

Pro Series SI-1750

Manual



Thiele
Technologies
A Barry-Wehmler Company

Streamfeeder
®

Part Number: 00900549

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CONTENTS

	Safety Information	ii
	Specifications	v
Section 1:	About the Machine	1
Section 2:	Preparing for Operation	7
Section 3:	How to Operate	22
Section 4:	Troubleshooting	26
Section 5:	Inspection and Care	28
Section 6:	Service and Maintenance Procedures	35
Section 7:	I/O Options	38
Section 8:	Mechanical Components	41
Section 9:	Electrical Components	57
Section 10:	Technical Troubleshooting	68
Section 11:	Menu Guide	76

BEFORE You BEGIN

Message Conventions



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



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



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



ELECTRICAL DANGER signifies an 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 minimize problems in the installation or operation of the feeder.



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



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



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



WARNING LABELS affixed to this product signify an action or specific equipment area that can result in serious injury or death if proper precautions are not taken.

BEFORE YOU BEGIN

Message Conventions



Avoid injury. Do not reach around guards.



Hazardous voltage. Contact will cause electric shock or burn. Turn off and lock out power before servicing.



Moving parts can crush and cut. Keep guards in place. Lock out power before servicing.



Pinch point. Keep hands and fingers clear.



Moving parts can crush and cut. Keep guards in place. Lock out power before servicing.

SAFETY

Make sure you thoroughly read this section to become familiar with all the safety issues relating to the safe operation of this product.

Please read all of the warnings that follow to avoid possible injury. Although every effort has been made to incorporate safety features in the design of this product, there are residual risks that an installer or operator should be aware of to prevent personal injury.

Please read all of the cautions that follow to prevent damage. This product is built with the highest quality materials. However, damage can occur if not operated and cared for within design guidelines as recommended.

Danger



- **Equipment interior contains incoming 115 or 230VAC electrical power. Bodily contact with these high voltages can cause electrocution, which can result in serious injury or death.**

SPECIFICATIONS

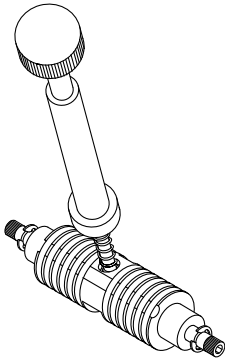
Maximum Product Size:	18 W x 12 L in (457.2 x 304.8 mm)
Minimum Product Size: With Small Product Kit:	7.875 W x 3 L in (200 x 76.2 mm) 2 W x 3 L in (50.8 x 76.2 mm)
Min/Max Product Thickness:	.003-.250 in (.0762-6.35 mm)
Belt Speed:	5700 ipm (144,780 mm/min)
Electrical Requirements:	115/230vac, 60Hz, 3A
Weight:	90 lbs. (40.82kg)

1 About Your Machine

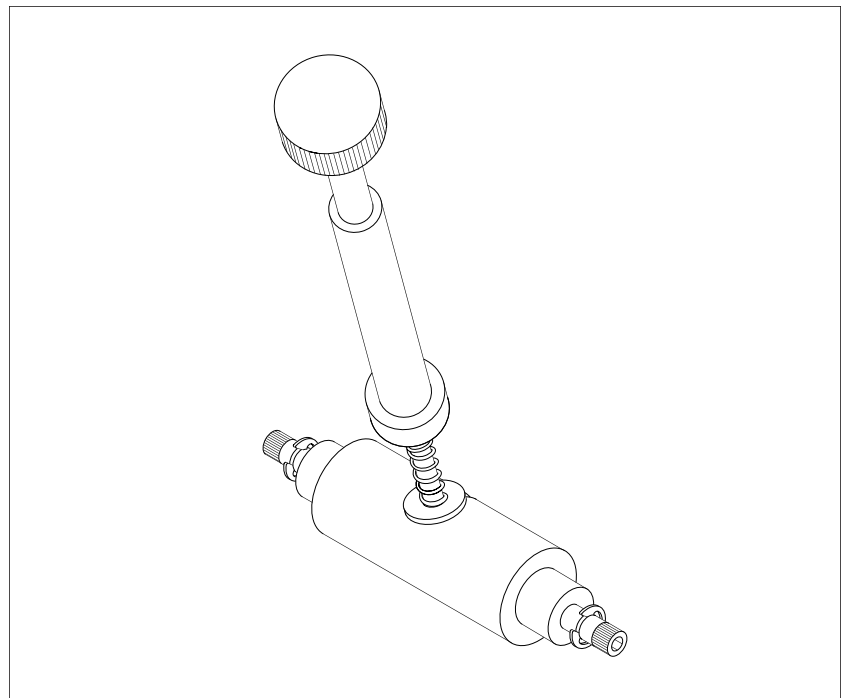
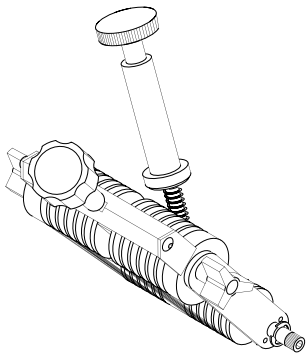
The SI-1750 is designed to separate, singulate, and feed a variety of cut sheets and non-nested products. After product is loaded into the hopper, a simple push of a button starts the feed cycle. Sensors mounted on-line and on the feeder control the start and stop sequence of the feeder cycle.

The design feature that makes the SI-1750 unique is a part called the *gate assembly*. This patented technology is the main reason the feeder can separate, singulate, and feed individual sheets with accuracy and reliability — even at high speeds. A single-knob adjustment allows you to easily setup the feeder for many different types of product.

Standard O-Ring Gate



Advancing O-Ring Gate



Bar Gate Assembly

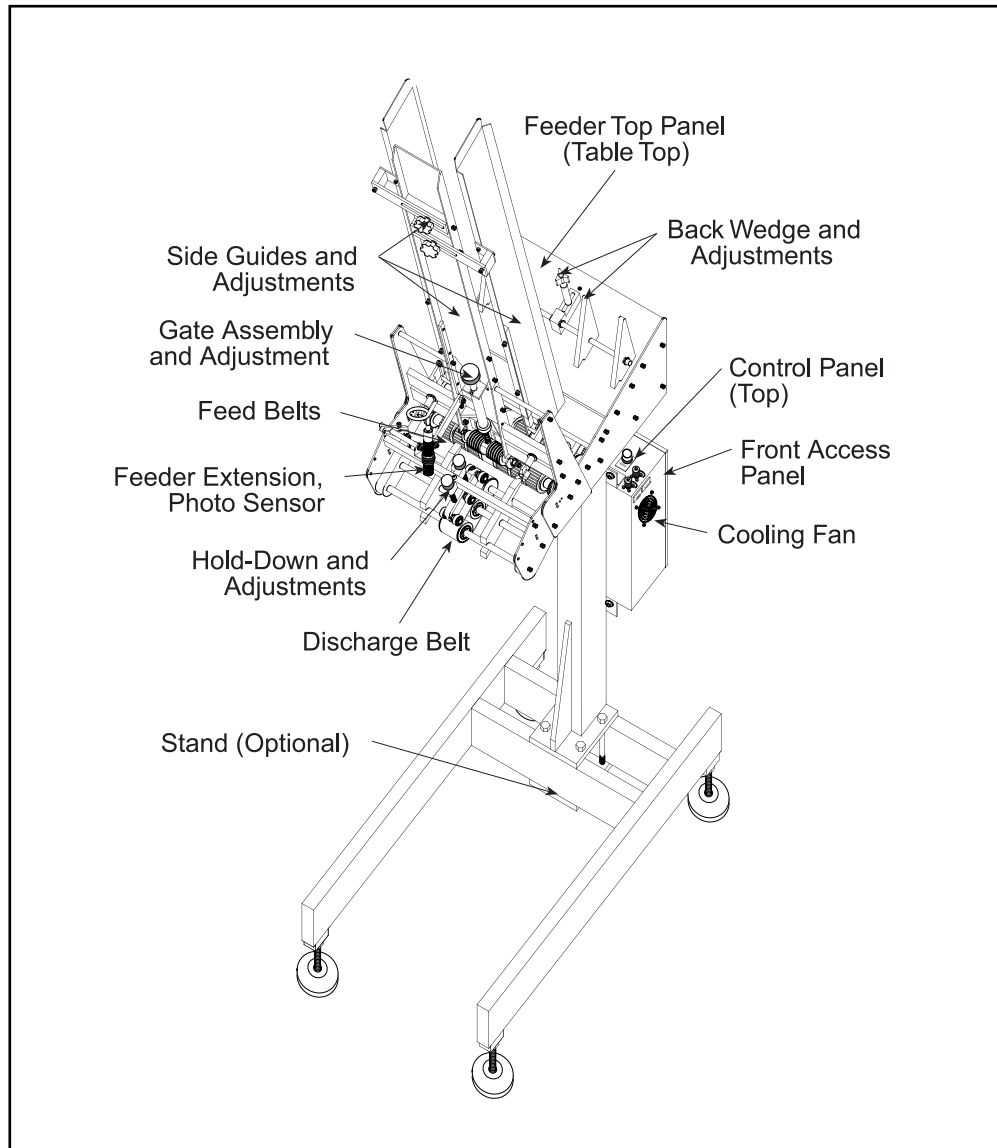
Main Features

NOTE

Your feeder may look slightly different than the model shown in the following diagrams.

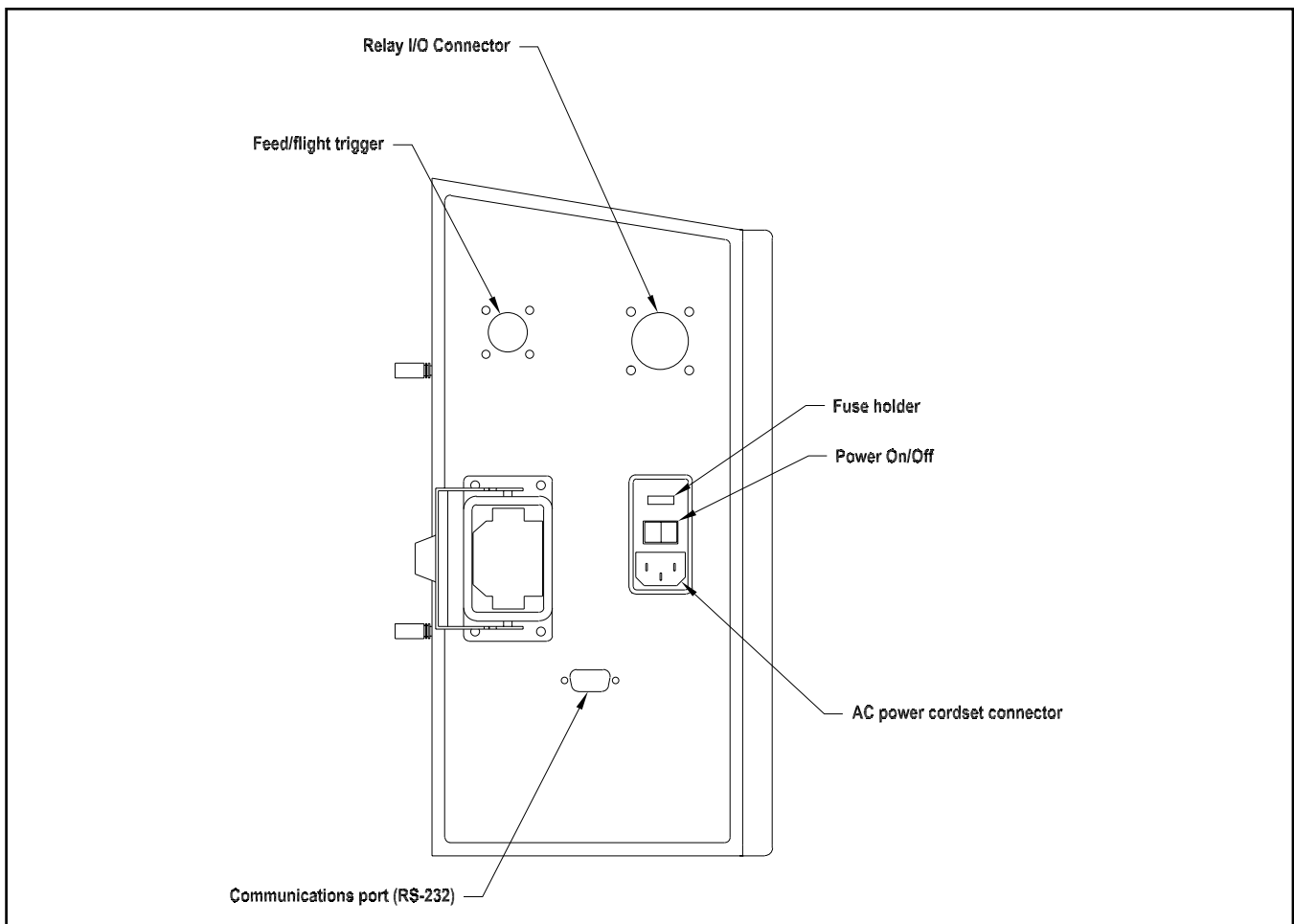
The machine is entirely powered by a single high-torque stepper motor that runs off of either a 120- or 240-VAC electrical power source. Once the machine is prepared for operation, the power-up and operation of the feeder is relatively easy.

But to get the most out of your machine, you should first become familiar with all of the features, including controls and sensors, connectors, and cables. Your feeder may look slightly different than the model shown in the following diagrams.



Feature Descriptions of SI-1750

FEEDER	Contains the all hardware, drive motor, and belts for singulating and feeding product from a stack.
Gate assembly and adjustment	<i>Mounted on a gate plate directly above the feed belts, this device provides a curvature to help preshingle stacked product. When properly adjusted, a one-thickness gap is created to help singulate and eject product. Three types of gate assemblies are available, standard O-ring gate, bar gate (optional), and advancing O-ring gate (optional).</i>
Top panel (table top)	<i>Used to support the back wedge. Also provides access to interior of feeder.</i>
Side guides and adjustments	<i>Holds a stack of product to be fed and helps keep it straight for proper entry through the gate assembly area.</i>
Back wedge and adjustments	<i>Lifts the product to keep it off the table top, reduces excessive contact with the feed belts, and helps push the product against the curvature of the gate assembly. Four (4) types of wedge assemblies are available, double S, low-profile, and articulating roller (optional), triangle wedge (optional).</i>
Hold-down and adjustments	<i>This series of rollers provides a varying pressure on top of product to force it down on the discharge belt, thus helping to eject a single product after it exits the gate assembly area.</i>
Extension, photo sensor	<i>Also called a sheet sensor, it “looks” for the leading edge of the product to stop the feeder momentarily. For effective operation, a movable extension allows you to adjust for distance and perpendicular to product.</i>
Feed belts	<i>Provides the friction and motion necessary to pull individual product from the bottom of the stack and through the gate assembly area.</i>
Discharge belts	<i>Combined with the hold-down rollers, provides the friction and motion necessary to pull product away from the gate assembly area. Rotates 50% faster than feed belts to separate and eject the bottom product away from next product entering the gate assembly area.</i>
CONTROLLER	Contains the electronics and controls for operating the feeder. Also, it provides AC power and sensor communications to the feeder via an interconnect cable.
Control panel (top)	<i>Contains all controls, flight sensor connector, and interface/power connectors.</i>
Front access panel	<i>Allows access to controller box interior.</i>
Cooling fan	<i>Draws external air into the interior of box to cool components.</i>
Stand (optional)	<i>Supports the feeder and controller.</i>



IQuipped Box Features

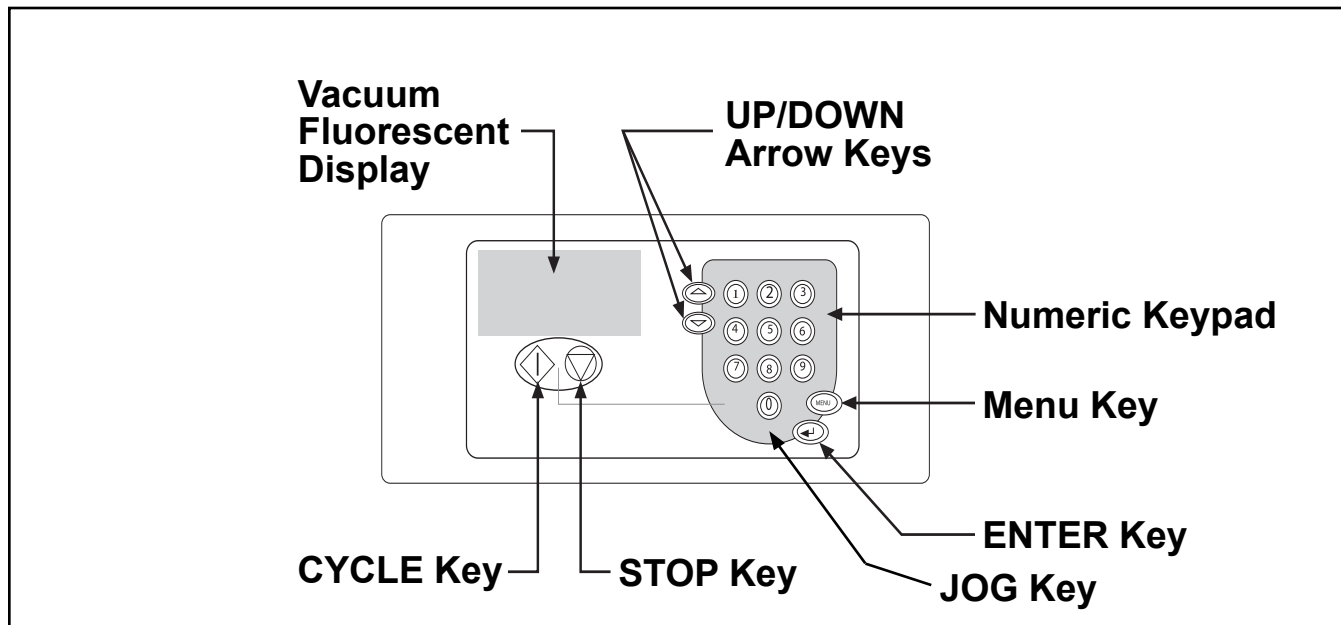
IQuipped Box Feature Descriptions

Feature	Description
AC power cordset connector	Cordset plugs into this IEC320 connector to provide feeder with power from 115-VAC or 230-VAC outlet.
Power On/Off	Toggles AC power On or Off.
Fuse holder	Contains 2 replaceable GMD3, 3.15-Amp, 5-mm fuses. <i>IMPORTANT: Always make sure power module is replaced exactly as removed. Failure to follow this caution can result in damaged electrical parts.</i>
Relay I/O connector	This 14-pin connector is used to output to other devices, either AC or DC voltages, and/or receive input control signals.
Communications port (RS-232)	This 9-pin connector is used to either receive control/data signals from a computer, or send control/data signals to a computer.
Feed/flight trigger	The remote flight-detect sensor plugs into this 4-pin connector to provide the “start” signal to begin a feed cycle.

Control Interface

The control interface consists of a keypad and display arrangement which allows you to not only control the operation of the feeder, but it also allows you to monitor the status of the job being run.

Control Interface Features



Control Interface Feature Descriptions

Feature	Description
Vacuum fluorescent display	This 4-line x 20-character display provides menus for the operator control interface and provides status of feeder during cycling.
Numeric keypad	Used to enter data which controls feeder activity, such as speed or batch count.
UP/DOWN arrow keys	Scrolls through the system configuration menus. Also, is used to increase and decrease the speed or batch count.
MENU key	Toggles display between the Run Display screen and the configuration menus.
ENTER key	Allows run values to be stored from the system configuration menus. Also, it resets the piece count or batch count.
CYCLE key	First, used to advance feeder from the "Suspended" mode to the "Ready" mode. Second, clears feeder faults, such as doubles and missed feeds (if applicable). Finally, completes one feed cycle when in "Ready" mode.
STOP key	Stops the feeder and holds it in "Suspended" mode. Also used to cancel a pending batch.
JOG key	Advances the feed belts at a fixed slow speed. This function is useful during feeder setup and may be used to clear jams.

General

The *control interface* provides you with several different options for monitoring status, entering configuration parameters, and cycling the feeder.

To fully understand how the control interface works, you must first understand the Run Display. The default menu from which you will start all control functions is called the *Run Display*. This screen is the default screen that is shown when you press any key after powering On the machine.

Run Display Defined

IMPORTANT

Even though the Run Display is factory-set for immediate operation, it can be customized to suit your changing on-site needs. For more information, please see the Technical Information Section of this manual, and/or consult with a qualified technician.

The Run Display for *batch* control is a real-time reporting tool containing information on the status of the feeder, such as run speed, number of batches fed for a particular job, and the batch size.

There are three types of status messages available for viewing from the Run Display screen: *Ready*, *Suspended*, and *Running*.

Ready	The feeder is ready to feed when faults (miss, double, and guard open) are cleared and the display reads "ready."
Suspended	The feeder will not feed when it receives a flight signal. Pressing the CYCLE key will advance the feeder to the "Ready" mode. Pressing the CYCLE key again will cause the feeder to feed.
Running	The feeder is currently feeding product (cycling).

- When the feeder is "ready" to receive a flight signal, the word "Ready" will scroll across the top line. From the Run Display, you can adjust the speed of the feeder by pressing the **UP/DOWN Arrow** keys.
- When the feeder is "suspended" (or idle), the word "Suspended" will scroll across the top line.
- When the feeder is "running," a rotating wheel is displayed.

Procedures for operating the feeder via the control interface are provided in Section 3, How to Operate.

2 Preparing for Operation



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

Do not attempt to make any adjustments while the machine is 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 SI-1750 is installed, you are then ready to prepare the machine for operation. To do so, you must perform several adjustments with the product you are going to be feeding. And, you must do a test run with this product to verify that it is set correctly before going on-line. *You will have to perform this procedure for each product that 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 setting
- 4: Hold-down setting
- 5: Photo sensor setting

STEP 1: Gate Assembly Adjustment



Hopper refers to the space where the product is stacked (made up of the side guides and gate plate).



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

Review

The gate assembly provides the curvature to help preshingle product and provides the proper gap to help the feed belts pull product 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 product against the curvature of the gate assembly, and help it contact the feed belts. This preshingling will allow the gate assembly to separate (and singulate) product as it moves toward the gap.

To achieve the optimum separation, you have to use the adjustment knob to either increase (clockwise) or decrease (counter-clockwise) the gap between gate assembly and the feed belts. Depending on the characteristics of the product 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.

Objective

Adjust the gate assembly for minimum gap, with minimum pressure on the product. Feeding problems will occur with either too much pressure on the product, or too large a gap between the gate assembly and the product.



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



Due to the discharge belt and hold-down assembly spinning 50% faster than the feed belts, excessive gate assembly pressure can cause premature wear to O-rings or feed belts.

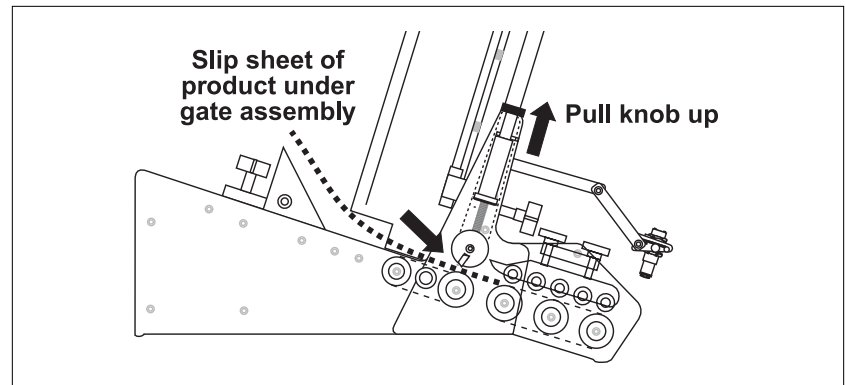


A wider gap between product and belt provides the highest tolerance for curled and bent edges.

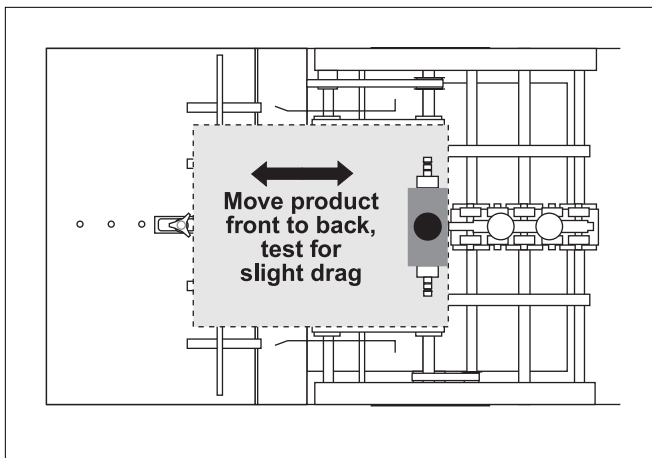
Procedure

To adjust the gate assembly for proper gap, follow these steps:

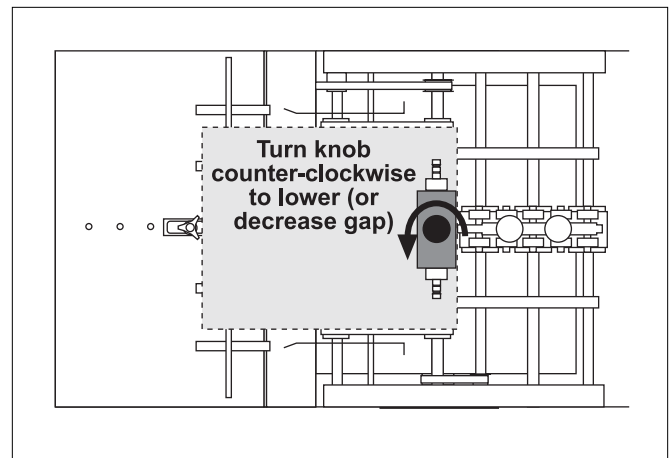
1. Slide a single sheet of sample product under the gate assembly. You may have to pull up on the adjustment knob to allow the product to be inserted.
2. Grasp the product with two hands and slide front-to-back under the gate assembly. A proper adjustment allows a “slight” drag on one-piece thickness of product.
3. Turn the gate assembly adjustment knob until the product has the desired drag: clockwise to increase gap, counter-clockwise to decrease gap.



Lifting Gate Assembly Upward to Insert Product



Using One-Piece Thickness of Product to Set Gap



Adjusting Gate Assembly for Correct Gap

Changing From Factory Set High-Tension to Low-Tension



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

Review

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

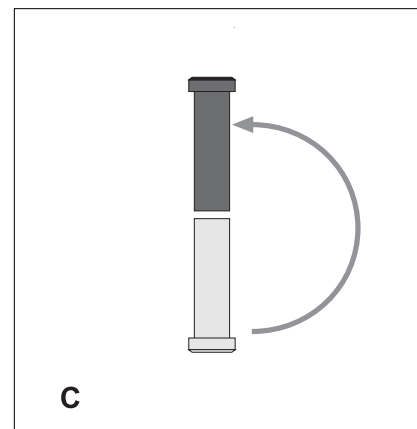
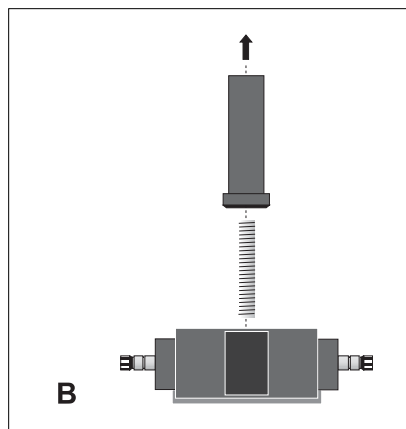
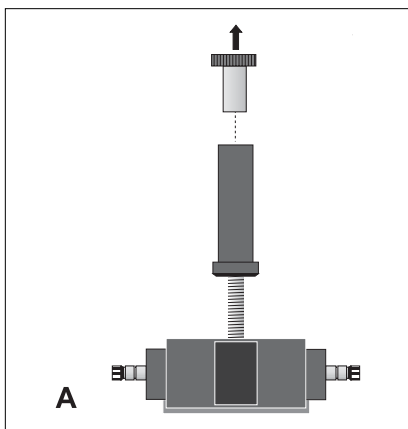
If you are feeding a product of irregular thickness, you should change to low-tension. This provides the following benefits:

- Allows the gate assembly to adjust to the irregular thickness among product pieces.
- Prevents marking on the product by the gate assembly.
- Prevents peeling back the top sheet of a multi-page product.

Procedure

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

1. Remove the gate assembly from gate plate (lift up on knob and tip at slight angle to remove).
2. Remove the adjustment knob by turning counter-clockwise.
3. Lift the cylinder off of top of spring.
4. Turn the cylinder around so that the cylinder collar faces up.
5. Place the cylinder on top of the spring.
6. Replace the adjustment knob (make about 8 revolutions of the knob before reinstalling gate assembly on gate plate).



Adjusting Gate Assembly for Low-Tension

STEP 2: Side Guides Setting



The bottom of the side guides cannot touch the feed belt. If the side guides are touching the product edges, skewing may occur as the product is fed through the gate.



A good “rule-of-thumb” measurement to use is about 1/16 in. (1.6 mm) between product edge and side guide (1/8 in. or 3.1 mm overall).



If the bottom edges of the side guides are too close to the feed belts, then contact between the two may occur while the machine is running, thus causing damage to the belts.

Review

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

Objective

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

For vertical adjustment, make sure the bottom of the side guides cannot touch the feed belts.

For horizontal adjustment, make sure the space between the side guides can accommodate the size of the product being fed. Consider the following as you adjust the guides horizontally:

- 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 product should rest equally on belts either side of gate assembly. *However, there can be certain instances where guides do not need to be centered due to product characteristics.*
- Adjust both side guides to be as close as possible to either sides of the product, without causing binding, curling of edges, or resistance to movement.

Procedure

To adjust each side guide for proper *vertical* positioning, follow these steps:

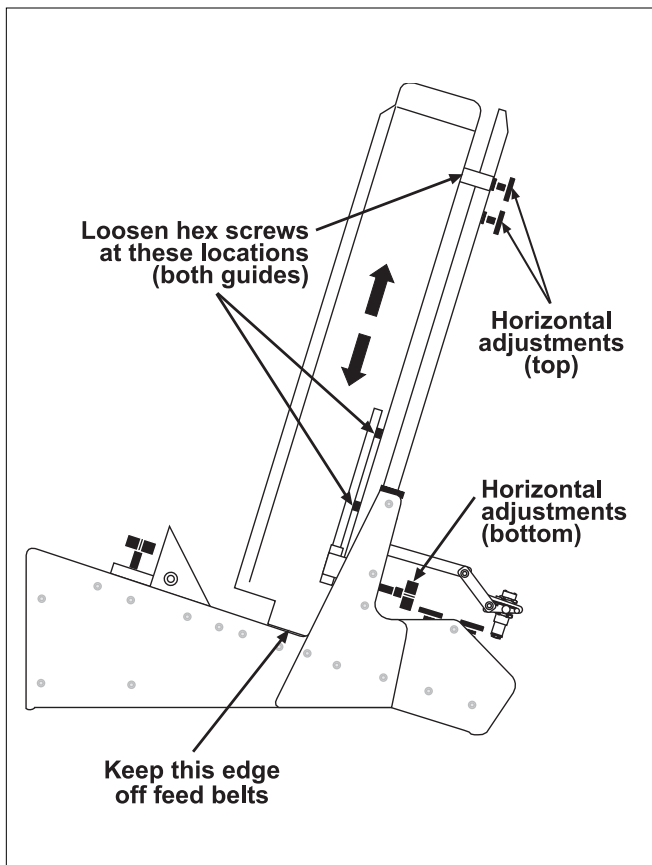
1. For the first guide, loosen the top hex screw that holds the upper part of the guide in place. Notice the slotted hole.
2. Do the same with the bottom two hex screws.
3. Slide the side guides up or down so that it is as low as possible *without touching the feed belt*.
4. Tighten all hex screws. Check clearance again.
5. Repeat steps 1 – 4 for second guide.

To adjust each side guide for proper *horizontal* spacing, follow these steps:

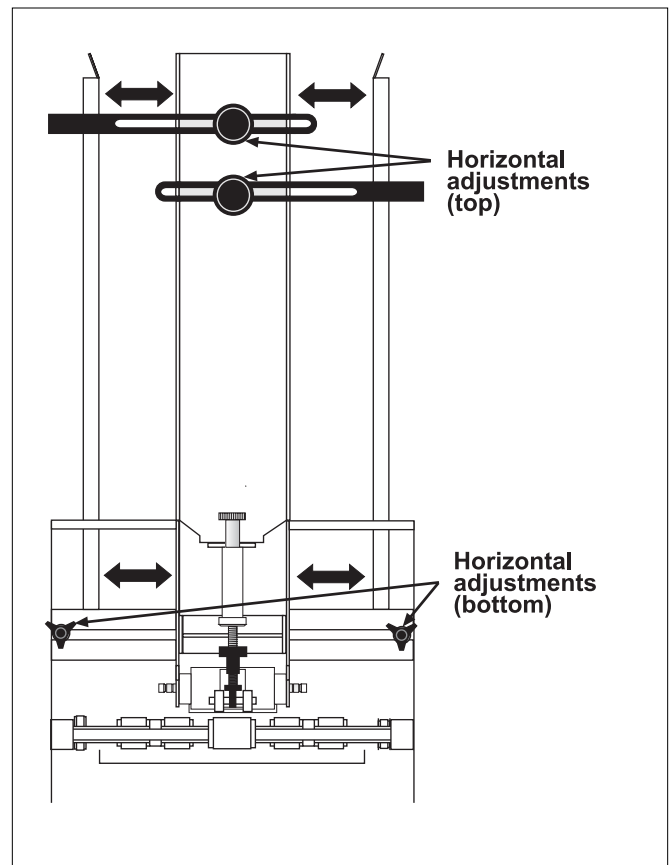
1. With a small stack of material in the hopper, start by loosening the bottom adjustment knob (counter-clockwise).
2. Grasp the lower part of each guide and move to the recommended distance from the product: 1/16 in. (1.6 mm) for each edge, 1/8 in. (3.1 mm) overall. Tighten the lower adjustment knob after you do this for each guide.
4. At the upper part of each guide, loosen the top adjustment knob (counter-clockwise).
5. Grasp the upper part of each guide and move to the recommended distance from the product: 1/16 in. (1.6 mm) for each edge, 1/8 in. (3.1 mm) overall. Tighten the upper adjustment knob after you do this for each guide.
6. Visually check both guides for parallel.



Avoid adjusting the side guides too close to the feed belts. Even slight contact with the belts can cause premature wear or even belt failure.



Vertical Adjustment of Side Guides



Horizontal Adjustment of Side Guides

STEP 3: Back Wedge Adjustment



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



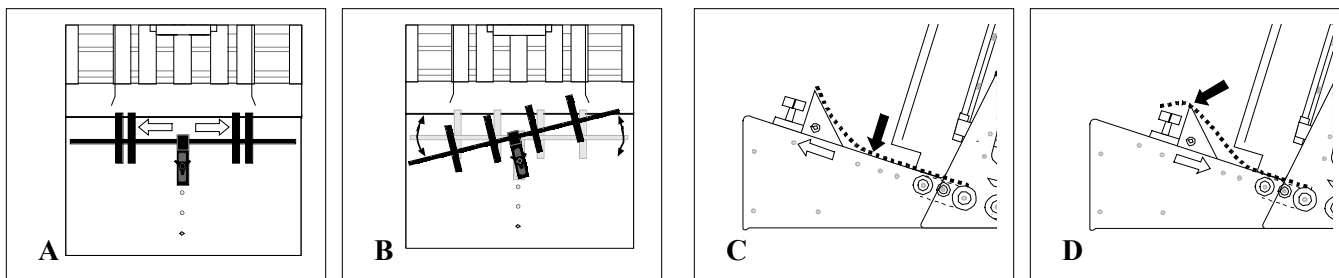
There are a number of feeding problems which can be solved by simply adjusting the back wedge to different positions. Some of these problems include double feeds, skewing, twisting, poor singulation, ink or varnish buildup on the belts, and jamming at the gate assembly area.

Review

The back wedge provides proper lift to the product to help keep it off the table top and feed belts, and it creates the force necessary to push product 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 product 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 product:

- *Moving the individual triangle wedges to the outside of the back wedge shaft will create a bow in the center. The bow will stiffen the product to promote better singulation of thinner product.*
- *Pivoting the back wedge from its perpendicular to the gate assembly will increase or decrease the amount of drag of contact (or traction) on the feed belts for a given side. This can also be used to control twisting or skewing of product as it leaves the gate assembly area.*
- *If the back wedge is positioned too far backward from the gate assembly, then the belts are driving the product before the bottom sheet has separated and left the gate assembly area. This pushes the gate assembly up, creating more pressure on the product, 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 product at a time to be forced under the gate assembly, creating a double feed.*
By moving the back wedge forward, only the bottom product 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, then a pinch point can be created between the top corner of the individual wedges and the product. Moving the back wedge even closer towards the gate assembly can allow product to overhang the corner of the wedge, creating too much lift of the product off the feed belts.*



Tips for Proper Back Wedge Adjustment

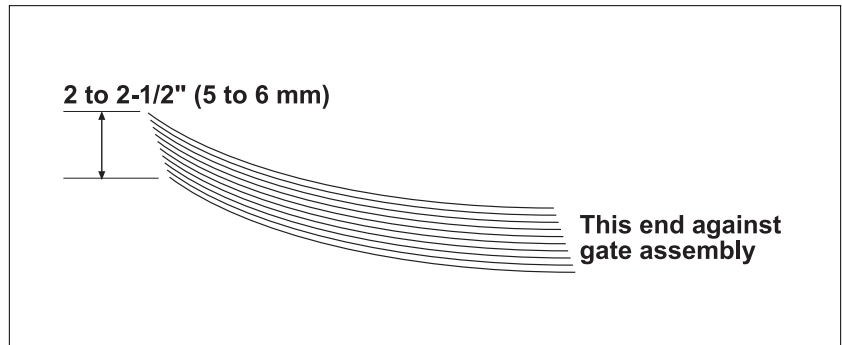
Objective

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

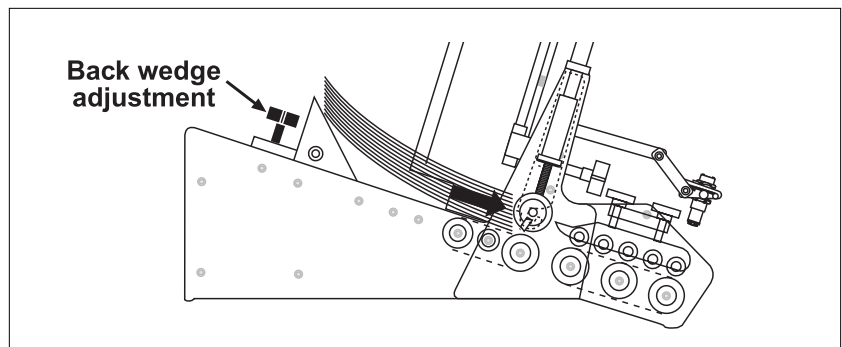
Procedure

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

1. Grasp a handful of product, approximately 2 to 2-1/2 in. (5 to 6 cm) thick, and preshingle the edges with your thumb.
2. Place the preshingled material in the hopper so that the edges rest against the curvature of the gate assembly.
3. Turn the back wedge knob counter-clockwise to loosen the wedge.
4. Move the back wedge forwards and backwards until the bot-



Preshingling a Small Stack of Material By Hand

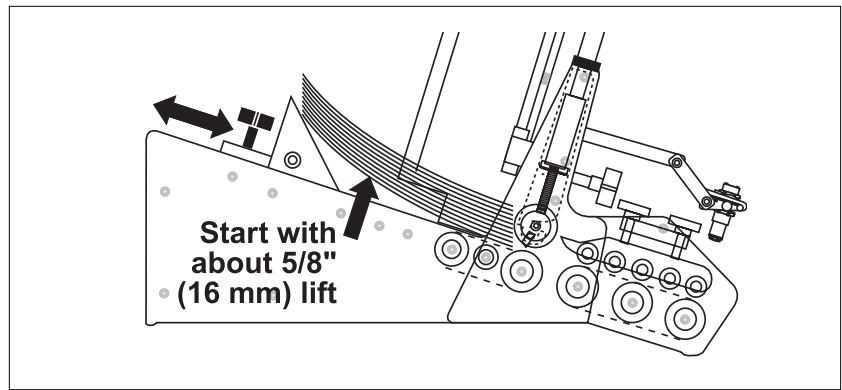


Positioning Product Prior to Loosening Back Wedge



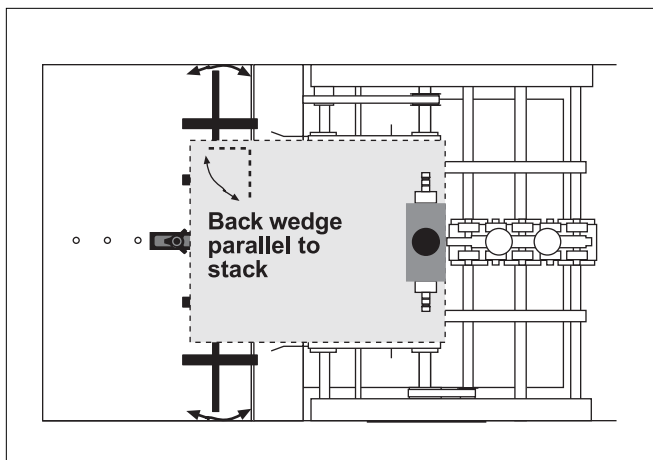
Moving the back wedge too far forward to the gate assembly can create a pinch point between the tip of the triangle wedges and the product. If moving the back wedge in is not effective, then an optional wedge may be required.

tom sheet is not touching the table top. A good starting point is to measure about 5/8 in. (16 mm) from the bottom sheet to front edge of table top. Then as you test, you can “fine tune” from this point. *Refer back to the previous page for other helpful guidelines.*

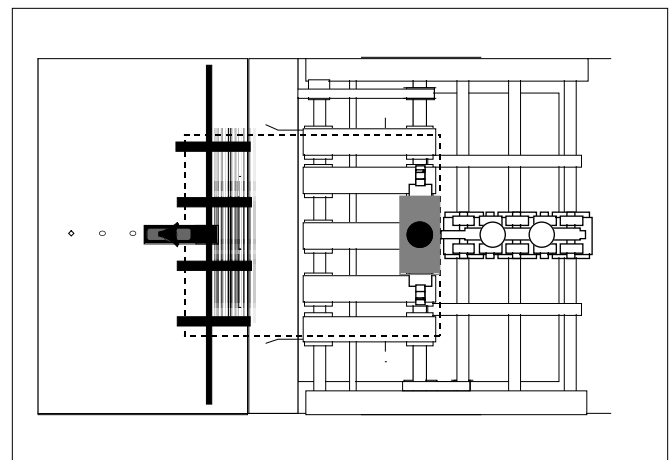


Adjusting Back Wedge for Proper Lift

5. Make sure the edge of the back wedge assembly is parallel with the edge of the product stack. Adjust as required and then tighten knob.
6. Check that individual triangle wedges are evenly spaced to provide enough support to lift the product off the table top and feed belts, without any bowing or twisting.



Adjusting Back Wedge for Parallel



Evenly Adjusting Individual Wedges

Now that you are familiar with the basic principles of using a wedge, it is simply a matter of combining these principles to all wedges.

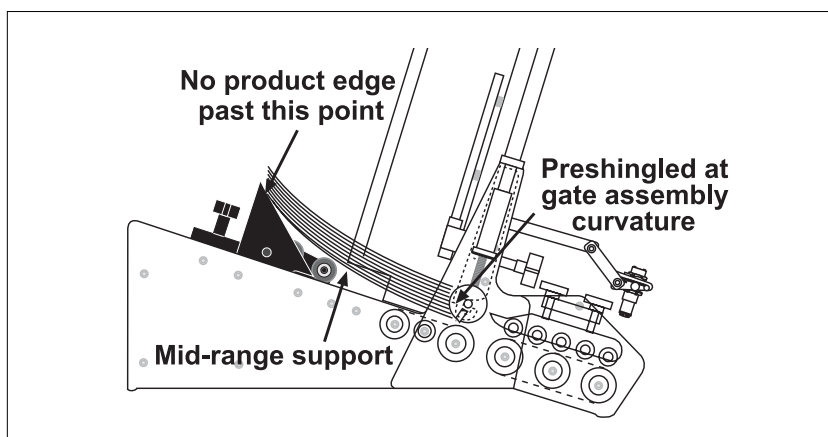
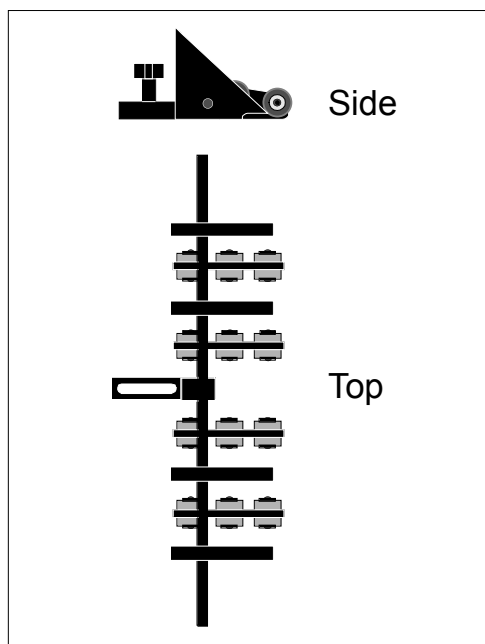
The following wedges are covered:

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

Combination Triangle/ Low-Profile

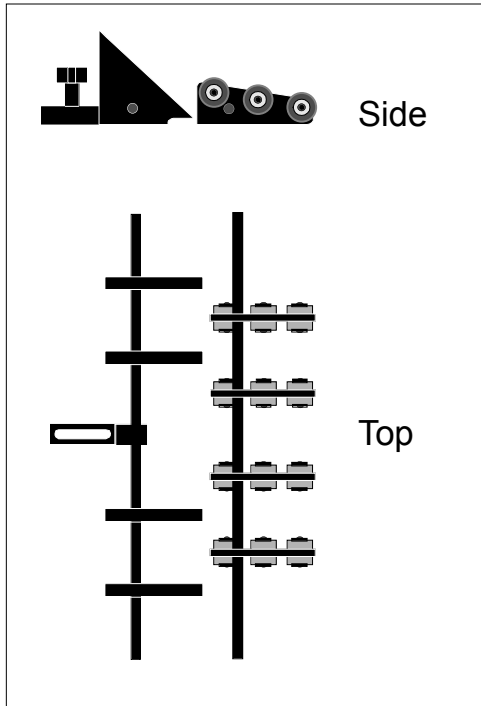
When to use: For thin product with minimal body, thus requiring minimal mid-range support.

Setup guidelines: Adjust so that bottom of stack preshingles against the curvature of gate assembly; make sure edges of product do not touch or overhang tip of triangle wedges, as this creates pressure points. Roller(s) should lift bottom of stack off table top to eliminate friction and create body.



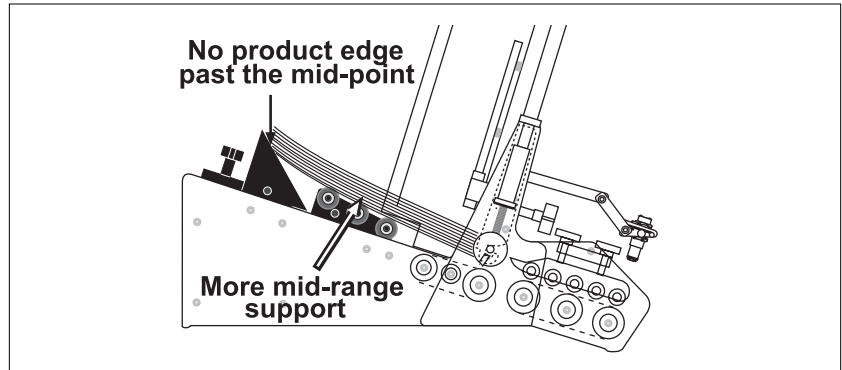
Combination Triangle/Low-Profile Wedge Setup

Separate Triangle and Low-Profile



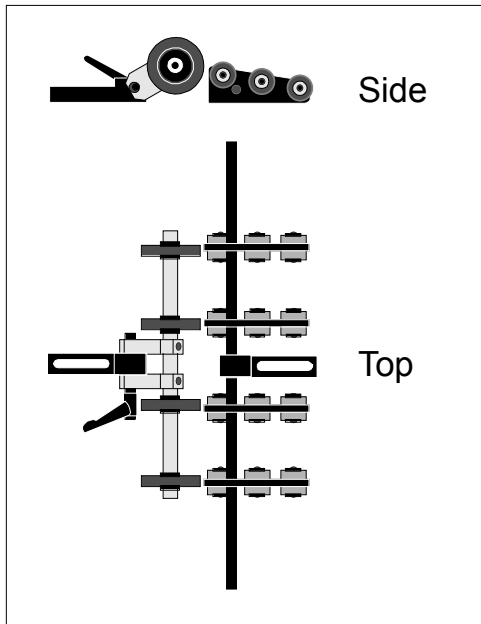
When to use: If moving combination triangle/low-profile wedge assembly back from the gate assembly, bottom of stack still touches table top. This means you need even more mid-range support.

Setup guidelines: Adjust the triangle wedge the same way that you would the combined triangle/low-profile wedge assembly (see previous page). Set the low-profile wedge relative to the triangle wedge so that it lifts bottom of the stack off the table top to eliminate friction and create body. Again, make sure edges of product do not touch or overhang tips of triangle wedges.



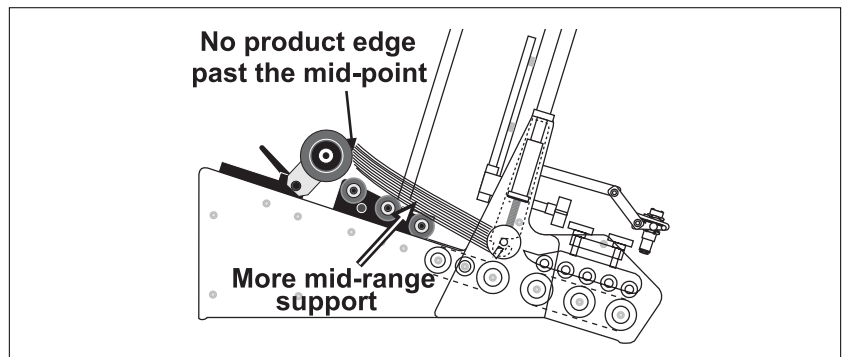
Separate Triangle and Low-Profile Wedge Setup

Separate Articulating Roller and Low-Profile



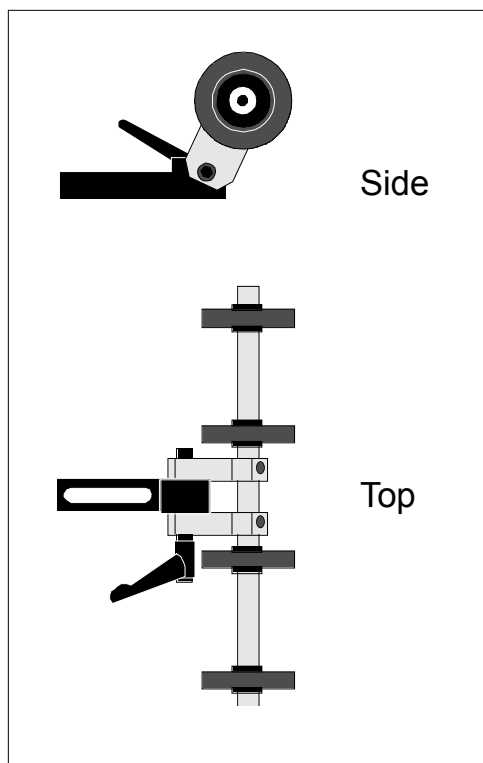
When to use: For thicker product with more body, thus requiring medium mid-range support. Longer product may also benefit.

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 product do not extend back more than mid-point of rollers. Set the low-profile wedge so that roller(s) lift bottom of stack off the table top to eliminate friction and create body.



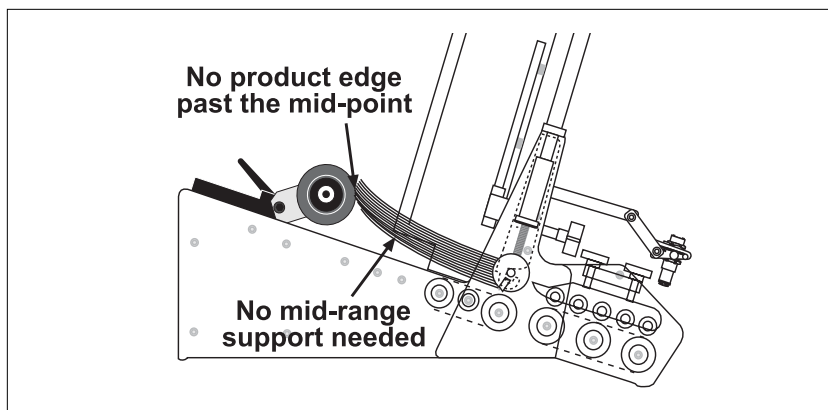
Separate Articulating Roller and Low-Profile Wedge Setup

Articulating Roller



When to use: Effective for very thick and/or ridged product requiring virtually no mid-range support.

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



Articulating Roller Wedge Setup

STEP 4: Hold-Down Setting

Review

The hold-down assembly consists of several adjustable rollers which rest on top of the product as it exits the gate assembly area. With the correct amount of pressure applied to the product, the discharge belt will have the proper amount of contact and friction needed to pull product away from the gate assembly area. Incorrect hold-down pressure can cause overlap or insufficient gap between one product and the next.

Objective

Adjust the hold-down rollers to the proper amount of pressure to allow the discharge belt to pull and separate the bottom sheet as it exits the gate assembly area.

Procedure

To adjust the hold-down assembly for proper pressure, follow these steps:

1. Insert one piece of product to be fed under the hold-down assembly. To facilitate this, turn all knobs clockwise several turns.
2. Turn knobs A and B counter-clockwise to lower the hold-down assembly so that a slight drag exists between the product and the hold-down rollers. Verify slight drag by sliding product side-to-side.
3. Turn knob A clockwise 1/8-turn so that slightly less drag exists on the roller closest to gate assembly. Again, verify drag by sliding product side-to-side.
4. Recheck knob B for proper drag on roller farthest from gate assembly (drag may have changed while adjusting knob A).



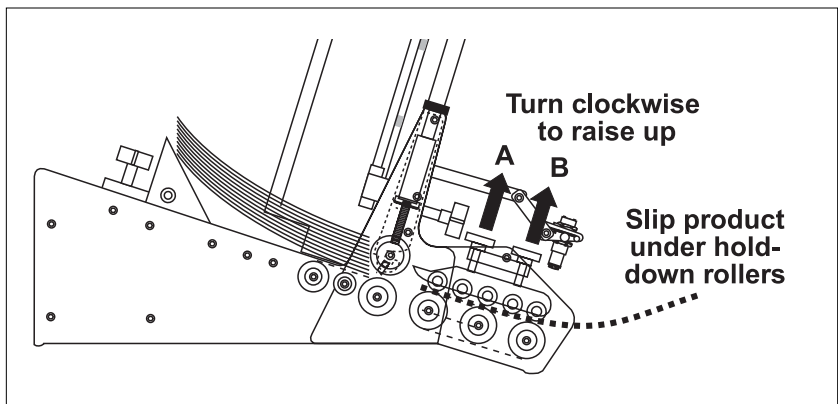
IMPORTANT

If the roller furthest from the gate assembly is tighter than the roller closest to the gate assembly, jamming may occur.

If either adjustment is too tight, product damage may occur.



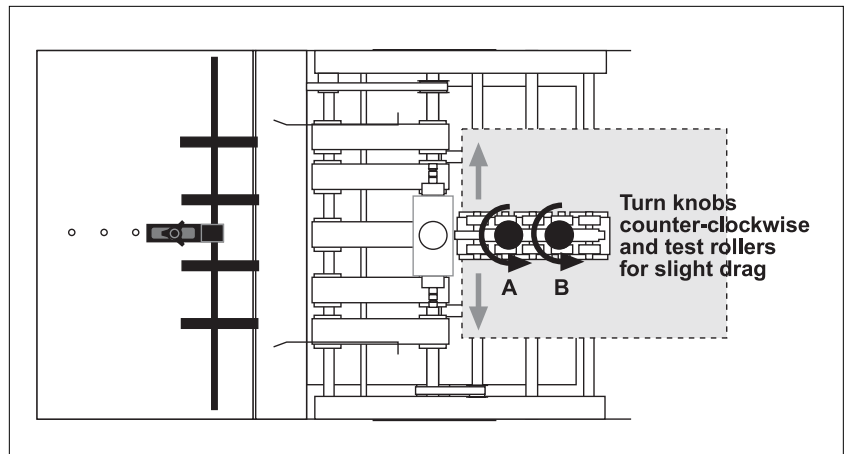
Due to the discharge belt and hold-down assembly spinning 50% faster than the feed belts, excessive gate assembly pressure can cause premature wear to O-rings or feed belts. Review “Step 1, Gate Assembly Adjustment”.



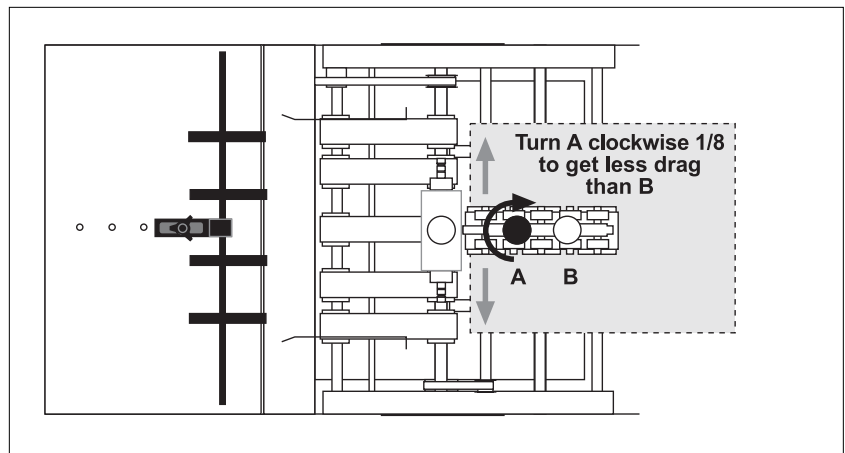
Inserting One Piece of Product Under Hold-down

NOTE

Often after you adjust the first roller you have to go back and readjust the second roller to make sure that the drag is correct.



Turning Knobs Counter-Clockwise to Insert Product



Turning Knob “A” Clockwise to Get Slight Drag

STEP 5: Photo Sensor Adjustment

Review

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

*For preparation for operation, your initial concern should be in properly adjusting the **Sheet** photo sensor.*

Objective

For the **Sheet** photo sensors to be effective, they must be adjusted within a specified range and angle to the product.

NOTE

Standard photo sensors shipped from the factory are two diffuse reflective detectors. No adjustment for gain is required or necessary.

NOTE

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

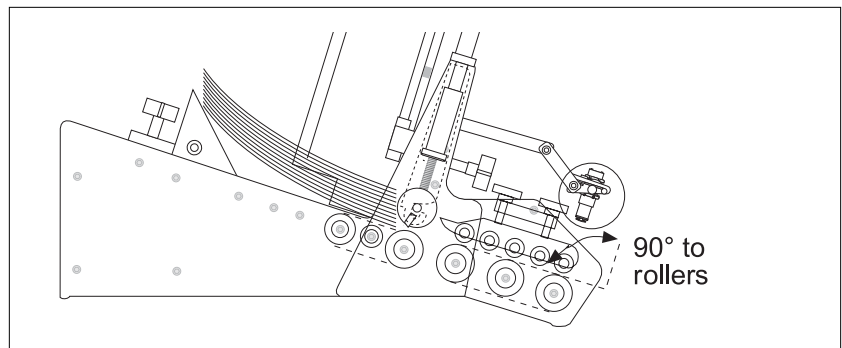
TIP

Avoid light colored backgrounds in the discharge area.

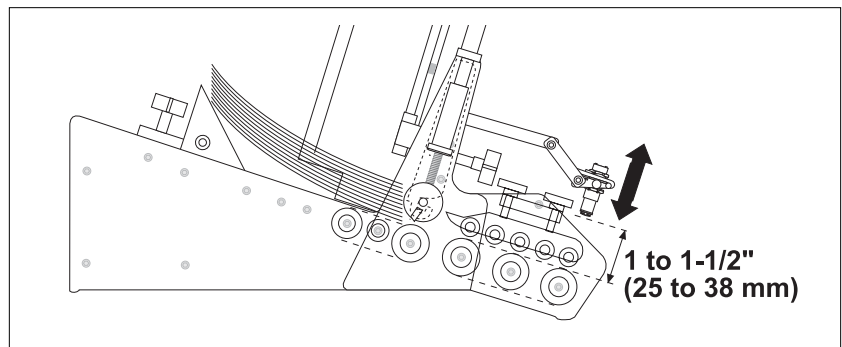
Procedure

To adjust the **Sheet** 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. If the photo sensor needs further adjustment, loosen the two threaded locknuts.
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.*



Adjusting Photo Sensor for Perpendicular Position



Adjusting Photo Sensor for Distance

Manual Test To Verify

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

Prepare your test by loading the hopper with approximately 2 to 2-1/2 in. (5 to 6 cm) of product. Make sure you preshingle the stack so that product rests against the curvature of the gate assembly.

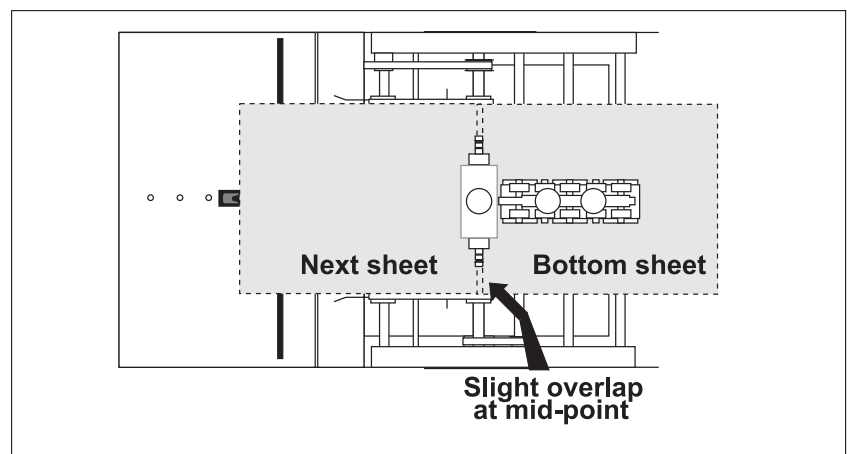
NOTE

If the gate assembly is too tight, the feeder will have difficulty pulling the product through the gate assembly area. This will cause “missed” feeds.

NOTE

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 product. If moving the back wedge in is not effective, then an optional wedge may be required. See Appendix A for more information.

1. Manually feed several sheets of product slowly through the gate assembly area. Move the drive belts by pressing your thumb against the discharge belt.
2. Observe how individual product 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. Ideally, this means a slight overlap of both the first sheet and the second sheet (1/8 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, then move the wedge in towards the gate assembly. Test again.
4. If sheets are overlapping excessively or, if the machine is feeding doubles, then reduce the gap slightly by moving the knob about 1/8 turn counter-clockwise. Test again.
5. As product moves through the hold-down area, check for any skewing or jamming. Also check for damage to the product.
6. If this or other feeding problems still persist (slipping, skewing, jamming), then review all the adjustment procedures in Section 2, “Preparing for Operation”.



Optimum Overlap and Separation of Product

3 How to Operate

Operational Sequences

Successful power-up and operation of the feeder is assured if you apply each of following sets of procedures where needed:

- Loading product
- Quick setup/cycle sequence
- Accessing the menus for setup
- Starting a cycle
- Stopping the feeder
- Clearing a jam

Loading Product

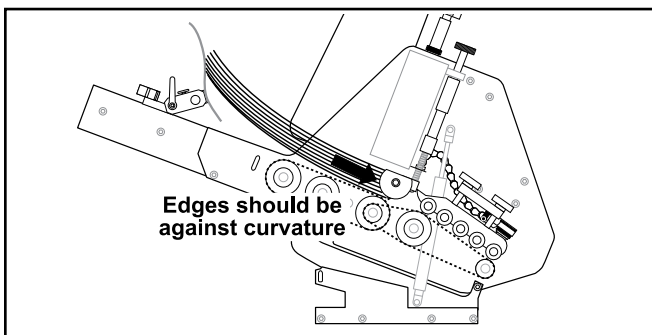


Preshingling prevents multiple sheets from jamming under the gate assembly at start-up.

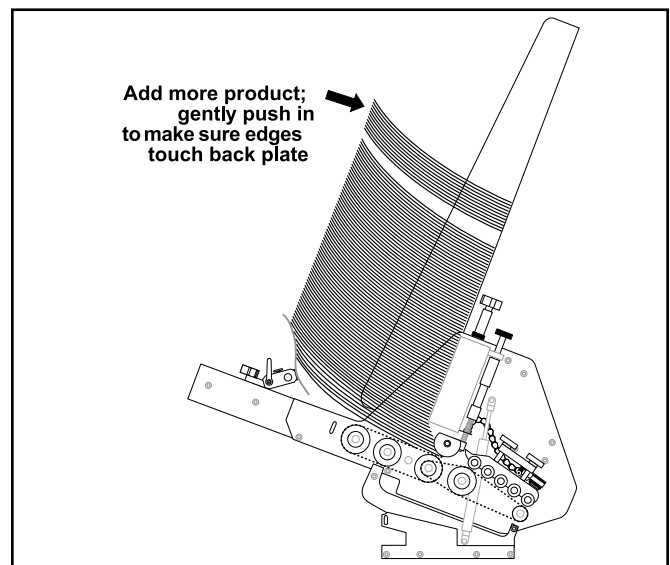


Stack height affects the downward pressure on the feed belts. Greater downward pressure can increase the chances for misfeeds or double feeds.

1. Preshingle a small stack of material and load in hopper.
2. With one end of the stack resting against the gate assembly, the other end will be resting on the back wedge.
3. Gradually add more product to the hopper. As stack height will have a preferred minimum and a maximum, you will have to experiment to determine the effective range of height.
4. As you add product, tamp each hand-full of product with your hand to make sure it rests evenly against the back plate.



Placing Product Against Gate Assembly











Adding More Product to Fill Hopper

Quick Setup/Cycle Sequence

IMPORTANT

Even though the Run Display is factory-set for immediate operation, it can be customized to suit your changing on-site needs via the “Passcode” menu. For more information, please consult with a qualified technician.

If the feeder is prepared for operation and you want get the feeder started in the quickest way possible, use the following sequence:


1. Turn power  **On**.
2. Press *any* key to advance to “Suspended” screen.
3. Press **UP/DOWN Arrow**  keys to desired speed percentage.
4. To set batch size:
 - a. Press **MENU** key.
 - b. Press **UP/DOWN Arrow**  key until batch size is displayed .
 - c. Press **ENTER**  key.
 - d. Press **UP/DOWN Arrow**  key to desired batch size **OR** enter the desired batch size via the keypad.
 - e. Press **ENTER**  key to save.
 - f. Press **MENU** key to return to “Suspended” screen.
 - g. Press **CYCLE**  key to advance to “Ready” screen.
 - h. Trigger the flight-detect sensor to begin feeding *or*, press **CYCLE**  key to test feed for one cycle.

Accessing the Menus for Setup

IMPORTANT

Menus can be customized to suit your changing on-site needs via the “Passcode” menu. For more information, please consult with a qualified technician.






TIP

Press and hold the UP/DOWN Arrow  keys to quickly change values.

TIP




Press the MENU key to restore old value and return to “Suspended” screen.

If you wish to configure all the parameters of your machine via the menus, use the following sequence for accessing the menus:


1. Turn power  **On**.
2. Press *any* key to advance to “Suspended” screen.
3. Press **MENU** key.
4. Press **UP/DOWN Arrow**  keys to view available menus:
 - Menu 1 Speed
 - Menu 2 Size
 - Menu 3 Clear
5. Press **ENTER**  key to change speed or reset job count.
6. Press **UP/DOWN Arrow**  keys to desired speed percentage or batch size.
7. Press **ENTER**  key to save change.
8. Press **MENU** key to return to “Suspended” screen.


Starting a Cycle

Once setup is complete, you can perform the following steps to start feeding.

1. Turn power  **On**.
2. Press *any* key to advance to “Suspended” screen.
3. Press **CYCLE**  key to *stage* product and advance to “Ready” screen.
4. Trigger the flight-detect sensor to begin feeding *or*, press **CYCLE**  key to test feed one cycle.

Stopping the Feeder

The feeder can be stopped either manually or automatically. Pressing the **STOP**  key will stop feed cycles and return the feeder to the “Suspended” status.


When a product fails to be staged in a preset amount of time, the feeder will automatically *timeout* or stop. If this occurs, the display will read “Feeder Timeout.” Determine and resolve the cause of the *timeout* and press the **CYCLE**  key to resume feeding.

Clearing a Jam




*Pressing the **JOG** key to advance the feed belts may clear some jams. If the JOG key does not work, use the procedure listed.*

If a jam occurs during operation, follow these steps:

1. Turn power  **Off**.
2. Open the discharge safety shield.
3. Remove jammed product from feeder. While doing so, try to determine the cause of the jam.
4. Verify whether any adjustments are loose. If so, refer back to Section 2, Preparing for Operation, for proper adjustment procedures.

Shutdown

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

1. Turn power  **Off**.
2. Disconnect feeder from AC power source.
3. If removing the **Flight-Detect** photo sensor from the production line, disconnect cable connector from feeder and coil up for storage.

4 Troubleshooting

This table will provide you with quick solutions to the more common day-to-day problems you may encounter.

Quick-Look Troubleshooting

Problem	Cause	Solution
No AC power to feeder	<ol style="list-style-type: none">1. On/Off switch in "Off" (or "0" position).2. Power cord loose or not plugged into outlet (or AC power source).3. Female end of power cable loose or not plugged into AC power inlet at rear of feeder.4. Interconnect cable loose or not connected at controller box.	<p>Check that switch pressed to "On" (or "—" position).</p> <p>Check and secure power cord at AC outlet.</p> <p>Check and secure cord at AC power inlet (rear of feeder).</p> <p>Check and secure interconnect cable end at controller box. Make sure it is locked.</p>
Feeding doubles	<ol style="list-style-type: none">1. Gate assembly improperly adjusted (possibly more than one sheet thickness).2. Back wedge improperly adjusted.3. Worn angled edge (or if applicable, O-rings).4. Product interlocking.5. Static buildup.	<p>Review gate assembly adjustment in Section 2, "Preparation for Operation".</p> <p>Review back wedge adjustment in Section 2, "Preparation for Operation".</p> <p>Replace angled edge. Or if applicable, rotate O-rings. (see Section 5, "Inspection and Care", for procedure). If wear is excessive, consult with a qualified technician.*</p> <p>Check product and source.</p> <p>Check product and source.</p>
Continuous feeding, no gap	<ol style="list-style-type: none">1. Possible overlapping.2. Incorrect hold-down pressure adjustment.	<p>See "Feeding Doubles" above.</p> <p>Review hold-down setting in Section 2, "Preparation for Operation".</p>
Continuous feeding, with gap	<ol style="list-style-type: none">1. Photo sensor out of adjustment relative to product (target). Background objects such as shafts, guides, belts, and supports may be causing false returns.	<p>Re-adjust feeder extension/photo sensor to "see" product only. Review photo sensor adjustment in Section 2, "Preparing for Operation".</p>

Quick-Look Troubleshooting (continued)

Problem	Cause	Solution
Feed belts are operating, but material not feeding	<ol style="list-style-type: none"> 1. Material stack weight is too low when stack height is down, resulting in reduction of down pressure. 2. Binding in side guides. 3. Slippery feed belts due to buildup of material. 4. Sheet adhesion or interlocking between the bottom and next sheet. 5. Gate assembly may be down too tight. 6. Too much weight in hopper. 	<p>Review loading the product in Section 3, "How To Operate".</p> <p>Adjust the side guides further apart to allow freedom of movement between sheets.</p> <p>Consult with a qualified technician.</p> <p>Review loading the product in Section 3, "How To Operate", or review back wedge adjustment in Section 2, "Preparation for Operation".</p> <p>Review gate assembly adjustment in Section 2, "Preparation for Operation".</p> <p>Remove product from stack. Test again.</p>
Feed belt(s) not tracking on rollers	<ol style="list-style-type: none"> 1. Excessive weight in hopper. 2. Excessive down pressure on gate assembly. 3. Off-centered product from gate plate. 4. Stack is bearing down on edge of belt. 5. Belt wear. 6. Rollers out of adjustment. 	<p>Reduce weight. Test again.</p> <p>Rotate clockwise 1/8 turn to increase gap and manually test. Also, review gate assembly adjustment in Section 2, "Preparation for Operation".</p> <p>Review side guides setting in Section 2, "Preparation for Operation".</p> <p>Move stack away from belt, even if this causes stack to be aligned off center from center line of feeder.</p> <p>Review gate assembly adjustment and back wedge adjustment in Section 2, "Preparation for Operation". Also, see Section 5, "Inspection and Care". If wear is excessive, consult with a qualified technician.*</p> <p>Consult with a qualified technician.</p>
Jamming occurs during operation	<ol style="list-style-type: none"> 1. Improper adjustment of any of the following areas: <ul style="list-style-type: none"> • gate assembly • back wedge • hold-down assembly 	<ol style="list-style-type: none"> 1. Turn the Power switch to Off by pushing the circle (O). 2. Remove jammed product from feeder. While doing so, try to determine the cause of the jam. 3. Verify each adjustment by reviewing Section 2, "Preparation for Operation".

5 Inspection and Care



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

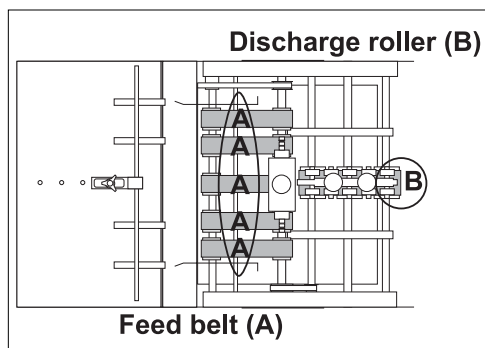
Do not attempt to make any adjustments while the machine is running. Failure to do so can expose you to moving parts which can cause serious injury. Do not wear loose clothing when operating the feeder.

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.

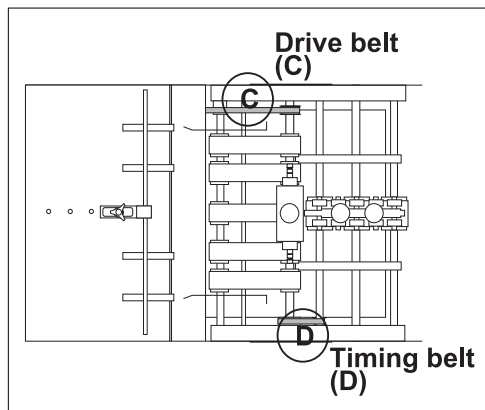
Visual Inspection



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:

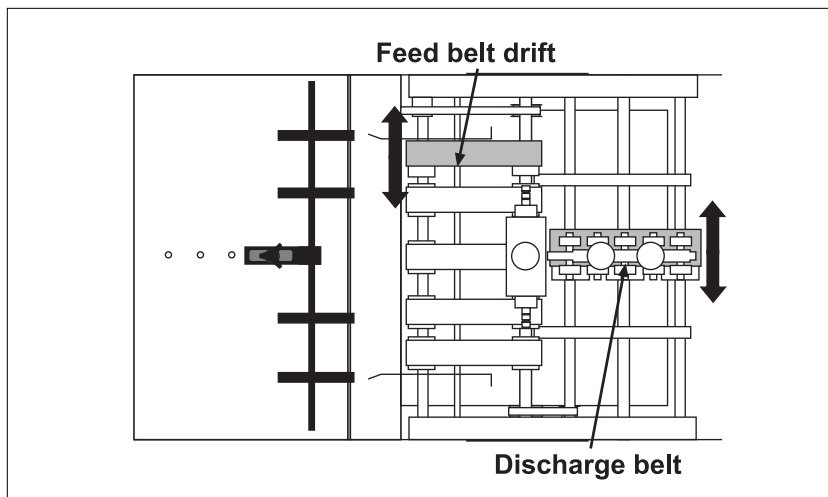
- Fraying. Replace as required.
- Missing teeth. Replace as required.
- Cracking. Replace as required.

Visual Inspection (continued)

Ensuring Proper Feed and Discharge Belt Tracking

Check for visual sign of:

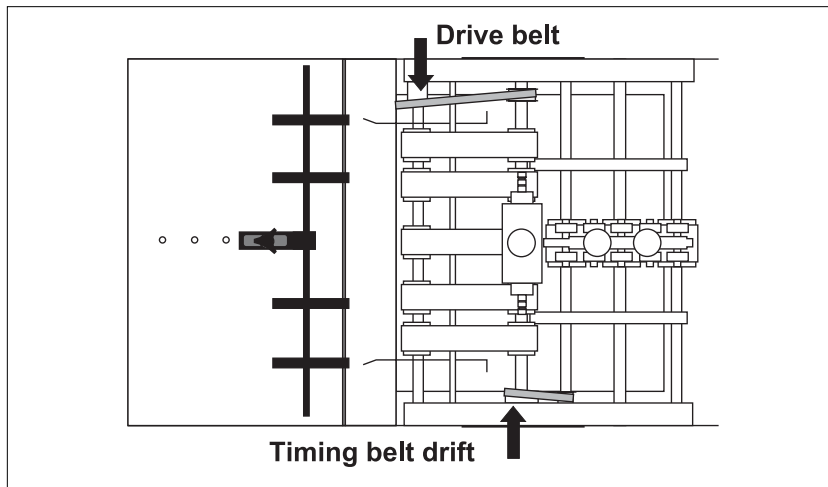
- Stretching.
- Improper roller adjustment.



Ensuring Proper Timing and Drive Belt Tracking

Check for visual signs of:

- Misaligned timing pulleys.



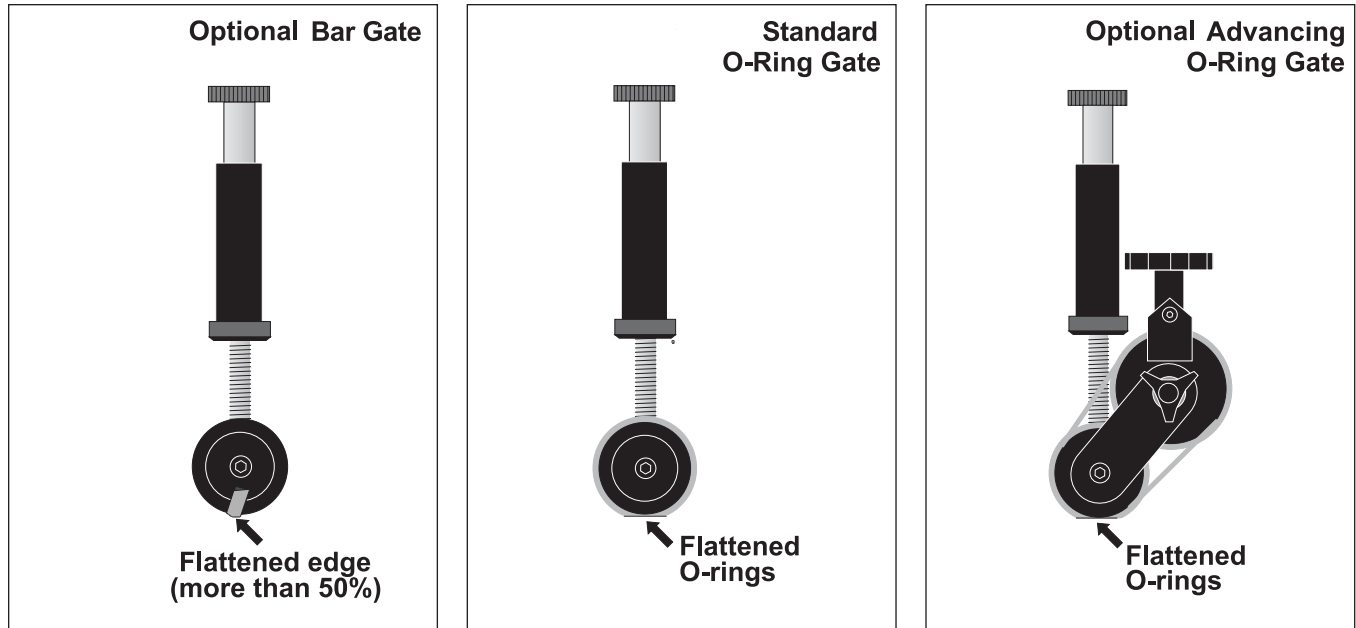
Visual Inspection (continued)

Checking for Gate Assembly Wear

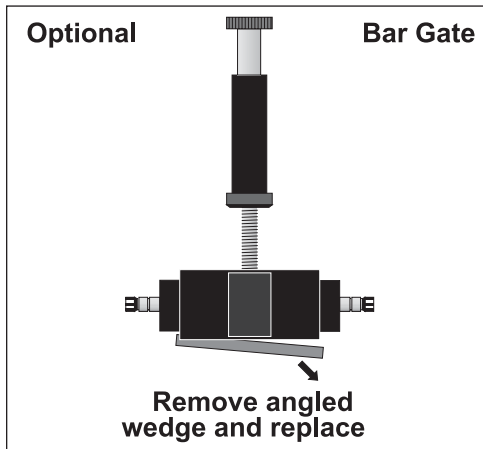
Check for visual signs of wear:

- Bar gate: Angled wedge begins to flatten excessively.
- Standard O-ring or advancing O-ring (if applicable): Flat areas along the O-rings.

See “Preventative Care” to follow.



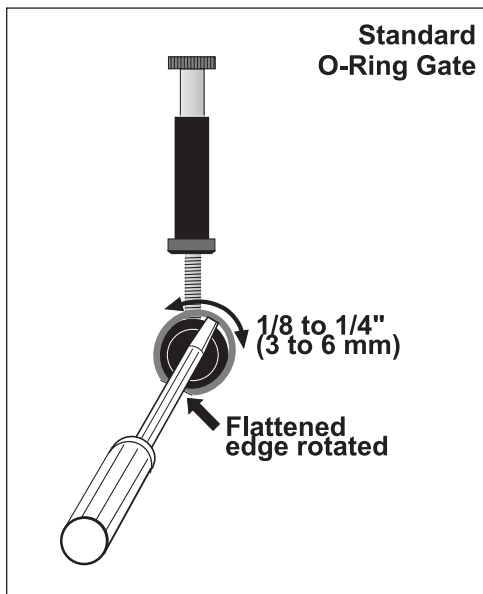
Visual Inspection (continued)



Replacing Worn Angled Wedge

To replace a worn angled wedge:

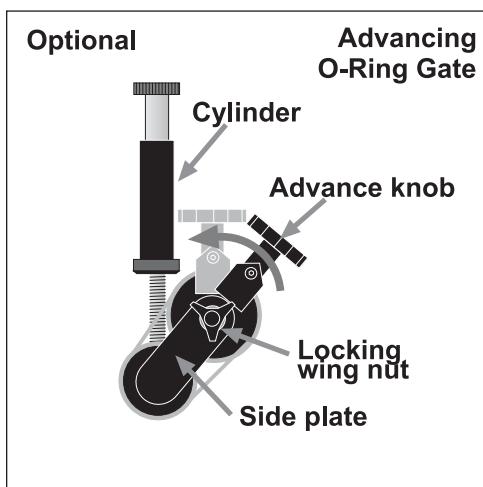
1. Turn Off feeder and remove power cord from outlet.
2. Remove gate assembly from gate plate.
3. Use a pliers to grip and remove angled wedge.
4. Install new wedge by inserting one end and then pushing in until centered. *Do not grip new wedge with pliers as this may cause damage to the edge.*
5. Reinstall gate assembly and restore power.



Standard O-Ring Gate: Adjusting Worn O-Rings

To adjust worn O-rings on standard O-ring gate:

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 counter-clockwise 360° so as to move worn area of O-ring about 1/8 to 1/4 in. (3 to 6 mm).
4. Remove screwdriver and repeat for each ring as necessary.
5. Reinstall gate assembly and restore power.



Advancing O-Ring Gate: Adjusting Worn O-Rings

To adjust worn O-rings on advancing O-ring gate:

1. Turn Off feeder and remove power cord from outlet.
2. Make sure advance knob is in-line with the side plate and secure. Then loosen left and right locking wing nuts.
3. Rotate O-rings by grasping advance knob and pushing towards gate cylinder about 1/8 to 1/4 in. (3 to 6 mm).
4. Retighten locking wing nuts. Then loosen advance knob and move to original position (in-line with side plate). Retighten.
5. Reinstall gate assembly and restore power.

Preventative Care

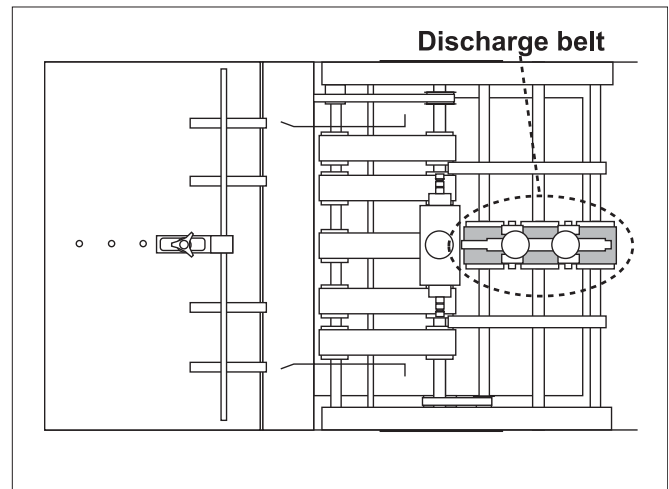
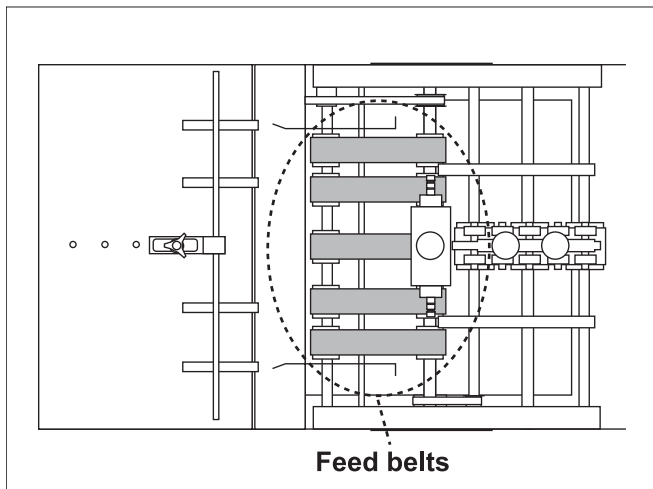


Use only isopropyl alcohol (98% concentration). Other solvents can cause belts to wear prematurely, and even total breakdown of material.

Cleaning Feed and Discharge Belts

To clean feed and discharge 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 discharge 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 also. 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. Repeat steps 3 – 5 for the discharge belt also.
7. Reinstall gate assembly and restore power.



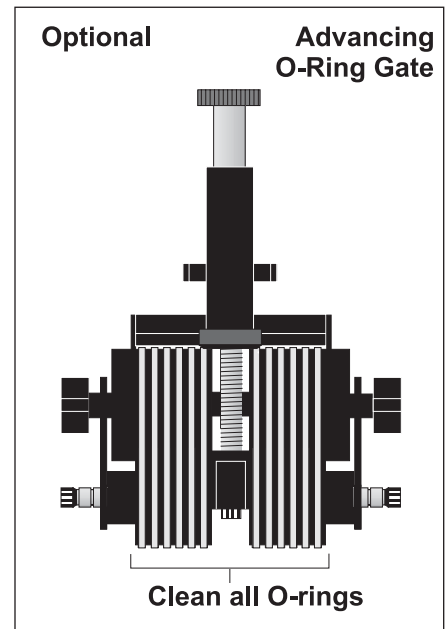
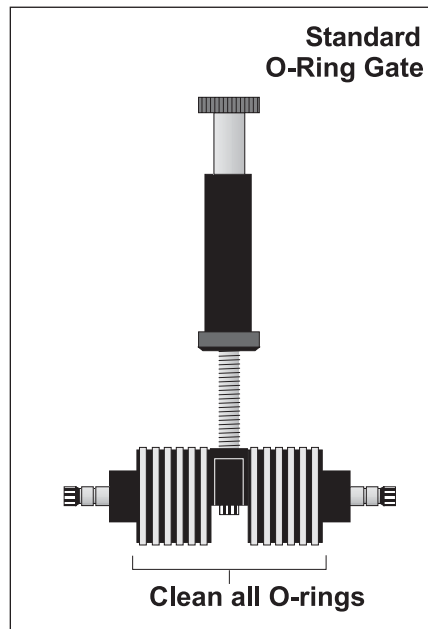
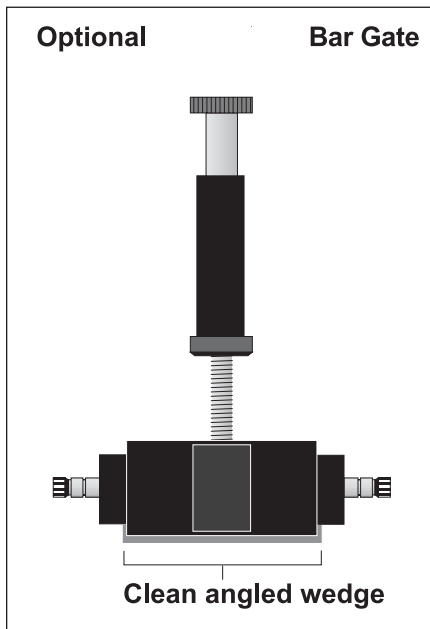
Preventative Care (continued)

Cleaning Gate Assembly

Use only isopropyl alcohol (minimum 98% concentration). Do not use any other types of solvents. They can 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 plate.
3. Apply a small amount of isopropyl alcohol to a soft cloth.
4. Wipe across angled wedge (or O-rings if applicable), first 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.





Turn off feeder and disconnect from main power source before cleaning. Do not attempt to open the access cover. 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.

Cleaning Controller Box

Visually check the fan ventilation area of the controller box for excessive dust or grime buildup that might inhibit air movement. For more information, consult with a qualified technician.

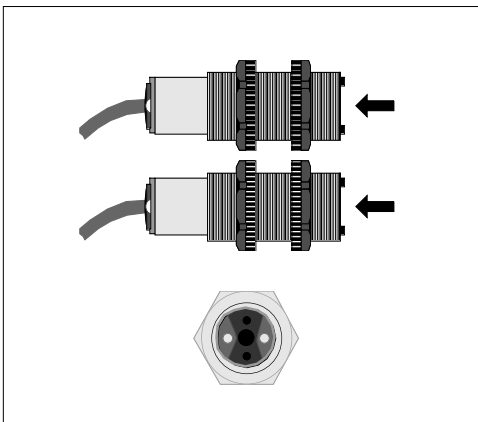


Do not use any solvents or cleaning agents when cleaning the photo sensor lenses. This can result in surface damage and eventual faulty performance.

Cleaning Photo Sensors

To clean the photo sensor lenses:

1. Turn Off feeder and remove power cord from outlet.
2. Using a soft, dry cloth, wipe across the face of each lens.
3. Recheck the adjustments of both photo sensors to make sure they are still in alignment to the targets.
4. Restore power.



6 Service and Maintenance Procedures

Emergency Stop Control

Emergency Stop (E-Stop) switches are intended for the safety of the machine operator in the event of an emergency. E-Stop switches should never be used as normal start/stop or power on/off switches.

Streamfeeder Universal Friction Feeders are almost always used as a component piece of equipment in a larger system. Streamfeeder does not include an E-Stop switch on our feeders because any E-Stop that is present must shut down the entire system, and not just the individual feeder.

It is important that you give consideration as to whether an E-Stop switch should be installed at the location where this feeder will be used. If you are not sure what is required, we recommend you check with local authorities, a competent engineering consulting firm, or a competent electrical contractor. On request, we will provide information on how to wire our feeder into your system E-Stop circuitry.

Remote Stop Input

IMPORTANT

THE REMOTE STOP SHOULD NOT BE USED AS AN EMERGENCY STOP.

The remote stop (R-Stop) input option allows the ST Series feeder to be connected to an external Run/Stop switch or host device relay contact. Removing power from this input module (#7) will cause the feeder to stop regardless of the product's position.

Menu configuration for the R-stop input allows the R-stop hardware input to be enabled or disabled. In addition, it allows you to specify whether or not operator intervention should occur after the R-stop signal clears. Refer to Configuring the System Menus for complete details. Connections to the 14-pin I/O connector will be made via the 8-foot cable included with this option.

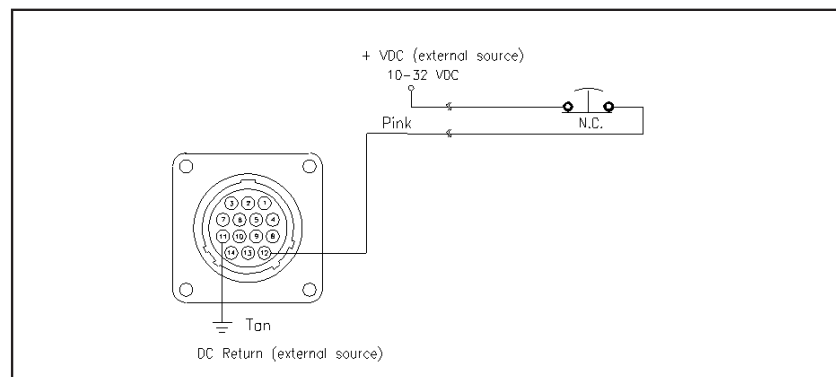
Wiring to External Switch or Relay Contacts; Power Supplied by Host System

There are two ways the R-stop input can be wired when the host device and not the feeder supplies power.

NOTE

This option requires software version 1.05 or greater.

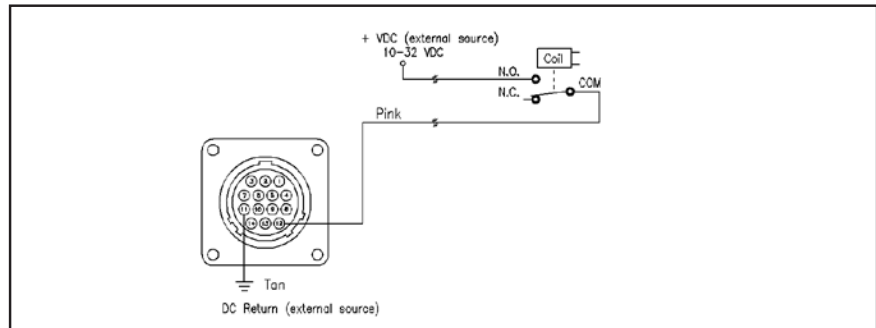
A maintained button/switch with a normally closed contact is used to switch power (10-32 VDC) to the internal input module. When power is removed (switch contact open) the feeder will stop feeding.



External Switch

Remote Stop Input (continued)

A relay contact or solid state relay with normally open contacts is used to switch power (10-32 VDC) to the internal input module. When power is removed (relay contact open) the feeder will stop feeding. Power must be applied to the host relay coil for the feeder to run.

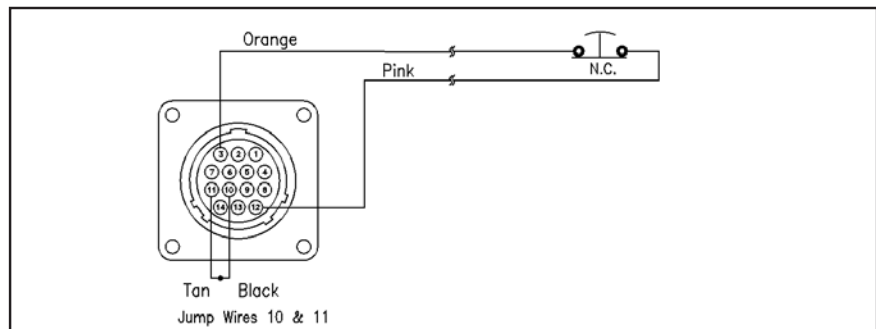


Relay Contacts

Wiring to External Switch or Relay Contacts; Power Supplied by Feeder

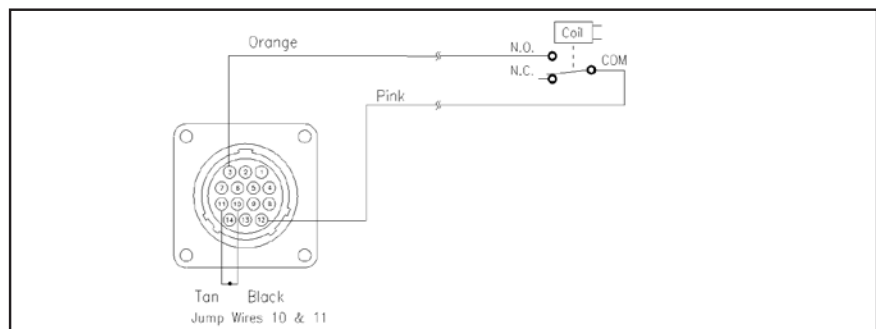
There are two ways the R-stop input can be wired when the feeder and not the host device supplies (12 VDC) power.

A maintained button/switch with a normally closed contact is used to switch 12 VDC to the internal input module. When power is removed (switch contact open) the feeder will stop feeding.



External Switch

A relay contact or solid state relay with open contacts is used to switch 12 VDC to the internal input module. When power is removed (relay contact open) the feeder will stop feeding. Power must be applied to the host relay coil for the feeder to run.



Relay Contacts

EPROM Replacement

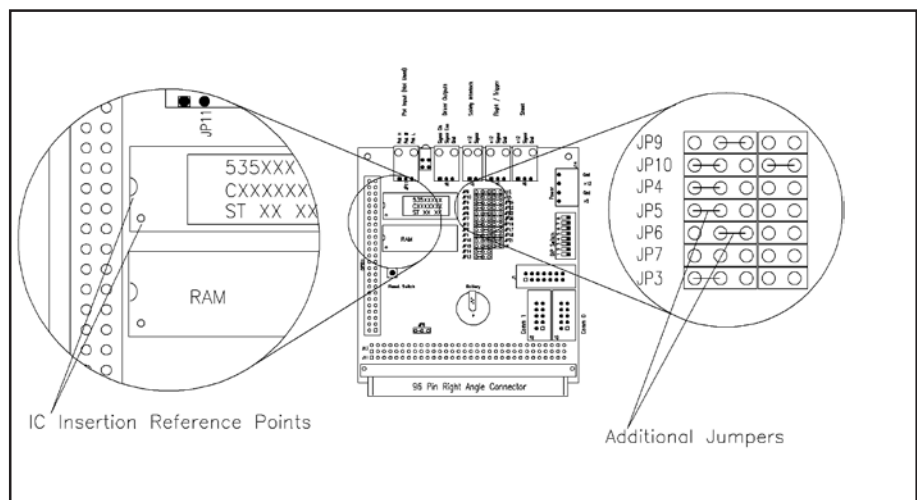


A qualified service technician should perform the changes listed in this document. Always disconnect the AC inlet power cord before performing any service activity.

Installation

To install or replace a programmed EPROM on the CPU/control board, refer to and carefully follow these steps:

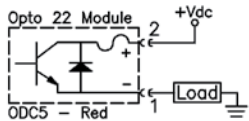
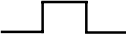
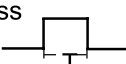
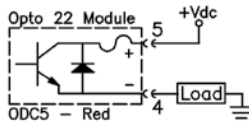

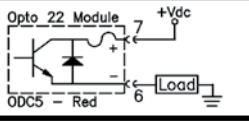

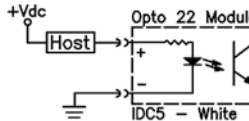

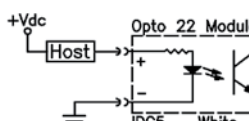
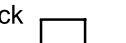
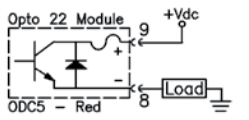
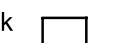
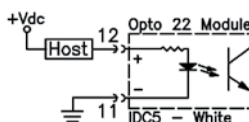
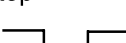
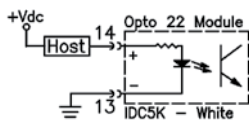
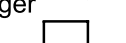
1. Always discharge yourself before handling any electronic component (CPU board or EPROM).
2. When replacing the CPU board, always verify the jumper settings on the new board match the settings on the old board.
3. When removing the EPROM from the socket, be very careful not to bend any pins on the IC.
4. When inserting the EPROM:
 - a. Verify the orientation, the notch should be on the side closest to the 50-pin ribbon cable connection.
 - b. Ensure all the pins on the EPROM are in the socket before applying pressure to completely seat the IC.
5. Confirm the additional jumpers on JP5 and JP6 have been installed.
Note: JP5 and JP6 may have been factory installed.



EPROM Location on CPU Board

7 I/O Options

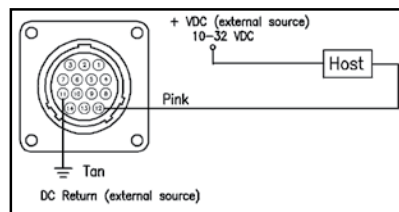
Quick-Look Reference Guide - Sourcing

MODULE	ELECTRICAL	SIGNAL	DESCRIPTION
# 1 Double/Miss Output (Standard)		Double  Miss 	This output is asserted if there is a signal present at the Double input. Miss is asserted anytime there are two consecutive flight/trigger signals before the cycle has finished. Double and Miss are menu selectable. Miss has an adjustable time period of 20 - 999ms.
# 2 Busy/Done Output (Optional)		Busy/ Done 	Busy: This output is asserted while the motor is running. Done: This output is asserted when a batch is done feeding.
# 3 Ready Output (Standard)		Ready 	This output is asserted anytime the feeder is ready to be triggered.
# 4 Double Input (Optional)		Double 	This input is provided with the Double option and is monitored for the indication that a double has occurred. This function is wired internally and has a minimum time period of >50ms.
# 5 Low Stack Input (Optional)		Low Stack 	This input is provided with the Low Stack option and is used to monitor the Low Stack sensor. This function is wired internally and has a minimum time period of >50ms.
# 6 Low Stack Output (Optional)		Low Stack 	This output is provided with the Low Stack option and asserted when the Low Stack input is asserted.
# 7 R-Stop Input (Optional)		R-Stop 	This input is used to stop the feeder anytime this input is not asserted. The feeder will continue from the same location prior to the deactivation of this input. This input has a minimum time period of >50ms.
# 8 External Trigger Input (Standard)		Ext Trigger 	This input is used to trigger the feed cycle, is edge triggered, and inverted by the input module. This input has a minimum time period of >50ms.

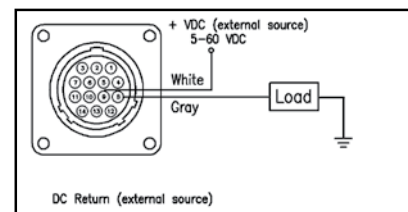


A qualified service technician should perform the electrical integration of this equipment to the host machinery. Always disconnect the AC inlet power cord before performing any service activity.

External Wiring Reference Diagrams



Sourcing Input

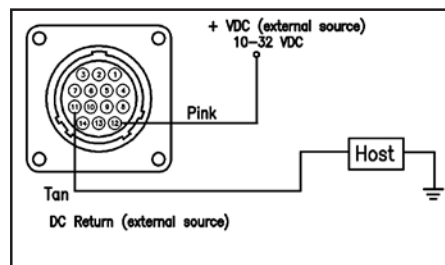


Sourcing Output

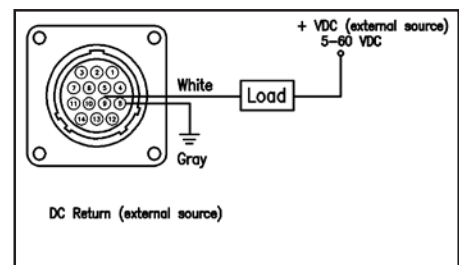
Quick-Look Reference Guide - Sinking

Module	Electrical	Signal	Description
# 1 Double/Miss Output (Standard)		Double Miss	This output is asserted if there is a signal present at the Double input. Miss is asserted anytime there are two consecutive flight/trigger signals before the cycle has finished. Double and Miss are menu selectable. Miss has an adjustable time period of 20 - 999ms.
# 2 Busy/Done Output (Optional)		Busy/ Done	Busy: This output is asserted while the motor is running. Done: This output is asserted when a batch is done feeding.
# 3 Ready Output (Standard)		Ready	This output is asserted anytime the feeder is ready to be triggered.
# 4 Double Input (Optional)		Double	This input is provided with the Double option, and is monitored for the indication that a double has occurred. This function is wired internally and has a minimum time period of >50ms.
# 5 Low Stack Input (Optional)		Low Stack	This input is provided with the Low Stack option and is used to monitor the Low Stack sensor. This function is wired internally and has a minimum time period of >50ms.
# 6 Low Stack Output (Optional)		Low Stack	This output is provided with the Low Stack option and asserted when the Low Stack input is asserted.
# 7 R-Stop Input (Optional)		R-Stop	This input is used to stop the feeder anytime this input is not asserted. The feeder will continue from the same location prior to the deactivation of this input. This input has a minimum time period of >50ms.
# 8 External Trigger Input (Standard)		Ext Trigger	This input is used to trigger the feed cycle, is edge triggered, and inverted by the input module. This input has a minimum time period of >50ms.

External Wiring Reference Diagrams

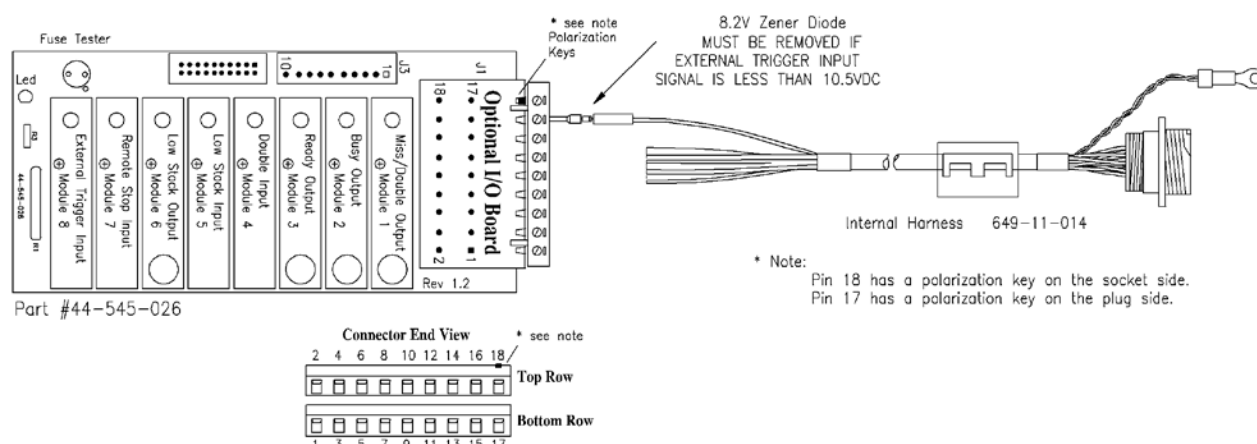


Sinking Input



Sinking Output

Relay Rack and Module Reference Diagrams



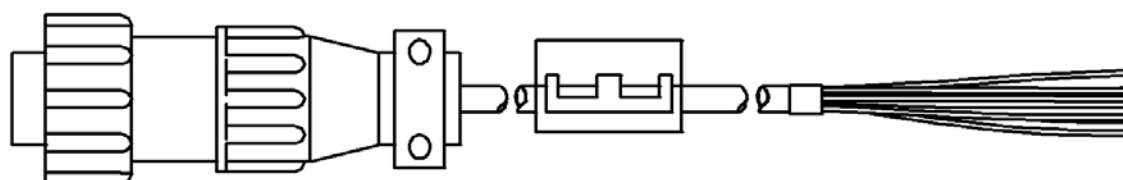
Reference Diagrams

I/O Cable Wiring

External I/O Cable Wiring

Pin #	Wire Color	Function	Module #	Module Type
1	Brown	Miss/Double Output (-)	1	ODC5
2	Red	Miss/Double Output (+)		5-60VDC
3	Orange	+12 VDC Supply (150ma. max) -		
4	Yellow	Busy Output (-)	2	ODC5
5	Green	Busy Output (+)		5-60VDC
6	Blue	Ready Output (-)	3	ODC5
7	Violet	Ready Output (+)		5-60VDC
8	Gray	Low Stack Output (-)	6	ODC5
9	White	Low Stack Output (+)		5-60VDC
10	Black & Shield	DC Supply Ground	-	
11	Tan	Remote Stop Input (-)	7	IDC5
12	Pink	Remote Input (+)		10-32VDC
13	Red / Yellow	External Trigger Input (-)	8	IDC5K
14	Red / Green	External Trigger Input (+)		12-24VDC

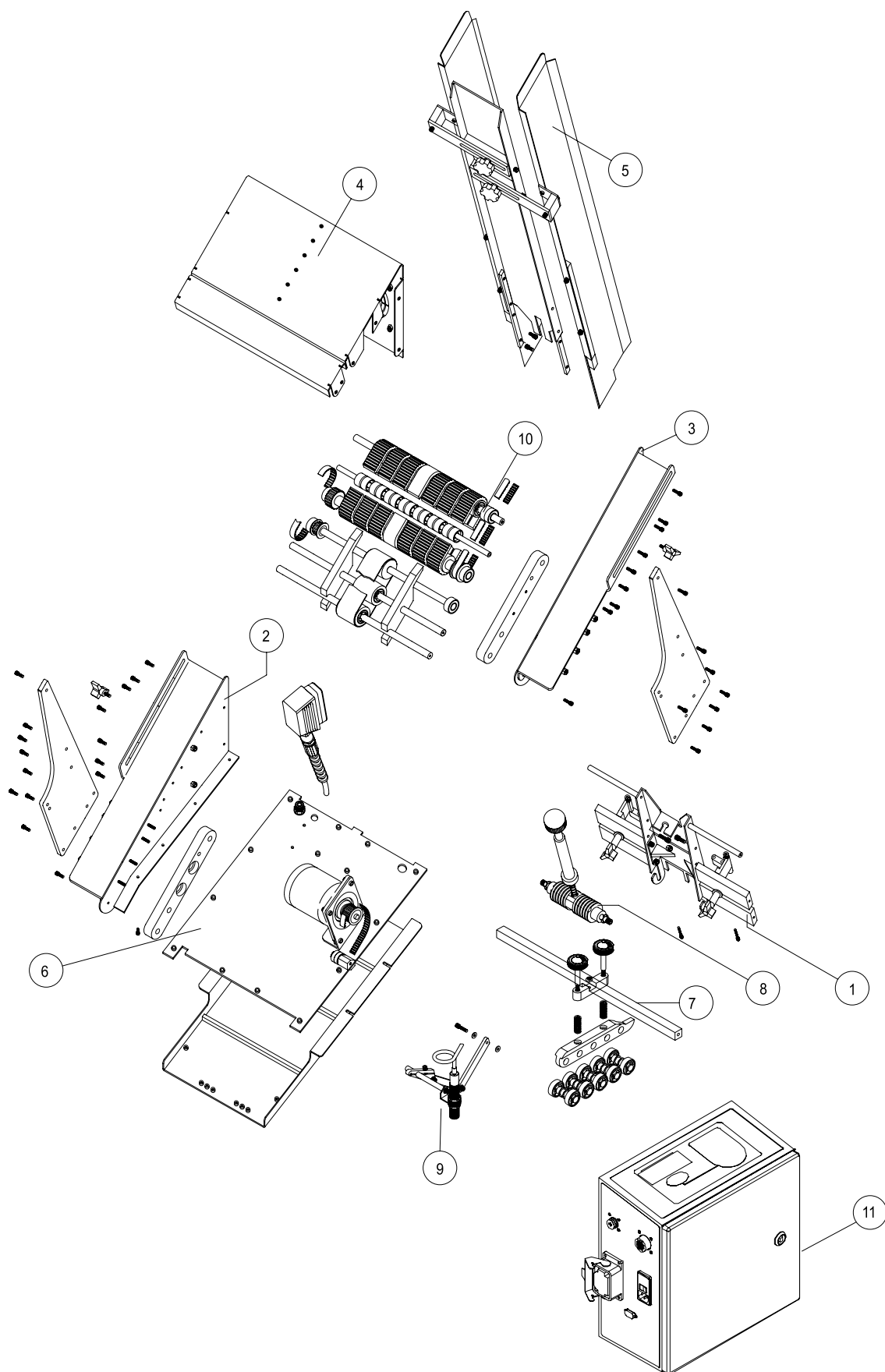
- **Bolded Modules** are included as part of the standard package.
- **Pins 3 and 10** are provided as a low current source for biasing input modules.
- Fuse Tester is used to test the continuity of an output module fuse. If the LED illuminates, the fuse is GOOD.

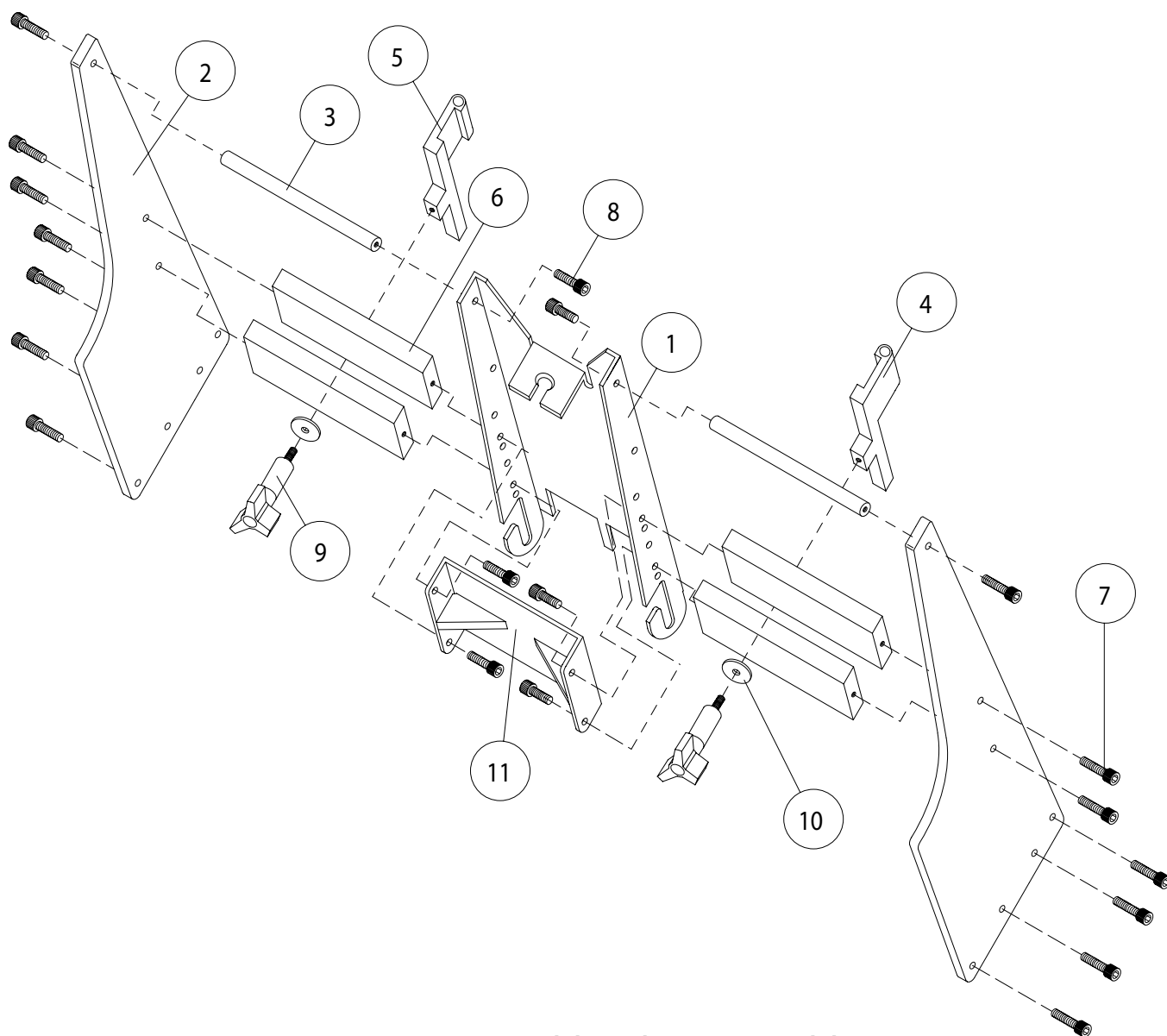


External I/O Cable 649-11-012

8 Mechanical Components

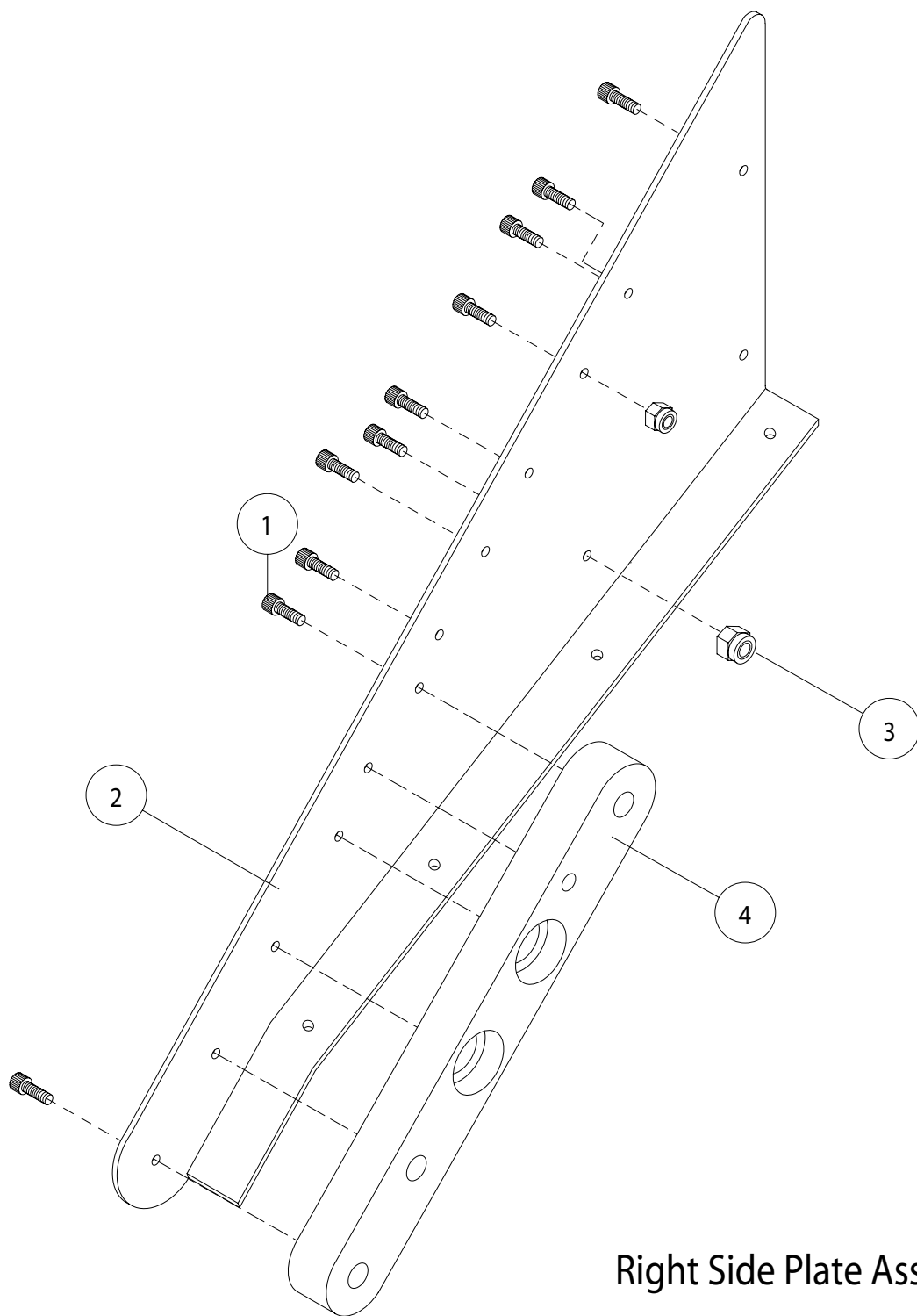
Item #	Description
1	Gate Holder Plate Assembly
2	Right Side Plate Assembly
3	Left Side Plate Assembly
4	Table Top Assembly
5	Tall Insert Guide Assembly
6	Base Plate Assembly
7	Hold Down Assembly
8	Gate Cylinder Assembly
9	Sheet Sensor Assembly
10	Grooved Gum Carriage Assembly
11	I-Quipped Box





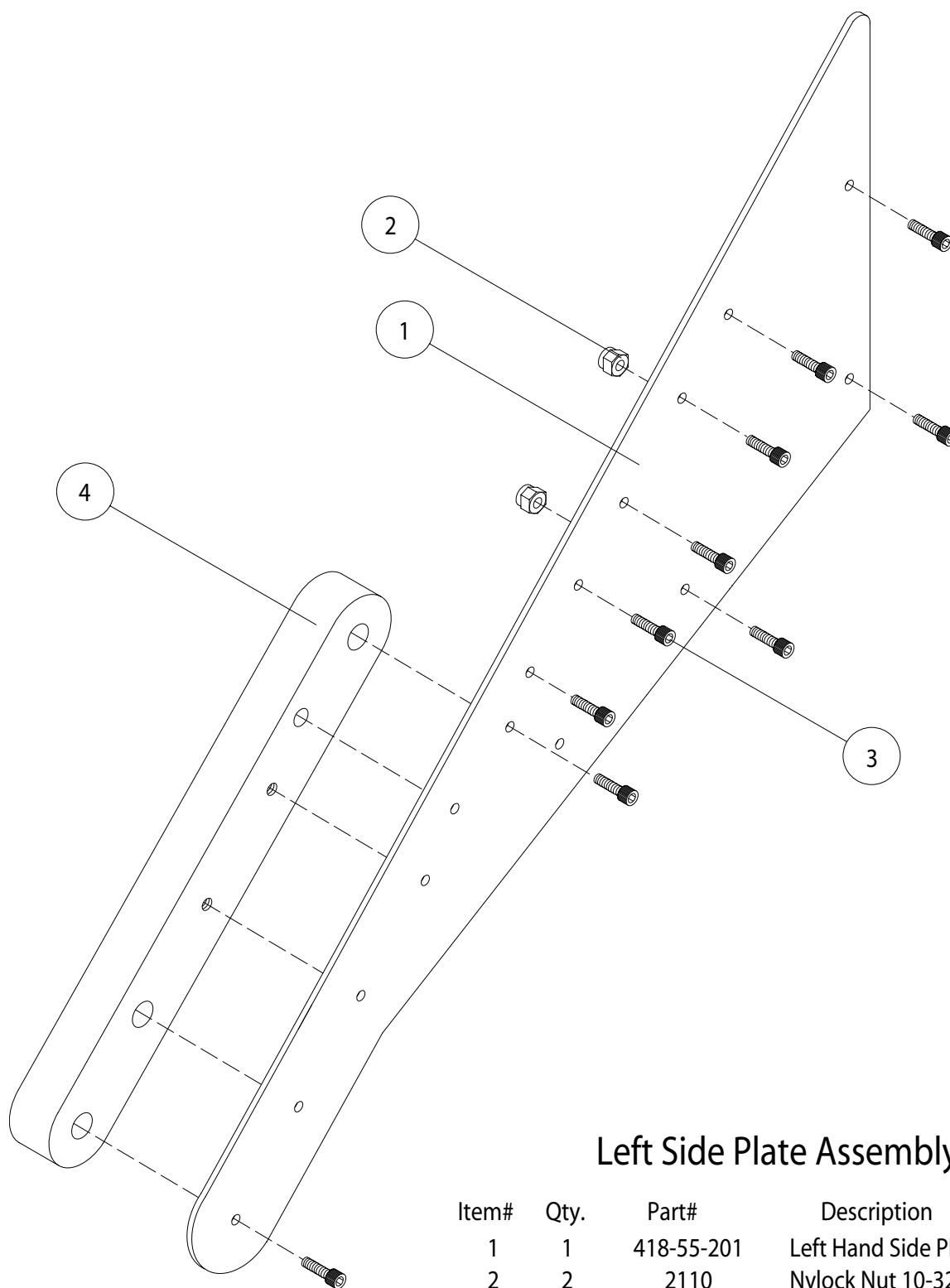
Gate Holder Plate Assembly

Item#	Qty.	Part#	Description
1	1	235-00-001	Gate Holder Plate
2	2	418-55-017	Insert Guide Stabilizing Bracket
3	2	418-55-010	Gate Support Shaft
4	1	418-55-014	Left Hand Side Guide Bracket
5	1	418-55-013	Right Hand Side Guide Bracket
6	4	418-55-016	Gate Support Bar
7	14	2315	SHCS 10-32 x 1/2"
8	6	2310	SHCS 10-32 x 3/8"
9	2	335-11-092	Medium Knob w/Extension
10	2	418-55-015	Oversized Washer
11	1	418-55-012	Back Up Plate



Right Side Plate Assembly

Item#	Qty.	Part#	Description
1	10	2310	SHCS 10-32 x 3/8"
2	1	418-55-200	Right Hand Side Plate
3	2	2110	Nylock Nut 10-32
4	1	235-60-202	Carriage Holder



Left Side Plate Assembly

Item#	Qty.	Part#	Description
1	1	418-55-201	Left Hand Side Plate
2	2	2110	Nylock Nut 10-32
3	10	2310	SHCS 10-32 x 3/8"
4	1	235-60-203	Carriage Holder

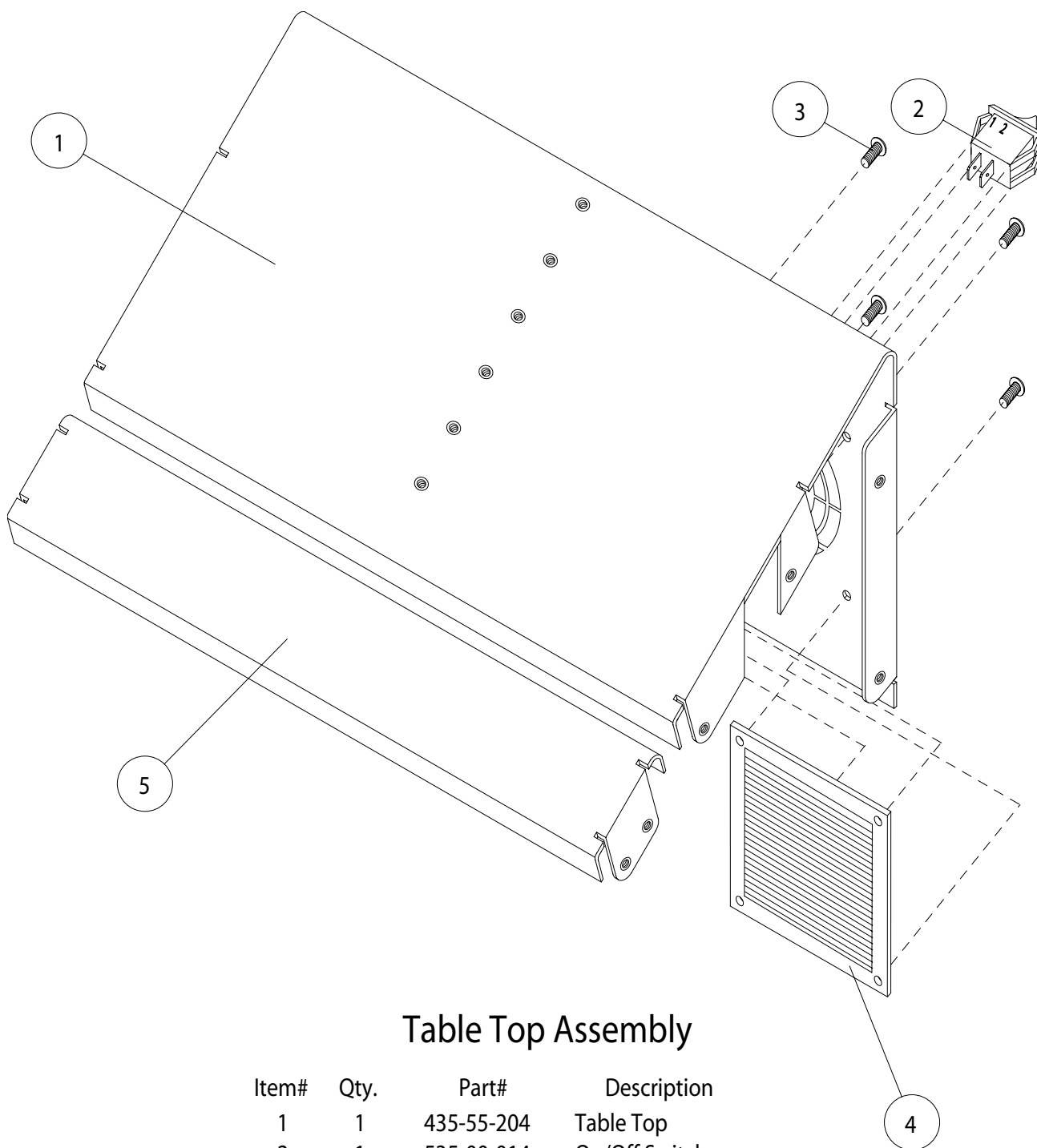
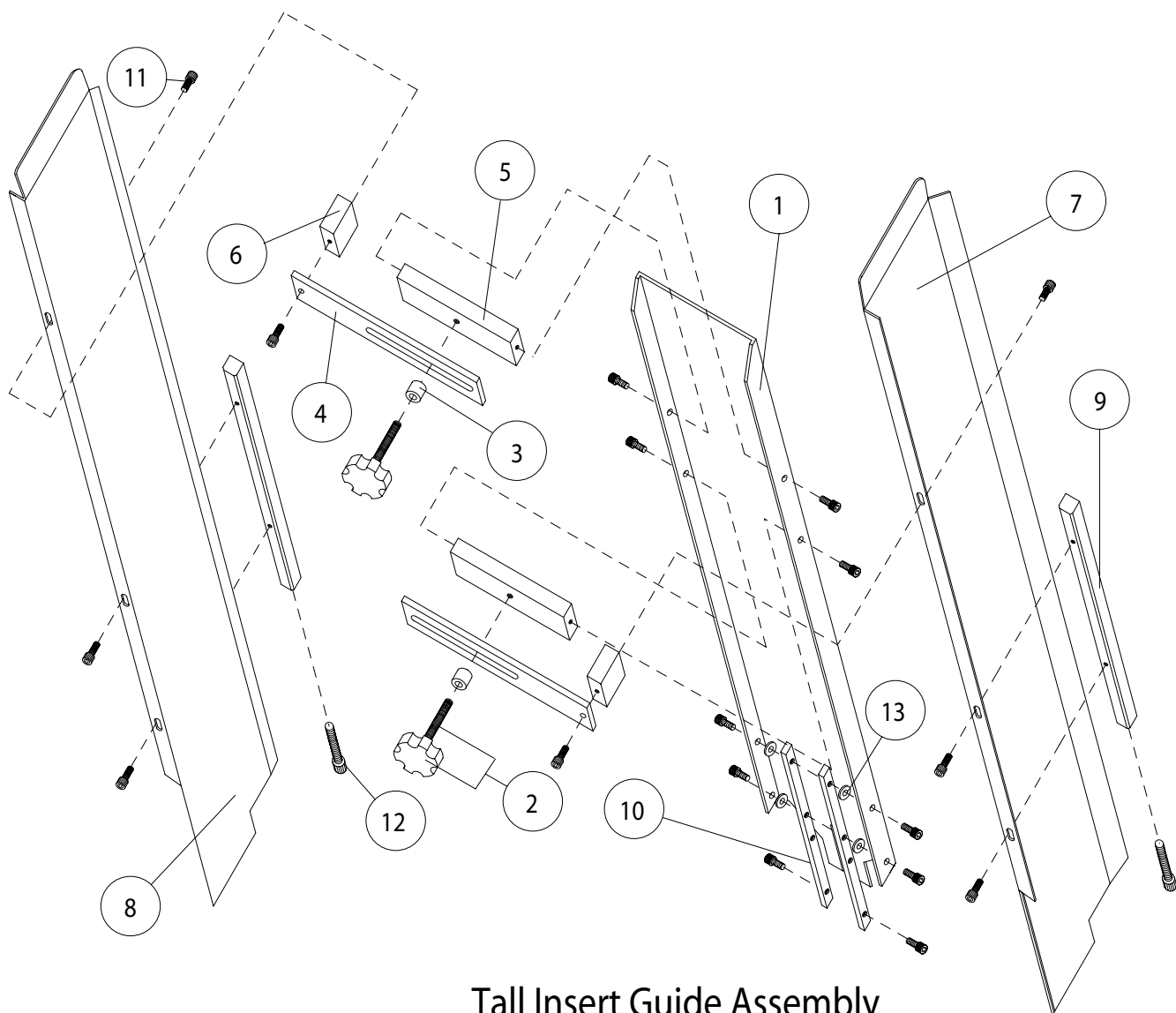


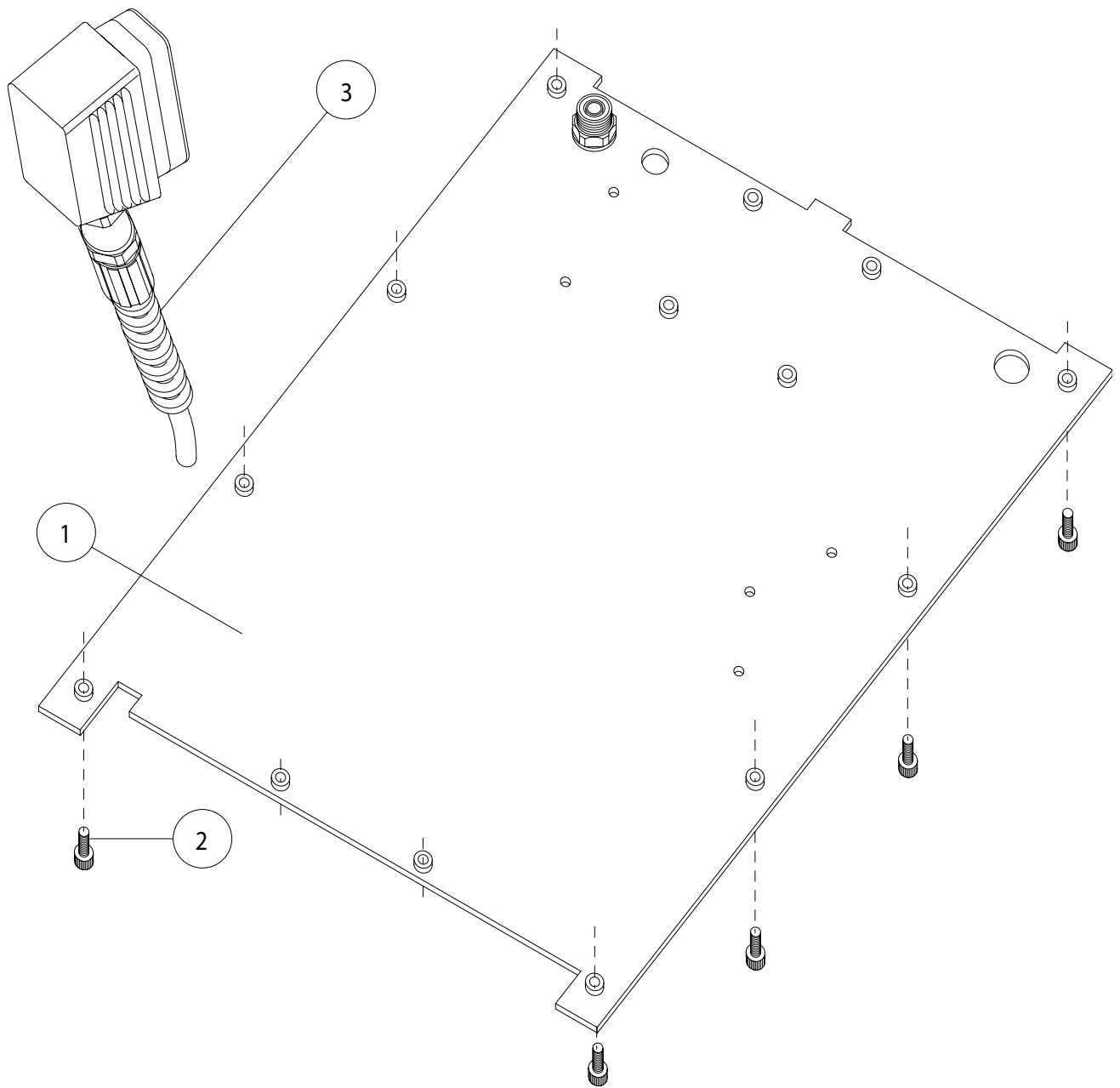
Table Top Assembly

Item#	Qty.	Part#	Description
1	1	435-55-204	Table Top
2	1	535-00-014	On/Off Switch
3	4	2305	BHCS 10-32 x 3/8"
4	1	535-00-105	Filter Screen
5	1	435-55-203	Timing Belt Access Cover
NS	1	235-00-064	USA Label
NS	1	235-00-066	Nameplate
NS	4	1101	Blind Rivet
NS	1	535-00-023	Legend "Power"
NS	Items Not Shown On Drawing		



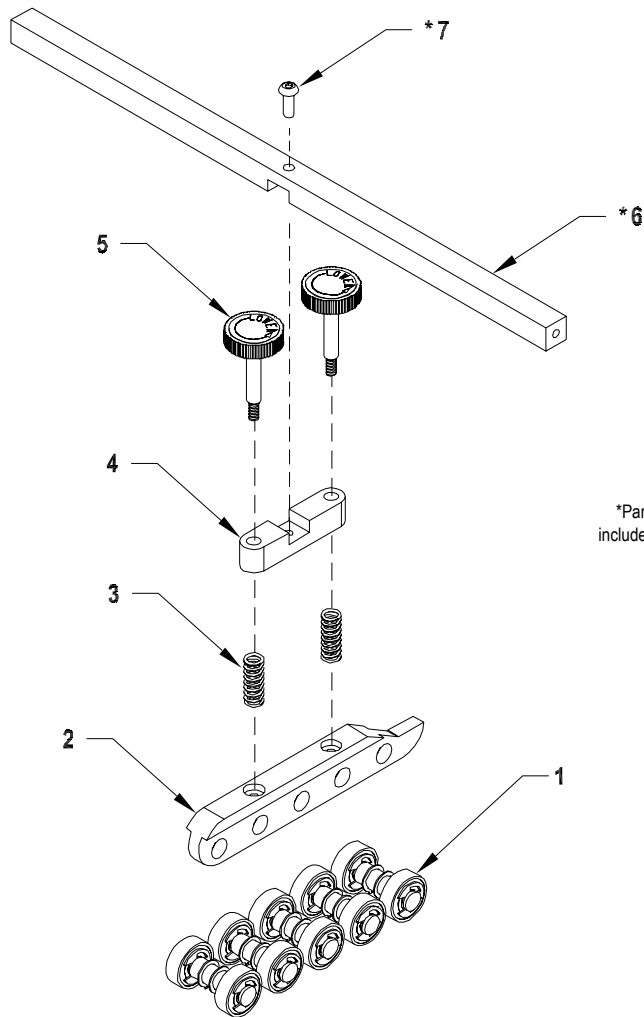
Tall Insert Guide Assembly

Item#	Qty.	Part#	Description
1	1	235-00-006	Tall Insert Guide
2	2	235-00-093	Large Thumb Screw
	2	2390	SHCS 1/4-20 x 1"
3	2	335-00-018	Sensor Extension Spacer
4	2	435-00-150	Adjusting Stabilizer Bracket
5	2	435-00-151	Center Stabilizer Mounting Bracket
6	2	435-00-152	Stabilizer Side Guide Spacer
7	1	435-60-208	Left Side Guide Extension
8	1	435-60-209	Right Side Guide Extension
9	2	435-00-157	Right/Left Side Guide Mounting Bracket
10	2	235-00-024	Tall Mounting Strap
11	18	2310	SHCS 10-32 x 3/8"
12	2	2396	SHCS 1/4-20 x 1-1/2"
13	4	2607	Flat Washer #10



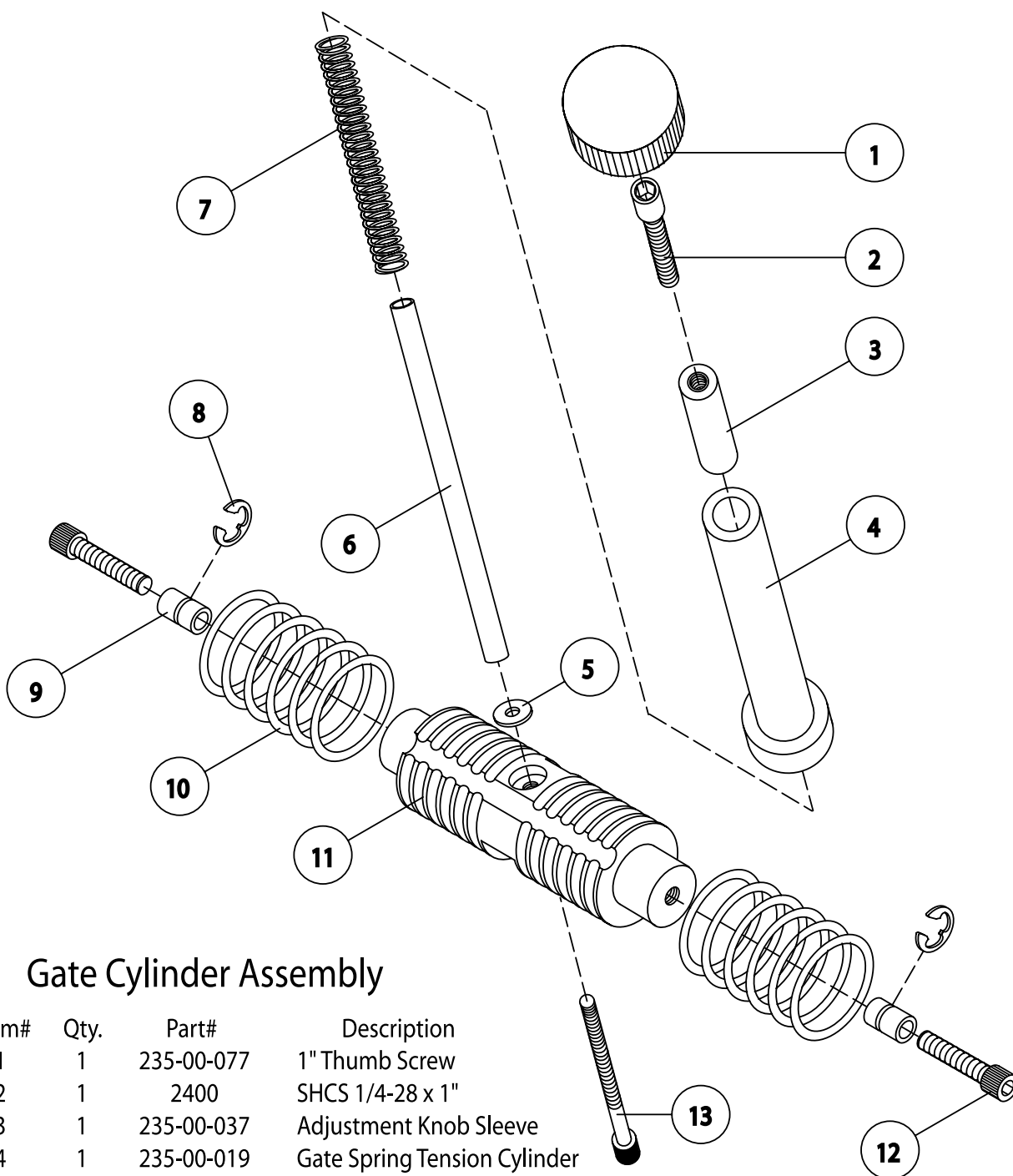
Base Plate Assembly

Item#	Qty.	Part#	Description
1	1	435-50-007	Base Plate
2	8	2310	SHCS 10-32 x 3/8"
3	1	535-11-005	2 Meter Power Cord



5 AXLE HOLD DOWN ASSEMBLY #43511310

DIAGRAM NUMBER	QTY	DESCRIPTION	PART NUMBER
1	5	Bearing Holder Shaft	43560008
	10	Bearing Ball R6	23500095
	10	Ring Grip 3/8 Waldes	00001110
	20	Clip E 3/8 Waldes	00001150
2	1	Holder Bearing 5 Axle	43560310
3	2	Spring Compression	23560083
4	1	Bar Hold Down Adjustment	23560086
5	2	Screw Cross Bar Hold Down Adjustment	23560087
	2	Hold Down Knob 1	23560077
	2	Grommet Rubber	00001130
	2	Label Gate Adjustment Knob	23500084
6*	1	Cross Support Bar	41855223
7*	1	BHCS 10-32 x 1/2" LG	00002334

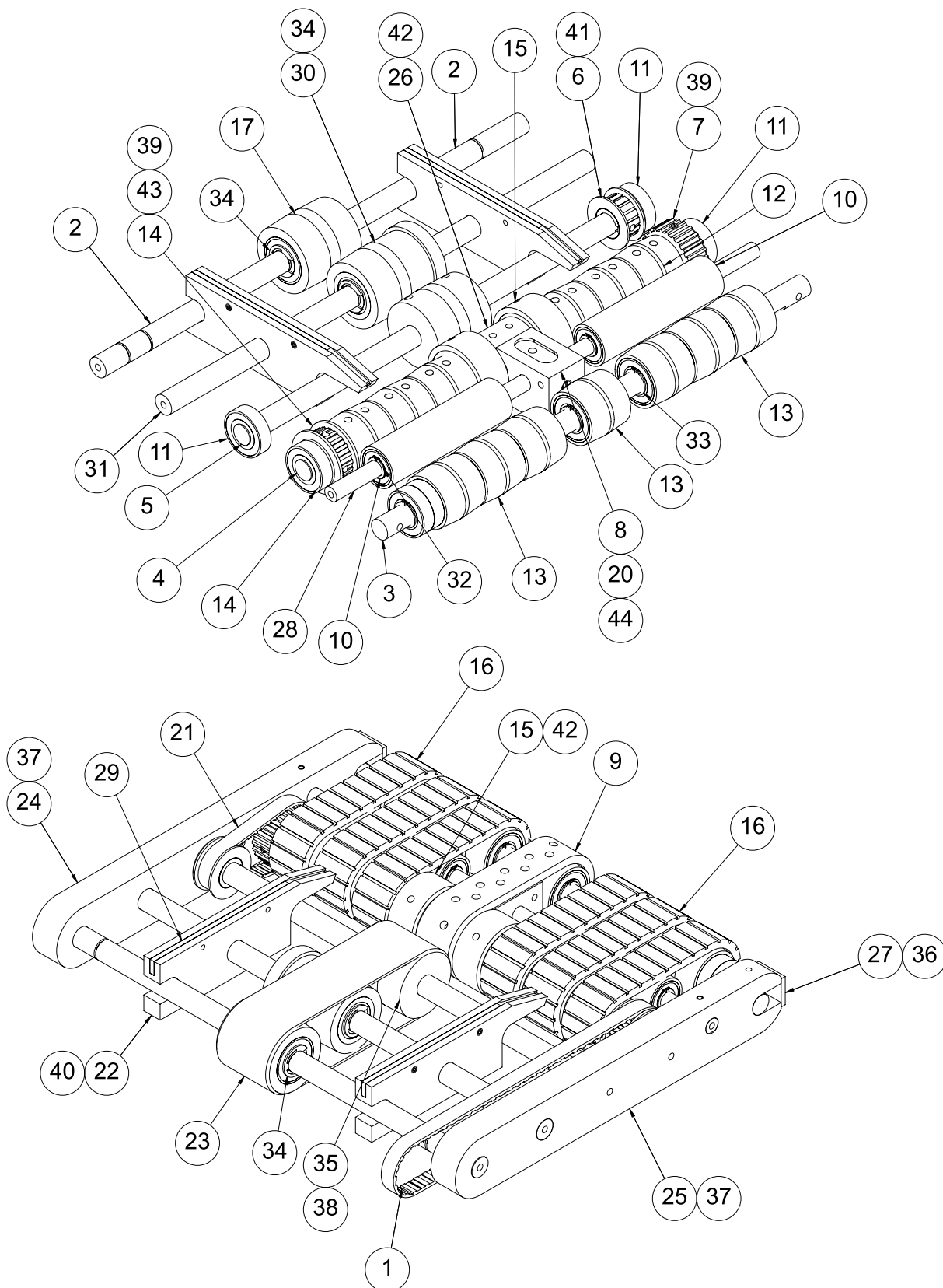


Gate Cylinder Assembly

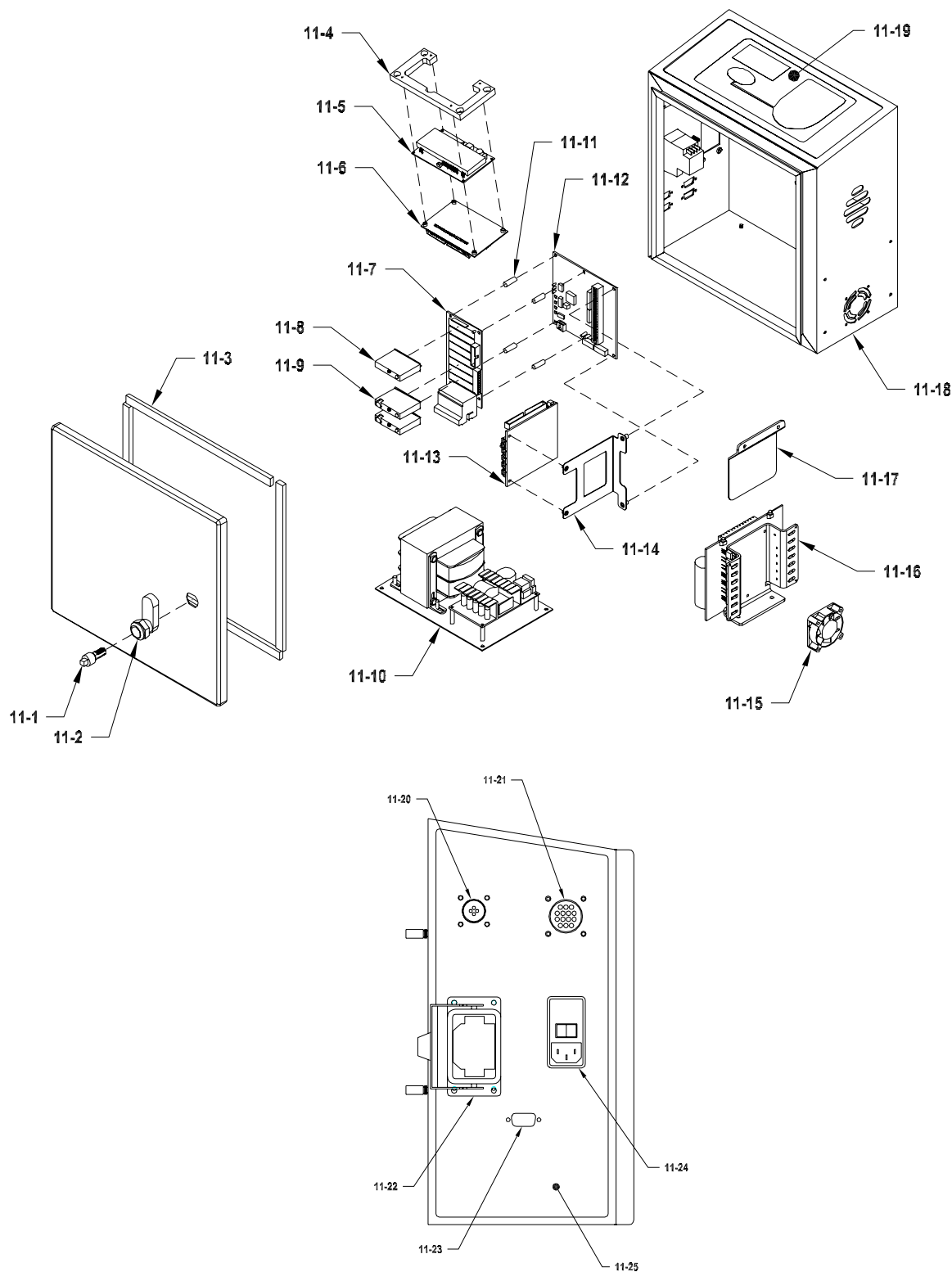
Item#	Qty.	Part#	Description
1	1	235-00-077	1" Thumb Screw
2	1	2400	SHCS 1/4-28 x 1"
3	1	235-00-037	Adjustment Knob Sleeve
4	1	235-00-019	Gate Spring Tension Cylinder
5	1	2607	Flat Washer #10
6	1	235-60-084	EJ Gate Lift Shaft
7	1	235-00-083	Gate Compression Spring
8	2	1150	"E" Clip 3/8"
9	2	235-00-082	Spacer 1/2"
10	12	235-00-104	Gate Cylinder O-Ring
11	1	235-60-300	EJ Gate Cylinder
12	2	2390	SHCS 1/4-20 x 1"
13	1	2336	SHCS 10-32 x 1-1/2"

GROOVED GUM RUBBER BELT CARRIAGE ASSEMBLY #43533485

<u>ITEM</u>	<u>QTY</u>	<u>NAME</u>
1	1	43500096 DRIVE BELT 170 X L037
2	1	43555047 IDLER SHAFT
3	1	43555147 IDLER SHAFT
4	1	43555205 3-4 IN DRIVE SHAFT
5	1	43555211 DRIVE SHAFT
6	1	43560097 PULLEY 16T
7	1	43560098 PULLEY 24T
8	1	44485001 MANIFOLD
9	1	44485003 VACUUM BELT
10	2	23511270 BELT SUPPORT ROLLER
11	8	23500094 BEARING R8-2RS
12	6	23560208 CROWN DRV ROLLER
13	7	33511028 CROWN DRIVEN ROLLER WITH BEARINGS
14	1	23500097 PULLEY 20T
15	2	23500126 FEED ROLLER
16	6	23500162 BELT TRACTOR
17	1	23511105 CROWN PUL CUP WBEAR
18	1	51476005 BULK HEAD UNION
19	1	51476006 UNEQUAL UNION ELBOW
20	1	51476007 MALE ELBOW
21	1	23560078 TIMING BELT
22	2	23560082 MAT SUPPORT SIDE RAIL
23	1	23560088 CLEAR BELT
24	1	23560202 RS CARR HOLD
25	1	23560203 LS CARR HOLD
26	1	23560206 FLAT DRIVE ROLLER
27	2	44485004 VACUUM BELT TENSION PLATE
28	1	44841056 VAC CARRIAGE SHAFT
29	2	44970006 SLIDE
30	1	51277068 ROLLER DOUBLE DETECT CARRIAGE
31	1	51438009 SHAFT IDLE DISCHARGE 1450
32	4	1110 G RING 3_8
33	11	1115 G RING 1_2
34	4	1155 E CLIP 1_2
35	1	23560106 CROWN PULLEY W_SS
36	2	2320 S 10-32 5_8
37	2	3316 SS 6-32 X 1-4
38	2	2327 SS 1_4-20 1_2
39	3	2217 SS 10-32 5_16
40	4	2203 S 8-32 1_4
41	2	3352 SS 10-32 1_8
42	16	2216 SS 10-32 1_4
43	1	3351 1-8 X 3-8 WOODRUFF KEY
44	1	2228 F 6-32 3_4



EQUIPPED BOX WITH I/O ASSEMBLY #68311050



**IQUIPPED BOX WITH I/O
ASSEMBLY #68311050**

<u>DIAGRAM NUMBER</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>PART NUMBER</u>
11-1	1	Insert 7mm Square	44683022
11-2	1	Cam Latch Lock	44683021
11-3	44"	Gasket	44683028
11-4	1	Bracket Display Mounting	44683002
11-5	1	Display VFD w/Connector Header Pin	53511605
11-6	1	Board Keypad Decoder	53500605
*11-7	1	Board Relay I/O	44545026
*11-8	1	Relay Module DC Input 2.5-16VDC Hi Speed	44649115
*11-9	2	Relay Module DC Output 5-60 VDC 3A	44649112
11-10	1	Power Pack Transformer/DC Supply Assy IQ	68311002
or	1	ASSY, POWER PACK	311-0637
*11-11	4	Spacer Standoff .75 X .25 Round Nylon	44675045
*11-12	1	Board Motherboard w/o Options	44649055
11-13	1	Board CPU w/ 96-Pin Connector	44649014
*9-14	1	Bracket Stabilizing PCB	44649125
11-15	1	Fan Assembly ST Box	68311008
11-16	1	Board Stepper Drive BLD 72-2	53500467
11-17	1	Plate Deflector	44683003
11-18	1	Box IQuipped Control (Door Included)	44683001
11-19	1	Keypad ST Series IQuipped	44683005

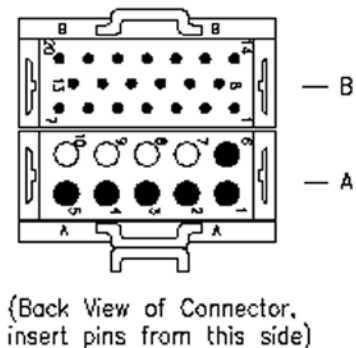
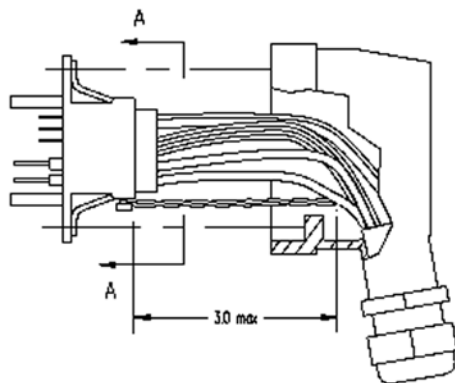
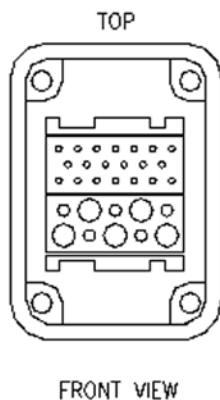
IQUIPPED BOX WITH I/O (continued)
ASSEMBLY #68311050

DIAGRAM NUMBER	QTY	DESCRIPTION	PART NUMBER
11-20	1	Harness Flight Trigger	64911005
11-21*	1	Harness I/O Internal 14 Pin	64911014
11-22	1	Harness Receptacle Interconnect IQ Box	68311009
11-23	1	Cable Communication DB9 Female IQ Box	44683027
	2	Jackscrew 4-40 Male-Female	
11-24	1	Module AC Power Entry (w/o Fuses)	44649034
11-25*	1	Graphic Overlay With I/O	44683029
NS	16	Cable Tie Wrap	435SO263
NS	2	U-Bolt Square Bend 3-3/8	44360051
NS	1	Cable Ribbon Display	44649022
NS	1	Plate Mounting IQuipped Box	44683006
NS	2	Retainer Mounting IQuipped Box	44683007
NS	1	Key 7mm Square	44683023
NS	2	Fuse 3A 250V Slo-Blo GMD 5 X 20mm	53500006
NS	2	Terminal Ring	53500046
NS	11	Wire MTW 18 Ga Stranded Green/Yellow St	53500057
NS	1	Eprom	63511001
NS	1	Cable Ground Wire Assembly	63011007
NS	1	Harness Power Supply DC Outputs	64911006
NS	1	Harness Drive Control	64911007
NS	1*	Cable Ribbon Relay I/O	44649007
NS	1*	Cable External Systems 14 Pin	64911012

*Denotes feature associated with I/O assembly #68311014.

Connector End (from)	AWG	Color	Break-Out Board No. (to) Label Wires at This End	Signal
Pin B1	22	BRN	Label "9"	DC Ground
Pin B2	22	RED	Label "10"	DC Ground
Pin B3	22	ORG	Label "11"	+12V DC
Pin B4	22	YEL	Label "12"	+12V DC
Pin B5	22	GRN	Label "13"	Sheet Signal
Pin B6	22	BLU	Label "14"	Inverted Sheet --*
Pin B7	22	VIO	Label "15"	Low Stack Signal
Pin B8	22	GRY	Label "16"	Safety Interlock
Pin B9	22	WHT	Label "17"	Double Detect Signal
Pin B10	22	BLK	Label "18"	D-Detect Signal Inverted --*
Pin B11	22	BRN/WHT	Label "19"	Tower Lamp--N.C.--*
Pin B12	22	RED/WHT	Label "20"	Tower Lamp --Red
Pin B13	22	ORG/WHT	Label "21"	Tower Lamp--Amber
Pin B14	22	YEL/WHT	Label "22"	Tower Lamp--Green
Pin B15	22	GRN/WHT	Label "23"	Spare 1--*
Pin B16	22	BLU/WHT	Label "24"	Spare 2--*
Pin B17	22	VIO/WHT	Label "25"	Spare 3--*
Pin B18	22	GRY/WHT	Label "26"	Spare 4--*
Pin B19	22	WHT/BLK	Label "27"	Spare 5--*
Pin B20	22	BLK/WHT	Label "28"	Spare 6--*
Pin A1	18	RED	Label "1"	Motor Lead 1
Pin A2	18	WHT/RED	Label "2"	Motor Lead 2
Pin A3	18	BLK	Label "3"	Motor Lead 3
Pin A4	18	WHT	Label "4"	Motor Lead 4-11
Pin A5	18	WHT/GRN	Label "5"	Motor Lead 5-12
Pin A6	18	GRN	Label "6"	Motor Lead 6-13

* Not wired on mating connector

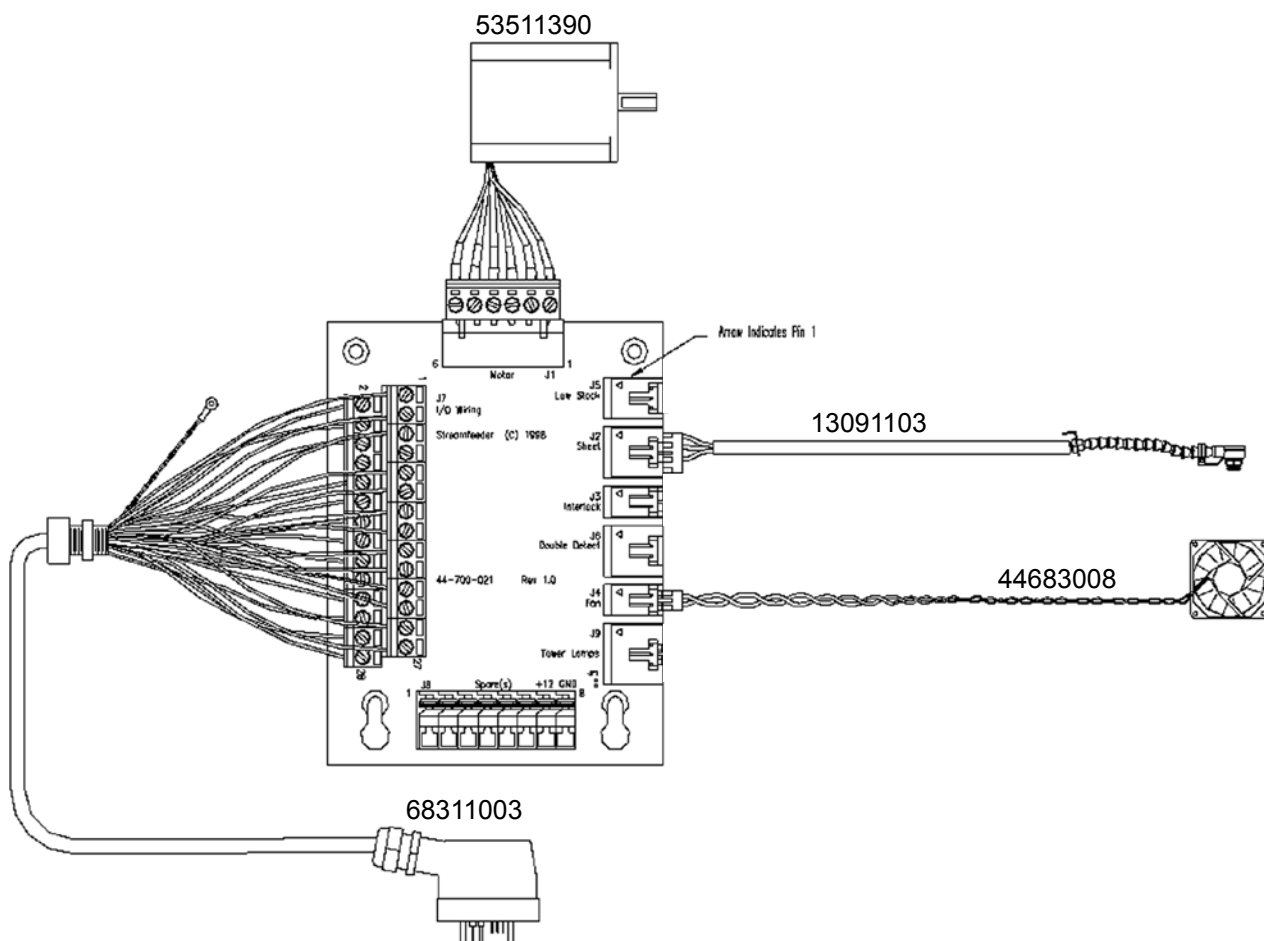


9 Electrical Components

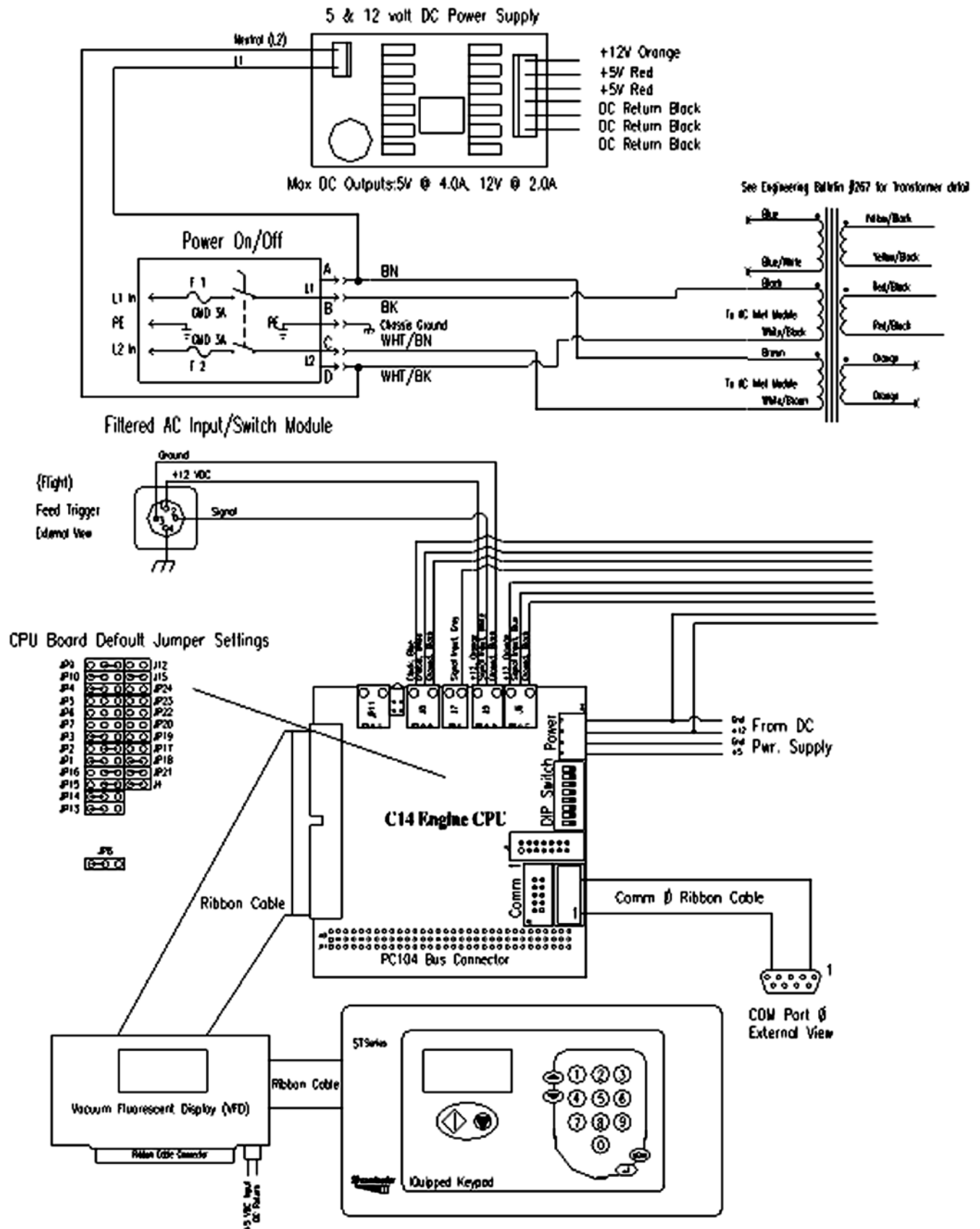
Electrical Detail

Supplied with Tower Lamp Option

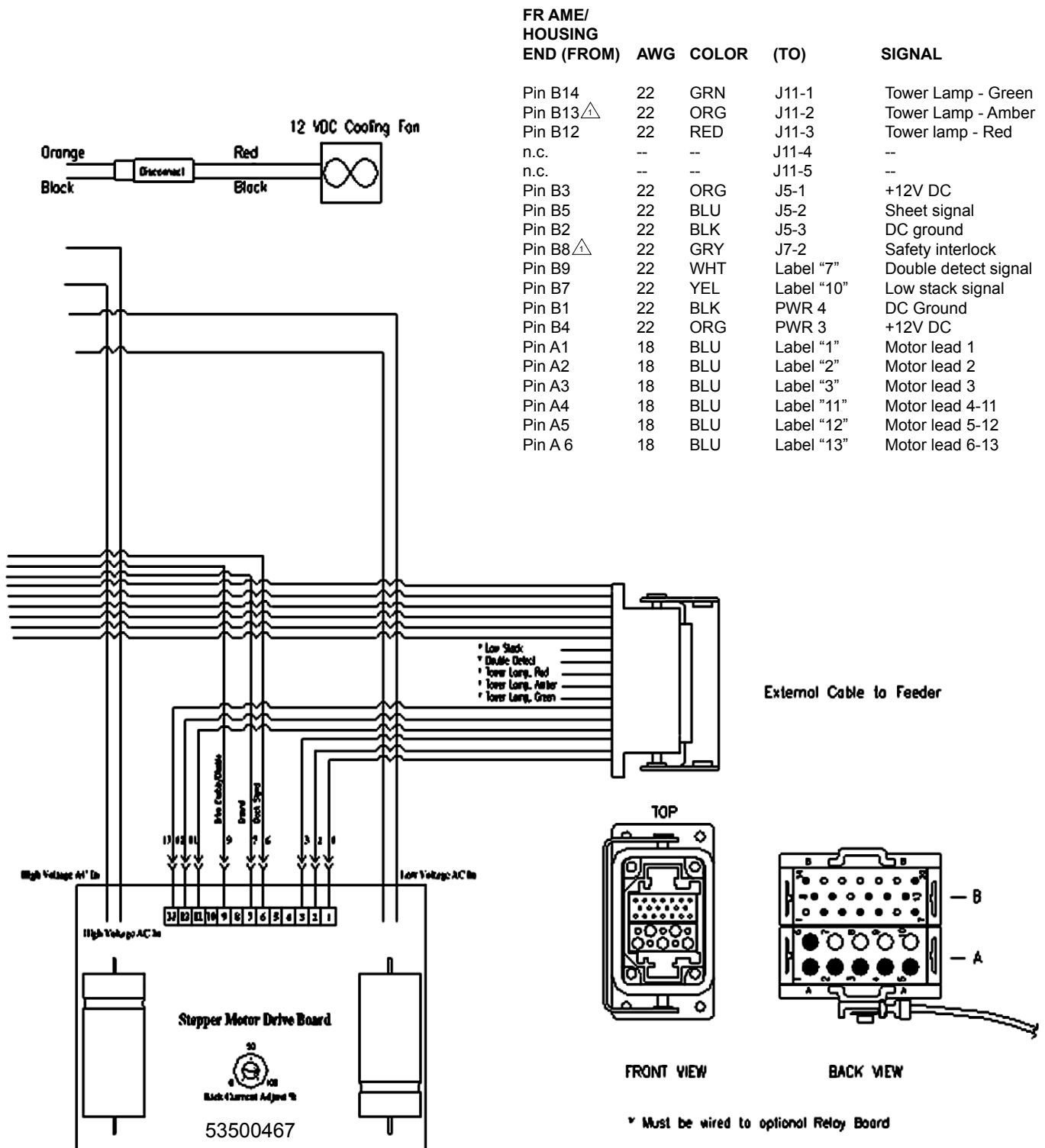
Low Stack	J5-1	BRN		+ 12V DC
	J5-2	BLK		Low Stack Signal
	J5-3	BLU & WHT		DC Ground
Sheet	J2-1	BRN		+ 12V DC
	J2-2	BLK		Sheet Signal
	J2-3	BLU		DC Ground
	J2-4	WHT		Inverted Sheet Signal
Interlock	J3-1	ORG		+ 12V DC
	J3-2	GRY		Interlock Signal
Double Detect	J6-1	BRN	(n.c.)	+ 12V DC
IR Burn Through (mechanical)	J6-2	BLK	(RED)	Double Detect Signal
	J6-3	BLU	(WHT)	DC Ground
	J6-4	--	(n.c.)	n.c.
	Fan	J4-1	RED	
Tower Lamp	J4-2	BLK		DC Ground
	J9-1	GRN		Green Lamp
	J9-2	ORG		Amber Lamp
	J9-3	RED		Red Lamp
	J9-4	--		n.c.
	J9-5	YEL		+12V DC



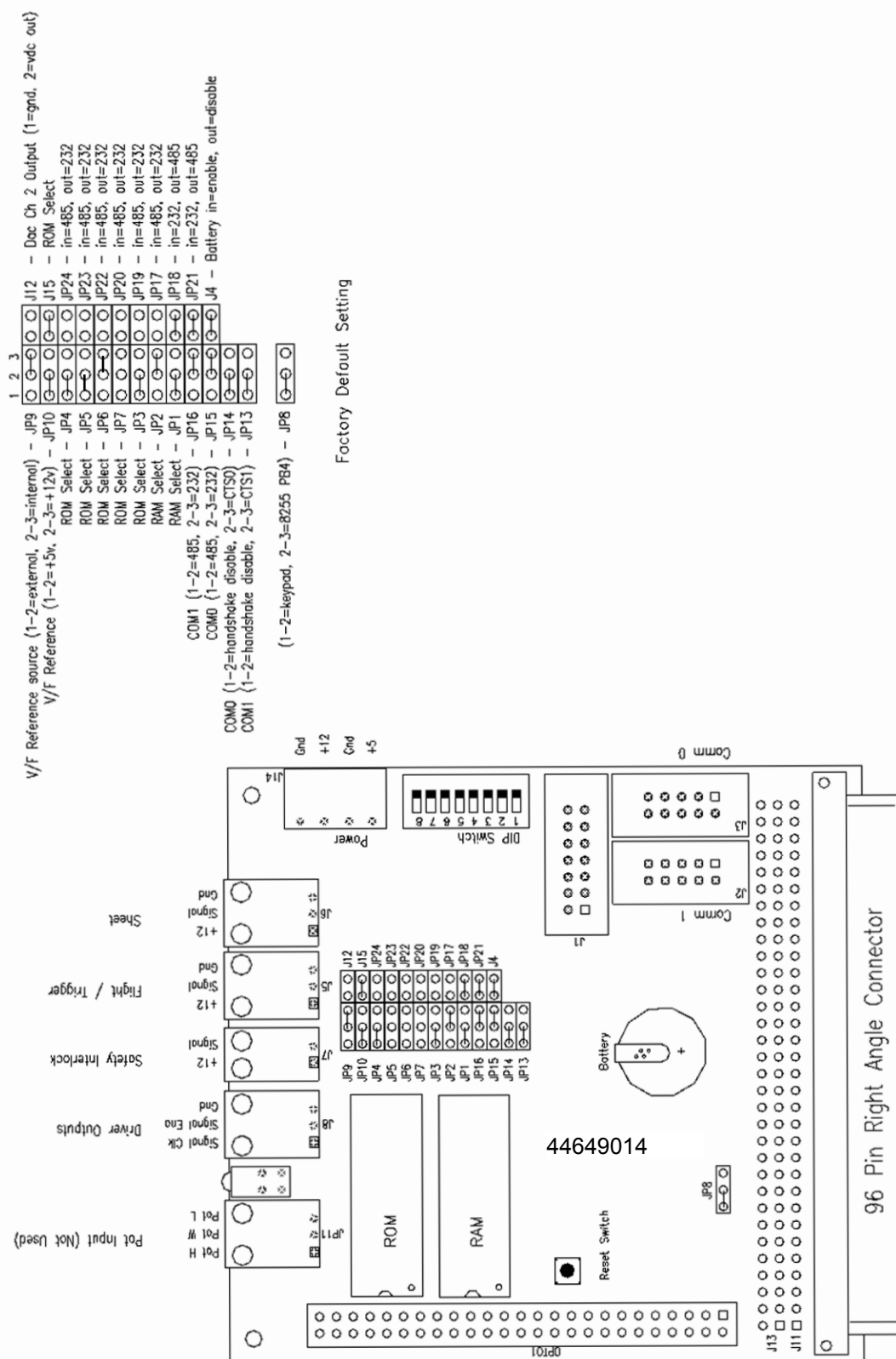
External IQipped Box



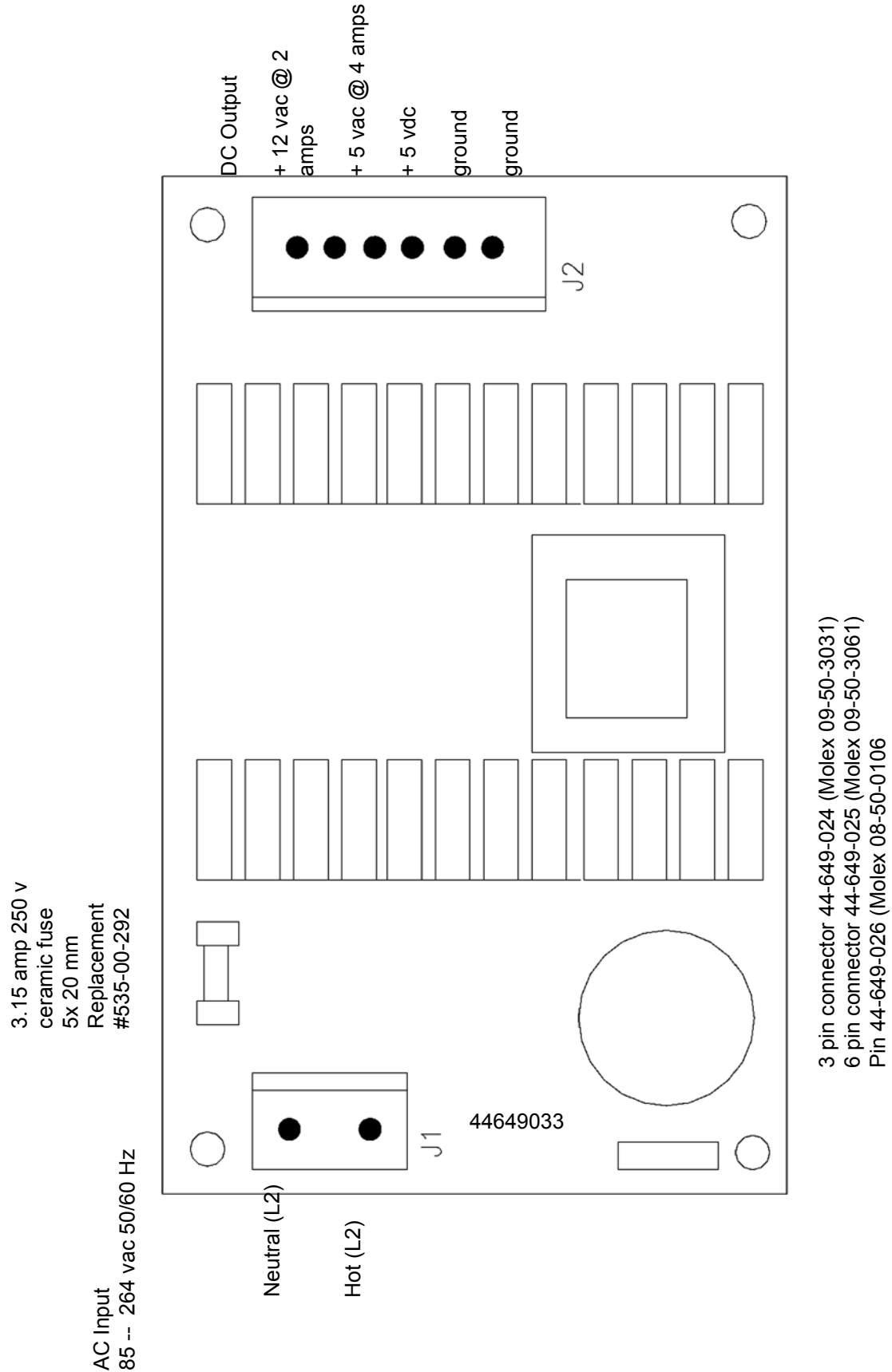
External IQipped Box




CPU Detail

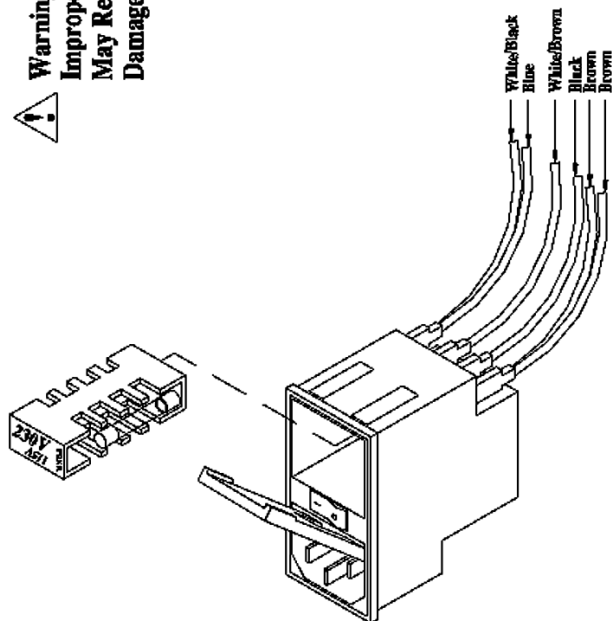


Power Supply

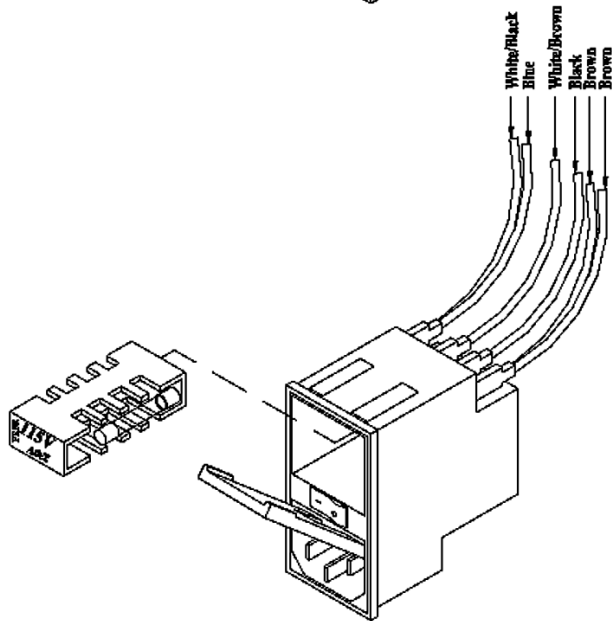


AC Input Module

 **Warning:**
Improper Voltage Selection
May Result In Permanent
Damage To Feeder



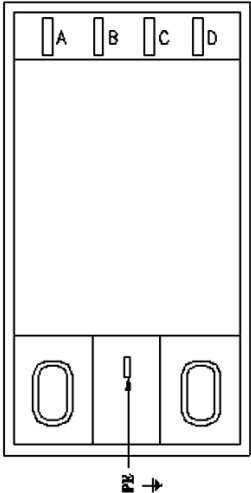
230 Volt Configuration



115 Volt Configuration

AC Input Module Connections

Pin #	Color	Function
A	Brown	To transformer and power supply
B	Black	To transformer
C	White/Brown	To transformer
D	Blue	To power supply; White/Black - To transformer
PE	Green/Yellow	To grounding stud




44649034

Motherboard

Mother Board Jumper Settings
(Factory Defaults)

	1	2	3	
JP1	○	○	○	RTC, DRQ0
JP2	○	○	○	Module 8, CPU 1
JP3	○	○	○	Module 7, CPU 1
JP4	○	○	○	Module 6, CPU 1
JP5	○	○	○	Module 5, CPU 1
JP6	○	○	○	Module 4, CPU 1
JP7	○	○	○	Module 3, CPU 1
JP8	○	○	○	Module 2, CPU 1
JP9	○	○	○	Module 1, CPU 1
				RTC, Interrupt 2
				Module 8, CPU 2
				Module 7, CPU 2
				Module 6, CPU 2
				Module 5, CPU 2
				Module 4, CPU 2
				Module 3, CPU 2
				Module 2, CPU 2
				Module 1, CPU 2

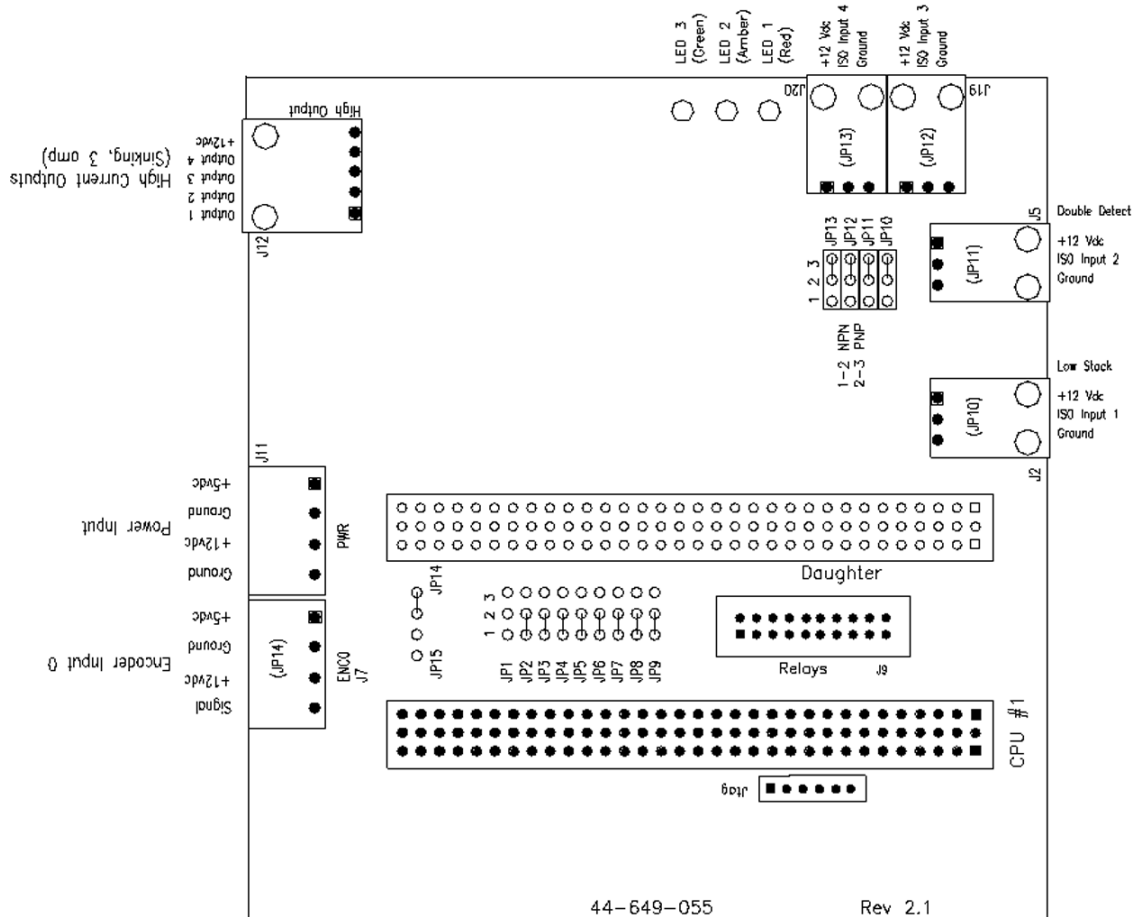
JP14  Encoder0, 1K pull-down resistor

	1	2	3	
JP13	○	○	○	PNP-Sourcing
JP12	○	○	○	PNP-Sourcing
JP11	○	○	○	PNP-Sourcing
JP10	○	○	○	PNP-Sourcing

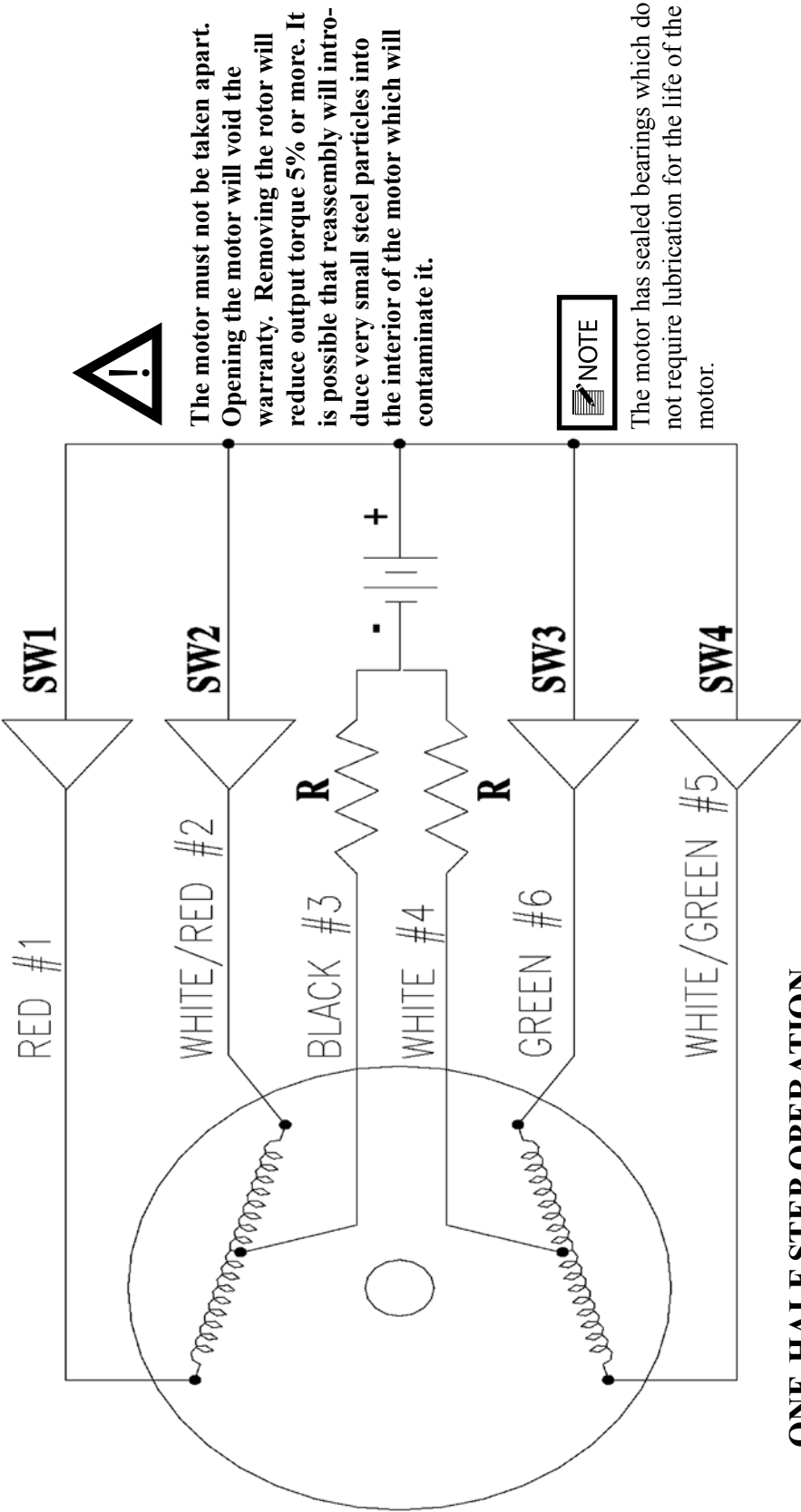
Note:

JP1 is not installed. If installed this jumper may conflict with the External trigger (Module 8) or (Module 6).

If Module 5 is used confirm jumper JP14 on CPU is not installed.



Wiring Diagram: 6-Lead Stepper Motor

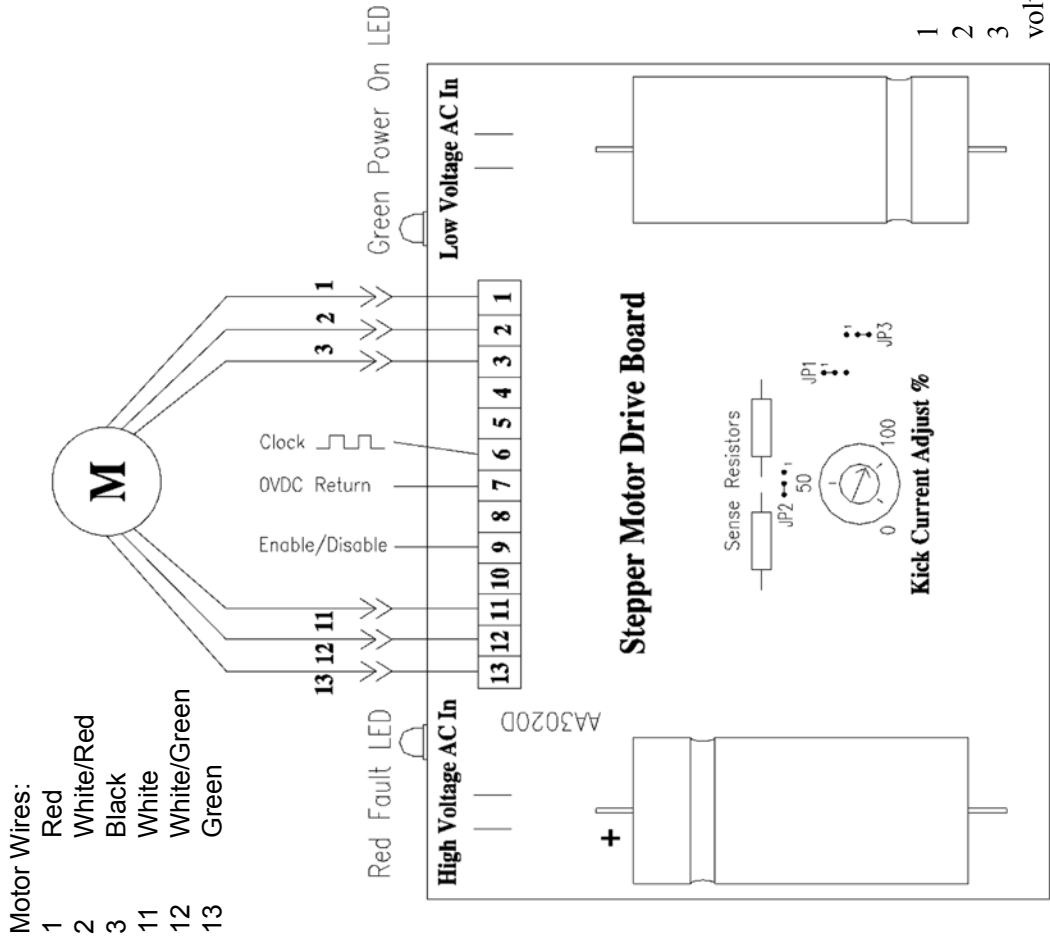


ONE-HALF STEP OPERATION EIGHT-STEP INPUT SEQUENCE

STEP	SW1	SW2	SW3	SW4
1	ON	OFF	ON	OFF
2	ON	OFF	OFF	OFF
3	ON	OFF	OFF	ON
4	OFF	OFF	OFF	ON
5	OFF	ON	OFF	ON
6	OFF	ON	OFF	OFF
7	OFF	ON	ON	OFF
8	OFF	OFF	ON	OFF
1	ON	OFF	ON	OFF

Stepper Motor Drive Boards #44649030 and #53500467

- 13 Pin Motor Coupler Pin Assignments**
- | | | | |
|---|---------------------|----|---------------------------|
| 1 | Motor Phase 1 | 8 | Not Used |
| 2 | Motor Phase 3 | 9 | Motor On/Off (Active Low) |
| 3 | Phases 1 & 3 Common | 10 | Not used |
| 4 | Not Used | 11 | Phases 2 & 4 Common |
| 5 | Not Used | 12 | Motor Phase 2 |
| 6 | Clock Input | 13 | Motor Phase 4 |
| 7 | 0 VDC/Ground | | |



Function	JP1	JP2	JP3
Negative Going Clocks	1-2	X	X
Positive Going Clocks	2-3	X	X
Terminal 5 = CCW	X	1-2	X
Terminal 5 = Direction	X	2-3	X
Fault Detection Enabled	X	X	2-3
Fault Detection Disabled	X	X	1-2
FACTORY DEFAULTS	1-2	2-3	2-3

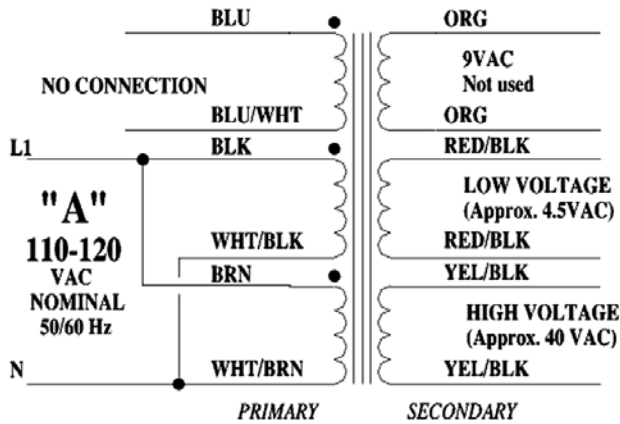
Fault Detection Protection LED Indictaion

- | | | |
|---|--------------------|--|
| 1 | Red LED-slow blink | Shorted wire in motor or cable |
| 2 | Red LED-fast blink | Open wire in motor or cable |
| 3 | Red LED-on steady | Ground fault (voltage shorted to 0) volts) |

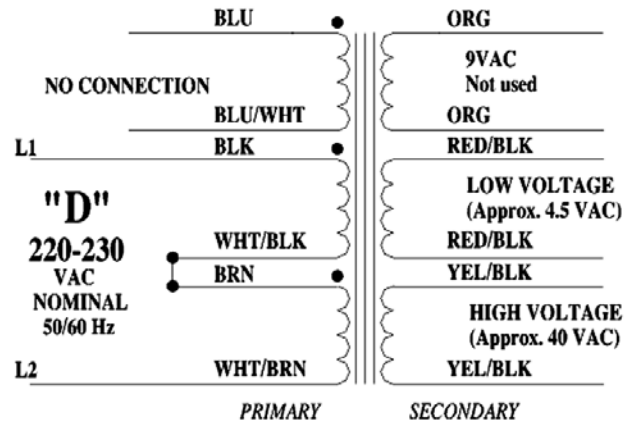


Drive is rated at 10 amps DC current max.
Motor Kick Current Adjustment set at 85 - 90%

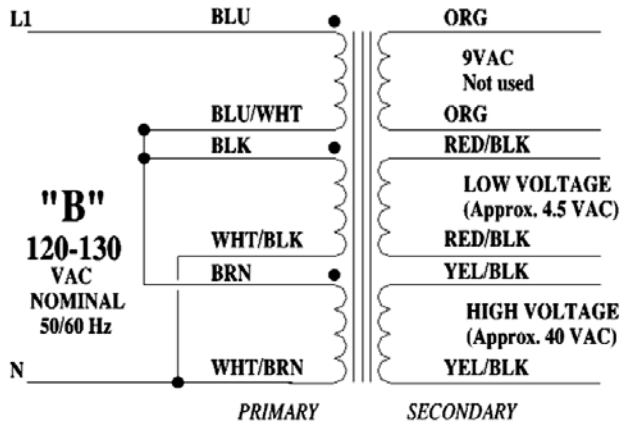
Transformer



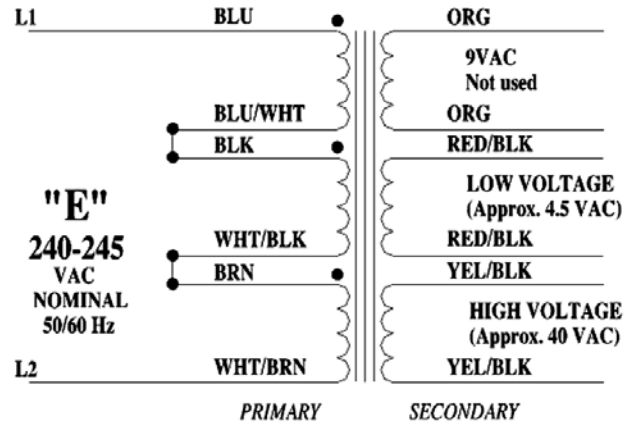
Standard wiring for most North American applications



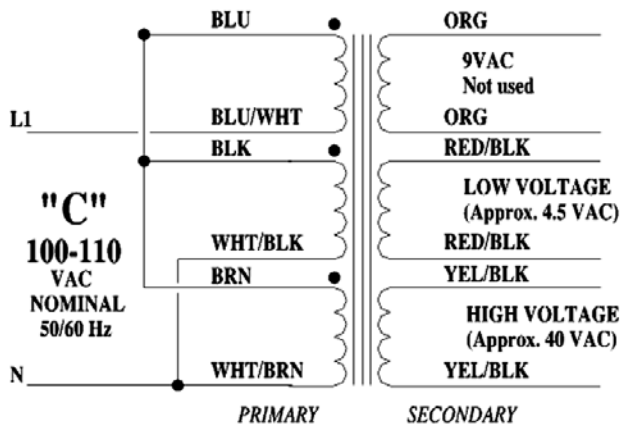
Standard wiring for Continental Europe, some 230V US applications



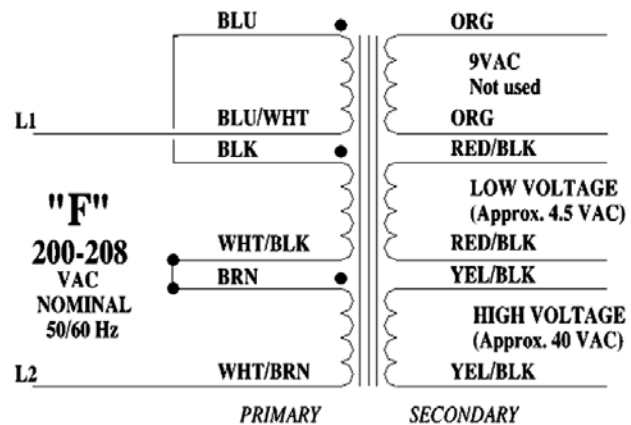
North America where voltage is over 120V



Standard wiring for U.K., Australia, New Zealand



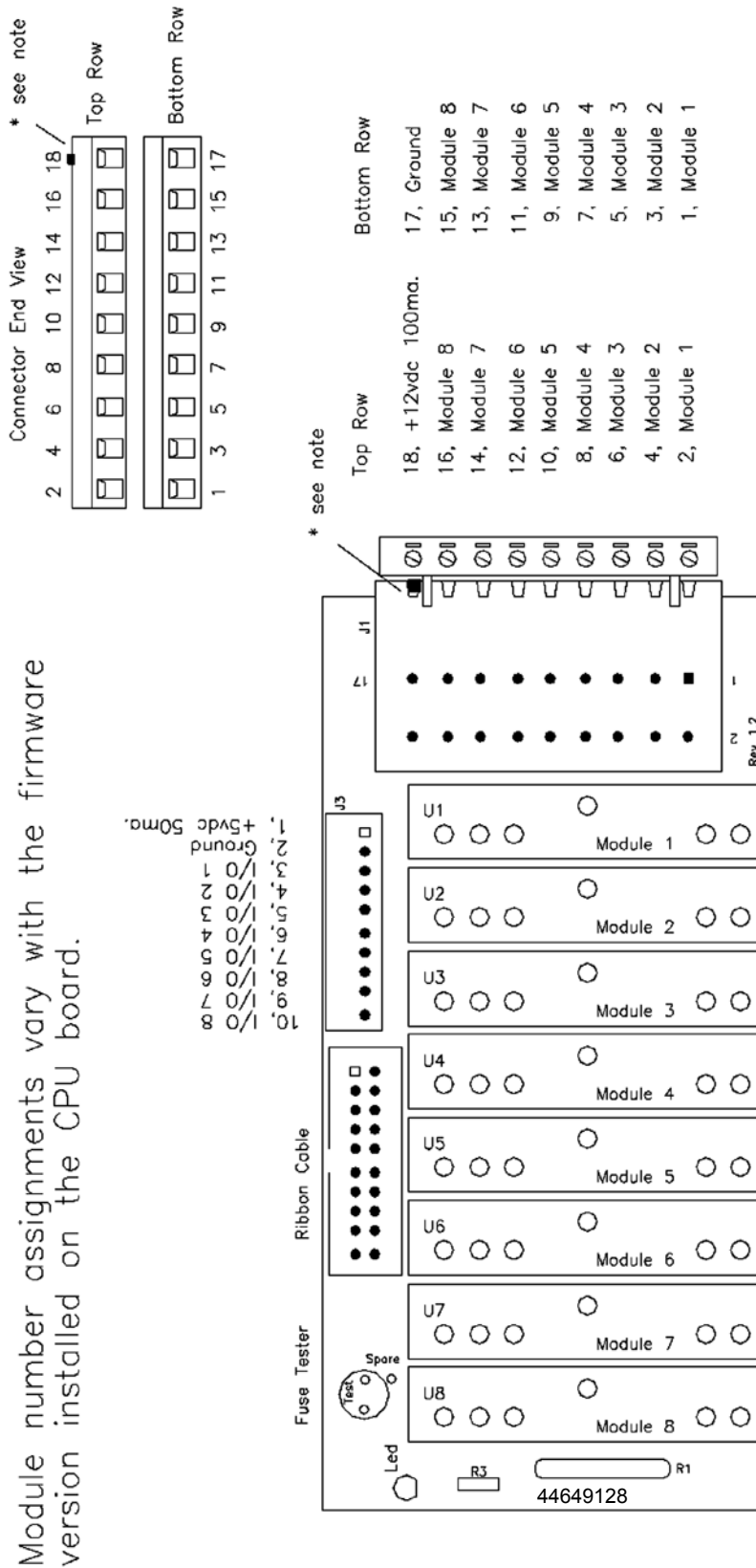
Standard wiring for Japan



Some Japanese (200V) applications, some US applications for 208V

53511701

I/O Board



* Note: Pin 18 has a polarization key on the socket side.
Pin 17 has a polarization key on the plug side.

10 Technical Troubleshooting

General Troubleshooting Terms



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.


The “drive” consists of the AC power supply (transformer), the stepper motor drive board, and the motor. The “controls” consist of the DC power supply, the CPU board, the display/keypad decoder boards, the keypad, any ribbon cables and wiring harnesses, the sensors, the motherboard, and the relay I/O. Depending upon the options your machine has, you may or may not have the motherboard and/or relay I/O. Once it is determined that you have a drive or a controls problem, the next thing to check is the power supply for that section.

The tables that follow are designed to be a “quick lookup” for a problem you may be having. Wiring and board diagrams also contained in this manual are provided for reference and component recognition and connection during troubleshooting.



Quick-Look Troubleshooting

Problem	Solution
<p>No power to feeder when power switch is turned on</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>IMPORTANT</p> <p><i>A visual inspection will not always be sufficient to determine fuse integrity.</i></p> </div>	<ol style="list-style-type: none"> 1. Make sure there is power present at the AC main where the control panel is plugged in. 2. Check three-wire AC power cord for integrity at all three points. 3. Remove power cord from AC input switch module and disconnect the four connections to AC loads located on the back of the module inside the control panel. 4. Check the two fuses located inside the control panel's input power module. BOTH fuses must be present and test good. Note: This power module is designed to hold 5mm x 20mm fuses, as well as 1.25" x .25" fuses. The machine ships from Stream-feeder's facility with 5mm x 20mm fuses. <ol style="list-style-type: none"> a. Observe the voltage label showing through the window on the fuse housing for proper orientation when the holder is re-inserted. 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 and has not allowed the fuses to slide back toward the outside of the control panel and away from where contact with the metal pressure points inside the module body is made. c. Use an ohmmeter to test the fuses. If necessary, replace with fuses of the same rating only. 5. Reconnect power cable and with power switch turned “On,” check for presence of AC at the output connectors on the back of module where the transformer primary lead connections are made. 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.
<p>Fuses blow on power up</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>NOTE</p> <p><i>A fuse failure indicates a problem with the last item connected before failure occurs.</i></p> </div>	<ol style="list-style-type: none"> 1. Install known good fuses of same rating only. 2. Disconnect all AC loads from the input: <ol style="list-style-type: none"> a. The transformer primary. b. The DC Supply AC input leads. c. Remove the red and yellow wire pairs from the stepper motor drive board.

Quick-Look Troubleshooting (continued)

Problem	Solution
Fuses blow on power up (continued)	3. Reconnect AC loads one item at a time while alternately applying power between new connections. Connect each load as follows one at a time to determine the faulty part: <ol style="list-style-type: none"> Connect the transformer primary leads to the AC input module. Connect leads to the two-pin AC input connector of the DC power supply. Connect the red and yellow wire pairs of the transformer secondary to the stepper motor drive board.
Decreased power experienced after fuse is replaced <div style="border: 1px solid black; padding: 2px; width: fit-content;">IMPORTANT</div> <p><i>Never apply more than 125V when the fuse holder is in the 115V position. Applying 230V to the feeder when the fuse holder is in the 115V position will damage the feeder's internal electronics.</i></p>	If the input power module fuse holder is installed in the 230V position, and the line power is at 115V, the feeder will have noticeably decreased power.
Fan(s) does/do not operate <div style="border: 1px solid black; padding: 2px; width: fit-content;"> NOTE</div> <p><i>When the output is shorted, a faintly audible "clicking" sound can be heard coming from the supply. This is the power supply protecting itself from failure due to a short on its output.</i></p>	<ol style="list-style-type: none"> Test output of DC supply. Note: The DC supply has dual outputs; 5 and 12 volts DC. Test wire harness to fan for the presence of 12VDC. (NOTE: There are two cooling fans. One is located inside the feeder and the other is located inside the control panel.) Check wiring harness for good electrical connections to pins in quick disconnect plugs. Check for shorted wires in DC harness on output of supply or in the multi-conductor cable. Replace fan. Note: Continued operation of the machine without a cooling fan working properly will cause further damage to the internal electronic components.
Keypad does not respond	<ol style="list-style-type: none"> Check green "heartbeat" LED located on the top of the CPU board. It will blink at regular intervals under normal operation when the feeder is in "Ready" or "Suspended" mode. If the blinking green "heartbeat" LED is not present, refer to the section titled "CPU board heartbeat pulse not present." Check outputs of DC power supply and connections to the keypad board as well as to the CPU board. The keypad board is mounted "piggy back" to the display board. Check all CPU jumpers for correct positioning, but specifically check jumper JP8 for correct positioning on pins 1 and 2. Test fuse on the keypad decoder board. Check 50-pin ribbon cable between keypad decoder board and the CPU board for positive connection and integrity. Replace keypad decoder board. If this does not give positive results, replace keypad.




Quick-Look Troubleshooting (continued)

Problem	Solution
<p>Display does not function properly</p> <div data-bbox="159 405 305 468">  NOTE </div> <p><i>Even though the display may not be working properly, it may still be possible to operate the feeder via the keypad. For example, if you can cycle the feeder by pressing the “cycle” key, and vary the speed with the up and down arrow keys, the keypad decoder board is most likely operational.</i></p> <div data-bbox="159 1140 402 1203">  IMPORTANT </div> <p><i>All user programmable parameters that are held in memory will be lost when the RAM is cleared.</i></p>	<ol style="list-style-type: none"> 1. Check green “heartbeat” LED located on the top of the CPU board. It will blink at regular intervals under normal operation when the feeder is in “Ready” or “Suspended” mode. If the blinking green “heartbeat” LED is not present, refer to the section titled “CPU board heartbeat pulse not present.” 2. Check outputs of DC power supply and connections to the keypad board as well as to the CPU board. The keypad decoder board is mounted “piggy back” to the display board. 3. Check fuse on the keypad decoder board. 4. Make sure keypad decoder board is operational by referring to the section titled “Keypad does not respond.” 5. Test vacuum fluorescent display (VFD) tube. <ol style="list-style-type: none"> a. Remove keypad ribbon cable from the connector on the keypad decoder board. b. Remove four screws holding keypad decoder/display board combination to its mounting apparatus. c. Locate connector CN2 on the face of the VFD circuit board, and jumper pins 2 and 3. d. Apply 5VDC power to keypad decoder board DC input. e. A checkerboard pattern should be seen alternating across the screen’s pixels where each character is normally displayed. If not, go to step 9. 6. Check 50-pin ribbon cable between keypad decoder board and the CPU board for positive connection and integrity. 7. Check all CPU jumpers for correct positioning, but specifically check jumper JP8 for correct positioning on pins 1 and 2. 8. Clear CPU board RAM by removing jumper J4 for 10 minutes. All user programmable parameters that are held in memory will be lost when the RAM is cleared. (It is recommended that the user programmable parameters should be noted in this manual prior to trouble for reference as needed in the future). After waiting 10 minutes, replace jumper J4 and reboot machine. 9. Replace display board. 10. If after determining the keypad decoder board, the ribbon cable, and the display board are all good components and this still does not give positive results, the CPU board is faulty and must be replaced.
<p>“FEEDER TIMED OUT” message displayed</p>	<ol style="list-style-type: none"> 1. Double check the mechanical setup of the gate cylinder, material hold down, and wedge assembly is correct. Verify a gap is pulled between each piece of material as it is fed through the discharge of the feeder. If the sensor does not sense a gap between each piece of material, a feeder time out will occur. 2. Make sure the green LED on the body of the “sheet” sensor is illuminated when the feeder power is on. If not go directly to step 3. Also check the amber LED on the body of the same sensor is illuminated when a sheet of fed material is presented to the sensor, and is NOT illuminated when a sheet is not present. Finally, make sure the “sheet” sensor cannot sense anything in the background beyond the fed material. If the green and amber LEDs operate as they should, go to step 3b.


Quick-Look Troubleshooting (continued)

Problem	Solution
“FEEDER TIMED OUT” message displayed (continued)	<ol style="list-style-type: none"> 3. Check connection to the CPU board at 3-pin connector J6. Note: Pin 1 is 12VDC, pin 2 is the signal input pin, and pin 3 is DC ground. Pins 1 and 3 give life to the sensor, and pin two requires 12VDC to be applied to it when a “sheet” is present and the output of the sensor is on. <ol style="list-style-type: none"> a. Measure between pins 1 and 3 of the CPU connector J6 for the presence of 12VDC. If this voltage is not present, the “sheet” sensor’s green LED will not be illuminated, and the CPU board must be replaced. b. Jumper pins 1 and 2 on CPU board connector J6. Cycle the feeder while alternately removing the jumper and applying the jumper to simulate the output of the sensor as sheets are feeding through the feeder. If your feeder has One Shot controls, only one jump across the pins should complete a cycle. If your feeder is equipped with Batch Count controls, you should see the batch size decrement on the “Run Display” once for each jump across pins 1 and 2 until a cycle is complete. c. If steps 3a and 3b produce positive results as described above, all three pins of J6 on the CPU board are good. d. If jumping pin 1 to pin 2 does NOT produce positive results as described in step 3b above, the input is bad, and you must replace the CPU board. 4. Check the integrity of the “sheet” sensor wiring harness. Be sure to check for broken wires at the quick disconnects on both ends of the harnesses, including the multi-conductor cable. 5. Check the sensor wires for integrity and positive connection at the pins of the quick disconnect where the sensor connects to the breakout board inside the feeder. 6. If all wire connections are good, the sensor’s output is bad and it must be replaced.
CPU board “heartbeat” pulse not present	<ol style="list-style-type: none"> 1. This LED should blink at regular intervals under normal operation when the feeder is in “Ready” or “Suspended” mode. Make sure the front safety guard is closed completely and no outside error conditions are present. 2. Check output of DC power supply. Check for shorted wires in DC harness on output of supply. Note: When the output is shorted, a faintly audible “clicking” sound can be heard coming from the supply. This is the power supply protecting itself from failure due to a short on its output. 3. Verify the cooling fan is operational and the supply is present at the 4-pin CPU board DC power input. If not, replace DC power supply. 4. Check CPU jumpers for correct positioning. 5. Check the EPROM and RAM chips are seated properly in their sockets. Note: Improperly seated chips may cause the CPU board to indicate a problem by illuminating the red LED located next to the green “heartbeat” LED. 6. Replace CPU board. 7. Replace EPROM.
Flight photo sensor does not trigger feeder	<ol style="list-style-type: none"> 1. Check the trigger mode setup in the menu screen called “TRIG.” Make sure it is set for “Flight Trigger,” and the submenu is set for “Photo Sensor Input.” 2. Check connection to the CPU board at 3-pin connector J5. <ol style="list-style-type: none"> a. Measure between pins 1 and 3 of the CPU connector J5 for the presence of 12VDC. If this voltage is not present, the “flight” trigger sensor’s green LED will not be illuminated, and the CPU board must be replaced.

Quick-Look Troubleshooting (continued)

Problem	Solution
<p>Flight photo sensor does not trigger feeder (continued)</p> <div data-bbox="162 409 308 472">  NOTE </div> <ul style="list-style-type: none"> • Pin 1 is 12VDC. • Pin 2 is the signal input pin. • Pin 3 is DC ground. • Pins 1 and 3 give life to the sensor. • Pin 2 requires 12VDC to be applied to it when a “flight” is present and the output of the sensor is on. 	<ol style="list-style-type: none"> Jumper pins 1 and 2 on CPU board connector J5. This will simulate the output of the “flight” sensor and should trigger a cycle. If steps 2a and 2b produce positive results as described above, all three pins of J5 on the CPU board are good. Go to step 3. If jumping pin 1 to pin 2 does NOT produce positive results as described in step 2b above, the input is bad, and you must replace the CPU board. <ol style="list-style-type: none"> Test the integrity of the wiring harness leading to the flight sensor input connector. <ol style="list-style-type: none"> Measure 12VDC across pins 1 and 3 on the 4-pin circular connector. If voltage is not present, repair broken wire. Jumper pin 1 to pin 2. This should trigger a cycle. If not, repair broken wire. Connect “flight” sensor to 4-pin circular connector and verify the sensor is getting power by checking the status LEDs on the sensor body for illumination. If not, check sensor leads for integrity. Test the flight sensor for a switching output. If not present, replace flight sensor.
<p>Motor does not run, is noisy, makes a “growling” sound, or runs in reverse</p> <div data-bbox="154 955 219 1018">  TIP </div> <p><i>A digital multimeter with frequency measurement capabilities is necessary for the following tests. If your meter does not have the ability to make a frequency measurement, an oscilloscope may be used instead.</i></p> <div data-bbox="162 1291 308 1354">  NOTE </div> <p><i>This test requires a meter that has frequency measurement capabilities, or an oscilloscope.</i></p>	<ol style="list-style-type: none"> Cycle the feeder and check for a rolling icon in the upper right corner of the “Run Display”. Note: This icon is active when the motor is supposed to be running. Is the rolling icon present? <ol style="list-style-type: none"> Yes: Go to step 3. No: Check CPU board for “heartbeat” LED and verify keypad is working correctly. Verify green LED on the stepper motor drive board is illuminated. If not, verify transformer secondary leads measure correct voltages: 40 VAC across yellow pair of wires, and 4.5VAC across red pair of wires. Go to section titled “Testing the transformer” for further information. If green LED is not illuminated and the transformer voltages test good, replace the drive board. Otherwise continue with next step. Look at the Red LED on the stepper motor drive board. Is it illuminated? <ol style="list-style-type: none"> YES: Go to section titled “Drive board red LED illuminated.” NO: Continue next step. Remove white wire from pin 9 on the stepper motor drive board 13-pin connector. Note: This is the drive disable line coming FROM the CPU board on connector J8 pin 2. The drive board is enabled by default when no connection is made at pin 9. Cycle the feeder. If the motor runs, the output on connector J8 pin 2 of the CPU board is bad, and the CPU board must be replaced. If not continue next step. Measure for the presence of pulse train. The pulse train comes FROM the CPU board connector J8 pins 1 (signal) and 3 (ground), and goes TO the stepper motor drive board at pins 6 (signal input) and 7 (ground). Test points are pins 6 and 7 on the drive board. <ol style="list-style-type: none"> Cycle the feeder and verify icon is rolling on the “Run Display.” Verify signal is present on pins 6 and 7. The frequency measured here directly affects the speed of the motor. At 1% run speed the frequency will be about 87 Hz minimum, and at 100% run speed, about 8.7 kHz maximum. It is recommended to set the run speed at about 50% where the frequency measured should be about one half the value of 8.7 kHz (or about 4350 Hz). Check integrity of both ends of drive wiring harness between the CPU board connector J8 and the drive board’s 13-pin connector.

Quick-Look Troubleshooting (continued)

Problem	Solution
<p>Motor does not run, is noisy, makes a “growling” sound, or runs in reverse (continued)</p>	<ol style="list-style-type: none"> Using a digital multimeter or an oscilloscope, measure the amplitude of the pulse train and verify it is at least 2.5VDC. If pulse tests good, replace the stepper motor drive board. If the pulse tests bad, the pulse output on connector J8 of the CPU board is bad, and the CPU board must be replaced.
<p>Drive board red LED illuminated</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>IMPORTANT</p> </div> <p><i>The stepper motor drive board has been designed to protect itself if motor problems occur. If a problem with the motor wires or motor is found and corrected, the board will still drive a good motor after correction is made. However, the board cannot protect itself from transient voltage spikes and/or power sags or brownouts. It is highly recommended in plants where power problems are evident or in question, a high quality surge suppressor or line conditioner should be employed for added protection.</i></p>	<ol style="list-style-type: none"> Slow Blink: (about once per second) indicates a SHORT in motor, motor cable, or drive power component. <ol style="list-style-type: none"> Check integrity of motor wires and/or cable. None of the wires should be exposed, and should have their full insulation so they may not short to each other or any other part of the machine. If wires look OK, go to section titled “Testing stepper motor drive board output pins.” If stepper motor drive board tests are positive, replace the motor. For further information, see the section titled “Testing motors.” Fast Blink: (multiple times per second) indicates an OPEN in motor, motor cable, or drive component. <ol style="list-style-type: none"> Check integrity of motor wires and/or cable. None of the wires should measure open, or be disconnected or loose from their terminals. If wires check OK, go section titled “Testing stepper motor drive board output pins.” If stepper motor drive board tests are positive, replace the motor. For further information, see the section titled “Testing motors.” On Steady: indicates a ground fault (wire shorted to zero volts). <ol style="list-style-type: none"> Remove ground fault.
<p>Testing stepper motor drive board output pins</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>IMPORTANT</p> </div> <p><i>Do not have power applied when doing these tests.</i></p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p> NOTE</p> </div> <p><i>Measuring zero volts drop across one of these pins may be evidenced by blowing fuses on power-up. See section titled “Fuses blow on power up.”</i></p>	<ol style="list-style-type: none"> Remove 13 terminal motor wire plug-in coupler from the drive board. Test motor phase pins. Note: A digital multimeter is required for these tests. <ol style="list-style-type: none"> Set the multimeter to Diode Test. Place the RED meter lead on one of the leads between the large black sense resistors located at the center of the drive board located above JP2. Touch the BLACK meter lead to each phase terminal (pins 1, 2, 12, and 13). This should give readings between 0.450V and 0.550V. If any readings are significantly greater than or less than 0.450V, then the unit is faulty and must be replaced. Test motor common pins: Note: A digital multimeter is required for these tests. <ol style="list-style-type: none"> Touch the BLACK meter lead to the positive lead of the large blue capacitor on the left side of the board located below the red fault indicator LED. Touch the RED meter lead to pins 3 and 11. These pins should give readings between 0.450V and 0.550V. If any readings are significantly greater than or less than 0.450V, then the unit is faulty and must be replaced.

DIAGNOSTICS / TESTS

Diagnostics / Tests

Problem	Solution
<p>Testing motors</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> IMPORTANT </div> <p><i>These motors are NOT repairable and should never be opened.</i></p>	<p>Refer to the wiring diagram of the 6-lead DC Stepping Motor found elsewhere in this manual.</p> <p>The motors have two windings, three leads associated with each winding, for a total of six leads. Each winding has a wire at each end of the winding with a wire connected at the center of the winding. This center tap is also called the “common” wire, while the end wires are called the “phase” wires. Motors are inductors. Inductors are tough to troubleshoot unless there is a catastrophic failure associated with the windings inside the inductor. An ohmmeter may be used to test for catastrophic failures, but is useless when a motor has a problem that is not catastrophic. Therefore, a motor can still have a problem even though it appears there is not a problem as measured with an ohmmeter. The following are tests that you can make with an ohmmeter:</p> <ol style="list-style-type: none"> 1. All three leads of each individual winding should measure continuity in any combination of two. Conversely, an OPEN should NOT be measured in any combination of two of the three leads tested in a single winding. If an open is measured in a single winding, it is a clear indication the motor is bad and needs to be replaced. 2. Since there are two separate windings, they need to measure electrically separate from each other. That is, any combination of one lead from one winding to any lead of the other winding should measure as OPEN. If a short is measured between windings, it is a catastrophic failure inside the motor, and must be replaced. 3. Both windings need to be insulated from the body of the motor. If continuity is measured between any motor lead and the body of the motor, a catastrophic failure has occurred inside the motor and must be replaced.
<p>Testing the transformer</p>	<p>Refer to the wiring diagram found in this manual. Note there are three primary windings and also three secondary windings, six windings altogether. Most feeders are shipped from the factory with the transformer set up for configurations “A” and “D.” Therefore, one of the primary windings is not used, and will be tied back. (The orange secondary leads are also not used in the ST Series of feeders and will be tied back.) Flipping the fuse holder around in the AC power entry module will set up the feeder for either 115VAC as shown in configuration “A,” or for 230VAC as shown in configuration “D.” In reality, flipping the fuse holder around re-wires the transformer primary windings as shown in configurations “A” and “D.”</p> <p>Transformers are inductors. Inductors are difficult to troubleshoot unless there is a catastrophic failure associated with the windings inside the inductor. An ohmmeter may be used to test for catastrophic failures, but is useless when a transformer has a problem that is not catastrophic. Therefore, a transformer can still have a problem even though it appears there is not a problem as measured with an ohmmeter. Fortunately, transformers very rarely fail, so, chances are any problem you may have that leads to the transformer is most likely caused by some other component.</p>

Diagnostics / Tests (continued)

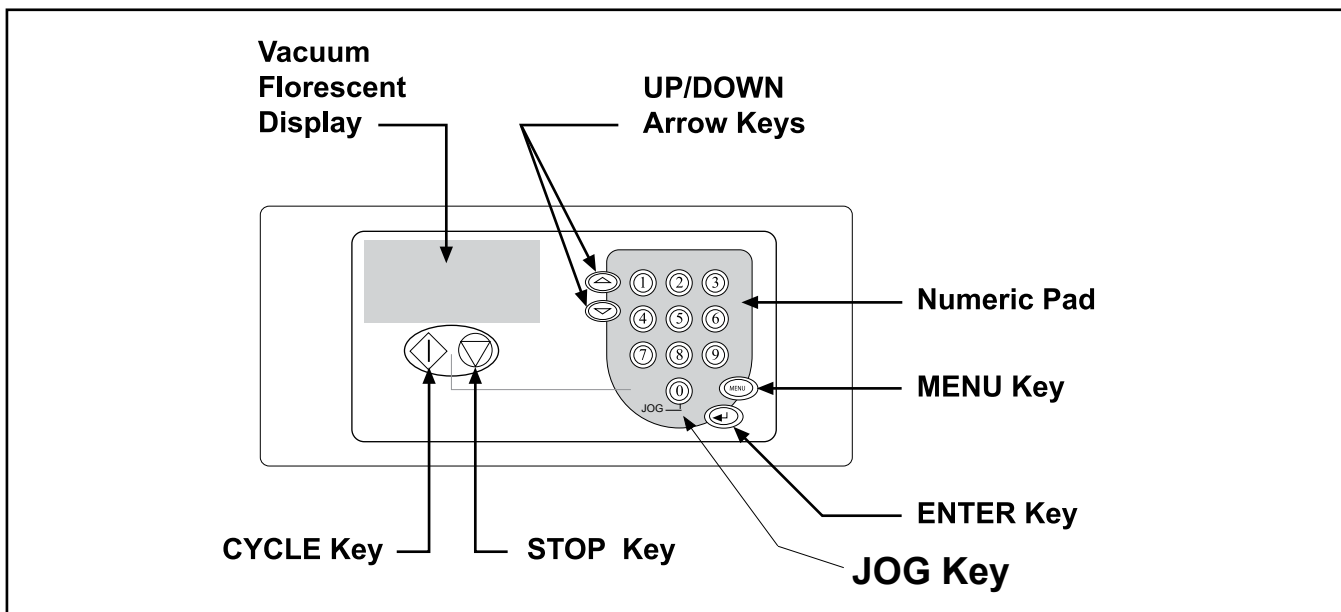
Problem	Solution
Testing the transformer (continued)	<p><i>The following assumes all crimp-on connectors are properly connected to the transformer wires and are making contact with them, or are NOT crimped onto the insulation preventing a good electrical connection to the individual wires of the transformer.</i></p> <ol style="list-style-type: none"> <i>1. The first step to testing a transformer is to remove the secondary windings from their loads. Remove the yellow and red wire pairs from the stepper motor drive board.</i> <i>2. Apply the correct power to the transformer primary depending upon the position of the fuse holder in the AC power entry module.</i> <i>3. Using an AC volt meter, measure the voltage across each secondary winding. Do not measure with one lead of your meter to ground or the chassis, but rather measure the wire pairs with respect to each other.</i> <ol style="list-style-type: none"> <i>a. Measure the yellow pair of wires with a black stripe on them by putting the red meter lead on one yellow wire, and the black meter lead on the other yellow wire. (It does not matter which meter lead goes to which transformer wire). You should measure approximately 40VAC between these two wires. If not, the transformer is faulty and must be replaced.</i> <i>b. Measure the red pair of wires with a black stripe on them, by putting the red meter lead on one red wire, and the black meter lead on the other red wire. (It does not matter which meter lead goes to which transformer wire). You should measure approximately 4.5VAC between these two wires. If not, the transformer is faulty and must be replaced.</i> <p><i>The following are tests you can make with an ohmmeter:</i></p> <ol style="list-style-type: none"> <i>1. Each of the six windings has two wires, one lead on each end of them. Make sure you measure continuity between winding leads. If a winding is measured open, the transformer is faulty and must be replaced.</i> <i>2. Next verify none of the windings are shorted to any other winding. Using your ohmmeter, you should NOT measure continuity from one winding to any of the other five windings. If a short is measured between windings, the transformer is faulty and must be replaced.</i>

11 Menu Guide

Control Interface

The control interface consists of a keypad and display arrangement which allows you to not only control the operation of the Pro Series feeder/dispenser, but it also allows you to monitor the status of the job being run.

Control Interface Features



Control Interface Feature Descriptions

Feature	Description
Vacuum fluorescent display	This 4-line x 20-character display provides menus for the operator control interface and provides status of feeder during cycling.
Numeric keypad	Used to enter data which controls feeder activity, such as speed (or batch count, for "Batch Control" mode only).
UP/DOWN arrow keys	Scrolls through the system configuration menus. Also, is used to increase and decrease the speed (or batch count, for "Batch Control" mode only).
MENU key	Toggles display between the Run Display screen and the configuration menus.
ENTER key	Allows run values to be stored from the system configuration menus. Also, it resets the piece count (or batch count, for "Batch Control" mode only).
CYCLE key	First, used to advance feeder from the "Suspended" mode to the "Ready" mode. Second, clears feeder faults, such as doubles and missed feeds (if applicable). Finally, completes one feed cycle when in "Ready" mode.
STOP key	Stops the feeder and holds it in "Suspended" mode.
JOG key	Advances the feed belts at a fixed slow speed. This function is useful during feeder setup and may be used to clear jams.

General

The *control interface* provides you with several different options for monitoring status, entering configuration parameters, and cycling the feeder.

Depending upon your particular needs, the control interface can provide you with either *one-shot* control or *batch* control. *Your machine will be set up for one or the other at the time of shipment.*

To fully understand how the control interface works, you must first understand the Run Display. The default menu from which you will start all control functions is called the *Run Display*. This screen is the default screen that is shown when you press any key after powering On the machine.

Run Display Defined

IMPORTANT

Even though the Run Display is factory-set for immediate operation, it can be customized to suit your changing on-site needs.

The Run Display for *batch* control is a real-time reporting tool containing information on the status of the feeder, such as run speed, batch size ('1' if Speed Following = On), number of batches fed for a particular job (if Speed Following = Off, otherwise the feeder displays the Speed Offset value if Speed following = On).

There are three types of status messages available for viewing from the Run Display screen: *Ready*, *Suspended*, and *Running*.

Ready	The feeder is ready to feed when a flight signal is received or when the CYCLE key is pressed.
Suspended	The feeder will not feed when it receives a flight signal or when the CYCLE key is pressed. Pressing the CYCLE key will advance the feeder to the "Ready" mode.
Running	The feeder is currently feeding product (cycling).

- When the feeder is "ready" to receive a flight signal, the word "Ready" will scroll across the top line. From the Run Display, you can adjust the speed or offset (depending on the speed-matching setting) of the feeder by pressing the UP/DOWN arrow keys.
- When the feeder is "suspended" (or idle), the word "Suspended" will scroll across the top line.
- When the feeder is "running," a rotating wheel is displayed.

Procedures for operating the feeder via the control interface are provided in Section 3, How to Operate.

Pro Series Operation Menus

Objective

This document provides an overview of technician-level menu programming and system configuration of the Pro Series version.

Gaining Access Beyond the Passcode Screen

This Pro Series version of code was designed to restrict access to certain types of non-operational menus and system configurations. As you navigate through the factory-default menus you will notice a PASSCODE screen. Entering the correct PASSCODE will provide access to the non-operational or technician only system menus. The Pro Series feeders/dispensers are shipped with a factory-set access code. This access code is “1”.

Configuring the System Menus

Moving from menu to menu, changing and saving new configurations, and returning to the “suspended” screen, are easily accomplished with the following keys:

Pressing the Up/Down arrow keys will allow you to:

1. Scroll between menus.
2. Scroll between options within each menu.

Pressing the Enter key will allow you to enter and save new values.

Pressing the MENU key will restore old values and return you to the “suspended” screen.



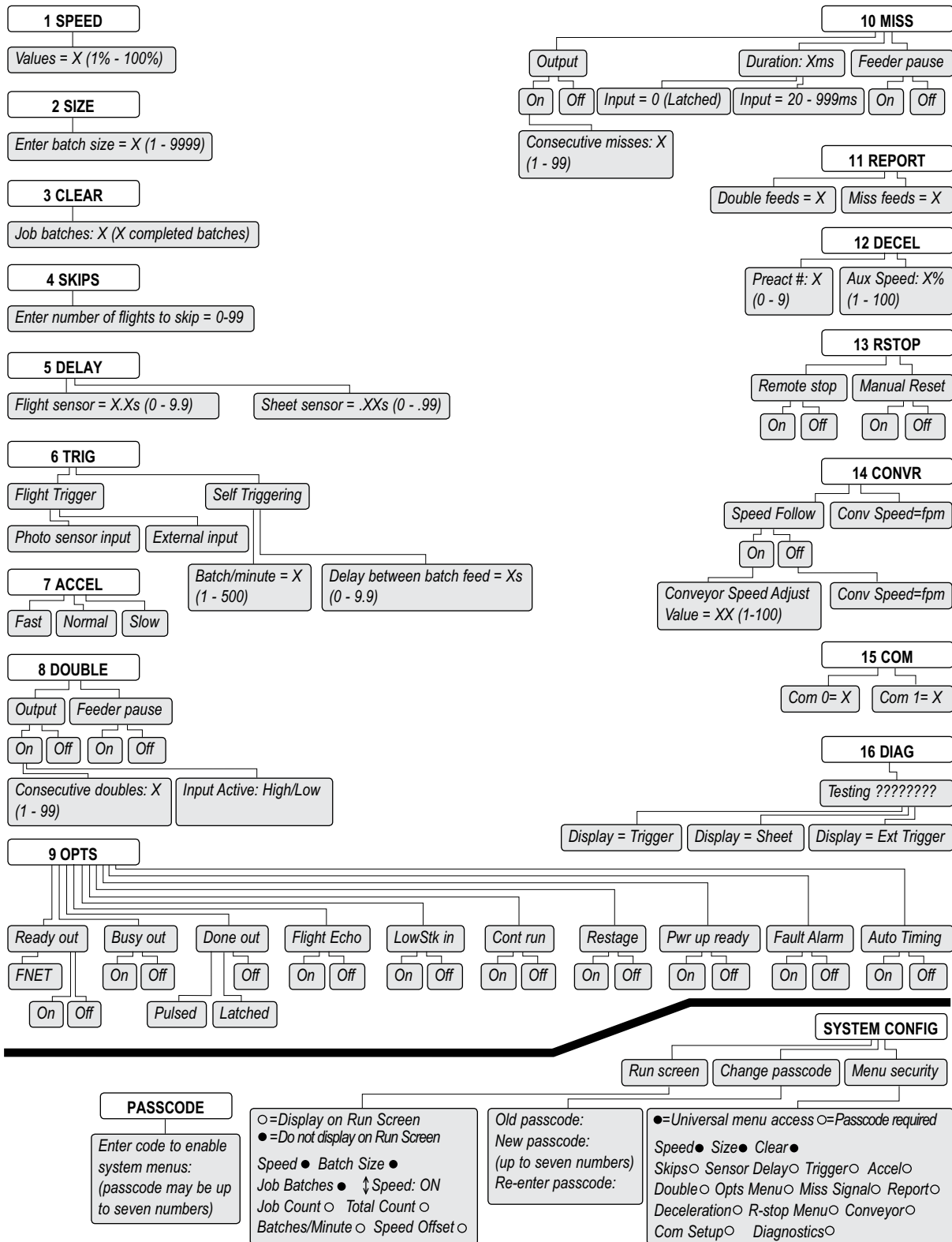
MENU

Pro Series System Menus

MENU 1: SPEED
MENU 2: SIZE
MENU 3: CLEAR
MENU 4: SKIPS
MENU 5: DELAY
MENU 6: TRIG
MENU 7: ACCEL
MENU 8: DOUBLE
MENU 9: OPTS
MENU 10: MISS
MENU 11: REPORT
MENU 12: DECEL
MENU 13: RSTOP
MENU 14: CONVR
MENU 15: COM
MENU 16: DIAG
SYSTEM CONFIG

Pro Series System Menus (continued)

PRO SERIES IQUPPED CONTROLS SOFTWARE MENUS VERSION 1.16 BATCH COUNT



Pro Series System Menus (continued)

MENU 1: SPEED

Allows you to set the desired speed value from 1 to 100 percent (This is the maximum speed when Speed Following = Off; See Menu 14: CONVR).

To change the speed value (If Speed Following = Off):

1. Press the Enter key to engage cursor.
2. Use the Up/Down arrow key or Numeric keypad to reach your desired speed percentage.
- 2a. Press the Enter key to save new speed percentage.
- 2b. Press the MENU key to restore old speed percentage and return to “suspended” screen.

MENU 2: SIZE

Allows you to change the batch size value (If Speed Following = Off)

To change the batch size value (If Speed Following = Off):

1. Press the Enter key to engage cursor.
2. Use the Up/Down arrow key or Numeric keypad to reach your desired batch size.
3. Press the Enter key to save new batch size. OR Press the MENU key to restore old size and return to “Run Display”

MENU 3: CLEAR

Allows you to reset the accumulated number of Cycles completed to zero. Press the Enter key to clear the number.

MENU 4: SKIPS

Allows you to set the number of flights to skip between feeds from 0 to 99.

MENU 5: DELAY

Sets the amount of time that the flight sensor (0.0 to 9.9 seconds) and/or sheet sensor (.00 to .99 seconds) will delay after a flight (or sheet edge) is detected before feeding or before stopping respectively. If Speed Following = On, this will have a direct effect on the dispensing of the product in relation to the feeder trigger point and the encoder position reading.

To enter the delay value:

1. Use the Up/Down arrow keys to position cursor arrow by the sensor (flight or sheet) you wish to delay.
2. Press the Enter key to engage cursor.

Pro Series System Menus (continued)

MENU 5: DELAY (continued)

3. Use the Up/Down arrow keys or Numeric keypad to reach your desired time delay.
4. Press the Enter key to save new time. OR Press the MENU key to restore old time and return to “Run Display.”

MENU 6: TRIG

To select a Flight Trigger method:

1. Use the Up/Down Arrow keys to position the cursor arrow by Flight Trigger.
2. Press the Enter key to select.
3. Use the Up/Down Arrow keys to position the cursor arrow by your desired trigger input: Photo sensor or External.
4. Press the Enter key to select.
5. Press the MENU key to save and return to the MENU 5 primary screen.

To select a Self Triggering method:

1. Use the Up/Down Arrow keys to position the cursor arrow by SelfTriggering.
2. Press the Enter key to select.
3. Use the Up/Down Arrow keys to position the cursor arrow by your desired method: Batch/Minute or Delay Between Batch Feed.
4. Press the Enter key to select.
- 5a. Batch/Minute: Use the Up/Down Arrow keys or numeric keypad to set rate from 1 to 500.
- 5b. Delay Between Batch Feed: Use the Up/Down Arrow keys or numeric keypad to set time from 0.0 to 9.9 seconds.
6. Press the Enter key to save selected value. OR Press the MENU key to restore old input and return to the MENU 6 Trig primary screen.

Pro Series System Menus (continued)

MENU 7: ACCEL

Allows you to set the feeder acceleration rate at Fast, Normal or Slow.

To set or change:

1. Use the Up/Down Arrow keys to position cursor arrow at your desired acceleration.
2. Press the Enter key to select and save. A darkened circle indicates the option has been selected.

MENU 8: DOUBLE

If your feeder is equipped with Double Detection and I/O options, this menu will allow you to do the following if a double feed occurs:

1. Output: OFF/ON
2. Feeder Pause: OFF/ON

To energize the output if a Double occurs:

1. Use the Up/Down Arrow keys to position the cursor arrow by Output.
2. Press the Enter key. This will take you to a submenu where you will choose either Consecutive Doubles OR Average Doubles:
 - a. Consecutive Doubles: (1-99)
 1. Press the Up/Down Arrow keys to position the cursor arrow by Consec Doubles:
 2. Press the Enter key to engage the cursor. Use the Up/Down keys or numeric keypad to set your desired number of doubles before an output signal is generated. (A value of 1 indicates that no doubles are acceptable; a value of 2 indicates that 1 double is acceptable but 2 in a row is not, etc.)
 3. Press Enter to save new value or press Menu to restore old value.
 4. Press the Menu key to bring you up a level, out of the submenu and back to the Double primary screen.
 5. Verify that Output is ON.

Pro Series System Menus (continued)

MENU 8: DOUBLE (continued)

b. Input Active: (High) or Low

1. Press the Up/Down arrow keys to position the cursor arrow by “Input Active: High.”
2. Press the Enter key to change Input Active state from High to Low (or vice versa).
3. Press the Menu key to return to previous menu level (Menu 8 primary screen).

To pause the feeder if a Double occurs:

1. Use the Up/Down Arrow keys to position the cursor arrow by Feeder Pause.
2. Press the Enter key to toggle function “On” or “Off.”

MENU 9: OPTS

This menu will enable you to energize the following inputs or outputs and enable/disable particular features.

1. Use the Up/Down Arrow keys to scroll and view various options that can be selected. Some of these menu items require additional hardware that must be present, and are used to enable the associated optional hardware.
 - a. Ready Out: OFF/ON/FNET
 - b. Busy Out: OFF/ON (Busy out will deactivate if Done Out is selected)
 - c. Done Out: OFF/PULSED/LATCH
 - d. Flight Echo: OFF/ON (Echo Photo Sensor input)
 - e. LowStk In: OFF/ON (Low Stack Detect)
 - f. Cont. Run: OFF/ON (Continuous Run Mode)
 - g. Re-stage: OFF/ON
 - h. PwrUp Ready: OFF/ON
 - i. Fault Alarm: OFF/ON
 - j. Auto Timing: OFF/ON (Automatically adjust feeder trigger timing based on time from trigger input to the next trigger input – MUST be set to Off for Speed Following to work as designed).

Pro Series System Menus (continued)

MENU 9: OPTS (continued)

2. Use the Up/Down Arrow keys to position the cursor arrow by the item you wish to change.
3. Press the Enter key repeatedly to change the option to the desired parameter.
4. When finished, pressing the Menu key will take you back to the "Run Display." Auto Timing – (Automatically adjust feeder trigger timing based on time from trigger input to the next trigger input – MUST be set to Off for Speed Following to work as designed).

Auto Timing:

The Auto Timing feature of the code uses the flight (photo) sensor input signals from a conveyor lug and determines over a brief period the proper trigger timing of the feeder to achieve the best placement of the product in the pocket. The important factor when setting up the auto timing option is the position of the flight sensor in relation to the feeder and where the conveyor lug is to be monitored.

In a collator system setup it is to be assumed that the feeders would be evenly positioned apart from each other at a distance equal to the spacing of the conveyor lugs. With this in mind the placement of the flight sensor will dictate where the feeders are to be positioned (in relation to the speed of the lugs passing by the sensor) into the pocket.

Auto Timing Setup:

The desired set up method is to place the flight sensor (pointing at the conveyor lug) before the feeder (approx. 6-8 inches) and then run the conveyor at a minimal speed and observe where the feeder is feeding into the pocket. Adjust the triggering timing by moving the flight sensor forward or backward and again observe where the product falls into the pocket so the product achieves the best possible placement in the pocket. Continue moving the flight sensor until the product is delivered into the desired position within the pocket. Once the positioning is satisfied the Auto Timing feature has been setup.

The delay from when the conveyor lug is seen to the time the feeder is triggered will then depend upon the conveyor speed. As the conveyor speed increases, the feeder flight timing delay should decrease so that the product continues to feed into the desired position within the pocket. As the conveyor speed decreases, the feeder flight timing delay should increase so that the product continues to feed into relatively the same desired position within the pocket.

Pro Series System Menus (continued)

MENU 10: MISS

If your feeder is equipped with the Systems Interface I/O option, this menu will allow you to activate the Miss Output and configure its operation as follows:

1. Output: OFF/ON
2. Duration: 20mS to 999mS (Default is 100mS)/0 LATCHED
3. Feeder Pause: OFF/ON

To energize the output if a Miss occurs:

1. Use the Up/Down Arrow keys to position the cursor arrow by Output.
2. Press the Enter key. This will take you to a submenu where you will choose either Consecutive Misses OR Average Misses:

Consecutive Misses: (1-99)

1. Press the Enter key to engage the cursor. Use the Up/Down keys or numeric keypad to set your desired number of misses before an output signal is generated. (A value of 1 indicates that no misses are acceptable; a value of 2 indicates that 1 miss is acceptable but 2 in a row is not, etc.)
2. Press Enter to save new value or press Menu to restore old value.
3. Press the Menu key to bring you up a level, out of the submenu and back to the Miss primary screen.
4. Verify that Output is ON.

To set the length of time the Miss Fault output will be energized in the event of a miss:

1. Use the Up/Down Arrow keys to position the cursor arrow by Duration.
2. Press the Enter key to engage the cursor.
3. Use the Up/Down keys or numeric keypad to set your desired value. (20mS to 999mS). However, you may enter a value of zero. This will cause the Miss Output to latch "On" in the event of a Miss. The Miss Fault output will remain latched until the next Flight Trigger is received.

Pro Series System Menus (continued)

MENU 10: MISS (continued)

4. Press Enter to save new value.
OR
Press Menu to restore old value and return to “Run Display.”

To pause the feeder if a Miss occurs:

1. Use the Up/Down Arrow keys to position the cursor arrow by Feeder Pause.
2. Press the Enter key to toggle function “On” or “Off.”

MENU 11: REPORT

This menu reports the total number of double and missed feeds that have occurred. To reset these numbers to zero:

1. Use the Up/Down Arrow keys to position the cursor arrow by the count you wish to clear: Double Feeds or Miss Feeds.
2. Press the Enter key to reset count to zero.

MENU 12: DECEL

Allows you to set the point at which the feeder decelerates or accelerates and the speed to which it decelerates or accelerates. The feeder can begin deceleration from 1 to 9 pieces before the end of the batch. To set the exact deceleration point:

1. Use the Up/Down Arrow keys to position cursor arrow at Preact #.
2. Press the Enter key to engage cursor.
3. Use the Up/Down Arrow keys or numeric keypad to enter your desired deceleration point (1 to 9).
4. Press the Enter key to save selected input.
OR
Press the MENU key to restore old count and return to “Run Display.”

To set the decelerate speed :

1. Use the Up/Down Arrow keys to position cursor arrow at Aux Speed.
2. Press the Enter key to engage cursor.

Pro Series System Menus (continued)

MENU 12: DECEL (continued)

3. Use the Up/Down Arrow keys or numeric keypad to enter your desired speed (1 to 100 percent).
4. Press the Enter key to save selected input.
OR
Press the MENU key to restore old speed and return to “Run Display.”

MENU 13: RSTOP

If your feeder is equipped with I/O and optional remote stop module, this menu will allow you to configure:

1. Remote Stop: OFF/ON.
2. Manual Reset: OFF/ON.

To configure the feeder for either Remote Stop or Manual Reset:

1. Use the Up/Down Arrow keys to position the cursor arrow by Remote Stop or Manual Reset.
2. Press the Enter key to turn “On” or “Off.”

Pro Series System Menus (continued)

IMPORTANT

Speed Following Pre-installation Instructions

MENU 14: CONVR

Theory of operation:

The speed following package allows the use of an encoder to provide an exact representation of the speed of an attached conveyor. Once the feeder knows the speed of the conveyor, the feeder can automatically adjust the speed of the feeder. Adjusting the speed of the feeder to match the speed of the conveyor allows us to gently place the product down onto the conveyor without damage and maintain good product control.

SETUP

Measure Conveyor Speed:

The maximum conveyor speed must be measured in Ft/Min. Depending on the size of the product, the maximum line speed will eventually be determined by the top speed of the feeder and the speed it can maintain for accurate placement. This package was designed to run from 10 to 300 Ft/Min.

Encoder Placement:

The encoder may be mounted to a shaft that spins when the conveyor is moving (using a flexible coupling) or use a wheel that rides on a motor shaft with connection to the encoder. Direct coupling to the end of a shaft or the use of a wheel riding on a shaft is preferred over a chain or belt drive to prevent windup and increase accuracy of readings.

Encoder Calibration:

The encoder must be calibrated so the feeder can convert the pulses coming from the encoder into a speed in Ft/Min. In menu 14 or the Convey menu there is a calibration setting and a speed display. To set the calibration you must:

- 1) Start the conveyor and bring it to a constant speed
- 2) If the speed of the conveyor is not known, measure the actual speed of the conveyor
- 3) Change the feeder to menu 14
- 4) Turn Speed Follow ON
- 5) Adjust "Conveyor speed adjust value" (1 thru 100, then press the ENTER key) until the conveyor speed displayed on the line above is equal or close to the actual conveyor speed.

Pro Series System Menus (continued)

MENU 14: CONVR (continued)

IMPORTANT

Speed Following Pre-installation Instructions

SETUP (continued)

6) The following table is a sample of how the encoder speeds (RPM), adjust value (ADJ) and conveyor speeds (FPM) are related.

	ADJ=2	ADJ=5	ADJ =10	ADJ =20	ADJ =30	ADJ =40	ADJ =50
RPM=60	FPM=8	FPM=20	FPM=40	FPM=80	FPM=120	FPM=160	FPM=200
RPM=100	FPM=13	FPM=33	FPM=67	FPM=134	FPM=200	FPM=267	FPM=334
RPM=200	FPM=27	FPM=67	FPM=134	FPM=268	N/A	N/A	N/A
RPM=300	FPM=40	FPM=100	FPM=200	N/A	N/A	N/A	N/A
RPM=400	FPM=53	FPM=133	FPM=267	N/A	N/A	N/A	N/A
RPM=500	FPM=67	FPM=167	FPM=334	N/A	N/A	N/A	N/A
RPM=600	FPM=80	FPM=200	N/A	N/A	N/A	N/A	N/A
RPM=700	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Feeder Speed:

With Speed Following turned on, the feeder's speed setting becomes the maximum speed for the feeder. Also, when feeding, the minimum Auto Speed is equal to 10%.

Fine Tuning:

The system may be fine tuned with product running. From the main run screen, the up/down arrow keys are used to adjust the Speed Offset setting, which allows the operator the ability to slow down the feeder speed (max -100) or speed up the feeder speed (max +100) through the conveyor speed changes.

Misc.:

- 1) Speed Following should not be used in 90 degree or right angle feeding.
- 2) Speed Following cannot be used without Auto Timing.
- 3) The maximum RPM of the encoder must not exceed 600.

Pro Series System Menus (continued)

MENU 14: CONVR (continued)

Adjusts the calculation of conveyor speed by changing the “Conveyor speed adjust value” setting. The “Conveyor speed adjust value” can be set from 1 to 100. Increasing the value will increase the measured conveyor speed. The ideal value should be set to correspond to the number of inches per revolution of the encoder. This information is conveyed to the operator by the conveyor speed in Feet per Minute on line 2 within MENU 14 (CONVEYOR CONFIG menu display) or on line 4 of the CONVR main menu display. This allows you to confirm that the sensor is correctly connected. The “Conveyor speed adjust value” setting should be verified by comparing the conveyor speed reading in feet per minute to the known speed of the conveyor.

If your feeder is equipped with an encoder, this menu will allow you to do use the Speed Following feature.

1. Enable: OFF/ON
2. Conv Speed: XXXX fpm (present configured conveyor speed in feet per minute)

To configure the conveyor speed to mirror the actual conveyor speed:

1. Press the Enter key. This will take you to a submenu where you will enter the “Conveyor speed adjust value”.
2. The “CONV Speed” line shows the speed of the conveyor in feet per minute, as the feeder is presently configured, this value directly corresponds to the conveyor speed adjust value. To change the Conveyor Speed display to reflect the actual conveyor speed, press the Enter key to engage the cursor.
3. Use the Up/Down arrow keys or numeric keypad to enter the desired “Conveyor speed adjust value” (1 to 100) to change the “CONV Speed” value to what the conveyor speed is or approximately is.
4. Press the Enter key to save the selected Conveyor speed adjust value and to update the newly calculated Conveyor speed value in the line above.

OR

Press the MENU key to restore the old values and return to previous menu level (Menu 14 primary screen).

Pro Series System Menus (continued)

MENU 15: COM

You may connect the feeder Communication Port to an RS-232 terminal to observe current feeder values stored in memory. Bold numbers shown are factory defaults.

1. Com0 Baud: 2400, 9600, 19200, 28800, 38400, 57600, or 115200.
2. Com1 Baud: 2400, 9600, 19200, 28800, 38400, 57600, or 115200.

Serial Command Function	Command syntax	Options
set feeder speed	<stx>s!x<cr>	x=speed 1-100%
set batch size	<stx>b!x<cr>	x=batch size 1-9999
set sheet delay	<stx>d!x<cr>	x=delay 0-99ms
trigger / flight	<stx>t!<cr>	
r-stop	<stx>r!<cr>	
feeder reset command	<stx>f!<cr>	
clear miss counter	<stx>mc!<cr>	
clear double counter	<stx>dc!<cr>	
clear job batches counter	<stx>tc!<cr>	
current setup query	<stx>?!<cr>	
read miss counter	<stx>mc?<cr>	
read double counter	<stx>dc?<cr>	
read total counter	<stx>tc?<cr>	

Pro Series System Menus (continued)

MENU 15: COM (continued)

To set up a Communication Port for a new baud rate:

1. Use the Up/Down Arrow keys to position the cursor arrow by the Communication Port that you wish to set up.
2. Press the Enter key to engage the cursor.
3. Use the Up/Down Arrow keys to select the baud rate that you wish to use.
4. Press Enter to save new value.

OR

Press Menu to restore old value and return to "Run Display."

To view current values stored:

1. Properly connect an RS-232 terminal to the feeder Communication Port. This port is connected to Com0 at the factory. Configure your terminal's Bits per Second setting to the baud rate you choose for Com0. Also configure the terminal to Data Bits: 8, Parity: None, Stop Bits: 1, Flow Control: None.
2. With the feeder turned OFF, press and hold the green Cycle key on the keypad while turning the feeder power ON.
3. The current values will be dumped to the terminal screen.

MENU 16: DIAG

The Diagnostic Menu is available to provide a means of testing three vital inputs to the CPU board. Two of these inputs are the Trigger Input and the Sheet Sensor Input. The third input is only included with the optional Systems Interface I/O package. Your feeder is equipped with the optional Systems Interface I/O package only if a 14-pin connector labeled "I/O" is present.

To test the Trigger Input:

1. Check the "Run Display" to make sure the feeder is in "Suspended" mode. If not, press the red Stop key. "*suspended*" should be scrolling across the display.
2. Navigate to the DIAG menu. The two lower lines of the display will read:
Testing: ??????????
Trigger Sensor Now

Pro Series System Menus (continued)

MENU 16: DIAG (continued)

3. Assert the Trigger Input. This input most commonly has a photo electric sensor connected to it and is referred to as the “Flight” sensor.
4. Observe the “Testing: ????????” line of the display.
 - a) If the input is operating correctly, the question marks will be replaced with the word “Trigger” each time the input is asserted.
 - b) If “Trigger” is not displayed on the testing line, the signal is either not making its way to the CPU board at connector J5, or the input is bad. Refer additional troubleshooting to a qualified technician.

To test the Sheet Input:

1. Check the “Run Display” to make sure the feeder is in “Suspended” mode. If not, press the red Stop key. “*suspended*” should be scrolling across the display.
2. Navigate to the DIAG menu. The two lower lines of the display will read:
Testing: ????????
Trigger Sensor Now
3. Assert the Sheet Input. This input has a photoelectric sensor connected to it, that is located near the discharge area of the feeder. It senses the “Sheet” material being fed through the feeder. Alternately cover and uncover the sensor.
4. Observe the “Testing: ????????” line of the display.
 - a) If the input is operating correctly, the question marks will be replaced with the word “Sheet” each time the input is asserted.
 - b) If “Sheet” is not displayed on the testing line, the signal is either not making its way to the CPU board connector J6, or the input is bad. Refer additional troubleshooting to a qualified technician.

Pro Series System Menus (continued)

SYSTEM CONFIG

The System Configuration is broken into three main sections:

1. Run Screen
2. Change Passcode
3. Menu Security

To change the information that is currently displayed on your “Run Screen”:

1. Use the Up/Down arrow keys to position cursor by “Run Screen.”
2. Press the Enter key to select.
3. Use the Up/Dwon arrow keys to scroll and view the various information that can be displayed, such as:
 - a. Speed
 - b. Batch Size
 - c. Job Batches
 - d. Job Count
 - e. Total Count
 - f. Batches/Minute
 - g. Speed Offset
 - h. Up/Down arrow speed (or Speed Offset if Speed Matching = 1) keys (On/Off)
4. Position the cursor arrow by the item you wish to have displayed.
5. Press the Enter key to select. A darkened circle indicates that the item is selected for viewing.
6. When finished, press the MENU key to return to the main System Configuration screen.

Pro Series System Menus (continued)

SYSTEM CONFIG (continued)

To change your system menus passcode:

1. Use the Up/Down Arrow keys to position cursor arrow by “Change Passcode.”
2. Press the Enter key to select.
3. Use the numeric keypad to enter your current passcode.
4. Use the numeric keypad to enter your new passcode; press the Enter key.
5. Use the numeric keypad to re-enter your new passcode.

To specify the menus that are operator accessible:

1. Use the Up/Down Arrow keys to position cursor arrow by “Menu Security.”
2. Press the Enter key to select.
3. Use the Up/Down Arrow keys to scroll and view the various menus that can be operator accessible.
4. Position the cursor arrow by the menu you wish to have displayed.
5. Press the Enter key to select. A darkened circle indicates the menu is operator accessible.
6. When finished, press the MENU key to return to the main System Configuration screen.

Small Product Narrowing Kit

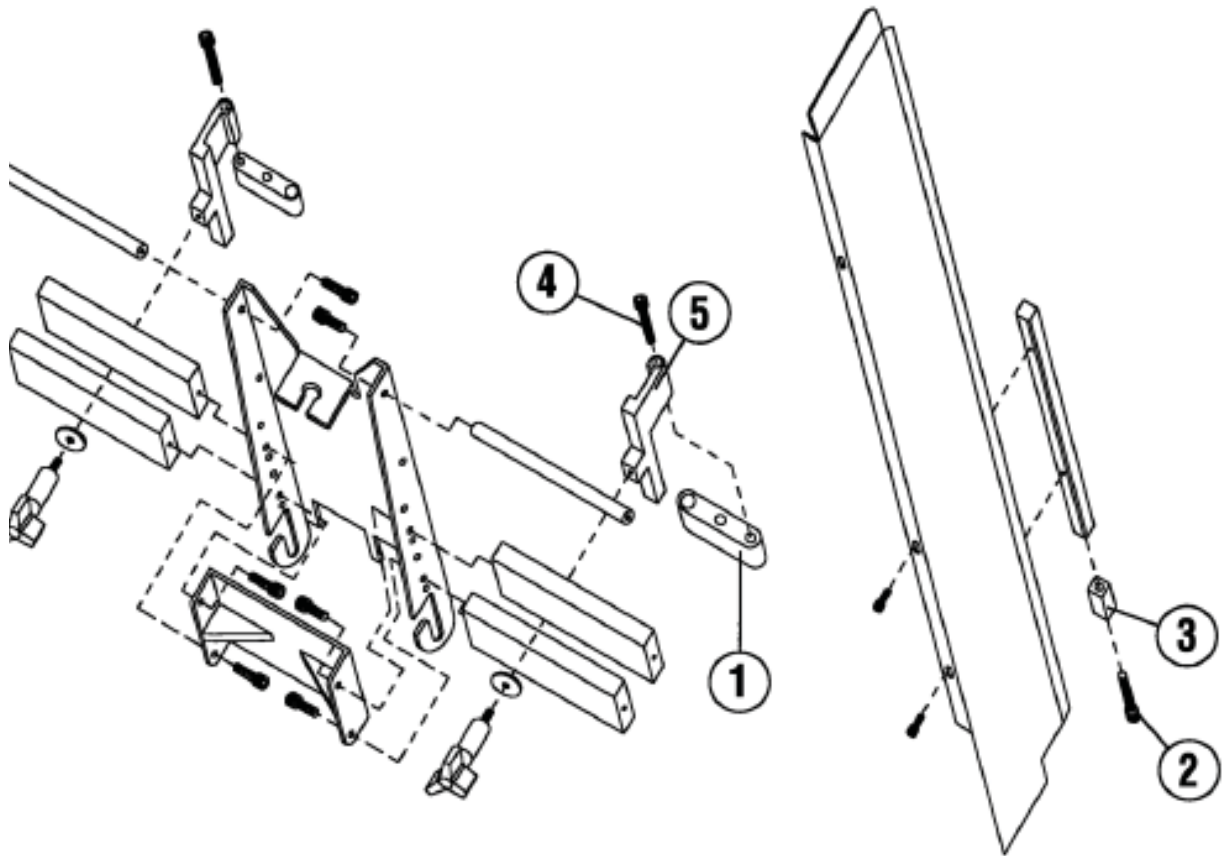


Diagram Number	Qty	Description	Part Number
1	2	Side Guide Extension Bracket	33500040
2	2	SHCS 1/4-20 x 1 1/2	00002396
3	2	Side Guide Mounting Spacer	43500158

Items 4 and 5 are S-1750/S-1750IJ components and not included in Side Guide Narrowing Kit.
Inclusion is for instruction purposes only.

To Install:

Remove screw (4) from side guide mounting. Install extension (1) to bottom side of adjuster (5) using screw (4).

Install screw (2) through non-threaded hole on extension (1), through spacer (3), and into side guide mounting.

Note: The upper mounting supports (not shown) must be disconnected to allow the side guides to close down to 2 inches.



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