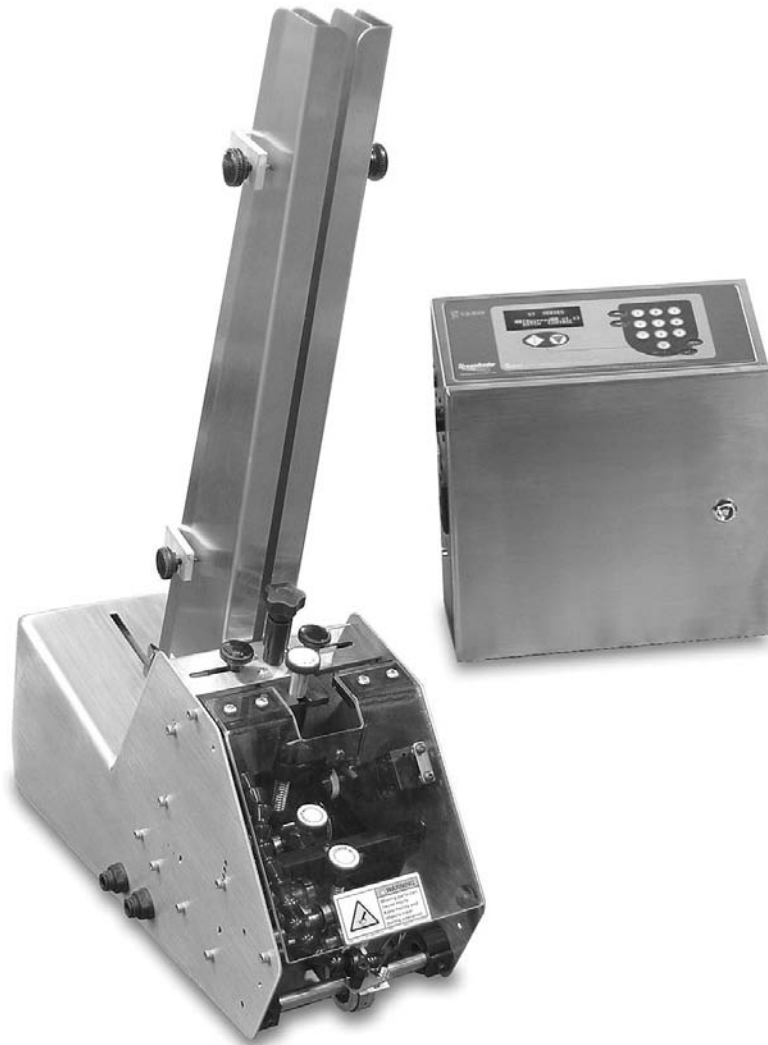


Pro Series ST-550

Manual



Thiele
Technologies

Streamfeeder
PRODUCT LINE

Part Number 901604

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BEFORE You BEGIN

Message Conventions



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



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



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



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



TIP signifies information that is provided to help minimize problems in the installation or operation of the feeder.



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



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



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



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

BEFORE YOU BEGIN

Message Conventions



Avoid injury. Do not reach around guards.



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



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



Pinch point. Keep hands and fingers clear.



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

SPECIFICATIONS

Maximum Product Size..... 5 W x 5.5 L in (127 x 139.7 mm)

Minimum Material Size..... 2 in. W x 2.5 in. L (50.8 mm x 63.5 mm)

Optional..... 1 W x 2.5 L in (25.4 x 63.5 mm)

Min/Max Product Thickness.... .003 in to 1 in. (.07 mm - 25.4 mm)

Belt Speed..... 5500 in/min (14,000 cm/min or 140 meters)

Electrical Requirements..... 115/230VAC, 50/60Hz, 6A

Overall Dimensions..... 23.32 in. L (5.9 cm)
13.15 in. W (3.3 cm)
28.82 in. H (adjustable) (7.3 cm)

Weight..... 69 lbs. (32kg)

1 About the Machine

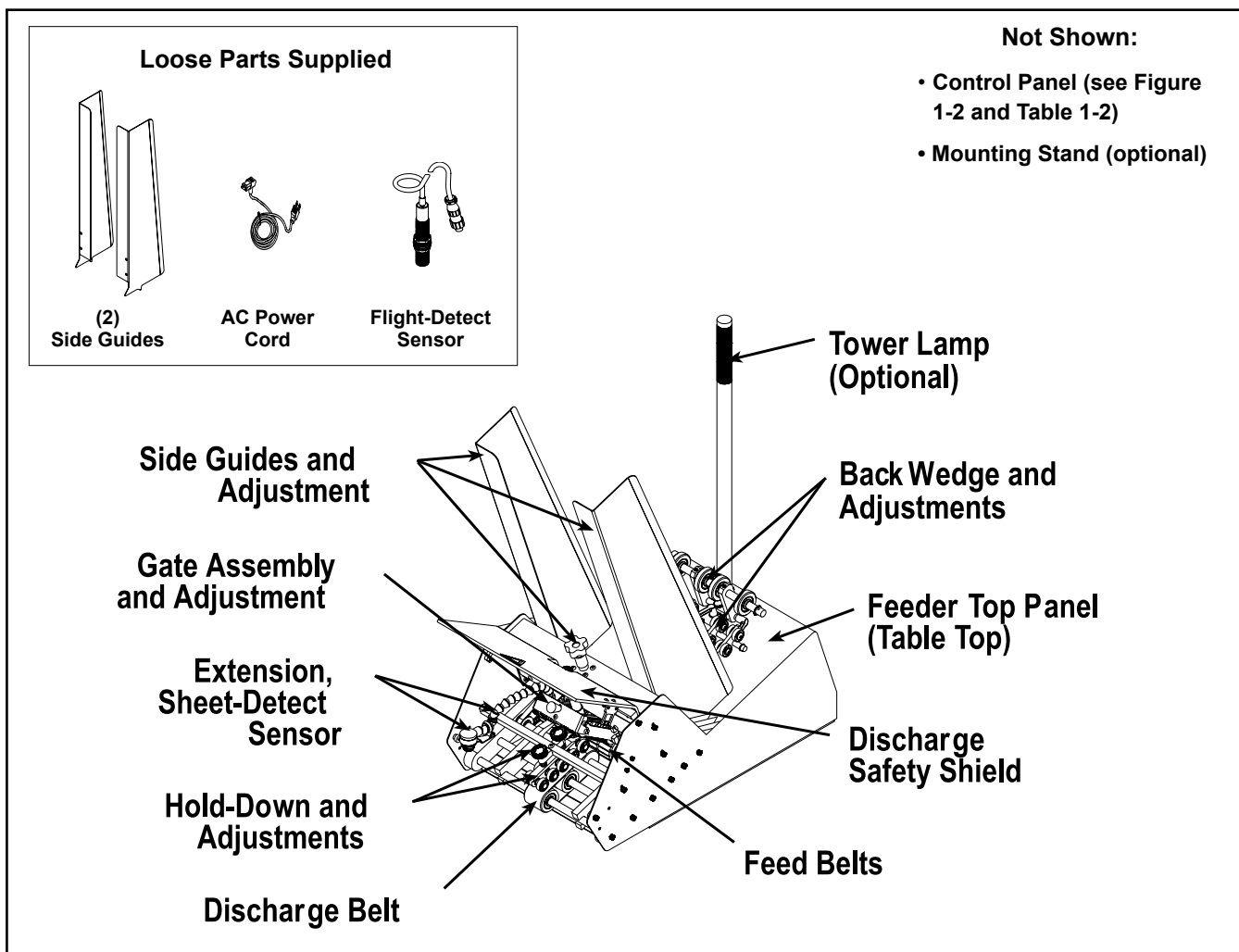
Features

The ST-550 is designed for reliability, flexibility, and ease of use.

All parts required for setup, loading, feeding, and easy operator control are combined into one compact unit.

Review the diagram below to become familiar with names and locations of feeder parts and adjustments. This will help to prepare you for initial setup.

Main Assemblies



Loose Parts Supplied:

- AC Power Cord
- Side Guides
- Product Guide
- External Run Input Cord (Optional)

Main Assemblies Feature Descriptions

Feature	Description
Gate assembly and adjustment	<i>Mounted on a gate plate directly above the feed belts, this device provides a curvature to help preshingle stacked product. Adjustment knob allows you to set downward pressure. When properly adjusted, a one-thickness gap is created to help singulate and eject product.</i>
Top panel (table top)	<i>Used to support the back wedge.</i>
Side guides and adjustments	<i>Holds a stack of product to be fed and helps keep it straight for proper entry through the gate assembly area. Adjustment knob allows you to move the side guides equally offset for different size products.</i>
Back wedge and adjustments	<i>Lifts the product to keep it off the table top, reduces excessive contact with the feed belts, and helps push the product against the curvature of the gate assembly. To achieve proper lift, adjustment wing-nuts allow you to adjust the wedge to various positions and angles.</i>
Hold-down and adjustments	<i>This series of rollers provides a varying pressure on top of product to force it down on the discharge belt, helping to eject a single product after it exits the gate assembly area. During setup, knob allows you to set downward pressure.</i>
Extension, sheet-detect sensor	<i>Mounted on the feeder 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.</i>
Flight-detect sensor	<i>Mounted at a remote location, it “looks” for a target on-line (such as a flighted conveyor) to start the feeder.</i>
Feed belts	<i>Provides the friction and motion necessary to pull individual product from the bottom of the stack and through the gate assembly area.</i>
Discharge belts	<i>Combined with the hold-down rollers, provides the friction and motion necessary to pull product away from the gate assembly area. Rotates 50% faster than feed belts to separate and eject the bottom product away from next product entering the gate assembly area.</i>
Control panel	<i>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.</i>
Discharge safety shield	<i>Provides residual risk protection to operator when feeder is running.</i>
Stand (optional)	<i>Supports the feeder and allows for easy mobility. Includes built-in height adjustment.</i>
Tower lamp (optional)	<i>Mounted on the feeder, it contains green, amber, and red colored lights which alert the operator to various status conditions.</i>

Control Panel Components

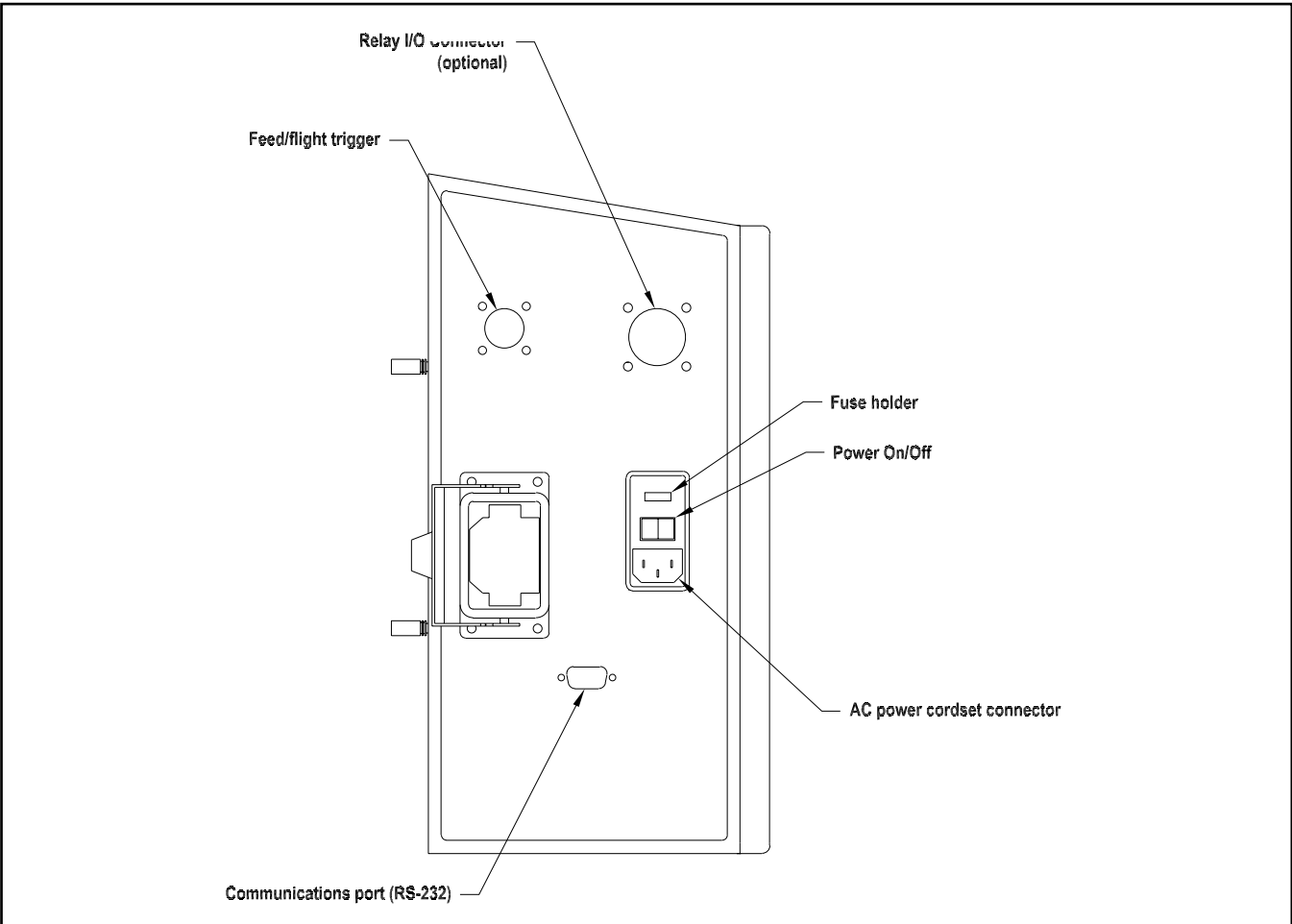


Figure 1-2. IQipped Box Features

Table 1-2. IQipped 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. <i>IMPORTANT: Always make sure power module is replaced exactly as removed. Failure to follow this caution can result in damaged electrical parts.</i>
Relay I/O connector	This 14-pin connector is used to output to other devices, either AC or DC voltages, and/or receive input control signals.
Communications port (RS-232)	This 9-pin connector is used to either receive control/data signals from a computer, or send control/data signals to a computer.
Feed/flight trigger	The remote flight-detect sensor plugs into this 4-pin connector to provide the “start” signal to begin a feed cycle.

Control Interface

The control interface consists of a keypad and display arrangement which allows you to not only control the operation of the 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.

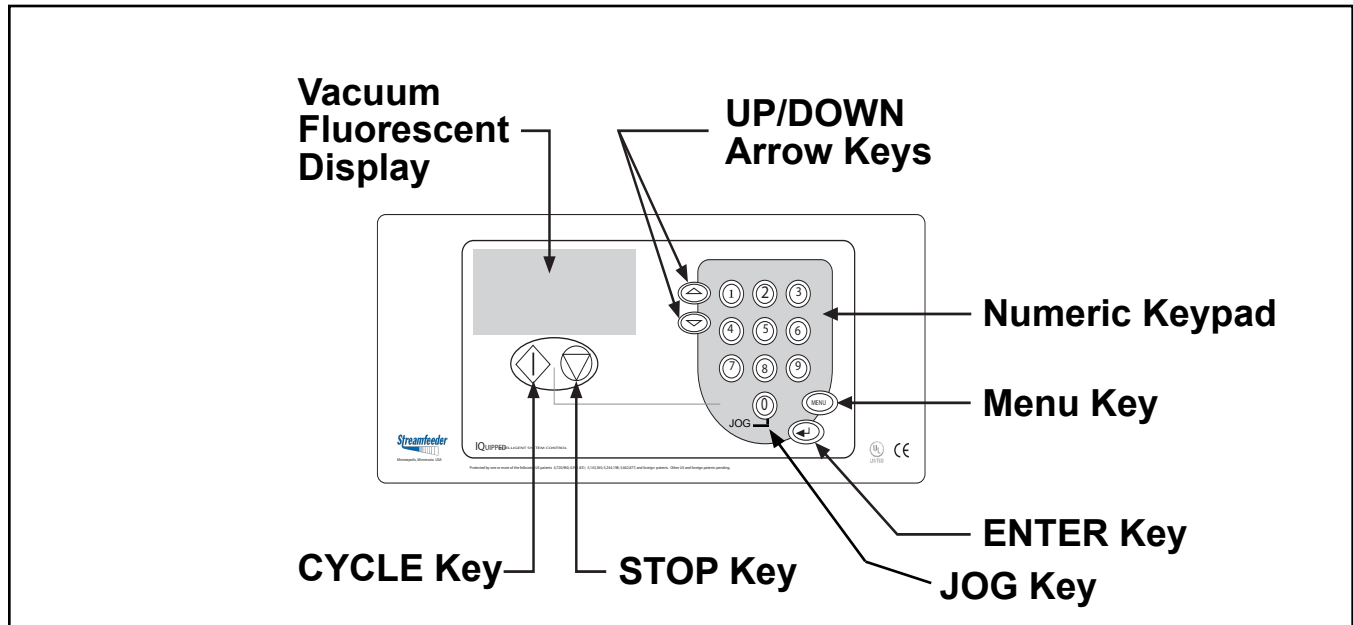


Figure 1-3. Control Interface Features

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

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

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*.

Ready	<i>The feeder is ready to feed when a flight signal is received or when the CYCLE key is pressed.</i>
Suspended	<i>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.</i>
Running	<i>The feeder is currently feeding product (cycling).</i>

- 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 feeder is installed, you are ready to prepare the machine for operation. You must perform several adjustments with the product you are going to be feeding and do a test run with this product to verify that it is set correctly before going on-line. *You will have to perform this procedure for each product 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 that the gate assembly works with the wedge to provide the proper lift, curvature of the product, and proper belt/product contact to separate and feed one sheet at a time.

Review

The gate assembly provides the curvature to help preshingle product and the proper gap to help the feed belts advance 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.



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



Due to the discharge belt and hold-down assembly spinning 50% faster than the feed belts, excessive gate assembly pressure can cause premature wear to O-rings or feed belts. Also see Step 4, Hold-Down Setting.

TIP

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

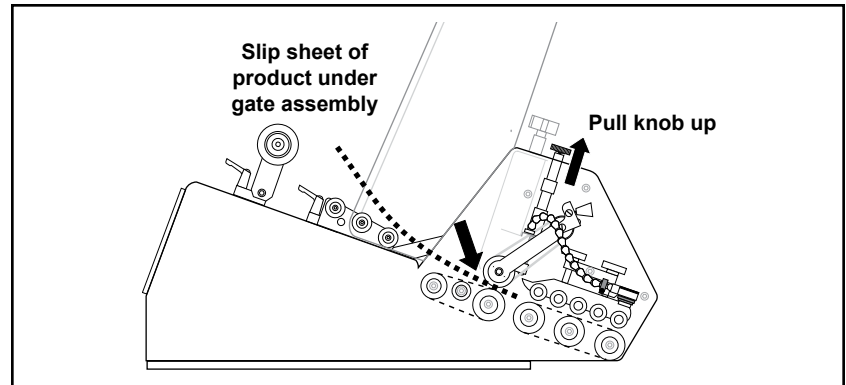
NOTE

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

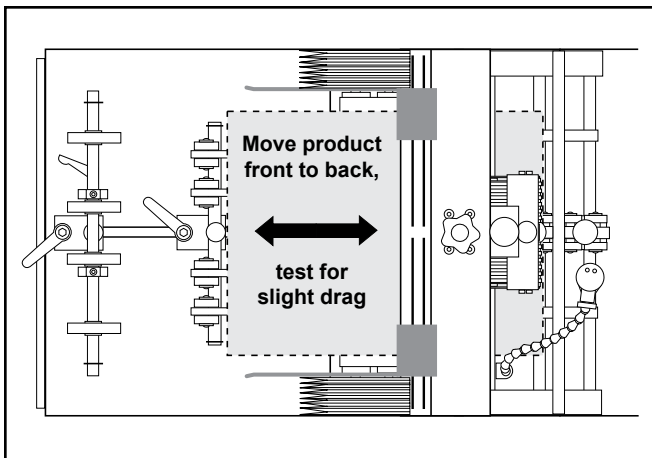
Procedure

To adjust the gate assembly for proper gap:

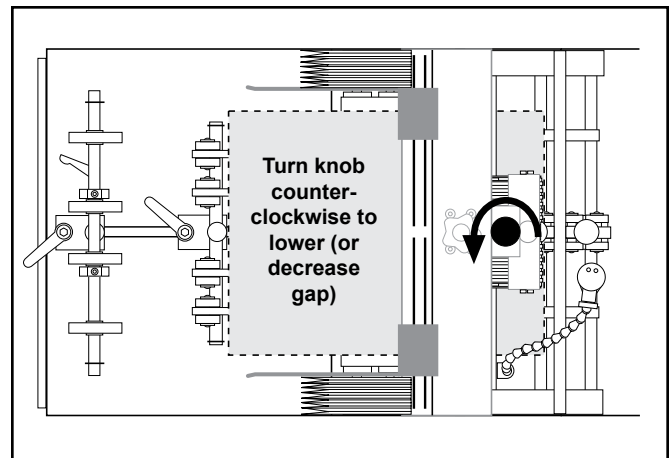
1. Slide a single sheet of test product under the gate assembly. It may be necessary to pull up on the adjustment knob to allow the piece to be inserted.
2. Test the piece for clearance. Grasp the product with two hands and slide it front-to-back under the gate assembly. A proper adjustment allows a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



Lifting Gate Assembly Upward to Insert Product



Using One-Piece Thickness of Product to Set Gap



Adjusting Gate Assembly for Correct Gap

STEP 1: Gate Assembly Adjustment (continued)



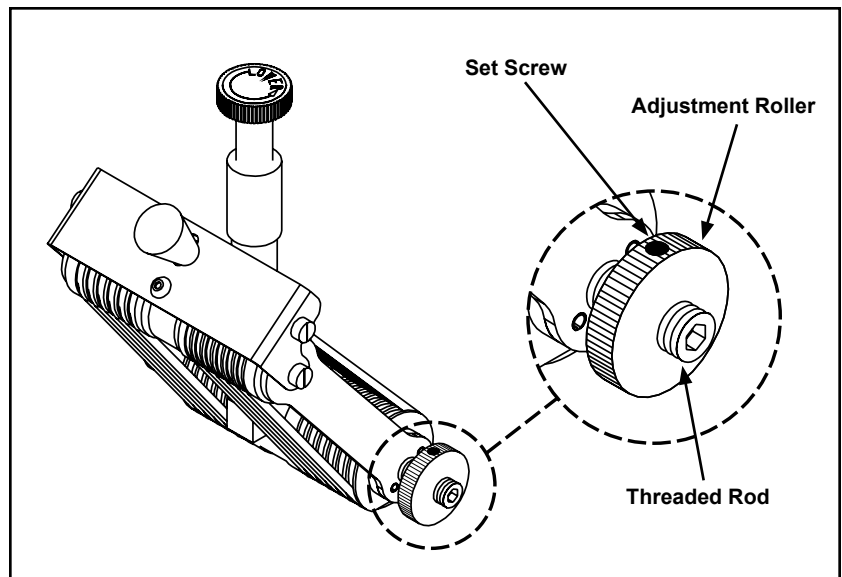
*When feeding product with varying thickness throughout, it may be necessary to turn both adjustment rollers 1-2 **full turns** counterclockwise to compensate for the differential thickness. This procedure allows the gate horizon to “float.”*

IMPORTANT

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

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

1. Repeat drag test detailed on previous page.
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).



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.*

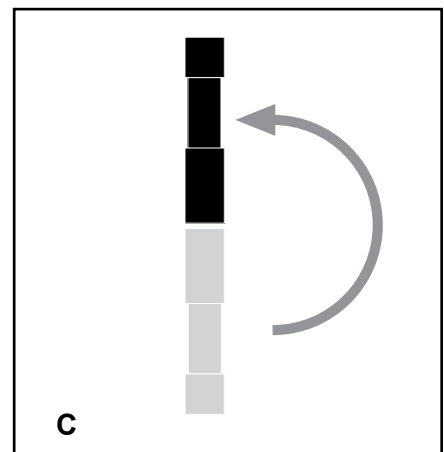
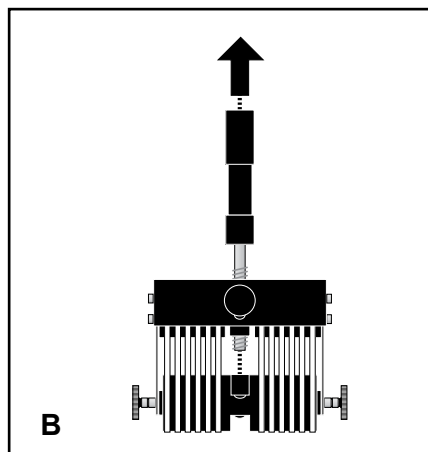
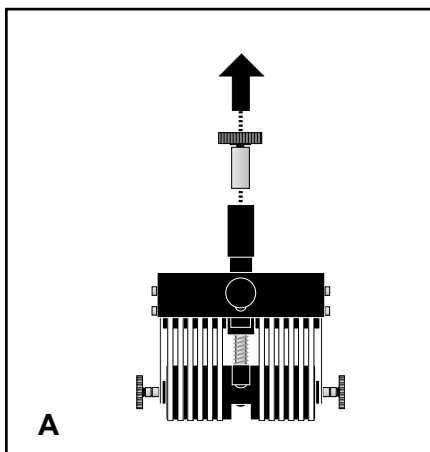
If you are feeding a product of irregular thickness, you should change to low-tension. This provides the following benefits:

- 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 (Fig. A).
3. Lift the cylinder off of top of spring (Fig. B).
4. Turn the cylinder around so that the cylinder collar faces up (Fig. C).
5. Place the cylinder on top of the spring.
6. Replace the adjustment knob (make about 8 revolutions of the knob before reinstalling gate assembly on gate plate).

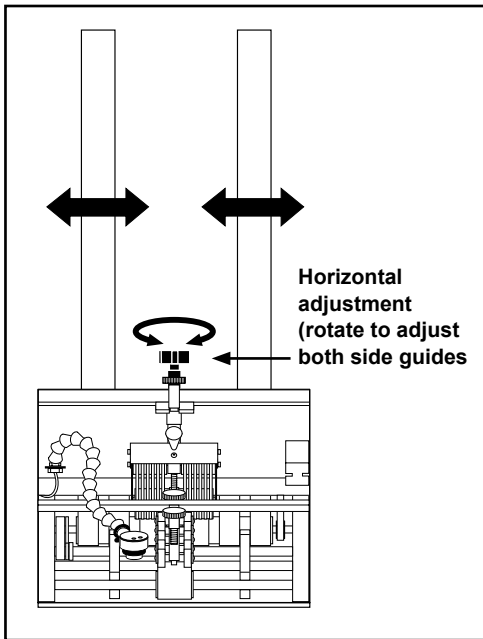


Adjusting Gate Assembly for Low-Tension

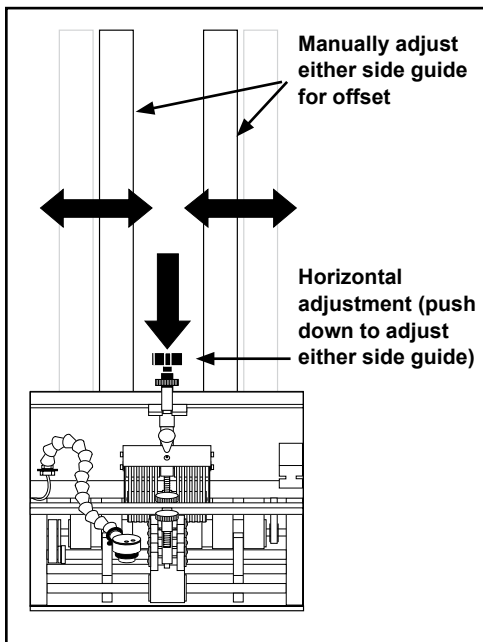
STEP 2: Side Guides Setting

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).



Horizontal Adjustment of Side Guides



Individual Side Guide Offset

Review

The side guides hold the stack of product being fed and 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.

Procedure

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

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.

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

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 that 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 that the guides lock into place.
6. Visually check both guides for proper spacing from product.

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.

Review

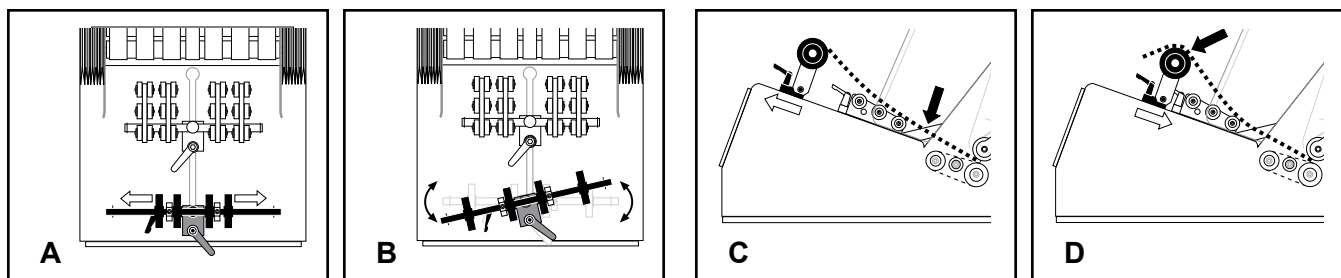
The back wedge provides proper lift to the product to help keep it off the table top and feed belts, and it creates the force necessary to push product against the gate assembly. By adjusting it back and forth from the gate assembly or pivoting side to side, you can create the lift and force necessary 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 (for illustration purposes, the optional Articulating Roller Wedge is shown):

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

By moving the back wedge forward, only the bottom product can make contact with the belt surface. Slippage is reduced, minimizing buildup on the belt surface. Double feeding is also reduced.

- *If the back wedge is positioned too far forward to the gate assembly (Fig. D), then a pinch point can be created between the top surfaces of the individual rollers and the product. Moving the back wedge even closer toward the gate assembly can allow product to overhang the wedge, creating too much lift of the product off the feed belts.*



Tips for Proper Back Wedge Adjustment

STEP 3: Back Wedge Adjustment (continued)

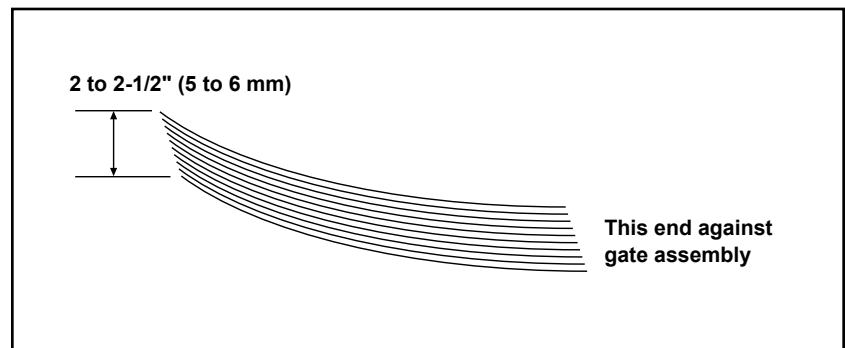
Objective

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

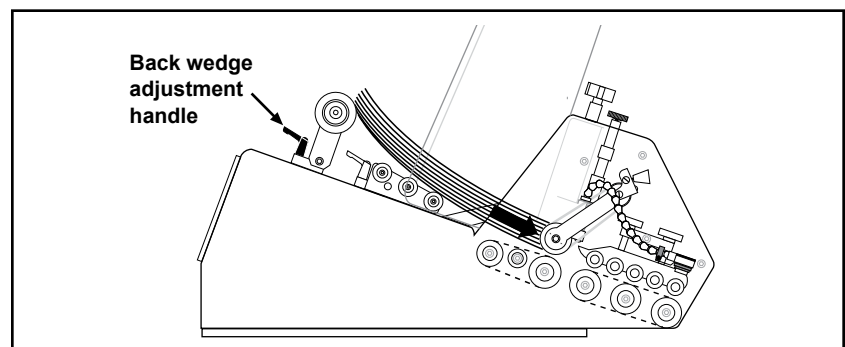
Procedure

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.
2. Place the preshingled material in the hopper so the edges rest against the curvature of the gate assembly.
3. Turn the back wedge adjustment handle counterclockwise to loosen the wedge.



Preshingling a Small Stack of Material By Hand



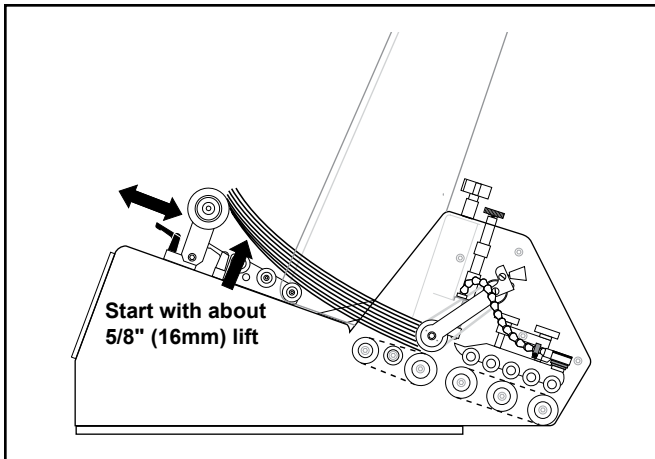
Positioning Product Prior to Loosening Back Wedge

STEP 3: Back Wedge Adjustment (continued)

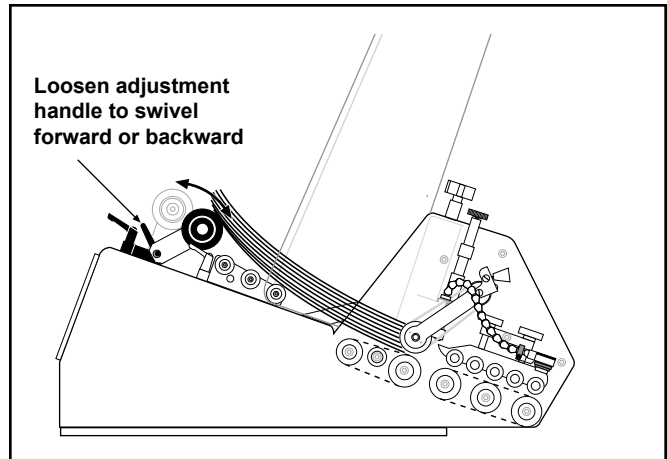
NOTE

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

4. Move the back wedge forward and backward until the bottom sheet is not touching the table top. A good starting point is to measure about 5/8 in. (16 mm) from the bottom sheet to front edge of table top. Then as you test, you can “fine tune” from this point. You can also fine tune back wedge location by loosening the roller swivel adjustment handle to pivot the rollers back and forth (Articulating Roller Wedge only).

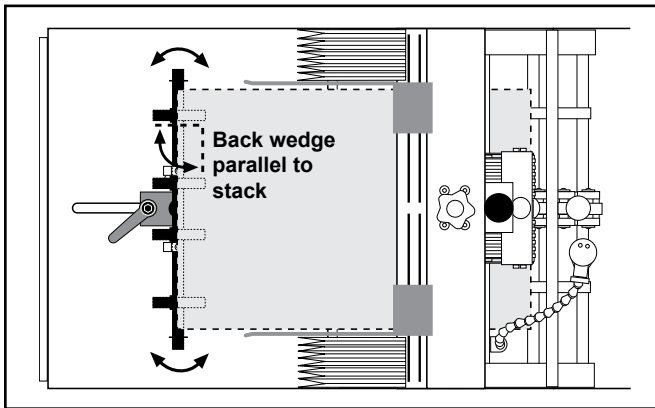


Adjusting Back Wedge for Proper Lift

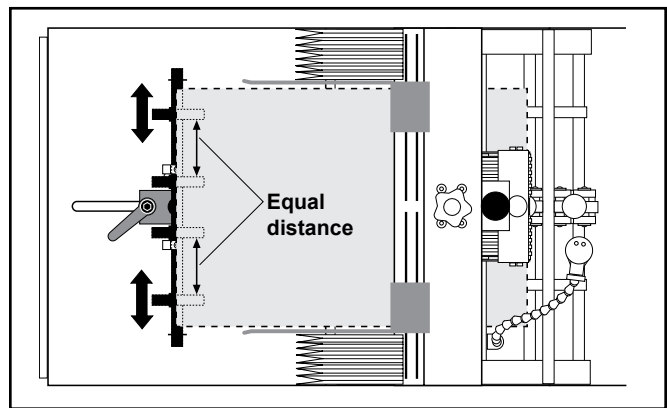


Adjusting Roller Position

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



Adjusting Back Wedge for Parallel



Evenly Adjusting Individual Rollers

STEP 4: Hold-Down Setting



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

Review

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

Objective

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

STEP 5: Photo Sensor Adjustment



Avoid light colored backgrounds in the discharge area.

Review

The **Flight-Detect** photo sensor is mounted on the line to detect a target and instruct the feeder to 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.

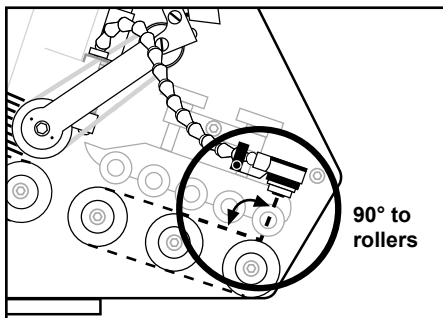
Objective

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

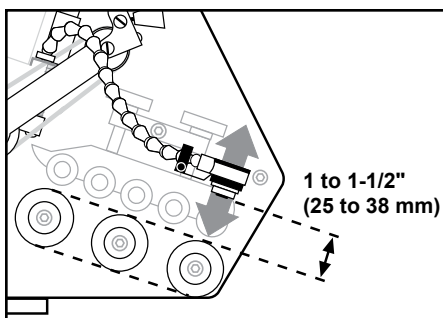
Procedure

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

1. Aim and align the photo sensor straight toward (perpendicular to) the product (Figure 2-18). If the photo sensor is at an angle, the light will not be reflected straight back to the receiver.
2. Position the photo sensor at distance between 1 to 1-1/2 in. (25 to 38 mm) from the product. Initially, use the adjustable arms on the extension assembly (Figure 2-19). *When only the green LED is On, you will know when the photo sensor is positioned properly. The amber LED is On when product is staged.*
3. When making the adjustment, be aware of any background objects beyond the product range. *On the feeder, such objects as shafts, guides, belts, and supports may cause false returns if the photo sensor is not adjusted properly for the product (or target). The resulting problem can be continuous feeding. See Section 4, Operational Troubleshooting, for a solution.*



Adjusting for Perpendicular Position



Adjusting for Distance

STEP 6: Manual Test to Verify

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

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

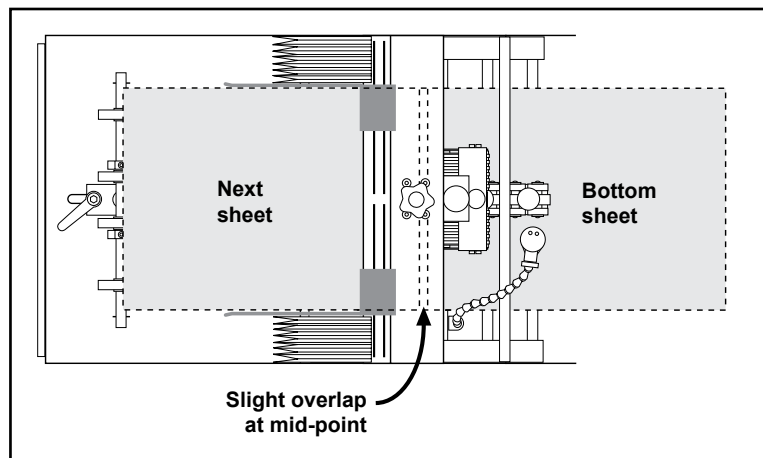
NOTE

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

NOTE

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

1. Manually feed several sheets of product slowly through the gate assembly area. Move the drive belts by pressing your thumb against the discharge belt.
2. Observe how individual product enters and exits the gate assembly area. Remember, a properly set gap will allow each new sheet to enter at about the centerline of the cylinder while the bottom sheet is exiting the gate assembly area (see below). 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.



Optimum Overlap and Separation of Product

3 How to Operate

Operational Sequences

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

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

Loading Product

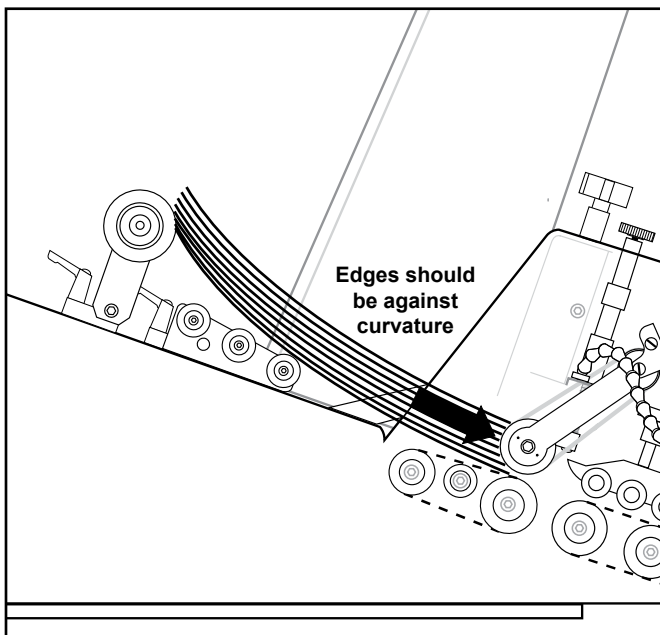


Preshingling prevents multiple sheets from jamming under the gate assembly at start-up.

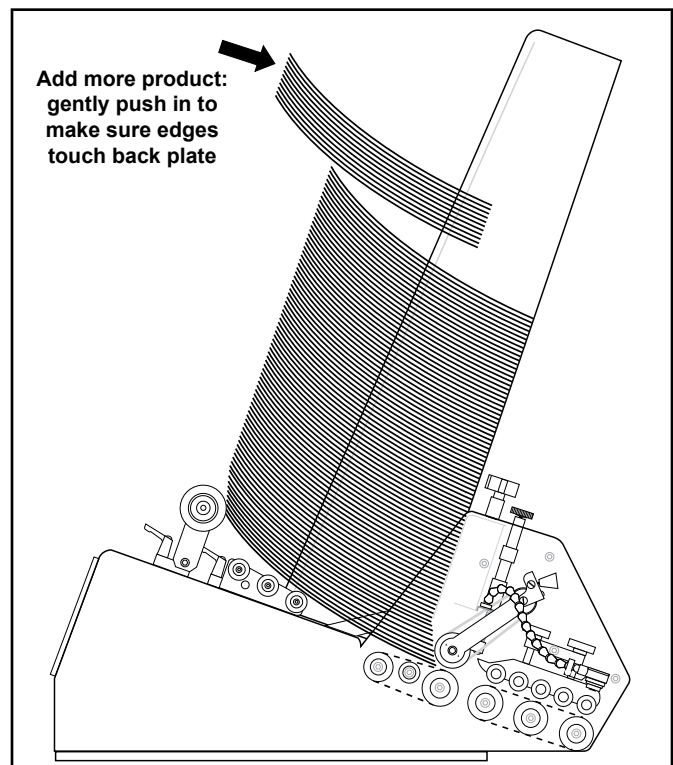


Stack height affects the downward pressure on the feed belts. Greater downward pressure can increase the chances for misfeeds or double feeds.

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











Placing Product Against Gate Assembly



Adding More Product to Fill Hopper

Quick Setup/Cycle Sequence

If the ST-1250 is prepared for operation and you want get the feeder started in the quickest way possible, use the following sequence:


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

Accessing the Menus for Setup

IMPORTANT

Menus can be customized to suit your changing on-site needs via the “Passcode” menu.






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 “Run Display” screen.*

If you wish to configure all the parameters of your machine via the menus, then use the following sequence for accessing the menus. Also refer to the Pro Series Menu Guide for a listing of full current menus.


1. Turn power  **On**.
2. Press *any* key to advance to “Run Display” 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 “Run Display” screen.


Starting a Cycle

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

1. Turn power  **On**.
2. Press *any* key to advance to “Status” screen.
3. Press **CYCLE**  key to *stage* product and advance to “Status” 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

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 (see Section 4, Operational Troubleshooting).
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 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.



You may want to follow the same procedure for the Sheet-Detect photo sensor also to prevent damage to any loose or hanging cabling.

4 Operational Troubleshooting

This table is intended to provide you with quick solutions to the more common day-to-day problems you may encounter. For additional troubleshooting information, refer to the Technical Troubleshooting section.

Problem	Cause	Solution
No AC power to feeder	<ol style="list-style-type: none"> 1. On/Off switch in "Off" (or "O" position). 2. Power cord loose or not plugged into outlet (or AC power source). 3. Female end of power cable loose or not plugged into AC power inlet at rear of feeder. 	<p>Move switch to "On" (or "I" position).</p> <p>Check and secure power cord at AC outlet.</p> <p>Check and secure cord at AC power inlet at rear of machine.</p>
Feeding doubles	<ol style="list-style-type: none"> 1. Gate assembly improperly adjusted (possibly more than one sheet thickness). 2. Back wedge improperly adjusted. 3. Worn O-rings (or angled edge). 4. Material interlocking. 5. Static buildup. 	<p>Review gate adjustment procedure.</p> <p>Review back wedge adjustment procedure.</p> <p>Rotate O-rings (or replace angled edge). If wear is excessive, consult with a qualified technician.</p> <p>Check material and source.</p> <p>Check material and source.</p>
Feed belts are operating, but material not feeding	<ol style="list-style-type: none"> 1. Material stack height is too low when stack height is down, resulting in reduction of down pressure. 2. Binding in side guides. 3. Slippery feed belts. 4. Sheet adhesion or interlocking between the bottom and next sheet. 5. Gate assembly may be down too tight. 6. Too much weight in hopper. 	<p>Review material loading procedure.</p> <p>Adjust side guides farther apart to allow freedom of movement between sheets.</p> <p>Consult with a qualified technician.</p> <p>Review material loading procedure and back wedge adjustment procedure.</p> <p>Review gate assembly adjustment procedure.</p> <p>Remove material from stack. Test again.</p>

Operational Troubleshooting (continued)

Problem	Cause	Solution
Feed belt(s) not tracking on rollers	<ol style="list-style-type: none">1. Excessive weight in hopper.2. Excessive down pressure on gate assembly.3. Off-centered product from center point of machine.4. Belt wear.	<p>Reduce weight. Test again.</p> <p>Rotate gate adjustment 1/8 turn to increase gap and manually test. Review gate assembly adjustment procedure.</p> <p>Review side guide setting procedure.</p> <p>Review gate assembly adjustment procedure. Also review inspection and care procedures. If wear is excessive, consult with a qualified technician.</p>
Jamming occurs during operation	<ol style="list-style-type: none">1. Improperly adjustment in one or more of the following areas:<ol style="list-style-type: none">A. Gate assembly.B. Back wedge.C. Top roller hold-down assembly.D. Discharge alignment rails.	<ol style="list-style-type: none">1. Turn the Power switch to "Off" by pressing the circle (O).2. Remove jammed material from feeder. While doing so, try to determine the cause of the jam.3. Verify each adjustment by reviewing the "Preparing for Operation" section of the manual.
Material skewing	<ol style="list-style-type: none">1. Back wedge not aligned properly.2. Excessive gate pressure on one side.	<p>Review back wedge adjustment procedure.</p> <p>Review gate assembly adjustment procedure.</p>

5 Inspection and Care



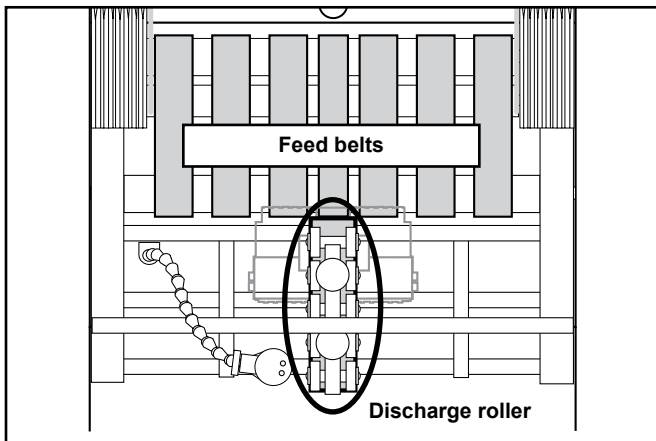
When performing initial adjustments prior to operation, always make sure you turn Off the main power switch, open the discharge safety shield (to disengage the interlock), and disconnect feeder from the electrical power source. Failure to do so can expose you to a potential start-up and moving parts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

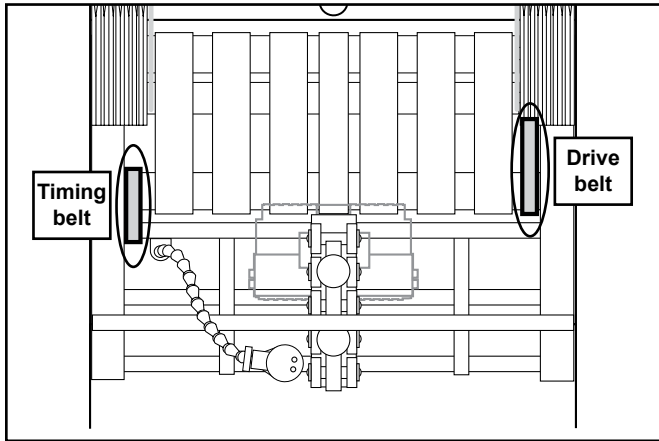


Checking for Feed and Discharge Belt Wear

Check for visual signs of:

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

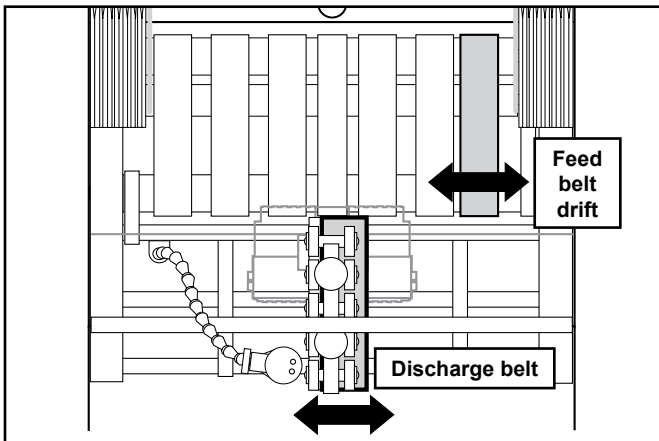
Visual Inspection (continued)



Checking for Timing and Drive Belt Wear

Check for visual signs of:

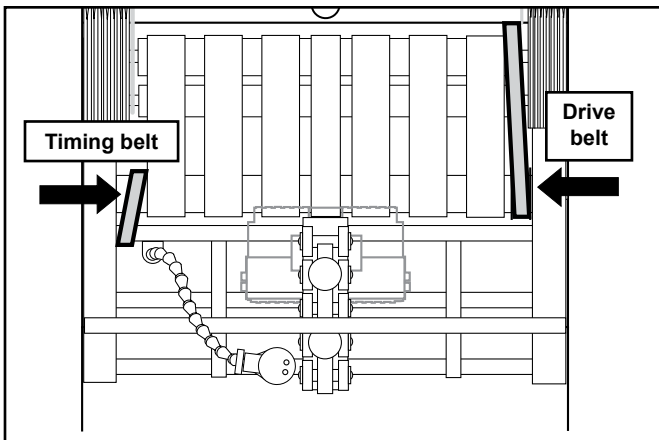
- Fraying. Replace as required.
- Missing teeth. Replace as required.
- Cracking. Replace as required.



Ensuring Proper Feed and Discharge Belt Tracking

Check for visual sign of:

- Stretching.
- Improper roller adjustment.



Ensuring Proper Timing and Drive Belt Tracking

Check for visual signs of:

- Misaligned timing pulleys.

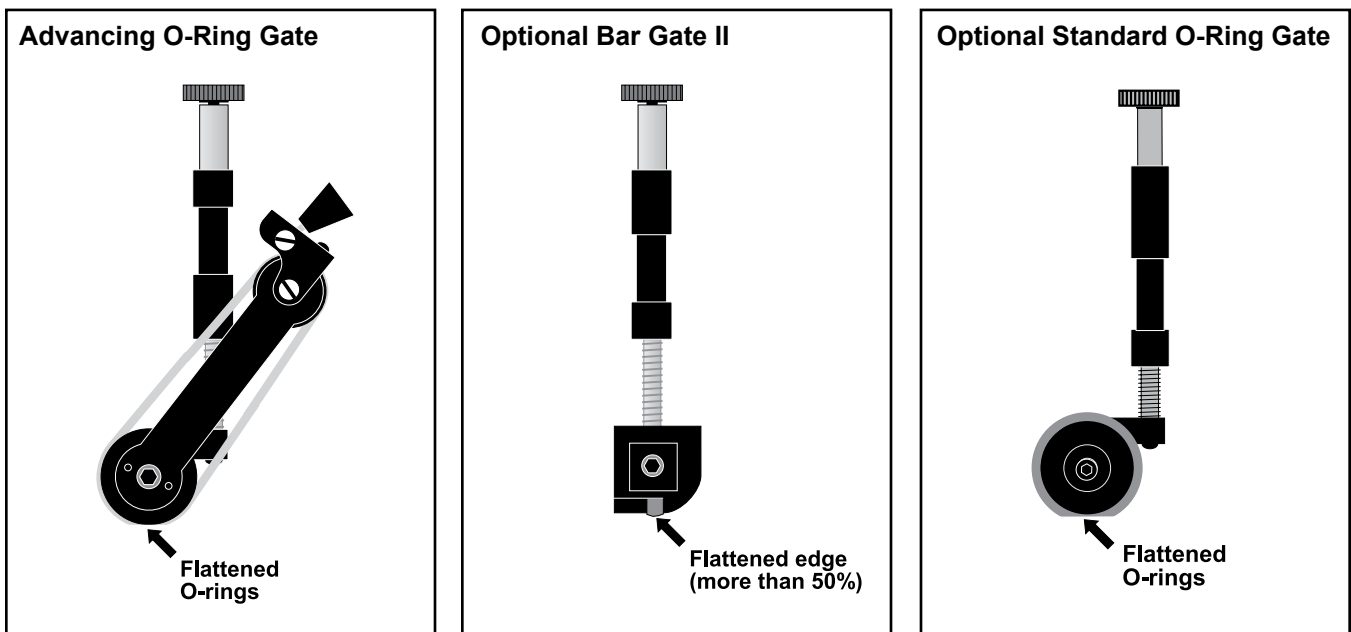
Visual Inspection (continued)

Checking for Gate Assembly Wear

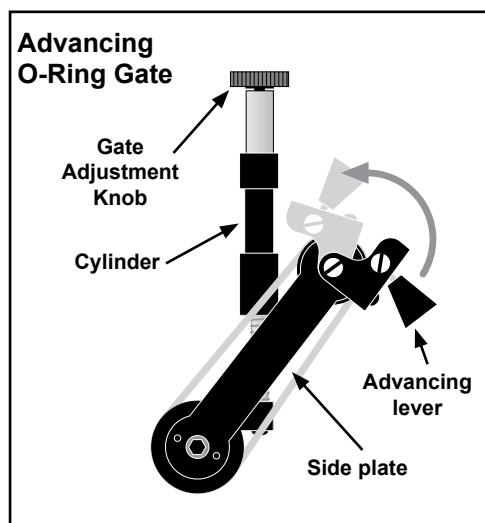
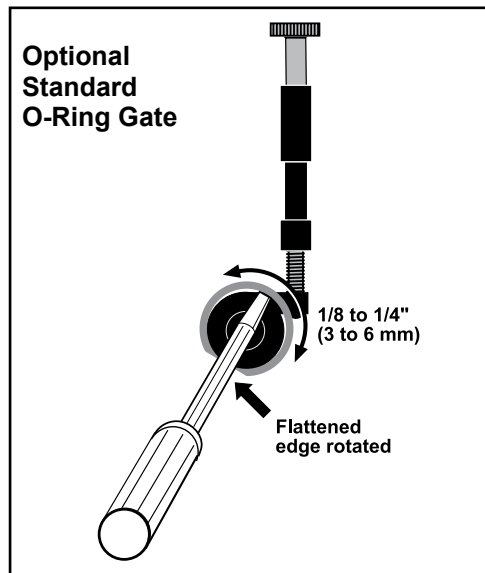
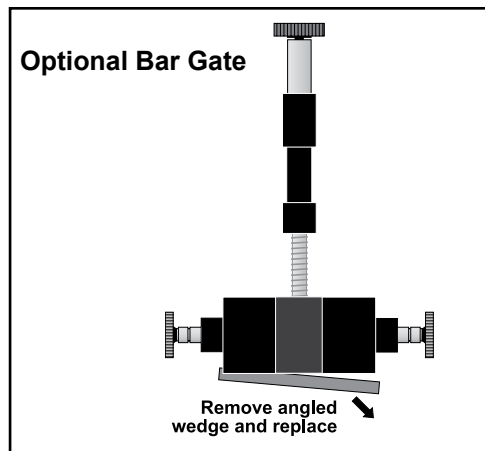
Check for visual signs of wear:

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

See “Preventive Care” to follow.



Visual Inspection (continued)



Replacing Worn Bar Material

To replace a worn bar material:

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 bar material.
5. Install new bar material by inserting one end and then pushing in until centered. *Do not grip bar material with pliers as this may cause damage to the edge.*
6. Reinstall clamp (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:

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.
5. Reinstall gate assembly and restore power.

Advancing O-Ring Gate: Adjusting Worn O-Rings

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

1. Turn Off feeder and remove power cord from outlet.
2. Remove gate assembly from gate plate.
3. Lower advancing lever away from gate adjustment knob.
4. Rotate O-rings by grasping advance knob and pushing toward gate cylinder about 1/8 to 1/4 in. (3 to 6 mm).
5. Lower advancing lever to resting position away from gate adjustment knob.
6. Reinstall gate assembly and restore power.

Preventive Care



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

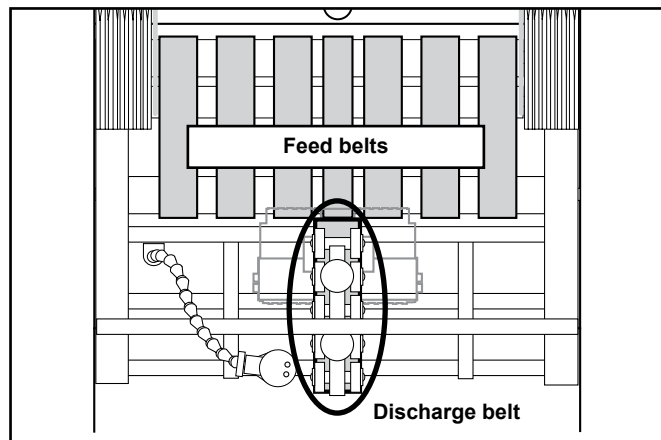


Do not use any solvents or cleaning agents when cleaning the keypad or display. This will result in surface damage. Do not spray any cleaning solutions directly on the keypad or display surfaces, as this could lead to faulty performance.

Cleaning Feed and Discharge Belts

To clean feed and discharge belts:

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



Cleaning Keypad and Display

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

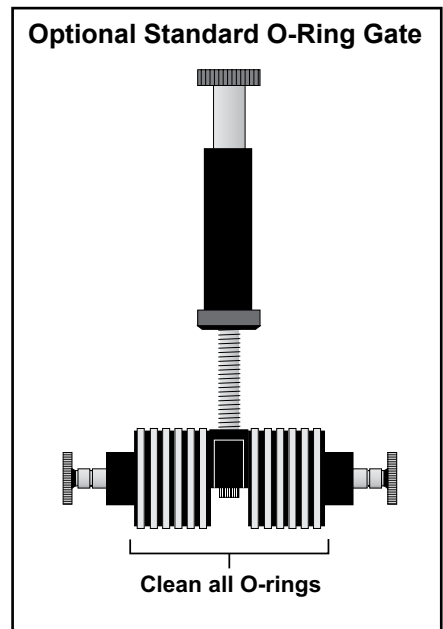
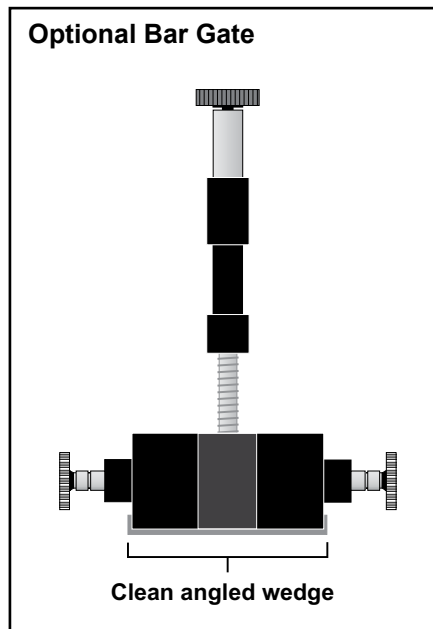
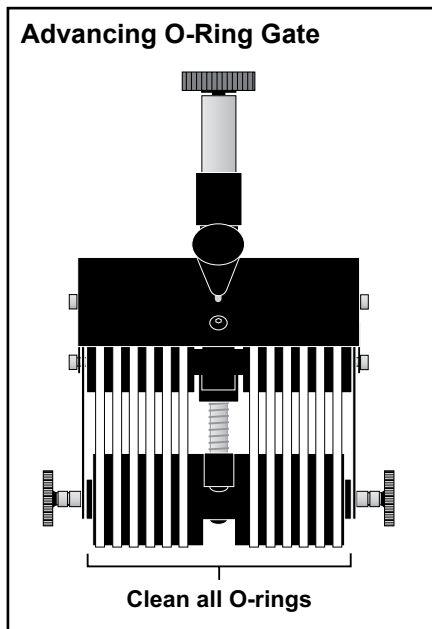
Preventive Care (continued)

Cleaning Gate Assembly

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

To clean gate assemblies:

1. Turn Off feeder and remove power cord from outlet.
2. Remove gate assembly from gate plate.
3. Apply a small amount of isopropyl alcohol to a soft cloth.
4. Wipe across bar material (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.



Preventive Care (continued)

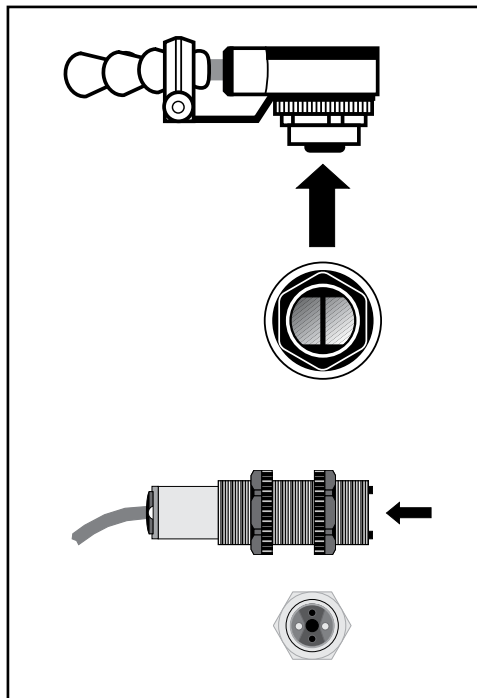


Do not use any solvents or cleaning agents when cleaning the photo sensor lenses. This can result in surface damage and eventual faulty performance.

Cleaning Photo Sensors



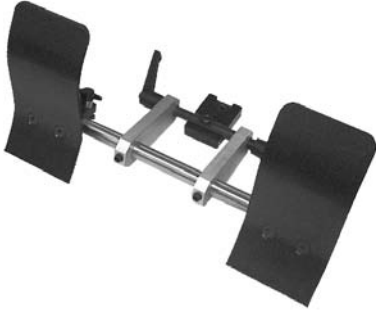
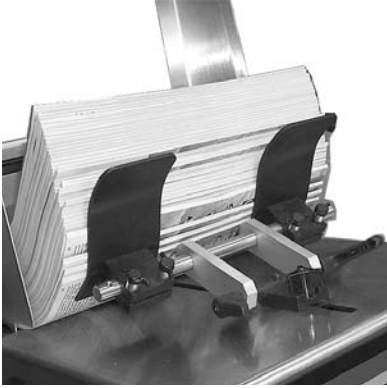

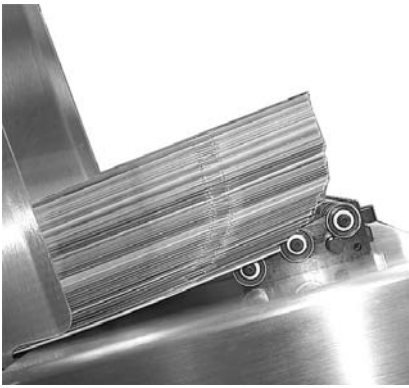
To clean the photo sensor lenses:

1. Turn Off feeder and remove power cord from outlet.
2. 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.





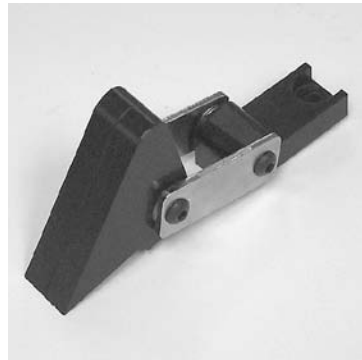





6 Wedge Applications



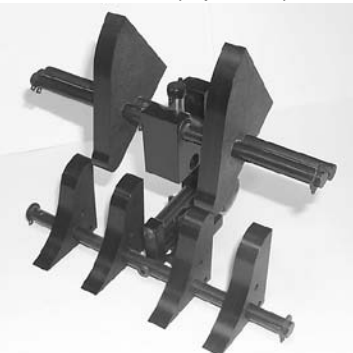

There is a variety of wedges that may be utilized for feeding various materials of differing properties. A wedge may be used either alone or in combination with another wedge depending upon the size and/or properties of the material that is being fed. The following will help to identify which wedge to use for a specific material.

Part Number	Description/Setup Example	Material Usage
63311214 (Standard) 	Large Triangle (5 inches wide) 	Light to medium weight products from 3 to 6 inches in length (longer if used with Low Profile wedge) such as Z-fold and C-fold letters, business reply cards, payment booklets, and tagboard.
63311025 (Standard) 	Double "S" 	Light to heavy weight products from 4 to 14 inches in length such as large envelopes, flat sheets, card stock and folded products.
63311050 (Standard) 	Low Profile 	Medium to heavy weight products from 8 to 14 inches in length such as magazines, flat sheets, and other flexible products greater than 8 inches. Most often used with Double S, Articulating, Large Articulating, or Large Triangle wedge, but may be used alone as shown in the photo.

Wedge Applications (continued)

Part Number	Description/Setup Example	Material Usage
63311017 (Optional) 	Small Triangle (4 inches wide) 	Light to medium weight products from 3 to 6 inches in length such as Z-fold and C-fold letters, business reply cards, and small booklets.
63311710 (Optional) 	Medium Triangle (5 inches wide) 	Light to medium weight products from 3 to 6 inches in length such as Z-fold and C-fold letters, business reply cards, and booklets.
63311212 (Optional) 	Extended Narrow 	Light to medium weight, small narrow products from 3 to 6 inches in length such as multifold leaflets, credit cards, business cards, trading cards, and coupons.
63311340 (Optional) 	Articulating Roller 	Light to heavy weight products from 6 to 14 inches in length such as envelopes, chipboard, corrugated, and heavy flat sheets.

Wedge Applications (continued)

Part Number	Description/Setup Example	Material Usage
63311350 (Optional)	Large Articulating Roller 	Light to heavy weight products from 6 to 17 inches in length such as large envelopes, flat sheets, card stock, and corrugated.
63311026 (Optional)	Single "S" 	Light to heavy weight products from 4 to 14 inches in length such as envelopes, card stock, and folded products.
63311968 (Optional)	Combination 	Light to heavy weight products such as envelopes, card stock, booklets, and folded leaflets.
63311214 and 63311050	Triangle and Low Profile (Combined) 	Medium to heavy weight products from 8 to 14 inches in length such as magazines, flat sheets, and other flexible products greater than 8 inches.

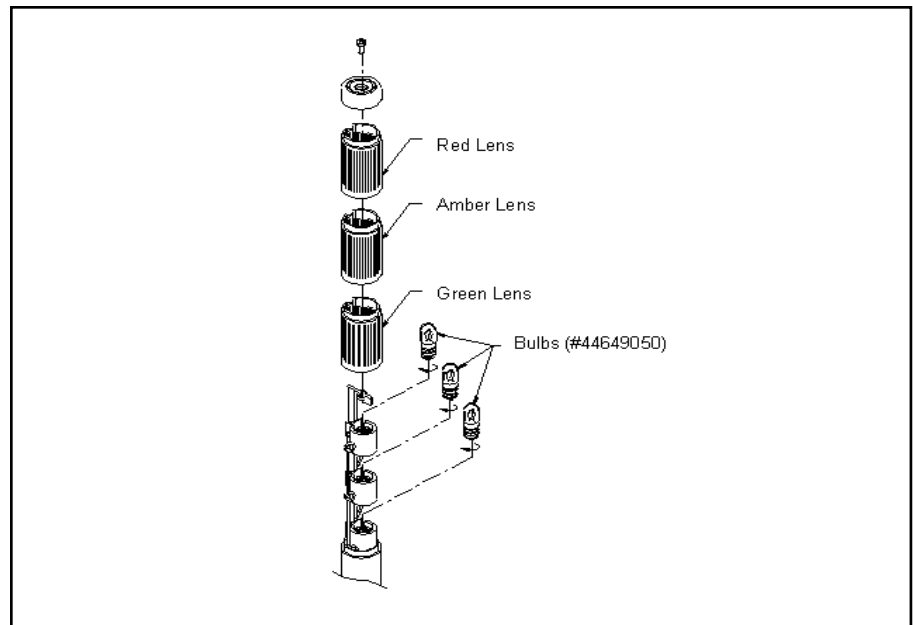
7 Service and Maintenance Procedures

Replacing Tower Lamp Bulbs

Follow this procedure to replace tower lamp bulbs (from optional tower lamp).

1. Remove the small Phillips-head screw on the top of the tower lamp.
2. Pull upward on the lenses to remove them, 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.



Bulb and Lens Assembly

Optional Low Stack Detection



This unit operates on 115V or 230V electrical power. Bodily contact with these voltages can result in serious injury or death. Always disconnect the AC inlet power cord before performing any service activity.

TIP

The following tools are required for this procedure:

- Phillips-head screwdriver
- Allen wrenches – 7/64, 3/32, 1/8

NOTE

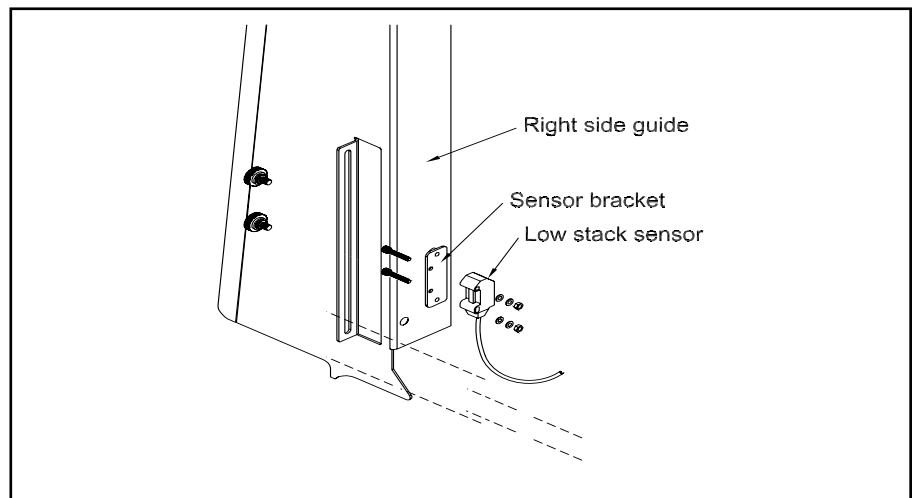
When using low stack detection with an optional tower lamp, solid amber and green lights signal a low stack condition.

Installation Procedure

Low Stack Sensor

To install the low stack detection option, you must first install the low stack sensor. To complete this task follow these steps:

1. Turn Off feeder and remove power cord from outlet.
2. Remove and replace right material side guide from feeder with new low stack side guide.
3. Secure sensor bracket to new side guide using two screws with black round knobs.
4. Secure low stack sensor to sensor bracket with plate and fasteners.



Low Stack Sensor Components

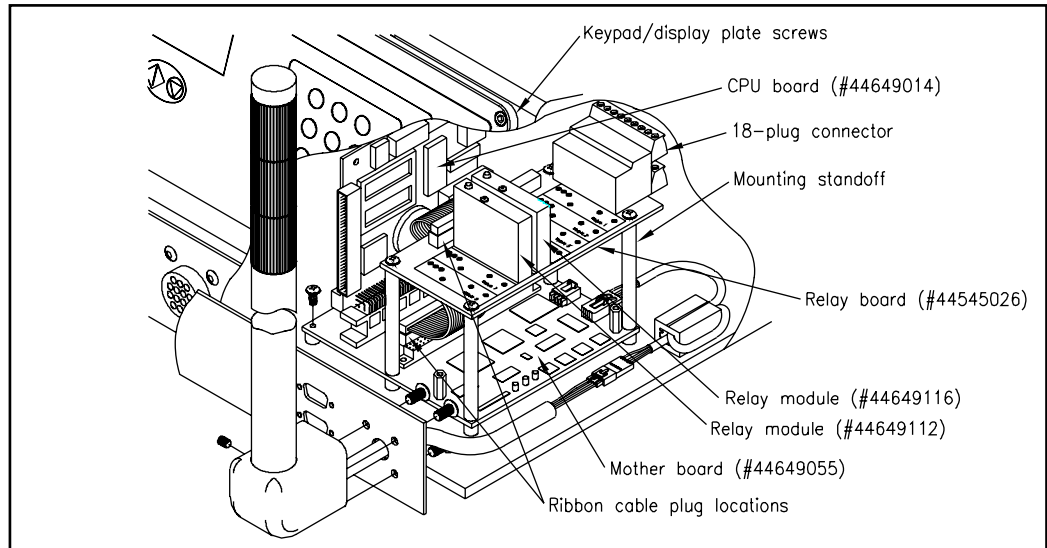
Motherboard and Relay Board

With the low stack sensor successfully installed, the next step is to install the motherboard and relay board.

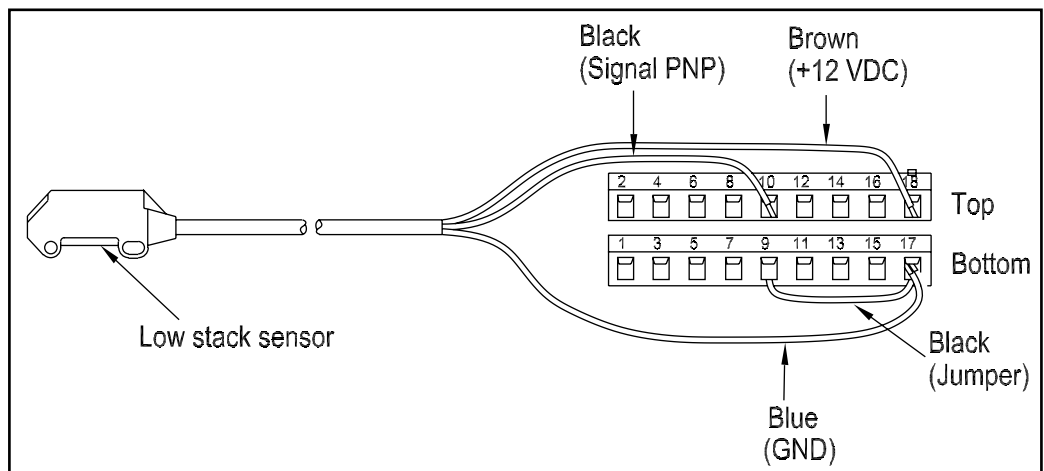
1. Verify that power cord has been removed from outlet.
2. Remove keypad/display plate by removing four screws.
3. Remove “L” bracket and CPU board by removing two Phillips screws.
4. Remove CPU board from “L” bracket.
5. Initially secure motherboard with two screws closest to CPU board.
6. Place four standoffs over the other four screw holes located on the motherboard. Position and secure relay board at these four locations.
7. Connect relay board to motherboard with ribbon cable.

Low Stack Detection (continued)

8. Install the white relay module in module 5 position. Tighten screw to secure.
9. Plug CPU into 96-pin connector located on the motherboard.
10. Following path of gray sheet sensor cable, route low stack sensor cable to interior of feeder. Use wire ties to secure cables together.
11. Connect low stack sensor wires and one jumper wire to 18-plug connector on relay board. See Figure 7-4.
12. Remove Jumper J14 from CPU board.
13. Reinstall keypad/display plate with four original screws.



Motherboard, CPU Board and Relay Board (output relay module #6 P/N 4464911 provided with I/O option only)



Sensor Wiring Connections

Low Stack Detection (continued)

Sensor Positioning

To position and adjust the low stack sensor, follow these steps:

1. Loosen two black slide adjustment knobs and slide bracket/sensor to desired vertical position and retighten. When product falls below the selected vertical position, the low stack sensor will signal the feeder of a low stack condition. Output relay module #6 will also energize during a low stack condition. This module is provided with the I/O option only.
2. The green status LED located on the sensor should be illuminated when the feeder power is on. When product stack falls below the sensor preset position the sensor's amber LED will no longer be illuminated, the tower lamp Amber light will illuminate and the feeder display will display "LOW STACK."

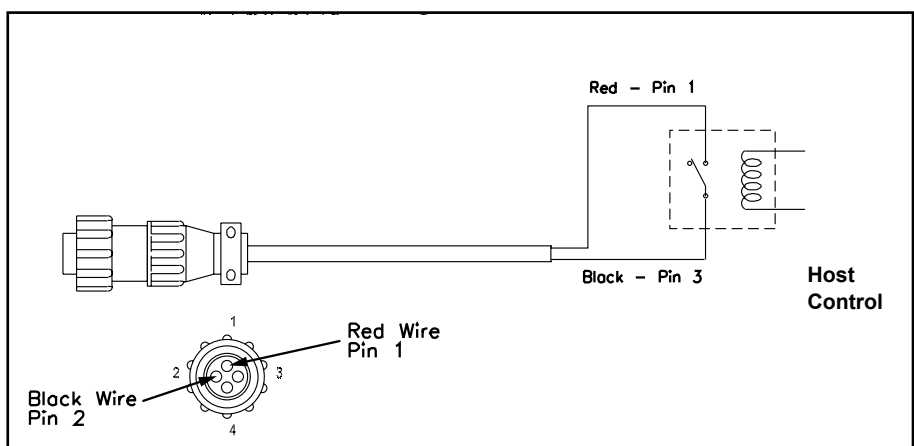
Sensorless Feed Trigger Wiring

Connecting to the Trigger Input

The information in this section provides an overview of how to interface to the trigger input without using an external photoelectric sensor.

Procedure

1. Remove any existing trigger sensor from the feeder or IQuipped™ control box.
2. Connect the sensorless trigger cable to the feeder trigger input.
3. Wire the sensor-less cable to the host equipment. The host equipment triggering the feeder to start is to be a dry contact of a relay. Any other equipment must not power this input. When the host equipment relay or contacts close the feeder should trigger.



Field Wiring.

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.

This feeder is almost always used as a component piece of equipment in a larger system. An E-Stop switch is not included on this feeder 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 your local codes and authorities. 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 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 signals 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.

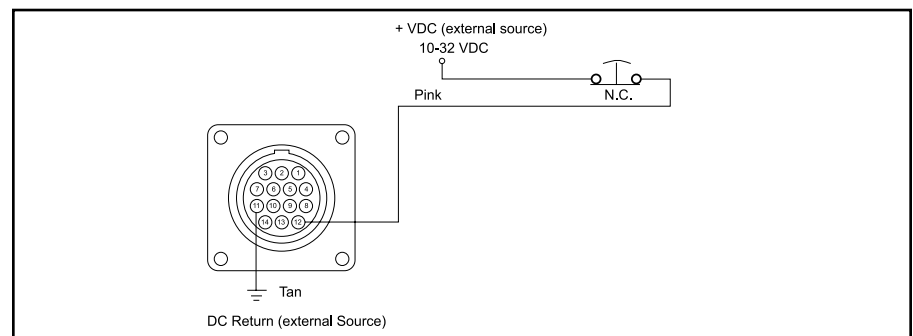
NOTE

This option requires software version 1.05 or greater, and requires the systems interface I/O option.

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

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

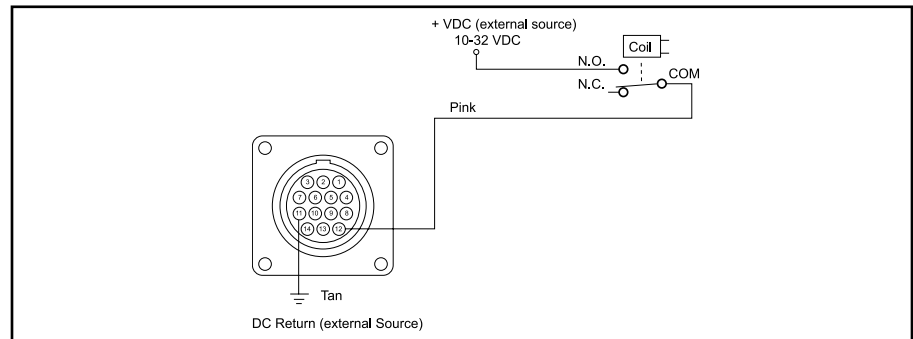
A maintained button/switch with a normally closed contact is used to switch power (10-32 VDC) to the internal input module. When power is removed (switch contact open) the feeder will stop feeding.



External Switch and Relay Contact wiring

Remote Stop Input (continued)

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

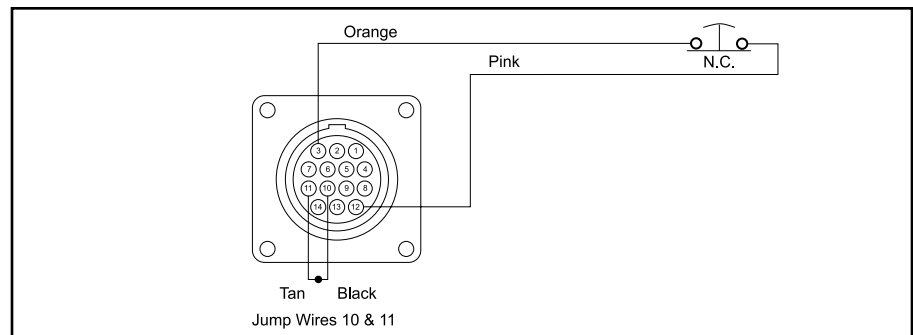


Relay Contacts

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

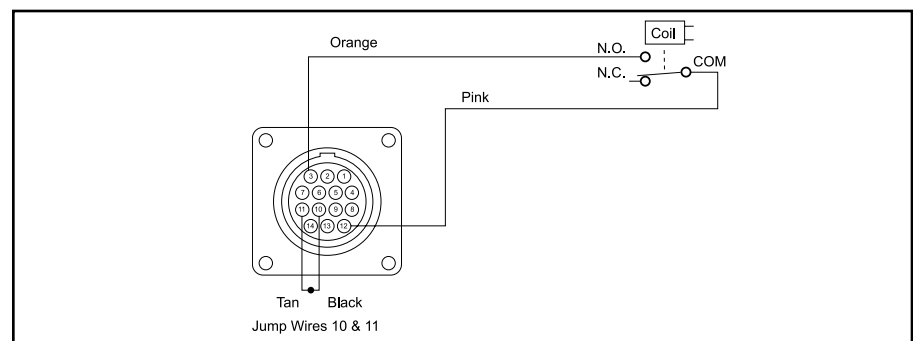
There are two ways that the R-stop input can be wired when the feeder and not the host device supplies (12 VDC) power.

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



External Switch

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



Relay Contacts

EPROM Replacement

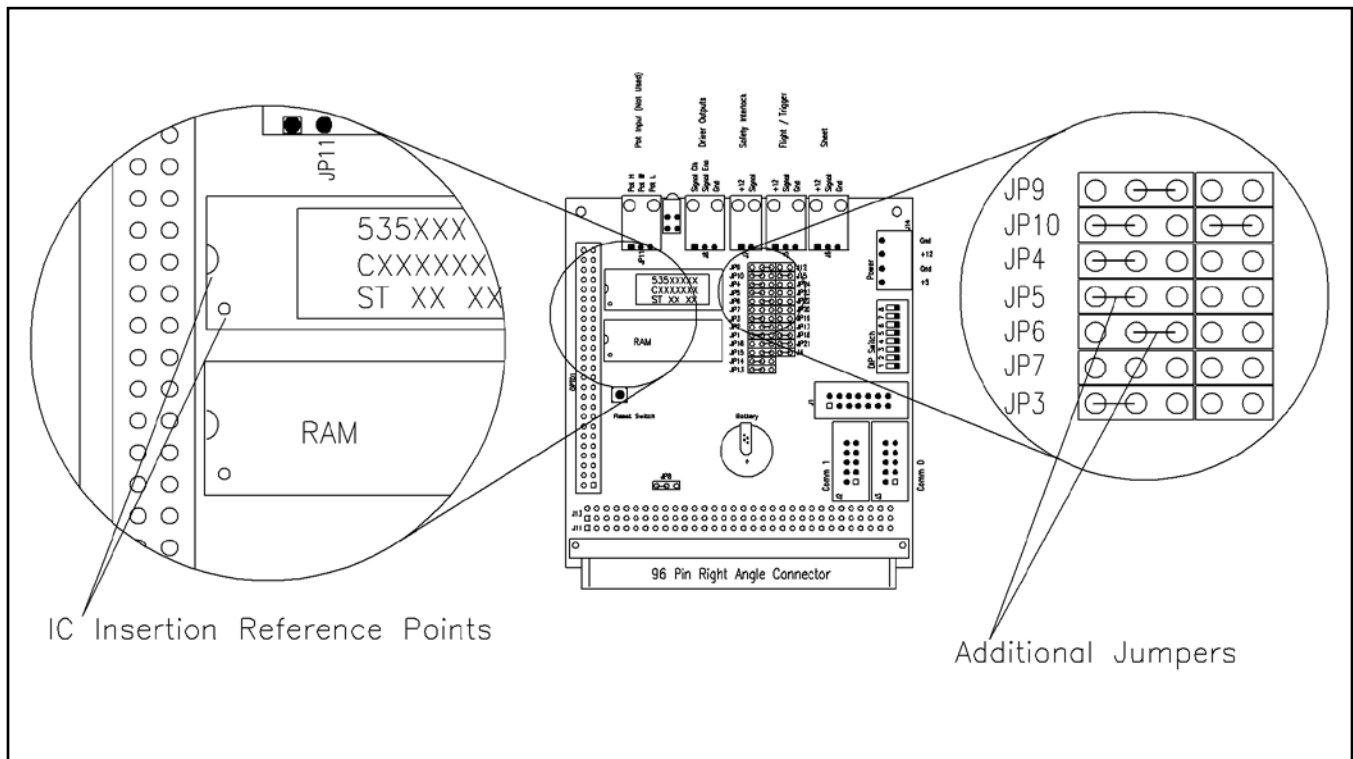


A qualified service technician should perform the changes listed in this document. Always disconnect the AC inlet power cord before performing any service activity.

Installation

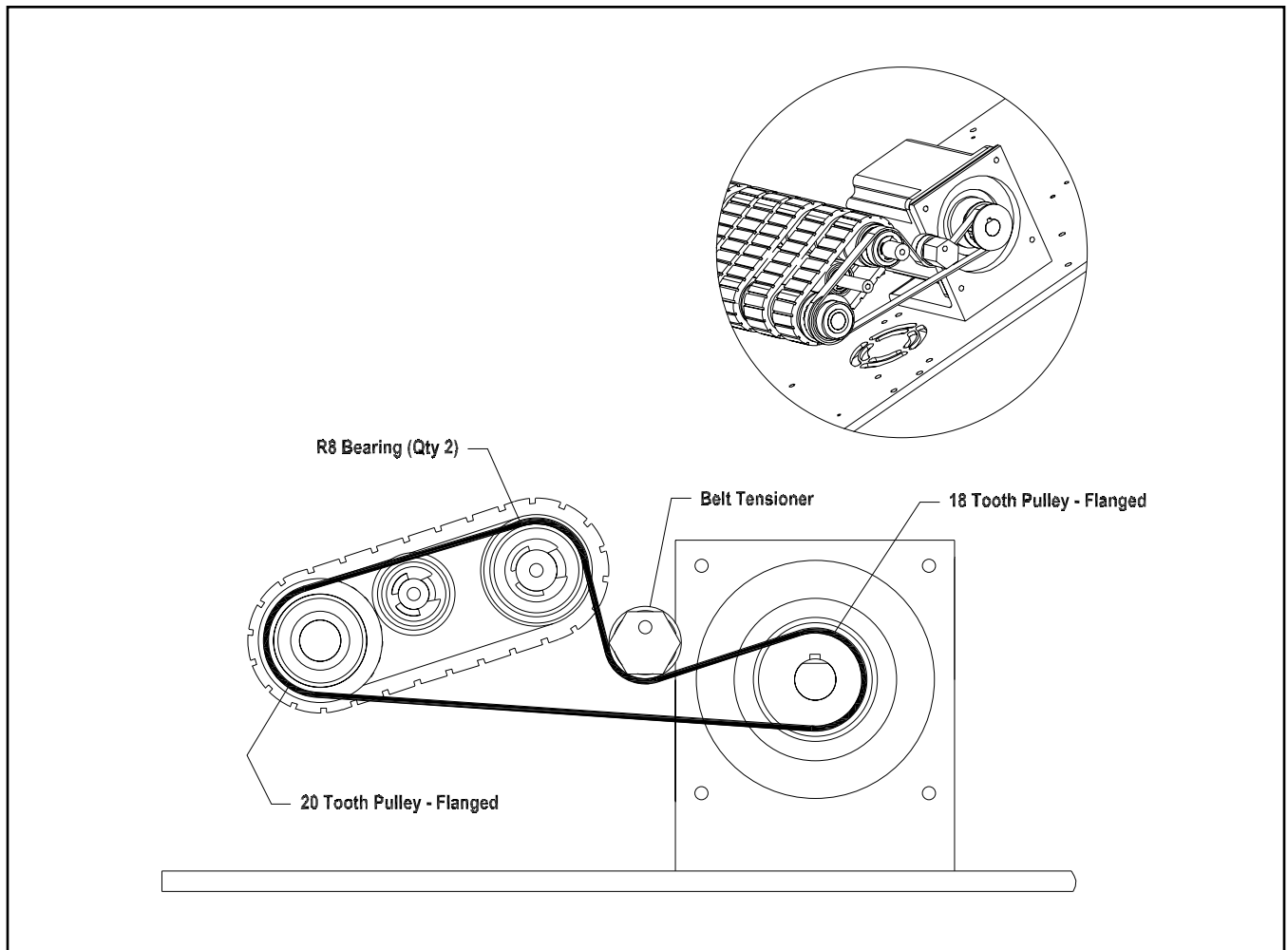
To install or replace a programmed EPROM on the CPU/control board, follow these steps:

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 the diagram below, the notch should be on the side closest to the 50-pin ribbon cable connection).
 - b. Ensure all the pins on the EPROM are in the socket before applying pressure to completely seat the IC.
5. Confirm the additional jumpers on JP5 and JP6 have been installed.
Note: JP5 and JP6 may have been factory installed.



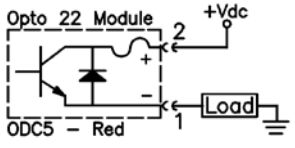


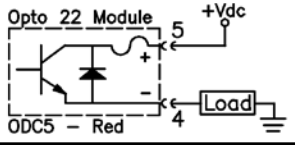
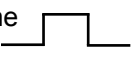
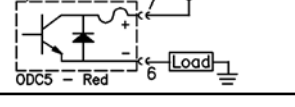
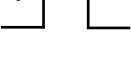
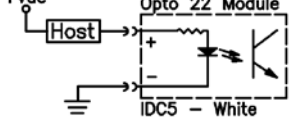

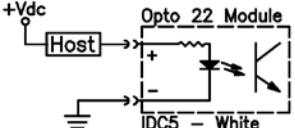

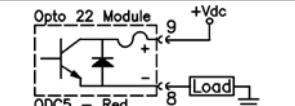
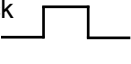
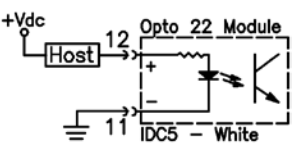

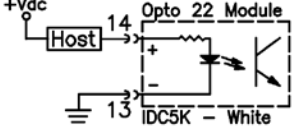
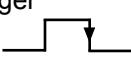
EPROM Location on CPU Board

Drive Motor Belt Routing



8 I/O Options

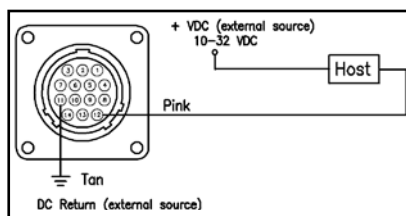
Quick-Look Reference Guide - Sourcing

Module	Electrical	Signal	Description
# 1 Double/Miss Output		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 - 999 ms.
# 2 Busy/Done Output		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		Ready 	This output is asserted anytime the feeder is ready to be triggered.
# 4 Double Input		Double 	This input is provided with the Double option. The input is monitored for the indication that a double has occurred. This function is wired internally. This input has a minimum time period of >50ms.
# 5 Low Stack Input		Low Stack 	This input is provided with the Low Stack option. The input is used to monitor the Low Stack sensor. This function is wired internally. This input has a minimum time period of >50ms.
# 6 Low Stack Output (Optional)		Low Stack 	This output is provided with the Low Stack option. The output is asserted when the Low Stack input is asserted.
# 7 R-Stop Input		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		Ext Trigger 	This input is used to trigger the feed cycle. This input is edge triggered and inverted by the input module. This input has a minimum time period of >50ms.

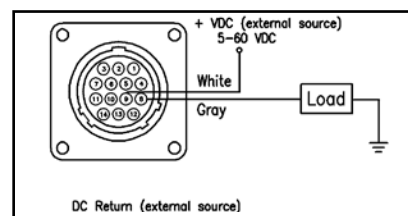
External Wiring Reference Diagrams



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.



Sourcing Input

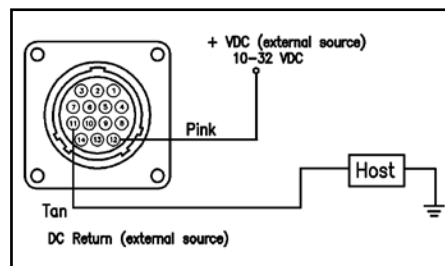


Sourcing Output

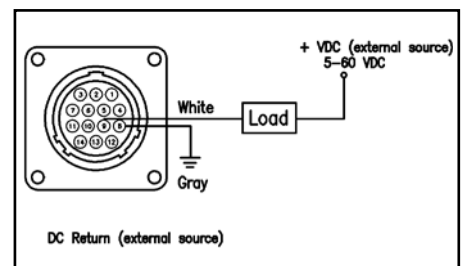
Quick-Look Reference Guide - Sinking

Module	Electrical	Signal	Description
# 1 Double/Miss Output			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 - 999 ms.
# 2 Busy/Done Output			Busy: This output is asserted while the motor is running. Done: This output is asserted when a batch is done feeding.
# 3 Ready Output			This output is asserted anytime the feeder is ready to be triggered.
# 4 Double Input			This input is provided with the Double option. The input is monitored for the indication that a double has occurred. This function is wired internally. This input has a minimum time period of >50ms.
# 5 Low Stack Input			This input is provided with the Low Stack option. The input is used to monitor the Low Stack sensor. This function is wired internally. This input has a minimum time period of >50ms.
# 6 Low Stack Output (Optional)			This output is provided with the Low Stack option. The output is asserted when the Low Stack input is asserted.
# 7 R-Stop Input			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			This input is used to trigger the feed cycle. This input is edge-triggered and inverted by the input module. This input has a minimum time period of >50ms.

External Wiring Reference Diagrams

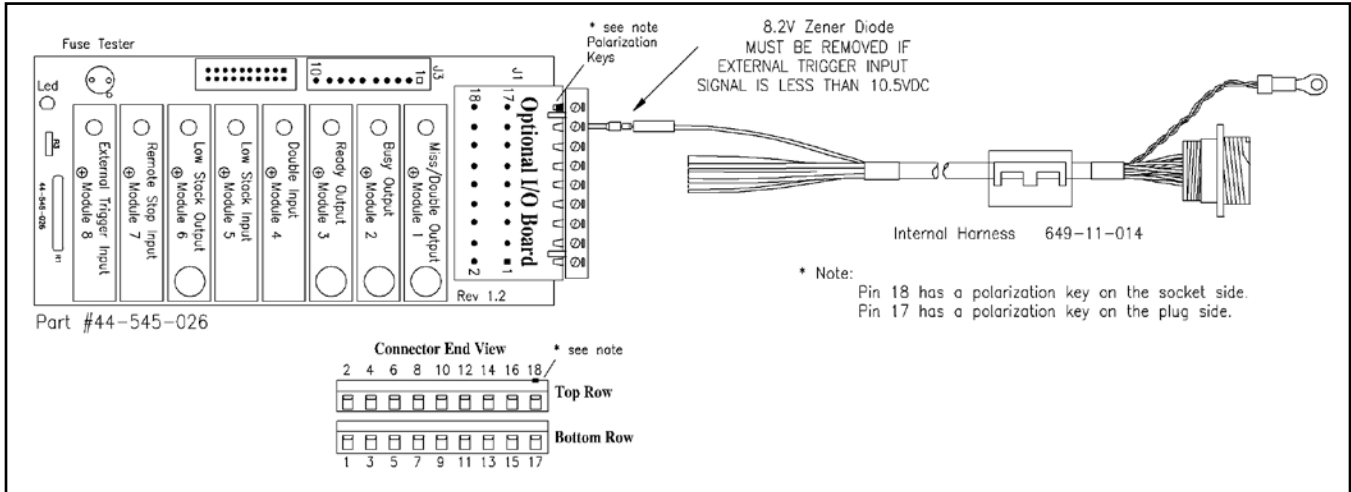


Sinking Input



Sinking Output

Relay Rack and Module Reference Diagrams

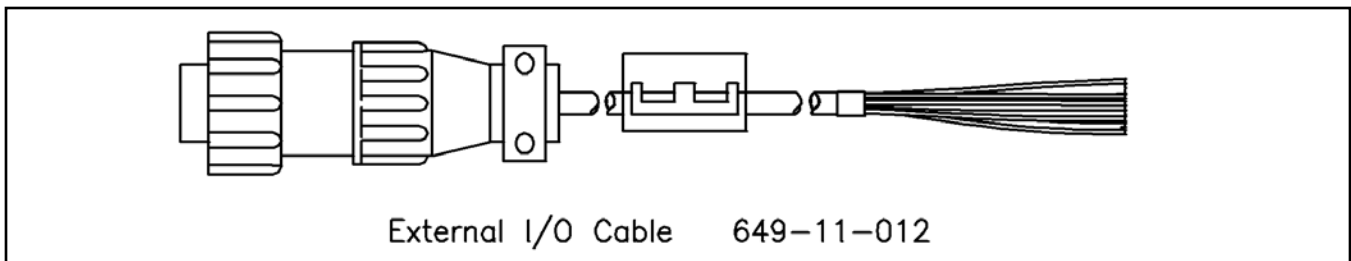


I/O Cable Wiring

External I/O Cable Wiring Table

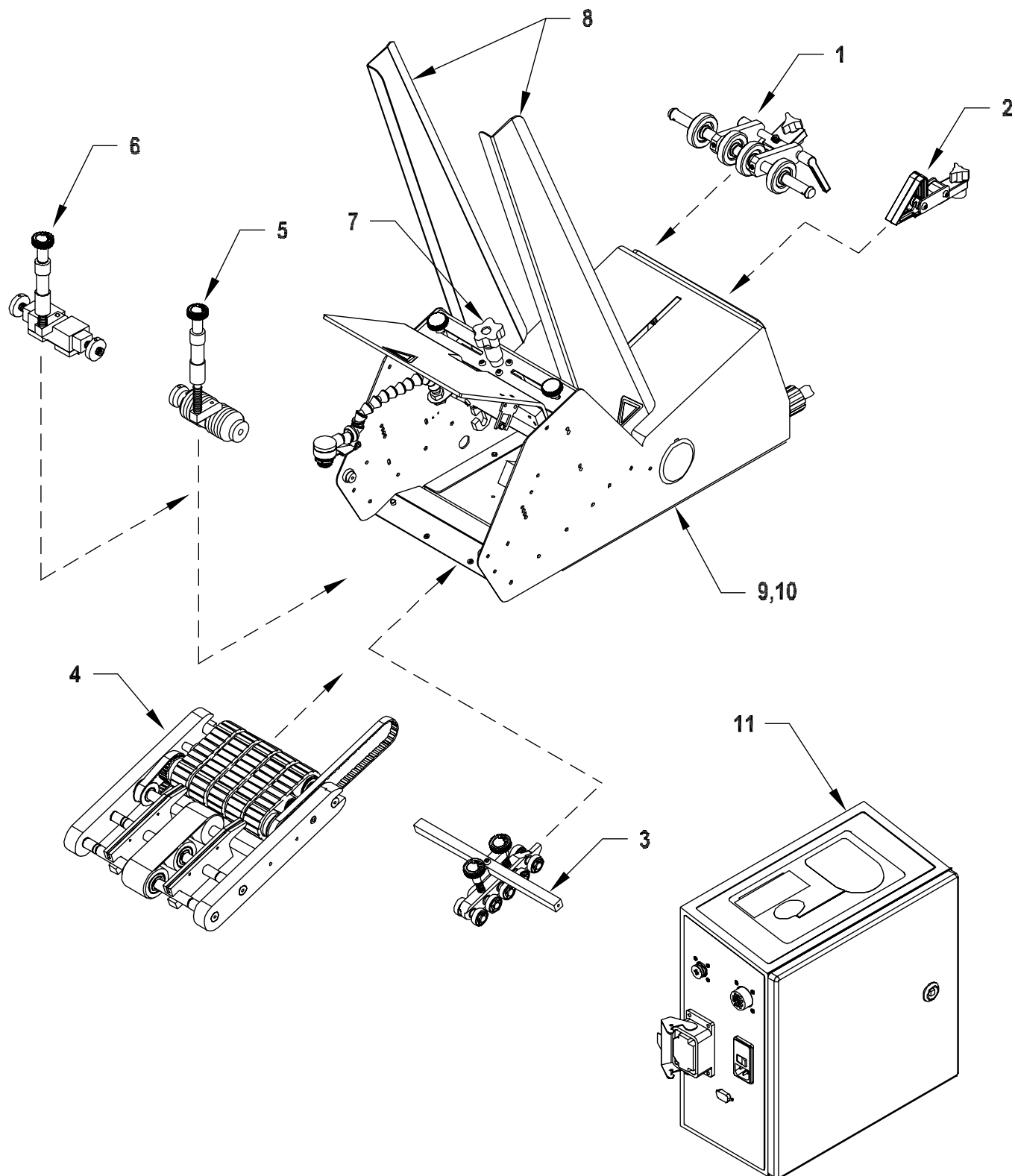
Pin #	Wire Color	Function	Module #	Module Type
1	Brown	Miss/Double Output (-)	1	ODC5
2	Red	Miss/Double Output (+)		5-60VDC
3	Orange	+12 VDC Supply (150ma. max) -		
4	Yellow	Busy/Done Output (-)	2	ODC5
5	Green	Busy/DoneOutput (+)		5-60VDC
6	Blue	Ready Output (-)	3	ODC5
7	Violet	Ready Output (+)		5-60VDC
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.



Notes	

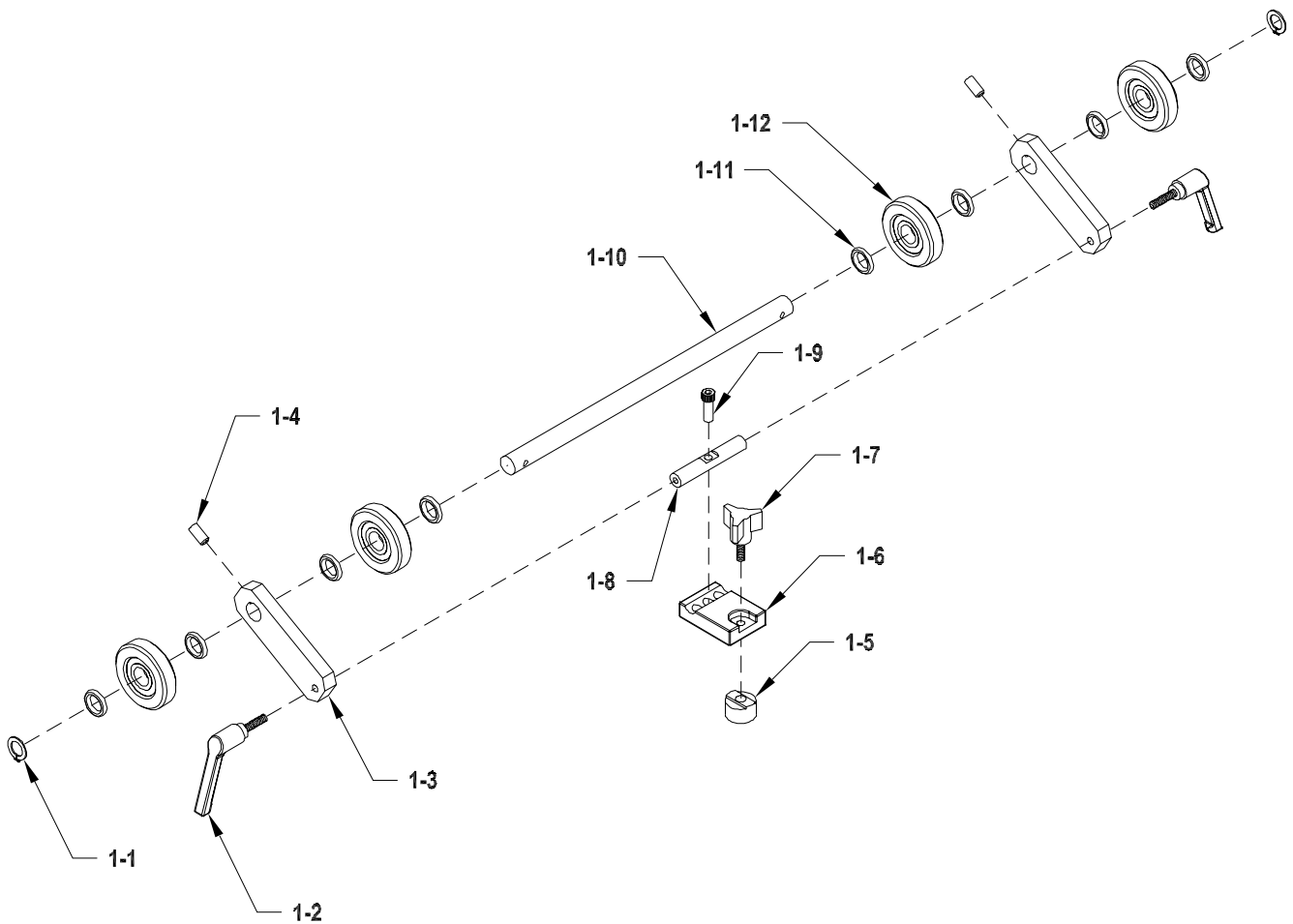
9 Mechanical Components



ST-550

Diagram Number	Description	Part Number
1	ARTICULATING ROLLER WEDGE ASSEMBLY	63311340
2	EXTENDED NARROW WEDGE	63311212
3	5 AXLE HOLD DOWN ASSEMBLY	43511310
4	GROOVED GUM RUBBER CARRIAGE ASSEMBLY	71011162
5	ADVANCING O RING GATE WITH HORIZON ADJUST ASSEMBLY	87211001
6	BAR GATE II w/HORIZON ADJUST & URETHANE INSERT (optional)	15011872
7	SOLID GATE PLATE ASSEMBLY	71011004
8	SIDE GUIDES & RELATED ITEMS	
9	BASE FEATURES EXTERIOR	
10	BASE FEATURES INTERIOR	
11	EQUIPPED BOX WITH I/O	
Not shown	I/O ASSEMBLY	68311014

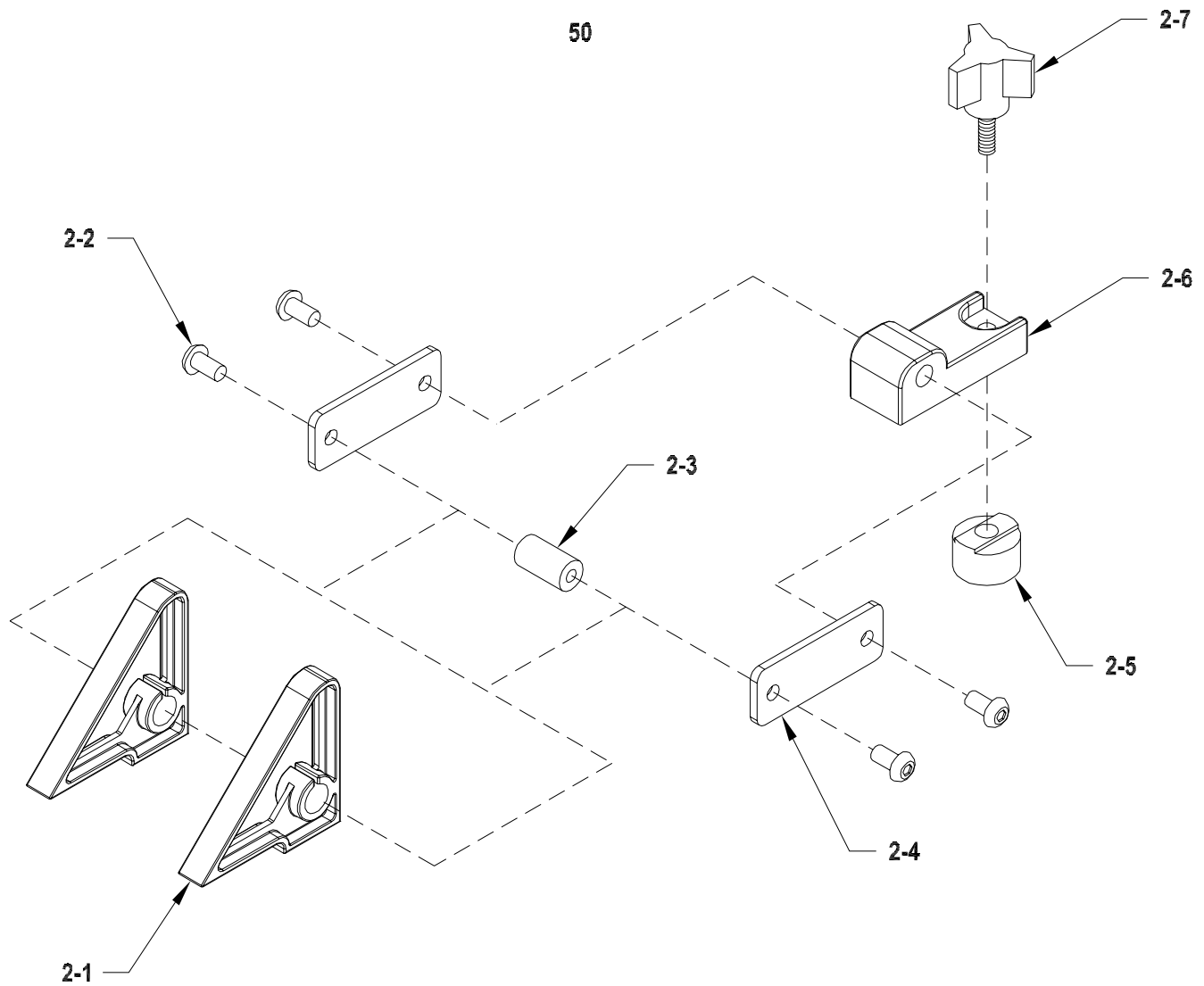
1: ARTICUALTING ROLLER WEDGE ASSEMBLY #63311340



**1: ARTICULATING ROLLER WEDGE
ASSEMBLY #63311340**

<u>DIAGRAM NUMBER</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>PART NUMBER</u>
1-1	2	Ring Grip 1/2 Waldes	00001115
1-2	2	Lever Adjustment 10-32 X .75	43555098
1-3	2	Bracket Roller Wedge Pivot	44633024
1-4	2	Screw Socket Set 1/4-20 X 1/2" LG	00002327
1-5	1	T-Nut Round	44633016
1-6	1	Wedge Block	44633014
1-7	1	Knob 3 Lobe 10-32 X 5/8	44633033
1-8	1	Roller Wedge Shaft	44633010
1-9	1	SHCS 10-32 X 5/8" LG	00002320
1-10	1	Shaft Idler	23560147
1-11	8	O Ring 7/16	44340017
1-12	4	Bearing Ball R8	23500094
	4	Wedge Roller Wheel	44340012

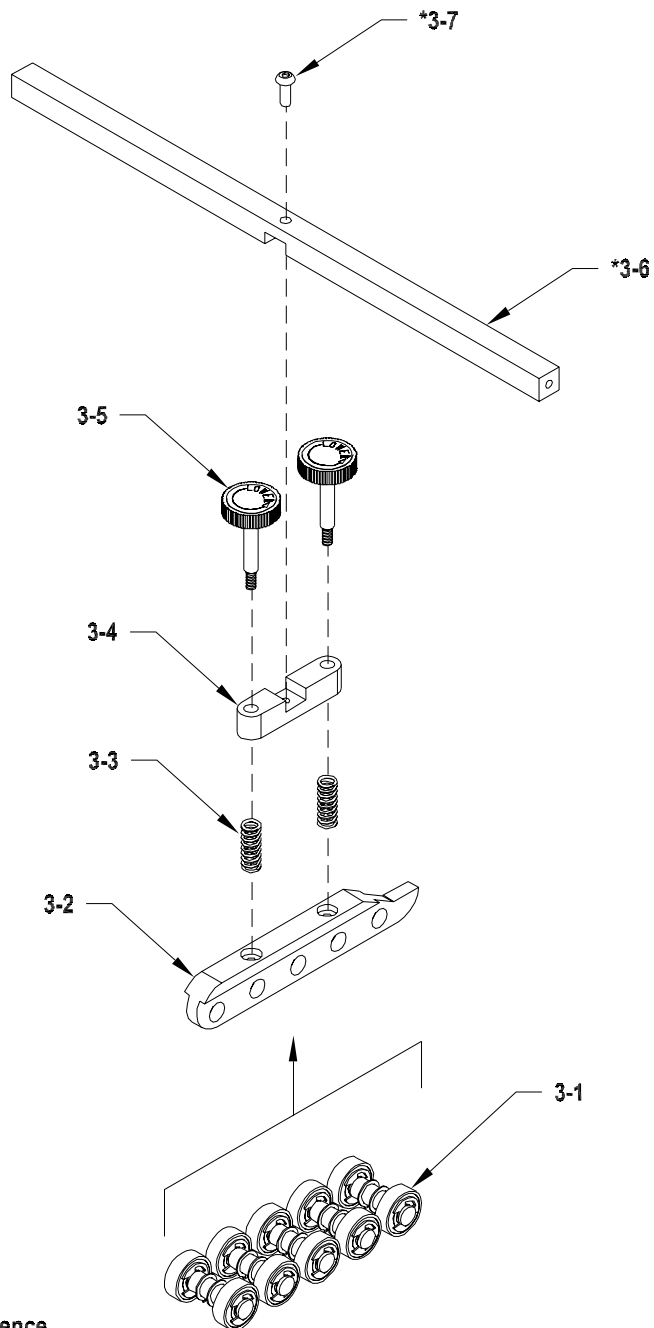
2: EXTENDED NARROW WEDGE ASSEMBLY #63311212



**2: EXTENDED NARROW WEDGE
ASSEMBLY #63311212**

<u>DIAGRAM NUMBER</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>PART NUMBER</u>
2-1	2	Wedge Material Support	33560212
2-2	4	BHCS 10-32 X 3/8	00002305
2-3	1	Shaft, Belt Tensioner 3/8	43555077
2-4	2	Bracket Extension Narrow Wedge	44633022
2-5	1	T-Nut Round	44633016
2-6	1	Block Hold Down Wedge	44633021
2-7	1	Knob 3 Lobe 10-32 X 5/8	44633033

3: 5 AXLE HOLD DOWN ASSEMBLY #43511310



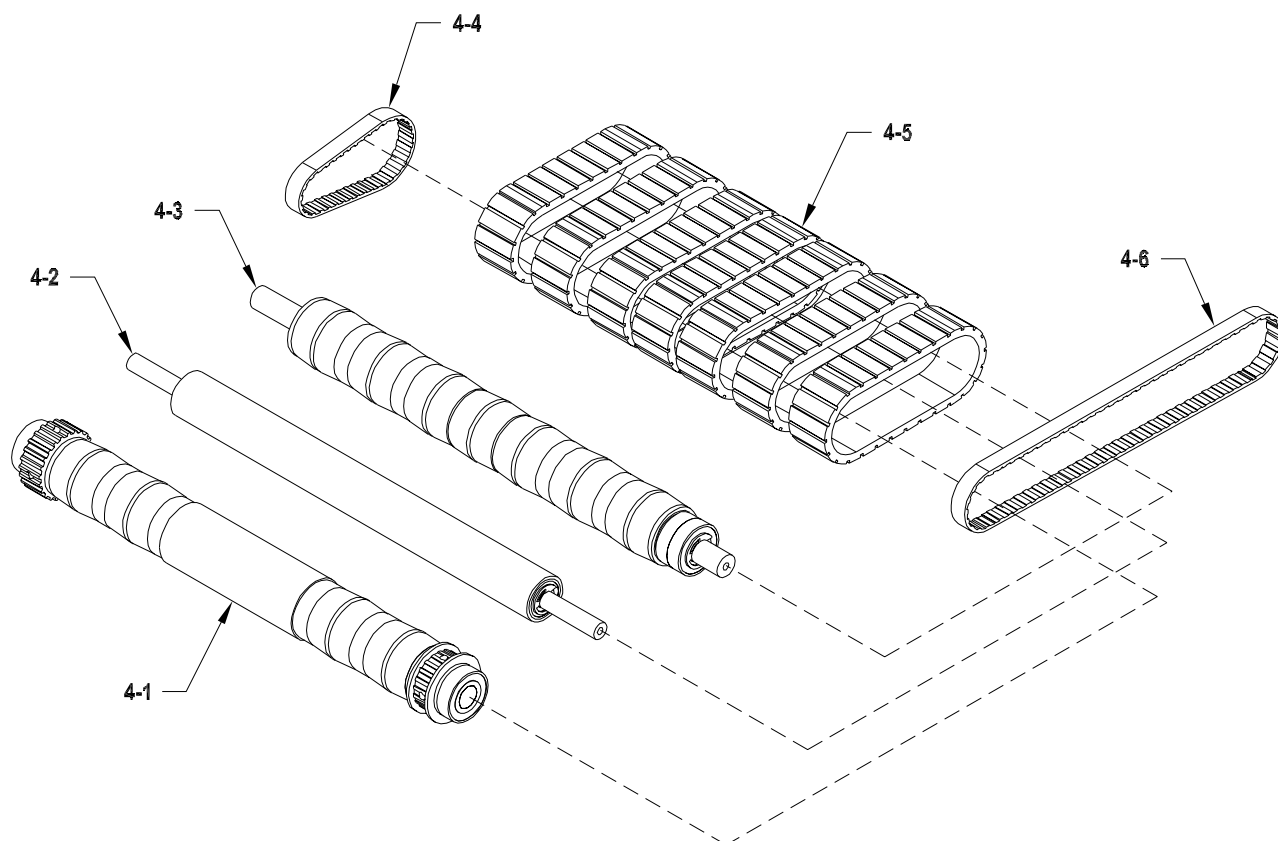
*Part exists in diagram for reference only and is not included with this assembly. Must be ordered separately.

3: 5 AXLE HOLD DOWN ASSEMBLY #43511310

<u>DIAGRAM NUMBER</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>PART NUMBER</u>
3-1	5	Bearing Holder Shaft	43560008
	10	Bearing Ball R6	23500095
	10	Ring Grip 3/8 Waldes	00001110
	20	Clip E 3/8 Waldes	00001150
3-2	1	Holder Bearing 5 Axle	43560310
3-3	2	Spring Compression	23560083
3-4	1	Bar Hold Down Adjustment	23560086
3-5	2	Screw Cross Bar Hold Down Adjustment	23560087
	2	Hold Down Knob 1	23560077
	2	Grommet Rubber	00001130
	2	Label Gate Adjustment Knob	23500084
3-6*	1	Cross Support Bar	43555215
3-7*	1	BHCS 10-32 x 1/2" LG	00002334

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

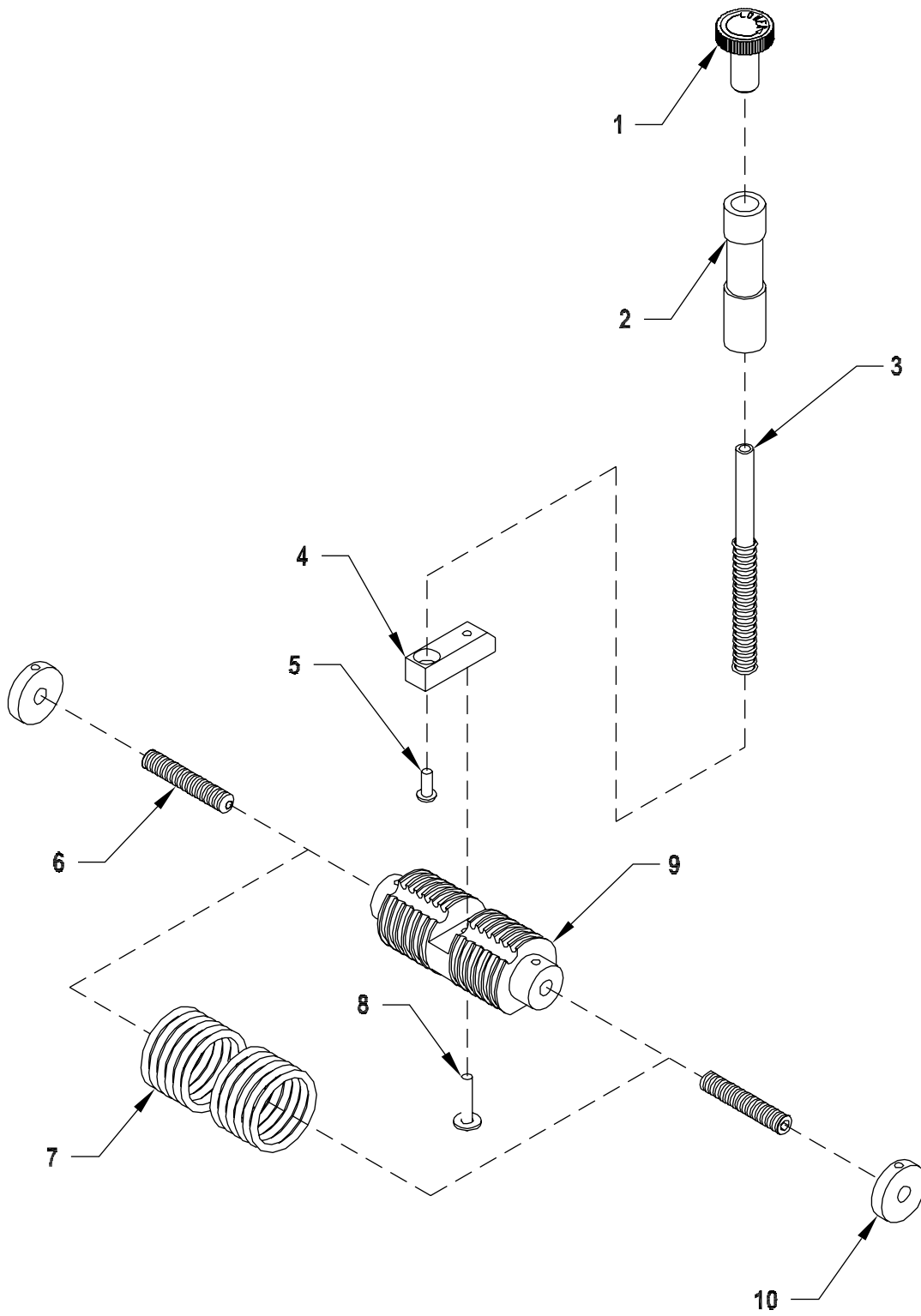
4: GROOVED GUM RUBBER CARRIAGE ASSEMBLY #71011162



4: GROOVED GUM RUBBER CARRIAGE ASSEMBLY #71011162

<u>DIAGRAM NUMBER</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>PART NUMBER</u>
4-1	2	Shaft, Idler	33560047
	2	Roller Crown Driven with Bearings	23511105
	4	Clip E 1/2 Waldes	
4-2	1	Shaft Drive 1/2 SS	33560211
	1	Drive Crown Pulley	23560106
	1	Pulley, Timing 16XL037 .500 KDFA	43560097
	2	Screw Socket Set 10-32 X 1/8" LG	00003352
	2	Screw Socket Set 1/4-20 1/2" LG	00002327
	2	Bearing Ball R8	23500094
	1	Woodruff Key 1/8 X 3/8	00003351
4-3	1	Belt, Timing 78XL037	23560078
4-4	1	Holder Right Hand Carriage	23560202
4-5	2	Rail, Material Support Slide	23560082
	2	Slide, Anti Dive	44970006
	4	Screw Socket Set 8-32 X 1/4" LG	00002203
4-6	1	Belt Discharge Clear 1.5 Wide	23560088
4-7	1	Holder Left Hand Carriage	23560203
4-8	3	Belt, Feed Tan Gum 24G Liner 1W X 9L	23500162
4-9	1	Belt, Timing 170XL037	43500096
4-10	1	Shaft Drive	44710012
	1	Pulley, Timing 24XL037 .500KA	43560098
	1	Pulley, Timing 20XL037 .500KDFA	23500097
	2	Bearing Ball R8	23500094
	2	Clip E 1/2 Waldes	00001155
	2	Key Woodruff 1/8 X 3/8	00003351
	1	Screw Socket Set 10-32 X 1/4" LG	00002216
	3	Screw Socket Set 10-32 X 5/16" LG	00002217
4-11	1	Shaft Belt Support Bearing	33560040
	1	Tube Belt Support	23500270
	2	Bearing Ball R6	23500095
	2	Clip E 3/8 Waldes	00001150
4-12	1	Shaft Idler	33560047
	1	Tube Driven	44710003
	4	Bearing Ball R8	23500094
	1	Grip Ring, 1/2 Shaft	00001115
	2	Clip E 1/2 Waldes	00001155

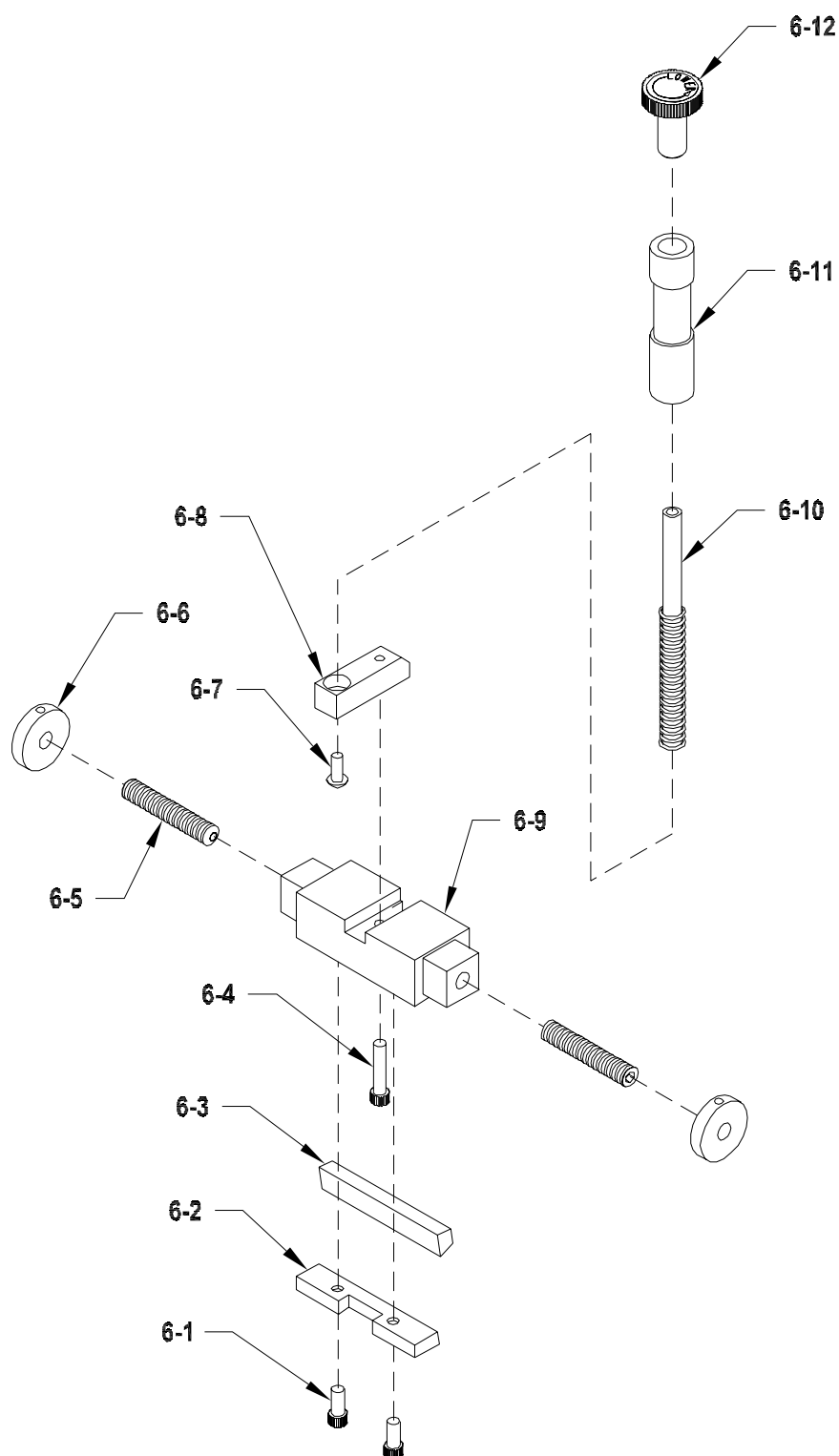
STANDARD O-RING GATE W/HORIZON ADJUST ASSEMBLY
Assembly # : 13511872



STANDARD O-RING GATE W/HORIZON ADJUST ASSEMBLY
Assembly # : 13511872

ITEM	QTY.	PART NUMBER	DESCRIPTION
1	1	23511037	ADJ KNOB ASSEMBLY FOR GATE
2	1	23500019	CYLINDER GATE SPRING
3	1	23560084	SHAFT GATE LIFT
	1	23500083	SPRING GATE COMPRESSION
4	1	15000001	MOUNT GATE LIFT SHAFT
5	1	00002334	BHCS 10-32 X 1/2" LG
6	2	44872005	SCREW ADJUSTMENT
7	12	23500089	O RING GATE CYLINDER
8	1	00002340	BHCS 10-32 X 1" LG
	1	00002607	WASHER FLAT #10
9	1	51101001	GATE CYLINDER (NOT SOLD SEPARATELY)
	2	00002216	SHSS 10-32 X 1/4" LG CUP PT
10	2	44872003	ROLLER
	2	44872007	SHSS 10-32 X 3/8" LG NYLON TIP

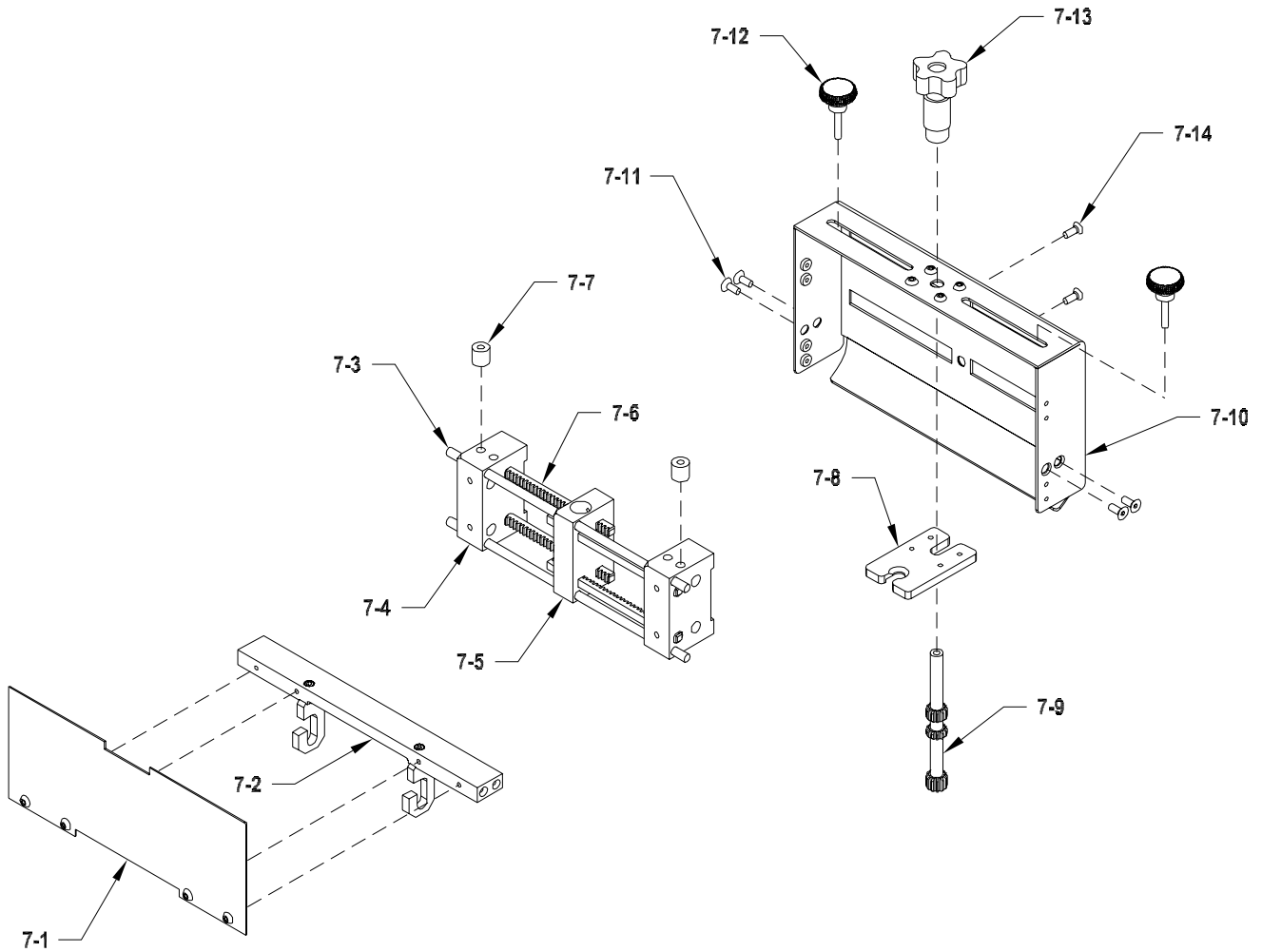
**6: BAR GATE II w/HORIZON ADJUST & URETHANE INSERT (OPTIONAL)
ASSEMBLY #15011872**



**6: BAR GATE II w/HORIZON ADJUST & URETHANE INSERT (OPTIONAL)
ASSEMBLY #15011872**

<u>DIAGRAM NUMBER</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>PART NUMBER</u>
6-1	2	SHCS 10-32 X 1/2" LG	00002315
6-2	1	V-Bar Gate Belting Holder	44500067
6-3	1	V Belting, 3/8 X 3 Inch Orange Urethane	44500054
6-4	1	SHCS 10-32 X 1" LG	00002335
6-5	2	Adjustment Screw	44872005
6-6	2	Roller	44872003
	2	Screw Socket Set 10-32 X 3/8" LG Nylon Tip	44872007
6-7	1	BHCS 10-32 X 1/2" LG	00002334
6-8	1	Mount Gate Lift Shaft	15000001
6-9	1	Bar Gate II Cylinder Horizon	44996008
	2	Screw Socket Set 10-32 X 1/4" LG Cup Point	00002216
6-10	1	Shaft Gate Lift	23560084
	1	Spring Gate Compression	23500083
6-11	1	Cylinder Gate Spring Tension	23500019
6-12	1	Adjustment Knob Assembly for Gate	23511037

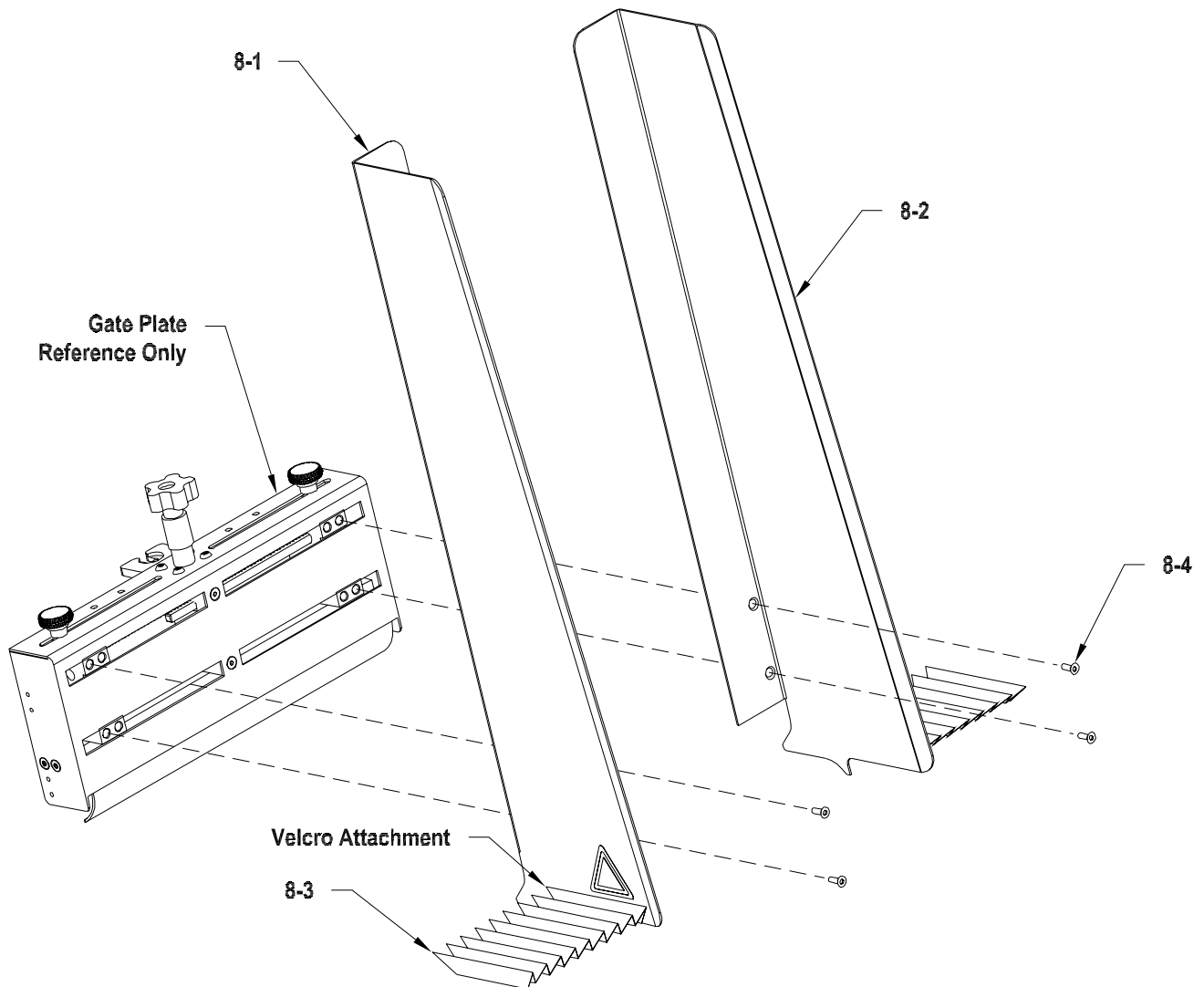
7: SOLID GATE PLATE ASSEMBLY #71011004



**7: SOLID GATE PLATE
ASSEMBLY #71011004**

<u>DIAGRAM NUMBER</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>PART NUMBER</u>
7-1	1	Cover Side Guide Adjustment	44710011
	2	BHCS 10-32 X 3/8" LG	00002805
7-2	1	Bar Lower Gate Support	44710008
	2	Hook Gate J	15000007
	2	SHCS 8-32 X 5/8" LG	00002215
7-3	2	Rail Side Guide Support	44710009
7-4	2	Side Guide Adjustment Block	44646001
	4	Screw Socket Set 1/4-20 X 1/4" LG	00002205
7-5	1	Guide Stationary Block Side	44646002
7-6	4	Rack	44710010
7-7	2	Spacer Lower	44646015
7-8	1	Block Adjustment Reference	44646004
	4	BHCS 10-32 X 3/8" LG	00002805
7-9	1	Shaft Pinion Adjustment	44646005
7-10	1	Solid Gate Plate	44710002
7-11	4	Screw Flat Head 10-32 X 3/8" LG	00002234
7-12	2	Knob Plastic 10-32	44681021
	2	Screw Socket Set 10-32 X 1-1/2" LG	00003313
	2	Spacer Upper	44646016
7-13	1	Knob 5 Lobe	44646009
	1	Spring Retainer Upper	44646008
	1	Spring Retainer Lower	44646007
	1	Spring Compression	44646013
7-14	2	Screw Flat Head 10-32 X 1/2" LG	00002830

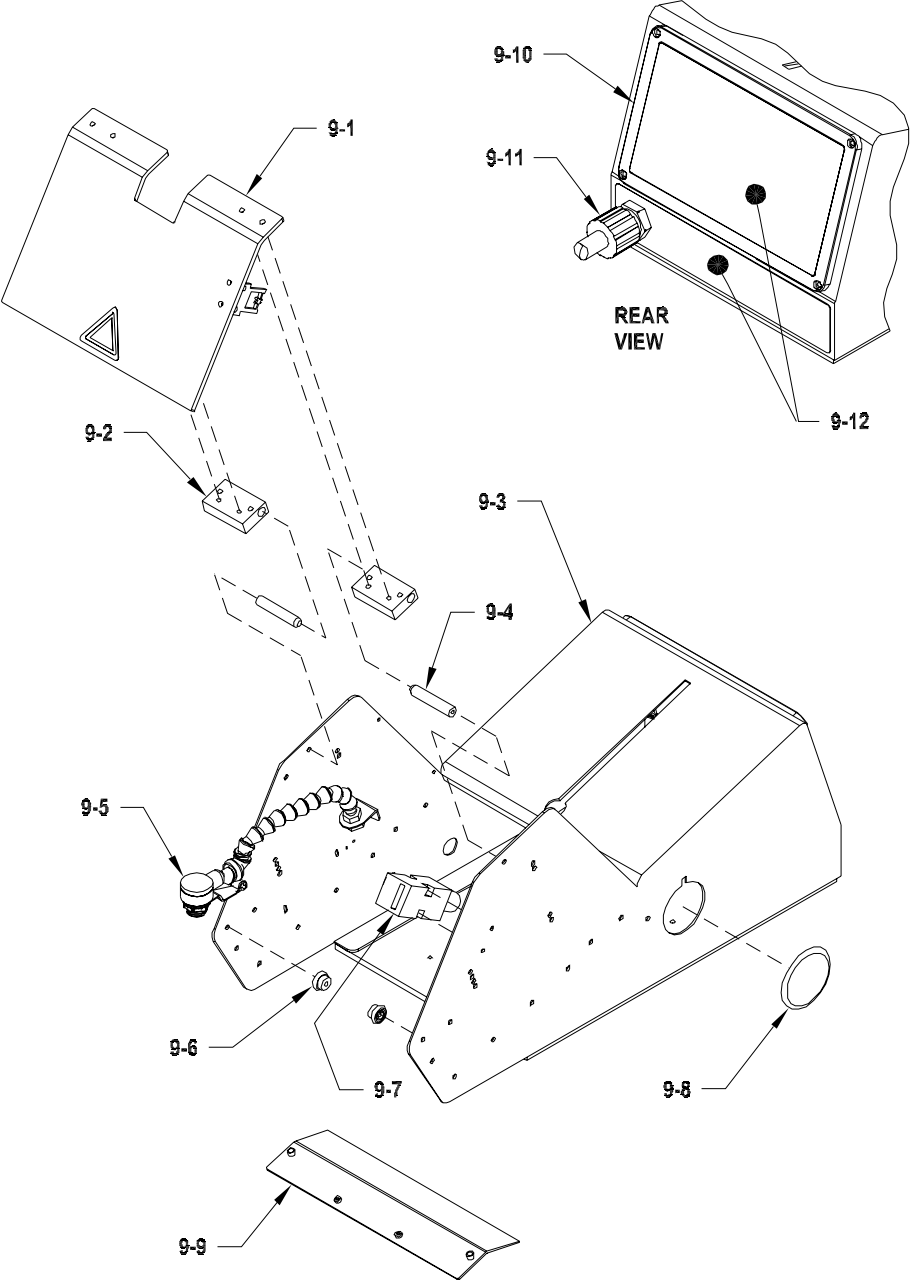
8: SIDE GUIDE & RELATED ITEMS



8: SIDE GUIDE & RELATED ITEMS

<u>DIAGRAM NUMBER</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>PART NUMBER</u>
8-1	1	Side Guide Left 1424	44640017
	1	Warning Label Side Guide	44600005
8-2	1	Side Guide Right 1424	44640018
	1	Warning Label Side Guide	44600005
8-3	2	Guard Rear Accordion	44600001
8-4	4	FHSS 10-32 X 1/2" LG	00002830

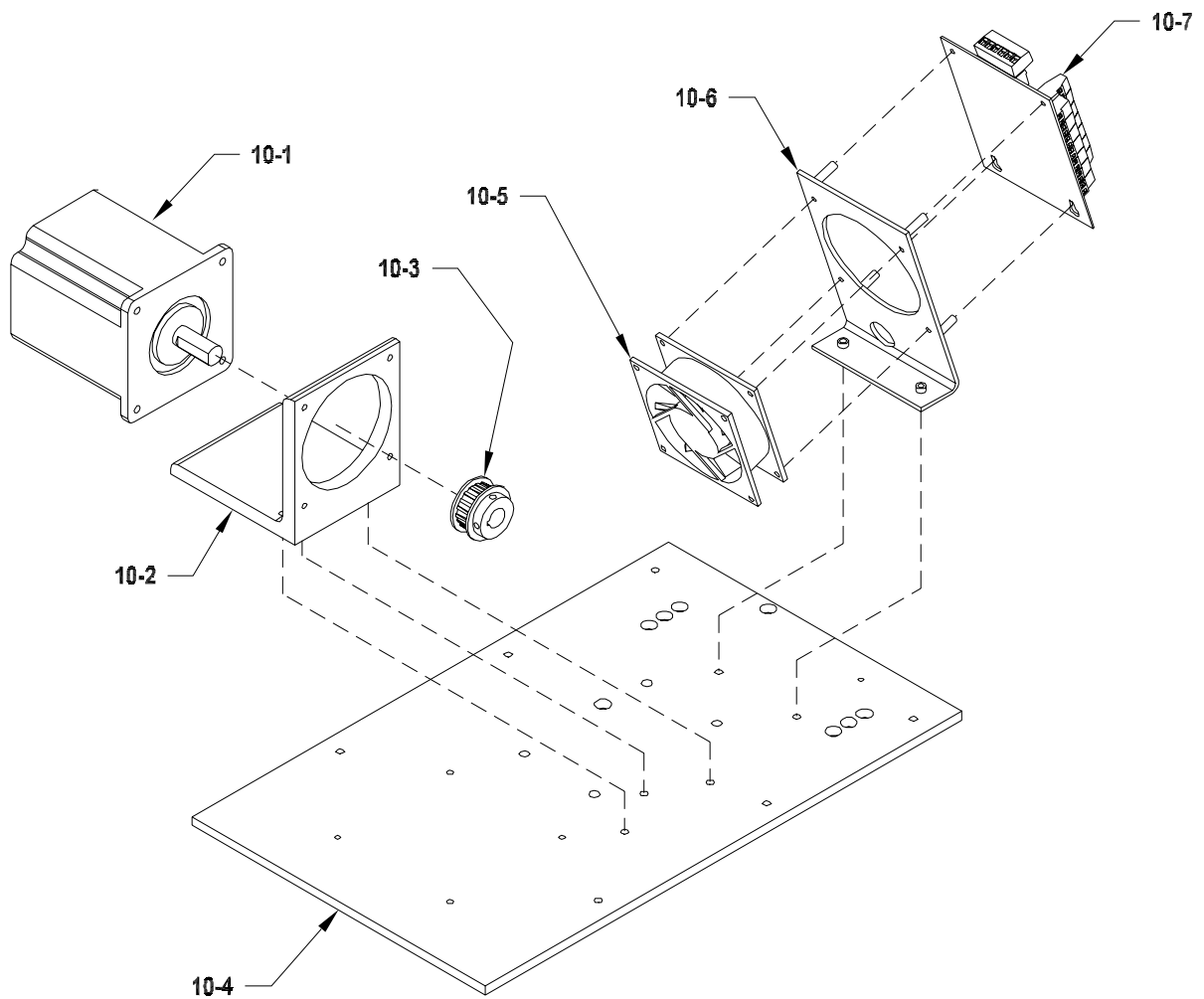
9: BASE FEATURES EXTERIOR



9: BASE FEATURES EXTERIOR

<u>DIAGRAM NUMBER</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>PART NUMBER</u>
9-1	1	Cover, Top Protective	44710006
	1	Label, Roller Pinch Point Warning	44600004
	1	Key, Safety Interlock	44649010
9-2	2	Hinge, Top Cover Mount	44640012
9-3	1	Shell	44710001
9-4	2	Shaft, Top Cover Hinge Mount	44640011
9-5	1	Sheet Sensor Assembly	70011008
9-6	2	Bracket, Rubber Spacer	44640009
	2	O Ring, Support Cover	43555068
9-7	1	Safety Interlock Switch Assembly	70011007
9-8	1	Plug, 2 Inch Hole Cover	44500061
	1	Label, Belt Routing	44500071
9-9	1	Cover, Bottom Protective	44710007
9-10	1	Plate, Cover	44710016
9-11	1	Cable, 5 foot Interconnect	68311003
9-12	1	Graphic	44710017

10: BASE FEATURES INTERIOR



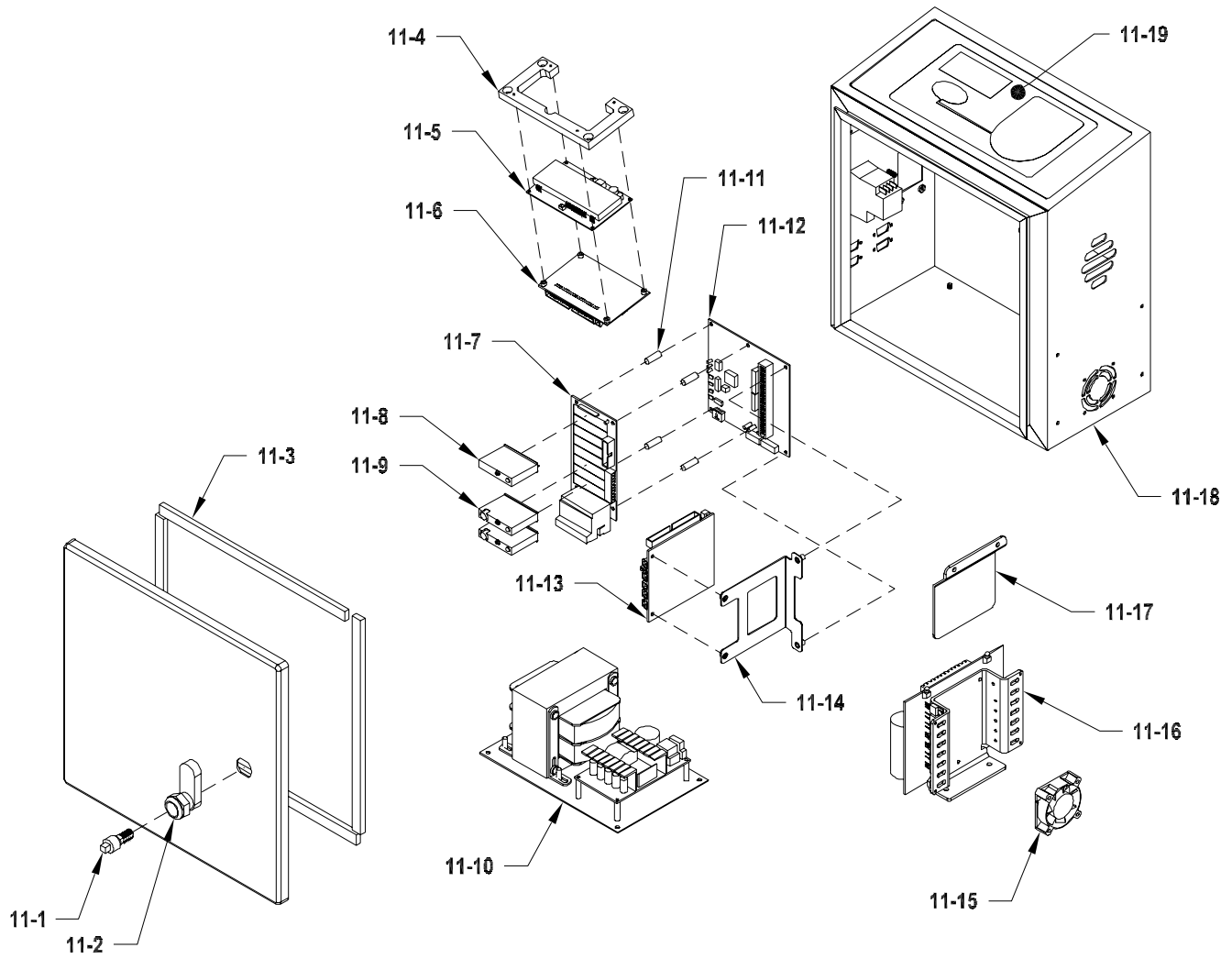
10: BASE FEATURES INTERIOR

<u>DIAGRAM NUMBER</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>PART NUMBER</u>
10-1	1	Stepper Drive Motor Assembly	53511390
10-2	1	Motor Mount	44630011
10-3	1	Pulley, Timing 18XL037 .500KDFHA	44350053
	2	Screw Socket Set 10-32 X 1/8	00003352
	(spec. length)	Key Stock 1/8	44852080
10-4	1	Mounting Base	44710013
10-5	1	Fan Assembly	70011001
10-6	1	Bracket, Fan Mounting	44700018
10-7	1	I/O Distribution Board	44700021

BASE FEATURES NOT SHOWN

<u>QTY</u>	<u>DESCRIPTION</u>	<u>NUMBER</u>
3	Mount, Cable Adhesive C Type	23500079
1	Belt Tensioner Assembly	23511290
1	Tie, Cable Black	435SO263
1	Power Cord (115V Models Only)	53511020
1	Power Cord & Allen Wrenches (230V Only)	53522210
1	Flight Sensor Assembly	63011038

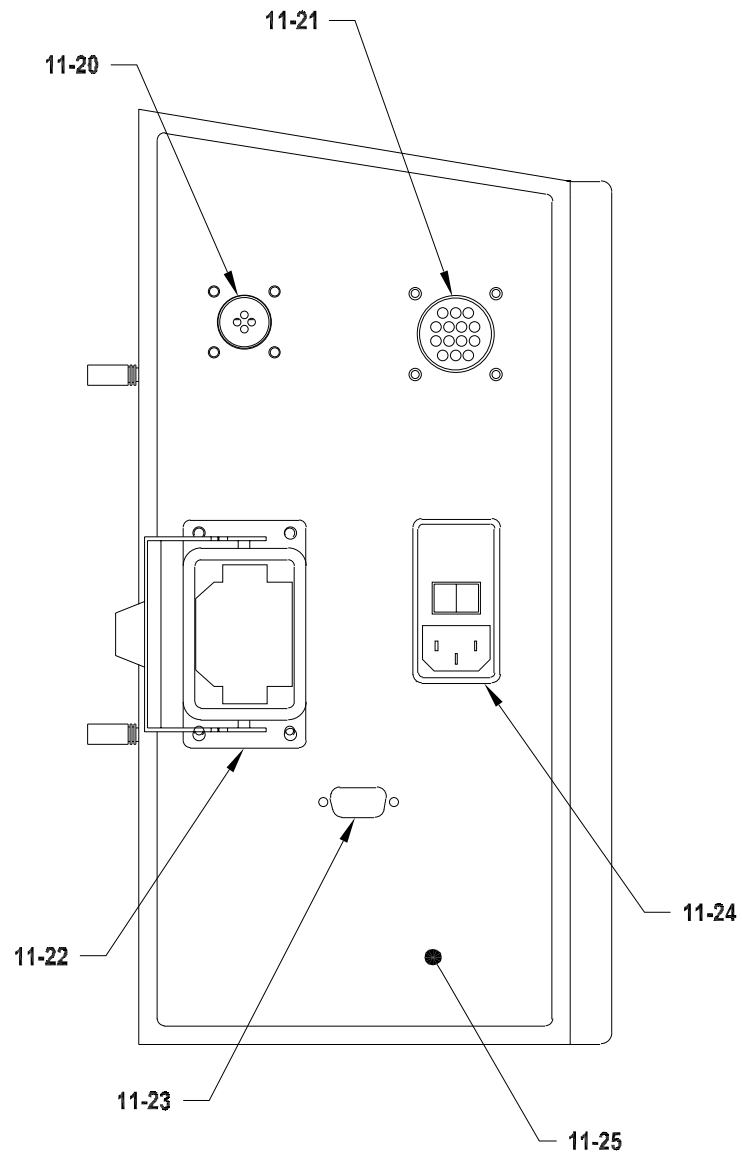
11: IQUIPPED BOX WITH I/O
BASE ASSEMBLY #68311001 I/O ASSEMBLY #68311014



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

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

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



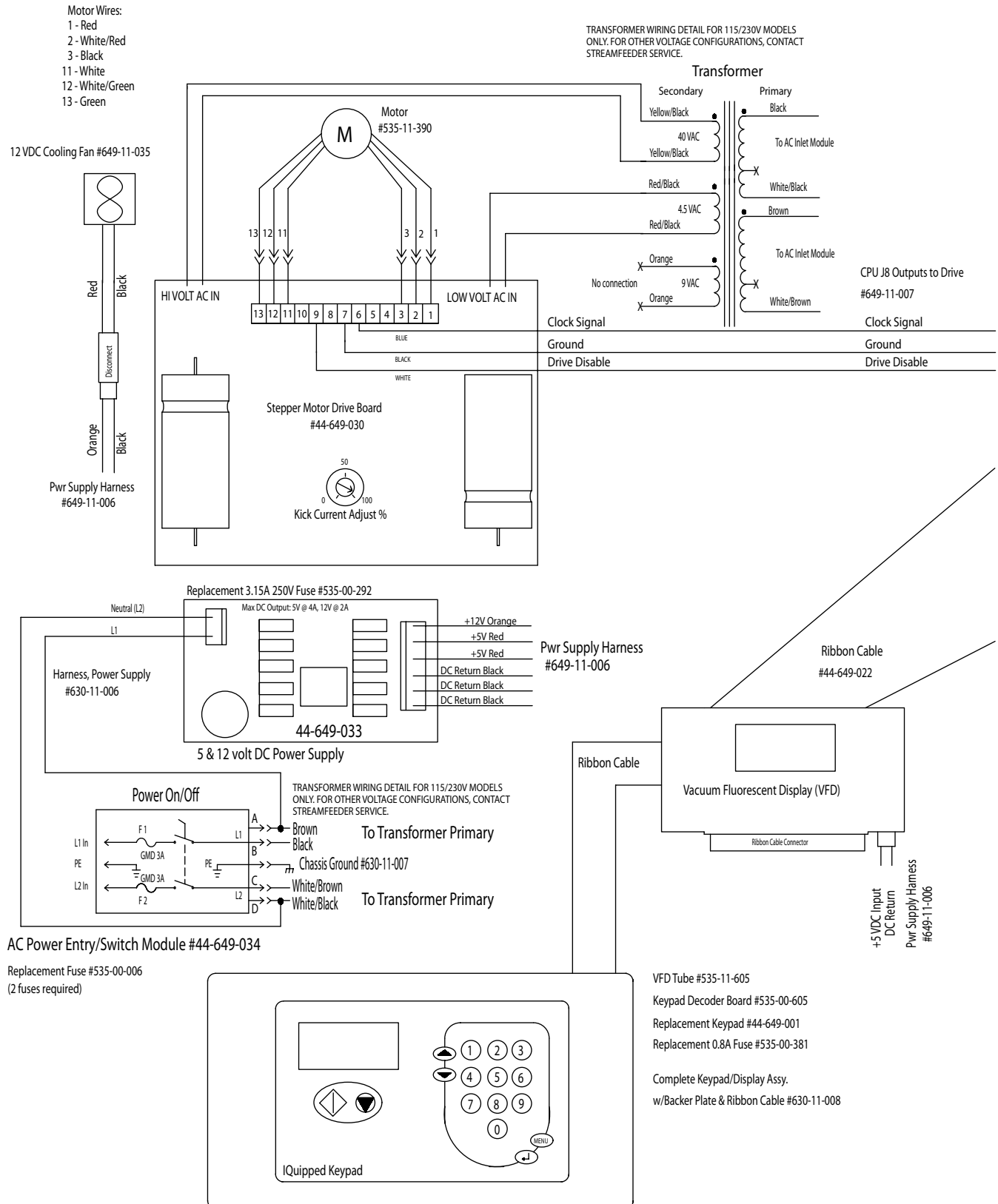
11: IQUIPPED BOX WITH I/O
BASE ASSEMBLY #68311001 I/O ASSEMBLY #68311014

<u>DIAGRAM NUMBER</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>PART NUMBER</u>
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
NOT SHOWN			
	16	Cable Tie Wrap	435SO263
	2	U-Bolt Square Bend 3 3/8	44360051
	1	Cable Ribbon Display	44649022
**1		Connector T&B 96 Pin	44649031
**1		Bracket Mounting CPU Board	44649038
	1	Plate Mounting IQuipped Box	44683006
	2	Retainer Mounting IQuipped Box	44683007
	1	Key 7mm Square	44683023
**1		Overlay Graphic IQuipped	44683024
	2	Fuse 3A 250V Slo-Blo GMD 5 X 20mm	53500006
	2	Terminal Ring	53500046
	11	Wire MTW 18 Ga Stranded Green/Yellow St	53500057
	1	Cable Ground Wire Assembly	63011007
	1	Harness Power Supply DC Outputs	64911006
	1	Harness Drive Control	64911007
*1		Cable Ribbon Relay I/O	44649007
*1		Cable External Systems 14 Pin	64911012
SOLD SEPARATELY			
	1	Eprom (Batch Count Model Only)	63511001
	1	Eprom (Batch Count Model Only)	63511002

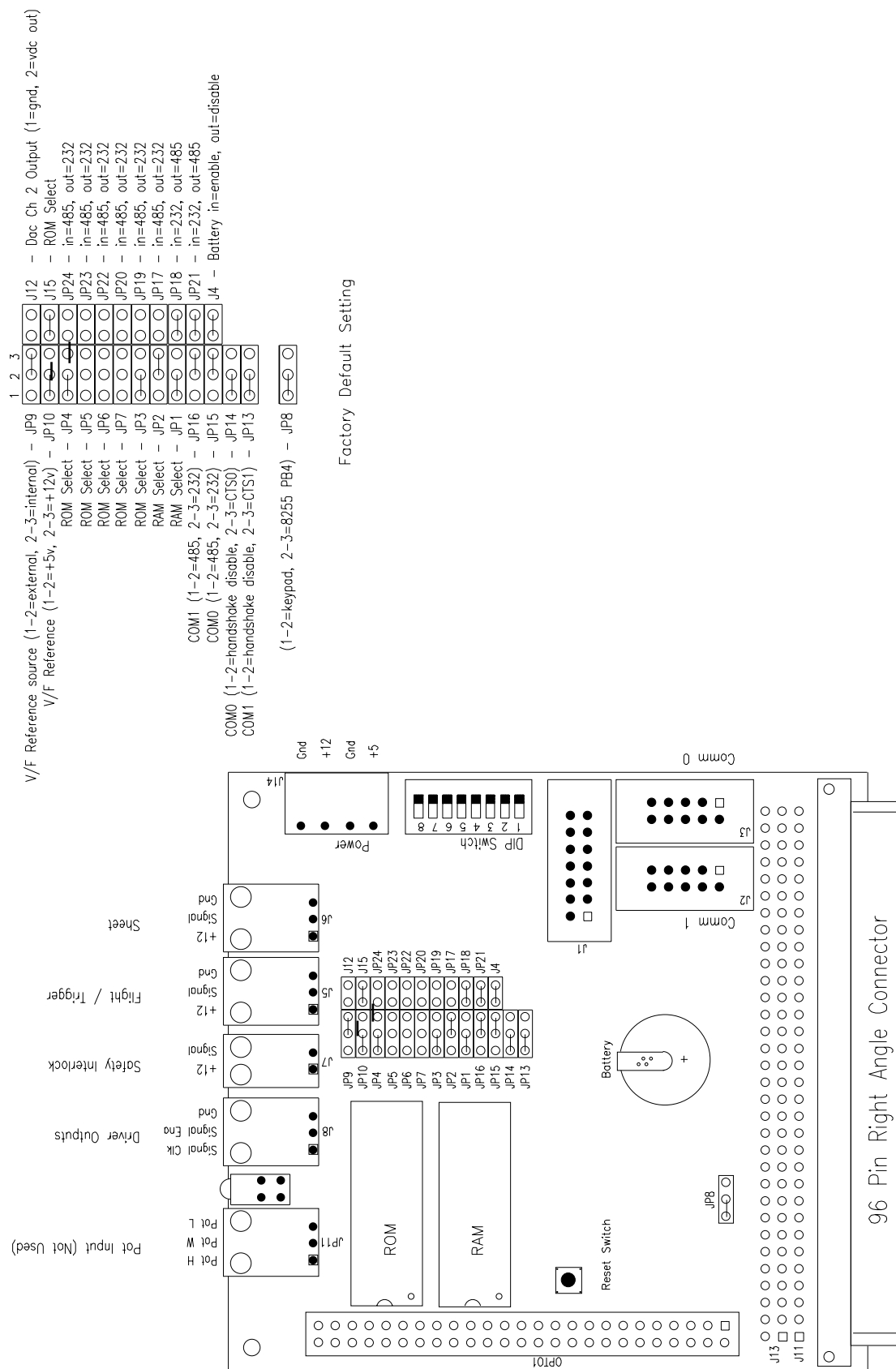
*Denotes optional feature associated with I/O assembly #68311014

**Denotes part that was removed from standard configuration to accommodate I/O option

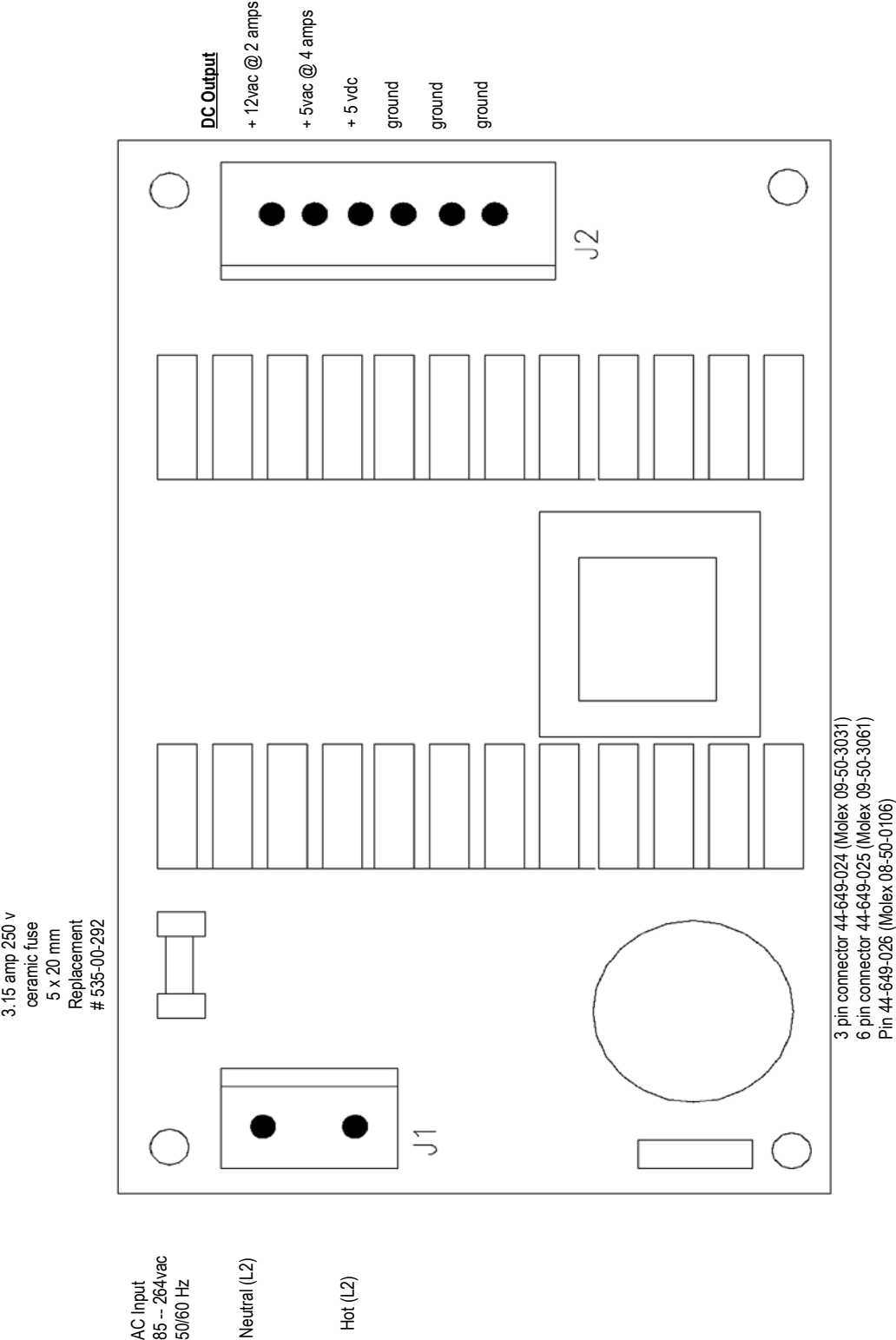
10 Electrical Components



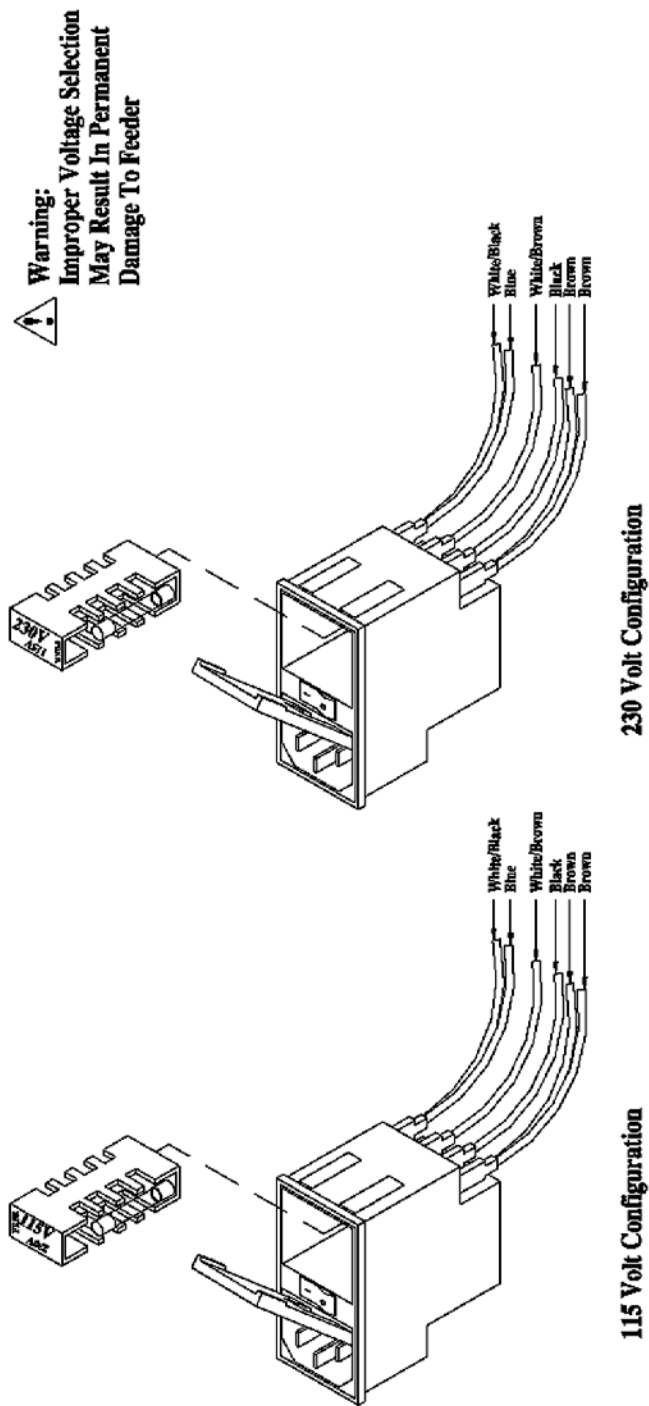
CPU Detail



Power Supply

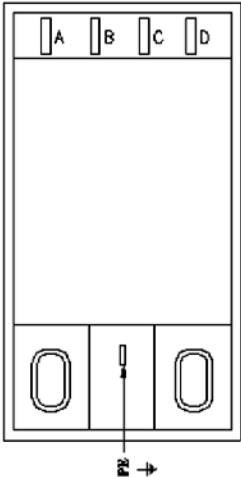


AC Input Module



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



PRO SERIES ST-550 MANUAL

6-Lead Stepper Motor

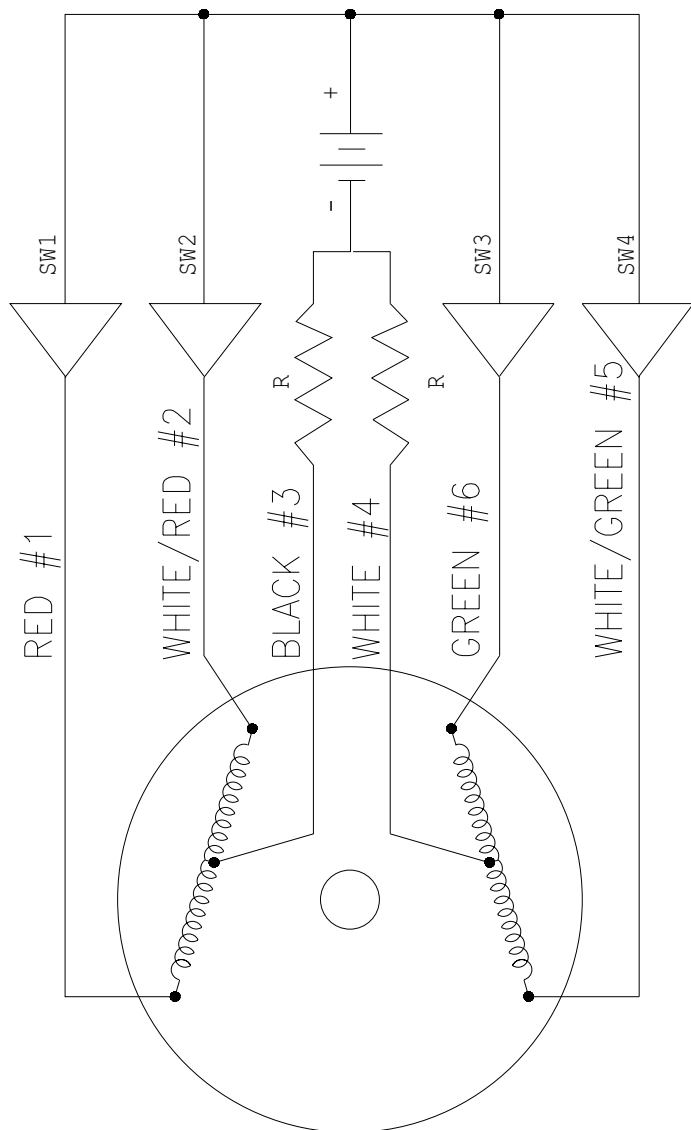


The motor must not be taken apart. Opening the motor will void the warranty. Removing the rotor will reduce output torque 5% or more. It is possible that reassembly will introduce very small steel particles into the interior of the motor which will contaminate it.



NO TE

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



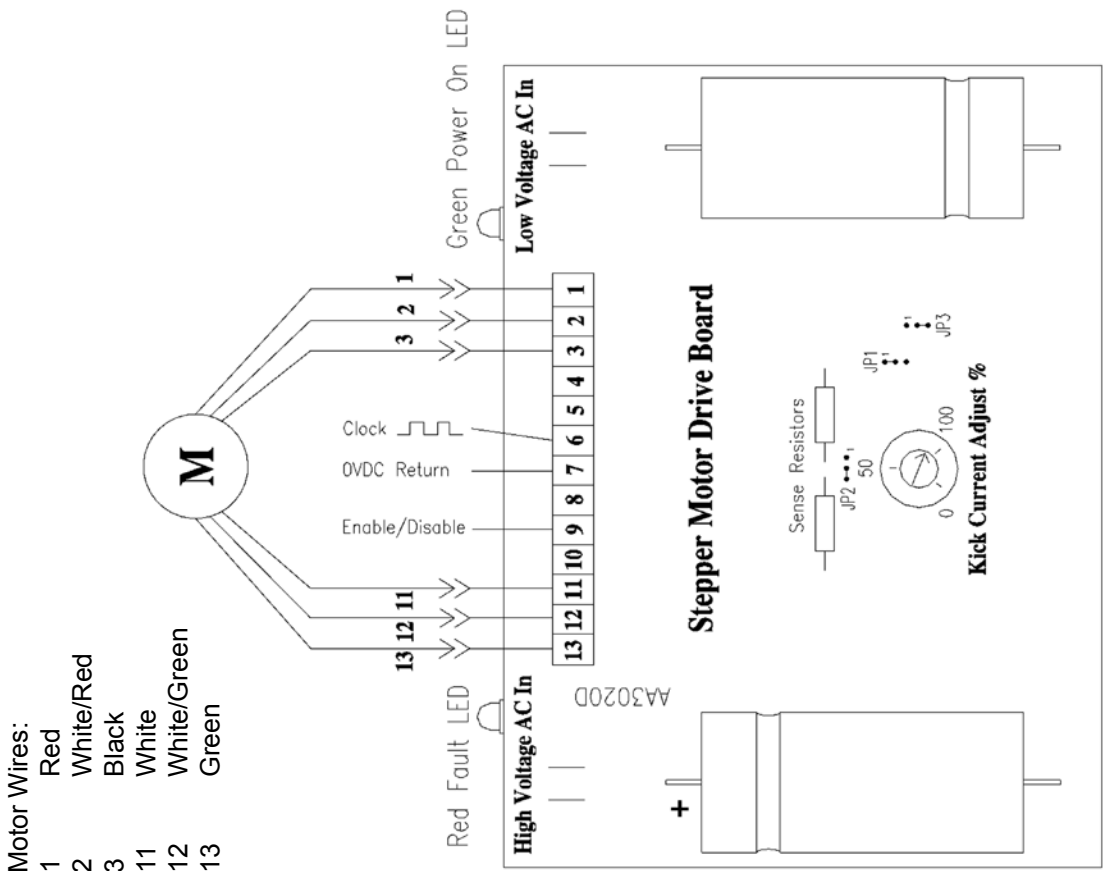
ONE-HALF STEP OPERATION EIGHT-STEP INPUT SEQUENCE

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

Stepping Motor Drive Boards #44649030 and #53500467

13 Pin Motor Coupler Pin Assignments

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



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

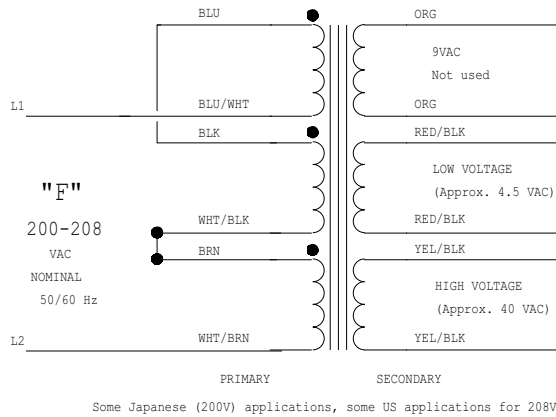
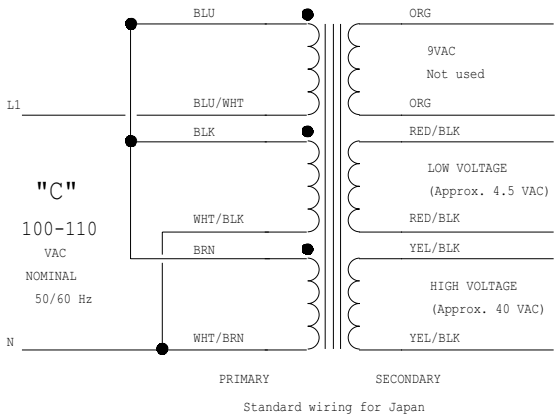
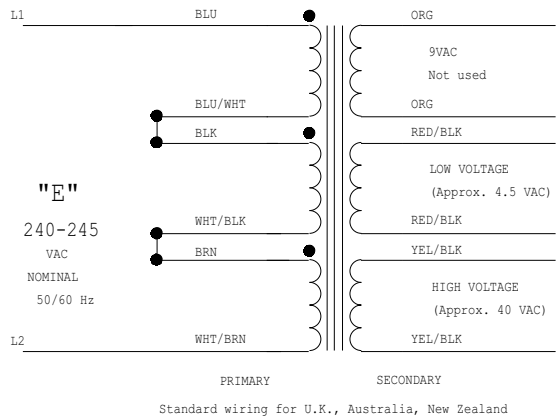
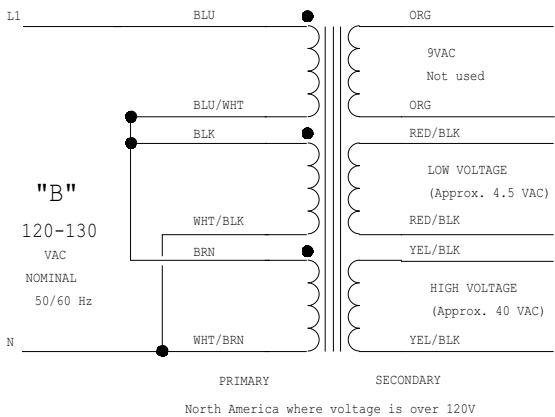
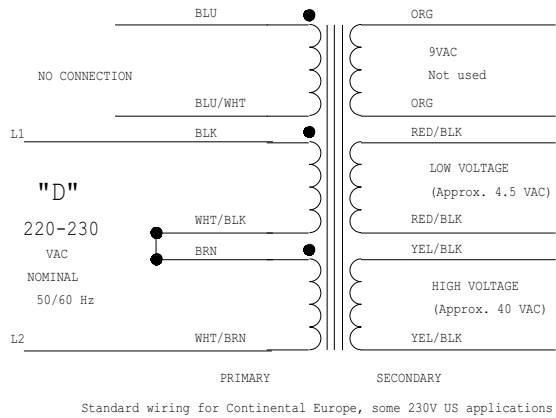
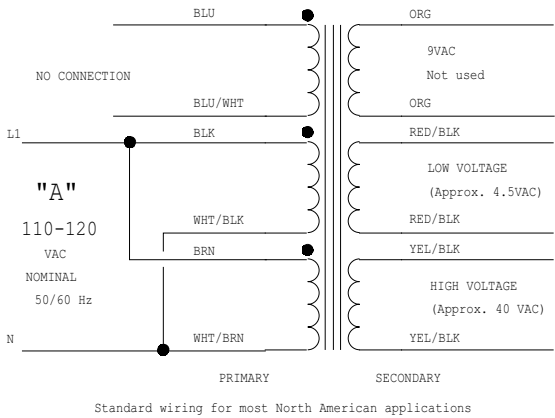
Fault Detection Protection LED Indictaion

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

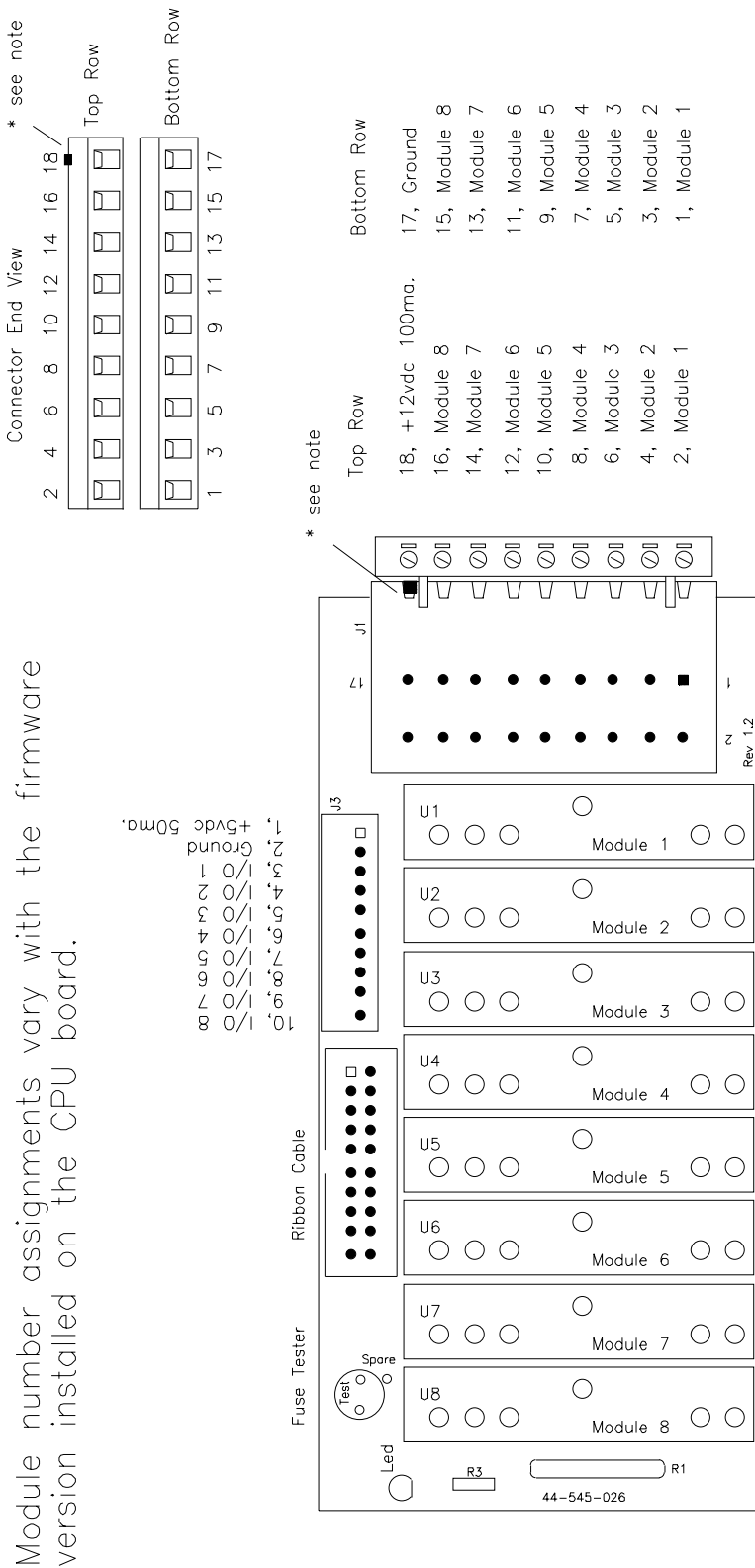


Drive is rated at 10 amps DC current max.
Motor Kick Current Adjustment set at 85 - 90%

Transformer



I/O Board



* 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.

Problem	Solution
<p>No power to feeder when power switch is turned on</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>IMPORTANT</p> <p><i>A visual inspection will not always be sufficient to determine fuse integrity.</i></p> </div>	<ol style="list-style-type: none"> 1. Make sure there is power present at the AC main where the feeder 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 feeder. 4. Check the two fuses located inside the feeder’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. <ol style="list-style-type: none"> a. Observe the voltage label showing through the window on the fuse housing for proper orientation when the holder is re-inserted. b. A small screwdriver inserted under the tab will allow you to pry open the fuse housing. Remove the red fuse holder. If the smaller 5mm x 20mm fuse is present, verify that the metal tab “finger” is holding the fuse in the forward position and has not allowed the fuses to slide back toward the outside of the feeder and away from where contact with the metal pressure points inside the module body is made. c. Use an ohmmeter to test the fuses. If necessary, replace with fuses of the same rating only. 5. Reconnect power cable and with power switch turned “On,” check for presence of AC at the output connectors on the back of module where the transformer primary lead connections are made. 6. If steady AC power is not measured as in the previous step, the module’s internal contacts are most likely worn, and the module must be replaced.
<p>Fuses blow on power up</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p> NOTE</p> <p><i>A fuse failure indicates a problem with the last item connected before failure occurs.</i></p> </div>	<ol style="list-style-type: none"> 1. Install known good fuses of same rating only. 2. Disconnect all AC loads from the input: <ol style="list-style-type: none"> a. The transformer primary. b. The DC Supply AC input leads. c. Remove the red and yellow wire pairs from the stepper motor drive board.

Technical Troubleshooting (continued)

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



Technical Troubleshooting (continued)

Problem	Solution
<p>Display does not function properly</p> <div data-bbox="155 369 302 432">  NOTE </div> <p><i>Even though the display may not be working properly, it may still be possible to operate the feeder via the keypad. For example, if you can cycle the feeder by pressing the “cycle” key, and vary the speed with the up and down arrow keys, the keypad decoder board is most likely operational.</i></p> <div data-bbox="155 1104 402 1167">  IMPORTANT </div> <p><i>All user programmable parameters that are held in memory will be lost when the RAM is cleared.</i></p>	<ol style="list-style-type: none"> 1. Check green “heartbeat” LED located on the top of the CPU board. It will blink at regular intervals under normal operation when the feeder is in “Ready” or “Suspended” mode. If the blinking green “heartbeat” LED is not present, refer to the section titled “CPU board heartbeat pulse not present.” 2. Check outputs of DC power supply and connections to the keypad board as well as to the CPU board. The keypad decoder board is mounted “piggy back” to the display board. 3. Check fuse on the keypad decoder board. 4. Make sure keypad decoder board is operational by referring to the section titled “Keypad does not respond.” 5. Test vacuum fluorescent display (VFD) tube. <ol style="list-style-type: none"> a. Remove keypad ribbon cable from the connector on the keypad decoder board. b. Remove four screws holding keypad decoder/display board combination to its mounting apparatus. c. Locate connector CN2 on the face of the VFD circuit board, and jumper pins 2 and 3. d. Apply 5VDC power to keypad decoder board DC input. e. A checkerboard pattern should be seen alternating across the screen’s pixels where each character is normally displayed. If not, go to step 9. 6. Check 50-pin ribbon cable between keypad decoder board and the CPU board for positive connection and integrity. 7. Check all CPU jumpers for correct positioning, but specifically check jumper JP8 for correct positioning on pins 1 and 2. 8. Clear CPU board RAM by removing jumper J4 for 10 minutes. All user programmable parameters that are held in memory will be lost when the RAM is cleared. (It is recommended that the user programmable parameters should be noted in this manual prior to trouble for reference as needed in the future). After waiting 10 minutes, replace jumper J4 and reboot machine. 9. Replace display board. 10. If after determining the keypad decoder board, the ribbon cable, and the display board are all good components and this still does not give positive results, the CPU board is faulty and must be replaced.
<p>“FRONT GUARD OPEN” message displayed</p>	<ol style="list-style-type: none"> 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. <ol style="list-style-type: none"> 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.

Technical Troubleshooting (continued)

Problem	Solution
“FRONT GUARD OPEN” message displayed (continued)	<ol style="list-style-type: none"> 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. 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	<ol style="list-style-type: none"> 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. 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. Check connection to the CPU board at 3-pin connector J6. Note: Pin 1 is 12VDC, pin 2 is the signal input pin, and pin 3 is DC ground. Pins 1 and 3 give life to the sensor, and pin two requires 12VDC to be applied to it when a “sheet” is present and the output of the sensor is on. <ol style="list-style-type: none"> 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. 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. If steps 3a and 3b produce positive results as described above, all three pins of J6 on the CPU board are good. 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. 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 harness. Check the sensor wires for integrity and positive connection at the pins of the quick disconnect. If all wire connections are good, the sensor’s output is bad and it must be replaced.
CPU board “heartbeat” pulse not present	<ol style="list-style-type: none"> 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. 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.

Technical Troubleshooting (continued)

Problem	Solution
CPU board “heartbeat” pulse not present (continued)	<ol style="list-style-type: none"> 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. Check CPU jumpers for correct positioning. 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. Replace CPU board. Replace EPROM.
Flight photo sensor does not trigger feeder <div style="border: 1px solid black; padding: 5px; margin: 10px 0;">  NOTE </div> <ul style="list-style-type: none"> Pin 1 is 12VDC. Pin 2 is the signal input pin. Pin 3 is DC ground. Pins 1 and 3 give life to the sensor. Pin 2 requires 12VDC to be applied to it when a “flight” is present and the output of the sensor is on. 	<ol style="list-style-type: none"> 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.” Check connection to the CPU board at 3-pin connector J5. <ol style="list-style-type: none"> 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. Jumper pins 1 and 2 on CPU board connector J5. This will simulate the output of the “flight” sensor and should trigger a cycle. If steps 2a and 2b produce positive results as described above, all three pins of J5 on the CPU board are good. Go to step 3. If jumping pin 1 to pin 2 does NOT produce positive results as described in step 2b above, the input is bad, and you must replace the CPU board. Test the integrity of the wiring harness leading to the flight sensor input connector. <ol style="list-style-type: none"> Measure 12VDC across pins 1 and 3 on the 4-pin circular connector. If voltage is not present, repair broken wire. Jumper pin 1 to pin 2. This should trigger a cycle. If not, repair broken wire. Connect “flight” sensor to 4-pin circular connector and verify the sensor is getting power by checking the status LEDs on the sensor body for illumination. If not, check sensor leads for integrity. Test the flight sensor for a switching output. If not present, replace flight sensor.
Motor does not run, is noisy, makes a “growling” sound, or runs in reverse <div style="border: 1px solid black; padding: 5px; margin: 10px 0;">  TIP </div> <p><i>A digital multimeter with frequency measurement capabilities is necessary for the following tests. If your meter does not have the ability to make a frequency measurement, an oscilloscope may be used instead.</i></p>	<ol style="list-style-type: none"> Cycle the feeder and check for a rolling icon in the upper right corner of the “Run Display”. Note: This icon is active when the motor is supposed to be running. Is the rolling icon present? <ol style="list-style-type: none"> Yes: Go to step 3. No: Check CPU board for “heartbeat” LED and verify keypad is working correctly. Verify green LED on the stepper motor drive board is illuminated. If not, verify transformer secondary leads measure correct voltages: 40 VAC across yellow pair of wires, and 4.5VAC across red pair of wires. Go to section titled “Testing the transformer” for further information. If green LED is not illuminated and the transformer voltages test good, replace the drive board. Otherwise continue with next step.

Technical Troubleshooting (continued)

Problem	Solution
<p>Motor does not run, is noisy, makes a “growling” sound, or runs in reverse (continued)</p> <div data-bbox="159 426 305 489" data-label="Image"> </div> <p>NOTE</p> <p><i>This test requires a meter that has frequency measurement capabilities, or an oscilloscope.</i></p>	<ol style="list-style-type: none"> 4. Look at the Red LED on the stepper motor drive board. Is it illuminated? <ol style="list-style-type: none"> a. YES: Go to section titled “Drive board red LED illuminated.” b. NO: Continue next step. 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. <ol style="list-style-type: none"> 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 87Hz 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.
<p>Drive board red LED illuminated</p> <div data-bbox="159 1255 407 1318" data-label="Image"> </div> <p>IMPORTANT</p> <p><i>The stepper motor drive board has been designed to protect itself if motor problems occur. If a problem with the motor wires or motor is found and corrected, the board will still drive a good motor after correction is made. However, the board cannot protect itself from transient voltage spikes and/or power sags or brownouts. It is highly recommended in plants where power problems are evident or in question, a high quality surge suppressor or line conditioner should be employed for added protection.</i></p>	<ol style="list-style-type: none"> 1. Slow Blink: (about once per second) indicates a SHORT in motor, motor cable, or drive power component. <ol style="list-style-type: none"> 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. <ol style="list-style-type: none"> 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). <ol style="list-style-type: none"> a. Remove ground fault.

Technical Troubleshooting (continued)

Problem	Solution
<p>Testing stepper motor drive board output pins</p> <div data-bbox="162 535 305 598" data-label="Image"> </div> <p>NOTE</p> <p><i>Measuring zero volts drop across one of these pins may be evidenced by blowing fuses on power-up. See section titled "Fuses blow on power up."</i></p>	<ol style="list-style-type: none"> 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. <ol style="list-style-type: none"> 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. <ol style="list-style-type: none"> 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.
<p>Testing motors</p> <div data-bbox="162 955 409 1018" data-label="Image"> </div> <p>IMPORTANT</p> <p><i>These motors are NOT repairable and should never be opened.</i></p>	<p>Refer to the wiring diagram of the 6-lead DC Stepping Motor found elsewhere in this manual.</p> <p>The motors in Pro Series 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:</p> <ol style="list-style-type: none"> 1. All three leads of each individual winding should measure continuity in any combination of two. Conversely, an OPEN should NOT be measured in any combination of two of the three leads tested in a single winding. If an open is measured in a single winding, it is a clear indication the motor is bad and needs to be replaced. 2. Since there are two separate windings, they need to measure electrically separate from each other. That is, any combination of one lead from one winding to any lead of the other winding should measure as OPEN. If a short is measured between windings, it is a catastrophic failure inside the motor, and must be replaced. 3. Both windings need to be insulated from the body of the motor. If continuity is measured between any motor lead and the body of the motor, a catastrophic failure has occurred inside the motor and must be replaced.

Technical Troubleshooting (continued)

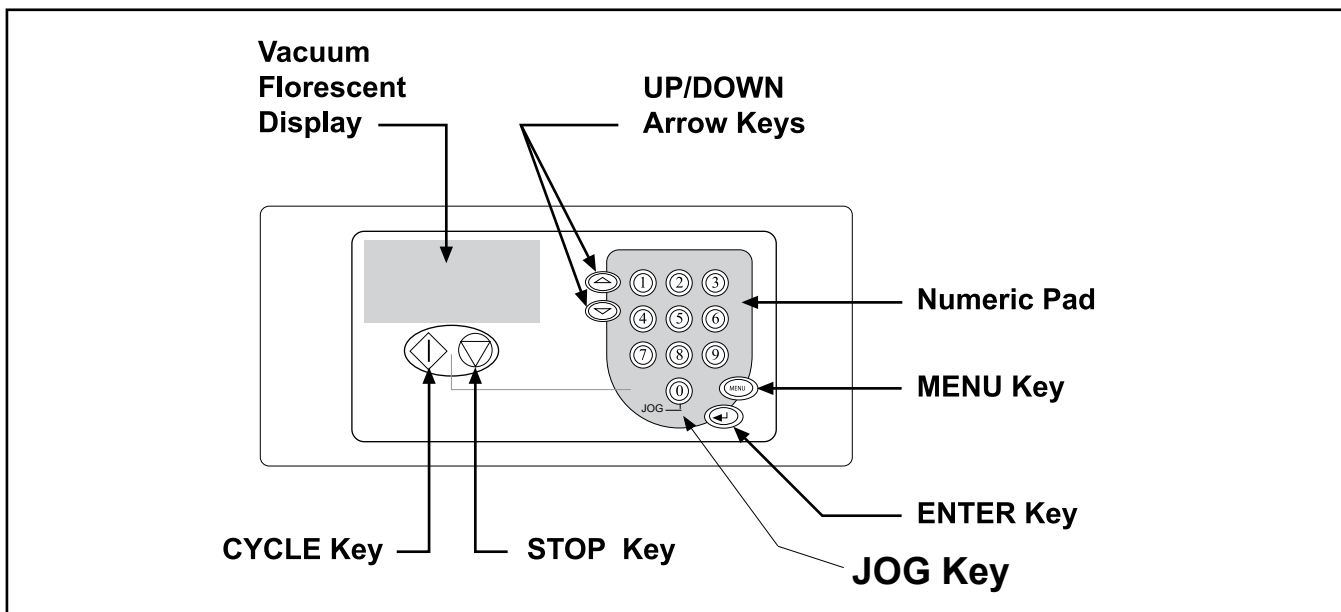
Problem	Solution
<p>Testing the transformer</p>	<p>Refer to the wiring diagram of the Pro Series Transformer found elsewhere in this manual. Note there are three primary windings and also three secondary windings, six windings altogether. Most feeders are shipped from the factory with the transformer 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 Pro Series feeders and will be tied back.) Flipping the fuse holder around in the AC power entry module will set up the feeder for either 115VAC as shown in configuration "A," or for 230VAC as shown in configuration "D." In reality, flipping the fuse holder around re-wires the transformer primary windings as shown in configurations "A" and "D."</p> <p>Transformers are inductors. Inductors are difficult to troubleshoot unless there is a catastrophic failure associated with the windings inside the inductor. An ohmmeter may be used to test for catastrophic failures, but is useless when a transformer has a problem that is not catastrophic. Therefore, a transformer can still have a problem even though it appears there is not a problem as measured with an ohmmeter. Fortunately, transformers very rarely fail, so, chances are any problem you may have that leads to the transformer is most likely caused by some other component.</p> <p>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.</p> <ol style="list-style-type: none"> 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. <ol style="list-style-type: none"> 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. <p>The following are tests you can make with an ohmmeter:</p> <ol style="list-style-type: none"> 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 correct PASSCODE will provide access to the non-operational or technician only system menus. The Pro Series feeders/dispensers are shipped with a factory-set access code. This access code is “1”.

Configuring the System Menus

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

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

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

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

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



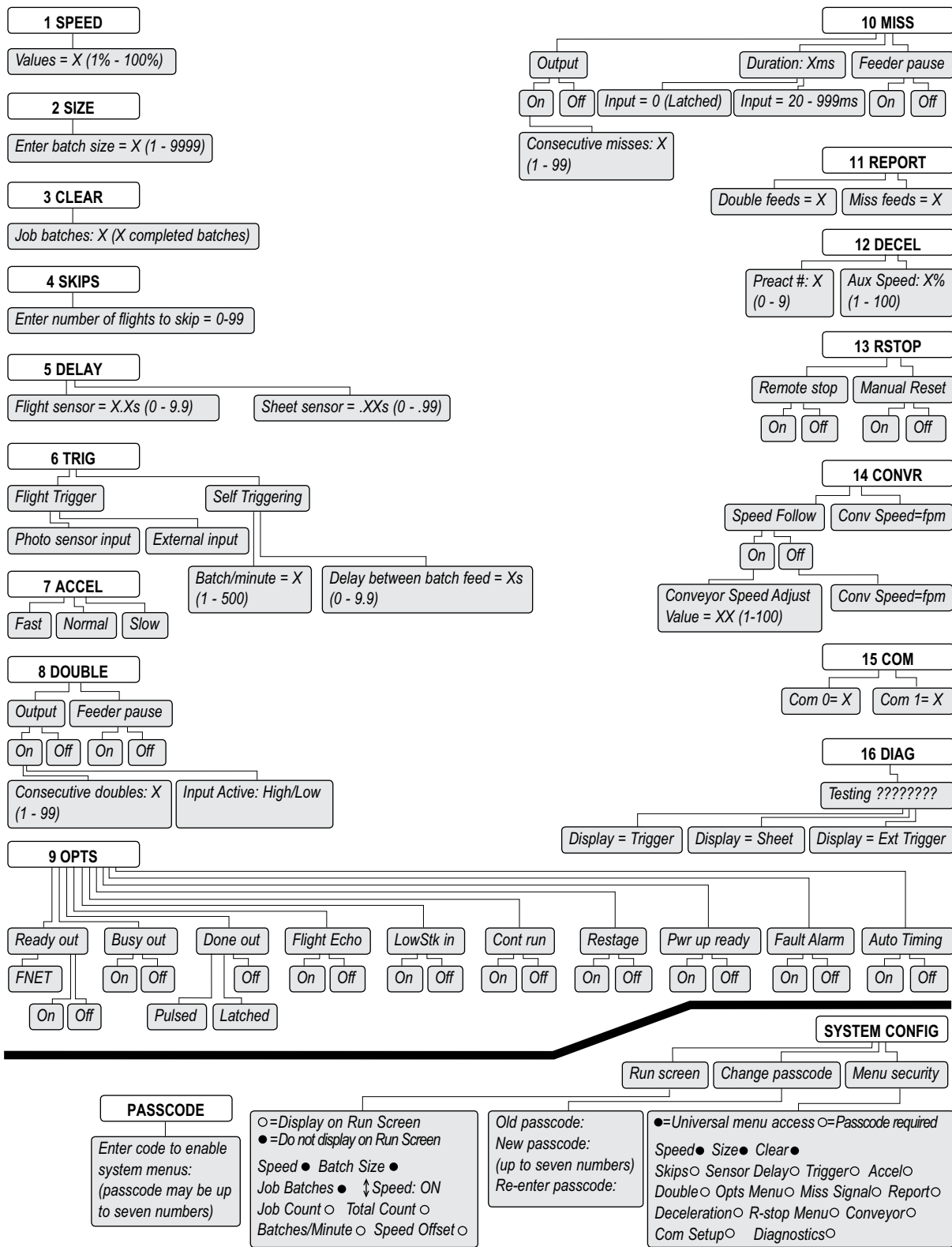
MENU

Pro Series System Menus

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

Pro Series System Menus (continued)

PRO SERIES 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 flights to skip between feeds from 0 to 99.

MENU 5: DELAY

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

To enter the delay value:

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

Pro Series System Menus (continued)

MENU 5: DELAY (continued)

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

MENU 6: TRIG

To select a Flight Trigger method:

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

To select a Self Triggering method:

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

Pro Series System Menus (continued)

MENU 7: ACCEL

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

To set or change:

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

MENU 8: DOUBLE

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

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

To energize the output if a Double occurs:

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

Pro Series System Menus (continued)

MENU 8: DOUBLE (continued)

b. Input Active: (High) or Low

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

To pause the feeder if a Double occurs:

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

MENU 9: OPTS

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

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

Pro Series System Menus (continued)

MENU 9: OPTS (continued)

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

Auto Timing:

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

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

Auto Timing Setup:

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

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

Pro Series System Menus (continued)

MENU 10: MISS

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

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

To energize the output if a Miss occurs:

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

Consecutive Misses: (1-99)

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

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

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

Pro Series System Menus (continued)

MENU 10: MISS (continued)

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

To pause the feeder if a Miss occurs:

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

MENU 11: REPORT

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

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

MENU 12: DECEL

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

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

To set the decelerate speed :

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

Pro Series System Menus (continued)

MENU 12: DECEL (continued)

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

MENU 13: RSTOP

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

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

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

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

Pro Series System Menus (continued)

IMPORTANT

Speed Following Pre-installation Instructions

MENU 14: CONVR

Theory of operation:

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

SETUP

Measure Conveyor Speed:

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

Encoder Placement:

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

Encoder Calibration:

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

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

Pro Series System Menus (continued)

MENU 14: CONVR (continued)

IMPORTANT

Speed Following Pre-installation Instructions

SETUP (continued)

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

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

Feeder Speed:

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

Fine Tuning:

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

Misc.:

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

Pro Series System Menus (continued)

MENU 14: CONVR (continued)

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

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

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

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

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

OR

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

Pro Series System Menus (continued)

MENU 15: COM

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

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

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

Pro Series System Menus (continued)

MENU 15: COM (continued)

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

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

OR

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

To view current values stored:

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

MENU 16: DIAG

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

To test the Trigger Input:

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

Pro Series System Menus (continued)

MENU 16: DIAG (continued)

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

To test the Sheet Input:

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

Pro Series System Menus (continued)

SYSTEM CONFIG

The System Configuration is broken into three main sections:

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

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

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

Pro Series System Menus (continued)

SYSTEM CONFIG (continued)

To change your system menus passcode:

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

To specify the menus that are operator accessible:

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

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