac. Pump	(Neutral)	(L2)

- 8) Take the tubes from the underside of the conveyor and attach to the conveyor leg with cable ties. Connect the brown, yellow, blue and green pipes to the control box bulkhead barbs.
- 9) Fit the digital control box to the top of the conveyor next to the seeder head. Connect the emitter, sensor and encoder plugs. Connect the drum

motor plug and the power cable which comes from the grey control box. It is important that a cable tie should be fitted around each of these two black plugs to prevent them from being disconnected.

- 10) Connect the large vacuum pipe from the seeder to the vane pump tee piece. Connect the other vacuum pipe from valve on the control box to the tee piece.
- 11) Fit the Vermiculite Coverer (if purchased) and connect as shown in figure 15.
- 12) Remove the packing material from the shaft encoder (speed pickup) which is located on the underside of the conveyor next to the conveyor motor.
- 13) Connect the cable to the mains electrical supply. The plug should be fitted with a 15 amp fuse for 110v operation and a 7½ amp fuse for 240v operation.
- 14) Turn the speed setting to number 1 and turn on the conveyor. If the conveyor belt runs the wrong way then disconnect the mains supply, reverse the two red leads which are connected to the conveyor motor at the bullet connectors. Reconnect the supply and check.
- 15) The conveyor and seeder can now be set up as shown in the operators manual.

## SECTION 6 – ACCESSORIES

### 6.1 Vermiculite Coverer

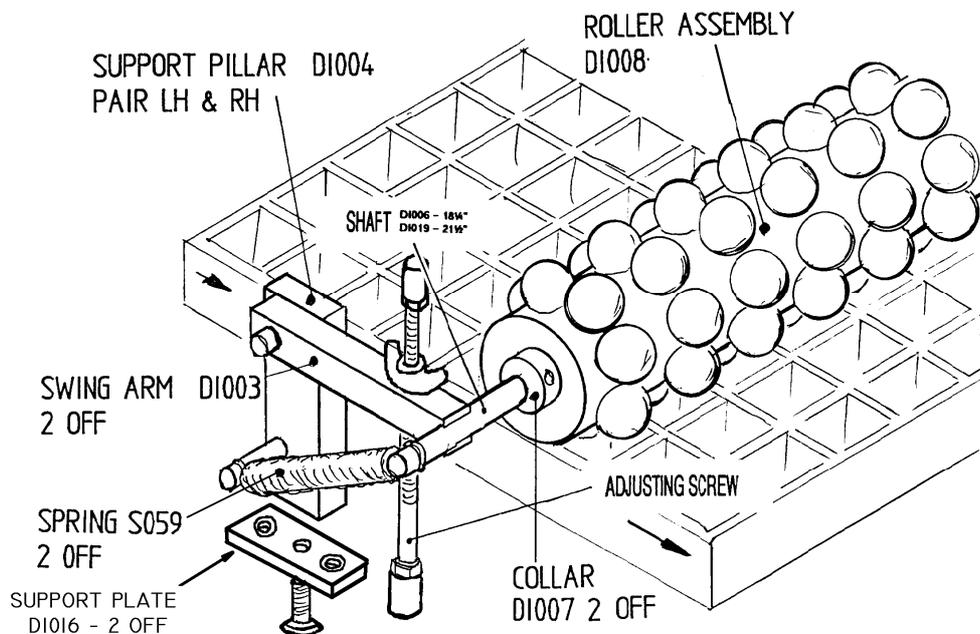
There are only two adjustments for the Vermiculite Coverer, the speed of the motor, and the height of the gate plate. Never make adjustments while the machine is running.

The gate plate should generally be set according to the grade of vermiculite used. It should be set higher (more open) for coarse grades, and lower (more closed) for finer grades.

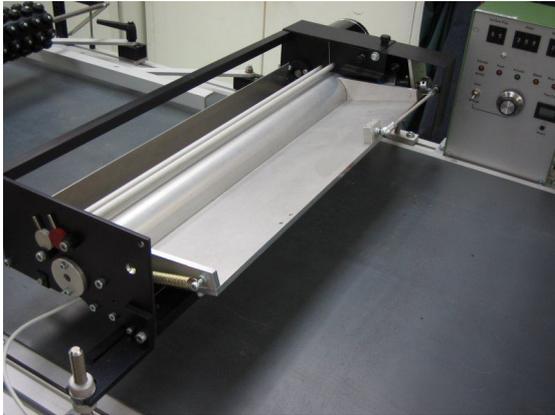
The motor speed can then be set for the covering thickness required. The motor speed control is the adjusting knob on the coverer itself. Increasing speed will increase the covering thickness.

### 6.2 Roller Dibblers

Adjustment of the roller dibbler is fairly straightforward. Turn the adjusting screws to adjust the roller height so that the bottom of the roller just touches the surface of the plug tray. Position the collars so that there is some side 'float' as the tray goes under the roller.

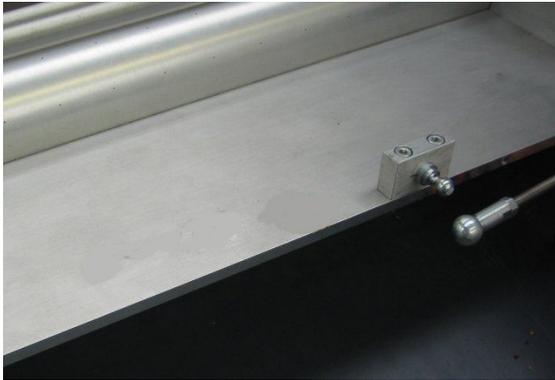


### 6.3 Oscillating Seed Tray Instructions

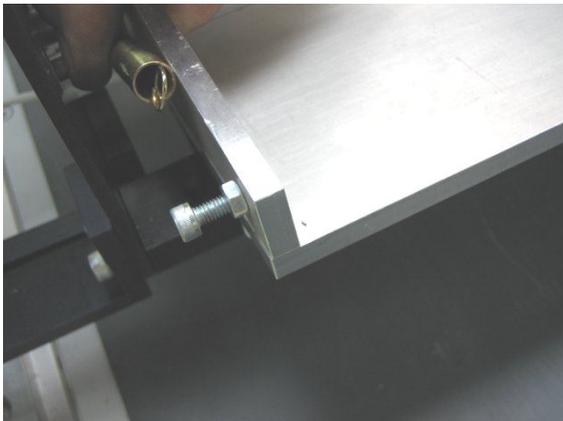


The oscillating seed tray is powered by a small 12 volt geared motor mounted at the drive end of the seeder. An offset crank connects it to the tray via a rod linkage with ball joints. The tray is held against the surface of the tray with springs, and is supported at the back end by a roller. The side-to-side motion created will agitate the seeds in the tray, making them pick up more easily. The mating faces of the tray and drum are covered with a PTFE impregnated fabric material to prevent wear to the surfaces.

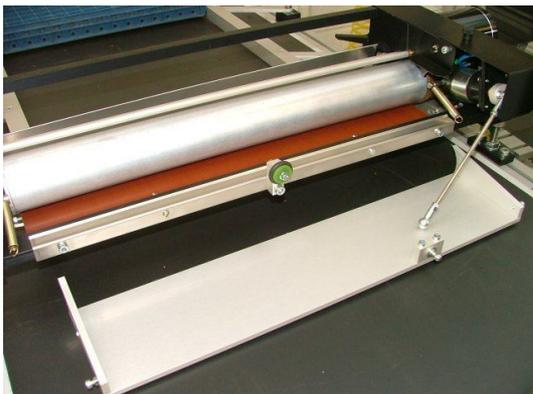
#### Tray Removal



Remove the ball joint where it connects to the tray..

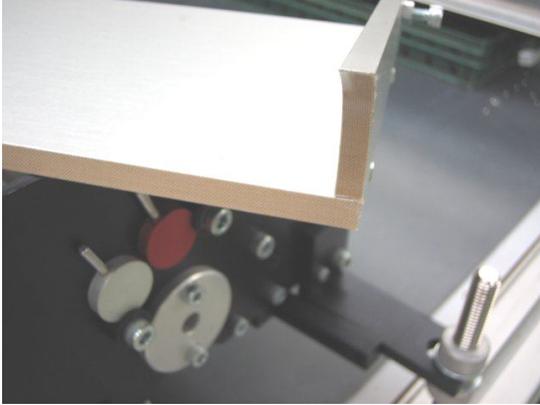


Remove the springs from each end by unhooking them from the screws. The springs will remain in place on the inner mounting posts.



Lift off the seed tray.

## Maintenance



Carefully inspect the fabric covered edges of the seed tray for signs of damage. Under no circumstances use the tray if the fabric is missing or damaged, as it may cause irreparable damage to the drum. Wash the seed tray using warm, soapy water and a soft cloth. Do not use solvents of any kind, as they can remove the adhesive backing of the fabric.

Note that on later machines the curved tray sides are made from nylon, and do not have the fabric covering.

## Operation



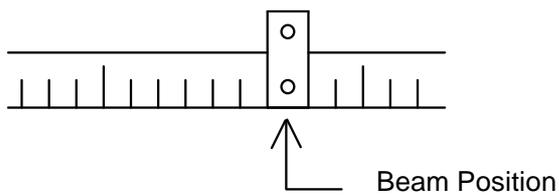
Turn on the seeder power switch on the top of the main control box. Switch the seed tray switch on the end of the control box to the down position. The tray will run until the switch is lifted, or the main power is turned off. Avoid running the tray for long periods without sowing, to preserve the life of the anti-wear impregnated fabric material.

Please note that if new machines are supplied with the oscillating seed tray as an upgrade, then the rear roller assembly and associated fittings are not supplied.

**Table 1 - Standard Tray Settings**

TRAY	1ST ROW POSITION	PITCH	ROW PRE-SET	BEAM
L-200	10	222	20	3
L-288	10	265	24	3
L-392	08	310	28	3
L-512	12	356	32	3
L-800	22	458	40	3
PP-576	12	365	32	3
PP-286	08	260	22	3
PP-180	08	205	18	3

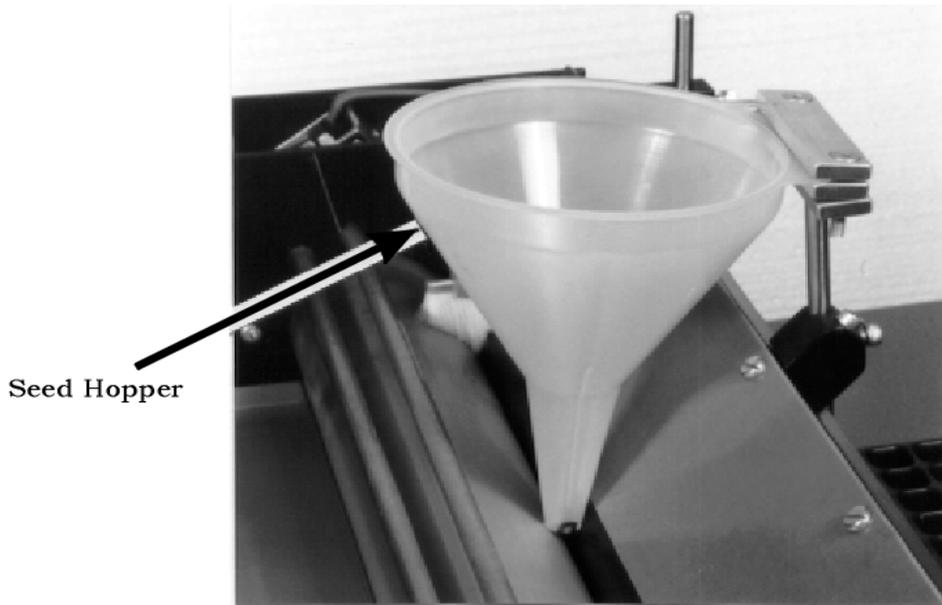
**NB:** These settings are only a guide - small variations will occur on individual machines



**Table 2 - Table of Pressure and Vacuum Settings**

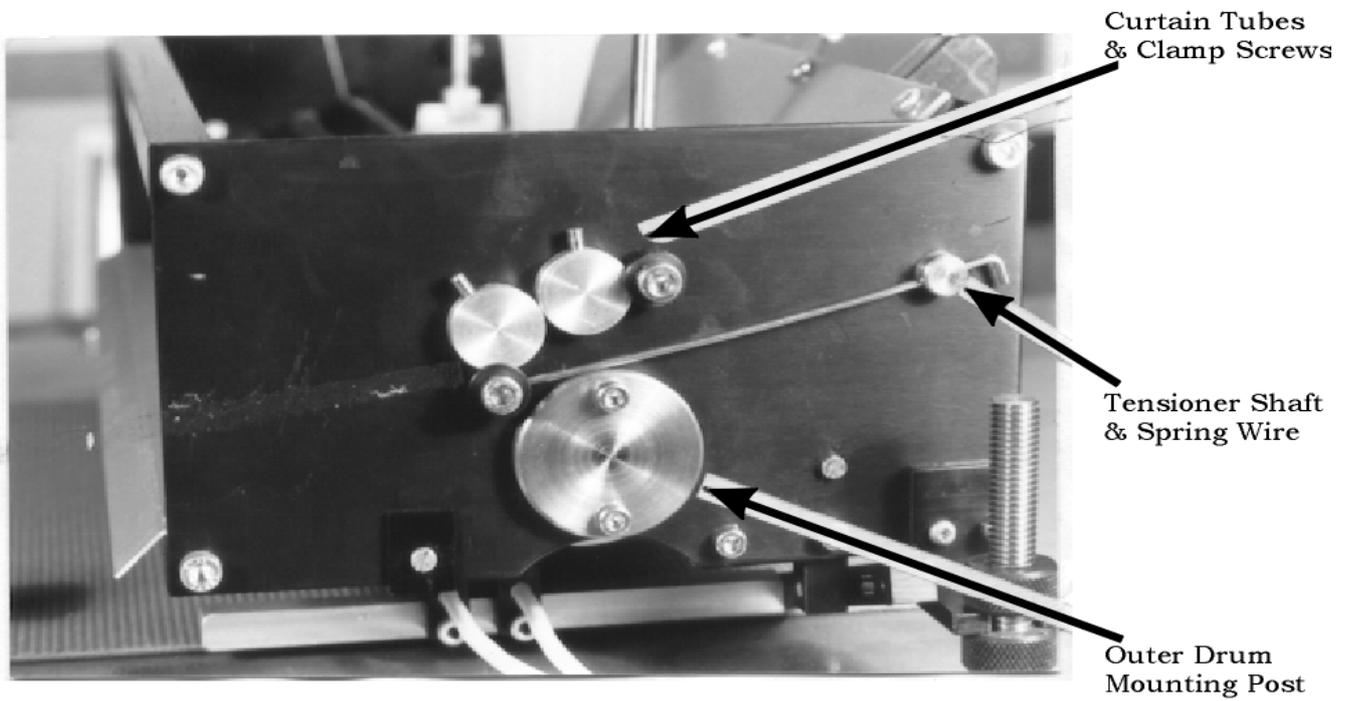
SEED	DRUM HOLE SIZE	VACUUM ("Hg)	CURTAIN AIR (PSI)	CLEANING AIR (PSI)	RELEASE AIR (PSI)
Ageratum	0.3mm	5	10	40	3
Alyssum	0.3mm	4	14	40	3
Begonia Pills	0.3mm	5	7	40	3
Cineraria Maritima	0.3mm	4	10	40	3
Impatiens	0.3mm	8	8	40	3
Nicotiana	0.3mm	3	14	40	3
Pansy	0.3mm	10	7	40	3
Petunia	0.3mm	3	5	40	3
Salvia	0.3mm	12	6	40	3
Viola	0.3mm	6	7	40	3

**NB:** These settings were determined from trials using a 0.3mm drum with Landmark 512 plug trays (16 rows across). Allowances would have to be made for different seed varieties, and tray sizes.



Seed Hopper

Figure 1



Curtain Tubes  
& Clamp Screws

Tensioner Shaft  
& Spring Wire

Outer Drum  
Mounting Post

Figure 2

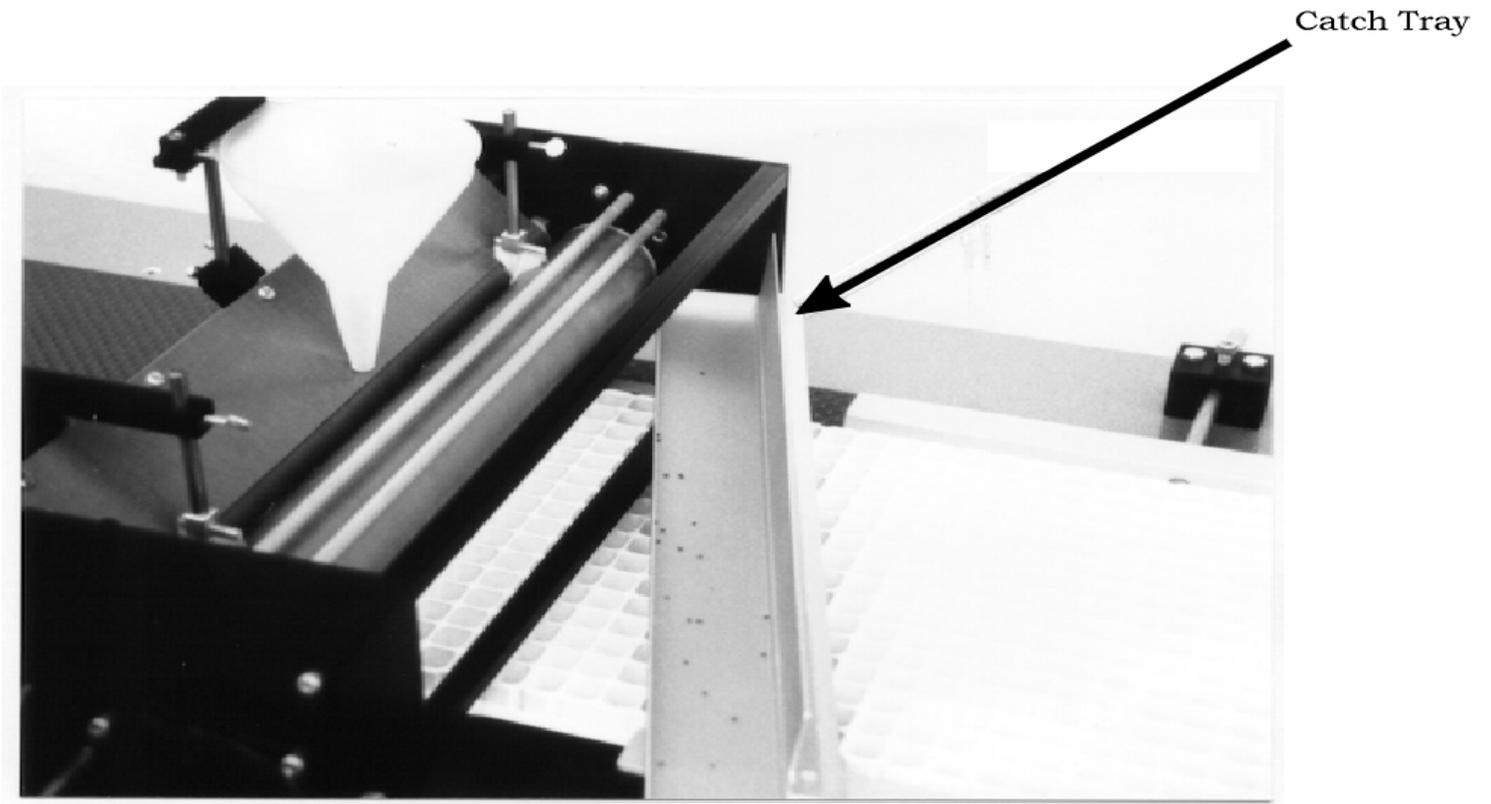


Figure 3

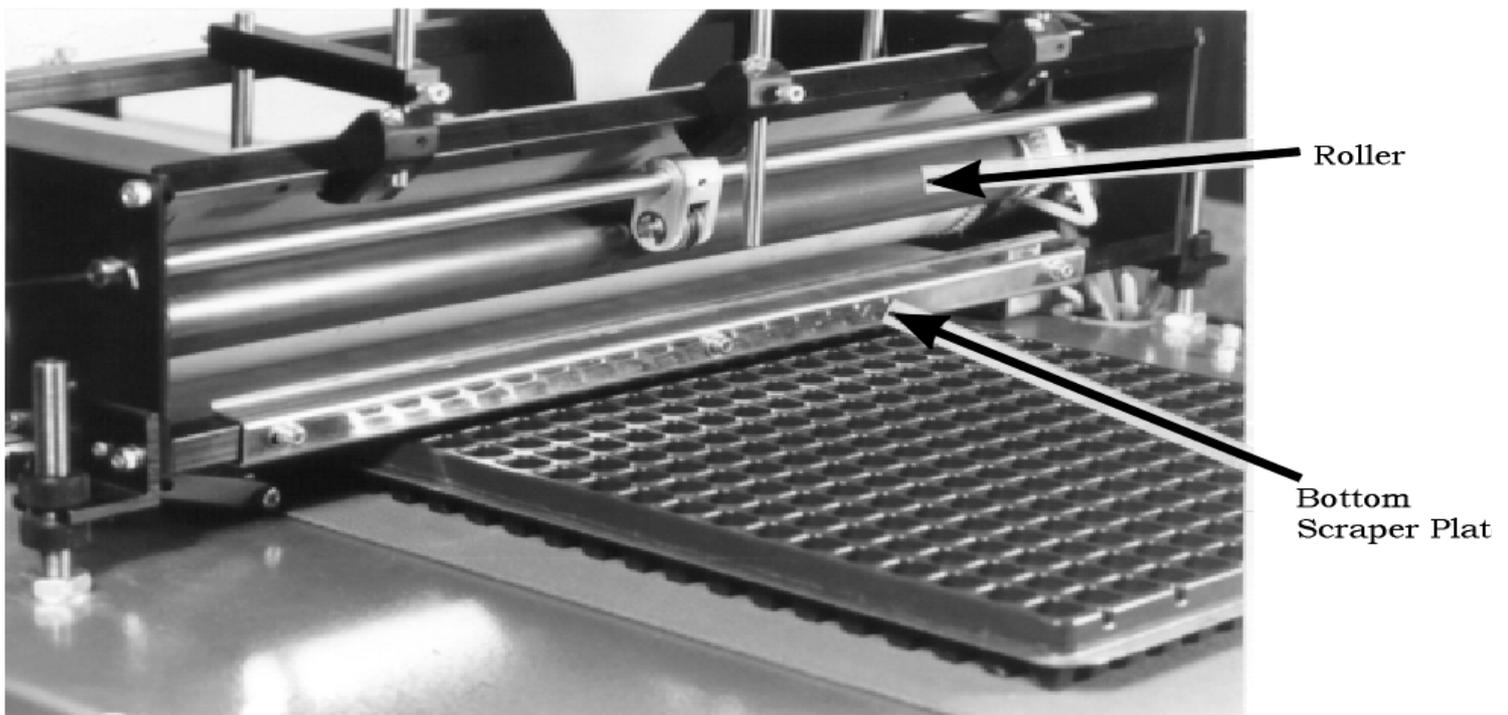


Figure 4

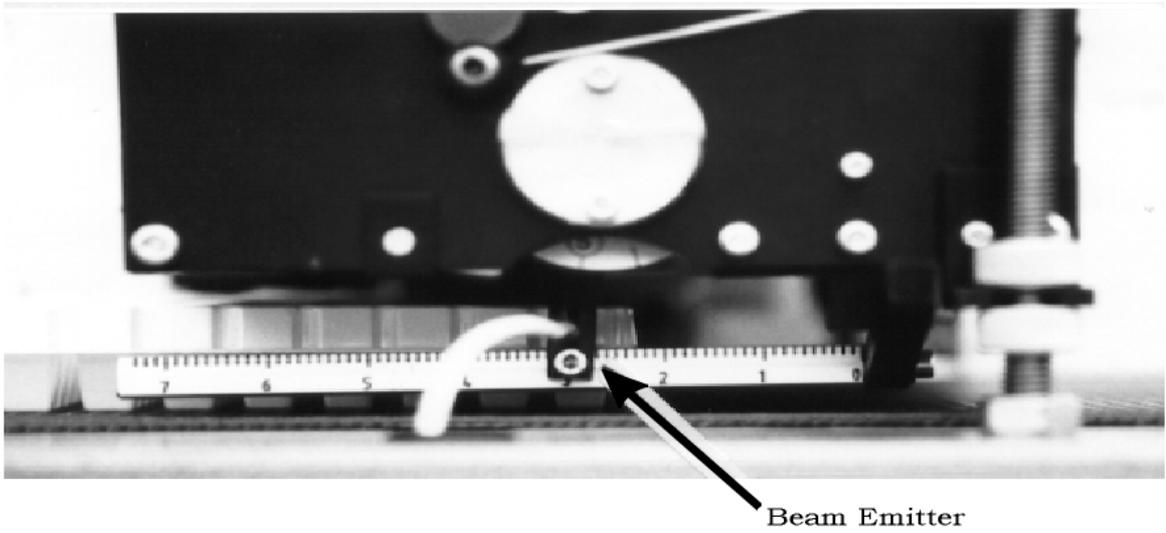


Figure 5

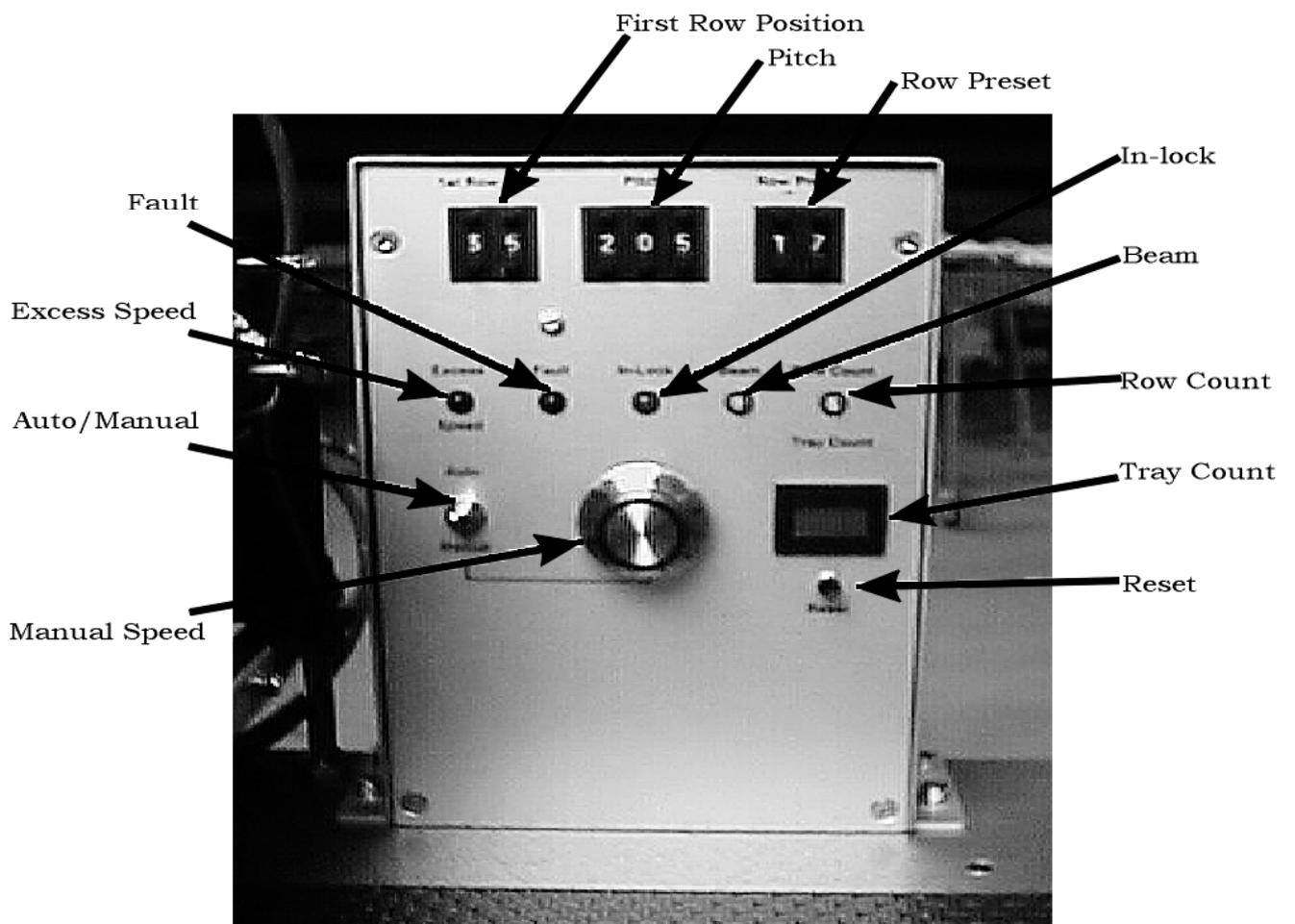


Figure 6

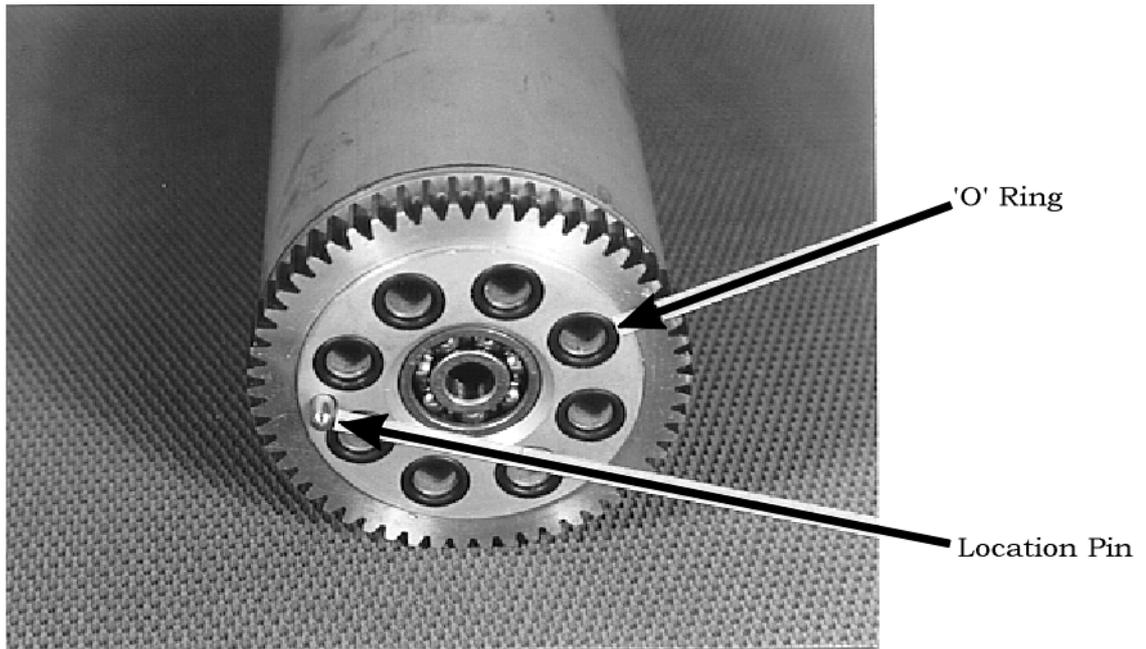


Figure 7

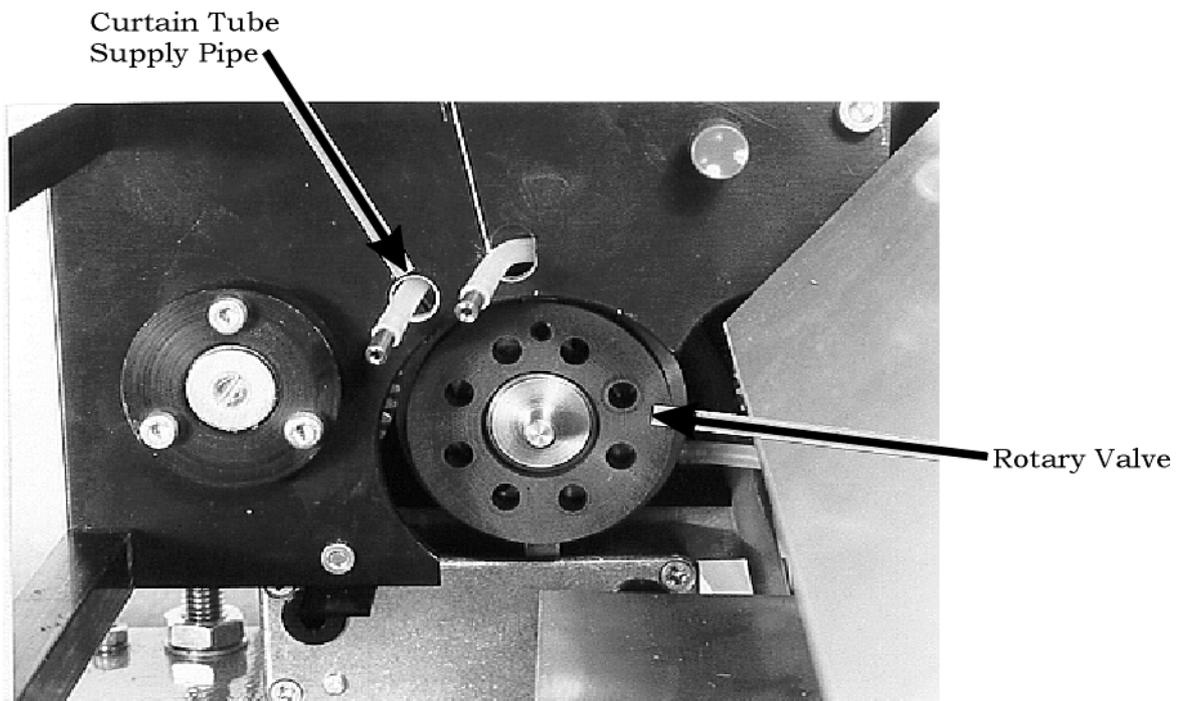


Figure 8

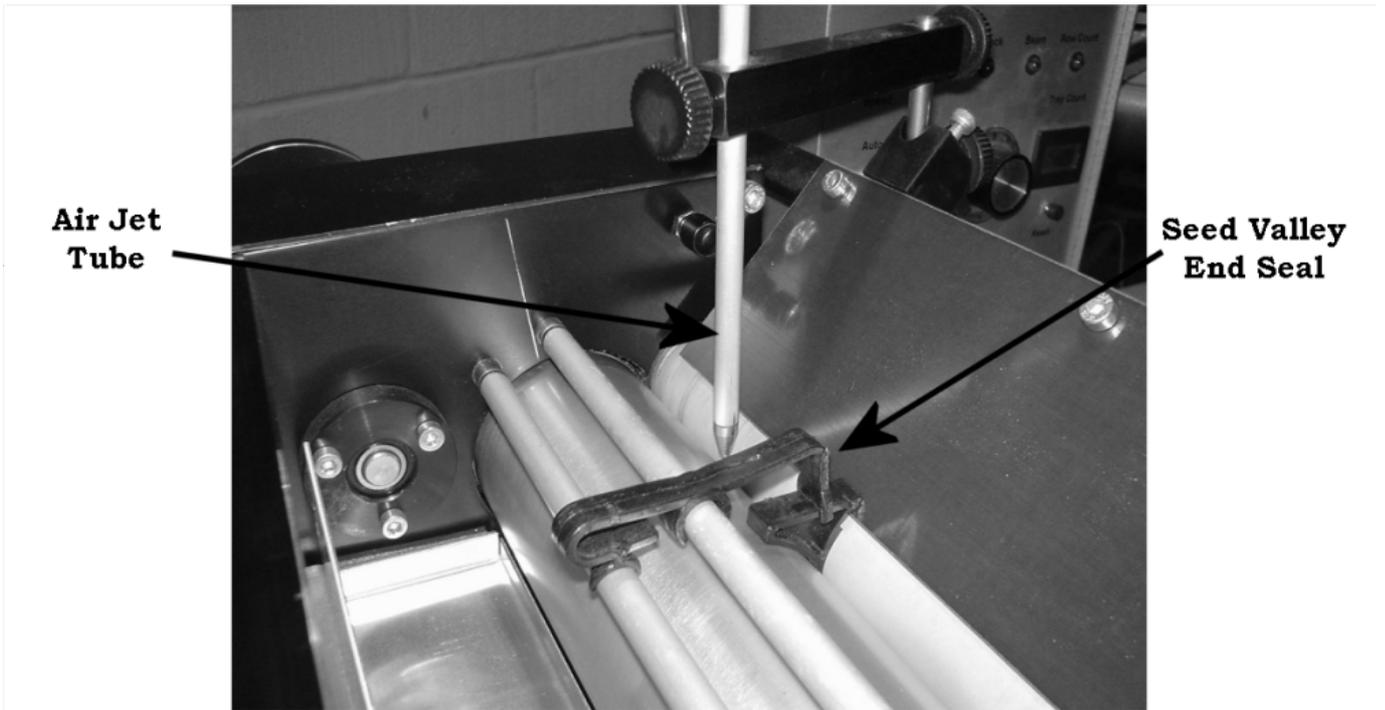


Figure 9

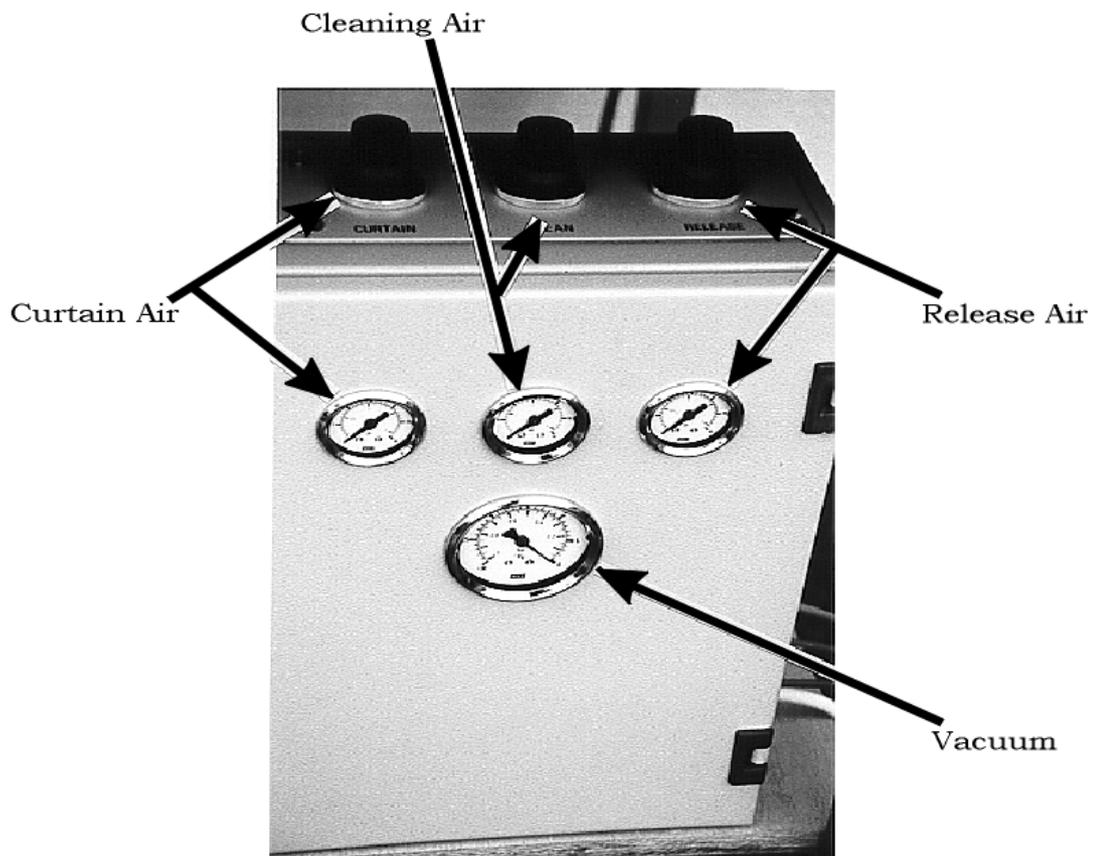


Figure 10

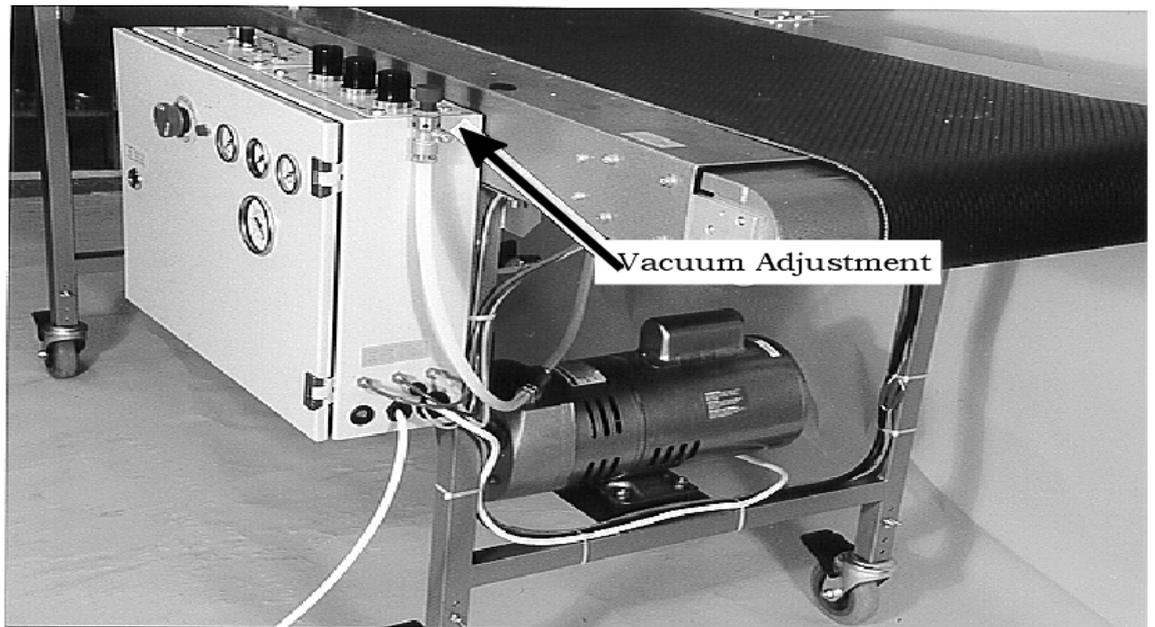


Figure 11

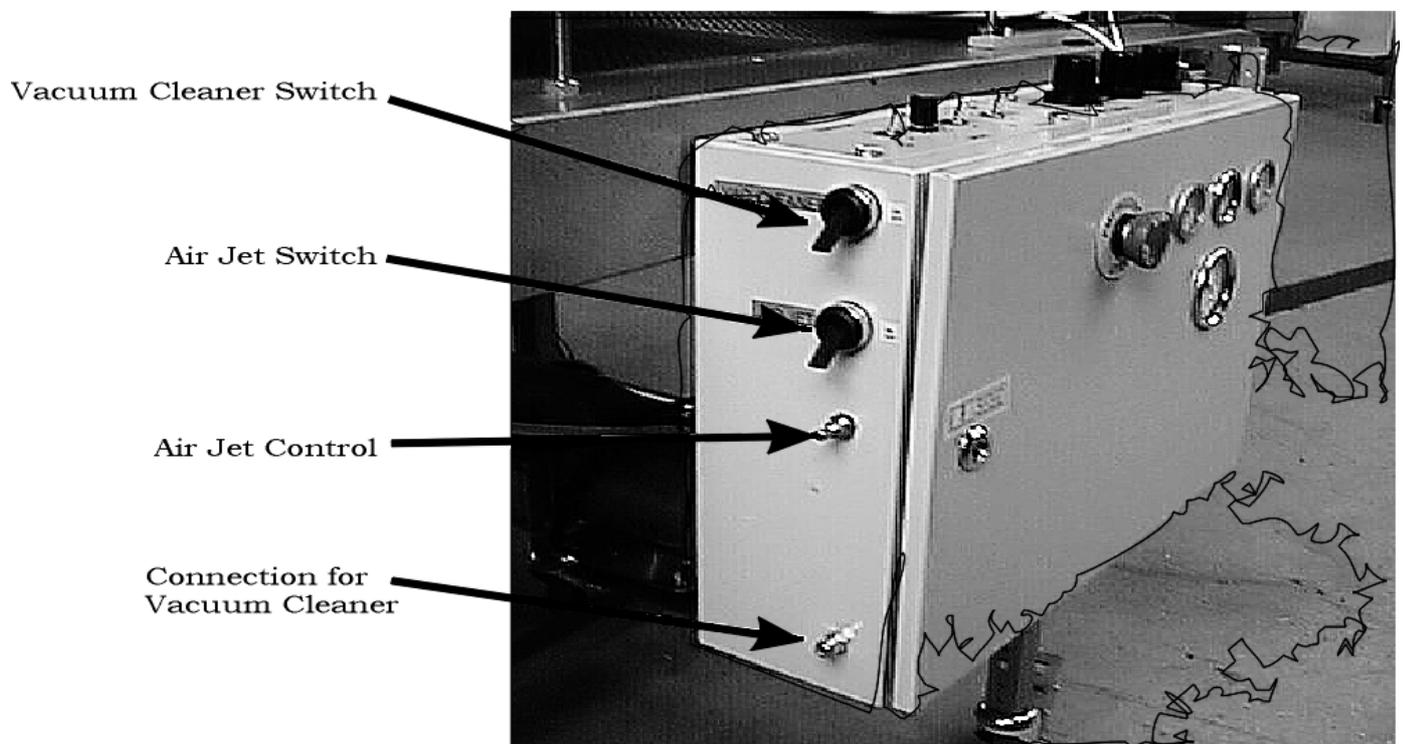


Figure 12

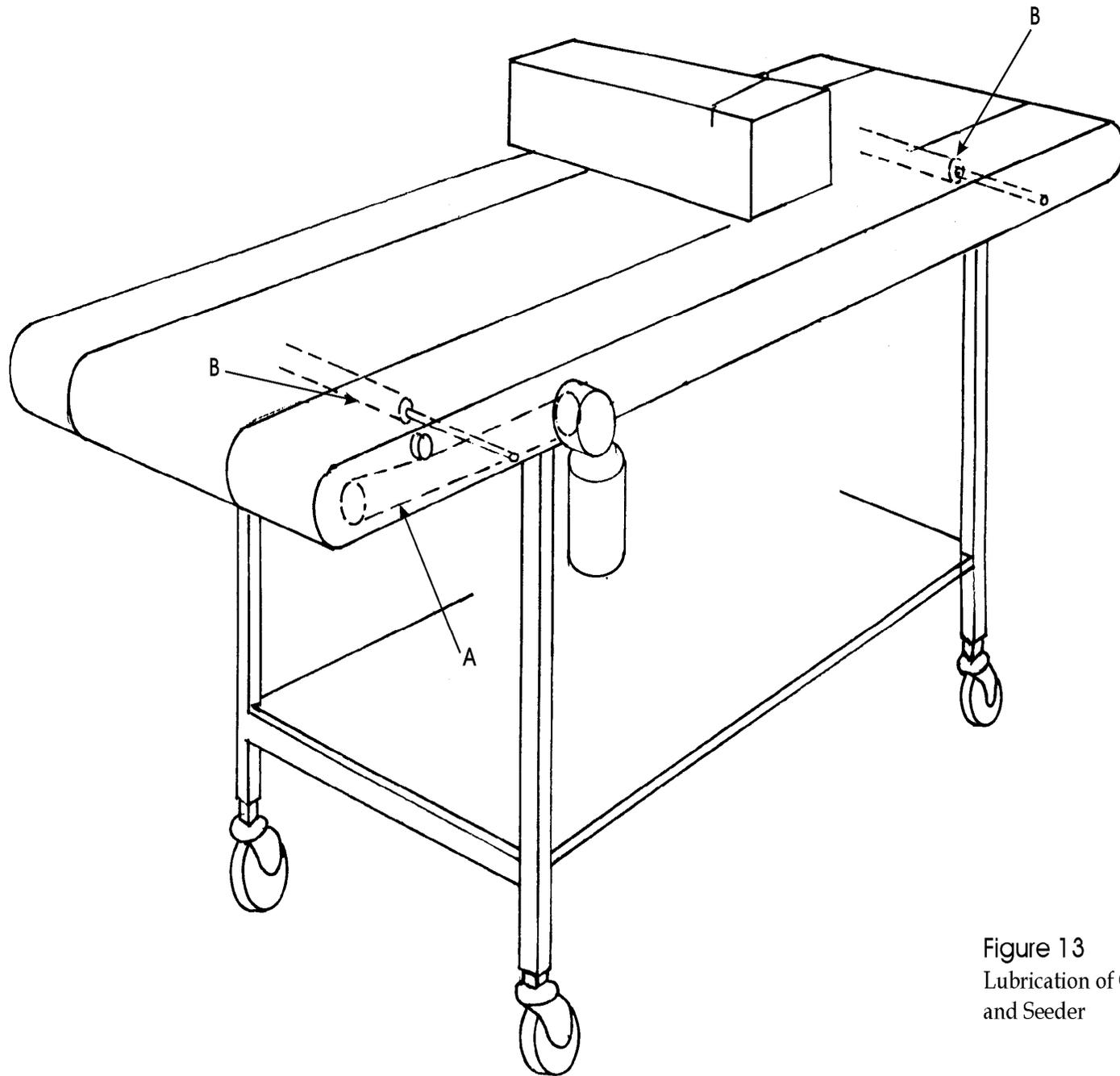


Figure 13  
Lubrication of Conveyor  
and Seeder

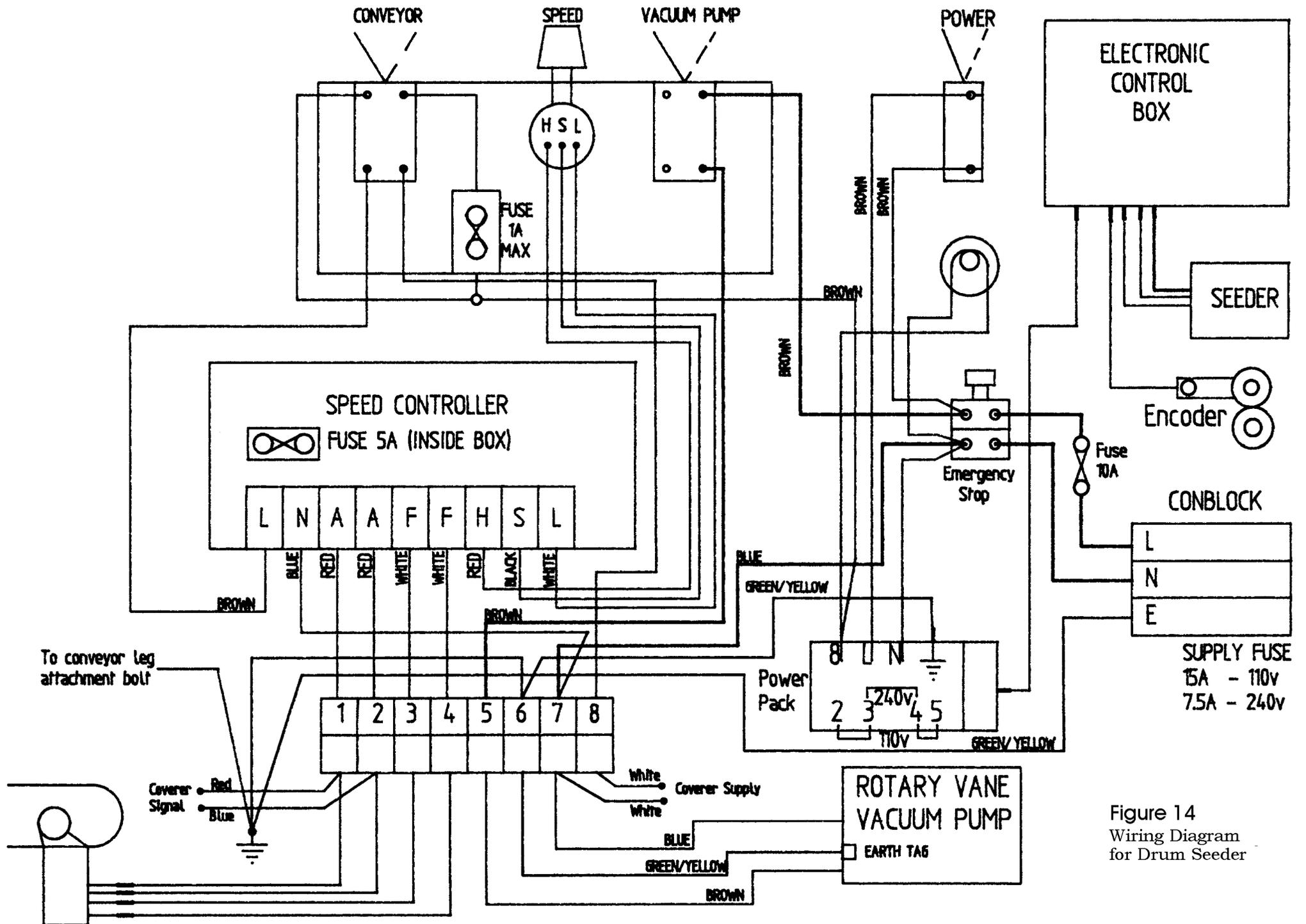


Figure 14  
Wiring Diagram  
for Drum Seeder

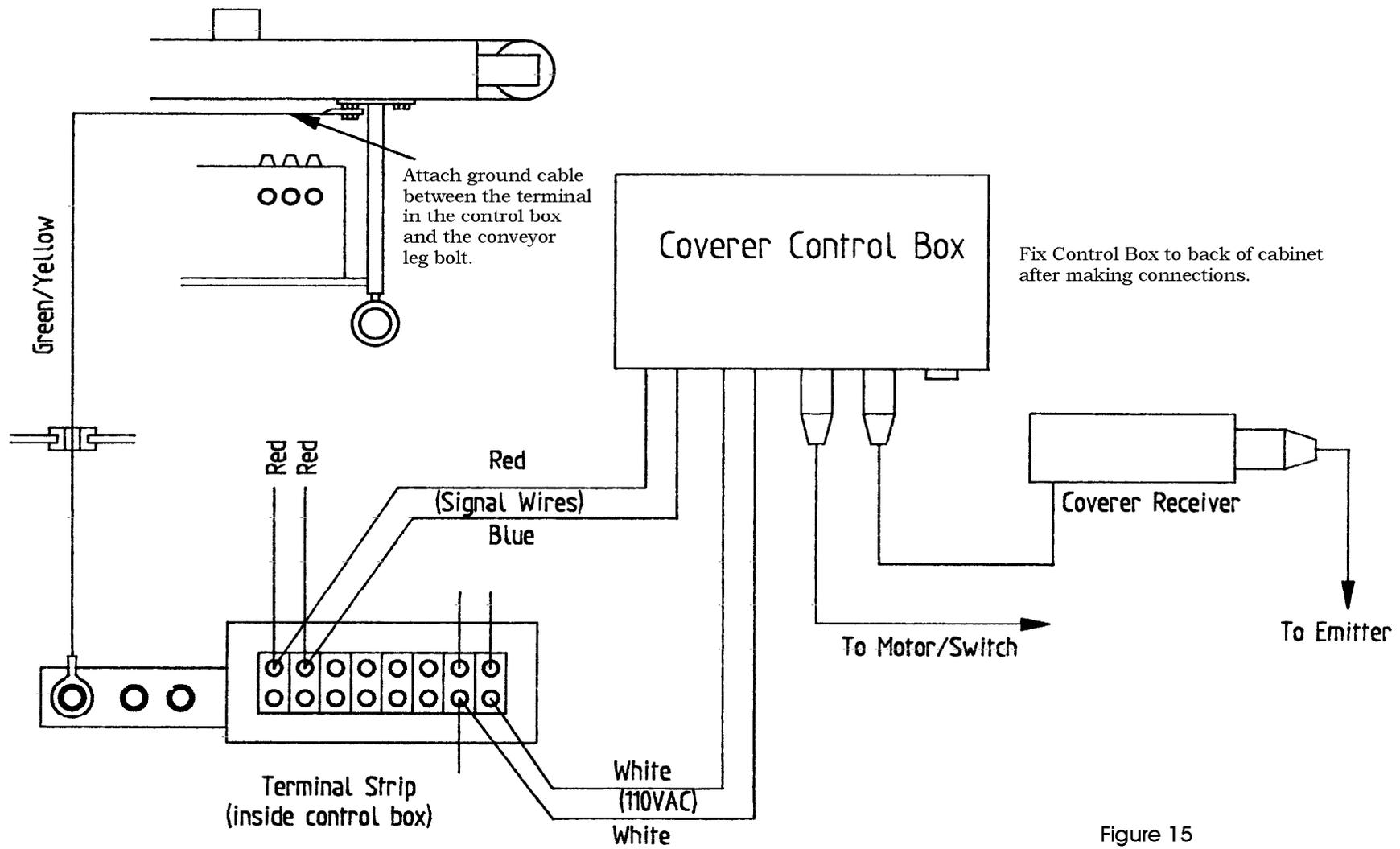


Figure 15  
Coverer Wiring Diagram

# Hamilton Drum Seeder

Spare Parts Lists  
and Exploded Views

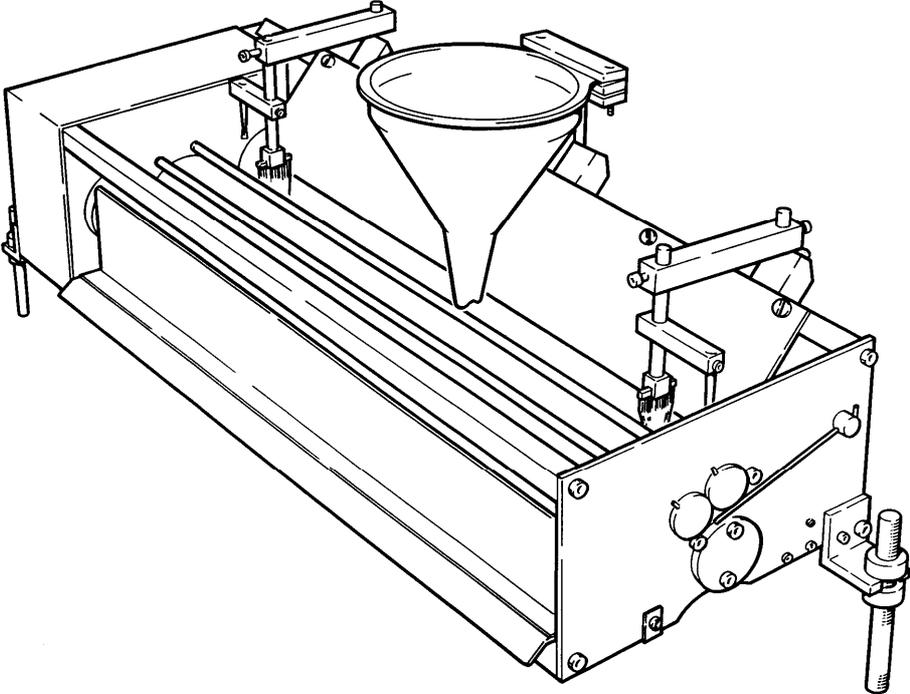
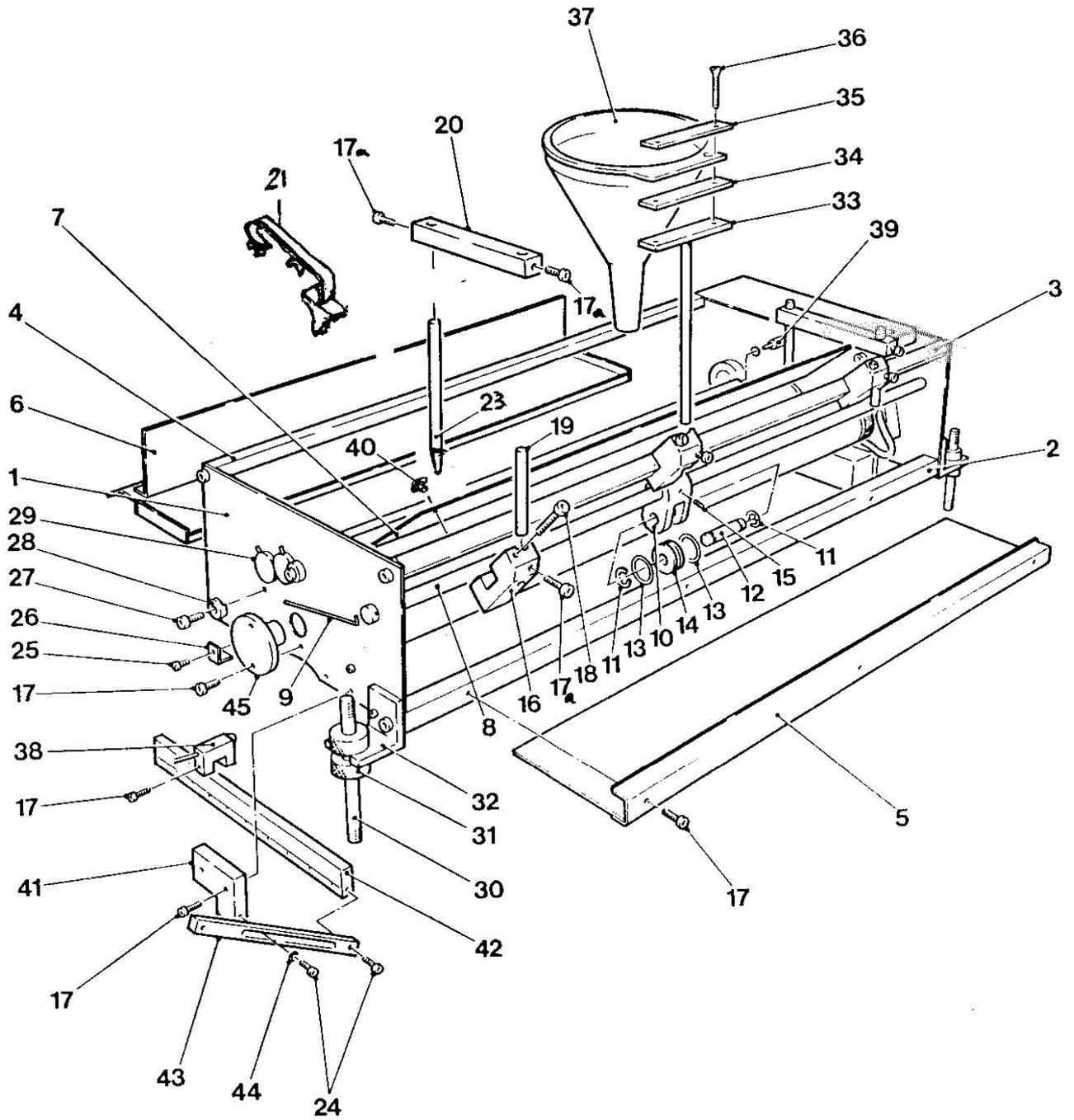


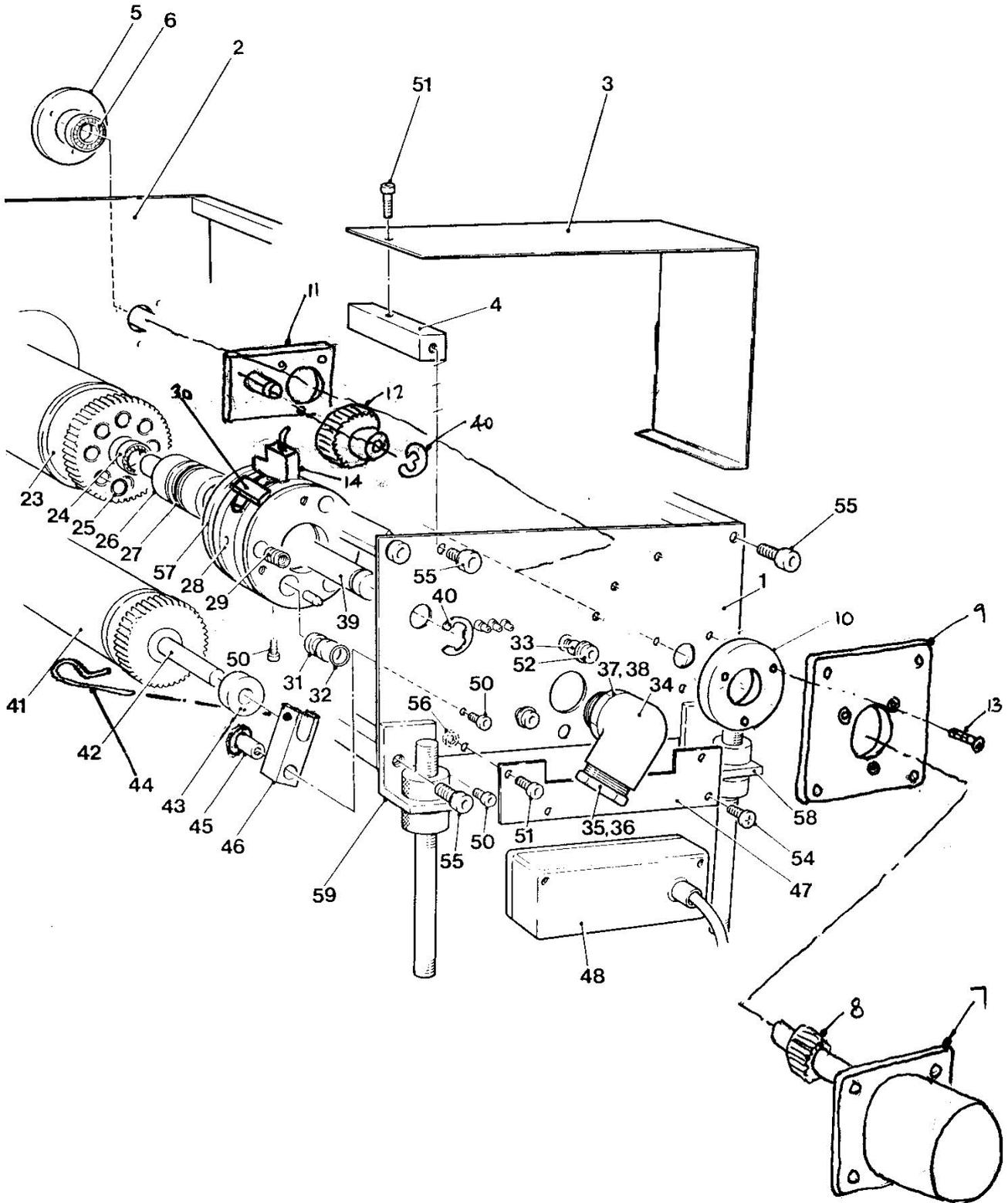
Figure 1



## Key to Figure 1

ILLUSTRATION NO.	PART NUMBER	DESCRIPTION
1	DS002	Main Plate (Datum End)
2	DS007	Frame Bar (Rear)
3	DS007	Frame Bar (Rear)
4	DS008	Frame Bar (Front - Long)
5	DS040A	Lower Scraper Blade Assembly
6	DS021	Catch Tray
7	DS039	Upper Scraper Blade
8	DS031	Tension Shaft
9	DS069	Tension Shaft Spring Rod
10	DS032	Tension Fork
11	DS070	E Clip
12	DS034	Tension Roller Pin
13	S035A	O Ring
14	DS033	Tension Roller
15	TA031	M4x 8 Socket Set Screw
16	DS036	Attachment Clamp
17	S136-07	M4x 10 Socket Head Cap Screw
17a	S163	Thumbscrew M4
18	ECC044	M4x 25 Socket Head Cap Screw
19	DS059	Positioning Bar Rods
20	DS052	Brush Positioning Bar
21	DS051V	Seed Valley End Seals (Pair)
23	DS832	Air Jet Tube Assembly
24	S118	M4x 16 Socket Head Cap Screw
25	DS072	M3x10 Socket Head Cap Screw
26	DS035	Catch Tray Support
27	S096	M5x12 Socket Head Cap Screw
28	S023	Clamp
29	DS038	Air Curtain Tube Assembly
30	DS041	Mounting Stud
31	DS042	Level Adjustment Nut
32	DS019R	Support Bracket (RH)
33	DS061/062	Hopper Support Strip and Rod
34	DS064	Hopper Clamp Back
35	DS063	Hopper Clamp
36	S160	M4x25 C'Sunk Socket Screw
37	DS060	Hopper
38	DS704	Emitter Assembly
39	DS038C	Curtain Tube Connector
40	S098	M4x6 Pan Head Screw
41	DS079	Emitter Carrier Mounting Block
42	DS081	Emitter Carrier
43	DS080	Emitter Adjustment Arm
44	DS091	M4 Plain Washer
45	DS017	Bearing Support (Datum End)

FIGURE 2



## Key to Figure 2

ILLUSTRATION NO.	PART NUMBER	DESCRIPTION
1	DS001	Main Plate (Drive End)
2	DS003	Intermediate Plate
3	DS056	Gear/Solenoid Cover
4	DS010	Frame Bar (Rear-Short)
5	DS037	Bearing Housing (Drive Sharft)
6	DS083	Drive Shaft Bearing
7	DS1026	Stepper Motor Assy
8	DS1012	Drive Shaft
9	DS1009	Motor Mounting Plate
10	DS1010	Motor Mounting Spacer
11	DS1011	Idler Mounting Plate
12	DS1027	Idler Gear
13	S160	M4 x 25 C'sk Head Cap Screw
14	DS1200	Pushbutton and Hall Effect Switch Assembly
23	DS150A	Drum Assembly
24	DS090	¼" Bearing
25	S135-08	O Ring (BS010)
26	DS016	Bearing Support (Drive End)
27	DS087	O Ring (BS018)
28	DS011	Valve Block
29	DS066	Valve Block Spring
30	DS071	Rotary Valve Retaining Clip
31	DS075	Piston Valve Block
32	S135-08	O Ring (BS010)
33	DS047	Valve Block Retainer
34	DS048	Hobbs Elbow Adapter
35	DS351	½" Tubing Nut
36	DS352	½" Tubing Sleeve
37	DS049	Hobbs Coned Locknut
38	DS050	Hobbs Seal
39	DS031	Tensioner Shaft
40	P127	E Clip
41	DS025A	Roller Assembly
42	DS028	Roller Shaft
43	DS029	Roller Shaft Collar
44	DS826	"R" Clip
45	DS821	Swing Arm Pin
46	DS820	Roller Shaft Swing Arm (Clip Type)
47	DS501	Receiver Mounting Plate
48	DS500	Receiver Assembly
49	DS094	M4 x 10 C'Sunk Slotted Screw
50	DS072	M3 x 10 Socket Head Cap Screw
51	S136-07	M4 x 10 Socket Head Cap Screw
52	S118	M4 x 16 Socket Head Cap Screw
53	TA031	M4 x 8 Socket Set Screw
54	DS535	M4 x 12 Posihead Screw
55	S099	M5 x 16 Socket Head Cap Screw
56	DP047	M4 Full Nut
57	DS1024	Rotary Valve Disc Assembly
58	DS1008	Extended Support Bracket
59	DS019L	Support Bracket (LH)

End