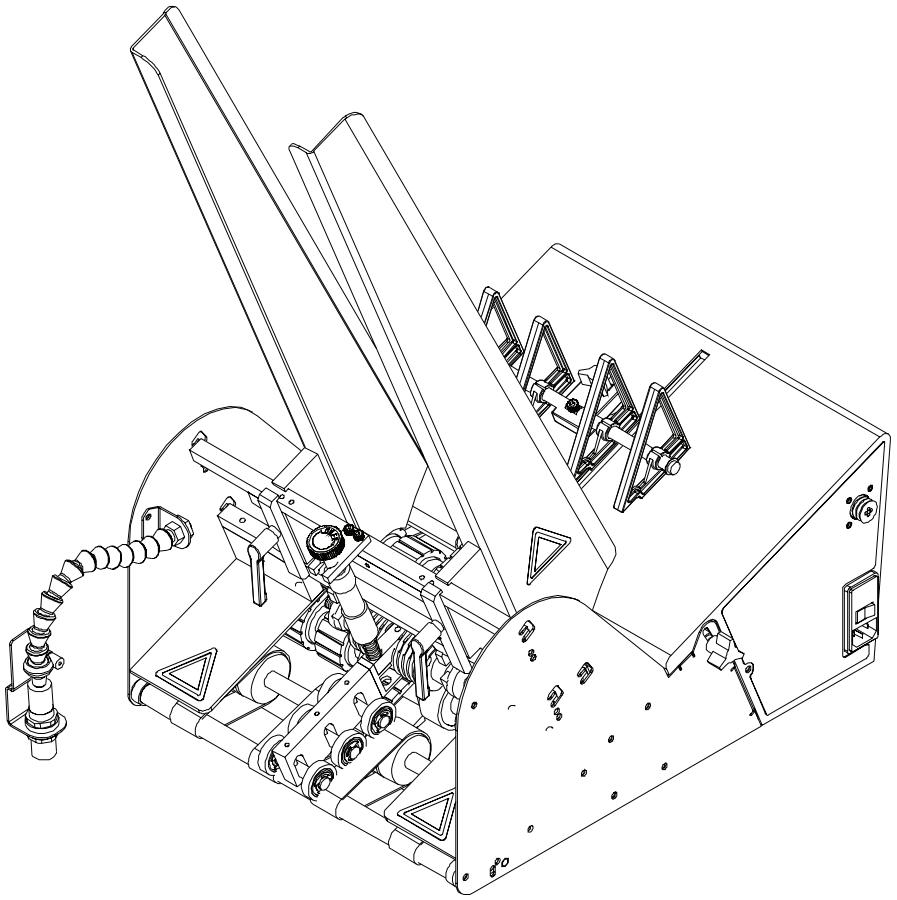
# Value Series V-710BC

## Product Guide



Thiele Technologies
A Barry-Wehmiller Company

Streamfeeder®

Part Number: 00900401



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# Contents

# Before You Begin

Welcome to Streamfeeder. This manual was included with your new Streamfeeder V-710BC Universal Friction Feeder. It provides all the information you need to efficiently operate and maintain the product.

## Who Should Read This Manual

This manual is primarily intended for operators who will be using the V-710BC Universal Friction Feeder in their day-to-day operations. *Please read it thoroughly before you operate the machine.*

Qualified technicians should also be familiar with the information in this manual.

## How This Manual Is Organized

This manual is divided into the following main areas:

- "**Safety**": *This section is at the front of this manual for good reason. It covers all safety issues that you should be familiar with before you go any further with adjustments, power-up, or operation.*
- Section 1, "**About the Machine**": *Introduces you to the feeder. It provides a complete description of all controls, connectors, and sensors.*
- Section 2, "**Preparing for Operation**": *Includes all adjustments you should make before attempting to do a power-up and successfully run material through the machine.*
- Section 3, "**How to Operate**": *Walks you through the basic steps needed to run the machine — from power-up to shutdown.*
- Section 4, "**Operational Troubleshooting**": *Gives you the basic diagnostic information you need to quickly and accurately solve problems to minimize downtime.*
- Section 5, "**Inspection and Care**": *Covers all the steps you can take to keep your feeder running properly to minimize downtime and increase longevity of parts.*
- Section 6, "**Additional Wedges**": *Contains information about the setup and use of parts which are optional on the V-710BC.*
- Sections 7 and 8, "**Mechanical Components**" and "**Electrical Components**": *These sections contain extensive detailed information for qualified technicians responsible for servicing and maintaining the V-710BC.*
- Section 9, "**Technical Troubleshooting**": *Gives you the basic diagnostic information you need to quickly and accurately solve problems to minimize downtime.*

**NOTE**

*The information in Sections 4 and 9 is designed to be a quick and easy method for the operator to minimize downtime. Streamfeeder does not recommend opening the feeder compartment, or performing any part replacement based on the information given in this manual. For more detailed information, please consult with a qualified technician.*

# Message Conventions

Here are eight types of messages that appear in this manual which help emphasize information of particular interest:

DANGER signifies an operator action or specific equipment area that can result in serious injury or death if proper precautions are not taken.

WARNING signifies an operator action or specific equipment area that can result in personal injury if proper precautions are not taken.

CAUTION signifies an operator action or specific equipment area that can result in equipment damage if proper precautions are not taken.

ELECTRICAL DANGER signifies an operator action or specific equipment area that can result in personal injury or death from an electrical hazard if proper precautions are not taken.


TIP signifies information that is provided to help the operator minimize problems in the operation of the machine.


NOTE provides useful additional information the operator should be aware of to perform a certain task.


CHECK signifies an action that should be reviewed by the operator before proceeding.


IMPORTANT signifies alerting the operator to actions that can potentially lead to operational problems or equipment damage if instructions are not followed properly.

# Safety

Make sure you thoroughly read this Section until you become familiar with all the safety issues relating to the safe operation of this machine.

*Please read all of the Warnings that follow to avoid possible injury.* Although Streamfeeder has made every effort to incorporate safety features in the design of this machine, there are residual risks that do exist that an operator should be aware of to prevent personal injury.

*Please read all of the Cautions that follow to prevent damage to the machine.* The V-710BC Universal Friction Feeder is built with the highest quality materials. However, damage can occur if the machine is not operated and cared for within design guidelines as recommended by Streamfeeder.

## Danger

- **Equipment interior contains incoming 120- or 240-VAC electrical power. Bodily contact with these high voltages can cause electrocution, which can result in serious injury or death.**

## Warnings

- **When operating the feeder, always make sure the discharge safety shield is in place (covering the discharge belts and rollers).** Failure to do so may expose your hands or fingers to moving parts which can cause serious injury.
- **When performing service or maintenance on the feeder, always turn Off the main power switch and disconnect the feeder from the electrical power source.** Failure to do so may expose you to dangerous high voltage or moving parts which can cause serious injury.
- **When performing initial adjustments prior to operation, always make sure you turn Off the main power switch, and disconnect the feeder from the electrical power source.** Failure to do so may expose you to a potential start-up and moving parts which can cause serious injury.
- **Make sure you always plug the machine into a 3-prong, properly grounded and fused electrical power source.** Never remove or disable the grounding lug at the outlet. Failure to follow these warnings may expose you to dangerous high voltage which can cause serious injury.

## Warnings (cont.)

- **Do not attempt to make any adjustments while the machine is running.** Failure to follow this warning may expose you to moving parts which can cause serious injury.
- **Never attempt to clear a jam from the machine until you turn Off the main power switch and disconnect the machine from the electrical power source.** Failure to do so may expose you to a potential start-up and moving parts which can cause serious injury.
- **Do not attempt to gain access to the inside of the feeder.** Refer all questions or problems to a qualified technician.

## Cautions

- **When the machine is not in use, avoid stacking or storing materials on the carriage assembly to prevent damage to the belts.**
- **When replacing fuses, always use the exact type and rating supplied with the machine as shipped from the factory. CAUTION: Double pole neutral fusing. IMPORTANT: Always make sure power module is replaced exactly as removed. Failure to follow this caution can result in damaged electrical parts.**
- **When performing routine cleaning of parts, only use those methods and cleaning solvents (isopropyl alcohol) which are specified by Streamfeeder.** Failure to do so may cause unpredictable results and damage to machine parts. See Section 5, Inspection and Care, for recommendations.
- **Do not attempt to use the machine for any other purpose other than what was recommended by Streamfeeder.** Failure to follow this caution may cause unpredictable performance, and/or damage to machine parts.
- **Avoid leaving any loose cabling near any moving parts.** Failure to follow this caution may result in damage to machine parts.
- **Avoid any type of direct impact to the sensor and extension assembly.** Failure to follow this caution will cause damage to the photo sensor or extension.
- **Do not apply lubricants to any part of the machine.**
- **Do not attempt to gain access to the inside of the feeder. Do not attempt to remove and replace parts.** Refer all questions or problems to a qualified technician.

## Labeling

Streamfeeder has affixed safety labels to those areas of the V-710BC Universal Friction Feeder where potential operator hazards do exist (such as moving belts or rollers). Shown below are label examples, along with their respective locations.

**Feed Belt Guards**

**Discharge Safety Shields**

## Electrical Noise

The air contains electromagnetic interference (EMI) fields and radio frequency interference (RFI), also known as “electrical noise.” Usually this noise is small enough in size (amplitude) to not be a problem. If intense enough, however, it can cause problems for other electrical equipment.

Streamfeeder has designed the feeder with noise immunity in mind. Even the sensors provided with the machine have a certain amount of noise immunity built-in. However, in extremely noisy environments, these design considerations are not necessarily immune to electrical noise and therefore, operational problems can occur. *If you suspect any such electrical noise problems, please report it to a qualified technician.*

## Safety Listings and Certifications

CE

Streamfeeder hereby declares the V-710BC is in conformance with the following standards:

**Machinery Directive 98/37/EC** (consolidation of 89/392/EEC as amended by 91/368/EEC, 93/94/EEC, 93/68/EEC, and 98/79/EC).

Annex I - Essential health and safety requirements relating to the design and construction of machinery and safety components.

ANSI/PMMI B155.1-2000 - American National Standard for Packaging Machinery and Packaging Related Converting Machinery - Safety Requirements for Construction, Care and Use.

**Low Voltage Directive 73/23/EEC** (as amended by 93/68/EEC). Safety of Information Technology Equipment based on publication IEC 60950, Third Edition (1999).

# Safety Listings and Certifications (continued)

**EMC Directive 89/336/EEC** (as amended by 92/31/EC and 93/68/EEC).

**Emissions:**

| | |
|---|---|
| EN 55011:1998 | |
| Group 1, Class A | Industrial, Scientific, and Medical (ISM) Radio Frequency Equipment, Radio Disturbance Characteristics, and Limits and Methods of Measurement. |

***including***

| | |
|---|---|
| EN 61000-3-2, Class A: 1995 | Harmonics. |
| EN 61000-3-3:1995 | Voltage Fluctuations and Flicker. |

**Immunity:**

| | |
|---|---|
| EN 55024:1998 | Information Technology Equipment - Immunity Characteristics - Limits and Methods of Measurement. |

***including***

| | |
|---|---|
| EN 61000-4-2:1995 | Electrostatic Discharge (ESD). |
| EN 61000-4-3:1996 | Radiated Electromagnetic Field. |
| EN 61000-4-4:1995 | Fast Transients (Burst). |
| EN 61000-4-5:1995 | Surge Transients. |
| EN 61000-4-6:1996 | Conducted Disturbance. |
| EN 61000-4-8:1994 | Power Frequency Magnetic Field. |
| EN 61000-4-11:1994 | Voltage Dips, Interruptions and Variations. |

Technical documentation for the V-710BC is maintained at the corporate headquarters of Streamfeeder in Minneapolis, Minnesota.

# Specifications

| | |
|---|---|
| **Maximum Product Size:** | 12 in. W x 12 in. L (305 x 305mm) |
| **Minimum Product Size:** | 3.75 in. W x 3.75 in. L (95 mm x 95 mm) |
| ***Optional:*** | 2.5 in. W x 2.5 in. L (63 mm x 63 mm) |
| **Min/Max Product Thickness:** | .003 in. to .750 in. (.076 mm to 19 mm) |
| **Belt Speed:** | 4000 in/min (101,600 mm/min) |
| **Batch Size:** | 1 to 50 pieces |
| **Electrical Requirements:** | 115/230vac,  50/60 Hz, 3A |
| **Controls:** | DC Diffuse reflective sensors |
| | Variable speed control |
| | 2-position thumb-wheel |
| | Miss detect |
| | Fault/Reset/Cycle button |
| **Weight:** | 43 lbs. (19.5 kg) |
| **Warranty:** | One-year limited warranty |

# 1 About Your Machine

## Features

The V-710BC Universal Friction Feeder is designed for reliability, flexibility, and ease of use with a variety of host systems. Included are such applications as gripper arm envelope inserters and infeed conveyors for various wrapping machines. All parts required for setup, loading, feeding, sensing and easy operator control are combined into one compact unit.

Review the *main assemblies* in Figure 1-1 to become familiar with names and locations of feeder parts and adjustments. This will help to prepare you for initial setup. Descriptions are found in Table 1-1.

Review the *control panel components* in Figure 1-2 to become familiar with names and locations of specific connectors, switches, and controls. This will help to prepare you for installation and operation. Descriptions are found in Table 1-2.

## Main Assemblies

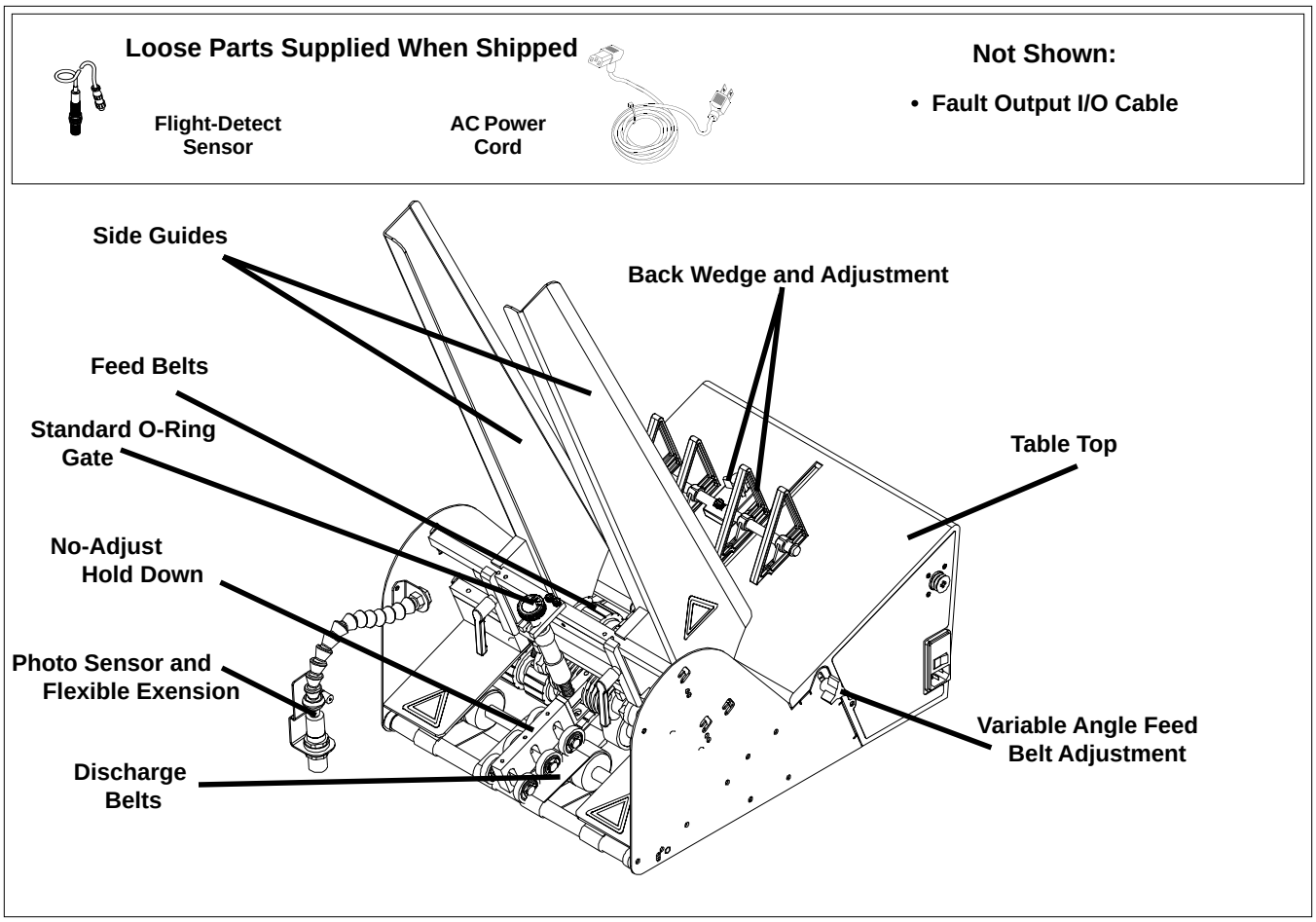



**Figure 1-1. Main Assemblies of the V-710BC Universal Friction Feeder**

**Table 1-1. Main Assemblies Feature Descriptions**

| Feature | Description |
|---|---|
| **Gate assembly and adjustment** | Mounted on a gate bracket assembly above the feed belts, this device provides a curvature to help preshingle stacked material. When properly adjusted, a clearance is created to help singulate and feed material. *(Note: For multiple page material, a 1 to 1.5 maximum thickness is typical.)* |
| **Table top** | Used to support the back wedge. |
| **Variable angle feed belts adjustment** | Located on each side of the feeder, these adjustment knobs allow you to raise the rear feed belts above the table top to achieve optimum contact with material. |
| **Side guides (adjustable)** | Holds a stack of material to be fed and helps keep it straight for proper entry through the gate assembly area. |
| **Back wedge and adjustment** | Lifts the material to keep it off the table top, reduces excessive contact with the feed belts, and helps push the material against the curvature of the gate assembly. To achieve proper lift, an adjustment wing-nut allows you to slide the wedge to various positions. |
| **Photo sensor and flexible extension** | Also called a *sheet-detect* photo sensor, it “looks” for the leading edge of the material to stop the feeder. For optimum setting, a flexible extension allows you to adjust for distance and perpendicular angle to material. |
| **Feed belts and discharge belts** | *Feed belts:* Provides the friction and motion necessary to pull individual material from the bottom of the stack and through the gate assembly area. *Discharge belts:* Combined with the top roller hold-down assembly, provides the friction and motion necessary to pull material away from the gate assembly area. |
| **No-adjust hold down assembly** | Provides the friction and motion necessary to pull materials away from the gate assembly. Positioned above discharge belts. |
| **Control panel** | All connectors and switches for sensor, interface, and AC power are located here. For descriptions, see Figure 1-2 and Table 1-2. |
| **Discharge safety shield** | Provides residual risk protection to operator when feeder is running. |
| **LOOSE PARTS** | |
| **AC power cord, 8 ft. (2.44 m)** | IEC320 removal three-prong. Shipped loose. |
| **Flight-detect sensor** | Mounted at a remote location. It "looks" for a target on-line, such as a hold-down ski or conveyor lug, to start the feeder. |
| **Fault output I/O cable** | Provides the interface for host system integration. |

## Control Panel Components

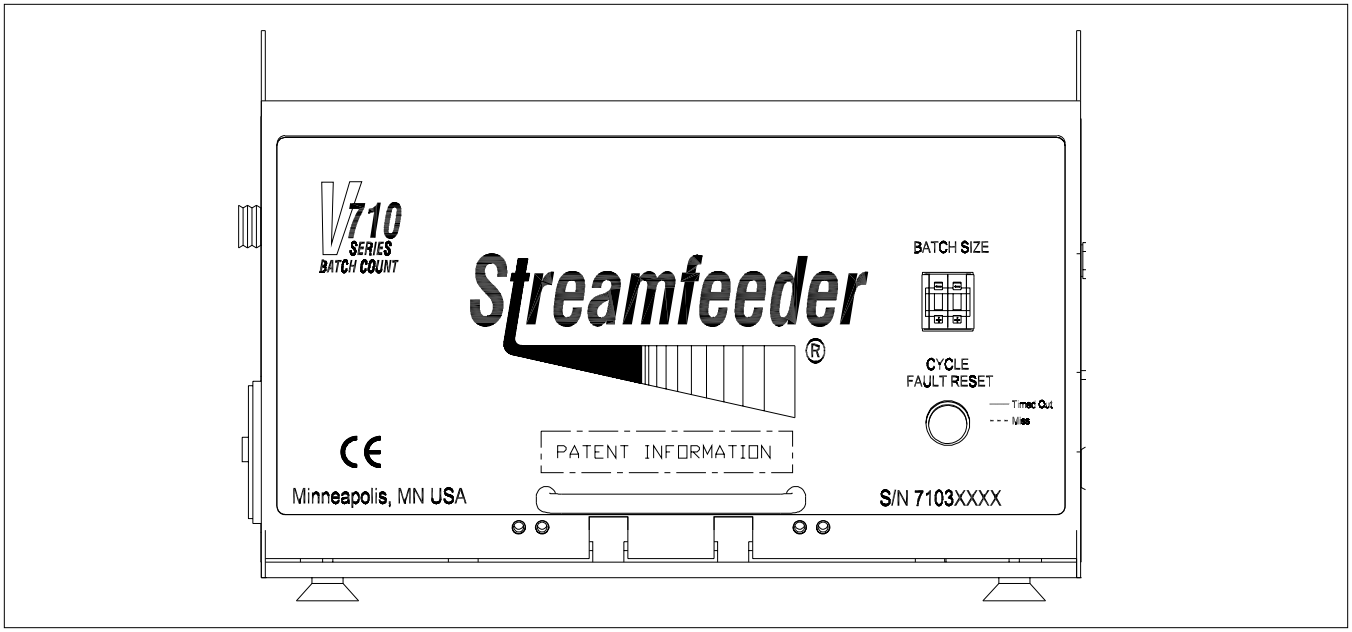



**Figure 1-2. Control Panel Components**

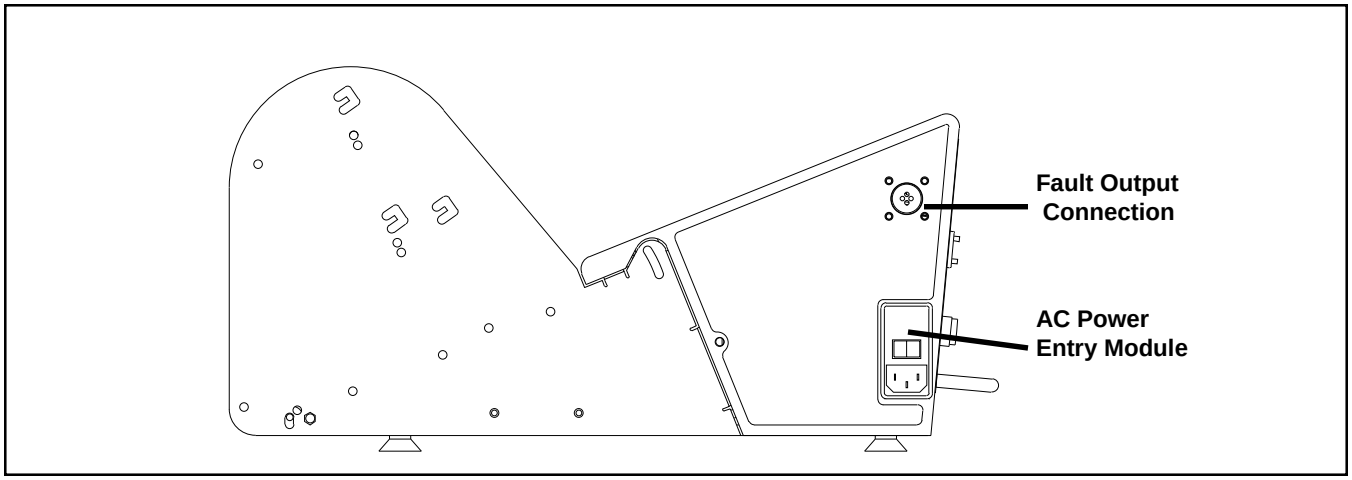



**Figure 1-3. Control Panel Components (Left Side View)**

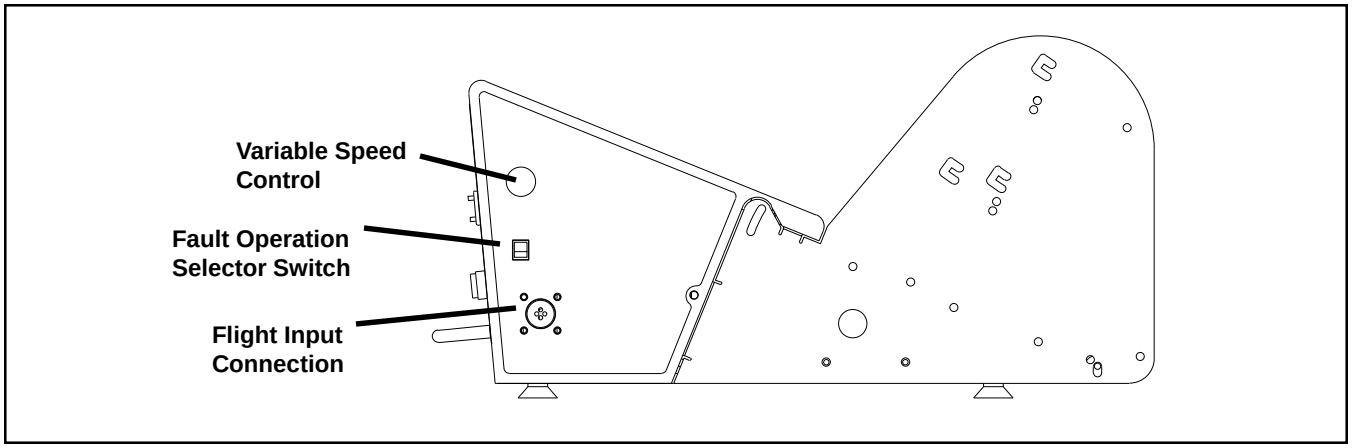



**Figure 1-4. Control Panel Components (Right Side View)**

**Table 1-2. Control Panel Feature Descriptions**

| Feature | Description |
|---|---|
| **AC power cordset connector** | Cordset plugs into this IEC320 connector to provide feeder with power from a grounded/fused outlet. Configured for either 115- or 230-VAC. |
| **Feed/flight trigger connector** | The remote flight-detect sensor plugs into this 4-pin connector to provide the “start” signal to begin a feed cycle. |
| **Power On/Off** | Toggles AC power On or Off. |
| **Fuse holder** | Contains two replaceable GMD3, 5A, 5-mm fuses. *IMPORTANT: Always make sure power module is replaced exactly as removed. Failure to follow this caution can result in damaged electrical parts.* |
| **Reset button/fault indicator/cycle button** | Labeled **Cycle Fault Reset**, the primary purpose of this push-button switch/indicator is to reset the feeder after: 1) a “time-out” occurs or, 2) "misfeed" occurs. Time-outs occur during a misfeed or when the hopper runs out of material. A "time-out" will occur only when operating at line speeds less than 30 pieces per minute. Speeds above 30 pieces per minute will result in a miss fault and a "time-out" will not occur. The push-button switch (labeled **Cycle**) is primarily used during preparation and test. This switch is used to manually start (or run) a feeder cycle. To “start” a cycle, push **Cycle** completely in and then release. |
| **Variable speed control** | This dial switch (labeled **Speed**) allows the feeder speed to be synchronized with an inserter, or infeed conveyor. Turning counterclockwise decreases speed; clockwise increases speed. |
| **Batch count thumbwheels** | These two wheels allow you to select a number from 01 to 59 to which the feeder will always count and then stop. |
| **Fault output connector (dry contact)** | The fault output I/O cable plugs into this connector to provide the host system interface. |
| **Fault configuration selector switch** | This switch allows the operator to select between stopping the feeder or sounding an alarm only when a fault is detected. |

# 2 Preparing for Operation

**When performing initial feeder adjustments prior to operation, always make sure you turn Off the main power switch and disconnect all equipment from the electrical power source. Failure to do so can expose you to a potential start-up and moving parts which can cause serious injury.**

**Do not attempt to make any adjustments while the feeder and machine of application are running. Failure to do so can expose you to moving parts which can cause serious injury. Do not wear loose clothing when operating the feeder.**

**Avoid making adjustments with loose or unsecured parts. This can potentially damage parts.**

Once the V-710BC Universal Friction Feeder is installed on your host system, you are ready to prepare the machine for operation. To do so, you must perform several adjustments with the material you are going to be feeding. Do a test run with this material to verify it is set correctly before you begin cycling the feeder with your particular application. *You will have to perform this procedure for material you plan to feed.*

The adjustments you must make (in order) are as follows:

1: Gate assembly adjustment
2: Side guides setting
3: Back wedge adjustment
4: Photo sensor adjustment
5: Manual test to verify

## STEP 1: Gate Assembly Adjustment

**NOTE**

*Hopper refers to the space where the material is stacked (made up of the side guides).*

**NOTE**

*Keep in mind the gate assembly works with the wedge to provide the proper lift, curvature of the material, and proper belt/material contact to separate and feed one piece at a time.*

**IMPORTANT**

*Feeding problems will occur with either too much material in the hopper, or too large a gap between the gate assembly and the material.*

### Review

The gate assembly provides the curvature to help preshingle material and the proper gap to help the feed belts pull material through the gate assembly area — one at a time. The downward pressure (or weight) of the stack in the hopper will provide the force to help push the material against the curvature of the gate assembly, and help it contact the feed belts. This preshingling will allow the gate assembly to efficiently separate (and singulate) material.

To achieve the optimum separation, you have to use the adjustment knob to either increase (clockwise) or decrease (counterclockwise) the gap between the gate assembly and the feed belts. Depending on the characteristics of the material you are using, you may have to change the gate assembly from the factory-set *high* spring tension to a *low* spring tension. See “Changing from Factory Set High-Tension to Low-Tension” to follow (page 8).

### Objective

Adjust the gate assembly for minimum gap, with minimum pressure on the material. Your objective is to adjust the clearance so that a single piece of material passes without resistance. The optimum setting should be a gap adjustment of 1.5 thickness of material.

# STEP 1: Gate Assembly Adjustment (continued)

Excessive lowering of the gate assembly can damage product or lead to premature wear of the O-rings or feed belts.


*If bottom piece of material does not move freely, the gate assembly is too tight. This can lead to premature wear of the O-rings or feed belts.*

**TIP**

*A wider gap between product and belt provides the highest tolerance for curled and bent edges.*

**NOTE**

*Feeding problems will occur with either too much material in the hopper, or too large a gap between the gate assembly and the material.*

## Procedure

To adjust the gate assembly for proper gap:

1. Slide a single sheet of test product under the gate assembly. It may be necessary to pull up on the adjustment knob to allow the piece to be inserted.
2. Test the piece for clearance. Grasp the product with two hands and slide it front-to-back under the gate assembly. A proper adjustment allows a slight amount of drag on the top of the piece.
3. Adjust the knob on the gate assembly until the piece has the desired drag. Turn the knob clockwise to increase clearance or counterclockwise to decrease clearance.
4. Repeat the drag tests and adjust as needed to achieve acceptable clearance.

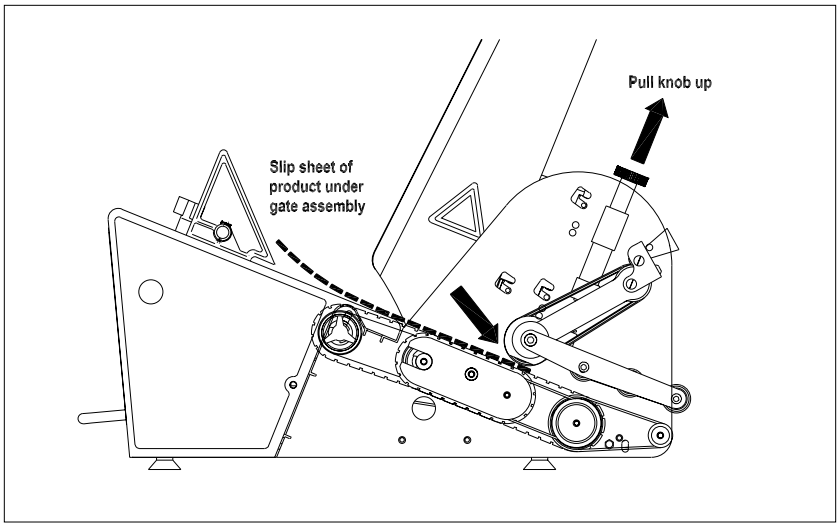



**Figure 2-1. Lifting Gate Assembly Upward to Insert Material**

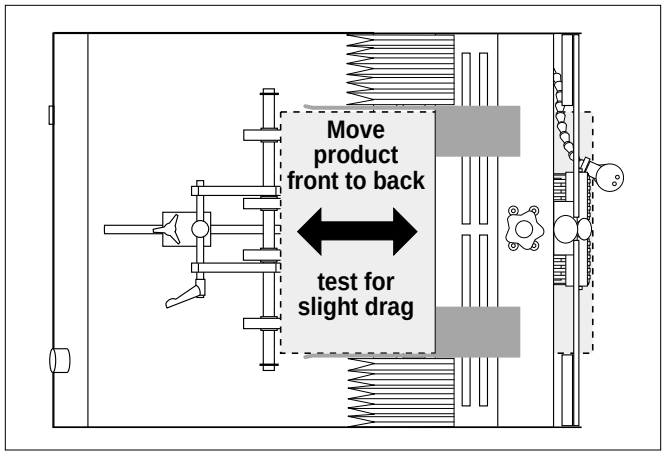



**Figure 2-2. Using Two Pieces of Material to Set Gap**

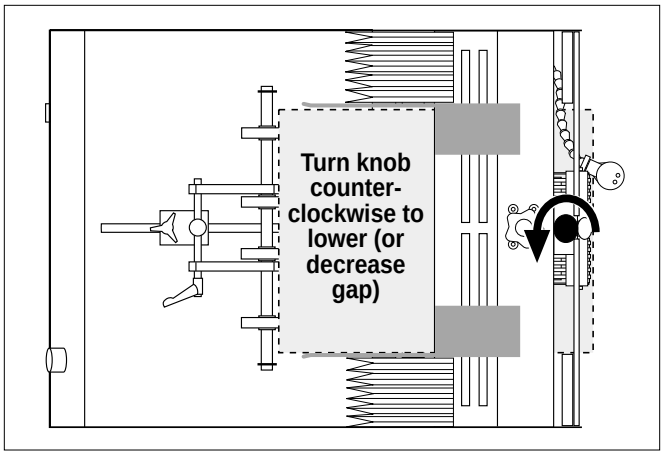



**Figure 2-3. Adjusting Gate Assembly for Correct Gap**

# STEP 1: Gate Assembly Adjustment (continued)

**NOTE**

*When feeding product with varying thickness throughout, it may be necessary to turn both adjustment rollers 1-2* ***full turns*** *counterclockwise to compensate for the differential thickness. This procedure allows the gate horizon to "float."*

**IMPORTANT**

*The adjustment knob set screws are pre-set at the factory to lock the knob to the threaded rod. DO NOT OVER-TIGHTEN! Over-tightening the set screws may damage the components.*

To adjust the gate for effective material skew control, follow these steps:

1. Repeat drag test.
2. Test the piece for uneven side-to-side drag. Grasp with two hands and slide it front-to-back under the gate assembly. A proper adjustment allows for equal drag on the left and right sides of the piece of material.
3. To compensate for greater drag on one side of the material, turn the *opposite* adjustment roller *counterclockwise* 1/8 turn. Next, turn the other adjustment roller *clockwise* 1/8 turn.
4. Repeat drag tests and adjust as needed until equal drag is achieved. You may need to repeat this procedure after observing the feeder cycling (refer to Section 3, How to Operate).

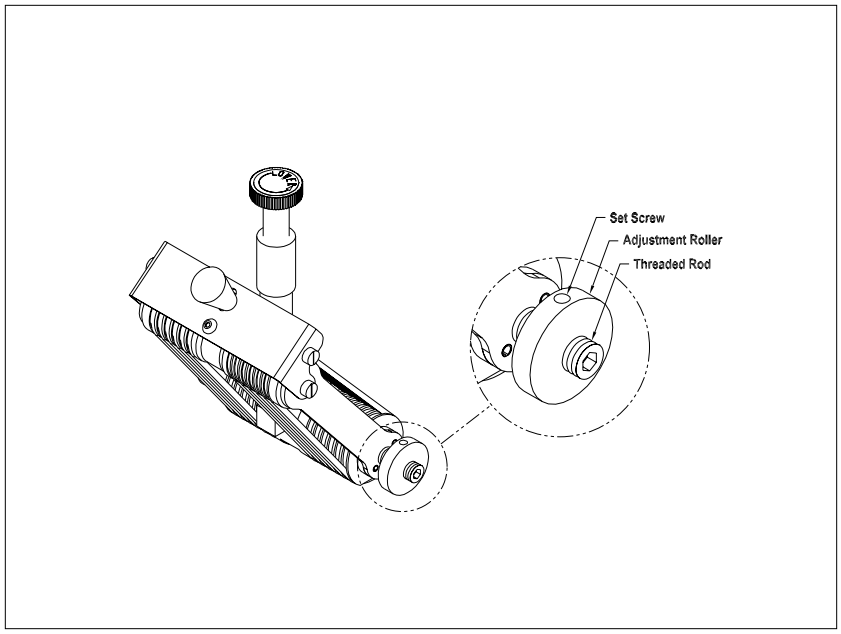



**Figure 2-4. Horizon Adjustment (shown on Advancing O-Ring Gate)**

# Changing From Factory Set High-Tension to Low-Tension

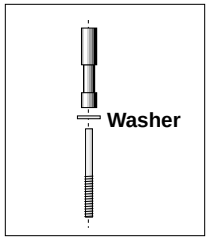
Excessive lowering of the gate assembly can damage material and/or lead to premature wear of the O-rings or feed belts.

**IMPORTANT**

*When changing from a low-tension to high-tension setting, you may have to adjust the stack height downward to prevent feeding problems.*

**NOTE**

*Certain types of single-sheet material may require even more tension than the high-tension setting can provide. To increase tension even further, place a washer between the cylinder and spring.*




## Review

The V-710BC is shipped to you with a high-tension spring in the gate assembly. This setting works well for most materials, allows for tall stack height, and helps provide the best performance in preventing doubles. Certain types of material, however, may demand that you change the gate assembly from a *high-tension* setting to a *low-tension* setting (for example, irregular shaped material).

*If you are feeding material of irregular thickness, you should change to low-tension. This setting provides the following benefits:*

*1) allows the gate assembly to adjust to the irregular thicknesses.*
*2) prevents marking on the material by the gate assembly.*
*3) prevents peeling back the top sheet of a multi-page item.*

## Procedure

To change the spring from a *high* to a *low* tension, follow these steps:

1. Remove the gate assembly from gate bracket assembly. To do so, pull cylinder down with one hand, lift up on knob with other, and tip at slight angle to remove.
2. Remove the adjustment knob by turning counterclockwise (Figure 2-5A). Then lift the cylinder off of top of spring (Figure 2-5B).
3. Turn the cylinder around so the cylinder collar faces up (Figure 2-5C). Then place the cylinder on top of the spring.
4. Replace the adjustment knob (make about 8 revolutions of the knob before reinstalling gate assembly on gate plate).

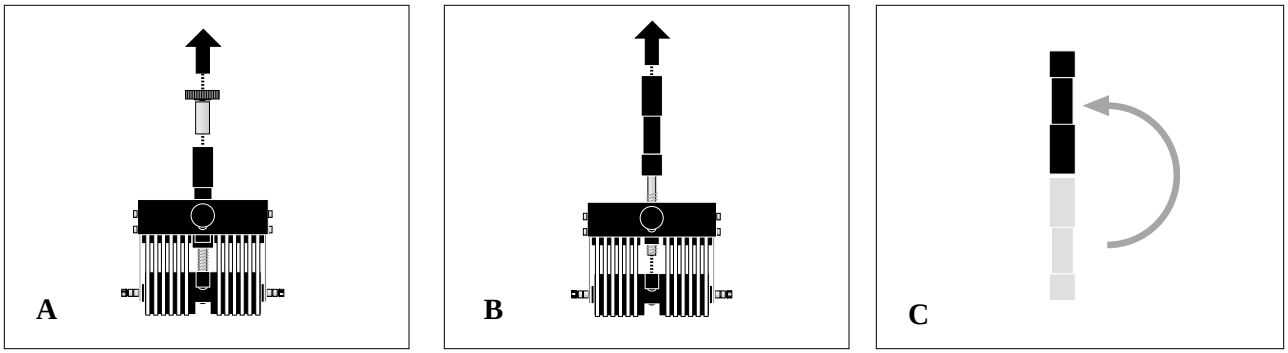



**Figure 2-5. Adjusting Gate Assembly for Low-Tension**

# STEP 2: Side Guides Setting

## Review

The side guides hold the stack of material being fed, and guide the material through the feeder in a straight line of movement. You can adjust the side guides to accommodate different sizes of material.

## Objective

Adjust the side guides so the material stack maintains uniformity from top to bottom, with no drifting or binding. Adjustments are made *horizontally*.

Make sure the space between the side guides can accommodate the size of the material being fed. Consider the following as you adjust the guides:

- An initial starting point should always be that each guide is of equal distance from the center point of the machine.
- Each edge of the material should rest equally on the belts, on both sides of the gate assembly (or equidistant spacing). *There may be certain instances where guides do not need to be centered due to material characteristics. This is called offset spacing.*
- Adjust both side guides to be as close as possible to either sides of the material, without causing binding, curling of edges, or resistance to movement.

## Procedure

**One-Knob Side Guides (optional).** To adjust each side guide for proper *equidistant* horizontal spacing using the single-knob adjustment, follow these steps (Figure 2-6):

1. Place a small stack of material in the hopper.
2. Using the side guides adjustment knob (centrally located between the two guides), turn in either direction until guides are located at the recommended distance from the material: .0625 in. (1.6 mm) from each edge, .125 in. (3.1 mm) overall.
3. Visually check both guides for proper spacing from material.

**Two-Knob Side Guides (standard).** To adjust each side guide for proper *equidistant* horizontal spacing using the dual-knob adjustment, follow these steps:

1. Place a small stack of material in the hopper.
2. Start by loosening each side guide wing adjuster (counterclockwise). This will allow you to move each side guide as needed.
3. Grasp the lower part of each guide and slide to the recommended distance from the material: .0625 in. (1.6 mm) from each edge, .125 in. (3.1 mm) overall. Tighten each wing adjuster after you establish proper position for each guide.
4. Visually check both guides for proper spacing from material.

**TIP**

*A good "rule-of-thumb" measurement to use is about .0625 in. (1.6 mm) between material edge and side guide (.125 in. or 3.1 mm overall).*

**NOTE**

*There are two types of side guide adjustments available:*

1) *One-Knob: Both side guides controlled simultaneously by a single knob (as shown in Figures 2-6 and 2-7).*
2) *Two-Knob: Each side guide controlled by separate knobs.*

# STEP 2: Side Guides Setting (continued)

**One-Knob Side Guides.** To adjust each side guide for proper *offset* horizontal spacing using the single-knob adjustment, follow these steps (Figure 2-7):

1. Push down on the side guides spring-loaded adjustment knob to disengage guides from gear mechanism.
2. Grasp whichever side you wish to offset first and move into position.
3. Place a small stack of material in the hopper, with edge of paper against offset guide.
4. Move the second side guide so it is located at the recommended distance from the material: .0625 in. (1.6 mm) from each edge, .125 in. (3.1 mm) overall.
5. Lift up on the spring-loaded adjustment knob so the guides lock into place.
6. Visually check both guides for proper spacing from material.

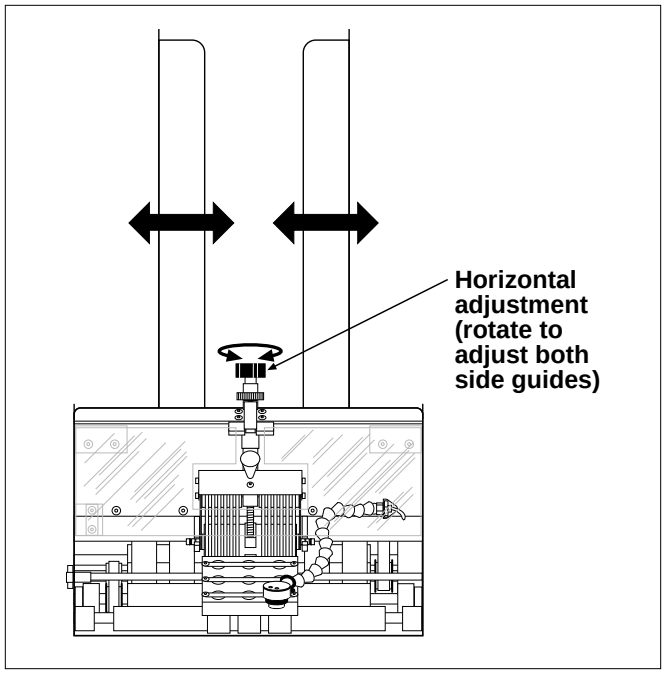



**Figure 2-6. Horizontal Adjustment of Side Guides**

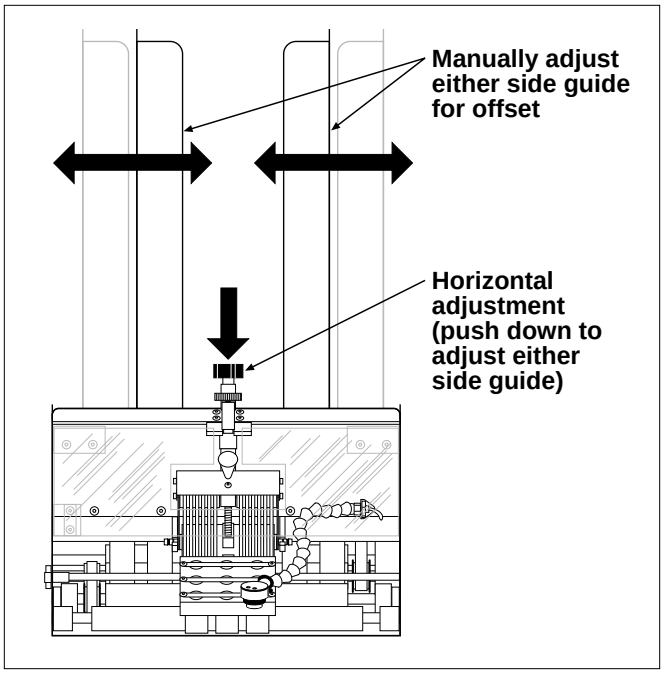



**Figure 2-7. Individual Side Guide Offset**

**Two-Knob Side Guides.** To adjust each side guide for proper *offset* horizontal spacing using the dual-knob adjustment, follow these steps:

1. Start by loosening each side guide wing adjuster (counterclockwise). This will allow you to move each side guide as needed.
2. Repeat steps 2-5 above.
3. Tighten each wing adjuster after you establish proper position for each guide.
4. Visually check both guides for proper spacing from material.

# STEP 3: Back Wedge Adjustment

**NOTE**

*Keep in mind the back wedge works with the gate assembly to provide the proper lift, curvature of the material, and proper belt/ material contact to separate and feed one sheet at a time.*

**TIP**

*There are a number of feeding problems which can be solved by simply adjusting the back wedge to different positions. Some of these problems include double feeds, skewing, twisting, poor singulation, ink or varnish buildup on the belts, and jamming at the gate assembly area.*

## Review

The back wedge provides proper lift to the material to help keep it off the table top and feed belts, and it creates the force necessary to push material against the gate assembly. By adjusting it back and forth from the gate assembly or pivoting side to side, you can create the lift and force necessary to preshingle material against the curvature of the gate assembly. Also, it keeps other sheets off the feed belts until proper separation of the bottom sheet at the gate assembly has occurred.

Here are some general guidelines that should help you determine how the back wedge should be positioned for your particular material:

- *Moving the individual wedge triangles to the outside* of the back wedge shaft will create a bow in the center. The bow will stiffen the material to promote better singulation of thinner material.
- *Pivoting the back wedge from its perpendicular to the gate assembly* will increase or decrease the amount of drag or contact (traction) on the feed belts for a given side. This can also be used to control twisting or skewing of material as it leaves the gate assembly area.
- *If the back wedge is positioned too far backward* from the gate assembly, the belts are driving the material before the bottom sheet has separated and left the gate assembly area. This pushes the gate assembly up, creating more pressure on the material, O-rings, and feed belts. The result can be premature buildup of ink or varnish on the belt surfaces. It can also cause more than one material at a time to be forced under the gate assembly, creating a double feed.

  By moving the back wedge forward, only the bottom material can make contact with the belt surface. Slippage is reduced, minimizing buildup on the belt surface. Double feeding is also reduced.
- *If the back wedge is positioned too far forward* to the gate assembly, a pinch point can be created between the top surfaces of the individual rollers and the material. Moving the back wedge even closer toward the gate assembly can allow material to overhang the wedge, creating too much lift of the material off the feed belts.

# STEP 3: Back Wedge Adjustment (continued)

## Objective

Adjust the back wedge for proper support of the material off the table top, without creating any pinch or stress points.

## Procedure

To adjust the back wedge for initial proper positioning, follow these steps:

1. Grasp a handful of material, approximately 2 to 2.5 in. (5 to 6 cm) thick, and preshingle the edges with your thumb (Figure 2-8).
2. Place the preshingled material in the hopper so the edges rest against the curvature of the gate assembly.

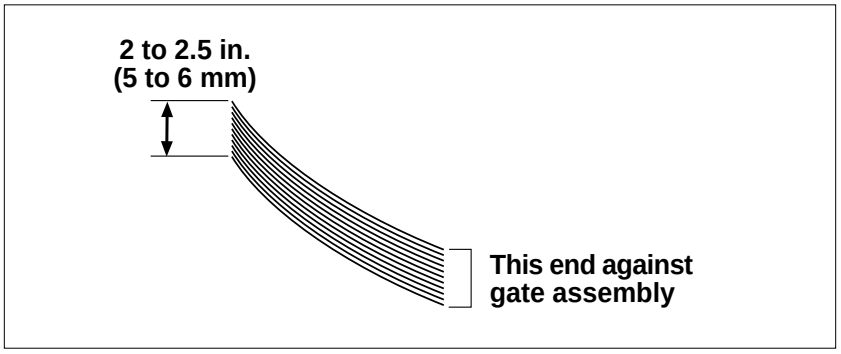



**Figure 2-8. Preshingling a Small Stack of Material By Hand**

**NOTE**

*Moving the back wedge too far forward to the gate assembly can create a pinch point between the wedge and the material. If moving the back wedge in is not effective, then an optional wedge may be required.*

3. Turn the back wedge wing-nut adjustment counterclockwise to loosen the wedge.
4. Move the back wedge forward and backward until the bottom sheet is not touching the table top. A good starting point is to measure about .625 in. (16 mm) from the bottom sheet to front edge of table top.
5. Make sure the edge of the back wedge assembly is parallel with the edge of the material stack. Adjust as required and then tighten the wing-nut.
6. Check that individual wedge triangles are evenly spaced to provide enough support to lift the material off the table top and feed belts, without any bowing or twisting. *Refer back to the previous page for guidelines on adjusting individual wedge triangles for thinner material.*

# STEP 4: Photo Sensor Adjustment

**NOTE**

*Standard photo sensor shipped from the factory is a diffuse reflective detector. No adjustment for gain is required or necessary.*

*Only adjust the photo sensor when the feeder power is Off. Do not attempt to adjust the photo sensor while the feeder power is On or while the feeder is running. Doing so will expose you to pinch points which can cause injury to hands or fingers.*

*Potential damage to feeder parts is avoided if adjustments are made when the feeder power is Off.*

**IMPORTANT**

*On the feeder, such objects as shafts, guides, belts, and supports may cause false "reads" if the photo sensor is not adjusted properly for the material. The resulting problem can be intermittent or continuous feeding. See Section 4, Operational Troubleshooting, for a solution.*

**NOTE**

*For any questions you may have about adjusting the Flight-Detect photo sensor, consult with a qualified technician.*

**TIP**

*Avoid light colored backgrounds in the discharge area.*

## Review

The **Flight-Detect** photo sensor is mounted on the line to detect a target (for example, a conveyor lug) so as to eject a product. The **Sheet-Detect** photo sensor is mounted on the flexible arm extension assembly to detect the leading edge of a product about to be ejected so as to turn the feeder Off.

*In preparing for operation, your initial concern should be to properly position the **Sheet-Detect** photo sensor.*

## Objective

For the **Sheet-Detect** photo sensor to be effective, it must be adjusted within a specified range and angle to the product.

## Procedure

To adjust the **Sheet-Detect** photo sensor for proper positioning, follow these steps:

1. Aim and align the photo sensor straight toward (perpendicular to) the product. If the photo sensor is at an angle, the light will not be reflected straight back to the receiver.
2. Position the photo sensor at distance between 1 to 1-1/2 in. (25 to 38 mm) from the product. Initially use the adjustable arms on the extension assembly. *When only the green LED is On, you will know when the photo sensor is positioned properly. The amber LED is On when product is staged.*
3. When making the adjustment, be aware of any background objects beyond the product range. *On the feeder, such objects as shafts, guides, belts, and supports may cause false returns if the photo sensor is not adjusted properly for the product (or target). The resulting problem can be continuous feeding. See Section 4, Operational Troubleshooting, for a solution.*

# STEP 5
# Manual Test to Verify

Now that you have made all the necessary adjustments for operation, it is recommended that you verify material singulation and separation at the feeder for your particular application. Before you power-up and run your machine with a full hopper, manually feed several sheets of material through the gate assembly area.

Prepare your test by loading the hopper with approximately 2 to 2.5 in. (5 to 6 cm) of material. Make sure you preshingle the stack so that material rests against the curvature of the gate assembly.

1. Manually feed several sheets of material slowly through the gate assembly area. Move the drive belts by pressing your thumb against the discharge belt.
2. Observe how individual material enters and exits the gate assembly area. Remember, a properly set gap will allow each new sheet to enter at about the center line of the cylinder while the bottom sheet is exiting the gate assembly area (Figure 2-9). Ideally, this means a slight overlap of both the first sheet and the second sheet (.125 in. or 3 mm) at the gate assembly area. The overlap occurs as the bottom sheet is exiting and the next sheet is entering.
3. If feeding doubles, move the wedge in toward the gate assembly. Test again.
4. If sheets are overlapping excessively or, if the machine is feeding doubles, reduce the gap slightly by moving the knob about 1/8 turn counterclockwise. Test again.
5. As material moves through the hold-down area, check for any skewing or jamming. Also check for damage to the material.
6. If this or other feeding problems still persist (slipping, skewing, jamming), then review all the adjustment procedures in Section 2, Preparing for Operation.

**NOTE**

*If the gate assembly is too tight, the feeder will have difficulty pulling the material through the gate assembly area. This will cause "missed" feeds.*

**NOTE**

*For certain types of materials, you may have to position the material "off-center" to prevent any skewing effect.*

**TIP**

*Moving the back wedge too far forward to the gate assembly can create a pinch point between the tip of the triangle wedges and the material. If moving the back wedge in is not effective, then an optional wedge may be required. See Section 6, Additional Wedges, for more information.*

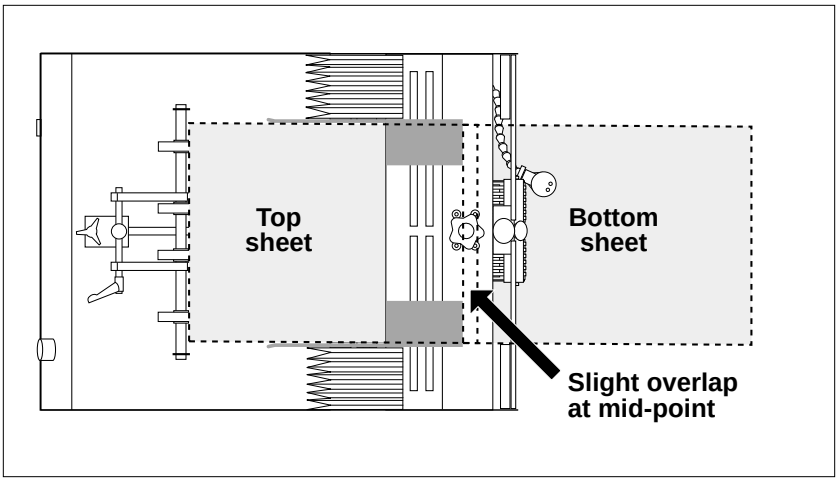



**Figure 2-9. Optimum Overlap and Separation of Material**

# 3 How to Operate

This section provides a *sequence of operation* for the V-710BC Universal Friction Feeder. It also provides information for *clearing a jam* and for *shutdown*.

## Sequence of Operation

Successful power-up and operation is assured if you apply the following sequence of steps:

1: Loading material in the hopper

2: Determining stack height

3: Powering On feeder

4: Setting/adjusting speed

5: Running test cycles

6: Final check

### STEP 1: Loading Material in the Hopper

**NOTE**

*Preshingling prevents multiple sheets from jamming under the gate assembly at startup.*

1. Start by preshingling by hand a small stack of material so that it conforms to the curvature of the gate assembly. Push in gently to make sure lead edges touch the gate bracket assembly and front edges of the hopper guides (Figure 3-1).
2. At the back wedge, notice how it helps lift the trailing edges of the material off the table top and feed belts. Also notice how the lifting helps to push the preshingled edges against the curvature of the gate assembly.

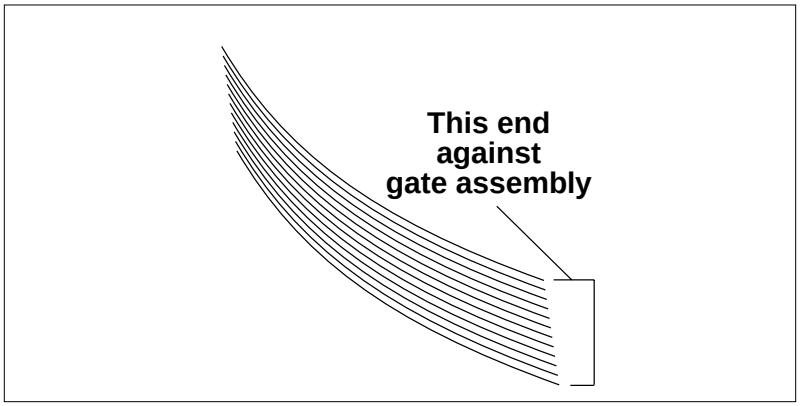



**Figure 3-1. Preshingling of First Stack**

## STEP 2: Determining Stack Height

1. Gradually add more material to the hopper after the initial stack is formed around the gate assembly. As stack height will have a preferred minimum and maximum, you will have to experiment to determine effective range of height (Figure 3-2).
2. Make sure the material is loaded in the hopper as straight as possible. Before adding to hopper, “jog” each handful of material on a flat surface to make sure lead edges are as even as possible. As you add each handful, gently push in each stack so that lead edges rest firmly against front of side guides.

**TIP**

*Stack height affects the downward pressure on the feed belts. Greater downward pressure can increase the chances for double feeds.*

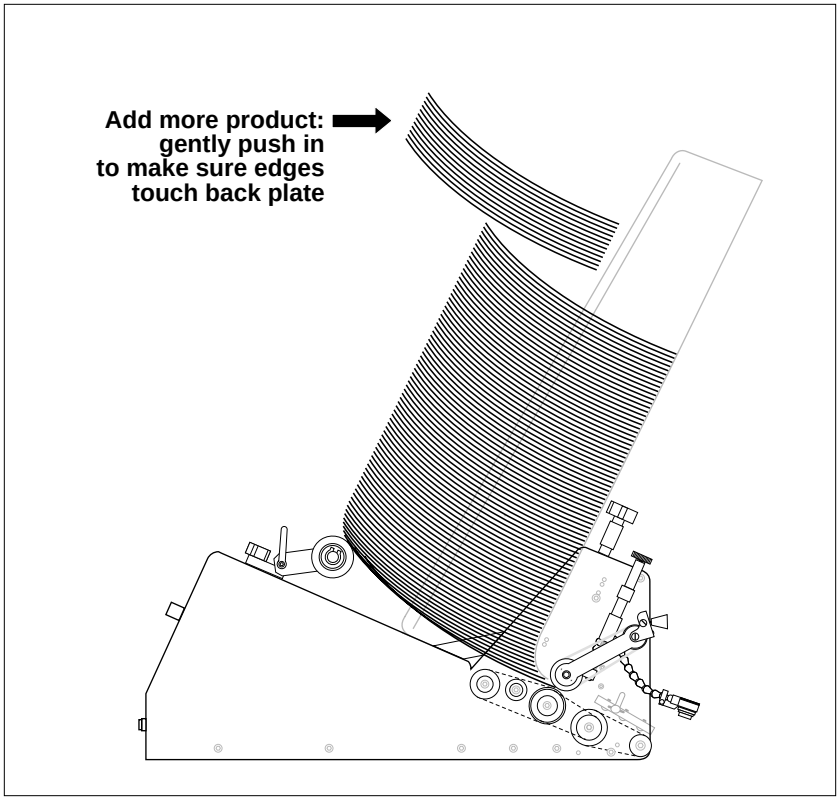
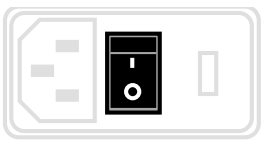


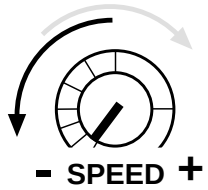

**Figure 3-2. Adding More Material to Hopper**

## STEP 3: Powering On Feeder

Turn the feeder power On by pushing the horizontal line (—) at the **Power** On/Off rocker switch.



## STEP 4: Setting/Adjusting Speed




1. Set the variable speed control to the lowest speed (counterclockwise).
2. Start by slowly turning the control clockwise to gradually increase feeder speed to coincide with the production line speed of your particular application.

## STEP 5: Running Test Cycles

**TIP**

*It might be helpful to know that a properly set gap will allow the leading edge of sheet to enter at about the center line of the cylinder, as the previous or bottom sheet is exiting the gate assembly area.*

- First test the feeder *off-line* by pressing and releasing the **Cycle** pushbutton switch. Cycle as many times as you need to ensure the material is feeding properly. Make sure the material is preshingling against the gate assembly, and has proper separation out of the gate assembly area.
- Watch for any damage to material.
- Test the feeder on-line (with the photo sensors).

## STEP 6: Final Check

Make sure:

- Leading edge of bottom sheet stops at proper location.
- Proper separation is occurring at gate assembly area.
- Effective preshingling is occurring at curvature of gate assembly.
- Material is not being damaged during cycling.
- Feeder is secured and will not move during operation.

## Clearing a Jam

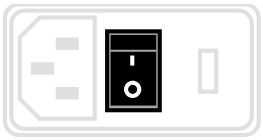
If a jam occurs during operation, follow these steps:

1. Lift hold-down rollers away from the discharge belts.
2. Remove jammed product from feeder. While doing so, try to determine the cause of the jam (see Section 4, Operational Troubleshooting).
3. Verify whether any adjustments are loose. If so, refer back to Section 2, Preparing for Operation, for proper adjustment procedures.
4. Reset the feeder by pressing the reset/fault indicator button (labeled **Cycle Fault Reset**).

**NOTE**

*Reposition photo sensor (as required).*

## Shutdown



Should you not be using the feeder for long periods of time, follow these steps to ensure safe and secure storage:

1. Turn the feeder power Off by pushing the circle (**O**) at the rocker **Power** On/Off rocker switch.
2. Disconnect the feeder power cord from the AC power source.
3. Cover the feeder with a cloth or plastic tarp to prevent dust and debris from accumulating.

# 4 Operational Troubleshooting

**Table 4-1. Quick-Look Troubleshooting**

| Problem | Cause | Solution |
|---|---|---|
| **No AC power to feeder** | 1. On/Off switch in "Off" (or "**O**" position).<br>2. Power cord loose or not plugged into outlet (or AC power source).<br>3. Female end of power cable loose or not plugged into AC power inlet at rear of feeder.<br>4. Blown fuse. | 1. Check that the switch is pressed to "On" (or "__" position).<br>2. Check and secure power cord at AC outlet.<br>3. Check and secure cord at AC power inlet (rear of feeder).<br>4. Consult with a qualified technician. |
| **Feeding doubles** | 1. Gate assembly improperly adjusted (possibly more than one sheet thickness).<br>2. Back wedge improperly adjusted.<br>3. Worn O-rings (or if applicable, angled edge).<br>4. Material interlocking.<br>5. Static buildup. | 1. Review gate assembly adjustment in Section 2, Preparing for Operation.<br>2. Review back wedge adjustment in Section 2, Preparing for Operation.<br>3. Rotate O-rings. Or, if applicable, replace angled edge (see Section 5, Inspection and Care, for procedure). If wear is excessive, consult with a qualified technician.<br>4. Check material and source.<br>5. Check material and source. |
| **Continuous feeding and timing out** | 1. Possible overlapping.<br>2. Photo sensor not adjusted properly; may be "seeing" background objects. | 1. See "Feeding Doubles" above.<br>2. Review photo sensor adjustment in Section 2, Preparing for Operation. |
| **Feed belts are operating, but material not feeding** | 1. Material stack weight is too low when stack height is down, resulting in reduction of down pressure.<br>2. Binding in side guides.<br>3. Slippery feed belts (material buildup).<br>4. Sheet adhesion or interlocking between the bottom and next sheet.<br>5. Gate assembly may be down too tight.<br>6. Too much weight in hopper. | 1. Review loading the material in Section 3, How to Operate.<br>2. Adjust the side guides farther apart to allow freedom of movement between sheets.<br>3. Consult with a qualified technician.<br>4. Review loading the material in Section 3, How to Operate, or review back wedge adjustment in Section 2, Preparing for Operation.<br>5. Review gate assembly adjustment in Section 2, Preparing for Operation.<br>6. Remove material from stack. Test again. |
| **Feed belts not operating; fast beep alarm sound** | 1. Feeder operation was stopped due to a "time-out" fault (i.e., miss, jam, no material in hopper). | 1. Check if reset button/fault indicator is illuminated. Press Reset button. |

**Table 4-1. Quick-Look Troubleshooting (continued)**

| Problem | Cause | Solution |
|---|---|---|
| **Feed belt(s) not tracking on rollers** | 1. Excessive weight in hopper.<br>2. Excessive down pressure on gate assembly.<br>3. Off-centered product from center point of machine.<br>4. Stack is bearing down on edge of belt.<br>5. Belt wear.<br>6. Rollers out of adjustment. | 1. Reduce weight. Test again.<br>2. Rotate clockwise 1/8 turn to increase gap and manually test. Also, review gate assembly adjustment in Section 2, Preparing for Operation.<br>3. Review side guides setting in Section 2, Preparing for Operation.<br>4. Move stack away from belt, even if this causes stack to be aligned off center from center line of feeder.<br>5. Review gate assembly adjustment and back wedge adjustment in Section 2, Preparing for Operation. Also see Section 5, Inspection and Care. If wear is excessive, consult with a qualified technician.<br>6. Consult with a qualified technician. |
| **Jamming occurs during operation** | 1. Improper adjustment of any of the following areas:<br>a. Gate assembly.<br>b. Back wedge. | a. Turn the Power switch to "Off" by pushing the circle ("O").<br>b. Remove jammed material from feeder. While doing so, try to determine the cause of the jam.<br><br>Verify each adjustment by reviewing Section 2, Preparing for Operation. |
| **Material skewing** | 1. Back wedge not aligned properly.<br>2. Gate horizon not set properly. | 1. Review back wedge adjustment in Section 2, Preparing for Operation.<br>2. Review gate assembly adjustment in Section 2, Preparing for Operation. |
| **Material too far from gripper jaw (inserter application only)** | 1. Photo sensor "staging" leading edge of material too far from hopper plate.<br>2. Gripper jaw adjusted too far from edge of hopper plate. | 1. Review photo sensor adjustment in Section 2, Preparing for Operation.<br>2. Adjust gripper jaw as required per inserter owner's manual. |
| **Material too deep in gripper jaw (inserter application only)** | 1. Photo sensor "staging" leading edge of material too far past hopper plate.<br>2. Gripper jaw adjusted too close to edge of hopper plate. | 1. Review photo sensor adjustment in Section 2, Preparing for Operation.<br>2. Adjust gripper jaw as required per inserter owner's manual. |

# 5 Inspection and Care

**When performing initial feeder adjustments prior to operation, always make sure you turn Off the main power switch and disconnect all equipment from the electrical power source. Failure to do so can expose you to a potential startup and moving parts which can cause serious injury.**

**Do not attempt to make any adjustments while the feeder and machine of application are running. Failure to do so can expose you to moving parts which can cause serious injury. Do not wear loose clothing when operating the feeder.**

**Avoid making adjustments with loose or unsecured parts. This can potentially damage parts.**

Please read this Section to learn how to:

- Visually inspect your machine to detect part problems which may require adjustment or replacement.
- Periodically care for your machine to prevent any operational problems.

## Visual Inspection

### Checking for Feed and Discharge Belt Wear

Check for visual signs of:

- Walking. Replace as required.
- Cracking. Replace as required.
- Thinning. Replace as required.

### Checking for Timing and Drive Belt Wear

Check for visual signs of:

- Fraying. Replace as required.
- Missing teeth. Replace as required.
- Cracking. Replace as required.
- Paper residue buildup. Clean from belts, especially in grooves. For more information, see “Preventive Care,” to follow.

### Ensuring Proper Feed and Discharge Belt Tracking

Check for visual signs of:

- Stretching.
- Improper roller adjustment.

# Visual Inspection (continued)

## Ensuring Proper Timing and Drive Belt Tracking

Check for visual signs of:

- Misaligned timing pulleys.

## Checking for Gate Assembly Wear

Check for visual signs of wear:

- Advancing O-ring, or standard O-ring gate: Flat areas along the O-rings (Figures 5-1 and 5-2, respectively).
- Bar Gate: Angled wedge begins to flatten excessively (Figure 5-3).

See “Preventive Care” to follow.

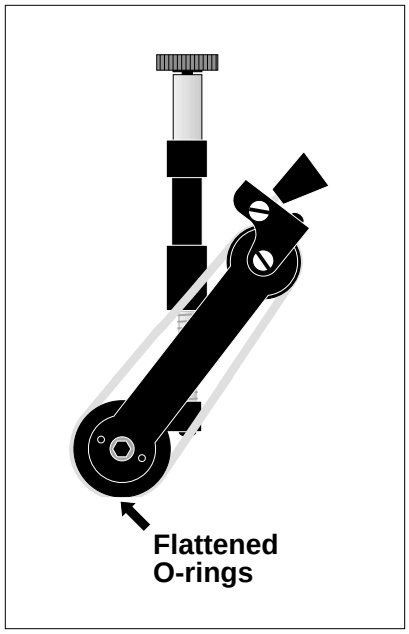



**Figure 5-1. Advancing O-Ring Gate**

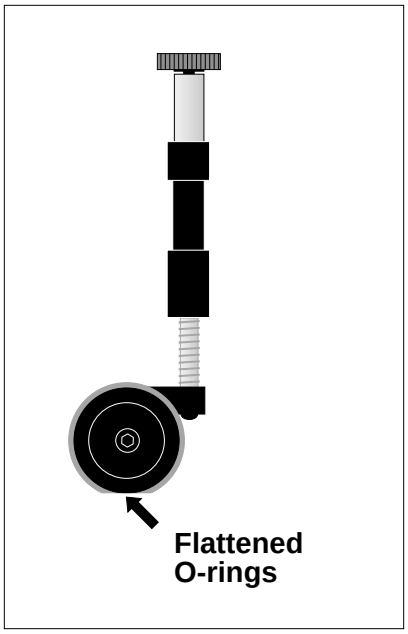



**Figure 5-2. Standard O-Ring Gate**

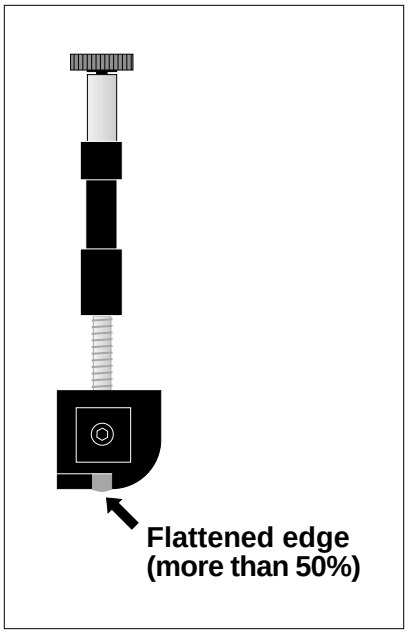



**Figure 5-3. Bar Gate**

# Visual Inspection (continued)

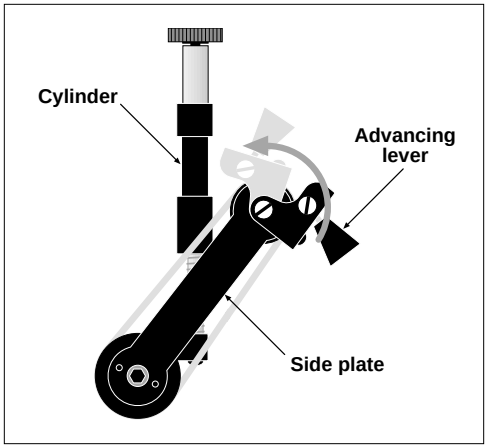



**Figure 5-4. Advancing O-Ring Gate**

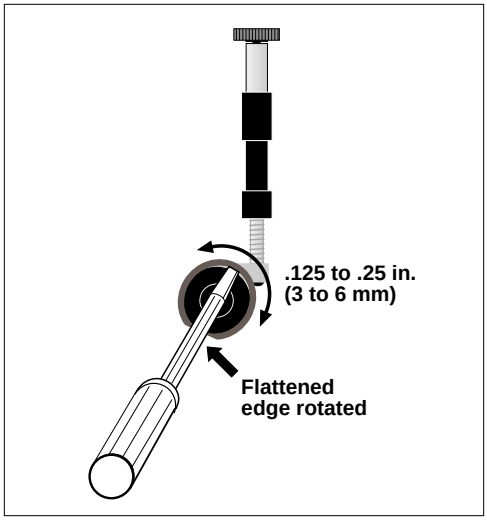



**Figure 5-5. Standard O-Ring Gate**

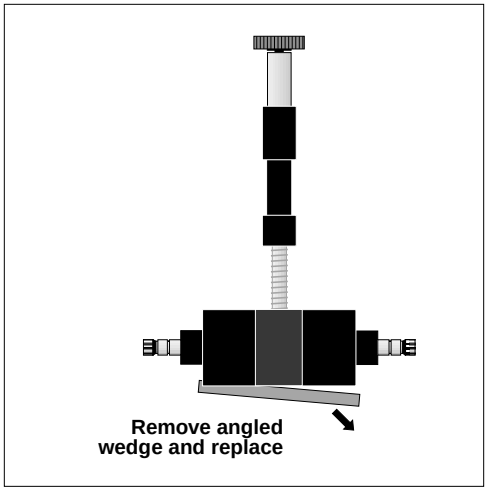



**Figure 5-6. Bar Gate**

## Advancing O-Ring Gate: Adjusting Worn O-Rings

To adjust worn O-rings on advancing O-ring gate (Figure 5-4):

1. Turn Off feeder and remove power cord from outlet.
2. Rotate O-rings by grasping advance knob and pushing toward gate cylinder about .125 to .25 in. (3 to 6 mm).
3. Restore power.

## Standard O-Ring Gate: Adjusting Worn O-Rings

To adjust worn O-rings on standard O-ring gate (Figure 5-5):

1. Turn Off feeder and remove power cord from outlet.
2. Remove gate assembly from gate plate.
3. Insert a screwdriver in slot on top of gate assembly and rotate screwdriver clockwise or counterclockwise 360° to move worn area of O-ring about .125 to .25 in. (3 to 6 mm).
4. Remove screwdriver and repeat for each ring as necessary.
5. Reinstall gate assembly and restore power.

## Replacing Worn Angled Wedge

To replace a worn angled wedge (Figure 5-6):

1. Turn Off feeder and remove power cord from outlet.
2. Remove gate assembly from gate plate.
3. Remove plate (two screws).
4. Remove angled wedge.
5. Install new angled wedge. Reinstall plate (two screws).
6. Reinstall gate assembly and restore power.

# Preventive Care

Use only isopropyl alcohol (98% concentration). Other solvents will cause belts to wear prematurely, and even cause total breakdown of material.

*Cleaning schedule for various materials:*

- *Typical: every month*
- *Dusty: after every shift*
- *High ink or varnish: 1 time per shift*

## Cleaning Feed and Discharge Belts

To clean feed belts:

1. Turn Off feeder and remove power cord from outlet.
2. Remove gate assembly from gate plate for easier access to belts.
3. Apply a small amount of isopropyl alcohol to a soft cloth.
4. Use your hand to move the feed belt, start with one feed belt at a time and carefully press the moistened area of the cloth to the belt. As you rotate the belt, use moderate pressure to wipe across the belt, making sure to wipe in direction of grooves. After several rotations of the belt, repeat for each belt.
5. Taking a dry portion of the cloth, go back to the first feed belt cleaned and use moderate pressure against the belt for several revolutions to ensure the belt is dried. Repeat for each belt.
6. Reinstall gate assembly and restore power.

To clean discharge belts:

1. Turn Off feeder and remove power cord from outlet.
2. To access discharge belts, remove gate assembly and hold down. Remove safety covers from hopper assembly.
3. Repeat steps 3-5 above.
4. Reinstall gate and hold down assembly, reinstall discharge safety shield and restore power.

# Preventive Care (continued)

## Cleaning Gate Assembly

**Use only isopropyl alcohol (98% concentration). Do not use any other types of solvents. They will cause premature wear of the belts, or even total breakdown of the material.**

To clean gate assemblies:

1. Turn Off feeder and remove power cord from outlet.
2. Remove gate assembly from gate bracket assembly.
3. Apply a small amount of isopropyl alcohol to a soft cloth.
4. Wipe across O-rings (Figures 5-7 or 5-8), or angled wedge if applicable (Figure 5-9). First wipe in one direction, then the other.
5. Taking a dry portion of the cloth, go back and wipe all surfaces to ensure they are dried.
6. Reinstall gate assembly and restore power.

**NOTE**

*Depending upon the application, it may be necessary to move the feeder from original installation so as to access gate assembly.*

| *Cleaning schedule for various materials:* |
|---|
| • *Typical: every month* |
| • *Dusty: after every shift* |
| • *High ink or varnish: 1 time per shift* |

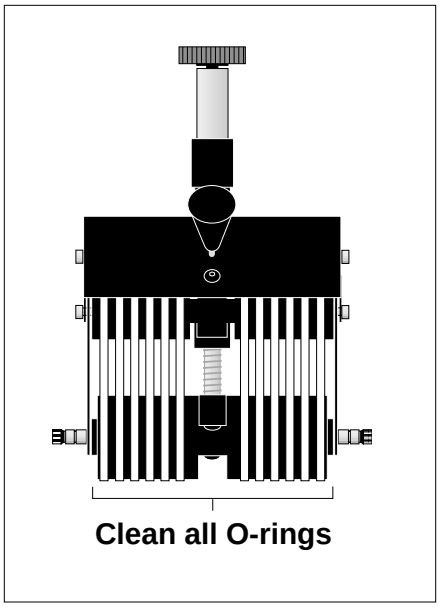



**Figure 5-7. Advancing O-Ring Gate**

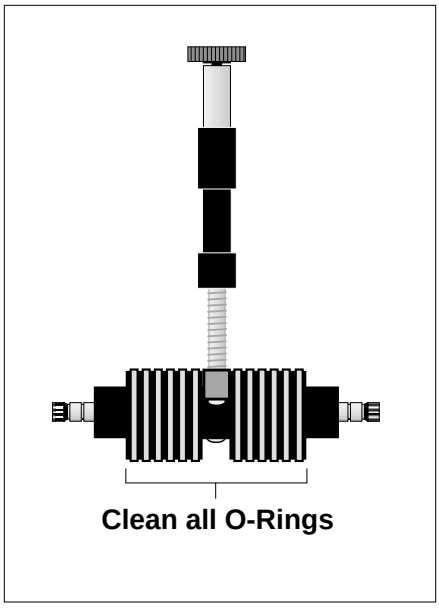



**Figure 5-8. Standard O-Ring Gate**

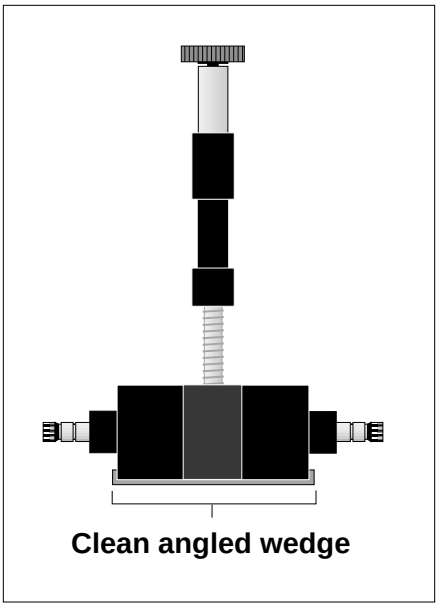



**Figure 5-9. Bar Gate**

# Preventive Care (continued)

Do not use any solvents or cleaning agents when cleaning the photo sensor lens. This will result in surface damage and eventual faulty performance.

## Cleaning Photo Sensor

To clean the photo sensor lens:

1. Turn Off feeder and remove power cord from outlet.
2. Using a soft, dry cloth, wipe across the face of the photo sensor lens.
3. Recheck the adjustments to make sure it is still in alignment to the target (for a review refer back to Section 2, Preparing for Operation).
4. Restore power.

# 6 Additional Wedges

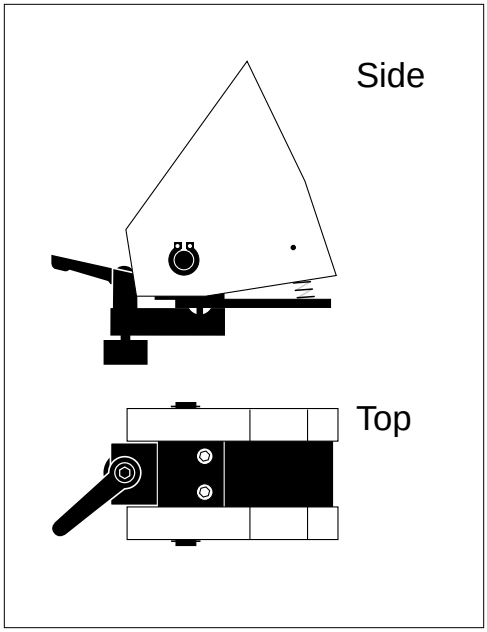
This Section provides information about setting up various wedges which are optional with the V-710BC Universal Friction Feeders.

Now that you are familiar with the basic principles of using a wedge, it is simply a matter of combining these principles with the information provided in this Section. This will allow you to get optimum performance when setting up the wedge included with your particular feeder.

The following wedges are covered:

- Load compensating
- Articulating roller
- Extended narrow
- Combination triangle and low-profile
- Separate triangle and low-profile
- Separate articulating roller and low-profile

## Load Compensating




**When to use:** Effective for moderately thick material. Due to characteristics of material, no mid-range support is required.

**Setup guidelines:** Adjust so the top angle of wedge preshingles the stack against the curvature of gate assembly. Edges of material should not extend beyond the tip of wedge. Ideal separation should be: as the stack moves down the wedge, 3 or 4 sheets of material separate out and come to rest on lower angle of wedge. Then, 3 or 4 sheets of material fall to table top, which are then replaced with another 3 or 4 sheets from stack above (Figure 6-1).

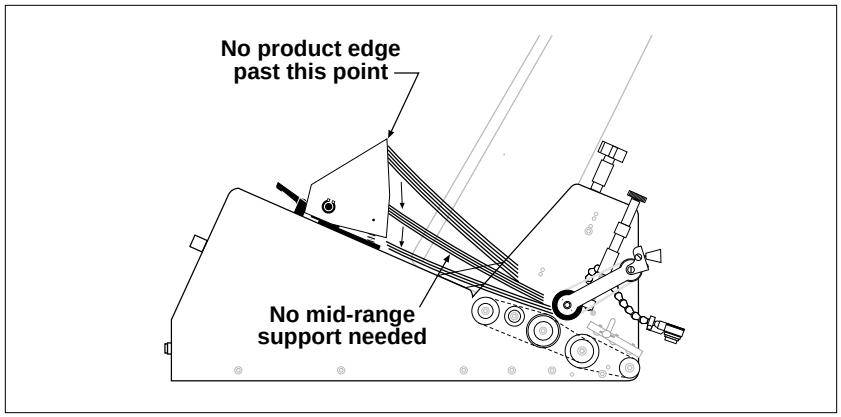
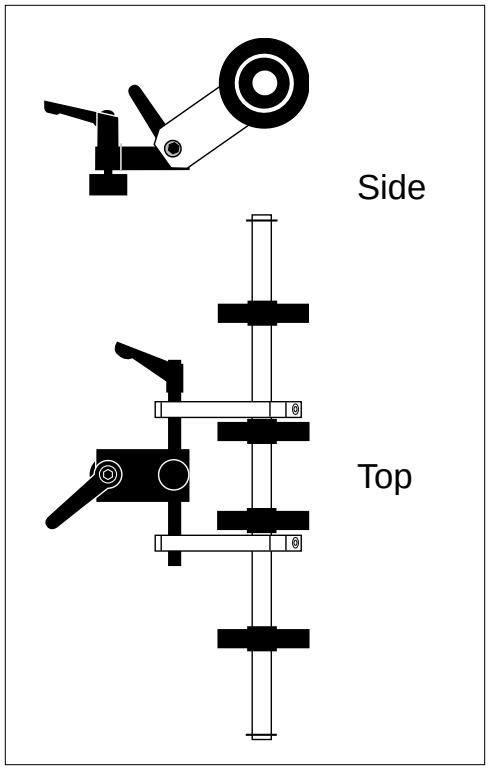



**Figure 6-1. Load Compensating Wedge Setup**

## Articulating Roller




**When to use:** Effective for very thick and/or ridged material. Due to characteristics of material, no mid-range support is required.

**Setup guidelines:** Adjust so the roller edges preshingle the stack against the curvature of gate assembly. Again, make sure edges of material does not extend back more than the mid-point of roller (Figure 6-2). *Note: With some material that tends to bind together (for example, perforated material), it may be beneficial to separate 4 to 5 sheets of material at the bottom to provide some air space.*

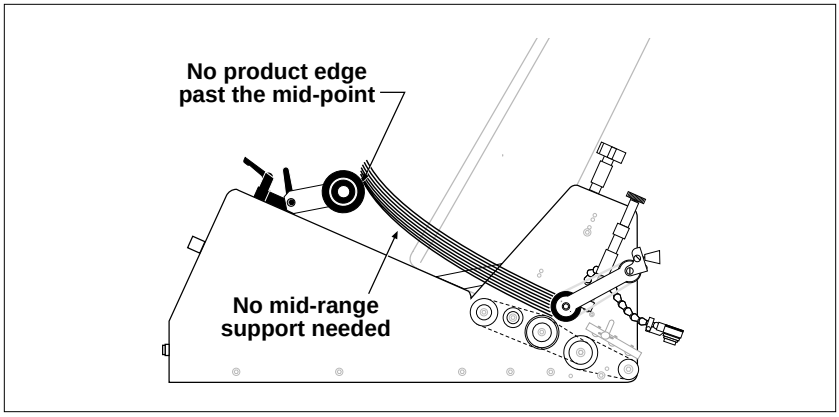
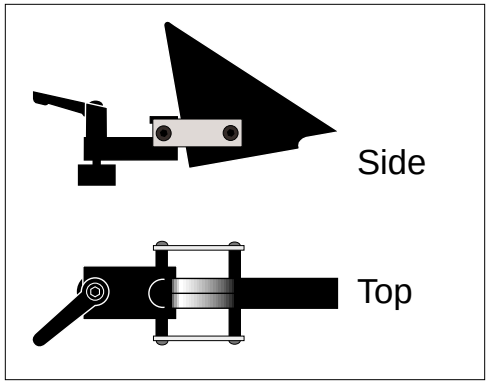



**Figure 6-2. Articulating Roller Wedge Setup**

## Extended Narrow




**When to use:** Effective for moving in close to the gate assembly for supporting very small material. Due to characteristics of material, no mid-range support is required.

**Setup guidelines:** Adjust so the wedge preshingles the bottom of stack against the curvature of gate assembly. Make sure edges of material do not extend back more than the mid-point of wedge (Figure 6-3).

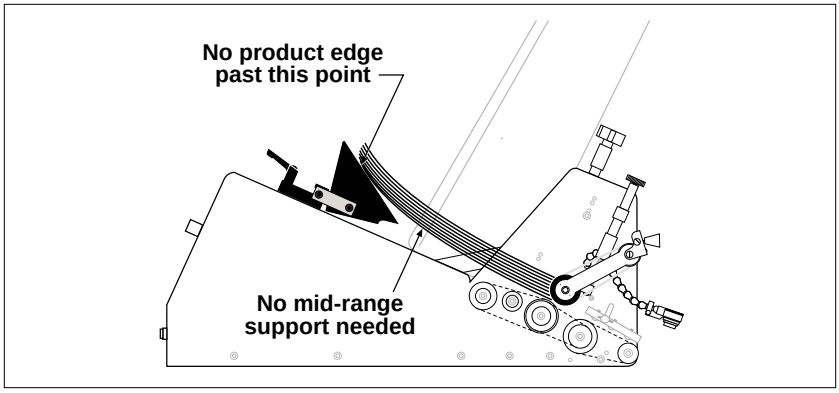
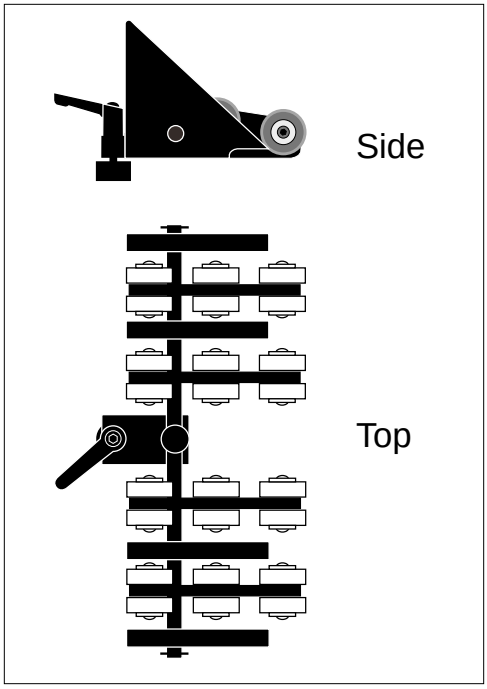



**Figure 6-3. Extended Narrow Wedge Setup**

## Combination Triangle and Low-Profile




**When to use:** For thin material with minimal body, thus requiring minimal mid-range support.

**Setup guidelines:** Adjust so that bottom of stack preshingles against the curvature of gate assembly. Make sure edges of material do not touch or overhang tips of triangle wedges as this creates pressure points. Roller(s) should lift bottom of stack off table top to eliminate friction and create body (Figure 6-4).

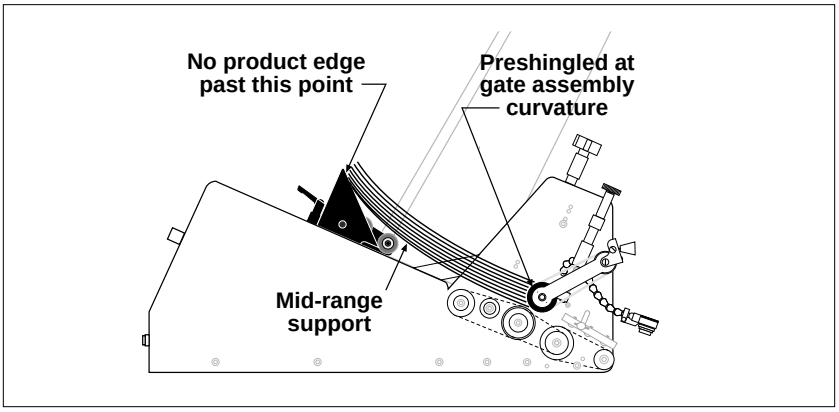
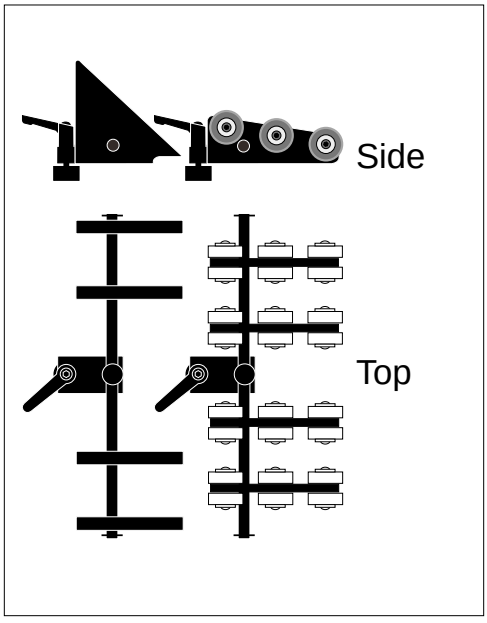



**Figure 6-4. Combination Triangle/Low-Profile Wedge Setup**

## Separate Triangle and Low-Profile




**When to use:** If moving separate triangle wedge assembly back from the gate assembly allows bottom of stack to still touch table top, you need mid-range support.

**Setup guidelines:** Adjust the triangle wedge the same way you would the combined triangle/low-profile wedge assembly (see above). Set the low-profile wedge relative to the triangle wedge so it lifts bottom of the stack off the table top to eliminate friction and create body. Make sure edges of material do not touch or overhang tips of triangle wedges, as this creates pressure points (Figure 6-5).

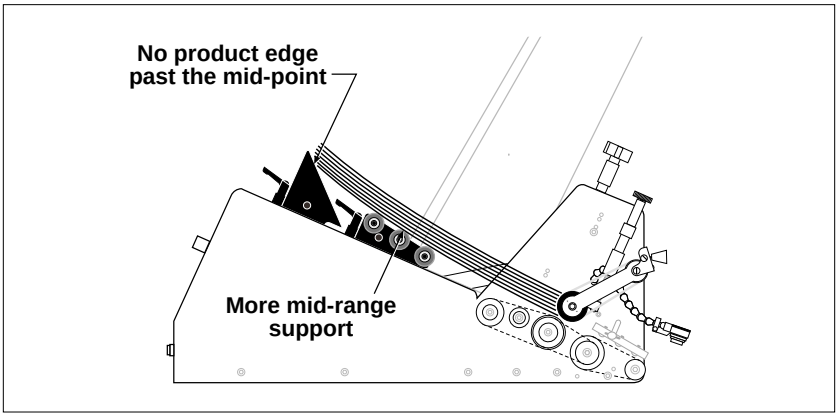
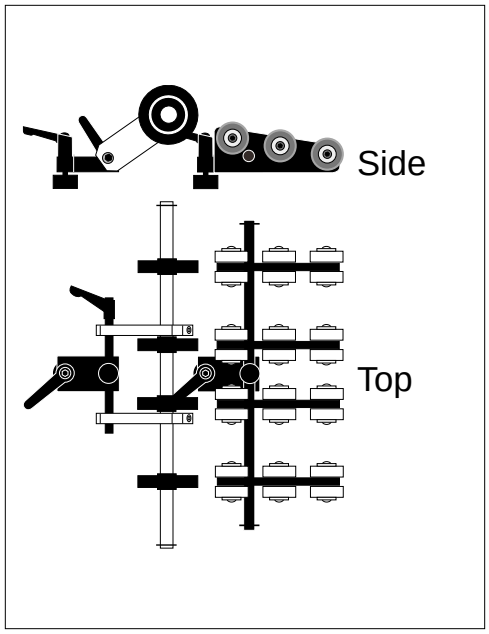



**Figure 6-5. Separate Triangle and Low-Profile Wedge Setup**

## Separate Articulating Roller and Low-Profile




**When to use:** For thicker material with more body, thus requiring medium mid-range support. Longer material may also benefit.

**Setup guidelines:** Initially adjust articulating wedge so that roller edges preshingle the bottom of the stack against the curvature of gate assembly. Make sure edges of material do not extend back more than mid-point of rollers (Figure 6-6). Set the low-profile wedge so that roller(s) lift bottom of stack off the table top to eliminate friction and create body.

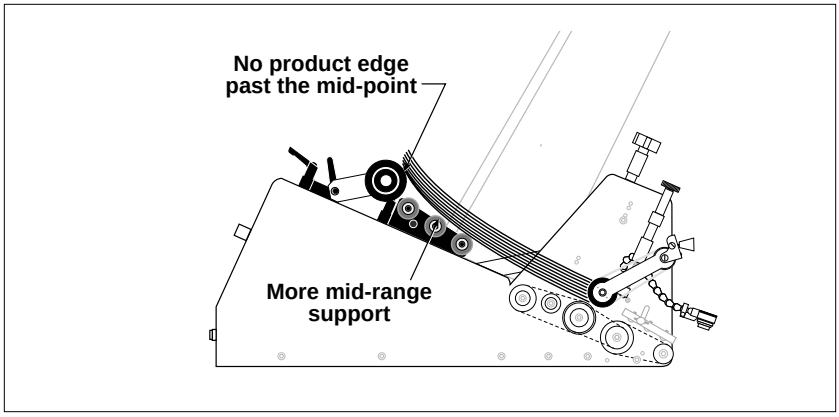
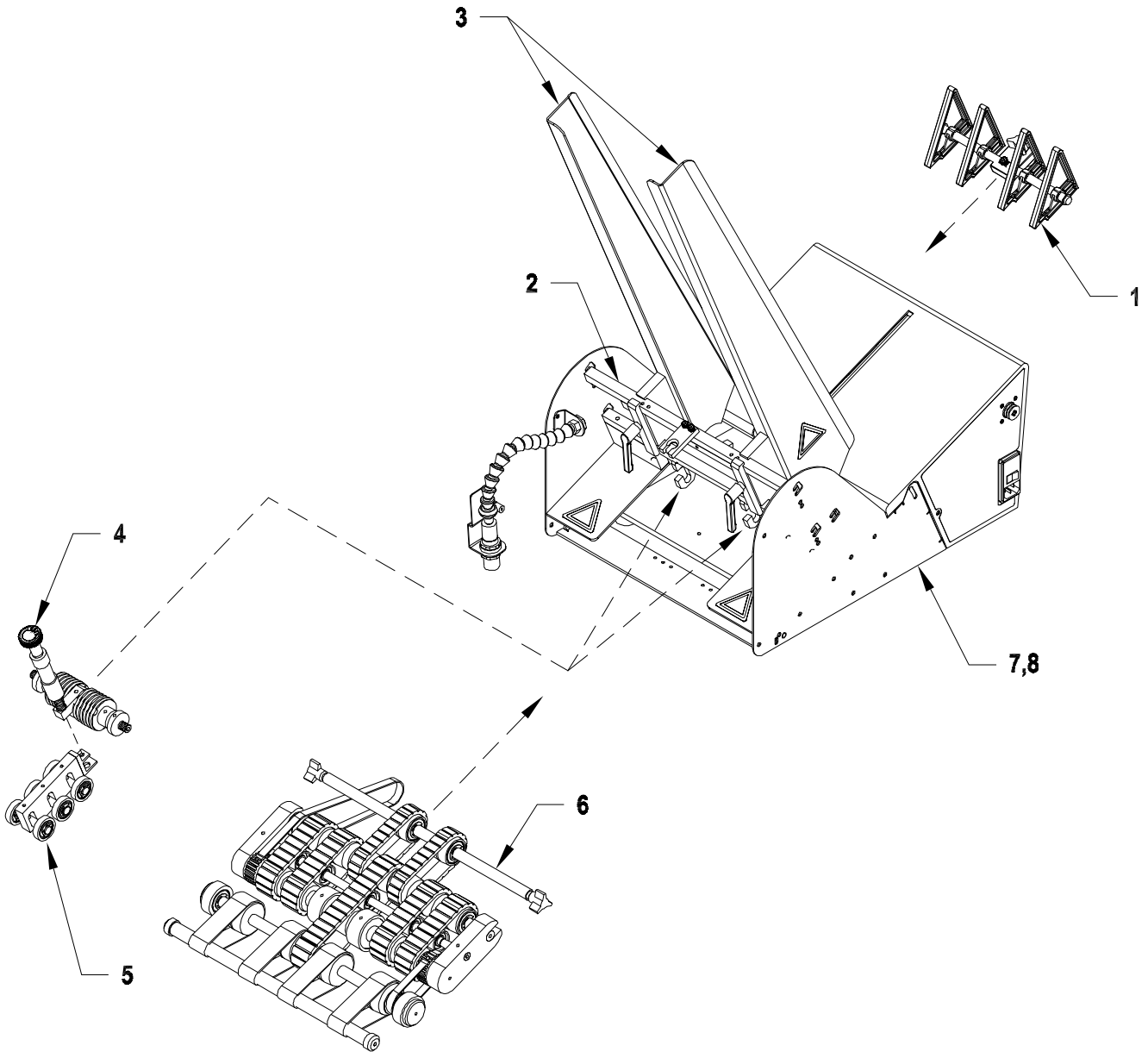



**Figure 6-6. Separate Articulating Roller and Low-Profile Wedge Setup**

# 7 Mechanical Components



## 1: TRIANGLE WEDGE
## ASSEMBLY #63311018

| DIAGRAM NUMBER | QTY | DESCRIPTION | PART NUMBER |
|---|---|---|---|
| 1-1 | 1 | Wedge Guide Shaft | 44633018 |
| 1-2 | 1 | SHCS 10-32 X 5/8” LG | 00002320 |
| 1-3 | 1 | Wedge Block | 44633014 |
| 1-4 | 1 | T-Nut Round | 44633016 |
| 1-5 | 1 | Knob 3 Lobe 10-32 X 5/8” LG | 44633033 |
| 1-6 | 2 | Ring Grip 3/8 Waldes | 00001110 |
| 1-7 | 4 | Wedge Material Support | 43560212 |

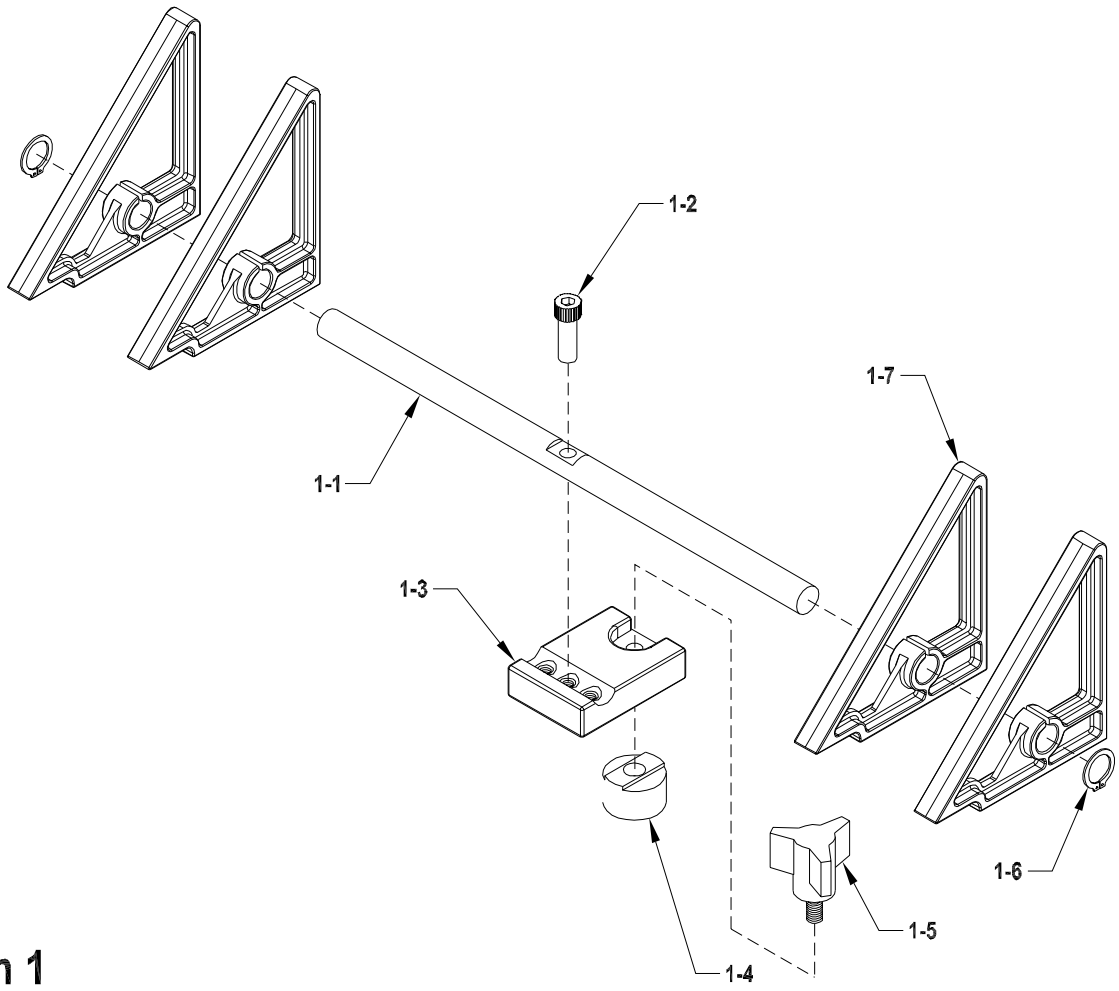



**Diagram 1**
Triangle Wedge
Assembly #63311018

## 2: GATE PLATE
## ASSEMBLY #84111006

| DIAGRAM NUMBER | QTY | DESCRIPTION | PART NUMBER |
|---|---|---|---|
| 2-1 | 2 | Lever Adjustment 10-32 X .75 | 43555098 |
| 2-2 | 2 | Side Guide Adjust Clamp Front | 44675006 |
| 2-3 | 1 | Lower Gate Support Bar | 44841005 |
| | 2 | Gate J Hook | 44841011 |
| | 2 | SHCS 8-32 X 5/8” LG | 00002215 |
| 2-4 | 1 | Upper Gate Support | 44841006 |
| 2-5 | 2 | Side Guide Adjust Clamp Rear | 44841004 |
| 2-6 | 1 | Pregate Bar | 44841007 |
| 2-7 | 1 | Pregate | 44841016 |
| | 4 | Screw FHS 10-32 X 1/2” LG | 00002330 |
| 2-8 | 1 | Adjustment Reference Block | 44841019 |
| 2-9 | 2 | SHCS 8-32 X 5/8” LG | 00002215 |
| NS | 4 | Screw FHS 10-32 x 1/2" LG | 00002330 |

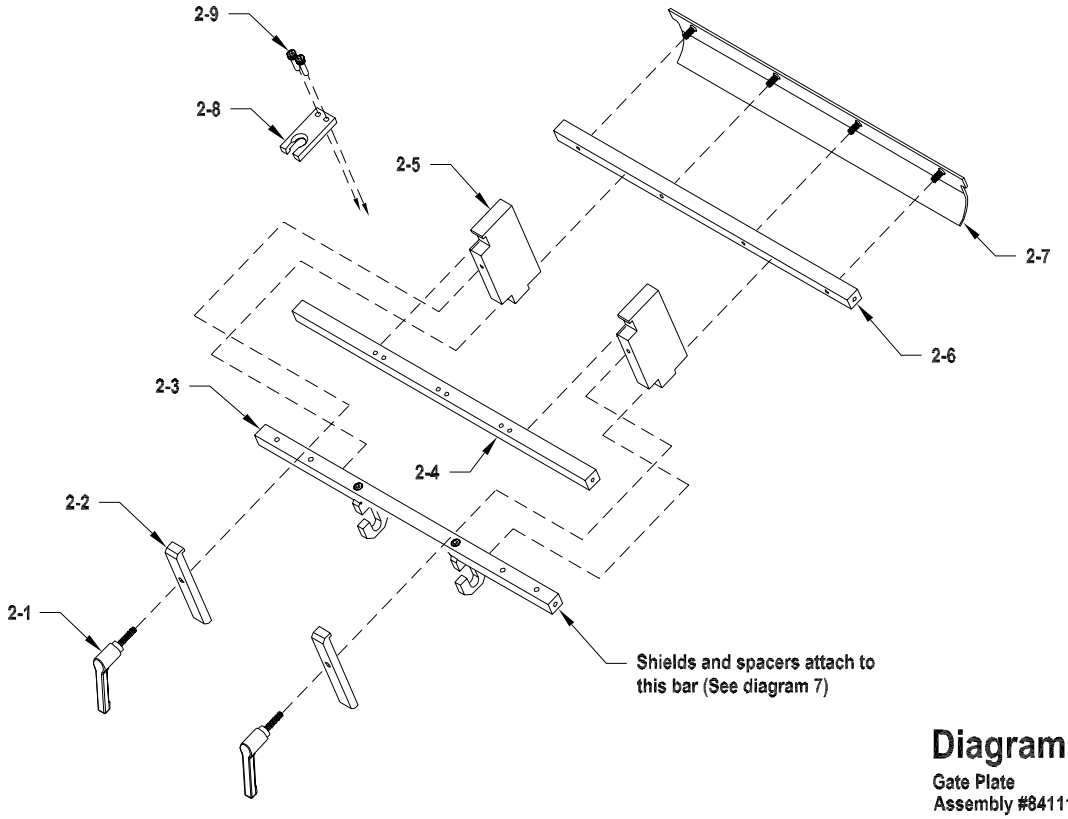
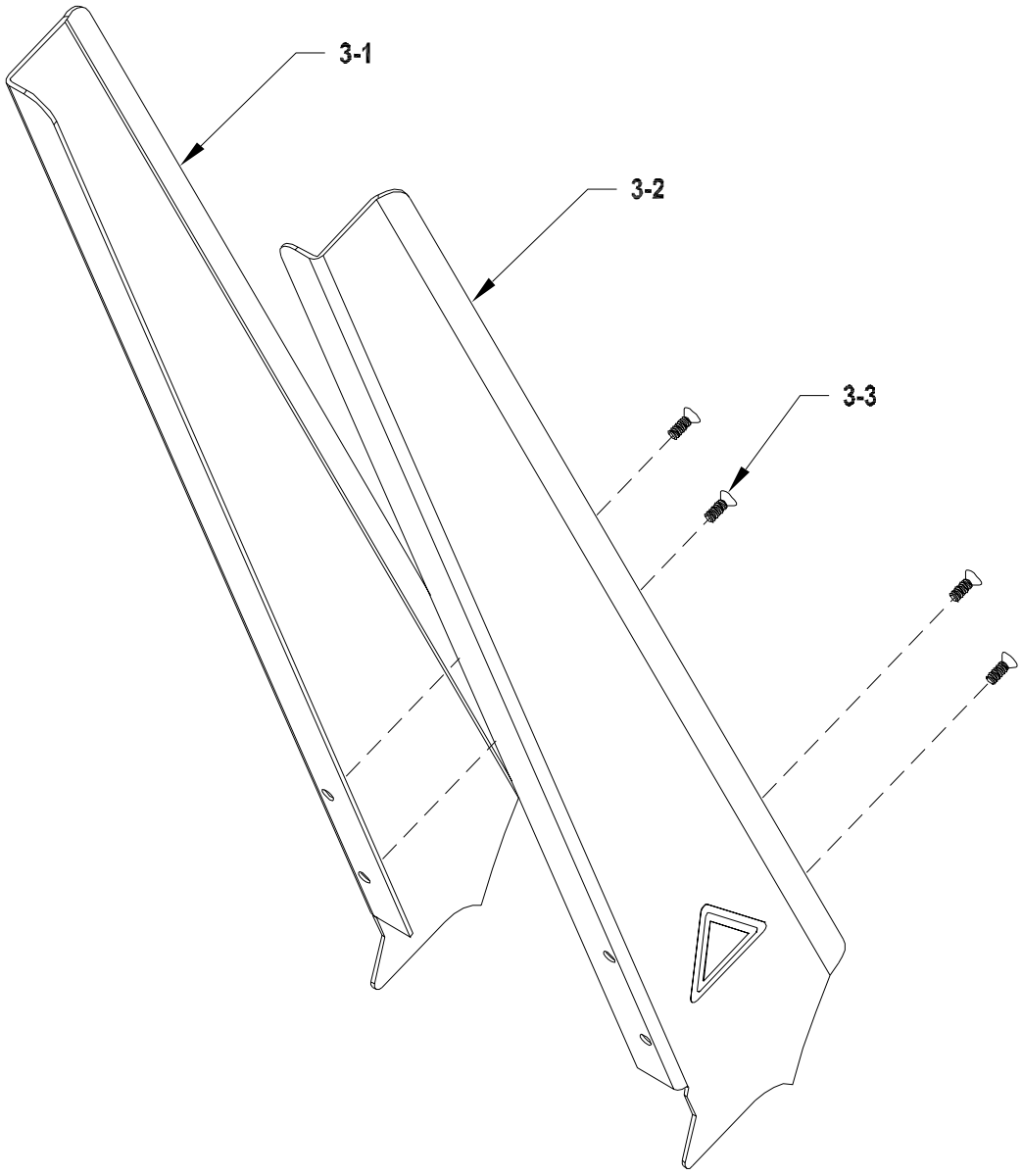



**Diagram 2**
Gate Plate
Assembly #84111006

### 3: SIDE GUIDE KIT 1424 TEFLON
### ASSEMBLY #10501108

| DIAGRAM NUMBER | QTY | DESCRIPTION | PART NUMBER |
|---|---|---|---|
| 3-1 | 1 | Side Guide Right 1424 Teflon | 51050040 |
| | 1 | Label Warning | 44600005 |
| 3-2 | 1 | Side Guide Left 1424 Teflon | 51050039 |
| | 1 | Label Warning | 44600005 |
| 3-3 | 4 | Screw FHS 10-32 X 1/2” LG | 00002330 |
| NS | 2 | Guard Rear Accordion | 44600001 |




# Diagram 3

**Side Guide Kit 1424 Teflon**
**Assembly #10501108**

## 4: STANDARD O-RING GATE WITH HORIZON ADJUST
## ASSEMBLY #13511872

| DIAGRAM NUMBER | QTY | DESCRIPTION | PART NUMBER |
|---|---|---|---|
| 4-1 | 1 | Adj Knob Assembly for Gate | 23511037 |
| 4-2 | 1 | Cylinder Gate Spring Tension | 23500019 |
| 4-3 | 1 | Shaft Gate Lift | 23560084 |
| | 1 | Spring Gate Compression | 23500083 |
| 4-4 | 1 | Mount Gate Lift Shaft | 15000001 |
| 4-5 | 1 | BHCS 10-32 X 1/2” LG | 00002334 |
| 4-6 | 2 | Screw Adjustment | 44872005 |
| 4-7 | 12 | O Ring Gate Cylinder | 23500089 |
| 4-8 | 1 | BHCS 10-32 X 1” LG | 00002340 |
| | 1 | Washer Flat #10 | 00002607 |
| 4-9 | 1 | Gate Cylinder (Not Sold Separately) | |
| | 2 | SHSS 10-32 X 1/4” LG Cup Pt | 00002216 |
| 4-10 | 2 | Roller | 44872003 |
| | 2 | SSS 10-32 X 3/8” LG Nylon Tip | 44872007 |

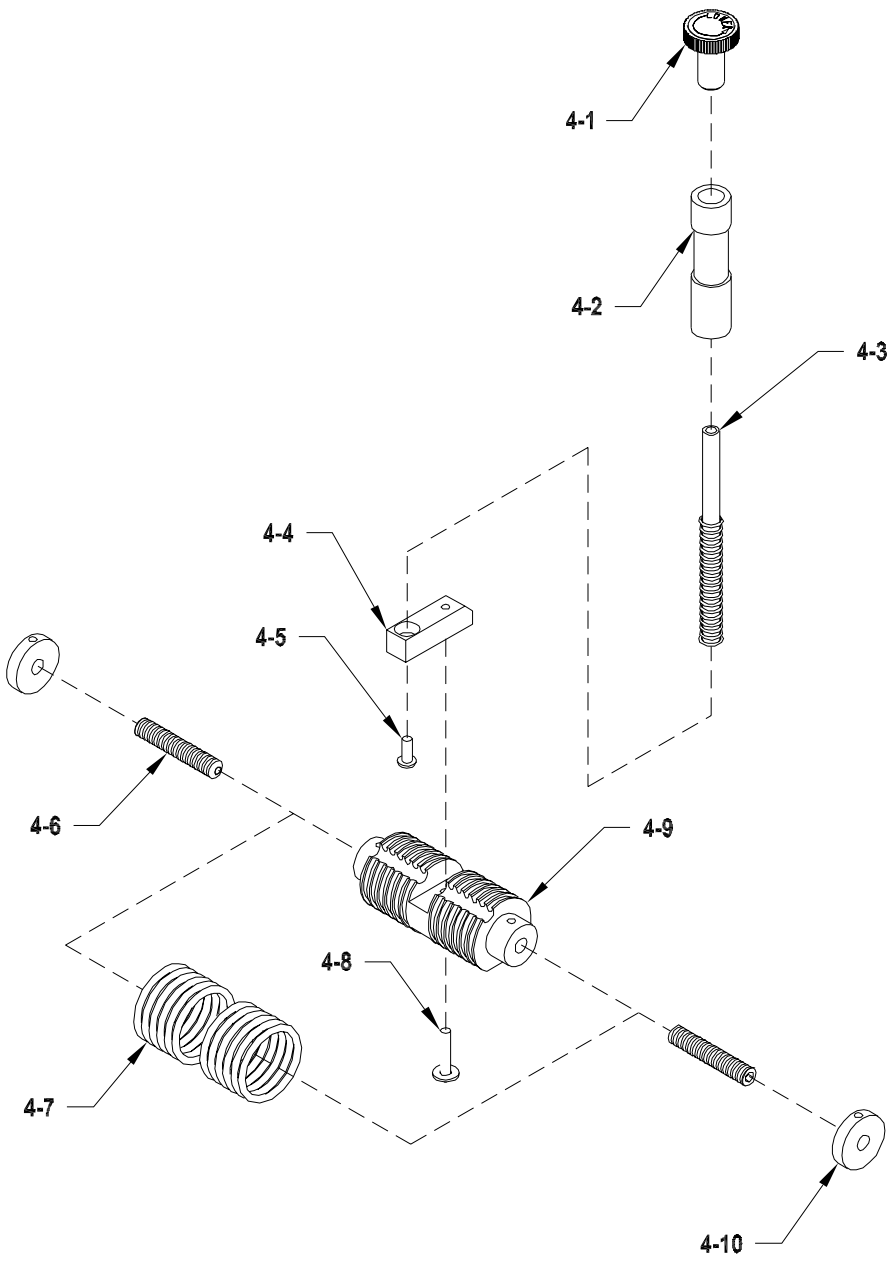



**Diagram 4**
**Standard O Ring Gate**
**w/Horizon Adjust**
**Assembly #13511872**

## 5: HOLD DOWN
## ASSEMBLY #10501109

| DIAGRAM NUMBER | QTY | DESCRIPTION | PART NUMBER |
|---|---|---|---|
| 5-1 | 6 | Discharge Roller Collar | 51277087 |
| 5-2 | 12 | E-Clip 3/8 | 00001150 |
| 5-3 | 6 | R6 Bearing | 23500095 |
| 5-4 | 3 | Hold Down Shaft | 51050238 |
| 5-5 | 3 | Spring Pin 1/8" | 51312003 |
| 5-6 | 3 | Hold Down Spring | 51328001 |
| 5-7 | 2 | FHSC 10-32 x 3/8" | 00002234 |
| 5-8 | 1 | Hold Down Mount | 51312001 |
| 5-9 | 1 | Hold Down Block | 51050239 |

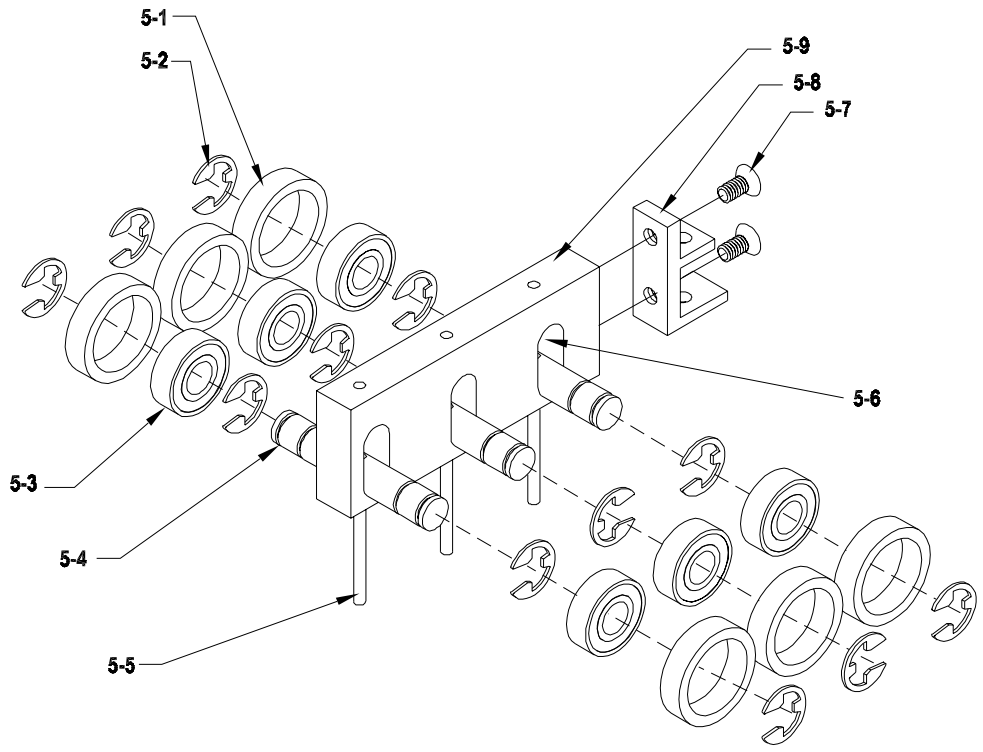



**Diagram 5**
No Adjust Hold Down
Assembly #10501109

## 6: GROOVED GUM CARRIAGE
## ASSEMBLY #10501101

| DIAGRAM NUMBER | QTY | DESCRIPTION | PART NUMBER |
|---|---|---|---|
| 6-1 | 1 | Adjustable Roller Shaft | 44841020 |
| | 2 | Roller Crown Driven Narrow | 44841033 |
| | 4 | Bearing Ball R8 | 23500094 |
| | 4 | Clip E 1/2 Waldes | 00001155 |
| 6-2 | 2 | Knob, Black 3 Arm 10-32 X 7/16 | 23500092 |
| 6-3 | 1 | Idler Shaft | 43555047 |
| | 1 | Tube Driven | 44630004 |
| | 4 | Bearing Ball R8 | 23500094 |
| | 3 | Clip E 1/2 Waldes | 00001155 |
| 6-4 | 1 | Shaft Discharge Feed Roller EX | 43550036 |
| | 10 | Roller Support Driven w/Bearing | 23511030 |
| | 10 | Ring Grip 3/8 Waldes | 00001110 |
| 6-5 | 1 | Shaft Drive 3/4 | 43555205 |
| | 2 | Pulley, Timing 24XL037 .500KA | 43560098 |
| | 4 | Crown Drive Roller | 23560208 |
| | 2 | Roller Feed .75 Inch Bore | 23500126 |
| | 1 | Roller Flat Drive | 23560206 |
| | 2 | Bearing Ball R8 | 23500094 |
| | 2 | Ring Grip 1/2 Waldes | 00001115 |
| | 10 | Screw Socket Set 10-32 X 1/4” LG | 00002216 |
| | 6 | Screw Socket Set 10-32 X 5/16” LG (2 for each 24T pulley, 1 for each blue feed roller) | 00002217 |
| | 2 | Key Woodruff 1/8 X 3/8 | 00003351 |
| 6-6 | 2 | Belt, Feed Tan Gum 24G Liner Grooved Composite 3/4W | 15000076 |
| 6-7 | 1 | Belt, Timing 206XL037 | 44841034 |
| 6-8 | 4 | Belt, Feed Tan Gum 24G Liner .75W X 9L | 23500162 |
| 6-9 | 1 | Holder Carriage Right Side | 44485005 |
| 6-10 | 1 | Belt, Timing 86XL037 | 51050010 |
| 6-11 | 4 | Belt Discharge Clear 1W | 51050062 |
| 6-12 | 1 | Belt, Feed Tan Gum 36G Liner 1W X 14L | 44759062 |
| 6-13 | 1 | Holder Carriage Left Side | 44485006 |

## 6: GROOVED GUM CARRIAGE
## ASSEMBLY #10501101 (Continued)

| DIAGRAM NUMBER | QTY | DESCRIPTION | PART NUMBER |
|---|---|---|---|
| 6-14 | 1 | Upper Discharge Shaft | 51050008 |
| | 2 | Holder Outboard Bearing Cup | 23500032 |
| | 4 | Drive Crown Roller | 51050006 |
| | 1 | Roller Crown Driven Narrow | 44841033 |
| | 1 | Pulley, Timing 16XL037 .500KDFA | 43560097 |
| | 4 | Bearing Ball R8 | 23500094 |
| | 4 | Clip E 1/2 Waldes | 00001155 |
| | 2 | Screw Socket Set 10-32 X 1/8” LG (for 16T pulley) | 00003352 |
| | 8 | Screw Socket Set 10-32 X 5/16” LG | 00002217 |
| | 1 | Key Woodruff 1/8 X 3/8 | 00003351 |
| 6-15 | 1 | Lower Discharge Shaft | 51050007 |
| | 2 | Cup Bearing R4 | 44846050 |
| | 2 | Bearing Ball R4 | 44582021 |

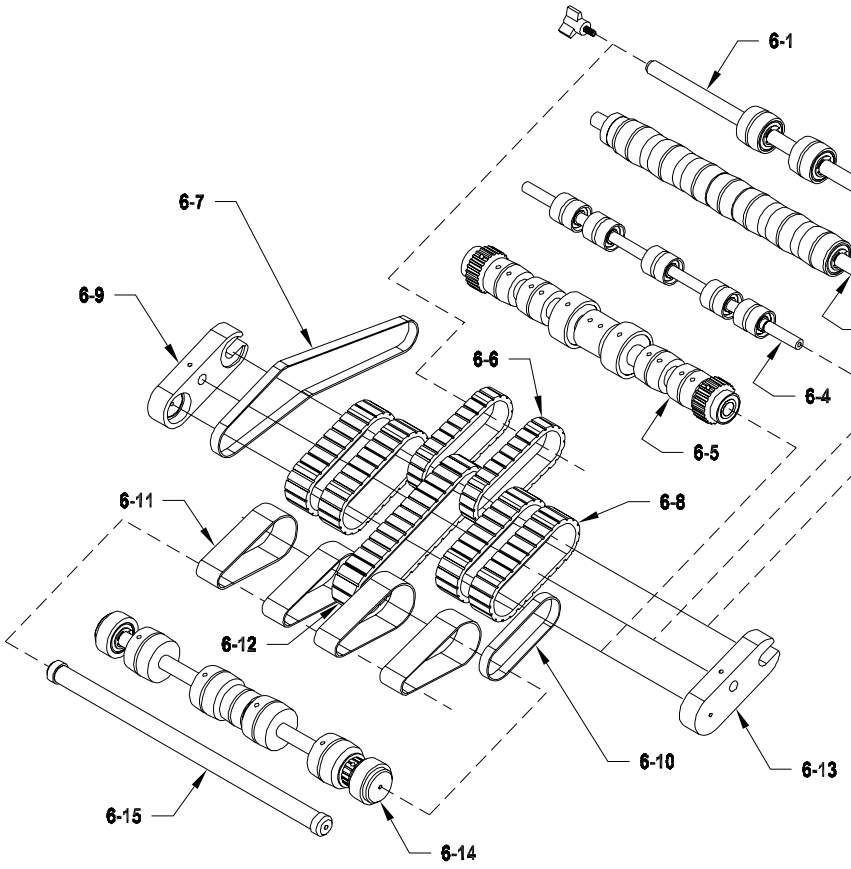
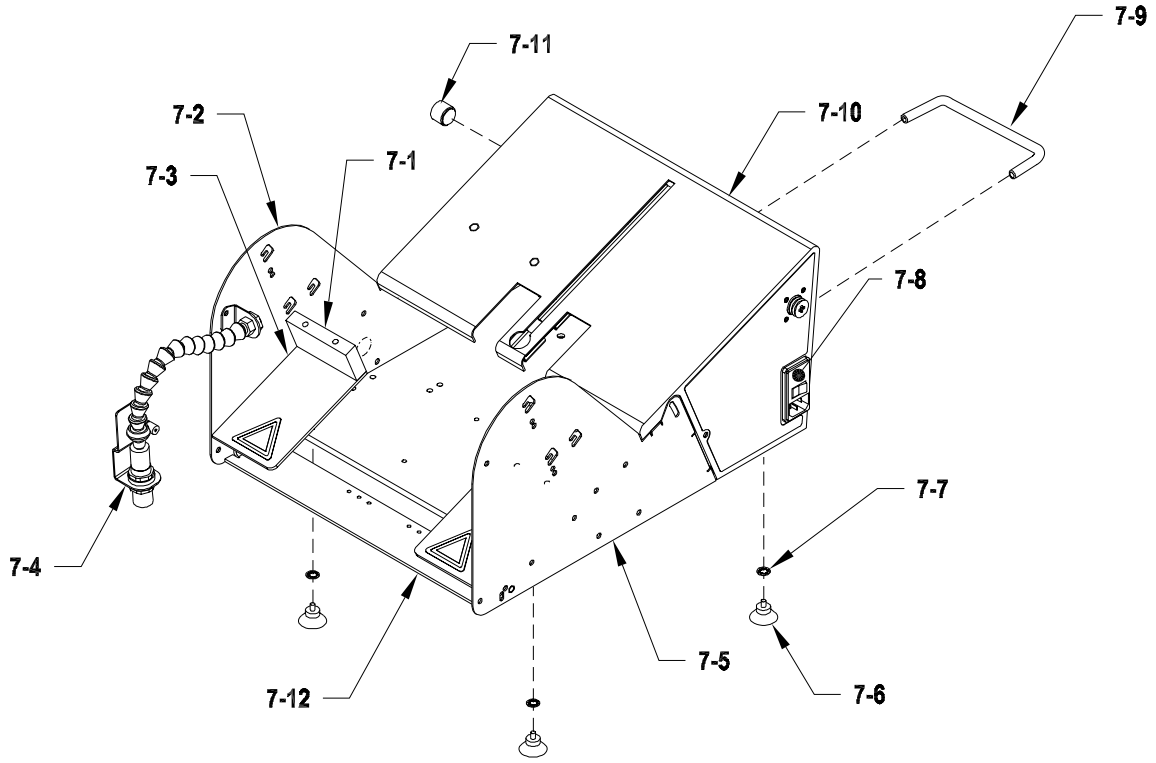



**Diagram 6**
**Grooved Gum Carriage**
**Assembly #10501101**

## 7: EXTERIOR FEATURES

| DIAGRAM NUMBER | QTY | DESCRIPTION | PART NUMBER |
|---|---|---|---|
| 7-1 | 2 | Spacer Shield | 51050073 |
| 7-2 | 1 | Shell Split Front Ear Right | 51050102 |
| 7-3 | 2 | Shield Lexan Smoked | 51050072 |
| | 2 | Label Warning Roller Pinch Point | 44600004 |
| | 4 | BHCS 10-32 X 2” LG | 00003396 |
| 7-4 | 1 | Sensor Assembly, Sheet V-710BC | 10501115 |
| 7-5 | 1 | Shell Split Front Ear Left | 51050101 |
| 7-6 | 4 | Foot Suction Cup | 44846058 |
| 7-7 | 4 | Washer Lock 1/4 Internal Star Tooth | 00003341 |
| 7-8 | 1 | Module AC Power Entry w/o Fuses | 44649034 |
| | 2 | Fuse 5A 250V Slo-Blo 5 x 20 mm | 53500558 |
| 7-9 | 1 | Pull Handle | 44841002 |
| 7-10 | 1 | Shell Split Back | 44841060 |
| 7-11 | 1 | Knob Straight Knurl Black | 44675030 |
| 7-12 | 1 | T-Nut Mounting Plate | 51050058 |

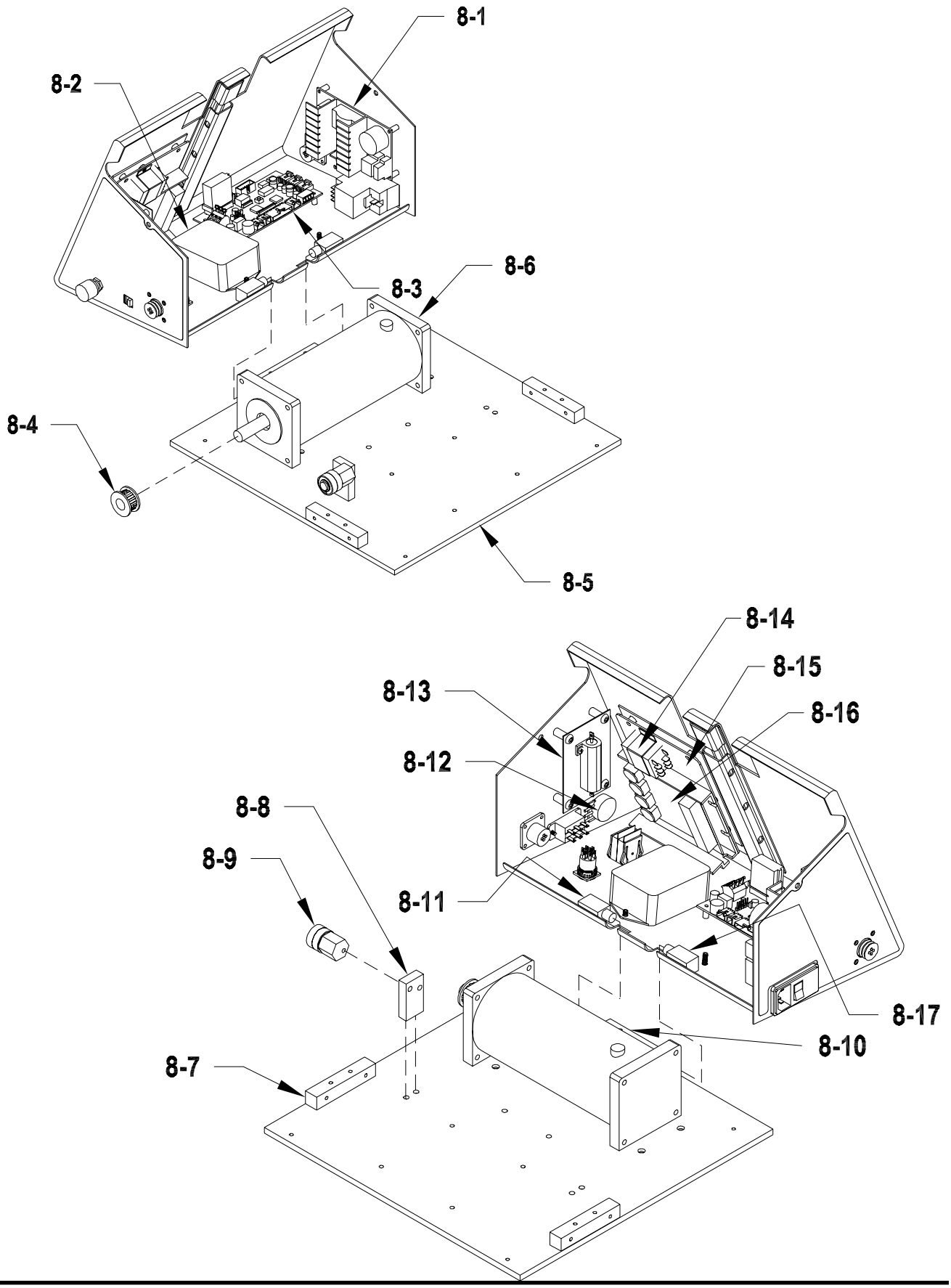


## 8: INTERIOR FEATURES

| DIAGRAM NUMBER | QTY | DESCRIPTION | PART NUMBER |
|---|---|---|---|
| 8-1 | 1 | Power Supply Switching 5V & 12V 2.5 X 4.25 | 44649033 |
| 8-2 | 1 | Line Filter Assembly | 10501157 |
| | 1 | Standoff Fem/Fem 5/16 Hex 8-32 x 1-5/16 Al | 51050115 |
| 8-3 | 1 | Control Board V710BC | 51050001 |
| 8-4 | 1 | Pulley, Timing 14XL037 .500DFA | 44846038 |
| 8-5 | 1 | Base Plate | 51050237 |
| 8-6 | 1 | Motor 90VDC Assembly (115V Models Only) | 10501133 |
| | 1 | Motor 180VDC Assembly (230V Models Only) | 10502233 |
| 8-7 | 2 | Mount Front Base Plate | 44675003 |
| 8-8 | 1 | Bracket Belt Tensioner | 44846056 |
| 8-9 | 1 | Belt Tensioner Assembly | 23511290 |
| 8-10 | 1 | Block Pivot Center | 44841063 |
| 8-11 | 1 | Block Pivot Right | 44841065 |
| 8-12 | 1 | Speed Pot Assembly | 10501137 |
| 8-13 | 1 | Resistor Inhibit Assy, 90VDC (115V Only) | 10501145 |
| | 1 | Resistor Inhibit Assy, 180VDC (230V Only) | 10502245 |
| 8-14 | 1 | Relay 120VAC DPDT K10P (115V Only) | 53500453 |
| | 1 | Relay 240VAC DPDT K10P (230V Only) | 53550457 |
| | 1 | Clamp, Relay | 51050114 |
| 8-15 | 1 | Plate, Mounting SCR | 51050112 |
| 8-16 | 1 | Board, SCR Drive w/36" Pot Leads | 44642025 |
| 8-17 | 1 | Block Pivot Left | 44841064 |
| NS | 1 | Mount, Cable Tie Blk Adh/Scr 4Way 3/4sq | 00003402 |
| NS | 1 | Wire Assy, Ground | 10501136 |
| NS | 1 | Cable, DC Motor Extension | 10501142 |

## 8: INTERIOR FEATURES (continued)

| DIAGRAM NUMBER | QTY | DESCRIPTION | PART NUMBER |
|---|---|---|---|
| NS | 1 | Harness, SCR Inhibit | 10501144 |
| NS | 1 | Cable Assy, Fault Output 5ft V710BC | 84111011 |
| NS | 9 | Terminal Fork | 53500047 |
| NS | 5 | Terminal Disc Female .020 22-18 AWG | 53500254 |
| NS | 1 | Power Cord (115V Models Only) | 53511020 |
| NS | 1 | Power Cord & Allen Wrench Kit (230V Models Only) | 53522210 |
| NS | 1 | Sensor Flight Assembly 50mm | 63011038 |
| NS | 1 | Harness Sheet Sensor | 10501154 |
| NS | 1 | Thumbwheel Assy, V710BC | 10501141 |
| NS | 1 | Harness Assy, Power Supply to Control Board | 10501147 |
| NS | 1 | Harness Assy, SCR to Relay to Control Board | 10501149 |
| NS | 1 | Harness Assy, Fault Selector Switch | 84111009 |
| NS | 1 | Reset/Cycle Button Assy | 10501156 |


8-1
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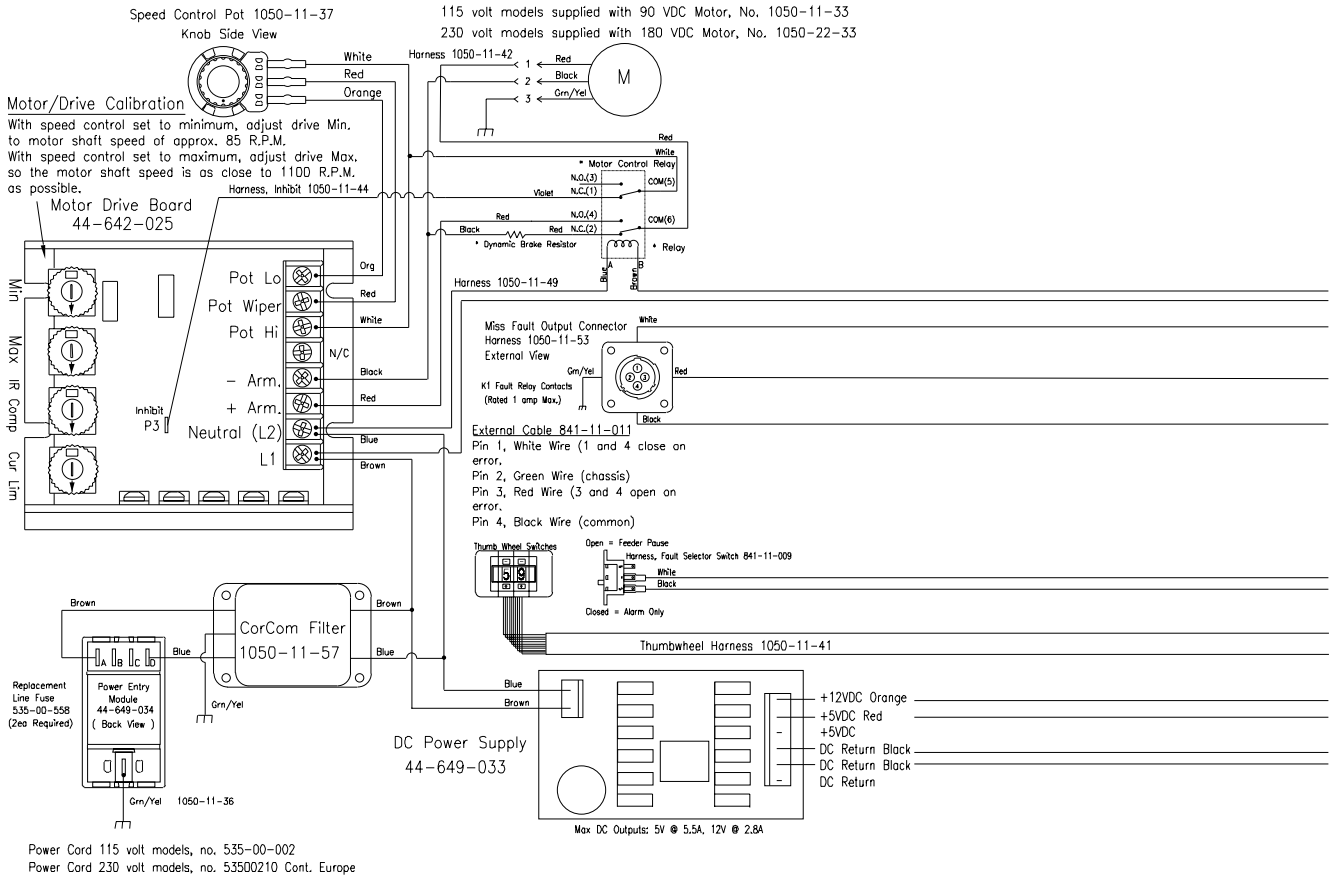
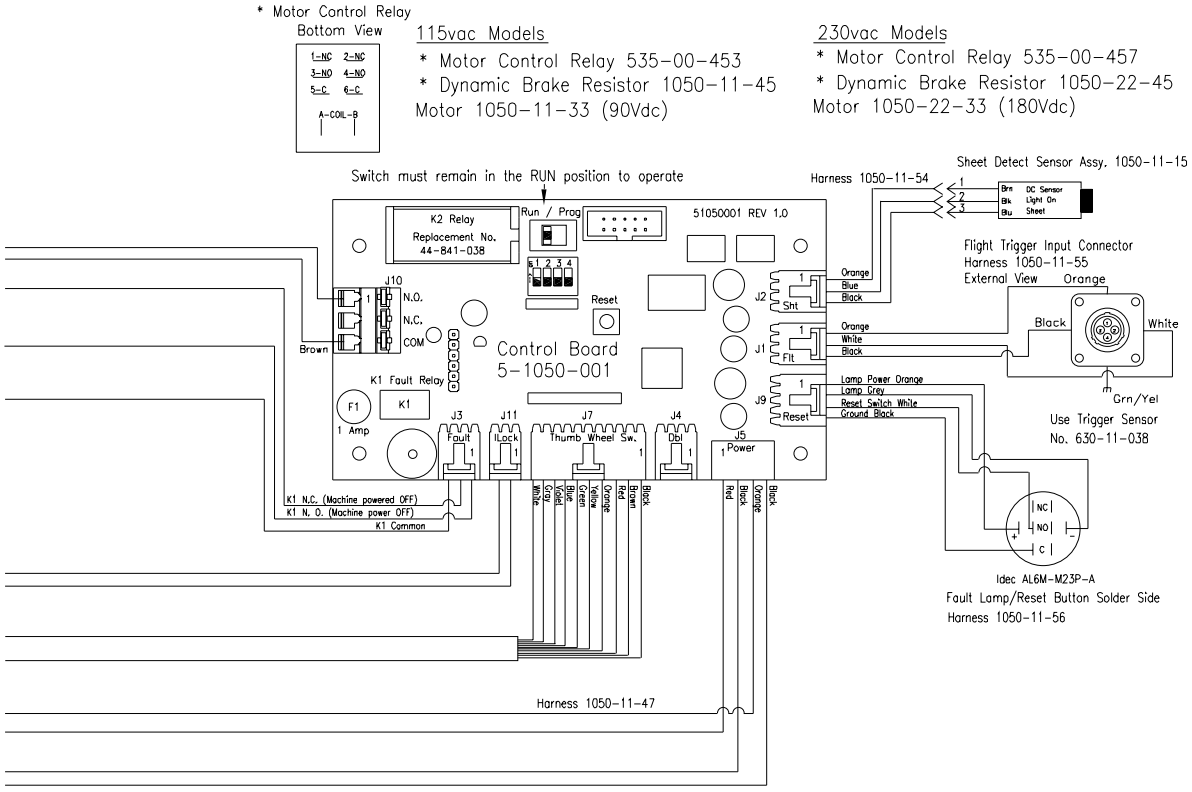

Speed Control Pot 1050-11-37
Knob Side View
115 volt models supplied with 90 VDC Motor, No. 1050-11-33
230 volt models supplied with 180 VDC Motor, No. 1050-22-33
Harness 1050-11-42
White
Red
Orange
Red
Black
Grn/Yel
M
Motor/Drive Calibration
With speed control set to minimum, adjust drive Min. to motor shaft speed of approx. 85 R.P.M.
With speed control set to maximum, adjust drive Max. so the motor shaft speed is as close to 1100 R.P.M. as possible.
Harness, Inhibit 1050-11-44
Motor Drive Board
44-642-025
* Motor Control Relay
N.O.(3)
N.C.(1)
COM(5)
Violet
N.O.(4)
N.C.(2)
COM(6)
Red
Black
* Dynamic Brake Resistor
* Relay
Harness 1050-11-49
Min
Max
IR Comp
Cur Lim
Pot Lo
Pot Wiper
Pot Hi
N/C
- Arm.
+ Arm.
Neutral (L2)
L1
Org
Red
White
Black
Red
Blue
Brown
Inhibit
P3
Miss Fault Output Connector
Harness 1050-11-53
External View
K1 Fault Relay Contacts
(Rated 1 amp Max.)
Grn/Yel
White
Red
Black
External Cable 841-11-011
Pin 1, White Wire (1 and 4 close on error.
Pin 2, Green Wire (chassis)
Pin 3, Red Wire (3 and 4 open on error.
Pin 4, Black Wire (common)
Thumb Wheel Switches
Open = Feeder Pause
Harness, Fault Selector Switch 841-11-009
White
Black
Closed = Alarm Only
Thumbwheel Harness 1050-11-41
Brown
CorCom Filter
1050-11-57
Brown
Blue
Blue
Grn/Yel
Replacement
Line Fuse
535-00-558
(2ea Required)
Power Entry
Module
44-649-034
( Back View )
Grn/Yel
1050-11-36
Blue
Brown
DC Power Supply
44-649-033
+12VDC Orange
+5VDC Red
+5VDC
DC Return Black
DC Return Black
DC Return
Max DC Outputs: 5V @ 5.5A, 12V @ 2.8A
Power Cord 115 volt models, no. 535-00-002
Power Cord 230 volt models, no. 53500210 Cont. Europe

# 8 Electrical Components




Title:
V710 Batch Count Wiring Detail

Drg. No.
Controlled Document No. 5-1050-250

## Notes

# 9 Technical Troubleshooting

## Gaining Access to the Internal Electrical Components

**Only a qualified technician should perform electrical troubleshooting activities. This unit operates on 115V or 230V electrical power. Bodily contact with these voltages can result in serious injury or death.**

Refer to the Model V-710BC electrical wiring diagram located in Section 8, Electrical Components. Also refer to the interior features diagram in Section 7, Mechanical Components. Access to the electrical components is gained by removing the two screws securing the rear section of the shell to the forward section. These screws are located on each side of the machine near the label that states: “No serviceable parts inside. Refer servicing to qualified service personnel.” Open the split-shell design by tipping the rear shell section back to expose the internal contents. It may also be desirable to completely remove the rear section of the shell. Remove the two screws securing the hinge to the base plate, leaving the hinge secured to the rear section of the shell.

In the test sections that follow, Streamfeeder OEM part numbers are shown in parentheses.

This machine utilizes an SCR motor drive board to run a DC motor. The board has an inhibit control pin that disables the drive and causes the motor to stop while the control pin is asserted. It also employs a dynamic braking resistor that is connected across the motor wires at the same time the inhibit control pin is asserted. This application reduces motor coasting, so that the feed belts stop sooner than otherwise would be possible.

## Machine Operation Overview

The Control Logic Board provides motor control. This board switches current to the AC coil of a DPDT mechanical relay, whose contacts switch to the motor and drive. Two sensors are used for signaling the Control Board. They are called the Flight Detect sensor and the Sheet Detect sensor. The Flight Detect sensor sends a signal that commands the feeder motor to run, and the Sheet Detect sensor sends the signal to count fed material pieces, then stop the motor. Also, a dual-purpose button is provided to either start a cycle or reset a fault.

A Fault Mode selector switch is provided to select whether the feeder stops when a missed cycle is detected, or to simply indicate the miss with an audible and visual alarm that is reset when a complete cycle is met.

A “Time-Out” feature has also been implemented. This feature causes the feeder motor to stop after approximately 3 seconds if the Sheet Detect sensor does not detect fed material within that time frame.

**Table 9-1. Quick-Look Troubleshooting**

| Problem | Solution |
|---|---|
| **Testing Power Entry Module**<br>  <br>*Exercise caution when performing the following test. Bodily contact with 115VAC or 230VAC power can result in serious injury or death.*<br>*Double pole/neutral fusing - for continued protection against fire, replace only with same type and rating of fuse.*<br>**NOTE**<br>*This power module is designed to hold 5mm x 20mm fuses, as well as 1.25" x .25" fuses. The machine ships from Streamfeeder's facility with 5mm x 20mm fuses rated at 5A, 250V, Slo-Blo.*<br>  <br>*To ensure operator safety, the machine must be connected to a three-prong grounded outlet. Never allow machine operation without the ground pin present in your power cord. Replace power cord if it is damaged in any way.* | 1. Make sure there is power present at the AC main where the feeder is plugged in.<br>2. Remove power cord from the AC input switch module (44-649-034) and disconnect the two spade connector leads located on the back of the module inside the feeder. These terminals are labeled "A" where the brown L1 wire is connected, and "D" where the blue Neutral (or L2) wire is connected. The brown and blue wires lead to the AC line filter (1050-11-57).<br>3. Check three-wire AC power cord 115V (535-00-002) or 230V (535-00-210) for integrity at all three points.<br>4. Check the two fuses (535-00-558) located inside the feeder's input power module. BOTH fuses must be present and test good.<br>a. Observe the voltage label showing through the window on the fuse housing for proper orientation when the holder is re-inserted.<br>b. A small screwdriver inserted under the tab will allow you to pry open the fuse housing. Remove the red fuse holder. If the smaller 5mm x 20mm fuse is present, verify that the metal tab "finger" is holding the fuse in the forward position. Make sure it has not allowed the fuse to slide back toward the outside of the feeder and away from where contact with the metal pressure points inside the module body is made.<br>c. Use an ohmmeter to test the fuses. A visual inspection will not always be sufficient to determine fuse integrity. If necessary, replace with fuses of the same rating only.<br>5. Reconnect power cable and with power switch turned ON, use your multimeter to check for the presence of AC at the output spade connectors "A" and "D" on the back of module where the internal L1 and Neutral (or L2) lead connections are made.<br>6. If steady AC power is not measured as in the previous step, the module's internal contacts are most likely worn, and the module must be replaced. |
| **Testing the DC power supply**<br>**NOTE**<br>*This supply is a switching DC power supply. It is possible for the supply to be faulty even when the proper voltages are measured on its outputs. The supply must have a load on it for proper testing, and the supply must hold up under a load to test good.* | 1. Remove all quick disconnects from the control board at J1, J2, J3, J7, J9 and J11.<br>2. Check the integrity of the ceramic fuse (535-00-292) located near the AC input side of the DC supply (44-649-033). Use an ohmmeter to test the fuse. A visual inspection will not always be sufficient to determine fuse integrity. If necessary, replace the fuse with one of the same rating only. If after replacing the fuse it fails on power up, replace the DC supply.<br>3. Verify the integrity of the DC supply output harness (1050-11-47) for secure connections both on the power supply output pin side, and the 4-pin quick disconnect plug end of the harness. Make sure none of these wires are broken or shorted to one another, and that their insulation is intact. Make sure the red, orange and black wires are connected in the proper order as shown on the electrical wiring diagram in Section 8: Pin 1, red; pin 2, black; pin 3, orange; and pin 4, black.<br>4. Turn the feeder power switch (44-649-034) ON and using a multimeter, verify AC power has been applied to the AC input side of the power supply where the brown L1 and blue Neutral (or L2) wires are connected. If not, verify integrity of the AC line filter harness (1050-11-57) and refer to the section titled "Testing the power entry module." |

**Table 9-1. Quick-Look Troubleshooting (continued)**

| Problem | Solution |
|---|---|
| **Testing the DC power supply (continued)**<br><br>**NOTE**<br><br>*This supply's outputs are rated for 2 amps at 12VDC, and 4 amps at 5VDC.* | 5. Measure the DC output voltages at the 4-pin quick disconnect plug. Do this with the connector plugged into the control board. The red wire is the 5VDC wire, the orange wire is the 12VDC wire, and the black wires are DC returns or ground. Verify the proper voltages are present as noted. Are the correct voltages present?<br><br>a. Yes: If the LEDs on the control board illuminate, the supply is most likely good. If when connected to the control board the sensor LEDs illuminate, this is further confirmation that the supply is good. Go to step 7.<br>b. No: Verify that step 1 has taken place, then go to step 6.<br><br>6. Verify the output of the supply is not shorted. The DC supply has short circuit protection built into the design of it. With the feeder in a quiet environment you should be able to hear a faint clicking sound coming from the DC supply if its output is shorted. If this clicking sound is heard, remove AC power from the unit, disconnect the 4-pin quick disconnect plug from the control board, and re-apply AC power. Measure again for the proper voltages at the 4-pin connector as in step 5. Are the correct voltages present?<br><br>a. Yes: There is most likely a short in the control board and the control board will have to be replaced. Go to step 7.<br>b. No: Replace DC supply.<br><br>7. Verify no other shorts are present. Reconnect J1, J2, J3, J7, J9 and J11. Alternately make one connection at a time between applying power to the machine. If the LEDs on the control board do not illuminate after a connection is made and power is applied, a short is associated with the last item connected and that part must be repaired or replaced. |
| **Testing the control board and harnesses** | 1. Verify the integrity of the motor control relay harness (1050-11-49) and the integrity of the motor control relay. See section titled "Testing the motor control relay."<br><br>2. Verify the DC power supply (44-649-033) is operational. See the section titled, "Testing the DC power supply."<br><br>3. Verify the Run/Prog switch is in the Run position. This switch must always be in the Run position.<br><br>4. Remove all quick disconnects from the control board at J1, J2, J3, J7, J9 and J11; but keep the power supply harness connected to J5. Observe the surface mount LEDs on the control board (5-1050-001).<br><br>5. Power on the feeder. You should hear 2 short beeps, and with each beep the red LED on the control board should blink once and go dark. Also, the amber LED should illuminate and stay on, and the green LED should continuously blink on and off. If these events do not occur, and DC power is verified as present, the control board is faulty and must be replaced.<br><br>6. Turn feeder power off and remove the K2 relay (44-841-038) from the control board's K2 relay socket. This relay has a 12VDC coil. Verify its integrity is intact, and replace if necessary.<br><br>7. Verify the flight trigger input harness is good. Also verify the integrity of the sheet sensor harness. Connect them to the board at J1 (Flight) and J2 (Sheet). Connect the flight and sheet sensors to the harnesses. |

**Table 9-1. Quick-Look Troubleshooting (continued)**

| Problem | Solution |
|---|---|
| **Testing the control board and harnesses (continued)** | 8. Connect the thumbwheel harness to the control board at J7. Set the batch count to 01.<br><br>9. Turn feeder power on. Using a known good Flight Detect sensor, assert the flight trigger input. If a Flight Detect sensor assembly is not available, jump pin 1 (12VDC) to pin 2 (signal input) with a piece of wire. The K2 relay should activate and the motor should run. Does the K2 relay activate?<br><br>a. Yes: The flight trigger input and the K2 relay functions of the control board test good. Go to step 10.<br>b. No: The control board is faulty and must be replaced.<br><br>10. Does the motor run as a result of step 9?<br><br>a. Yes: Go to step 11.<br>b. No: Go to the associated section to test the motor drive board, speed control, motor control relay and the motor.<br><br>11. Connect a known good Sheet Detect sensor to the sheet detect input and cover the sensor with something at about one inch from the lens. If a known good sensor is not available, jump pin 1 (12VDC) of sheet detect harness to pin 2 (signal input) of the sheet detect harness.<br><br>12. Test the sheet detect input. Begin by asserting the trigger input. The K2 relay should engage. Within less than 3 seconds after the trigger input is asserted, alternately uncover and then cover the sheet detect sensor lens, or remove the jumper and then jump pins 1 and 2 together. The K2 relay should disengage. Does the K2 relay disengage when the sheet detect input is asserted?<br><br>a. Yes: The input tests good.<br>b. No: The input is bad, the control board is faulty and must be replaced.<br><br>13. Turn the feeder off. Verify continuity is measured between pins 3 and 4 of the cycle and fault lamp/reset button assembly when the button is pressed, and connect it to the control board at connector J9. If continuity is not measured, replace the cycle and fault lamp/reset assembly.<br><br>14. Turn on the feeder. Press the button. The K2 relay should engage and then disengage after about 3 seconds, the beeper on the control board should beep, and the fault lamp should blink on and off. Do these events occur?<br><br>a. Yes: The J9 input and fault lamp output connector is good.<br>b. No: The J9 input is bad and the control board must be replaced.<br><br>15. Verify the integrity of the fault output connector harness and connect the harness to J3. J3 provides connection to the K1 relay on the control board. The common contact has a 1 amp fuse (F1) series with it. Verify the integrity of F1 and replace as necessary.<br><br>16. Check the K1 relay by using an ohmmeter to measure continuity across the normally open and normally closed contacts. Pins 1 and 4 of the fault output connector close on an error, and open under normal machine operation. Pins 3 and 4 of the fault output connector open on an error, and are closed during normal machine operation. |

**Table 9-1. Quick-Look Troubleshooting (continued)**

| Problem | Solution |
|---|---|
| **Testing the control board and harnesses (continued)** | 17. Verify the integrity of the fault selector harness. The switch should be open when it is in the feeder pause position, and closed when it is in the alarm only position. If this is not the case, replace the switch and/or repair the open wire. |
| **Testing the motor control relay**<br><br>⚠<br><br>*Exercise care when performing the following test. Bodily contact with 115VAC or 230VAC power can result in serious injury or death.* | 1. Remove relay 115V (535-00-453), or 230V (535-00-457) from the machine, disconnecting all leads from the relay terminals.<br><br>2. Measure the normally closed sets of contacts for continuity using an ohmmeter:<br><br>a. Measure between terminals 1 and 5, and terminals 2 and 6. Zero ohms measured indicates complete continuity. If more than a couple of ohms is measured, replace relay.<br><br>3. Verify coil operation, and test the normally open sets of contacts for continuity using an ohmmeter:<br><br>a. Carefully apply the appropriate AC power to the coil terminals “A” and “B” on the relay. If the contacts do not move, replace the relay.<br>b. While the coil is energized, measure between terminals 3 and 5, and terminals 4 and 6. Zero ohms measured indicates complete continuity. If more than a couple of ohms is measured, replace relay.<br><br>4. If the contacts move when power is applied, and all contacts have continuity, the relay is good. |
| **Testing the dynamic brake resistor** | 1. Remove resistor 115V (1050-11-45), or 230V (1050-22-45) red lead from relay terminal number 2.<br><br>2. Using an ohmmeter, measure between the red lead of the resistor and the black lead of the resistor (the black lead is connected to the motor drive board terminal labeled - Arm):<br><br>a. 115V models have a dynamic brake resistor whose properties are rated at 5 ohms, 1%, 50 watts. If 5 ohms is not measured across this resistor, replace the assembly (1050-11-45).<br>b. 230V models have a dynamic brake resistor whose properties are rated at 10 ohms, 1%, 50 watts. If 10 ohms is not measured across this resistor, replace the assembly (1050-22-45). |
| **Testing the user speed control assembly** | 1. Remove the three pot leads from the drive board; orange, red, and white.<br><br>2. Using an ohmmeter, measure between the orange and white leads for approximately 5k ohms. If approximately 5k ohms is not measured, replace user speed control.<br><br>3. Turn user speed control pot (1050-11-37) fully clockwise.<br><br>4. Measure between the red and orange leads for approximately 5k ohms. If approximately 5k ohms is not measured, replace user speed control.<br><br>5. Keeping the ohmmeter leads connected to the red and orange leads, slowly turn the user speed control counterclockwise. Your meter should indicate a continuous reduction of the ohm value across its entire range to less than 100 ohms. If not, replace the user speed control assembly. |

**Table 9-1. Quick-Look Troubleshooting (continued)**

| Problem | Solution |
|---|---|
| **Testing the user speed control assembly (continued)** | 6. Next measure between the red and white leads. You should measure approximately 5k ohms with the user speed control set fully counterclockwise. If not, replace user speed control assembly.<br><br>7. Keeping the ohmmeter leads connected to the red and white leads, slowly turn the user speed control clockwise. Your meter should indicate a continuous reduction of the ohm value across its entire range to less than 100 ohms. If not, replace the user speed control assembly. |
| **Testing DC motor drive**<br><br>  <br><br>*Exercise care when performing the following test. Bodily contact with 115VAC or 230VAC power can result in serious injury or death.* | 1. Verify motor integrity and re-install in feeder if necessary. See section titled “Testing the motor.”<br><br>2. Disconnect red motor wire from the motor control relay’s common terminal number 6. Connect this wire to the motor drive board (44-642-025) terminal labeled + Arm.<br><br>3. Remove violet wire from the motor drive inhibit pin. Prevent this wire from touching anything. Cover its terminal with electrician’s tape if necessary.<br><br>4. Verify user speed control integrity (see section titled “Testing the user speed control assembly”) and turn control fully clockwise.<br><br>5. Set all four dials on the motor drive to their respective positions as shown in the electrical wiring diagram: Min, Max, IR Comp, and Cur Lim. (If your feeder operates on 230V power, your Max dial will be set to a more clockwise position.) See the section titled “DC motor drive calibration procedure.”<br><br>6. Turn feeder power on and verify AC power has been applied to terminals labeled L1 and Neutral (L2). Does the motor run?<br><br>a. Yes: The drive tests good. See the section titled “DC motor drive board calibration procedure.”<br>b. No: Replace DC motor drive board and see section titled “DC motor drive board calibration procedure.” |
| **DC motor drive board and calibration procedure**<br><br>  <br><br>*Exercise care when performing the following test. Bodily contact with 115VAC or 230VAC power can result in serious injury or death.*<br><br>**NOTE**<br><br>*The following adjustments require the use of a tachometer.* | 1. Remove power from the machine. Set the user speed control to the fully clockwise position (maximum speed).<br><br>2. Set all four dials of the DC motor drive board (44-642-025) to their respective positions as shown in the electrical wiring diagram: Min, Max, IR Comp, and Cur Lim.<br><br>3. On the Control Board, set DIP switch number 1 to the ON position. (Numbers 2 through 4 must always be in the OFF position.)<br><br>4. Turn the feeder on and press the cycle button to run the motor.<br><br>5. Using a tachometer with a conical tip adapter, measure the speed of the motor shaft in RPM (revolutions per minute). A dimple centered on the end of the shaft is provided for this purpose.<br><br>6. While the motor is running, carefully rotate the Max dial on the motor drive board until approximately 1100 RPM shaft speed is measured.<br><br>7. Turn the user speed control to fully counterclockwise. Adjust the Min dial until a shaft speed of approximately 85 RPM is obtained. |

**Table 9-1. Quick-Look Troubleshooting (continued)**

| Problem | Solution |
|---|---|
| **DC motor drive board calibration procedure (continued)**<br><br>**NOTE**<br><br>*Do not apply more than 90VDC to a motor in 115V models, or more than 180VDC to a motor in 230V models. Failure will occur. Motor voltage can be measured at the + and - Arm terminals of the drive board.* | 8. Remove power. Set DIP switch number 1 back to the OFF position. |
| **Testing the motor** | 1. Verify machine line voltage configuration:<br><br>a. 115V machine: Go to step 2.<br>b. 230V machine: Go to step 3.<br><br>2. In 115V machines you will find a 90VDC motor (1050-11-33). Using an ohmmeter, measure across the red and black motor leads. You should measure less than about 10 ohms across the motor leads. If you measure an open or high resistance, rotate the motor shaft to ensure the brushes are making good contact with the commutator. Check the brushes (44-642-035) and replace if necessary.<br><br>3. In 230V machines you will find a 180VDC motor (1050-22-33). Using an ohmmeter, measure across the red and black motor leads. You should measure less than about 20 ohms across the motor leads. If you measure an open or high resistance, rotate the motor shaft to ensure the brushes are making good contact with the commutator. Check the brushes (44-642-035) and replace if necessary.<br><br>4. Replace the motor if an open is measured after replacing the brushes.<br><br>5. Using an ohmmeter, measure between the red lead and the motor body (where paint is not covering the body), and between the black motor lead and the body. The motor winding must not be shorted to the motor body. If you measure a short to the body, replace the motor.<br><br>6. Using an ohmmeter, measure between the motor body and the motor connector pin that has the green wire with a yellow stripe. This is a ground wire that bonds the motor body to earth ground. You should measure continuity between the pin and the motor body. Also, when the motor is connected to the drive, you should be able to measure continuity between the motor body and the ground pin of the power entry module. If continuity is not measured, repair faulty ground wire connection, as this is a user safety issue. |

## Notes

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