Pro Series ST-1450

Manual

Thiele Technologies
A Barry-Wehmiller Company

Streamfeeder®

Part Number: 00900269

Thiele Technologies, Inc. - Streamfeeder
103 Osborne Road
Minneapolis, MN 55432-3120 USA

TEL: 763.502.0000
FAX: 763.502.0100
E-MAIL: service@streamfeeder.com
WEB: www.streamfeeder.com

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SAFETY

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.

SAFETY

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 Streamfeeder has made every effort 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 by Streamfeeder.

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:	14.5 in. W x 9 in. L (368 mm x 228 mm)
With Optional Deck Extension	14.5 in. W x 14 in. L (368 mm x 355 mm)
Minimum Product Size:	3.75 in. W x 2.5 in. L (95 mm x 63 mm)
Optional	2 in. W x 2.5 in. L (51 mm x 63 mm)
Min/Max Product Thickness:	.003 in. to 1 in. (.076 mm to 25.4 mm)
Belt Speed:	5500 in.min (140,000 mm/min)
Electrical Requirements:	115/230vac, 50/60 Hz, 3A
Weight:	84 lbs. (40.367kg)
Warranty:	One-year limited

1 About the Machine

Main Features

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

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

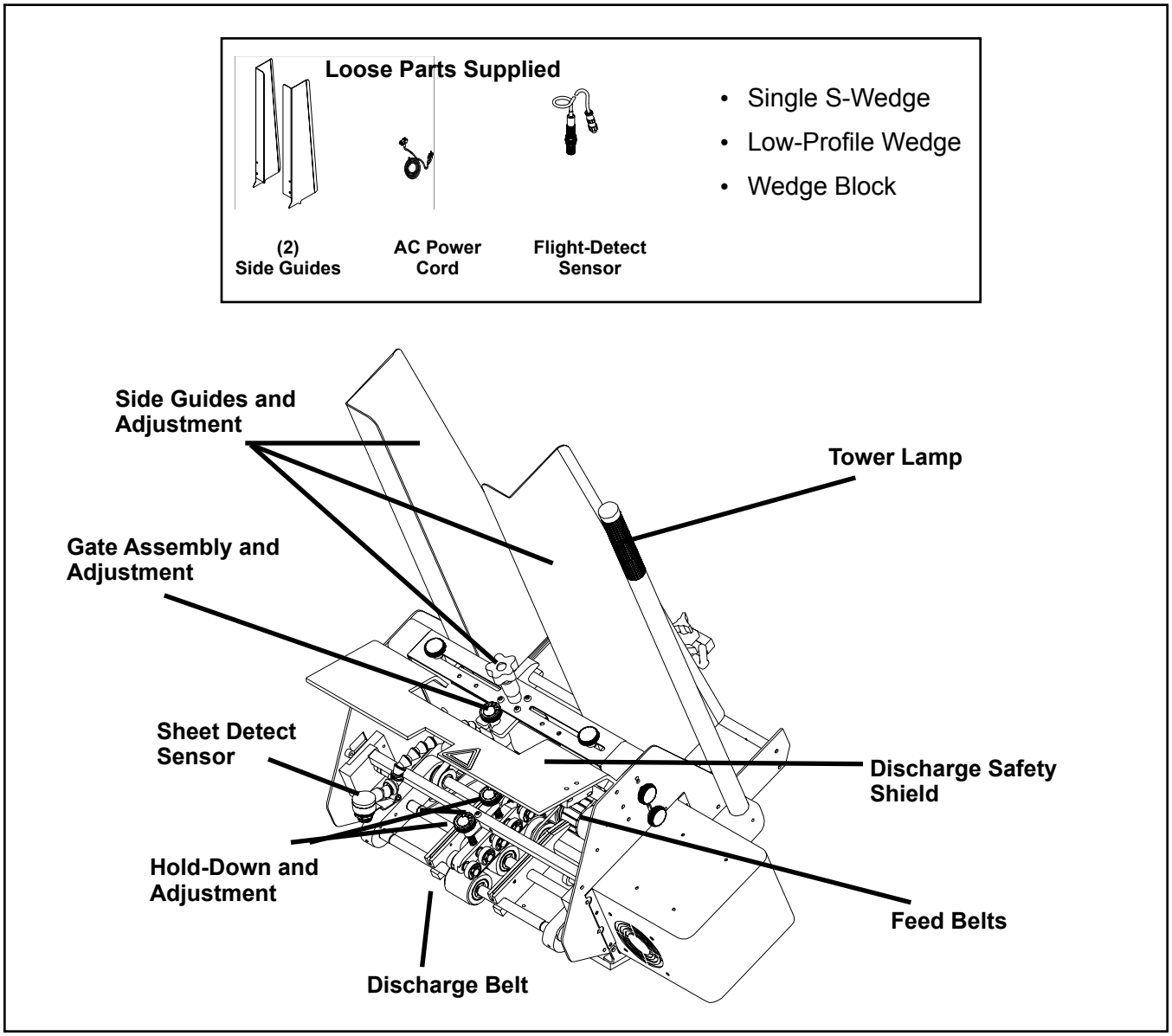


Figure 1-1. Main Assemblies of ST 1450

Table 1-1. Main Assemblies Feature Descriptions

Feature	Description
Gate assembly and adjustment	Mounted on a gate plate directly above the feed belts, this device provides a curvature to help preshingle stacked product. Adjustment knob allows you to set downward pressure. When properly adjusted, a one-thickness gap is created to help singulate and eject product.
Side guides and adjustments	Holds a stack of product to be fed and helps keep it straight for proper entry through the gate assembly area. Adjustment knob allows you to move the side guides equally offset for different size products.
Back wedge and adjustments	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. To achieve proper lift, adjustment wing-nuts allow you to adjust the wedge to various positions and angles.
Hold-down and adjustments	This series of rollers provides a varying pressure on top of product to force it down on the discharge belt, helping to eject a single product after it exits the gate assembly area. During setup, knobs allow you to set downward pressure.
Sheet-detect sensor	Mounted on an extension arm, it “looks” for the leading edge of the product to stop the feeder momentarily. For effective operation, a flexible extension allows you to adjust for distance and perpendicular to product.
Flight-detect sensor (not shown)	Mounted at a remote location, it “looks” for a target on-line (such as a conveyor lug) to initiate a feed cycle.
Feed belts	Provides the friction and motion necessary to pull individual product from the bottom of the stack and through the gate assembly area.
Discharge belts	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.
External IQuipped control box (not shown)	All connectors and switches for sensor, interface, and AC power are located here. Also contains numeric keypad and vacuum fluorescent display for operator control interface. For descriptions, see Figure 1-2 and Table 1-2.
Discharge safety shield	Provides residual risk protection to operator when feeder is running.
Stand (optional) (not shown)	Supports the feeder and allows for easy mobility. Includes built-in height adjustment.
Tower lamp	Mounted on the feeder, it contains green, amber, and red colored lights which alert the operator to various status conditions.

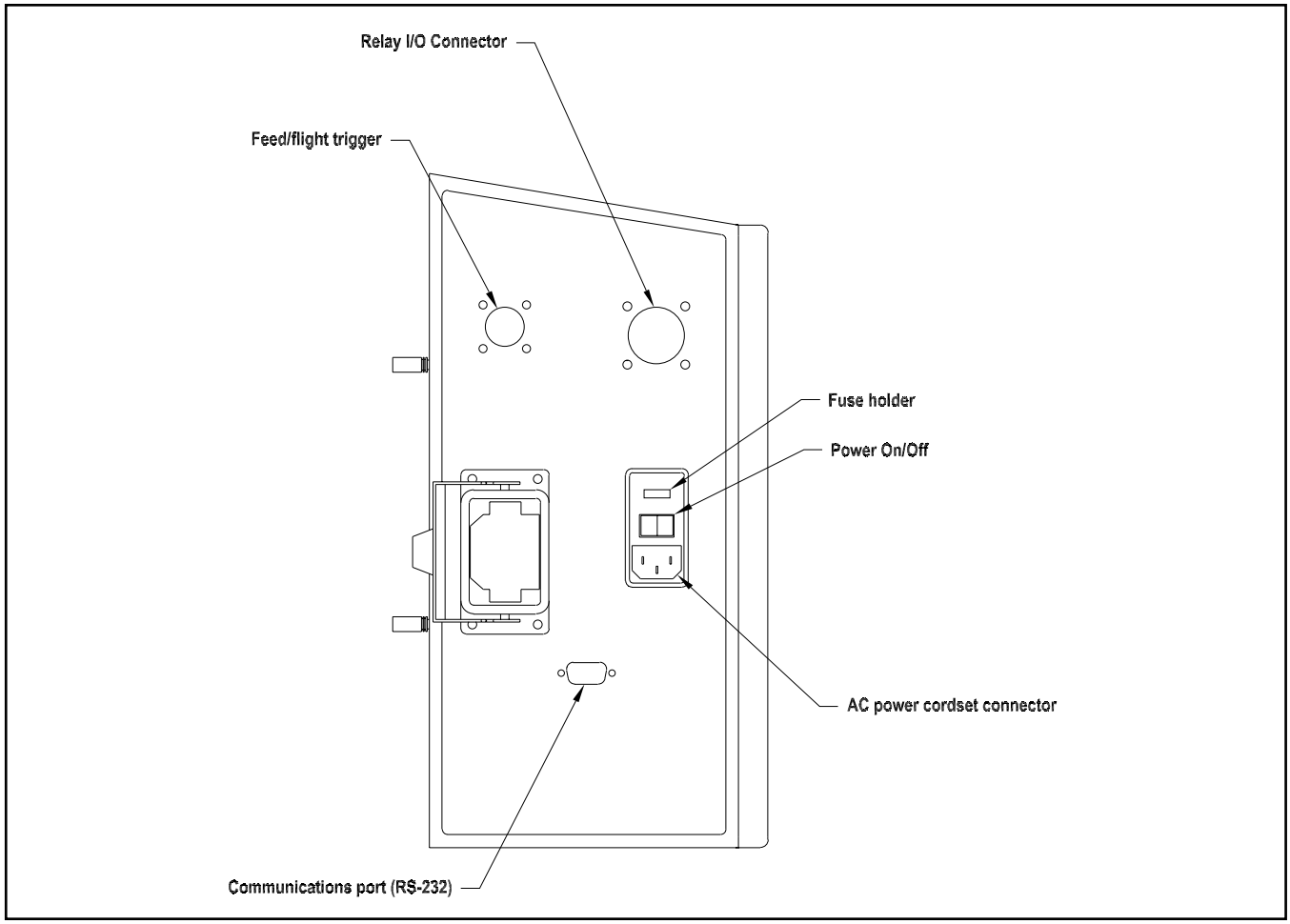


Figure 1-2. IQuipped Box Features

Table 1-2. 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 a replaceable GMD3, 3-Amp, 5-mm fuse. *IMPORTANT: Always make sure power module is replaced exactly as removed. Failure to follow this caution can result in damaged electrical parts.*
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 ST-1450, but it also allows you to monitor the status of the job being run.

Refer to Figure 1-3 for names and locations of each part of the control interface. Descriptions are found in Table 1-3.

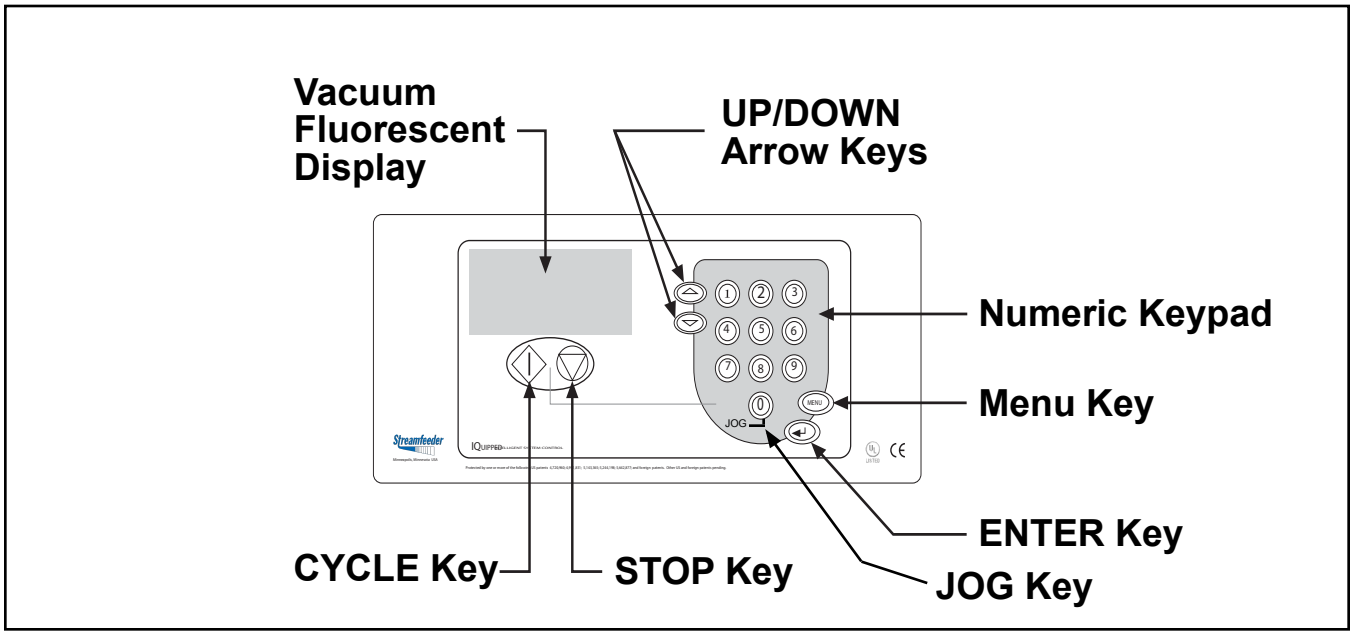


Figure 1-3. Control Interface Features

Table 1-3. 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. 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.

Run Display Defined

The Run Display 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*.

IMPORTANT

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

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 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, open the discharge safety shield (to disengage the interlock), and disconnect feeder from the electrical power source. Failure to do so can expose you to a potential start-up and moving parts which can cause serious injury.

Do not attempt to make any adjustments while the 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 Streamfeeder ST 1450 is installed, you are ready to prepare the machine for operation. You will need to perform several adjustments with the product you are going to be feeding. You must also do a test run with this product to verify it is set correctly before going on-line. *You will have to perform this procedure for each product 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 adjustment
6: Manual test to verify

STEP 1: Gate Assembly Adjustment

NOTE

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

NOTE

Keep in mind 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 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 (counterclockwise) the gap between gate assembly and the feed belts. Depending upon 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.

STEP 1: Gate Assembly Adjustment (continued)

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

TIP

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 (Figure 2-1).
2. Grasp the product with two hands and slide front-to-back under the gate assembly (Figure 2-2). 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, counterclockwise to decrease gap (Figure 2-3).

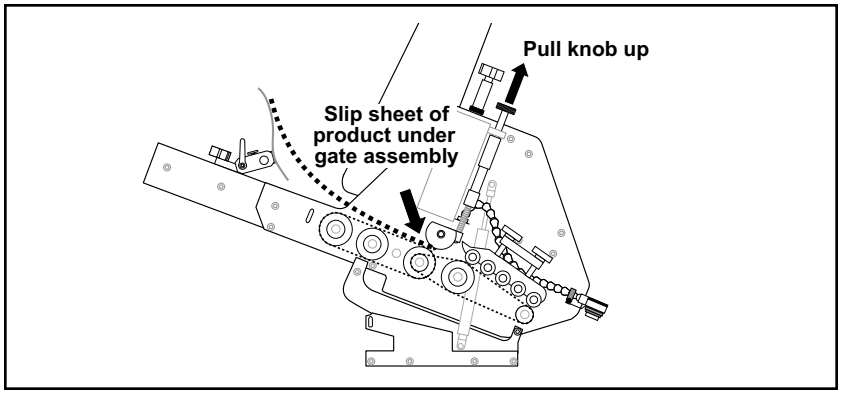


Figure 2-1. Lifting Gate Assembly Upward to Insert Product

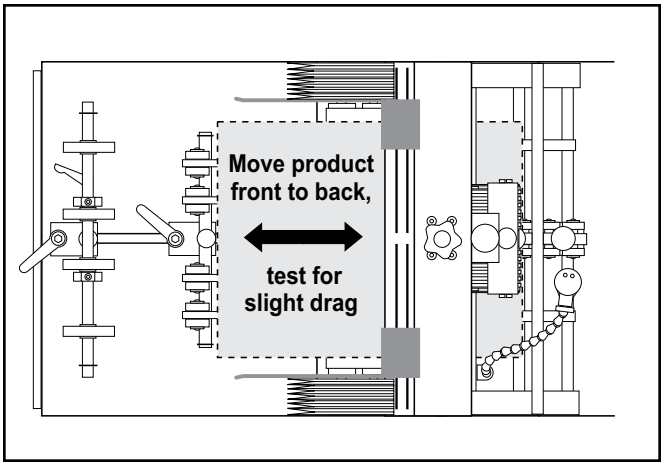


Figure 2-2. Using One-Piece Thickness of Product to Set Gap

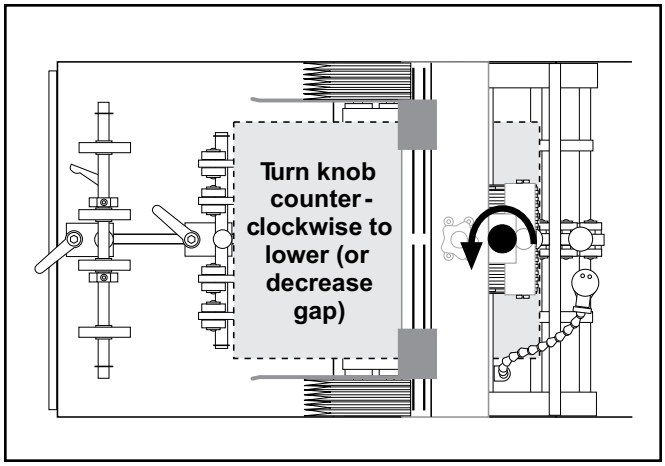


Figure 2-3. Adjusting Gate Assembly for Correct Gap

STEP 1: Gate Assembly Adjustment (continued)

NOTE

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

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

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

IMPORTANT

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

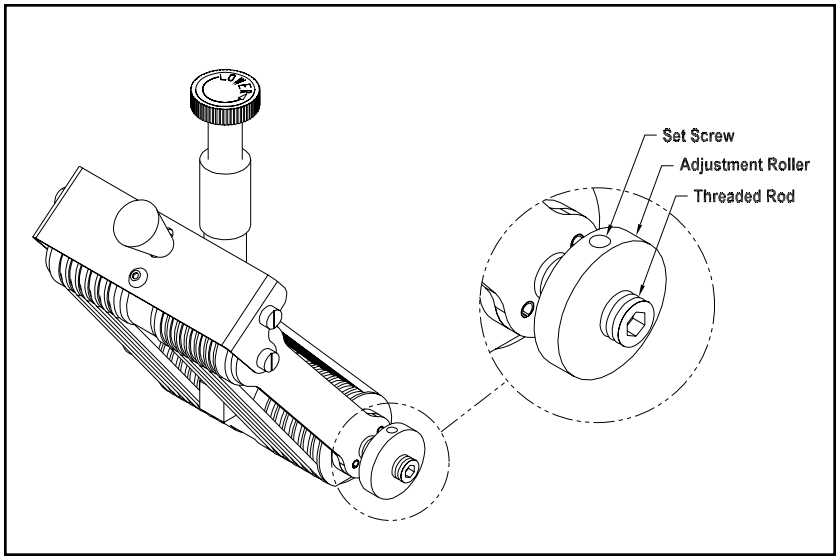


Figure 2-4. Horizon Adjustment Mechanism (shown on Advancing O-Ring Gate)

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 counterclockwise (Figure 2-5A).
3. Lift the cylinder off of top of spring (Figure 2-5B).
4. Turn the cylinder around so that the cylinder collar faces up (Figure 2-5C).
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).

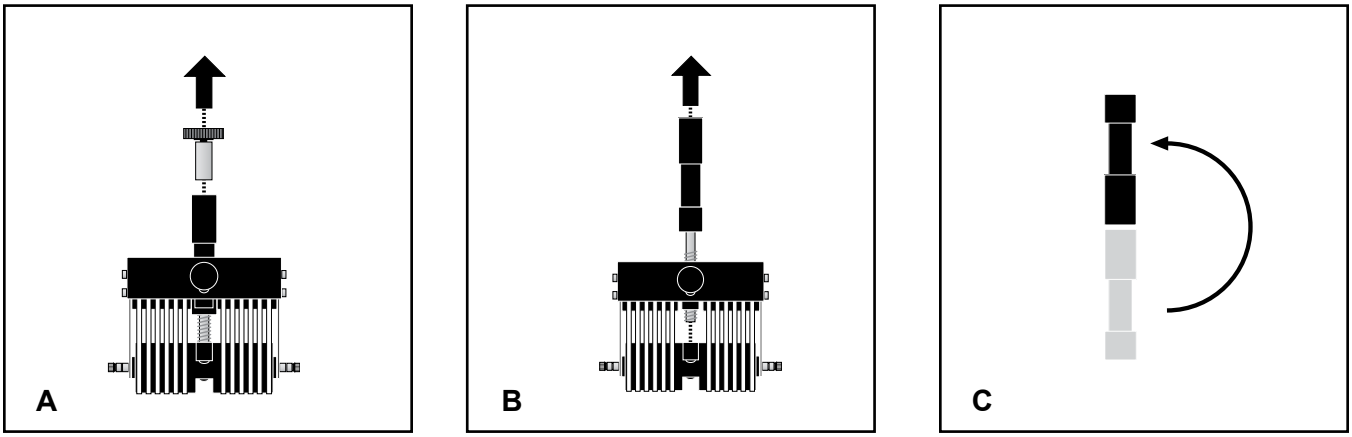


Figure 2-5. Adjusting Gate Assembly for Low-Tension

STEP 2: Side Guides Setting

Review

The side guides hold the stack of product being fed and help 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 the product stack maintains uniformity from top to bottom with no drifting or binding. Adjustments are made *horizontally*.

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

- An initial starting point should always be that each guide is of equal distance from the center point of the machine.
- Each edge of the product should rest equally on belts either side of gate assembly (or equidistant spacing). *There can be certain instances where guides do not need to be centered due to product characteristics. This is called offset spacing.*
- 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.

TIP

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).

Procedure

To adjust each side guide for proper *equidistant* horizontal spacing, follow these steps (Figure 2-6):

1. Place a small stack of product in the hopper.
2. Using the side guides adjustment knob (centrally located between the two guides), turn in either direction until guides are located at the recommended distance from the product: 1/16 in. (1.6 mm) for each edge, 1/8 in. (3.1 mm) overall.
3. Visually check both guides for proper spacing from product.

STEP 2:
Side Guides Setting (continued)

To adjust each side guide for proper *offset* horizontal spacing, follow these steps (Figure 2-7):

1. Push down on the side guides adjustment knob to disengage guides from gear mechanism.
2. Grasp whichever side you wish to offset first and move into position.
3. Place a small stack of product in the hopper with edge of paper against offset guide.
4. Move the second side guide so it is located at the recommended distance from the product; 1/16 in. (1.6 mm) for each edge, 1/8 in. (3.1 mm) overall.
5. Lift up on the adjustment knob so the guides lock into place.
6. Visually check both guides for proper spacing from product.

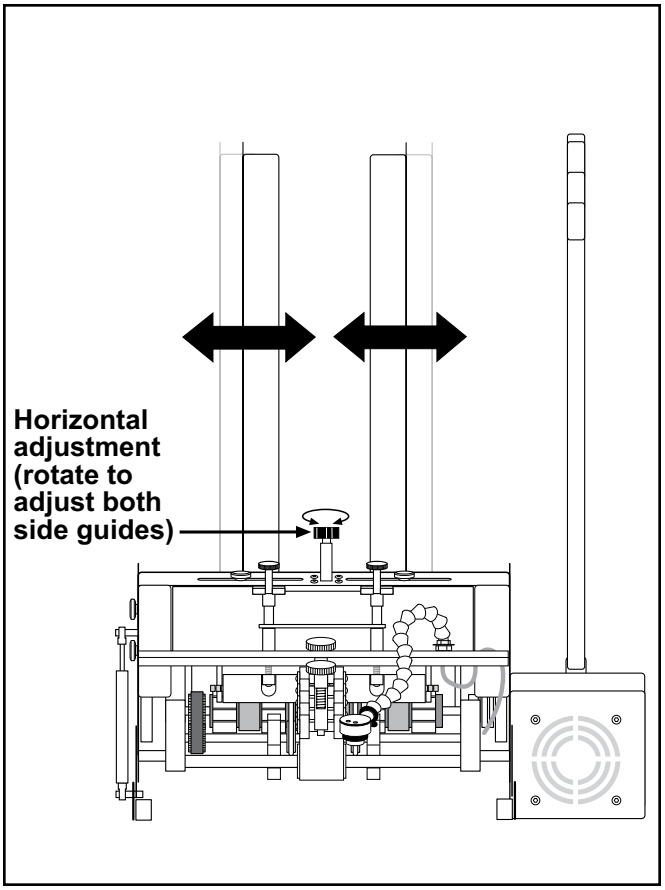


Figure 2-6. Horizontal Adjustment of Side Guides

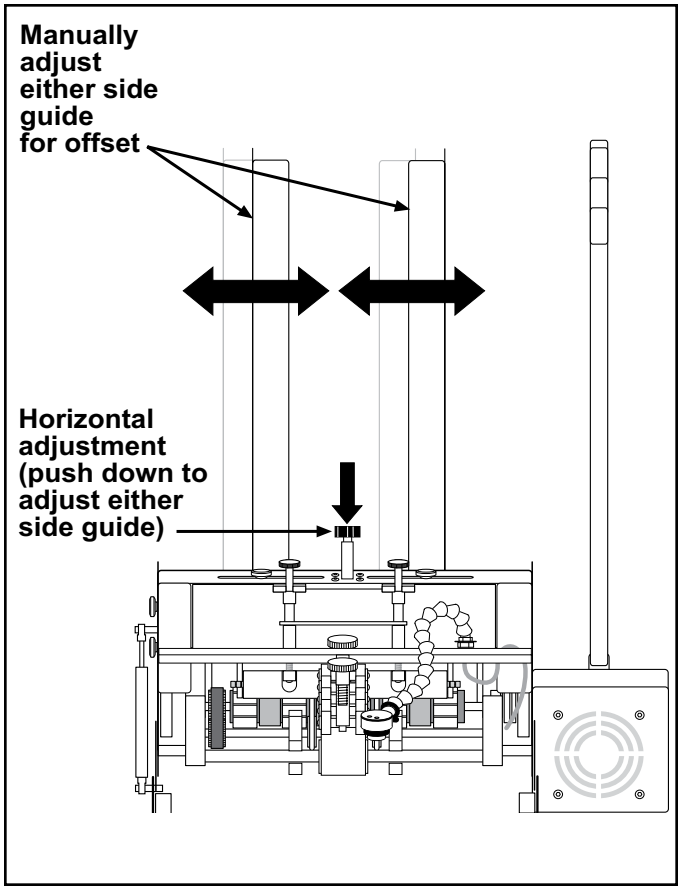


Figure 2-7. Individual Side Guide Offset

STEP 3: Back Wedge Adjustment

NOTE

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

TIP

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

NOTE

For more information about optional wedges and their use with various products, see Section 6, Additional Wedges.

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:

- *If the back wedge is positioned too far backward* from the gate assembly, 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 (Figure 2-8A), 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 (Figure 2-8B), a pinch point can be created between the top surfaces of the individual rollers and the product. Moving the back wedge closer toward the gate assembly allows product to hang over the wedge, creating too much lift of the product off the feed belts.

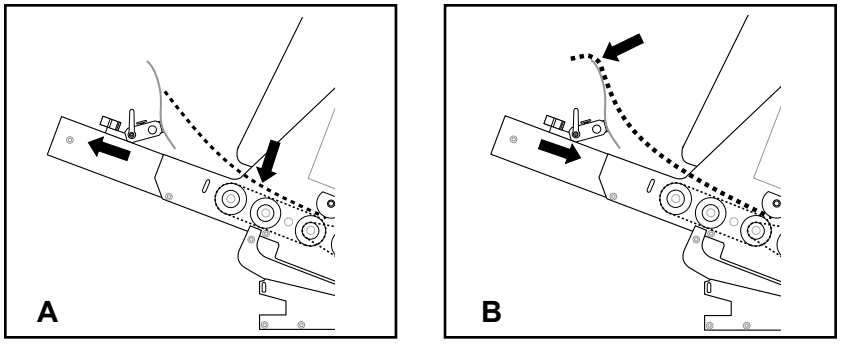


Figure 2-8. Tips for Proper Back Wedge Adjustment

STEP 3: Back Wedge Adjustment (continued)

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 (Figure 2-9).
2. Place the preshingled material in the hopper so the edges rest against the curvature of the gate assembly (Figure 2-10).
3. Turn the back wedge wing-nut adjustment counterclockwise to loosen the wedge (Figure 2-10).

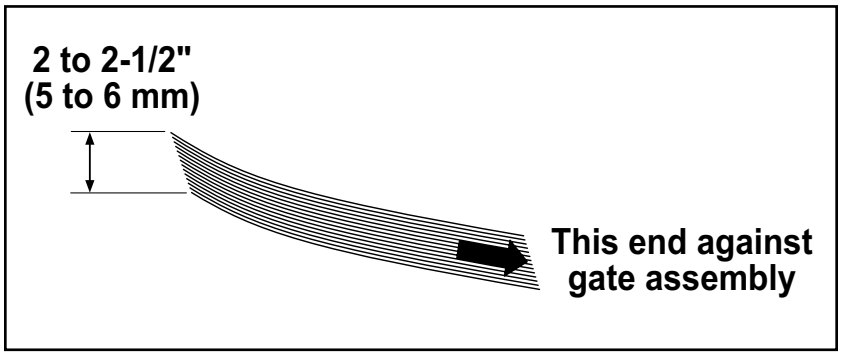


Figure 2-9. Preshingling a Small Stack of Material By Hand

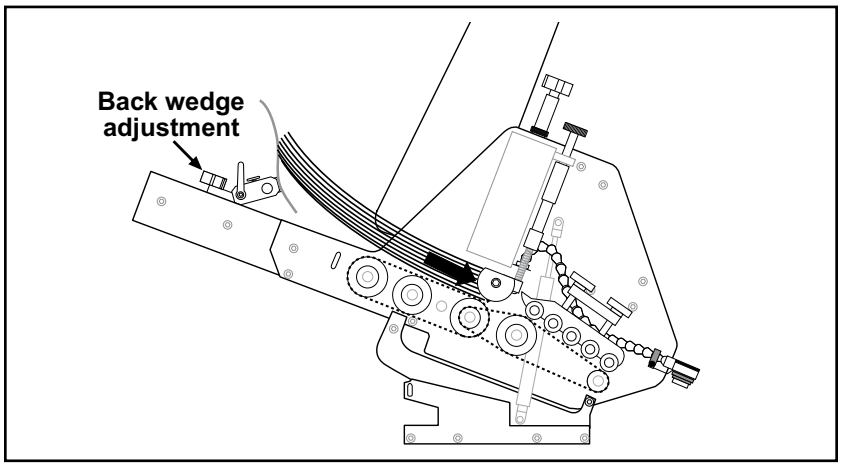


Figure 2-10. Positioning Product Prior to Loosening Back Wedge

NOTE

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

4. Move the back wedge forward and backward until the bottom sheet is not touching the table top (Figure 2-11). A good starting point is to measure about 5/8 in. (16 mm) from the bottom sheet to front edge of table top. As you test, you can "fine tune" from this point.

STEP 3: Back Wedge Adjustment (continued)

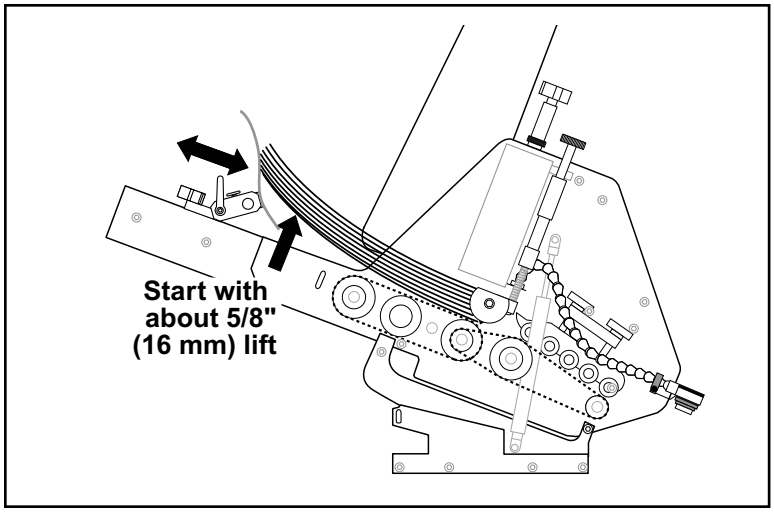


Figure 2-11. Adjusting Back Wedge for Proper Lift

5. Make sure the edge of the back wedge assembly is parallel with the edge of the product stack (Figure 2-12). Adjust as required and tighten wing-nut.

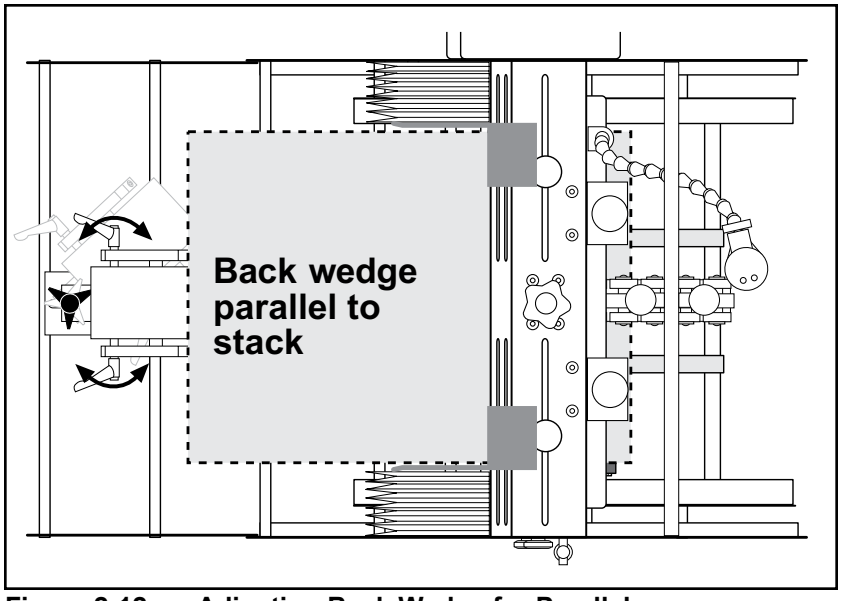


Figure 2-12. Adjusting Back Wedge for Parallel

STEP 4: Hold-Down Setting

Review

The hold-down assembly consists of several bearing 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 assemblies 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 (Figure 2-13). To facilitate this, turn all knobs clockwise several turns.
2. Turn knobs A and B counterclockwise (Figure 2-14) to lower the hold-down assembly so that a slight drag exists between the product and the hold-down. Verify slight drag by sliding product side-to-side.
3. Turn knob A clockwise 1/8-turn (Figure 2-15) 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 closest to the gate assembly is tighter than the roller farthest from 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 rotating 50% faster than the feed belts, excessive gate assembly pressure may cause premature wear to O-rings or feed belts. Review Step 1, Gate Assembly Adjustment.

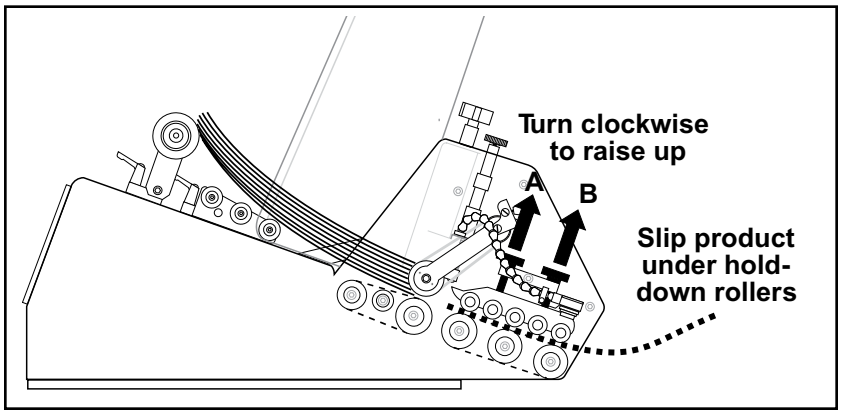


Figure 2-13. Inserting One Piece of Product Under Hold-down

STEP 4: Hold-Down Setting (continued)

NOTE

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

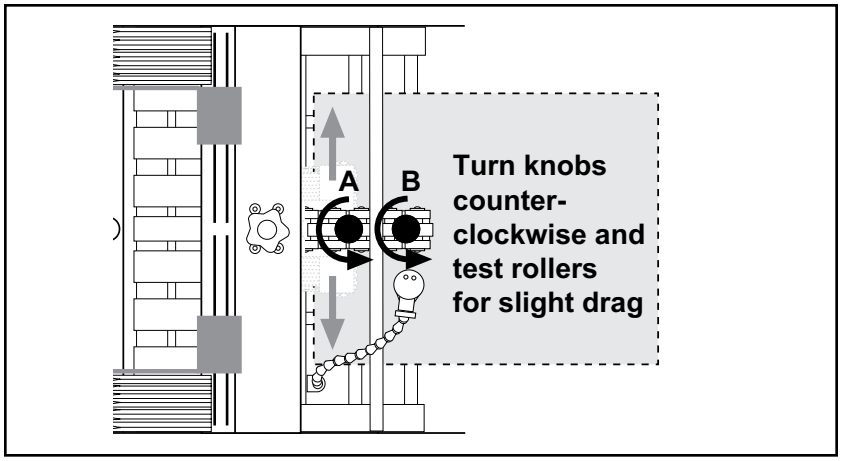


Figure 2-14. Turning Knobs Counterclockwise to Insert Product

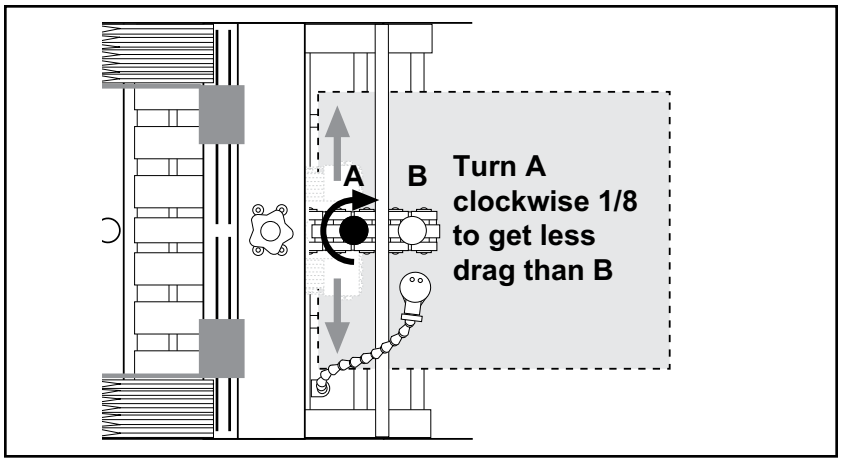


Figure 2-15. Turning Knob "A" Clockwise to Get Slight Drag

STEP 5: Photo Sensor Adjustment

Review

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

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

Objective

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

STEP 5: Photo Sensor Adjustment (continued)

NOTE

Sensors shipped from the factory do not require any adjustment.

NOTE

For any questions on adjusting the Flight-Detect photo sensor, consult with a qualified technician.

TIP

Avoid light colored backgrounds in the discharge area.

Procedure

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

1. Aim and align the photo sensor straight above (perpendicular to) the product (Figure 2-16). If the photo sensor is at an angle, the light will not be reflected back to the receiver.
2. Position the photo sensor at a distance between 1 to 1-1/2 in. (25 to 38 mm) from the product. Initially use the adjustable arms on the extension assembly (Figure 2-17). *When only the green LED is On, you will know when the photo sensor is positioned properly. The amber LED is On when product is staged.*
3. When making the adjustment, be aware of any background objects beyond the product range. *On the feeder, such objects as shafts, guides, belts, and supports may cause false reads if the photo sensor is not adjusted properly for the product (or target). The resulting problem can be continuous feeding.*

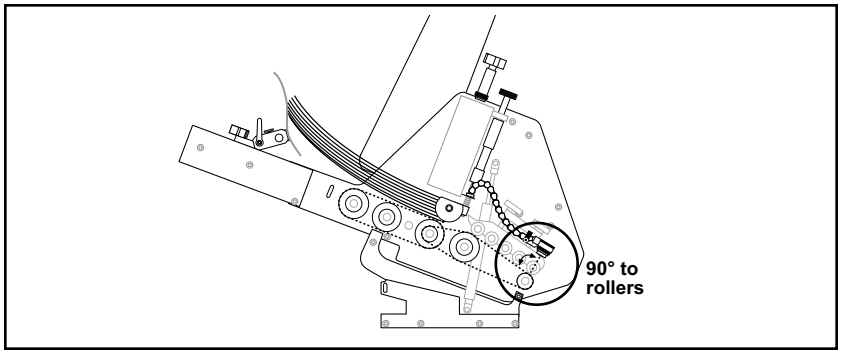


Figure 2-16. Adjusting Photo Sensor for Perpendicular Position

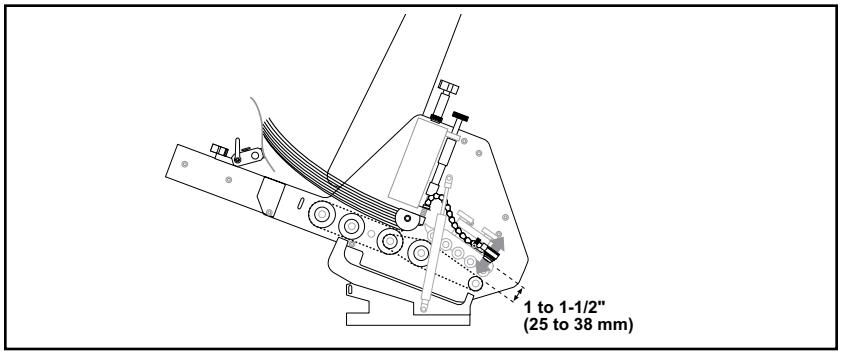


Figure 2-17. Adjusting Photo Sensor for Sheet Stopping Distance

STEP 6:
Manual Test to Verify

Now that you have made all 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.

TIP

*Use the **JOG** key to quickly and easily advance product instead of rotating the belts manually.*

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 product rests against the curvature of the gate assembly.

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 (Figure 2-18). 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, move the wedge in toward the gate assembly. Test again.
4. If sheets are overlapping excessively or, if the machine is feeding doubles, reduce the gap slightly by moving the knob about 1/8 turn counterclockwise. Test again.
5. As 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), review all the adjustment procedures in Section 2, Preparing for Operation.

NOTE

If the gate assembly is too tight, the feeder will have difficulty pulling the 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 Section 6, Additional Wedges, for more information.

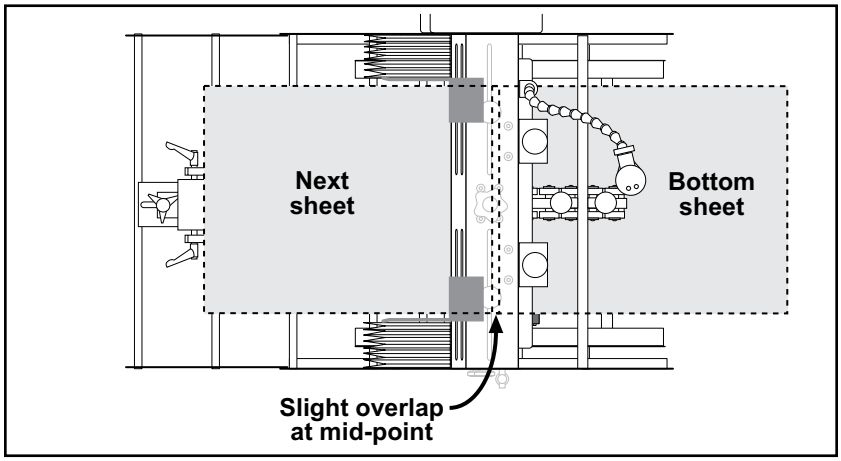


Figure 2-18. Optimum Overlap and Separation of Product

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

One-shot control and batch control will be shown separately when there are differences in operational sequence.

Loading Product

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 (Figure 3-1).
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 (Figure 3-2).
4. As you add product, tamp each hand-full of product with your hand to make sure it rests evenly against the back plate.

NOTE

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

TIP

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

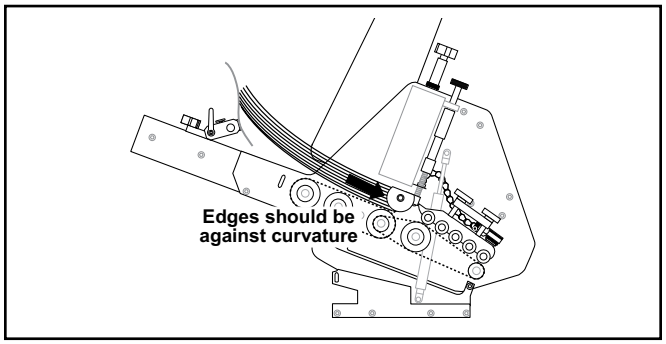


Figure 3-1. Placing Product Against Gate Assembly

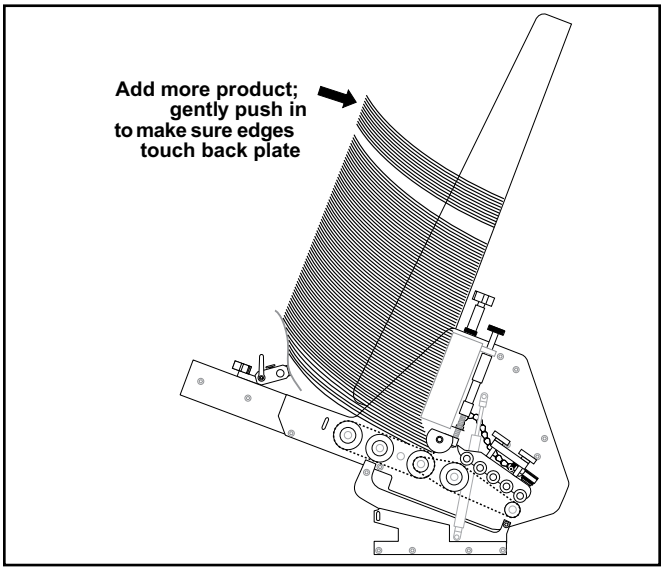


Figure 3-2. Adding More Product to Fill Hopper

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 ST is prepared for operation and you want get the feeder started in the quickest way possible, use the following sequence for *one-shot* control and *batch* control, respectively:

One-Shot Control

1. Turn power **On**.
2. Press *any* key to advance to "Suspended" screen.
3. Press **UP/DOWN Arrow** keys to desired speed percentage.
4. Press **CYCLE** key to advance to "Ready" screen.
5. Trigger the flight-detect sensor to begin feeding *or,* press **CYCLE** key to test feed for one cycle.

Batch Control

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.

If you wish to configure all the parameters of your machine via the menus, use the following sequence for accessing the menus for both *one-shot* control and *batch* control, respectively:

One-Shot Control

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 Clear
5. Press **ENTER** key to change speed or reset job count.
6. Press **UP/DOWN Arrow** keys to desired speed percentage.
7. Press **ENTER** key to save change.
8. Press **MENU** key to return to "Suspended" screen.

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.

Batch Control

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.

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.

Starting a Cycle

Once setup is complete, you can perform the following steps to start feeding. The procedure below applies to both *one-shot* control and *batch* control.

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

NOTE

*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.
5. Reposition photo sensor (as required).

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. Cover the feeder with a cloth or plastic tarp to prevent dust and debris from accumulating.

4 Operational Troubleshooting

Table 4-1 is intended to provide you with quick solutions to the more common day-to-day problems you may encounter. For more detailed troubleshooting information, see Section 11, Technical Troubleshooting.

Table 4-1. Quick-Look Troubleshooting

Problem	Cause	Solution
No AC power to feeder	1. On/Off switch in "Off" (or "O" position).	Move switch to "On" (or "–" position).
	2. Power cord loose or not plugged into outlet (or AC power source).	Check and secure power cord at AC outlet.
	3. Female end of power cable loose or not plugged into AC power inlet at rear of feeder.	Check and secure cord at AC power inlet at rear of machine.
Feeding doubles	1. Gate assembly improperly adjusted (possibly more than one sheet thickness).	Review gate adjustment procedure.
	2. Back wedge improperly adjusted.	Review back wedge adjustment procedure.
	3. Worn angled edge on gate assembly.	Replace angled edge. If wear is excessive, consult with a qualified technician.
	4. Material interlocking.	Check material and source.
	5. Static buildup.	Check material and source.
Feed belts are operating, but material not feeding	1. Material stack height is too low when stack height is down, resulting in reduction of down pressure.	Review material loading procedure.
	2. Binding in side guides.	Adjust side guides farther apart to allow freedom of movement between sheets.
	3. Slippery feed belts (material build up).	Consult with a qualified technician.
	4. Sheet adhesion or interlocking between the bottom and next sheet.	Review material loading procedure and back wedge adjustment procedure.
	5. Gate assembly too tight.	Review gate assembly adjustment procedure.
	6. Too much weight in hopper.	Remove material from stack. Test again.

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

Problem	Cause	Solution
Feed belt(s) not tracking on rollers	1. Excessive weight in hopper.	Reduce weight. Test again.
	2. Excessive down pressure on gate assembly.	Rotate gate adjustment 1/8 turn to increase gap and manually test. Review gate assembly adjustment procedure.
	3. Off-centered product from center point of machine.	Review side guide setting procedure.
	4. Belt wear.	Review gate assembly adjustment procedure. Also review inspection and care procedures. If wear is excessive, consult with a qualified technician.
Jamming occurs during operation	1. Improperly adjustment in one or more of the following areas: A. Gate assembly. B. Back wedge. C. Top roller hold-down assembly. D. Discharge alignment rails.	Turn the Power switch to "Off" by pressing the circle (O). Remove jammed material from feeder. While doing so, try to determine the cause of the jam. Verify each adjustment by reviewing the "Preparing for Operation" section of the manual.
Material skewing	1. Back wedge not aligned properly.	Review back wedge adjustment procedure.
	2. Excessive gate pressure on one side.	Review gate assembly adjustment procedure.

5 Inspection and Care

When performing initial adjustments prior to operation, always make sure you turn Off the main power switch, open the discharge safety shield (to disengage the interlock), and disconnect feeder from the electrical power source. Failure to do so can expose you to a potential start-up and moving parts which can cause serious injury.

Do not attempt to make any adjustments while the 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

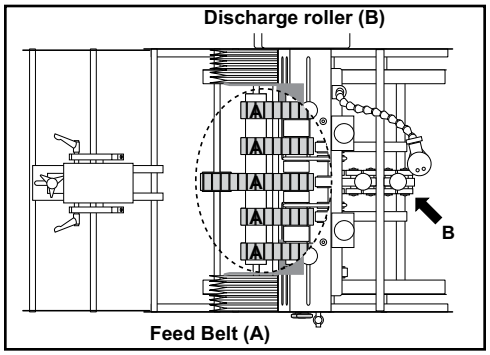


Figure 5-1.

Checking for Feed and Discharge Belt Wear

Check for visual signs of (Figure 5-1):

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

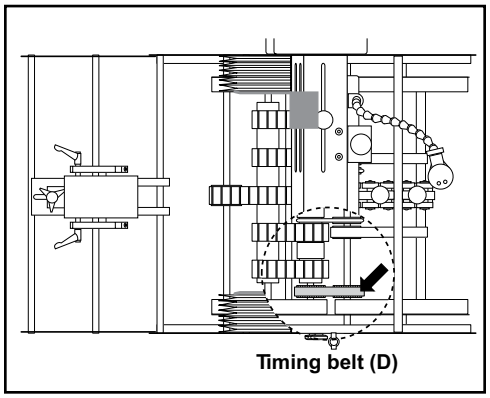


Figure 5-2.

Checking for Timing and Drive Belt Wear

Check for visual signs of (Figure 5-2):

- 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 signs of (Figure 5-3):

- Stretching.
- Improper roller adjustment.

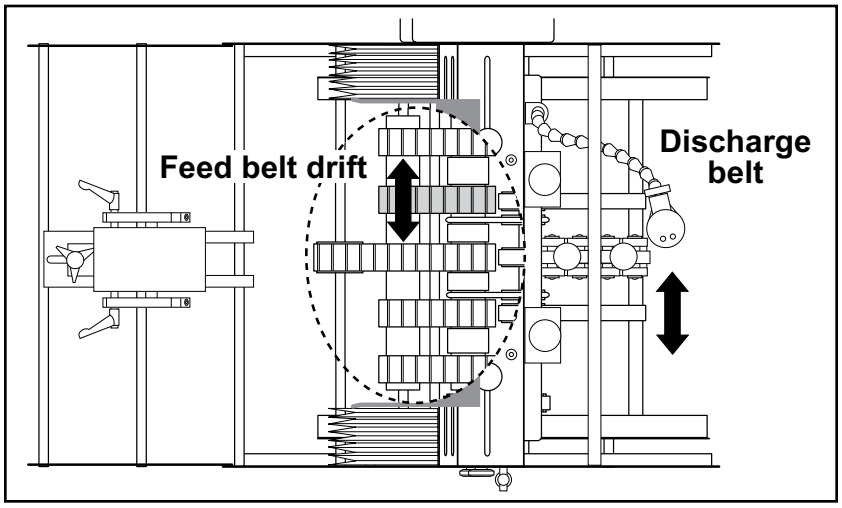


Figure 5-3.

Ensuring Proper Timing and Drive Belt Tracking

Check for visual signs of (Figure 5-4):

- Misaligned timing pulleys.

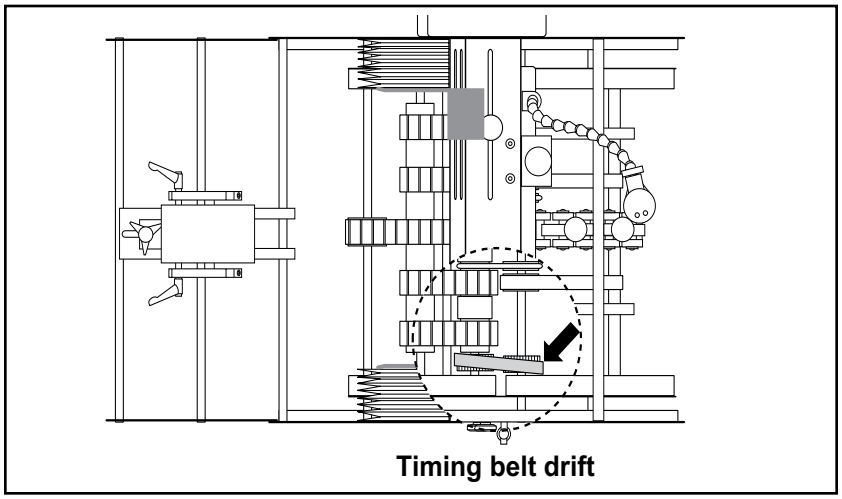


Figure 5-4.

Visual Inspection (continued)

Checking for Gate Assembly Wear

Check for visual signs of wear (Figures 5-5, 5-6 and 5-7):

- Bar gate/jumbo bar gate: Angled wedge begins to flatten excessively.
- Standard O-ring or Advancing O-ring (if applicable): Excessive flat areas along the O-rings.

See “Preventive Care” to follow.

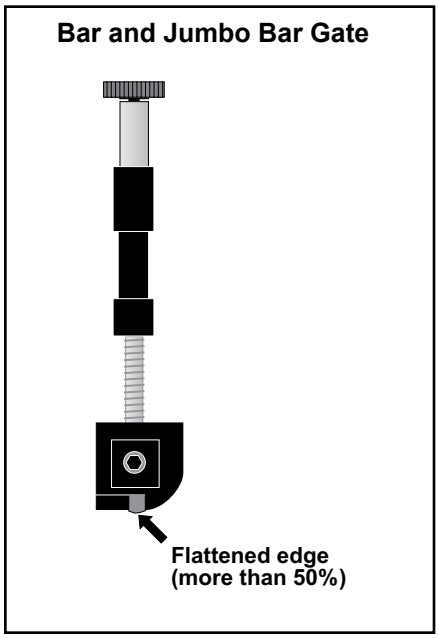


Figure 5-5.

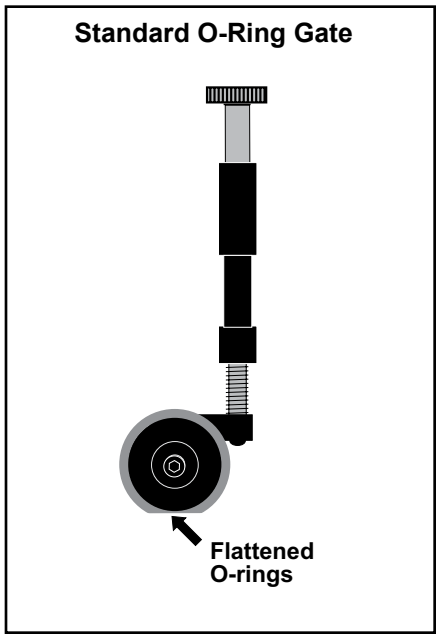


Figure 5-6.

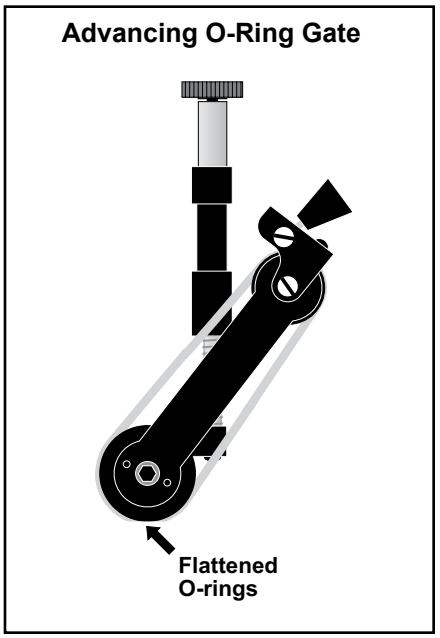


Figure 5-7.

Visual Inspection (continued)

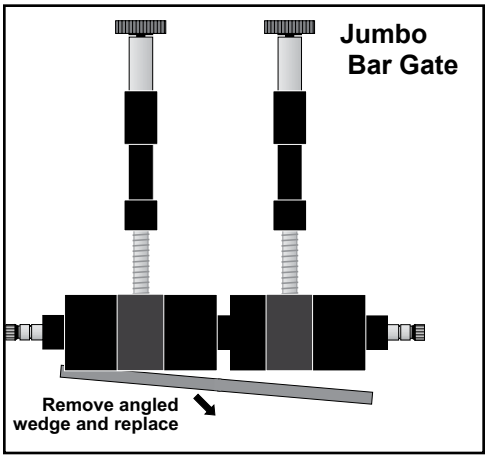


Figure 5-8.

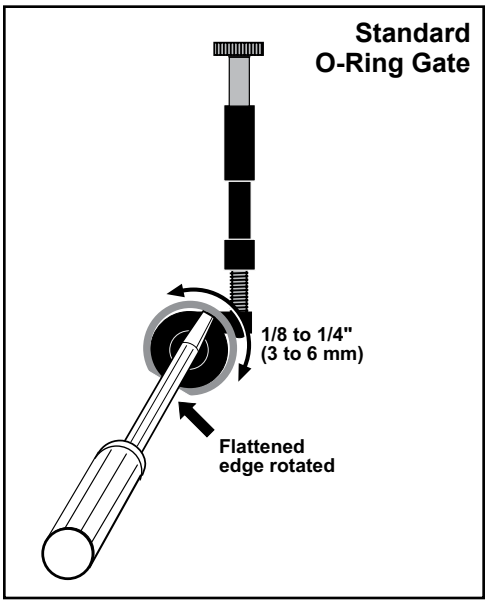


Figure 5-9.

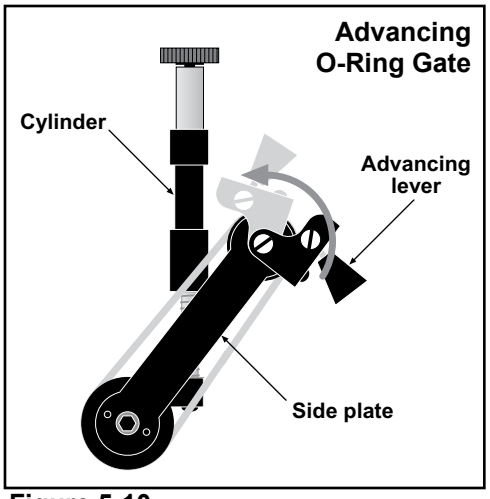


Figure 5-10.

Replacing Worn Angled Wedge

To replace a worn angled wedge (Figure 5-8):

1. Turn Off feeder and remove power cord from outlet.
2. Remove gate assembly from gate plate.
3. Remove plate (two screws).
4. Use a pliers to grip and remove angled wedge.
5. 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.*
6. Reinstall plate (two screws).
7. Reinstall gate assembly and restore power.

Standard O-Ring Gate: Adjusting Worn O-Rings

To adjust worn O-rings on standard O-ring gate (Figure 5-9):

1. Turn Off feeder and remove power cord from outlet.
2. Remove gate assembly from gate plate.
3. Insert a screwdriver in slot on top of gate assembly and rotate screwdriver clockwise or counterclockwise 360° to move worn area of O-ring about 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 (Figure 5-10):

1. Turn Off feeder and remove power cord from outlet.
2. Make sure advance knob is in-line with the side plate and secure.
3. Rotate O-rings by grasping advance knob and pushing toward gate cylinder about 1/8 to 1/4 in. (3 to 6 mm).
4. Reinstall gate assembly and restore power.

Preventive 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 (Figures 5-11 and 5-12):

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 through 5 for the discharge belt also.
7. Reinstall gate assembly and restore power.

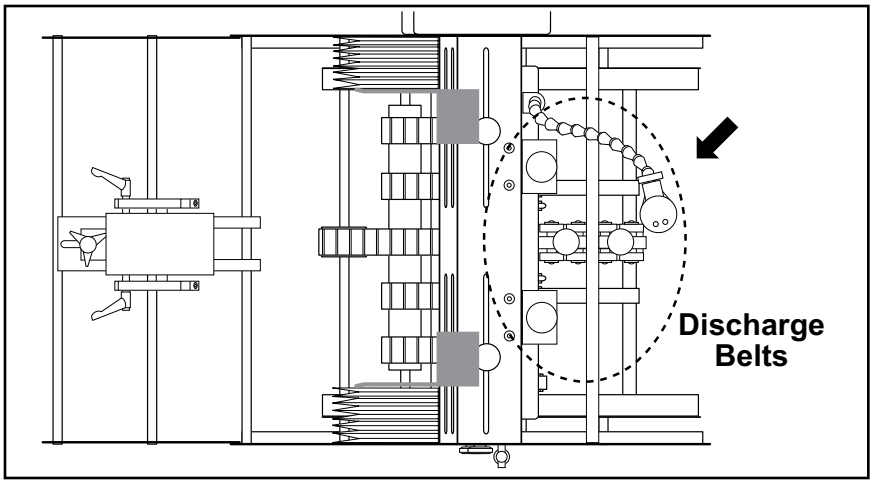


Figure 5-11.

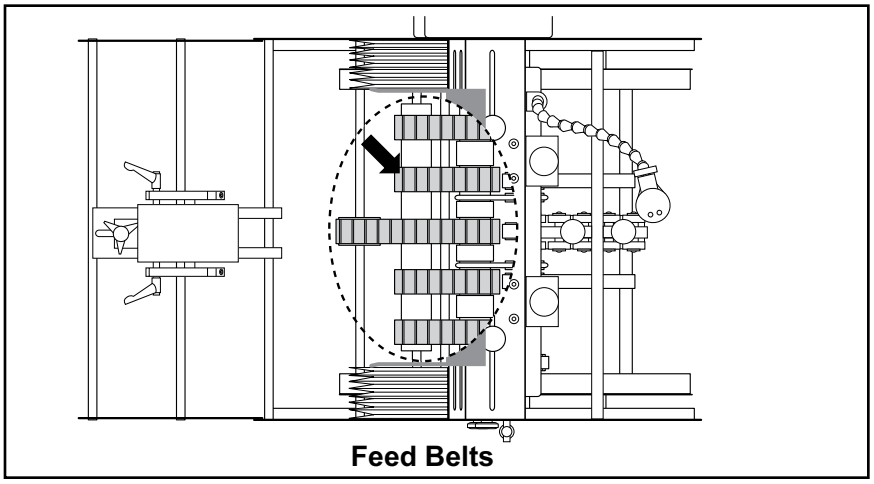


Figure 5-12.

Preventive Care (continued)

Do not use any solvents or cleaning agents when cleaning the keypad or display. This can result in surface damage. Do not spray any cleaning solutions directly on the keypad or display surfaces, as this could lead to faulty performance.

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 Keypad and Display

Visually check the keypad and display area for excessive dust or grime buildup. When cleaning, use a mild cleaning solution or isopropyl alcohol and spray directly on a soft cloth or rag.

Cleaning Photo Sensors

To clean the photo sensor lenses (Figures 5-13 and 5-14):

1. Turn Off feeder and remove power cord from outlet.
2. Open the discharge safety shield (to access sheet-detect sensor).
3. Using a soft, dry cloth, wipe across the face of each lens.
4. Repeat step 3 above for flight-detect sensor.
5. Recheck the adjustments of both photo sensors to make sure they are still in alignment to the targets.
6. Close discharge safety shield and restore power.

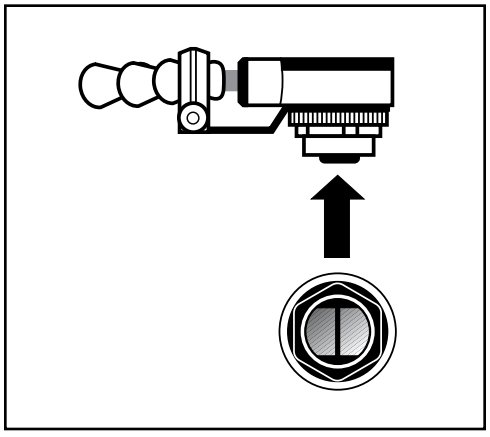


Figure 5-13. Sheet Sensor

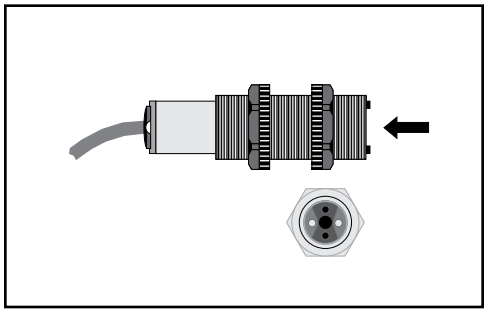


Figure 5-14. Flight Sensor

Preventive Care (continued)

Cleaning Gate Assembly

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

To clean gate assemblies (Figures 5-15, 5-16 and 5-17):

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.

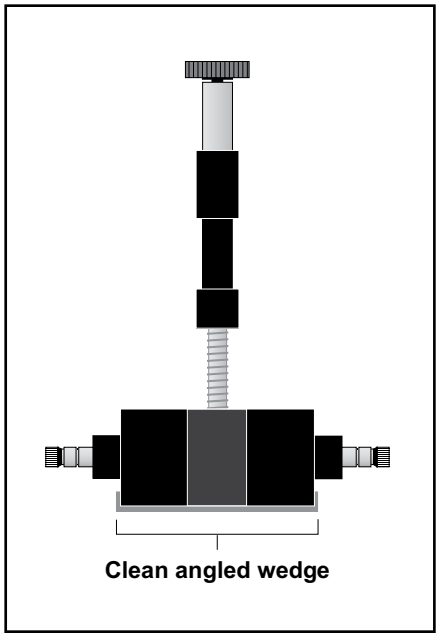


Figure 5-16. Bar Gate/ Jumbo Bar Gate

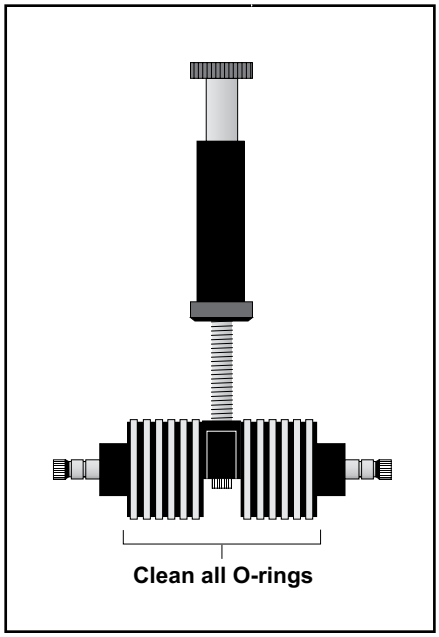


Figure 5-15. Standar O-Ring Gate

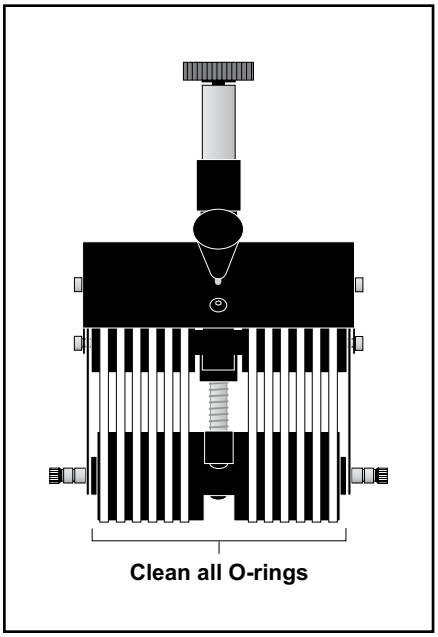


Figure 5-17. Advancing O-Ring Gate

6 Additional Wedges

This section provides information about setting up various wedges which are compatible with the ST Series Universal Friction Feeders.

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

The following wedges are covered:

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

Combination Triangle and Low-Profile

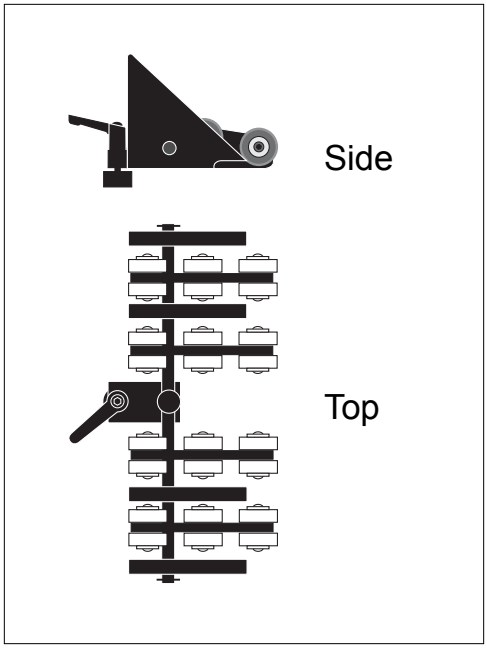


Figure 6-1.

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

Setup guidelines: Adjust so 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. See Figure 6-2.

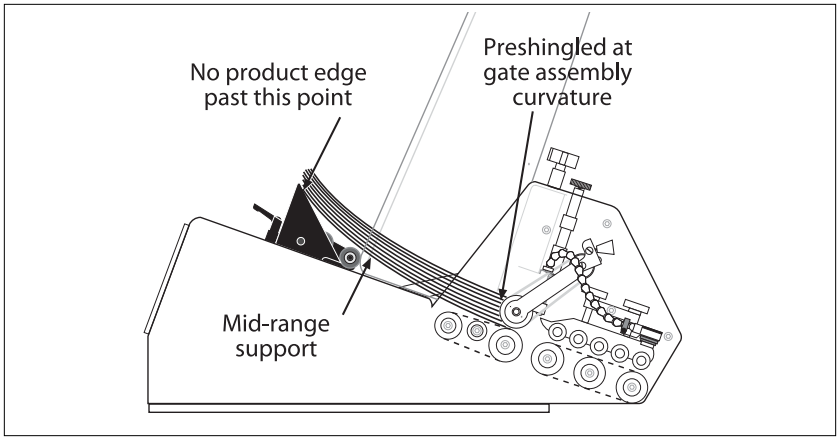


Figure 6-2. Triangle/Low-Profile Wedge Setup

Separate Triangle and Low-Profile

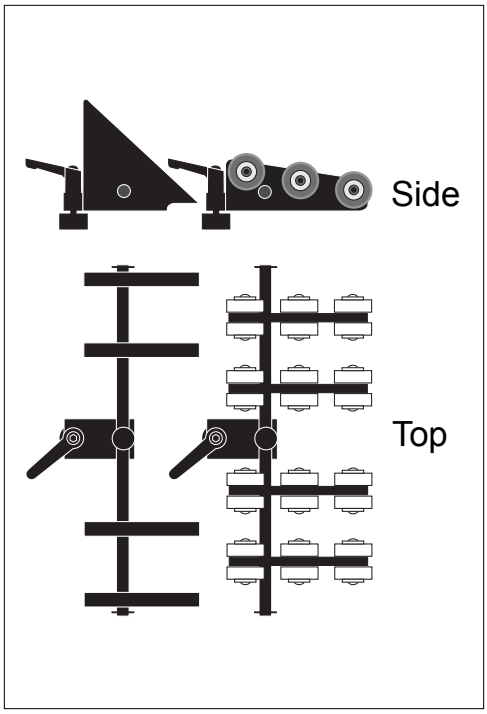


Figure 6-3.

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 you would the combined triangle/low-profile wedge assembly (see previous page). Set the low-profile wedge relative to the triangle wedge so it lifts the 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. See Figure 6-4.

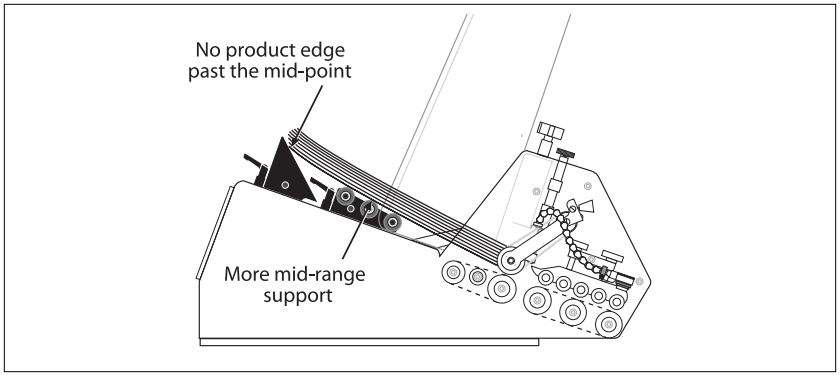


Figure 6-4. Separate Triangle and Low-Profile Wedge Setup

Separate Articulating Roller and Low-Profile

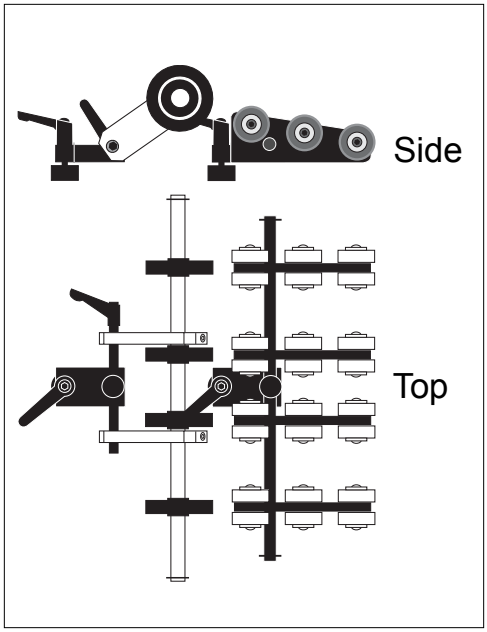


Figure 6-5.

When to use: For thicker product with more body 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.

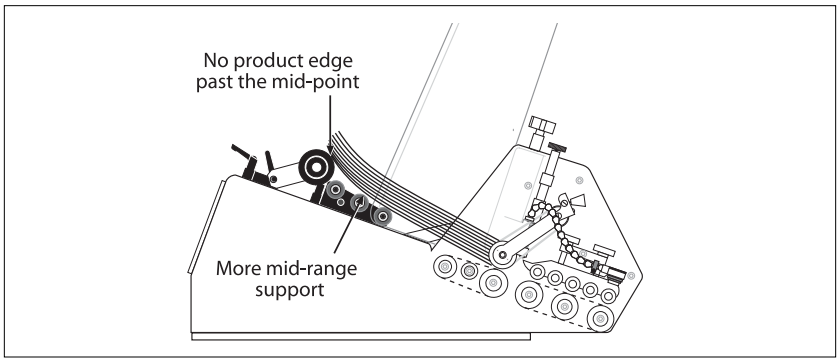


Figure 6-6. Separate Articulating Roller and Low-Profile Wedge Setup

Articulating Roller

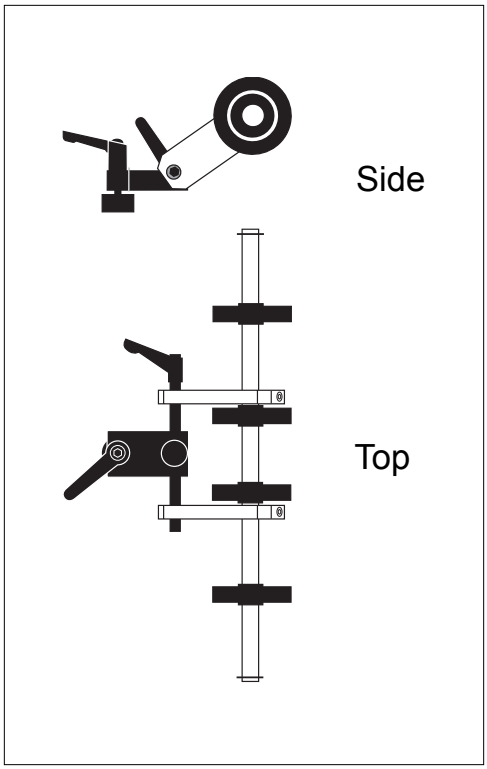


Figure 6-7.

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

Setup guidelines: Adjust so 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. See Figure 6-8. *NOTE: With some product that tends to bind together (e.g., perforated product), it may be beneficial to separate 4 to 5 sheets of product at the bottom to provide some air space.*

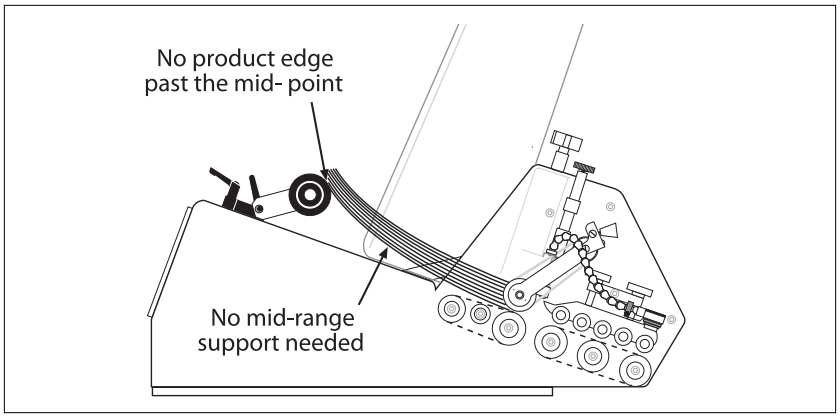


Figure 6-8. Articulating Roller Wedge Setup

Extended Narrow

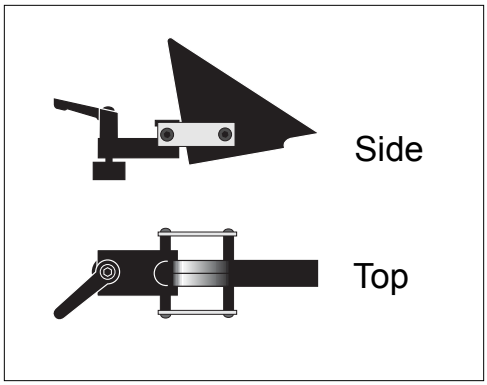


Figure 6-9.

Setup guidelines: Effective for moving in close to the gate assembly for supporting very small product. Due to size, no mid-range support is required.

Ideal setup: Adjust so wedge preshingles the bottom of stack against the curvature of gate assembly. Make sure edges of product do not extend back more than the mid-point of wedge. See Figure 6-10.

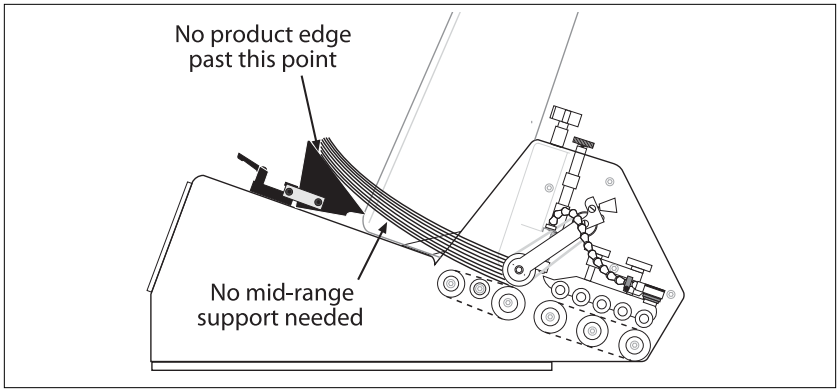


Figure 6-10. Extended Narrow Wedge Setup

Combination Wedge

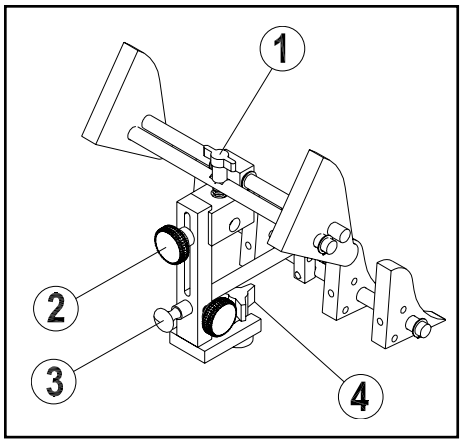


Figure 6-11.

When to use:

Product Length:	4 in. to 14 in. (10.16 cm to 35.56 cm)
Product Weight:	Light to Heavy
Product Body:	Flexible or Rigid
Product Friction:	Low to High
Sample Products:	Envelopes, card stock, and booklets

Setup guidelines:

Adjust the back wedge for proper support of the product off the table top without creating any pinch or stress points. The combination wedge is a two piece design that allows the ability to run difficult material with a full hopper. The top part of the wedge is designed to hold the weight of the stack and allows the bottom wedge to support only a light stack of product.

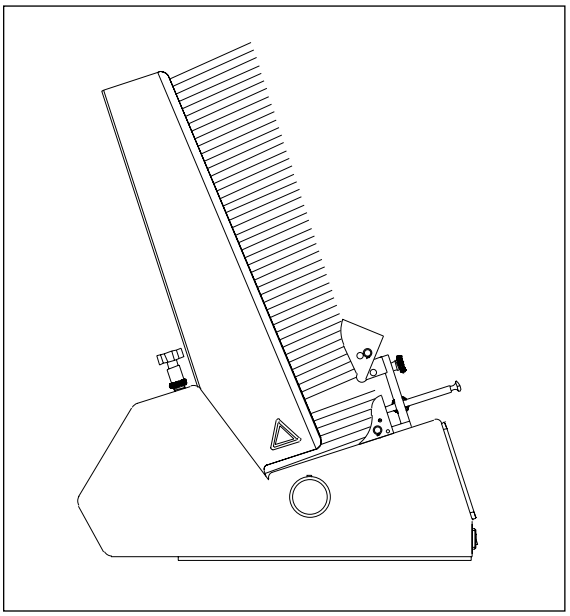


Figure 6-12. Proper Wedge Adjustment (short product)

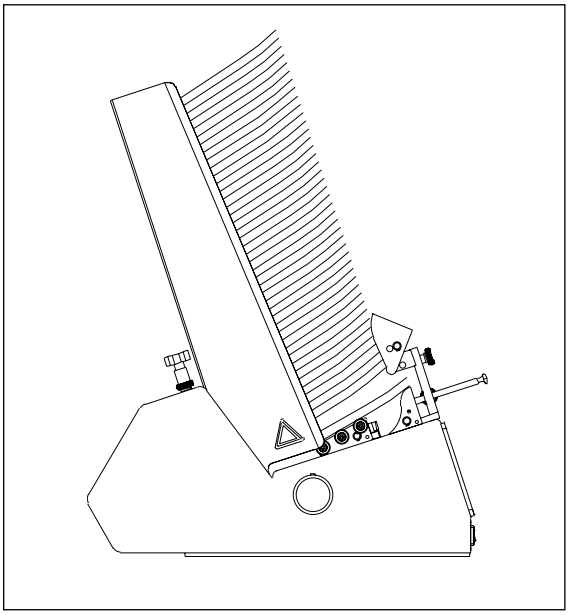


Figure 6-13. Proper Wedge Adjustment (long product)

7 Service and Maintenance Procedures

Replacing Tower Lamp Bulbs

Objective

The information in this section details the procedure to replace tower lamp bulbs.

Procedure

1. Remove the small Phillips-head screw on the top of the tower lamp.
2. Pull upward on the lenses to remove them thus exposing the bulbs and bulb holders.
3. Remove the bad bulb by turning it counterclockwise.
4. Replace the bulb by inserting a new bulb and turning it clockwise until finger tight.

The bulb is an industry standard (1487) 14 VDC bulb powered by the feeder's 12 VDC supply. Utilizing a 14 VDC bulb with a heavier filament greatly increases bulb life. High quality bulbs such as (GE or Sylvania) are recommended.

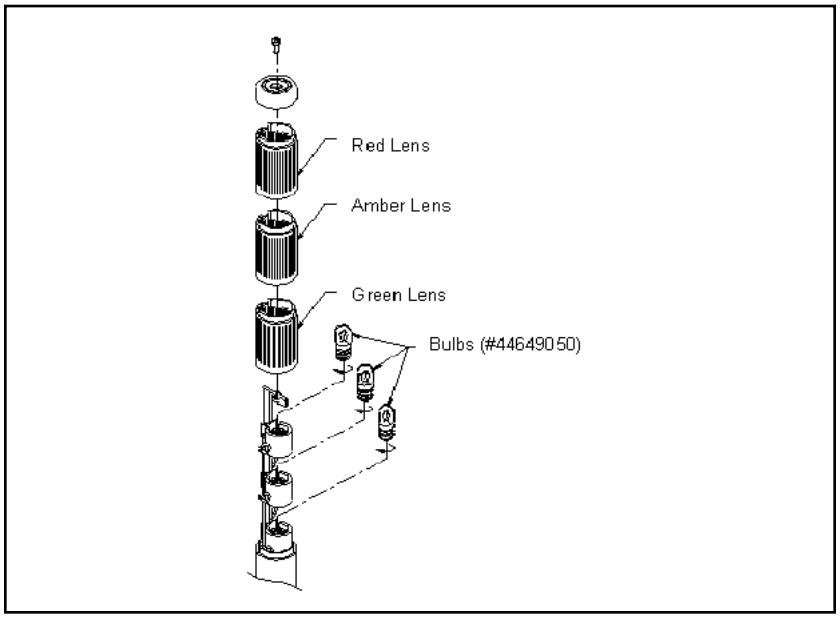


Figure 7-1. Bulb and Lens Assembly

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 a thorities, 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.

NOTE

This option requires software version 1.05 or greater

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. Figures 7-2 and 7-3 depict wiring to an external switch and relay contact respectively.

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. See Figure 7-2 below.

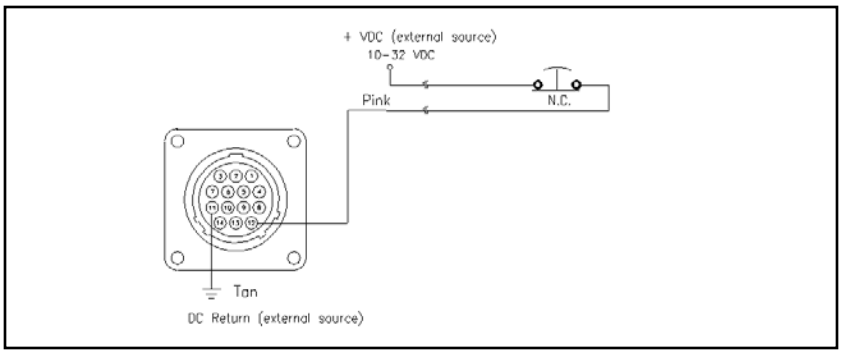


Figure 7-2. External Switch

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. See Figure 7-3 below.

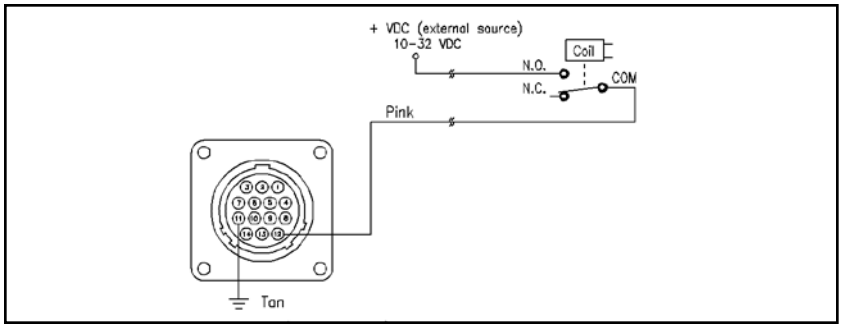


Figure 7-3. Relay Contacts

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.

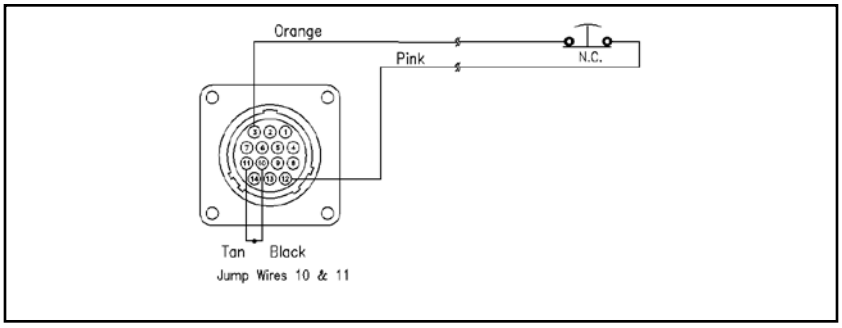


Figure 7-4. External Switch

A relay contact or solid state relay with open contacts is used to switch 12VDC 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.

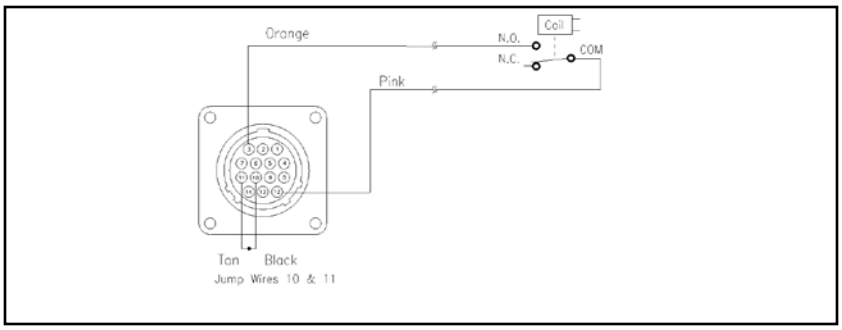


Figure 7-5. Relay Contacts

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 Figure 7-6 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 (as shown in Figure 7-5), 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.

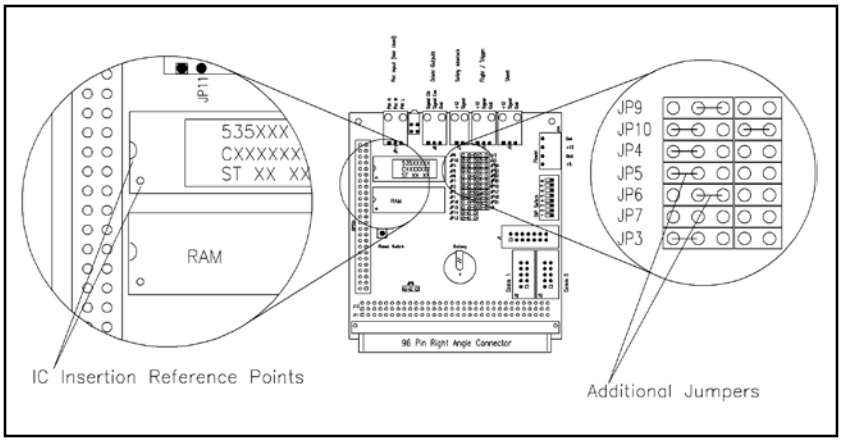
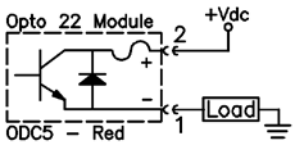
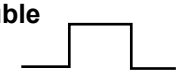
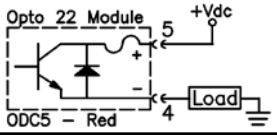
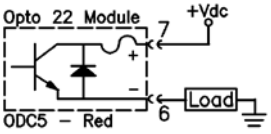
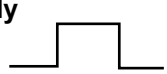
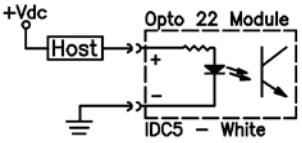
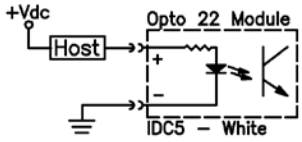
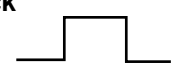
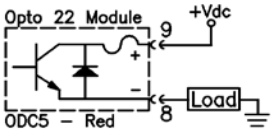
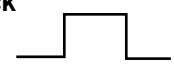
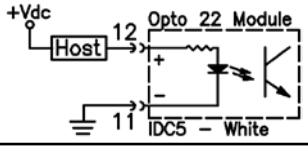
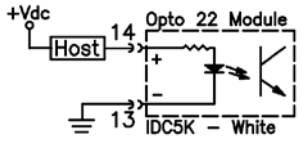
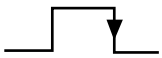


Figure 7-6. EPROM Locations on CPU Board

8 I/O Options

Table 8-1. 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

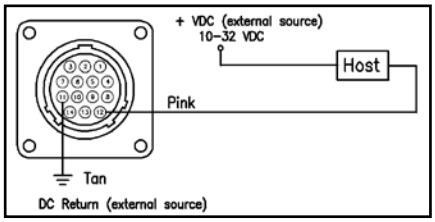


Figure 8-1. Sourcing Input

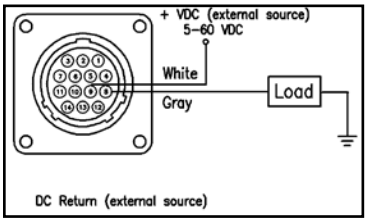
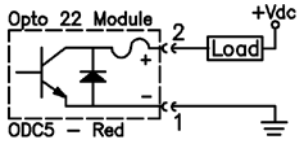
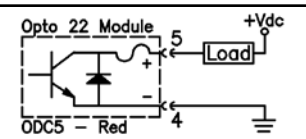
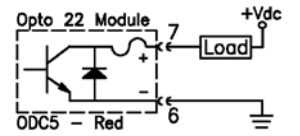
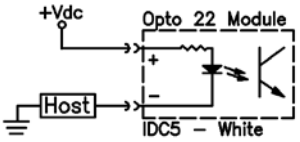
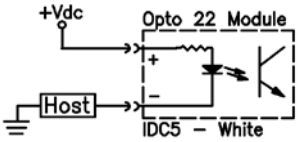
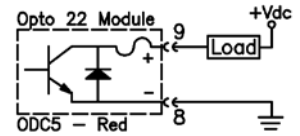
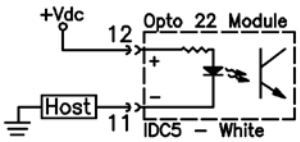
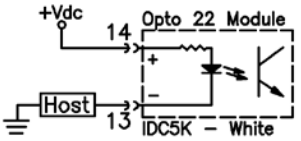


Figure 8-2. Sourcing Output

Table 8-2. Quick-Look Reference Guide - Sinking

MODULE	ELECTRICAL	SIGNAL	DESCRIPTION
# 1 Double/Miss Output (Standard)		**Double** **Miss** Time	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

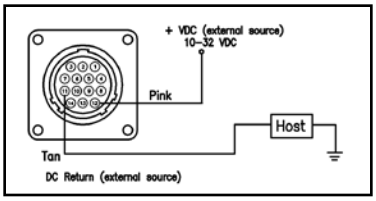


Figure 8-3. Sinking Input

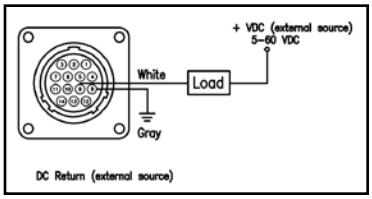


Figure 8-4. Sinking Output

Relay Rack and Module Reference Diagrams

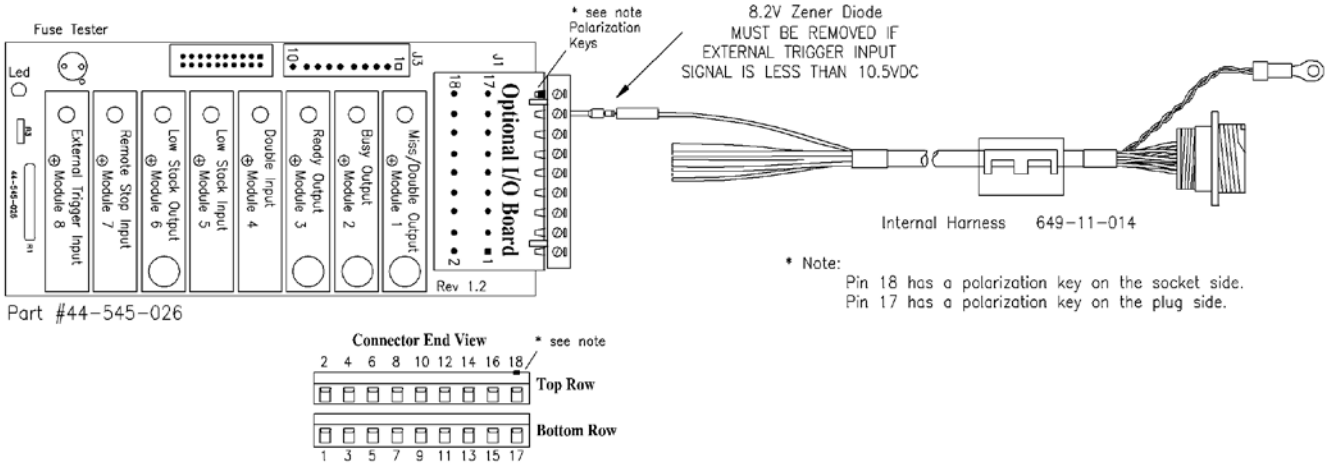


Figure 8-5. Reference Diagrams

I/O Cable Wiring

Table 8-3. 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.

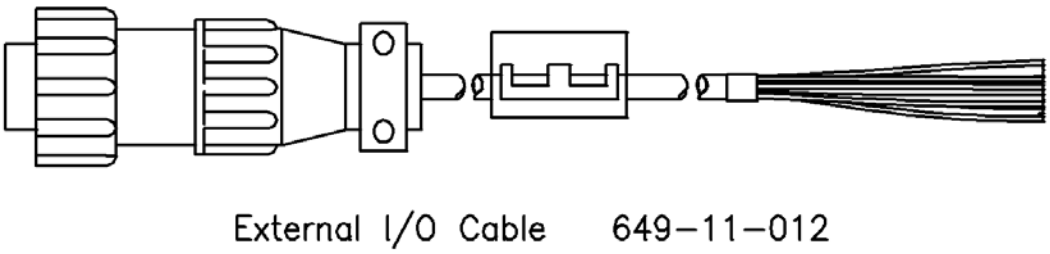


Figure 8-6. External I/O Cable

9 Mechanical Components

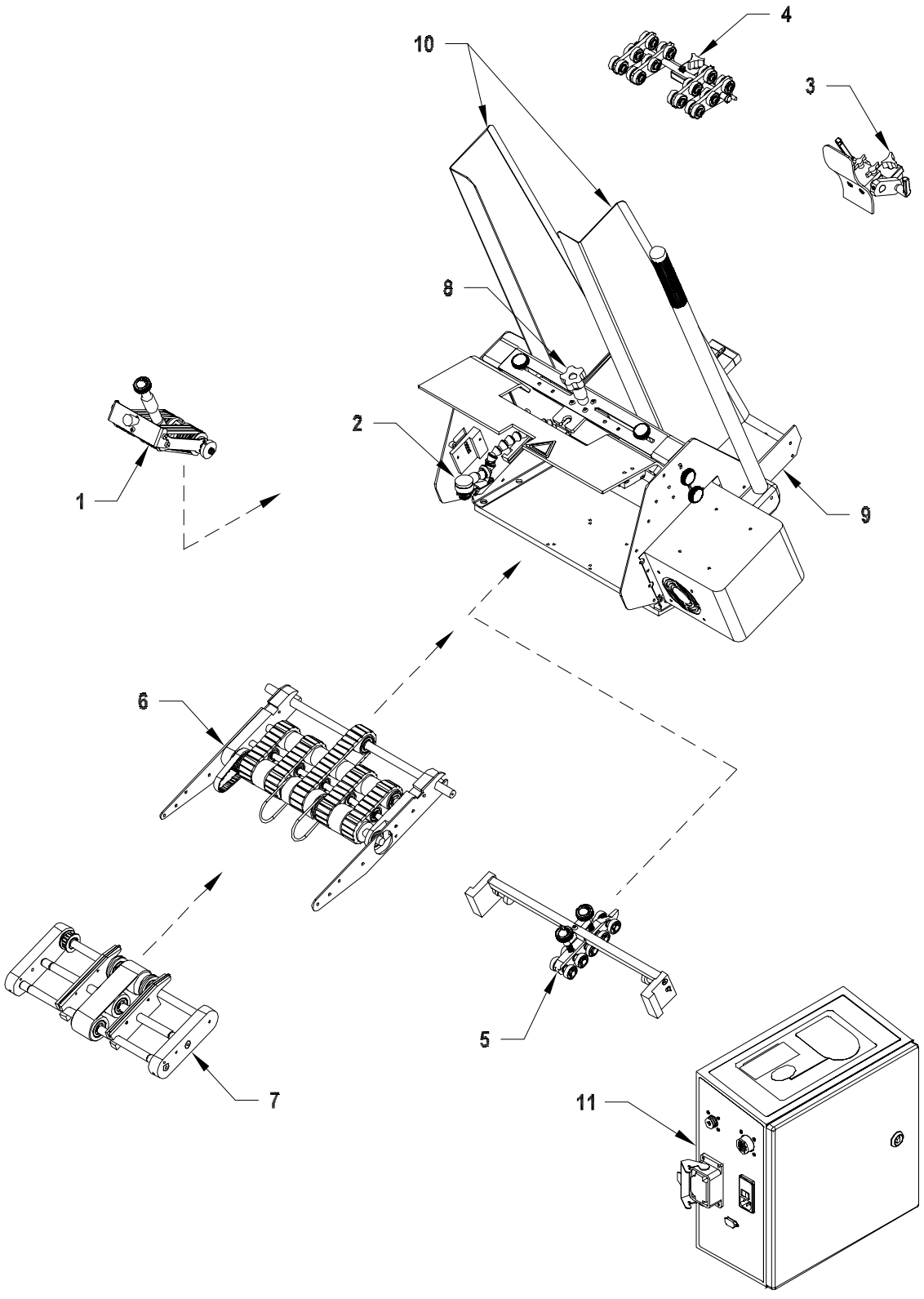
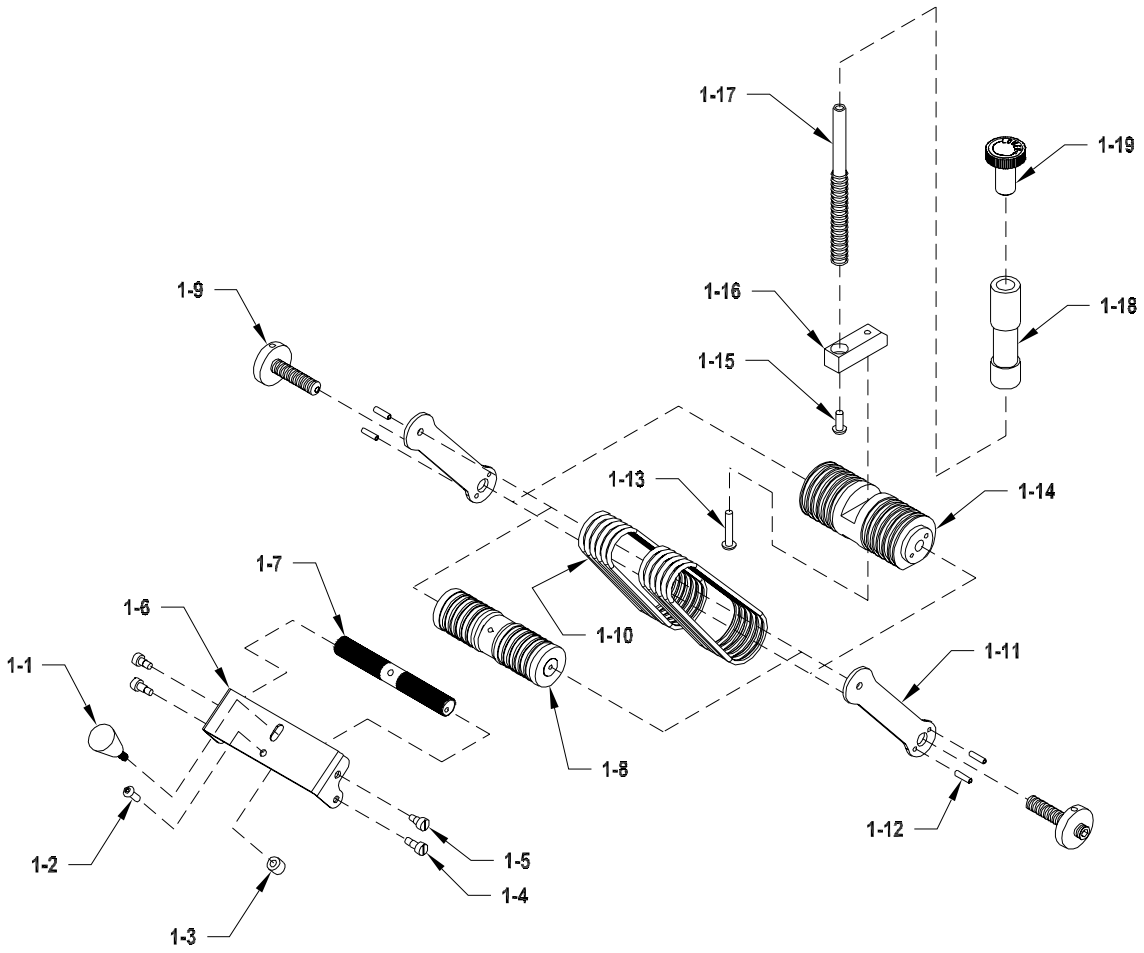


DIAGRAM NUMBER	DESCRIPTION	PART NUMBER
1	ADVANCING O-RING GATE WITH HORIZON ADJUST	87211001
2	SHEET SENSOR	70011008
3	SINGLE S WEDGE	63311026
4	LOW PROFILE WEDGE	63311087
5	5 AXLE HOLD-DOWN WITH MOUNT	75911025
6	GROOVED GUM FEED SECTION	75911020
7	CLEAR URETHANE DISCHARGE SECTION	75911019
8	SOLID GATE PLATE	64011004
9	BASE	
10	SIDE GUIDE KIT	64011039
11	IQUIPPED BOX WITH I/0 BASE ASSEMBLY I/O ASSEMBLY	 68311001 68311014

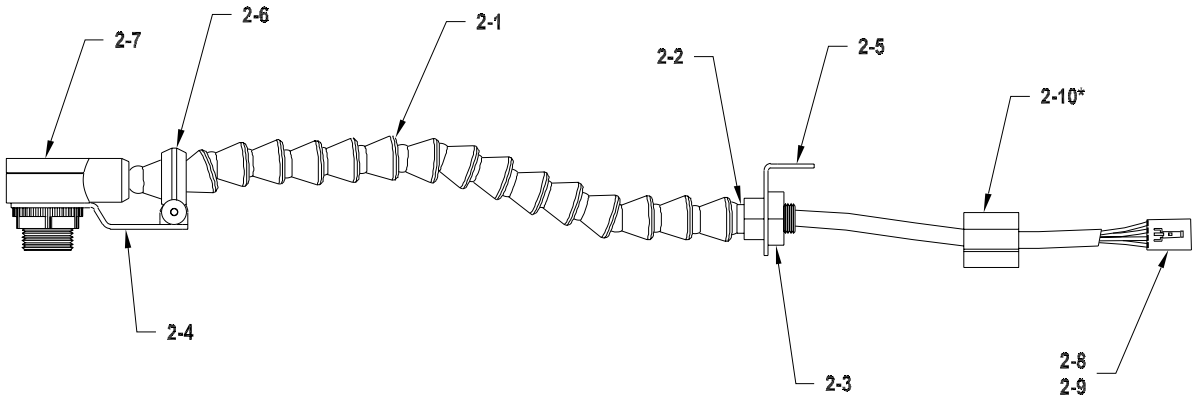
1: ADVANCING O-RING GATE WITH HORIZON ADJUST
ASSEMBLY #87211001



1: ADVANCING O-RING GATE WITH HORIZON ADJUST
ASSEMBLY #87211001

DIAGRAM NUMBER	QTY	DESCRIPTION	PART NUMBER
1-1	1	Handle Studded 10-32 X 1/2”	44657007
1-2	1	BHCS 8-32 X 1/2” LG	00002302
1-3	1	Spacer Belt Indexer .312 X .375	44657010
1-4	2	Screw Shoulder 8-32 Slotted	00003320
1-5	2	Screw Shoulder 8-32 X 1/8	00003321
1-6	1	Belt Indexer Bracket	44657005
1-7	1	Pinch Roll Cam	44657003
1-8	1	Belt Indexer Shaft	44657008
	2	O Ring Take Up Roller	44657002
	1	Belt Indexer Center Hub	44657009
	2	Clip E 1/2 Waldes	00001155
	2	SHSS 8-32 X 5/16 Cup Point	00002211
1-9	2	Roller	44872003
	2	Adjustment Screw	44872005
	2	SHSS 10-32 X 3/8” LG Nylon Tip	44872007
1-10	12	O Ring Advancing ST	44657006
1-11	2	Side Plate Adjust	44872002
1-12	4	Pin Roll 1/8 X 1/2	00001161
1-13	1	BHCS 10-32 X 1” LG	00002340
1-14	1	Gate Cylinder w/Horizon (Not Sold Individually)	
1-15	1	BHCS 10-32 X 1/2” LG	00002334
1-16	1	Mount Gate Lift Shaft	15000001
1-17	1	Shaft Gate Lift	23560084
	1	Spring Gate Compression	23500083
1-18	1	Cylinder Gate Spring Tension	23500019
1-19	1	Adjustment Knob Assembly for Gate	23511037

2: SHEET SENSOR
ASSEMBLY #70011008



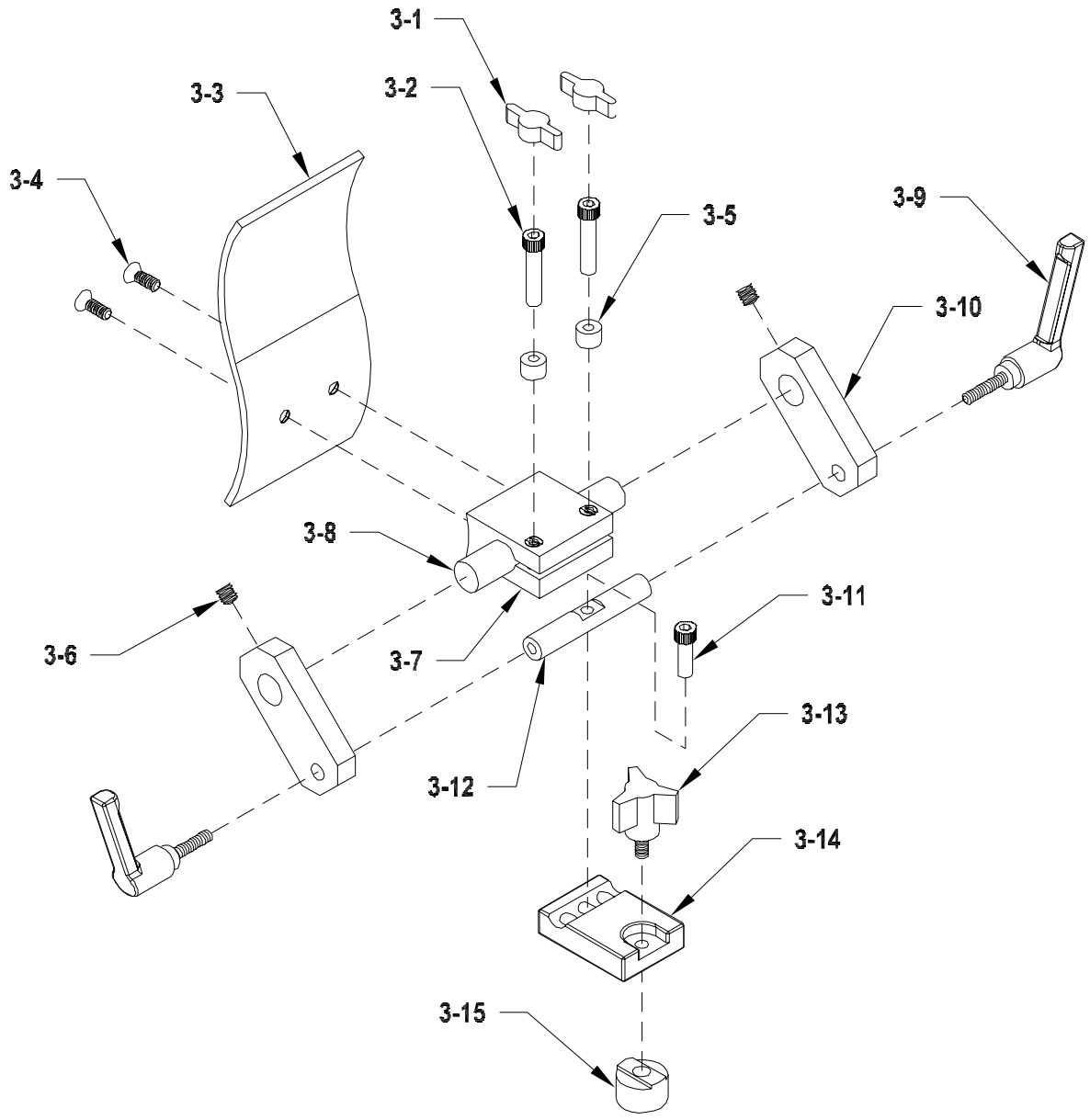
*Part exists in diagram for reference only
and is not included with this assembly.
Must be ordered separately

2: SHEET SENSOR
ASSEMBLY #70011008

DIAGRAM NUMBER	QTY	DESCRIPTION	PART NUMBER
2-1	16	Locline Adjustable 1/4”	44608041
2-2	1	Locline NPT Connector 1/4” X 1/8”	44608042
2-3	1	Hex Nut 1/8” NPT	44608046
2-4	1	Bracket Sensor	44640014
2-5	1	Bracket Sensor Mounting	44640015
2-6	1	Locline Collar 1/4” Mounting	44640016
2-7	1	Sensor PNP Diffuse Reflective Right Angle	44649011
2-8	4	Pin Connector Female Molex	44649019
2-9	1	Housing Connector 4 Pin Female Molex	44649023
2-10*	1	Holder Adhesive Wire	23500079

*Part exists in diagram for reference only and is not included with this assembly.
Must be ordered separately.

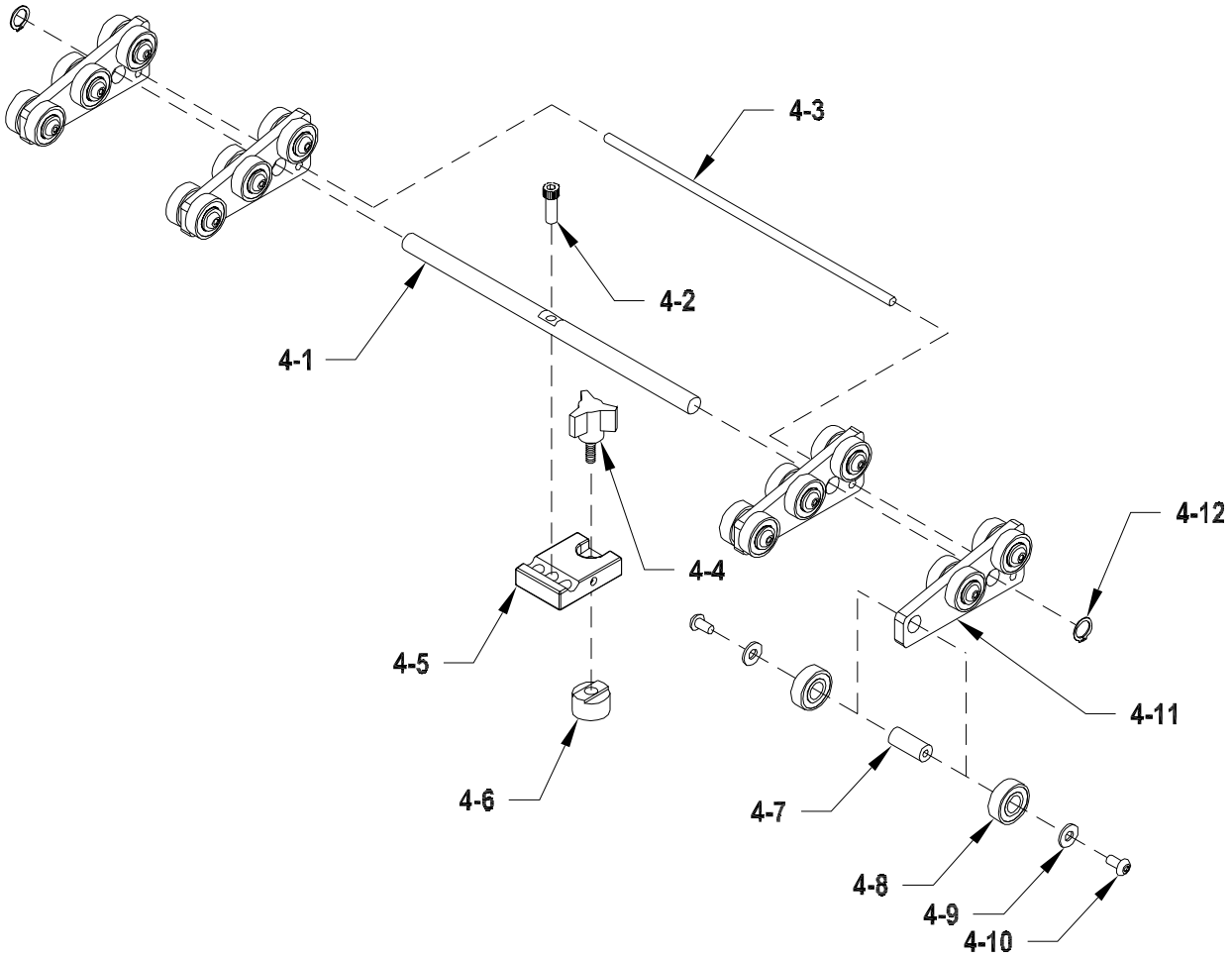
3: SINGLE S WEDGE
ASSEMBLY #63311026



3: SINGLE S WEDGE
ASSEMBLY #63311026

DIAGRAM NUMBER	QTY	DESCRIPTION	PART NUMBER
3-1	2	Knob Wing #10 w/o Screw	23500076
3-2	2	SHCS 10-32 X 1” LG	00002335
3-3	1	S Wedge	44633025
3-4	2	FHSS 10-32 X 1/2” LG	00002330
3-5	2	Spacer .25 X .375 Tapped 10-32	44633027
3-6	2	SHSS 1/4-20 X 1/4” LG	00002205
3-7	1	Block Mounting	44633026
3-8	1	Shaft Pivot Block	44633028
3-9	2	Adjustment Clamping Handle 1/4-20 X .63	44340015
3-10	2	Bracket Roller Wedge Pivot	44340013
3-11	1	SHCS 10-32 X 5/8” LG	00002320
3-12	1	Shaft Wedge Guide	44633032
3-13	1	Knob 3 Arm 10-32 X 5/8	44633033
3-14	1	Wedge Block	44633014
3-15	1	T-Nut Round	44633016

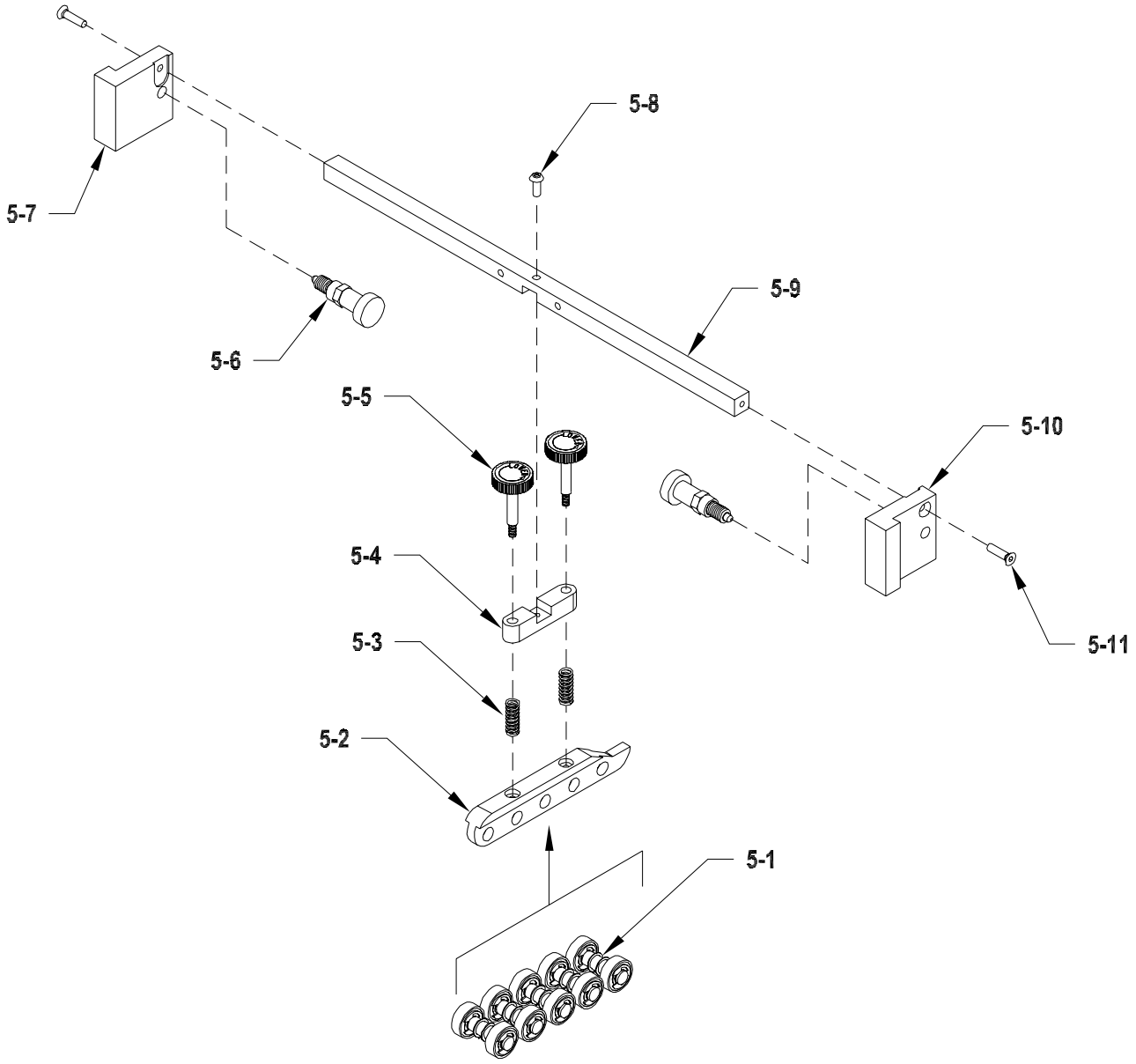
4: LOW PROFILE WEDGE
ASSEMBLY #63311087



4: LOW PROFILE WEDGE
ASSEMBLY #63311087

DIAGRAM NUMBER	QTY	DESCRIPTION	PART NUMBER
4-1	1	Wedge Guide Shaft	44633018
4-2	1	SHCS 10-32 X 5/8” LG	00002320
4-3	1	Wedge Support Shaft	44759076
4-4	1	Knob 3 Arm 10-32 X 5/8	44633033
4-5	1	Wedge Block	44759088
4-6	1	T-Nut Round	44633016
4-7	12	Shaft Belt Tension	33500020
4-8	24	Bearing Ball R6	23500095
4-9	24	Washer Flat #10	00002607
4-10	24	BHCS 10-32 X 3/8” LG	00002305
4-11	4	Narrow Roller Wedge	43560050
4-12	2	Ring Grip 3/8” Waldes	00001110

5: 5 AXLE HOLD-DOWN WITH MOUNT
ASSEMBLY #75911025

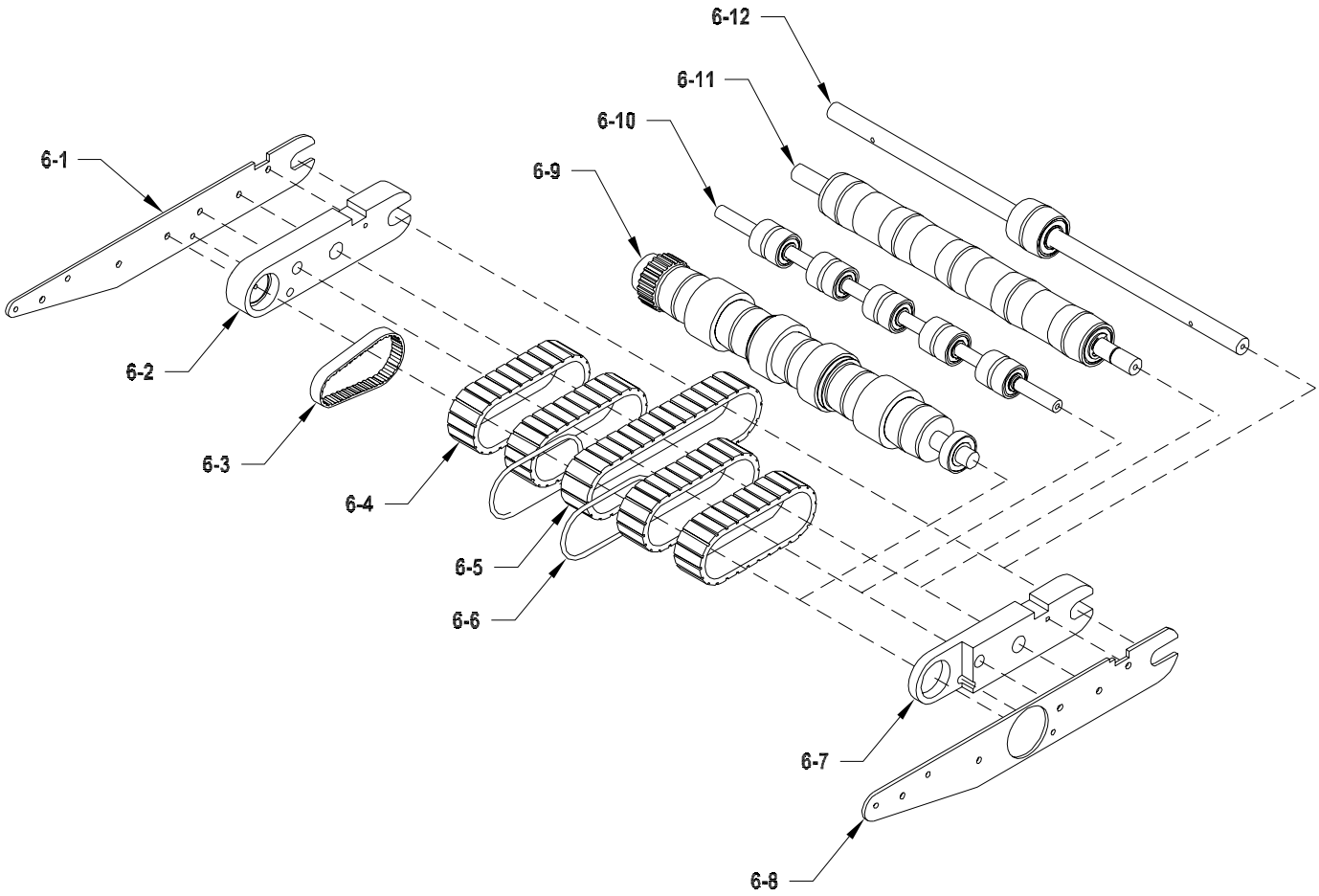


5: 5 AXLE HOLD-DOWN WITH MOUNT
ASSEMBLY #75911025

DIAGRAM NUMBER	QTY	DESCRIPTION	PART NUMBER
5-1	5	Bearing Holder Shaft	43560008
	10	Bearing Ball R6	23500095
	10	Ring Grip 3/8 Waldes	00001110
	20	Clip E 3/8 Waldes	00001150
5-2	1	Holder Bearing 5 Axle	43560310
5-3	2	Spring Compression	23560083
5-4	1	Bar Hold-Down Adjustment	23560086
5-5	2	Screw Cross Bar Hold-Down Adjustment	23560087
	2	Hold-Down Knob 1/4 w/o Screw	23560077
	2	Grommet Rubber	00001130
	2	Label Gate Adjustment Knob	23500084
5-6	2	Plunger, Indexing	44759060
	2	Bearing Oilite 3/8 X 1/2	23500250
5-7	1	Block, Hold-Down Right	44759142
5-8	1	BHCS 10-32 X 1/2” LG	00002334
5-9	1	Hold-Down Cross Support Bar	44759111
5-10	1	Block, Hold-Down Left	44759141
5-11	2	FHSS 10-32 X 3/4” LG	00002338

Note: Hold-Down without Mounting components is Assembly #43511310.

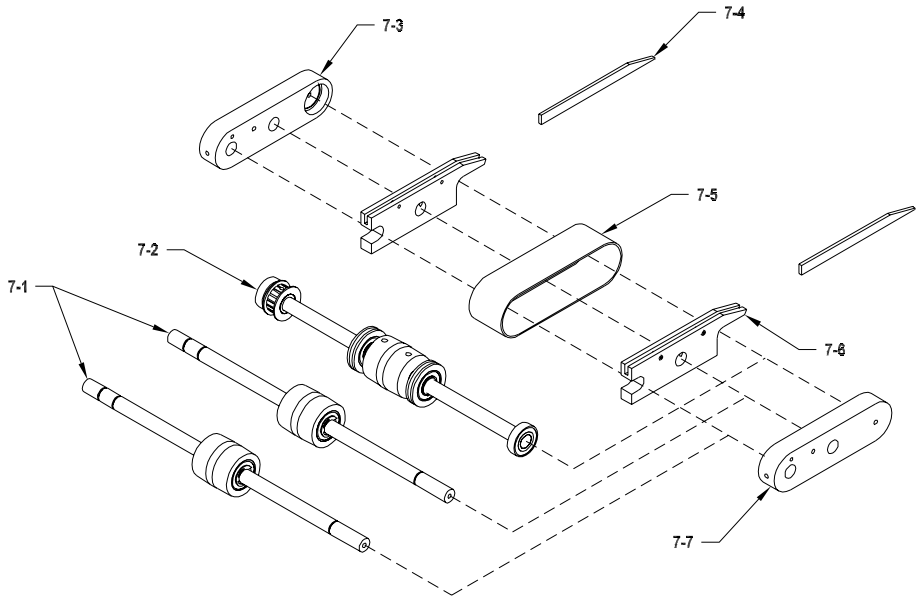
6: GROOVED GUM FEED SECTION
ASSEMBLY #75911020



6: GROOVED GUM FEED SECTION
ASSEMBLY #75911020

DIAGRAM NUMBER	QTY	DESCRIPTION	PART NUMBER
6-1	1	Plate Right Carriage Holder	44759004
6-2	1	Right Carriage Holder	44759033
6-3	1	Belt Drive Timing 78XL037	23560078
6-4	4	Belt Feed Tan Gum Grooved Composite 1Wx9L	23500162
6-5	1	Belt Feed Tan Gum Grooved Composite 1Wx14L	44759062
6-6	2	O Ring Discharge	27500016
6-7	1	Left Carriage Holder	44759006
6-8	1	Plate Left Carriage Holder	44759003
6-9	1	Drive Shaft	44759005
	1	Pulley 24T 1/2 Bore Flangeless	43560098
	2	Bearing Ball R8	23500094
	2	Clip E 1/2” Waldes	00001155
	2	SHSS 10-32 X 5/16” LG	00002217
	1	Key Stock 1/8”	44852080
6-10	1	Shaft Discharge Feed Roller EX	43550036
	10	Roller Support Driven with Bearing	23511030
	10	Ring Grip 3/8” Waldes	00001110
6-11	1	Idler Shaft	43555047
	1	Driven Shaft	44759010
	2	Bearing Ball R8	23500094
	2	Clip E 1/2” Waldes	00001155
6-12	1	Wedge Shaft	44759011
	1	Roller Crown Driven with Bearings	33511028
	2	Ring Grip 1/2” Waldes	00001115
NS	7	SHCS 10-32 X 3/8” LG	00002310
NS	2	SHCS 8-32 X 3/8” LG	00002213

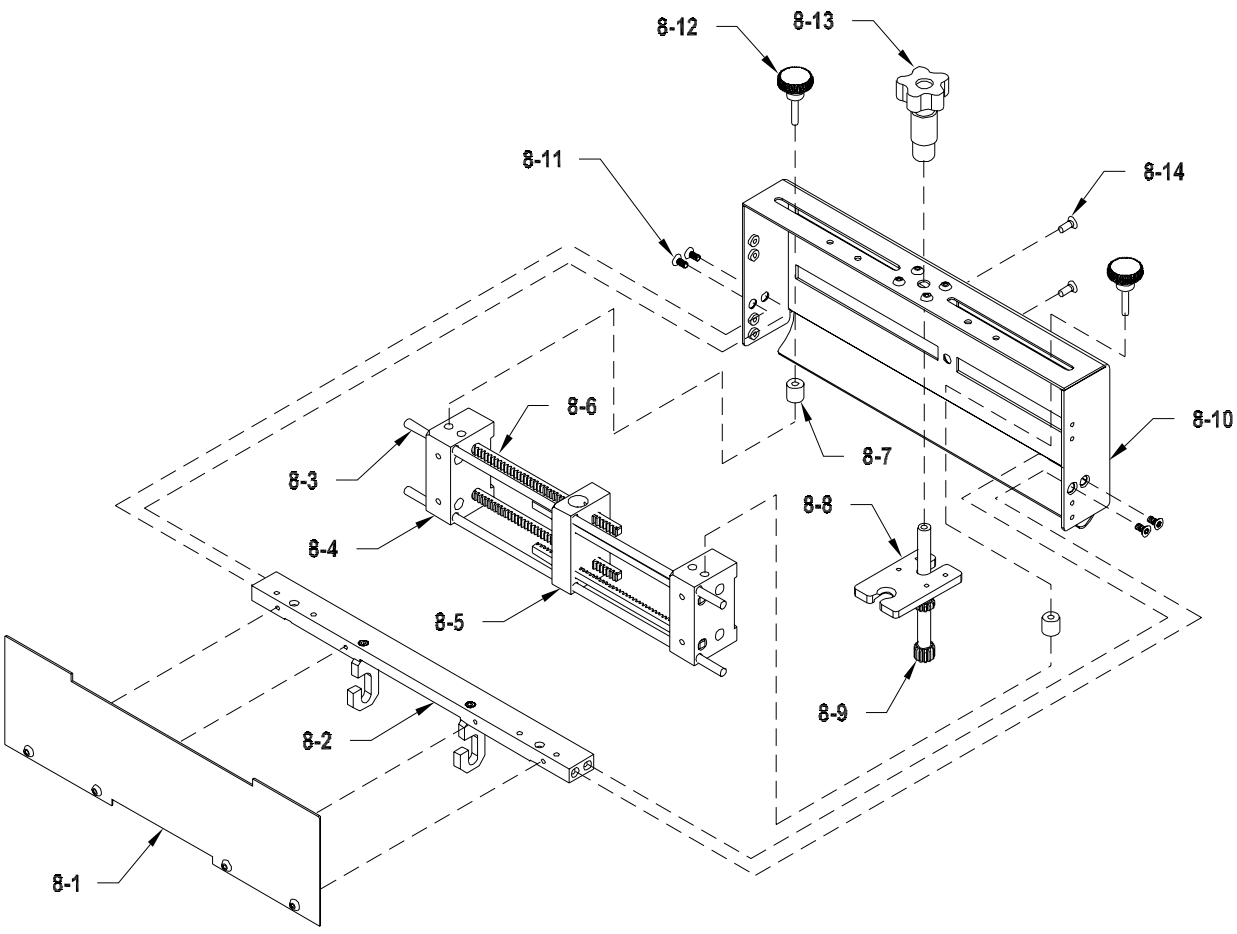
7: CLEAR URETHANE DISCHARGE SECTION
ASSEMBLY #75911019



7: CLEAR URETHANE DISCHARGE SECTION
ASSEMBLY #75911019

DIAGRAM NUMBER	QTY	DESCRIPTION	PART NUMBER
7-1	2	Idler Shaft	43555047
	2	Roller Crown Driven with Bearings	23511105
	4	Clip E 1/2” Waldes	00001155
7-2	1	Shaft Drive SS 1/2	43555211
	1	Drive Crown Pulley	23560106
	2	O Ring Pulley	44759067
	1	Pulley 16T 1/2” Bore with Flange	43560097
	2	SHSS 10-32 X 1/8” LG	00003352
	2	SHSS 1/4-20 X 1/2” LG	00002327
	4	Bearing Ball R8	23500094
	4	Ring Grip 1/2”	00001115
	1	Woodruff Key 1/8 X 3/8	00003351
7-3	1	Carriage Holder Right	44759109
7-4	2	Slide, Anti-Dive	44970006
7-5	1	Belt Discharge Clear 1.5 Wide	23560088
7-6	2	Rail Material Support Slide	23560082
	4	Screw Socket Set 8-32 X 1/4” LG	00002203
7-7	1	Carriage Holder Left	44759108

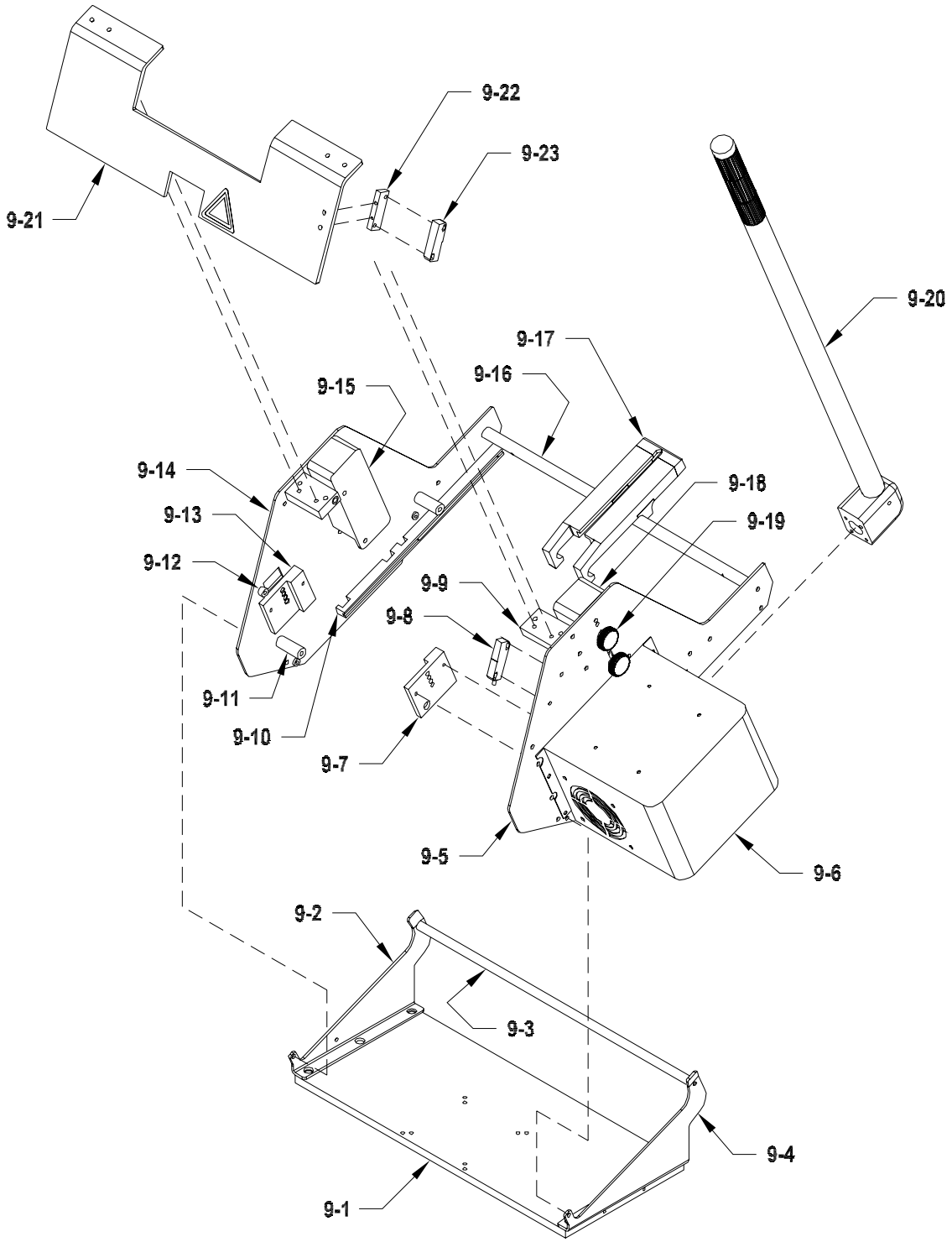
8: SOLID GATE PLATE
ASSEMBLY #64011004



8: SOLID GATE PLATE
ASSEMBLY #64011004

DIAGRAM NUMBER	QTY	DESCRIPTION	PART NUMBER
8-1	1	Guide Adjustment Cover Side	44646012
	4	BHCS 10-32 X 3/8” LG	00002805
8-2	1	Gate Support Bar Lower	44646003
	2	Hook Gate J	15000007
	2	SHCS 8-32 X 5/8” LG	00002215
8-3	2	Rail Side Guide Support	44646006
8-4	2	Guide Adjustment Block	44646001
	4	SHSS 1/4-20 X 1/4” LG	00002205
8-5	1	Guide Stationary Block Side	44646002
8-6	4	Rack	44646010
8-7	2	Spacer Lower	44646015
8-8	1	Block, Adjustment Reference	44646004
	4	BHCS 10-32 X 3/8” LG	00002805
8-9	1	Shaft Pinion Adjustment	44646005
8-10	1	Solid Gate Plate	44640004
8-11	4	FHSS 10-32 X 3/8” LG	00002234
8-12	2	Knob Plastic 10-32 w/o Screw	44681021
	2	SHSS 10-32 X 1 1/2” LG	00003313
	2	Spacer Upper	44646016
8-13	1	Knob 5 Lobe 1/4-20 X 1/2	44646009
	1	Spring Retainer Upper	44646008
	1	Spring Retainer Lower	44646007
	1	Spring Compression	44646013
8-14	2	FHSS 10-32 X 1/2” LG	00002830

9: BASE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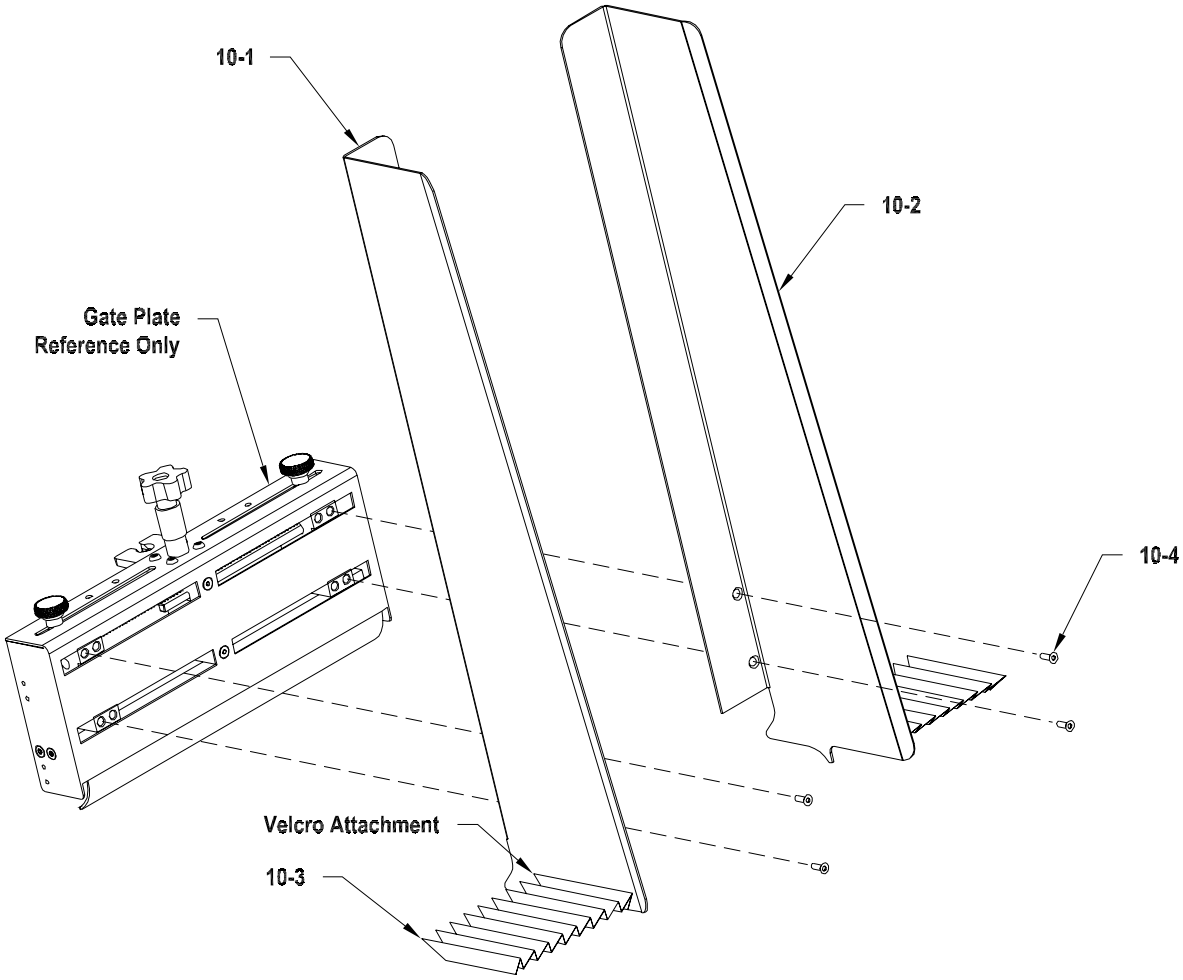
9: BASE

DIAGRAM NUMBER	QTY	DESCRIPTION	PART NUMBER
9-1	1	Plate, Bottom Mounting ST1450	44759116
9-2	1	Right Mounting Bracket	44759051
9-3	1	Bottom Support Shaft	44759070
9-4	1	Left Mounting Bracket	44759050
9-5	1	Left Side Plate	44759001
9-6	1	ST I/O Distribution Board	44700021
	1	Motor Cover	44759024
	1	Coupling Motor	44759046
	2	Motor Spacer	44759063
	1	Cable Plate	44759074
	4	Standoff Hex F/F 6-32 .375L	44759083
	1	Fan Assembly	70011001
	1	Cable Interconnect 5ft ST1450	75911001
	1	ST1450 Motor Drive Stepper Assembly	75911390
9-7	1	Block, Mounting Hold Down Left	44759144
9-8	1	Magnetic Safety Switch Assembly	75911002
9-9	2	Hinge, Top Cover Mount	44640012
	2	Shaft, Top Cover Hinge Mount	44640011
9-10	2	Slide Rail	44759034
9-11	4	Carriage Spacer	44759009
9-12	2	Spacer .25 X .375 Tapped 10-32	44633027
9-13	1	Block, Mounting Hold Down Right	44759143
9-14	1	Right Side Plate	44759002
9-15	1	Right Gate Spacer	44759066
9-16	1	Wedge Shaft	44759011
9-17	1	Wedge Block	44759027
	1	Plunger Ball 10-32	44681019
9-18	1	Left Gate Spacer	44759036
9-19	4	Knob Plastic 10-32 w/o Screw	44681021
	4	SHSS 10-32 10-32 X 1” LG	00002201
9-20	1	Tower Lamp Assembly	70011010
9-21	1	Protective Cover	44759047
	1	Label, Warning Roller Pinch Point	44600004
9-22	1	Top Interlock Bracket	44759072
9-23	1	Actuator Magnet	53500514
NS	1	Top Shock Mount	44759068
NS	1	Bottom Shock Mount	44759069
NS	1	Shock	44759071
NS	1	Graphic ST1450 (Not Sold Separately)	44759082
NS	1	Lower Machine Guard	44759035
NS	1	Bushing 1/2 KO	53500415
NS	1	Power Cord (115V Model)	53511020
NS	1	Power Cord & Allen Wrench Set (230V Model)	53522210
NS	1	Flight Sensor Assembly	63011038

10: SIDE GUIDE KIT
ASSEMBLY #64011039



10: SIDE GUIDE KIT
ASSEMBLY #64011039

DIAGRAM NUMBER	QTY	DESCRIPTION	PART NUMBER
10-1	1	Side Guide Left 2424	44640039
10-2	1	Side Guide Right 2424	44640038
10-3	2	Guard Rear Accordion	44600001
10-4	4	FHSS 10-32 X 1/2” LG	00002830
NS	2	Warning Label Side Guide	44600005

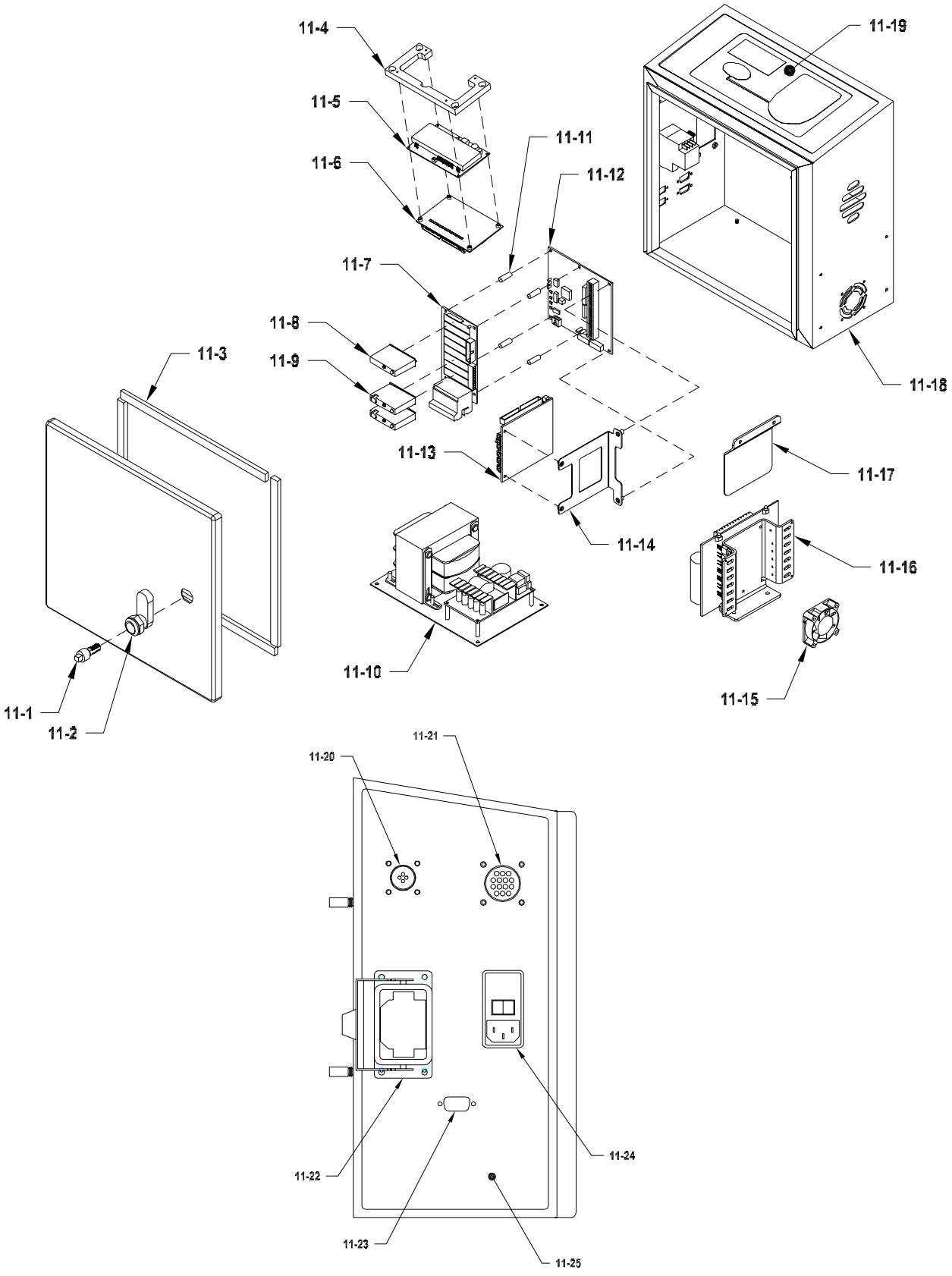
11: IQUIPPED BOX WITH I/0
BASE ASSEMBLY #68311001 / I/O ASSEMBLY #68311014

DIAGRAM NUMBER	QTY	DESCRIPTION	PART NUMBER
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
11-14*	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
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	53500512
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**	Connector T&B 96-Pin	44649031
NS	1**	Bracket Mounting CPU Board	44649038
NS	1**	Mounting Block	44649126
NS	1	Plate Mounting IQuipped Box	44683006
NS	2	Retainer Mounting IQuipped Box	44683007
NS	1	Key 7mm Square	44683023
NS	1**	Overlay Graphic IQuipped (Not Sold Individually)	
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 (Batch Count Model Only)	63511001
NS	1	Eprom (One Shot Model Only)	63511002
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.

**Denotes part that was removed to accommodate I/O feature.

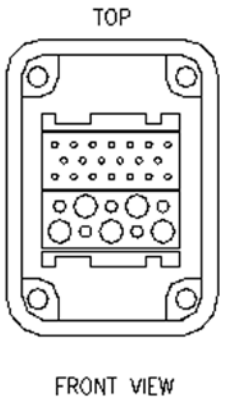
11: IQUIPPED BOX WITH I/0
BASE ASSEMBLY #68311001 / I/O ASSEMBLY #68311014

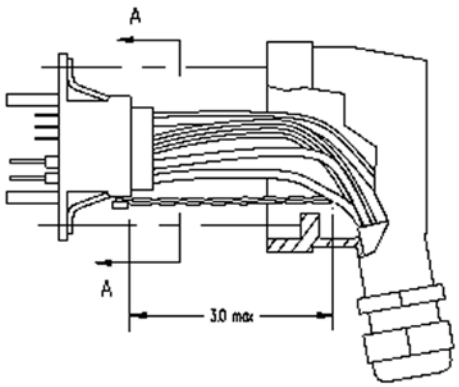


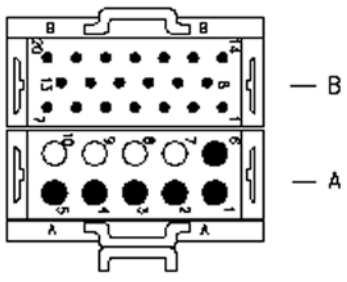
10 Electrical Components

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



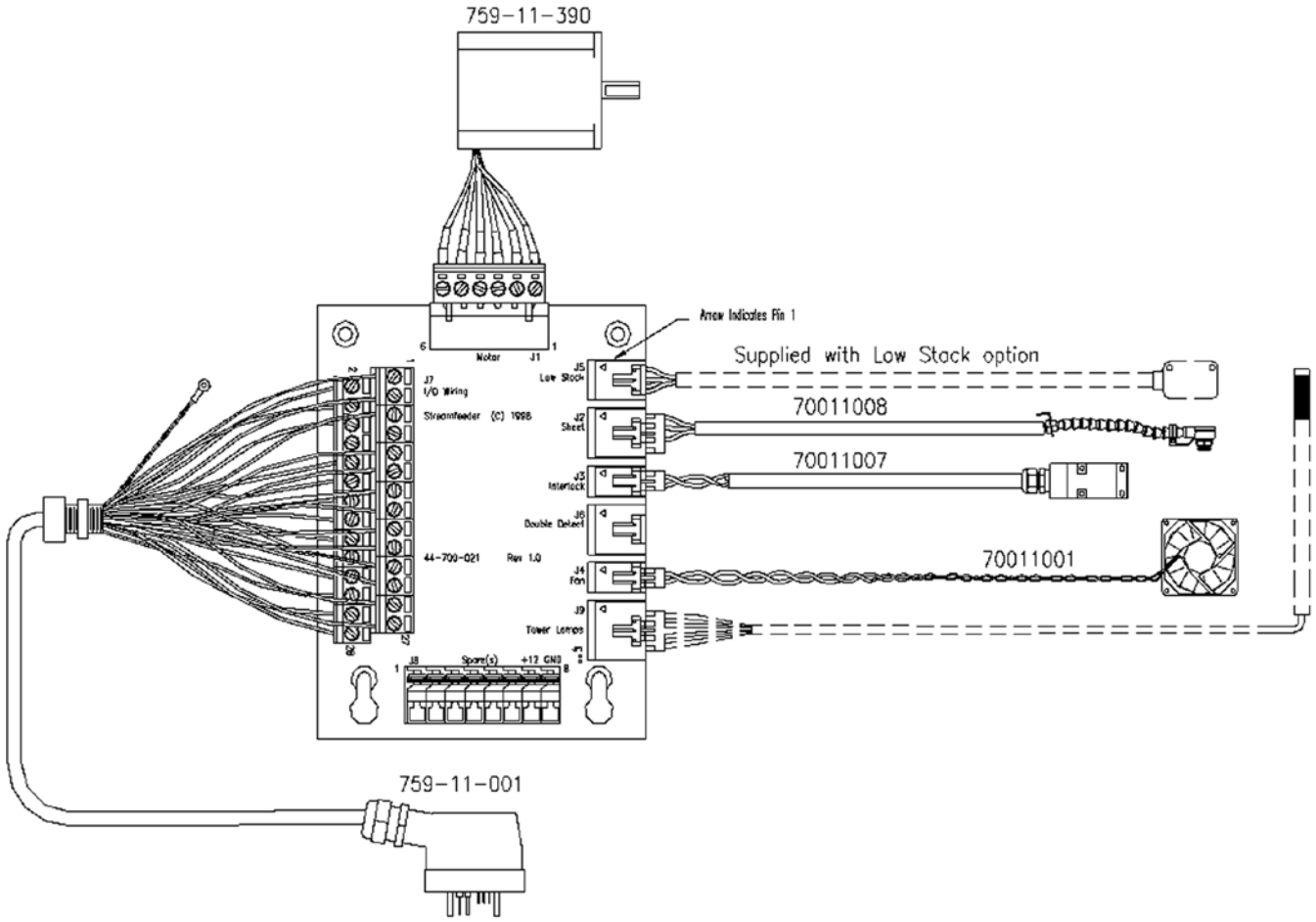




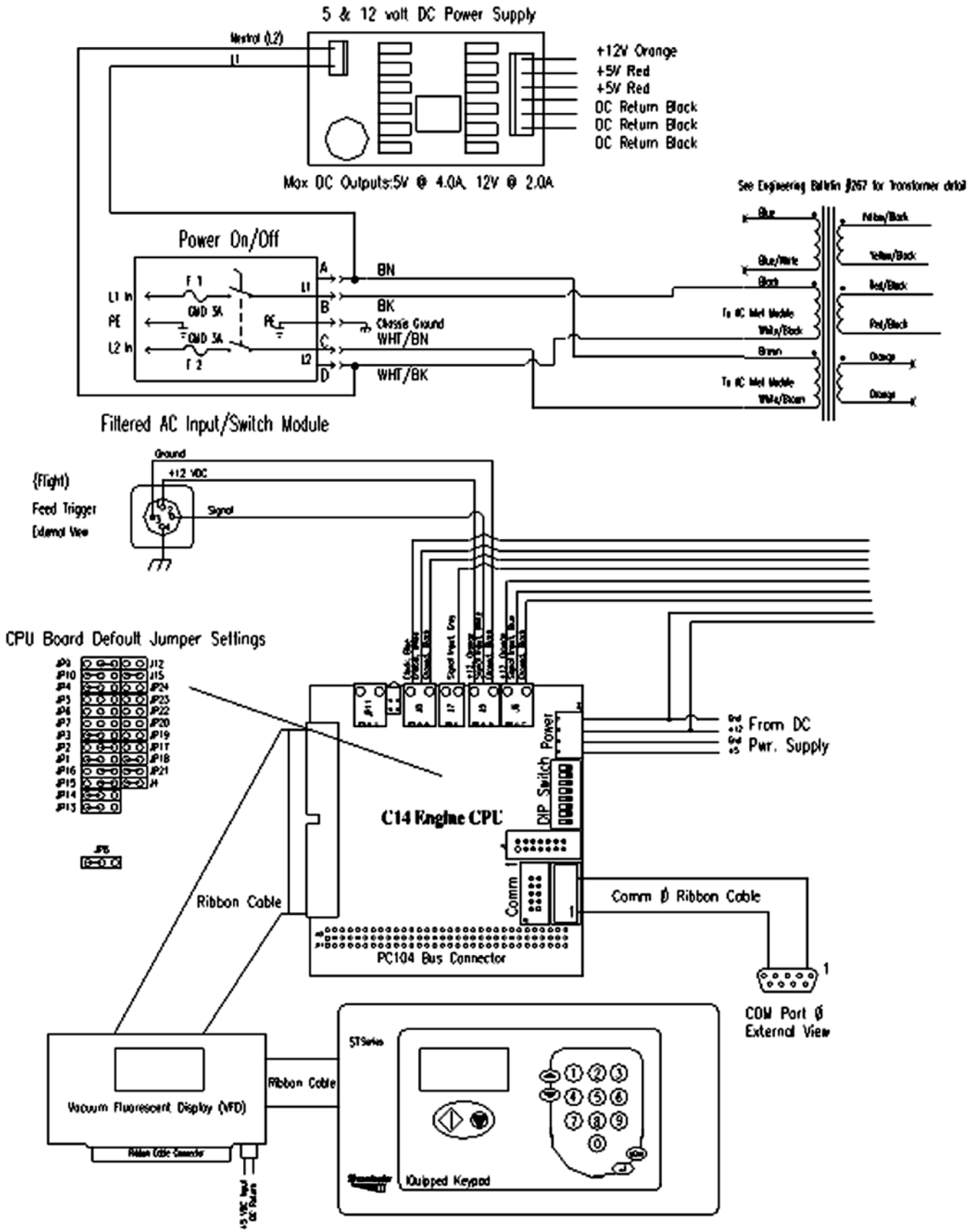
Electrical Detail

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	J6-2	BLK	(RED)	Double Detect Signal
(mechanical)	J6-3	BLU	(WHT)	DC Ground
	J6-4	--	(n.c.)	n.c.
Fan	J4-1	RED		+12V DC
	J4-2	BLK		DC Ground
Tower Lamp	J9-1	GRN		Green Lamp
	J9-2	ORG		Amber Lamp
	J9-3	RED		Red Lamp
	J9-4	--		n.c.
	J9-5	YEL		+12V DC

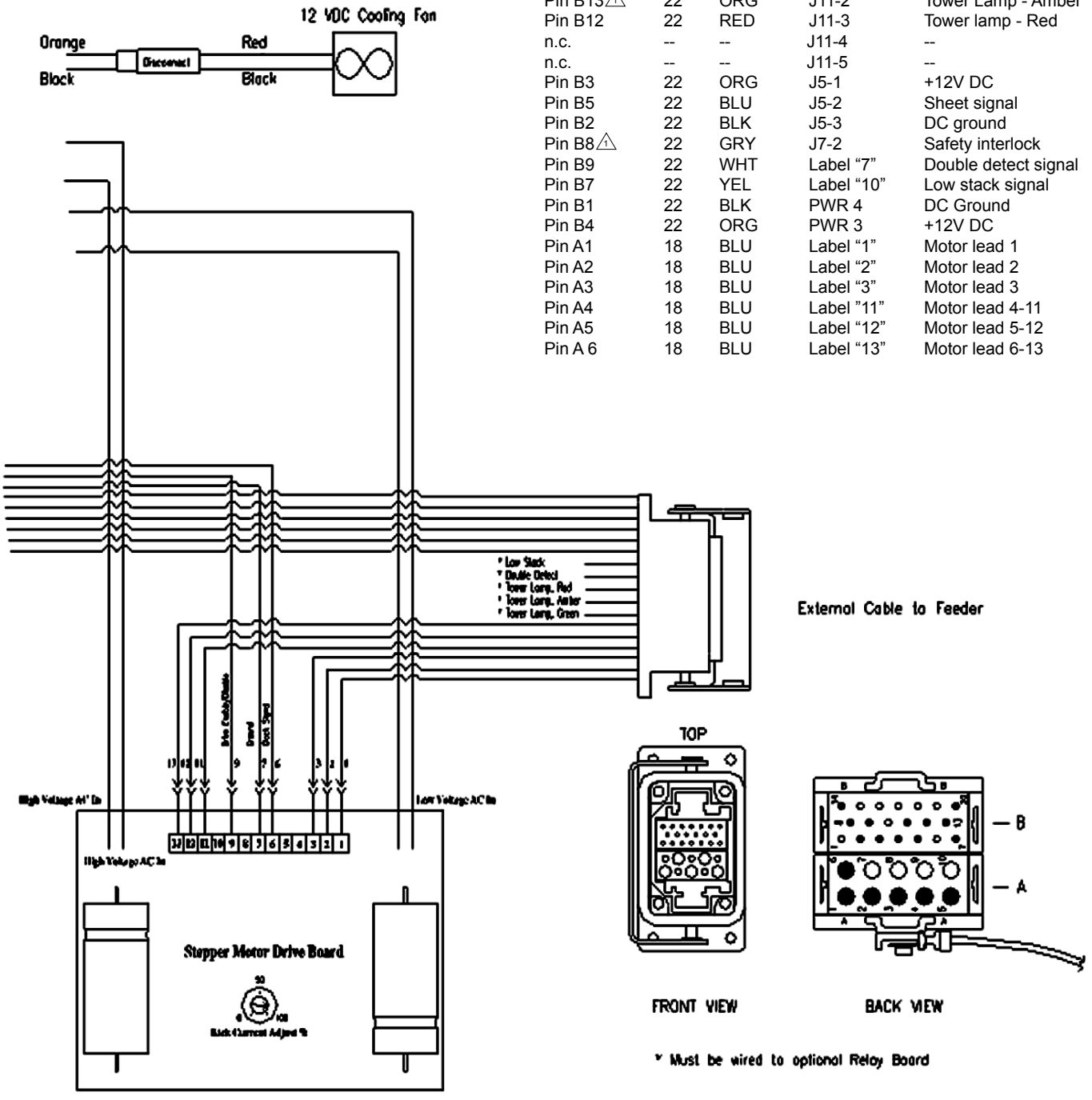


External IQuipped Box

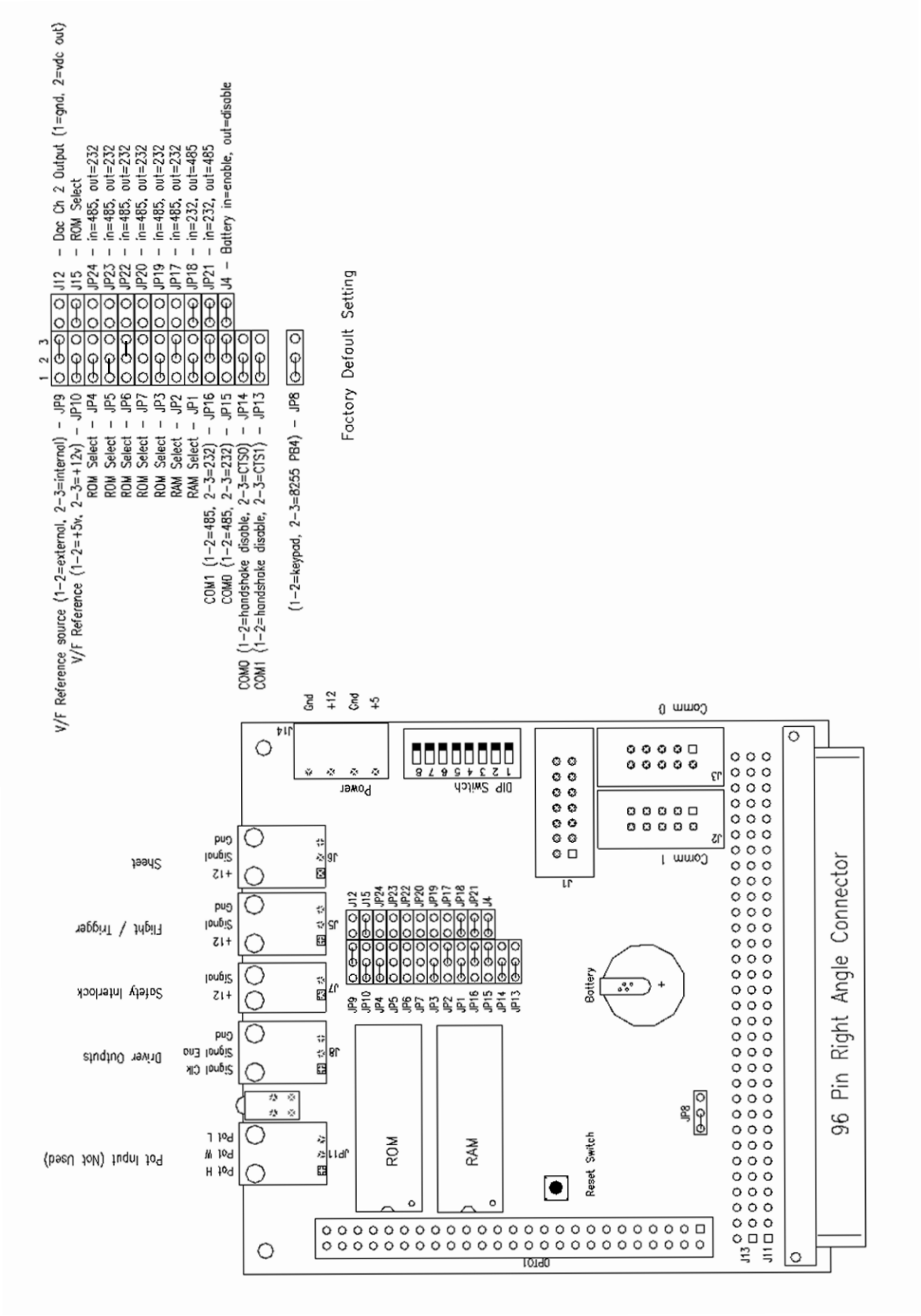


External IQuipped Box

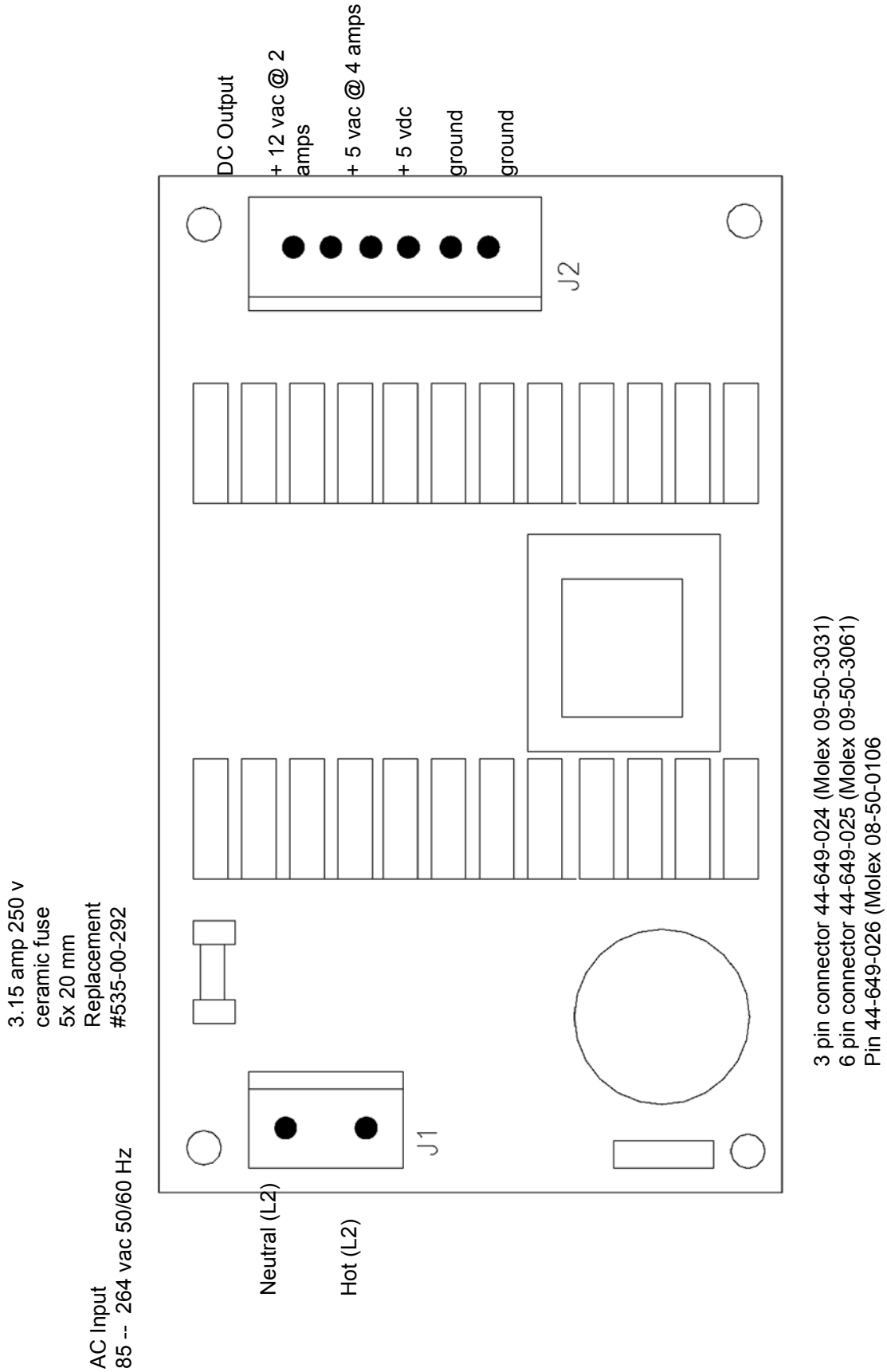
FR AME/ HOUSING END (FROM)	AWG	COLOR	(TO)	SIGNAL
Pin B14	22	GRN	J11-1	Tower Lamp - Green
Pin B13⚠1	22	ORG	J11-2	Tower Lamp - Amber
Pin B12	22	RED	J11-3	Tower lamp - Red
n.c.	--	--	J11-4	--
n.c.	--	--	J11-5	--
Pin B3	22	ORG	J5-1	+12V DC
Pin B5	22	BLU	J5-2	Sheet signal
Pin B2	22	BLK	J5-3	DC ground
Pin B8⚠1	22	GRY	J7-2	Safety interlock
Pin B9	22	WHT	Label “7”	Double detect signal
Pin B7	22	YEL	Label “10”	Low stack signal
Pin B1	22	BLK	PWR 4	DC Ground
Pin B4	22	ORG	PWR 3	+12V DC
Pin A1	18	BLU	Label “1”	Motor lead 1
Pin A2	18	BLU	Label “2”	Motor lead 2
Pin A3	18	BLU	Label “3”	Motor lead 3
Pin A4	18	BLU	Label ”11”	Motor lead 4-11
Pin A5	18	BLU	Label “12”	Motor lead 5-12
Pin A 6	18	BLU	Label “13”	Motor lead 6-13



ST Series CPU Detail

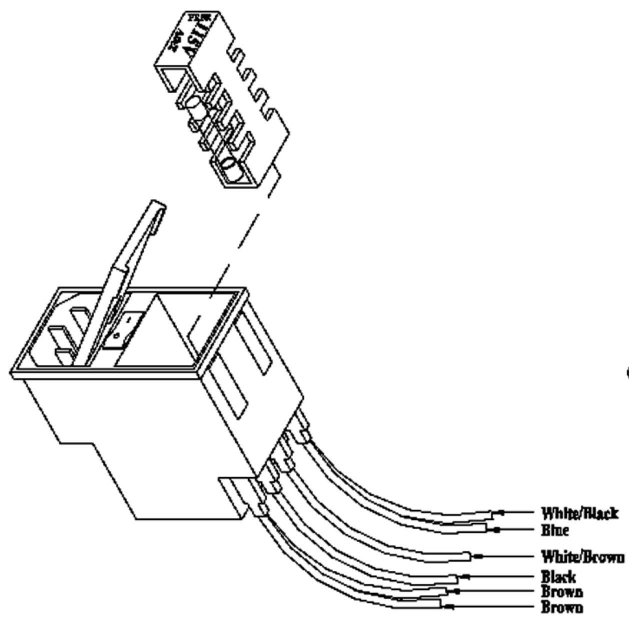


Power Supply

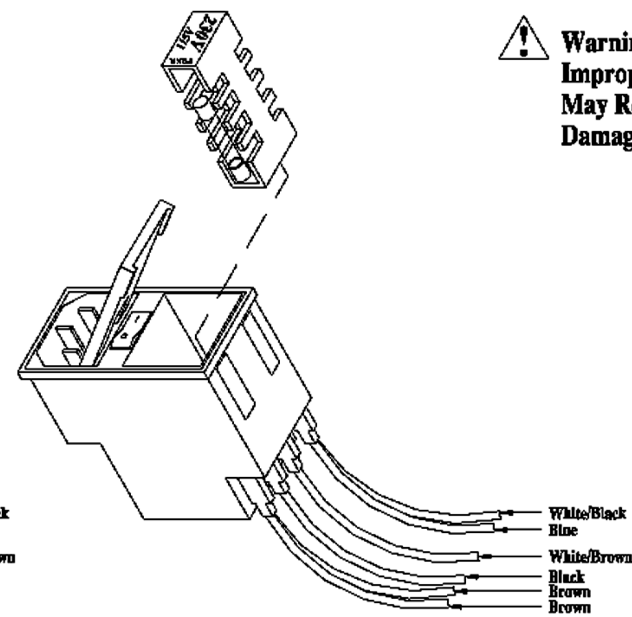


AC Input Module

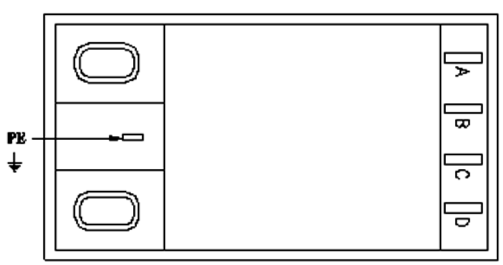
⚠ **Warning:**
Improper Voltage Selection
May Result In Permanent
Damage To Feeder



115 Volt Configuration



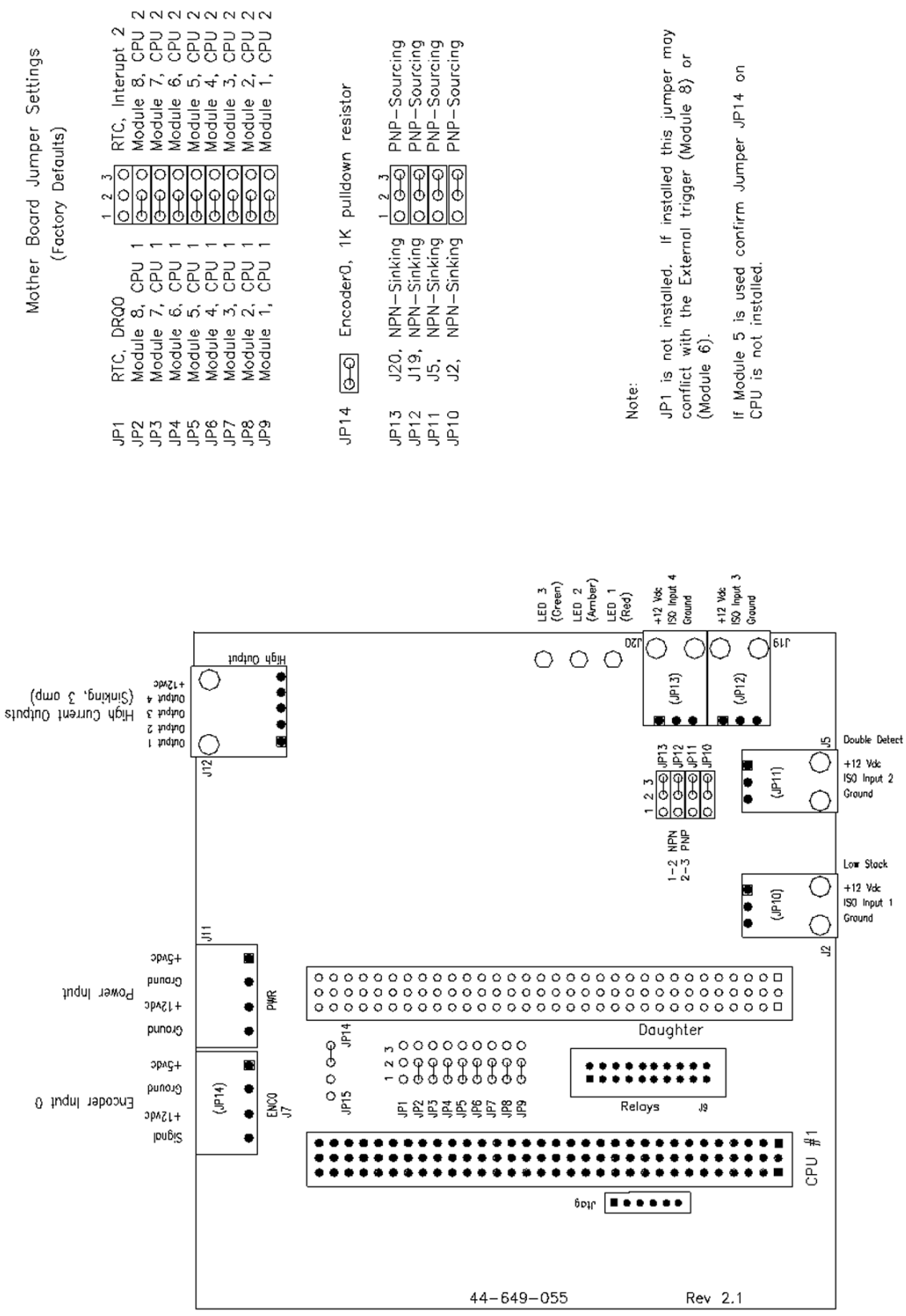
230 Volt Configuration



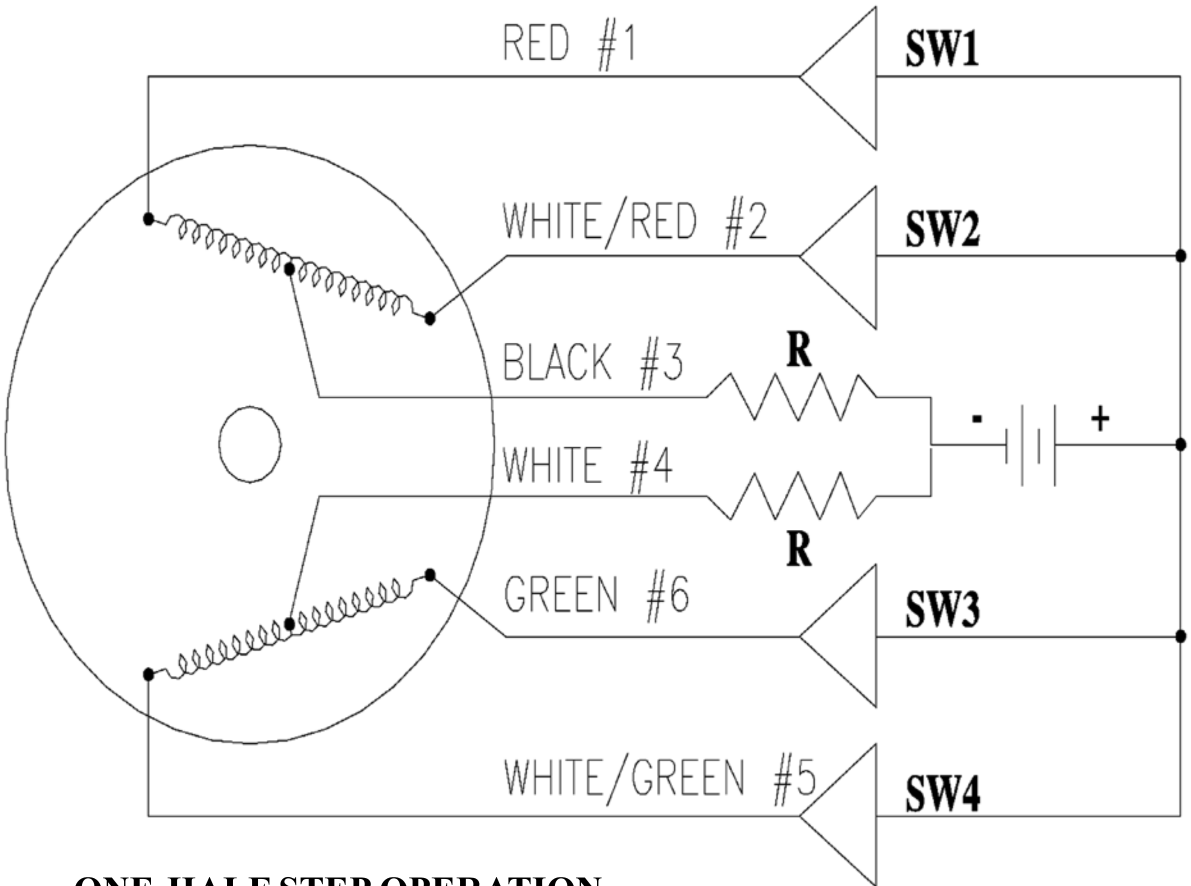
AC Input Module Connections

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

Motherboard



Wiring Diagram: 6-Lead Stepper Motor



The motor must not be taken apart. Opening the motor will void the warranty. Removing the rotor will reduce output torque 5% or more. It is possible that reassembly will introduce very small steel particles into the interior of the motor which will contaminate it.

NOTE

The motor has sealed bearings which do not require lubrication for the life of the motor.

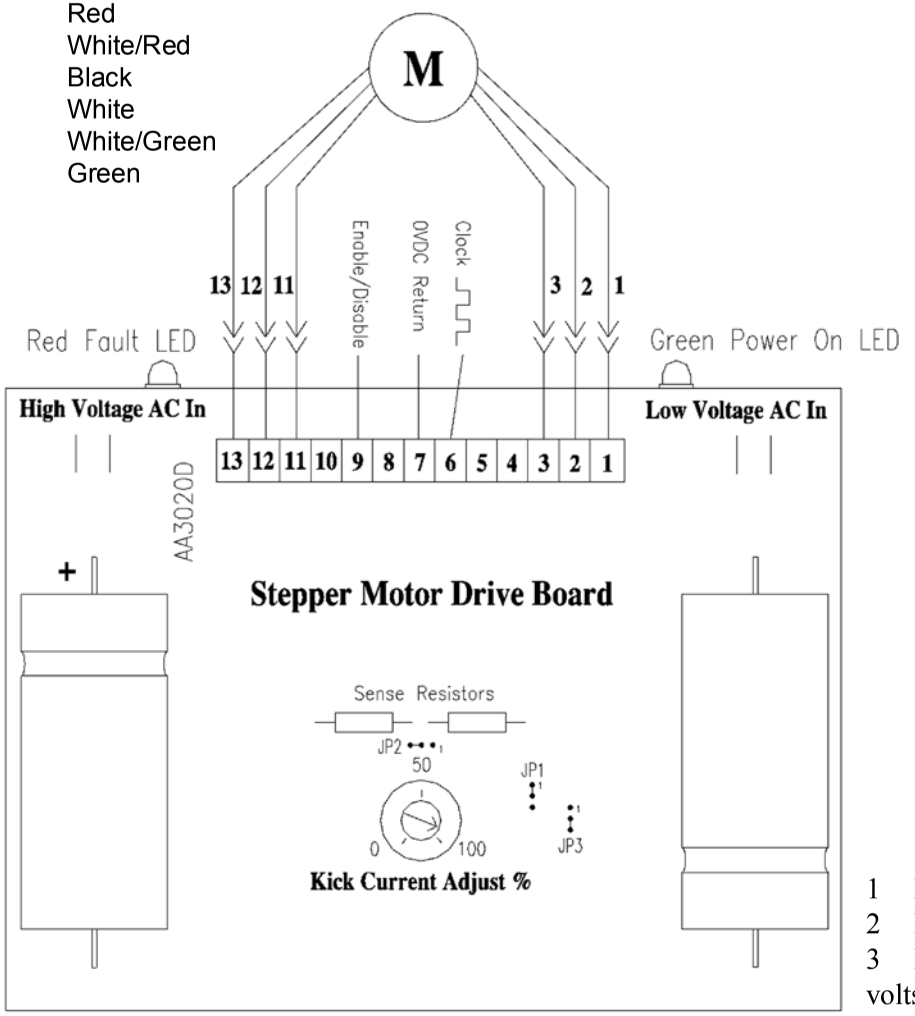
ONE-HALF STEP OPERATION
EIGHT-STEP INPUT SEQUENCE

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

Motor Wires:

1	Red
2	White/Red
3	Black
11	White
12	White/Green
13	Green



13 Pin Motor Coupler Pin Assignments

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

Jumper Settings

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

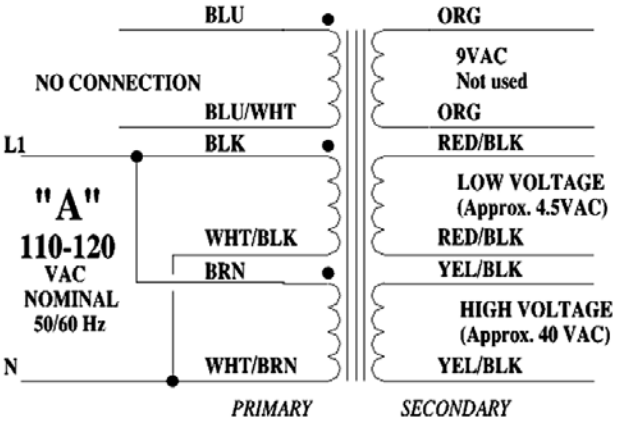
Fault Detection Protection LED Indictaion

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)

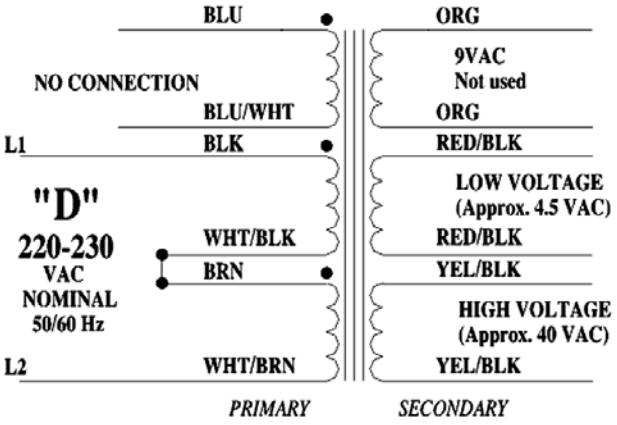
NOTE

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

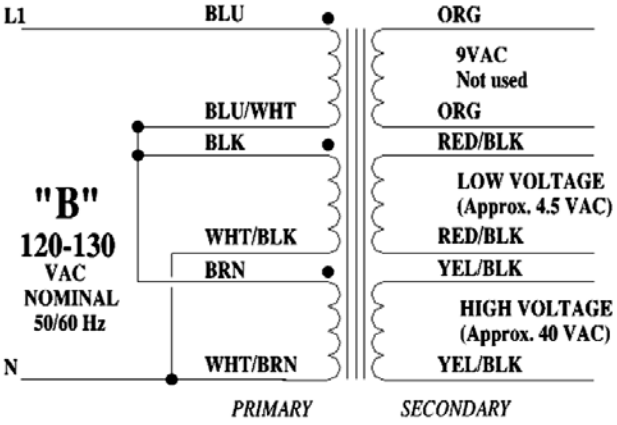
Transformer



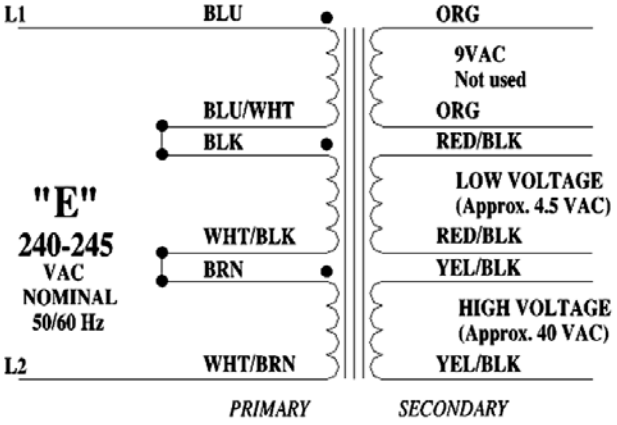
Standard wiring for most North American applications



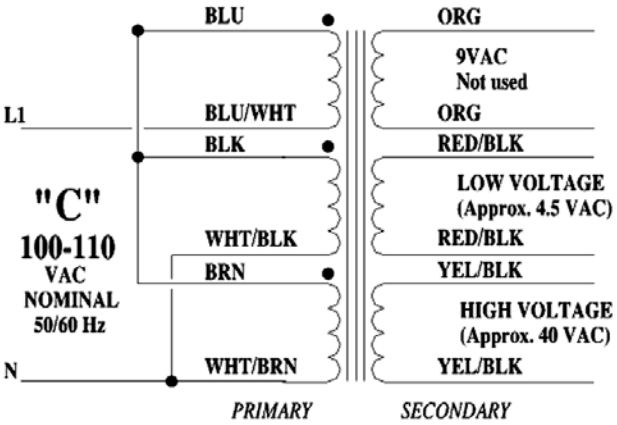
Standard wiring for Continental Europe, some 230V US applications



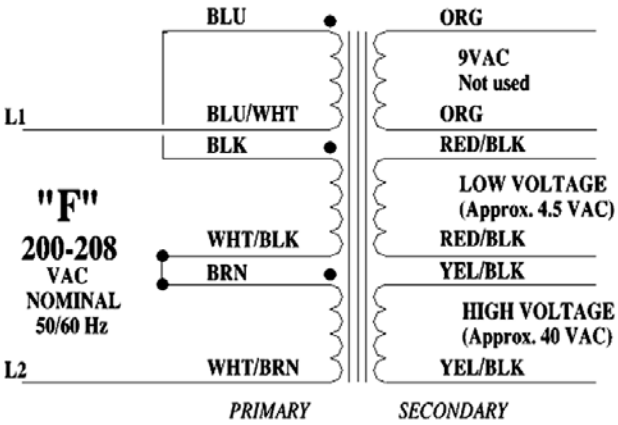
North America where voltage is over 120V



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

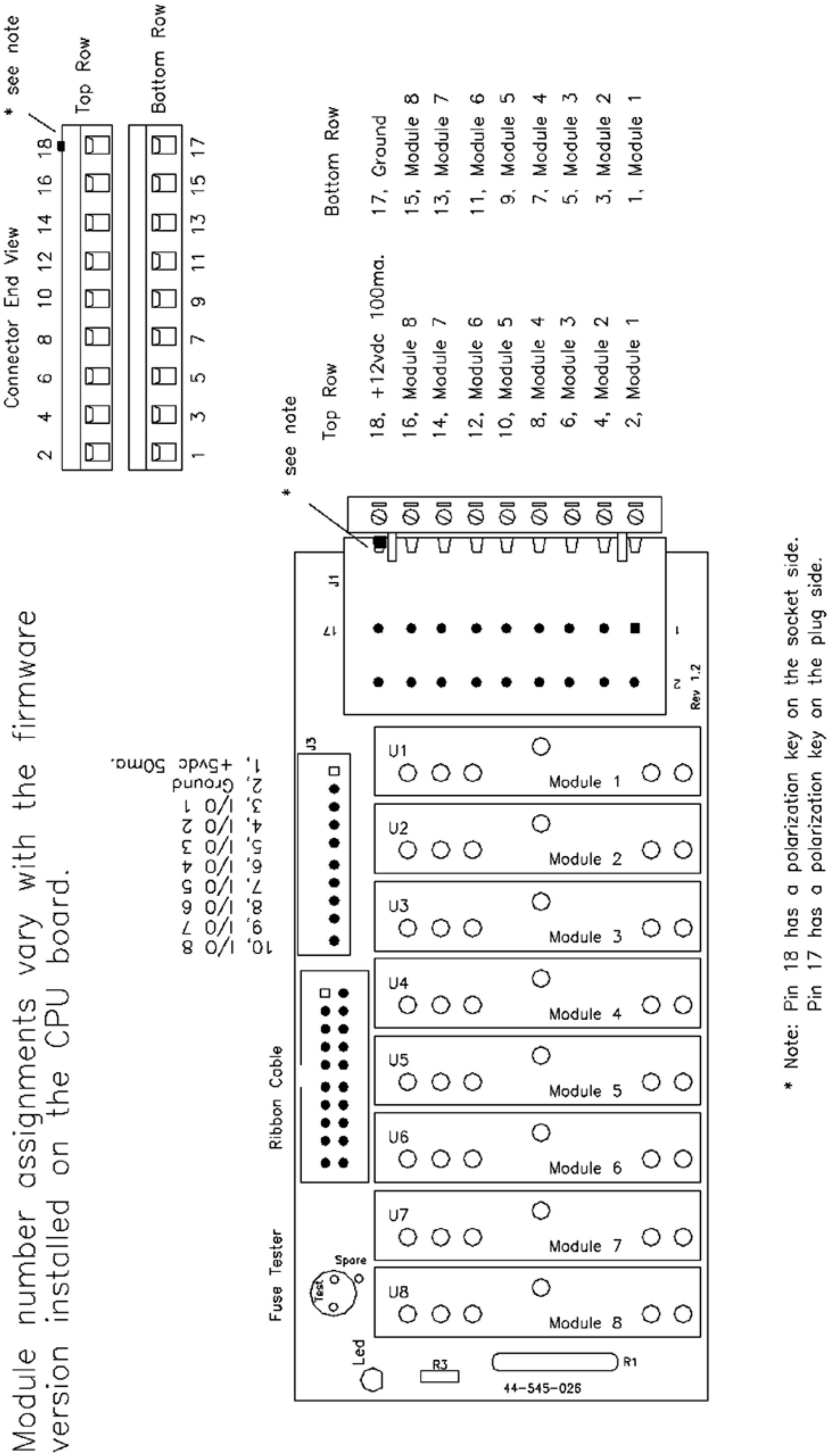


Standard wiring for Japan



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

I/O Board



Module number assignments vary with the firmware version installed on the CPU board.
Connector End View
* see note
Top Row
Bottom Row
Top Row
18, +12vdc 100ma.
16, Module 8
14, Module 7
12, Module 6
10, Module 5
8, Module 4
6, Module 3
4, Module 2
2, Module 1
Bottom Row
17, Ground
15, Module 8
13, Module 7
11, Module 6
9, Module 5
7, Module 4
5, Module 3
3, Module 2
1, Module 1
J1
J3
Ribbon Cable
Fuse Tester
Spare
Test
Led
R3
R1
44-545-026
Rev 1.2
Module 1
Module 2
Module 3
Module 4
Module 5
Module 6
Module 7
Module 8
* Note: Pin 18 has a polarization key on the socket side.
Pin 17 has a polarization key on the plug side.

11 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.

Table 11-1. Quick-Look Troubleshooting

Problem	Solution
No power to feeder when power switch is turned on **IMPORTANT** *A visual inspection will not always be sufficient to determine fuse integrity.*	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 Streamfeeder's facility with 5mm x 20mm fuses. 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.
Fuses blow on power up NOTE *A fuse failure indicates a problem with the last item connected before failure occurs.*	1. Install known good fuses of same rating only. 2. Disconnect all AC loads from the input: 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.

Table 11-1. 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: a. Connect the transformer primary leads to the AC input module. b. Connect leads to the two-pin AC input connector of the DC power supply. c. Connect the red and yellow wire pairs of the transformer secondary to the stepper motor drive board.
Decreased power experienced after fuse is replaced **IMPORTANT** *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.*	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 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.*	1. Test output of DC supply. Note: The DC supply has dual outputs; 5 and 12 volts DC. 2. 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.) 3. Check wiring harness for good electrical connections to pins in quick disconnect plugs. 4. Check for shorted wires in DC harness on output of supply or in the multi-conductor cable. 5. 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	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 board is mounted "piggy back" to the display board. 3. Check all CPU jumpers for correct positioning, but specifically check jumper JP8 for correct positioning on pins 1 and 2. 4. Test fuse on the keypad decoder board. 5. Check 50-pin ribbon cable between keypad decoder board and the CPU board for positive connection and integrity. 6. Replace keypad decoder board. 7. If this does not give positive results, replace keypad.

Table 11-1. Quick-Look Troubleshooting (continued)

Problem	Solution
Display does not function properly NOTE *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.* **IMPORTANT** *All user programmable parameters that are held in memory will be lost when the RAM is cleared.*	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. 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.
"FRONT GUARD OPEN" message displayed	1. Make sure the safety interlock under the front guard is fully engaged. 2. Make sure DC power supply harness integrity is intact, and is fully plugged into 4-pin DC input connector on CPU board. 3. Jumper CPU board connector J7 pins 1 and 2 together. a. If message on display is still present after pressing the green "cycle" key, replace CPU board. b. If message goes away after pressing the green "cycle" key, continue with next step. 4. Using an ohmmeter, check the wiring harness connected between J7 and the safety interlock switch harness for integrity. If continuity is not measured, replace harness or repair broken wire. 12VDC should be measured on the gray wire connected to J7 pin two, when the safety interlock switch is closed.

Table 11-1. Quick-Look Troubleshooting (continued)

Problem	Solution
"FRONT GUARD OPEN" message displayed (continued)	5. Using an ohmmeter, check for continuity between wires connected to safety interlock switch. The switch is closed when the key on the front guard is inserted into the slot on the interlock switch. If continuity is not measured, replace switch or repair broken wire.
"FEEDER TIMED OUT" message displayed	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. 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. 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-conductorr 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	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.

Table 11-1. Quick-Look Troubleshooting (continued)

Problem	Solution
CPU board "heartbeat" pulse not present (continued)	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 NOTE • *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.*	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. 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. b. Jumper pins 1 and 2 on CPU board connector J5. This will simulate the output of the "flight" sensor and should trigger a cycle. c. 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. d. 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. 3. Test the integrity of the wiring harness leading to the flight sensor input connector. a. Measure 12VDC across pins 1 and 3 on the 4-pin circular connector. If voltage is not present, repair broken wire. b. Jumper pin 1 to pin 2. This should trigger a cycle. If not, repair broken wire. 4. 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. 5. Test the flight sensor for a switching output. If not present, replace flight sensor.
Motor does not run, is noisy, makes a "growling" sound, or runs in reverse	1. 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. 2. Is the rolling icon present? a. Yes: Go to step 3. b. No: Check CPU board for "heartbeat" LED and verify keypad is working correctly. 3. 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. 4. Look at the Red LED on the stepper motor drive board. Is it illuminated? a. YES: Go to section titled "Drive board red LED illuminated." b. NO: Continue next step.

Table 11-1. Quick-Look Troubleshooting (continued)

Problem	Solution
Motor does not run, is noisy, makes a "growling" sound, or runs in reverse (continued) TIP *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.* NOTE *This test requires a meter that has frequency measurement capabilities, or an oscilloscope.*	5. 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. 6. 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. 7. 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. a. Cycle the feeder and verify icon is rolling on the "Run Display." b. 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). c. Check integrity of both ends of drive wiring harness between the CPU board connector J8 and the drive board's 13-pin connector. d. Using a digital multimeter or an oscilloscope, measure the amplitude of the pulse train and verify it is at least 2.5VDC. e. 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.
Drive board red LED illuminated IMPORTANT *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.*	1. Slow Blink: (about once per second) indicates a SHORT in motor, motor cable, or drive power component. a. 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. b. If wires look OK, go to section titled "Testing stepper motor drive board output pins." c. If stepper motor drive board tests are positive, replace the motor. For further information, see the section titled "Testing motors." 2. Fast Blink: (multiple times per second) indicates an OPEN in motor, motor cable, or drive component. a. Check integrity of motor wires and/or cable. None of the wires should measure open, or be disconnected or loose from their terminals. b. If wires check OK, go section titled "Testing stepper motor drive board output pins." c. If stepper motor drive board tests are positive, replace the motor. For further information, see the section titled "Testing motors." 3. On Steady: indicates a ground fault (wire shorted to zero volts). a. Remove ground fault.

DIAGNOSTICS / TESTS

Table 11-2. Diagnostics / Tests

Problem	Solution
Testing stepper motor drive board output pins **IMPORTANT** *Do not have power applied when doing these tests.* NOTE *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."*	1. Remove 13 terminal motor wire plug-in coupler from the drive board. 2. Test motor phase pins. Note: A digital multimeter is required for these tests. a. Set the multimeter to Diode Test. b. 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. c. 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. 3. Test motor common pins: Note: A digital multimeter is required for these tests. a. 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. b. 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.
Testing motors **IMPORTANT** *These motors are NOT repairable and should never be opened.*	Refer to the wiring diagram of the 6-lead DC Stepping Motor found elsewhere in this manual. The motors used in the ST Series of feeders 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: 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.

Table 11-2. Diagnostics / Tests (continued)

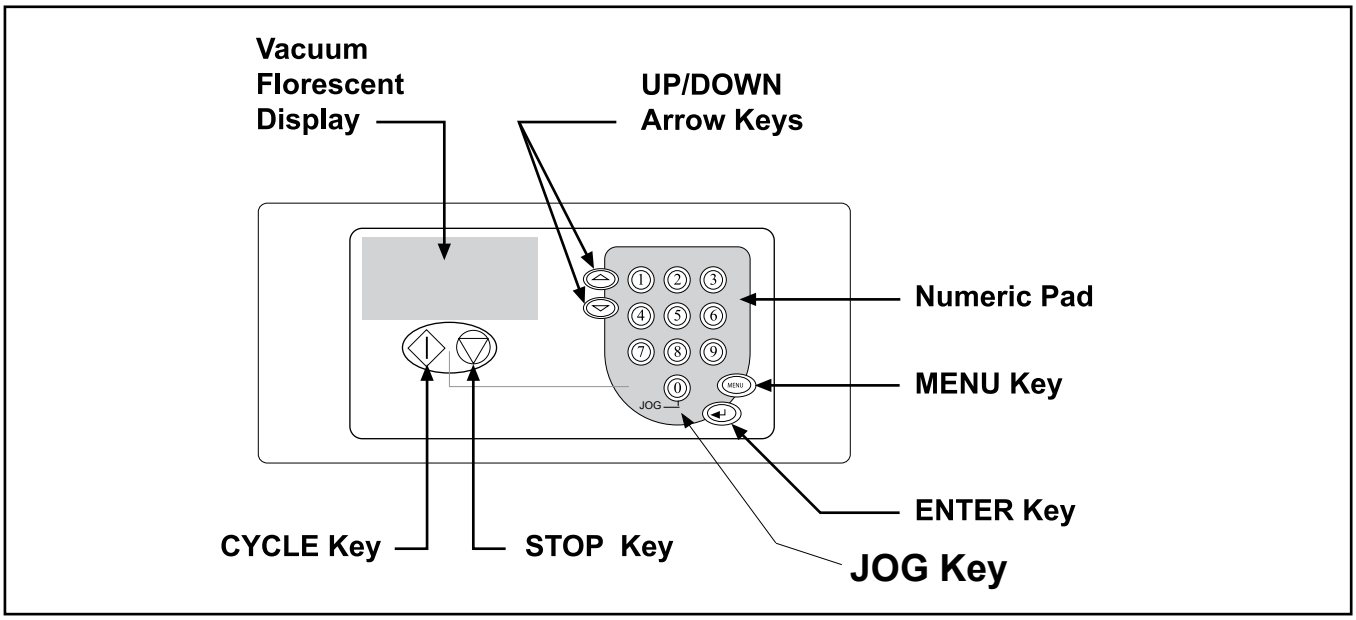
Problem	Solution
Testing the transformer	Refer to the wiring diagram of the ST Series Transformer found elsewhere in this manual. Note there are three primary windings and also three secondary windings, six windings altogether. Most feeders are shipped from the factory with the transformer set up for 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.” 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. 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. 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. 2. Apply the correct power to the transformer primary depending upon the position of the fuse holder in the AC power entry module. 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. 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. 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. The following are tests you can make with an ohmmeter: 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. 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.

12 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.

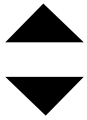
Gaining Access Beyond the Passcode Screen

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 corrct 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 men 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.

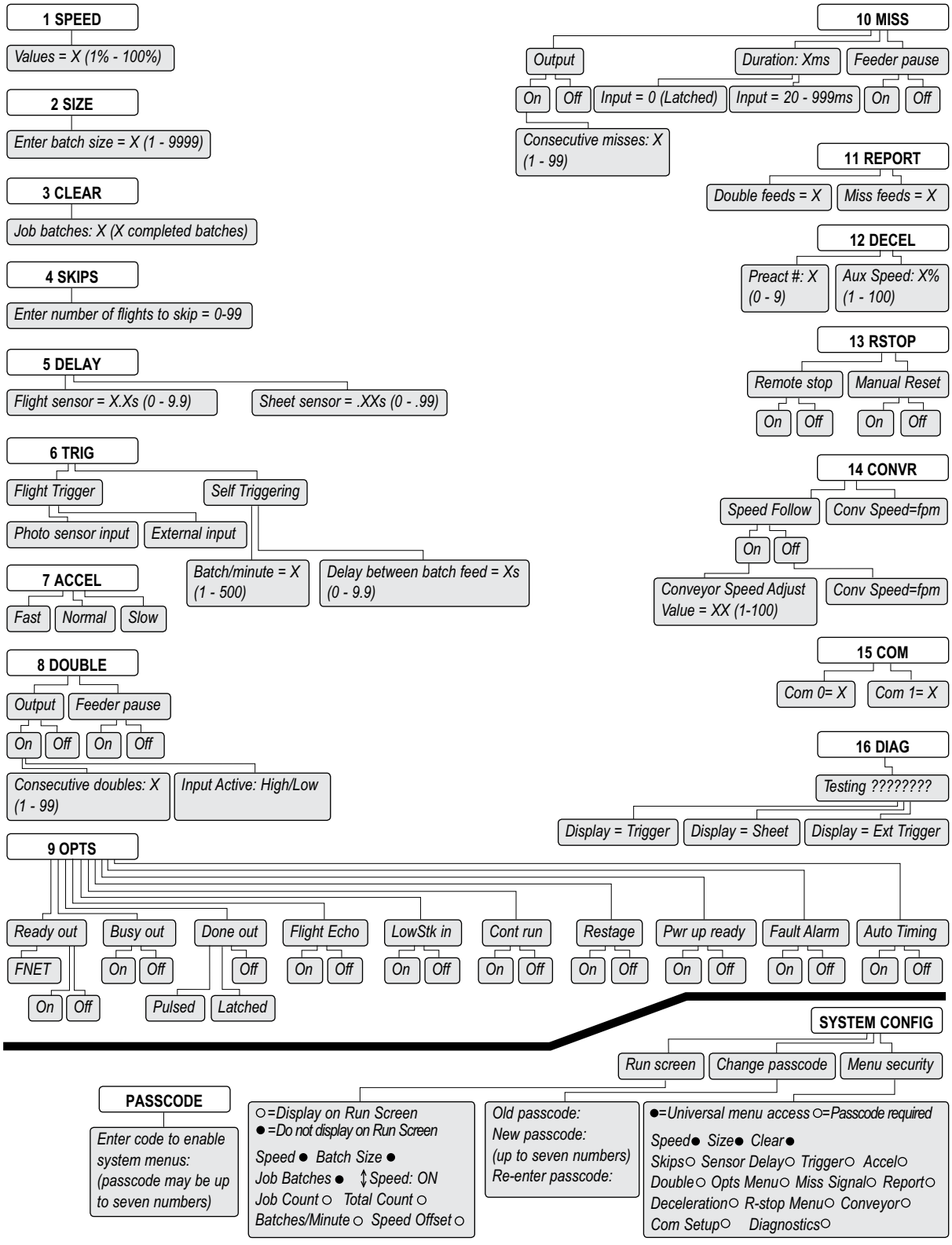
MENU

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 IQUIPPED 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 fl ights 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.

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 nu meric 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.

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).

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 fl ight 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 fl ight 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. 6-8inches) 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.

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.

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.

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."

MENU 14: CONVR

IMPORTANT

Speed Following Pre-installation Instructions

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.

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.

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).

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>	

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 Inter face 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

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. Al ternately 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 trhee 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.

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.

Thiele Technologies
A Barry-Wehmiller Company

Streamfeeder®

103 Osborne Road • Minneapolis, MN 55432-3131 USA
TEL: 763.502.0000 • FAX: 763.502.0100
E-MAIL: service@streamfeeder.com
WEB: www.streamfeeder.com