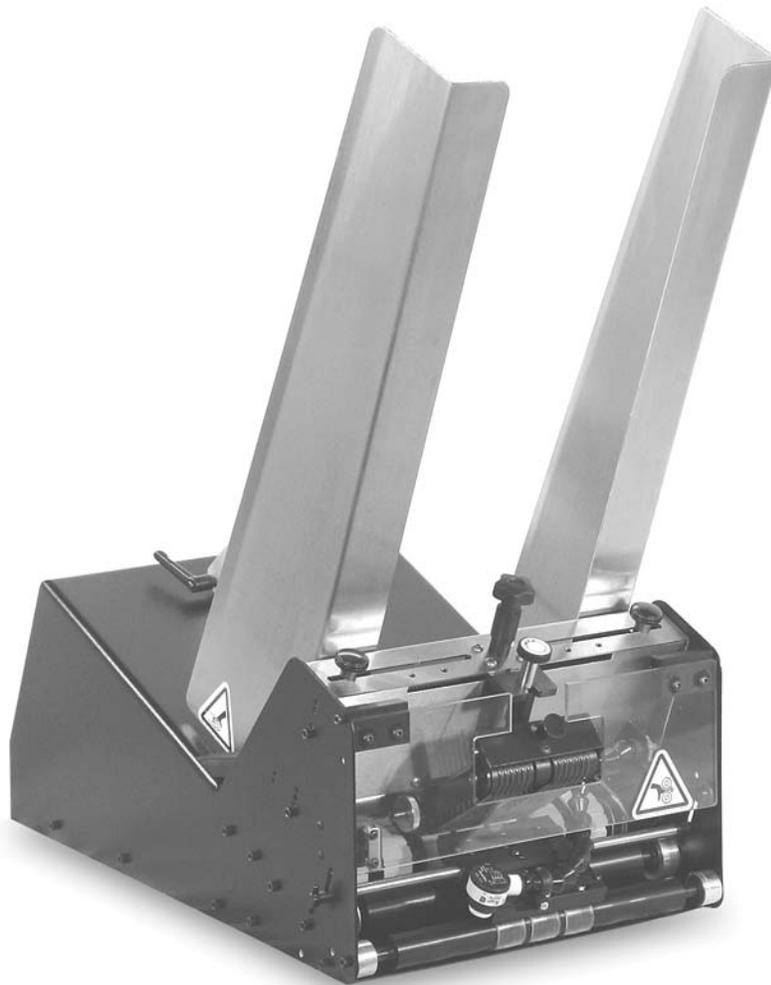


# Reliant 3700

---

## Manual



---

**Thiele**  
Technologies

**Streamfeeder**  
PRODUCT LINE

Part Number: 00900383

**© 2010 Thiele Technologies, Inc. - Streamfeeder. All rights reserved.**

No part of this publication may be reproduced, photocopied, stored on a retrieval system, or transmitted without the express written consent of Thiele Technologies, Inc. - Streamfeeder.

Thiele Technologies, Inc. - Streamfeeder  
315 27th Avenue NE  
Minneapolis, MN 55418 USA

TEL: (763) 502-0000  
FAX: (763) 502-0100  
E-MAIL: [service@streamfeeder.com](mailto:service@streamfeeder.com)  
WEB: [www.streamfeeder.com](http://www.streamfeeder.com)

Printed in the USA.

# CONTENTS

---

	Safety Information .....	ii
	Specifications .....	iv
Section 1:	About the Machine .....	1
Section 2:	Preparing for Operation .....	5
Section 3:	How to Operate .....	15
Section 4:	Operational Troubleshooting .....	19
Section 5:	Inspection and Care .....	21
Section 6:	Wedge Applications .....	28
Section 7:	Mechanical Components .....	31
Section 8:	Electrical Components.....	67
Section 9:	Technical Troubleshooting .....	75

# 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:** ..... 11.75 W x 14 L in (298.5 x 355.6 mm)

**Minimum Product Size:** ..... 3.75 W x 3.75 L in (95.3 x 95.3 mm)

**Optional:** ..... 2 W x 2.5 L in (50.8 x 63.5 mm)

**Min/Max Product Thickness:** ..... .003-1.0 in (.076-25.4 mm)

**Speed:** ..... 5700 in/min (144,780 mm/min)

**Batch Size:** ..... 1 to 99 pieces

**Electrical Requirements:** ..... 115/230vac, 50/60Hz, 3A

**Weight:** ..... 75 lbs. (34kg)



# 1 About the Machine

## Features



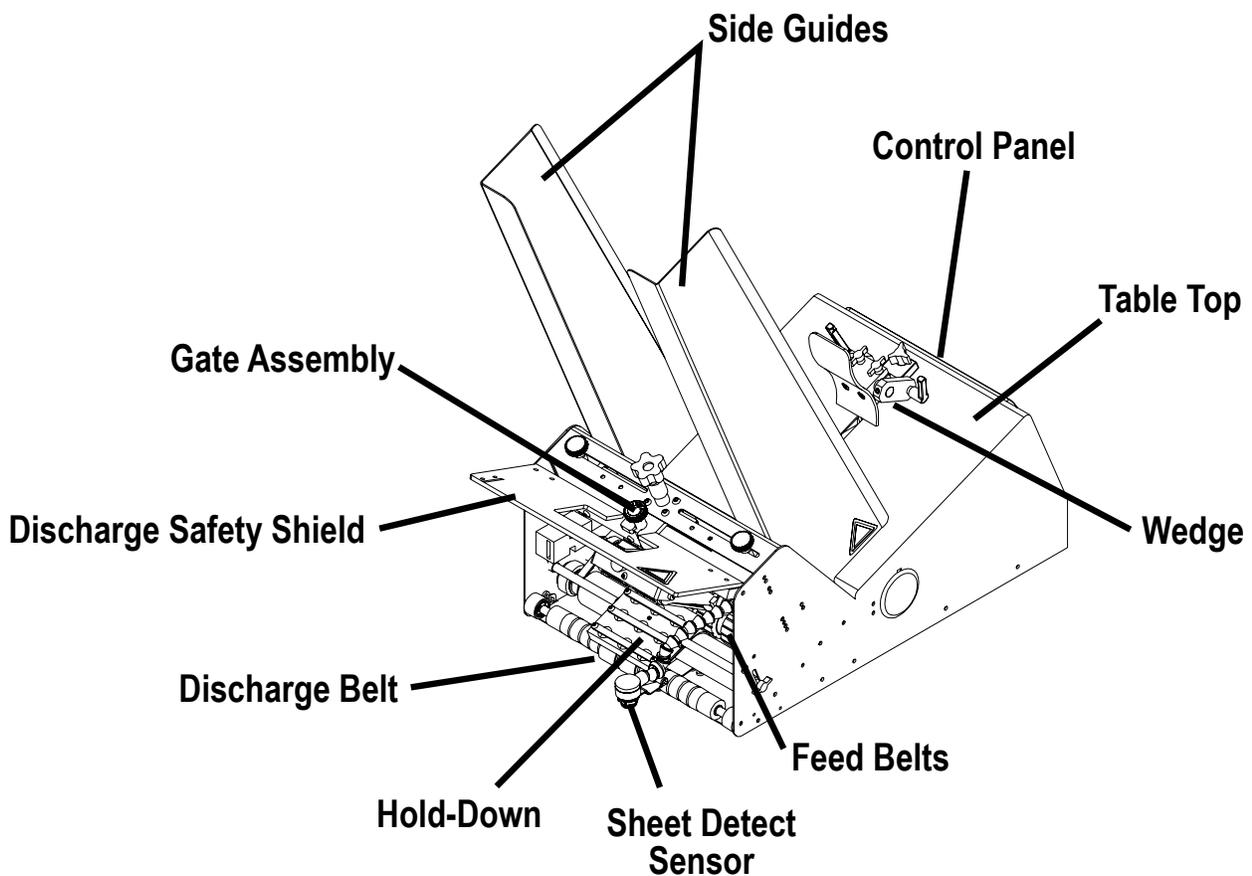
- *Feeders can be configured two ways: one-shot mode or batch count mode.*
- *One-shot mode feeders are capable of feeding one piece of product when a flight signal is received.*
- *Batch count mode feeders are capable of feeding 1-99 pieces of product when a flight signal is received.*
- *For purposes of illustration, a batch count feeder is shown in all drawings of this manual.*

The Reliant 3700 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.

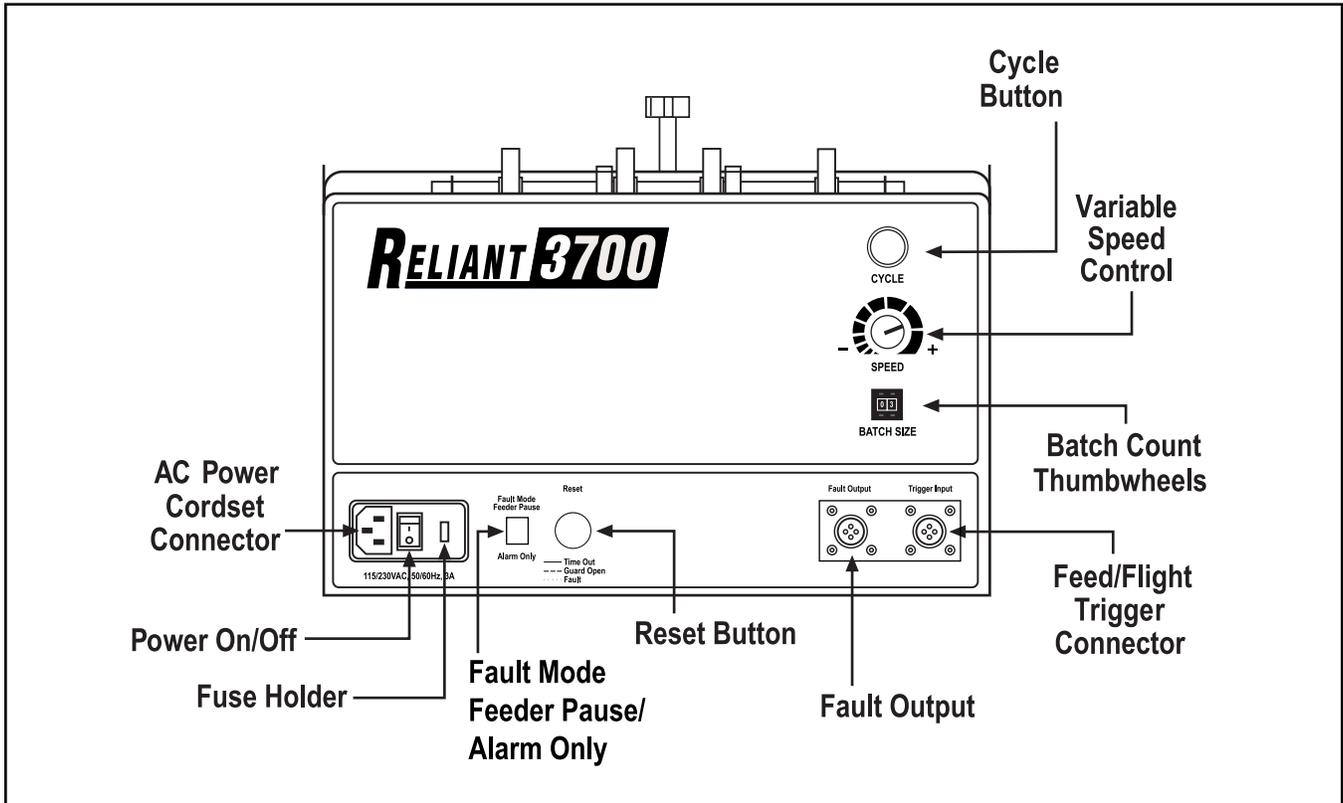
## Main Assemblies



## Main Assemblies Feature Descriptions

Feature	Description
<b>Gate assembly</b>	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.
<b>Table top</b>	Used to support the back wedge.
<b>Side guides</b>	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.
<b>Wedges</b>	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.
<b>Hold-down</b>	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.
<b>Sheet detect sensor</b>	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.
<b>Flight-detect sensor (not shown)</b>	Mounted at a remote location, it “looks” for a target on-line (such as a flighted conveyor) to start the feeder.
<b>Feed belts</b>	Provides the friction and motion necessary to pull individual product from the bottom of the stack and through the gate assembly area.
<b>Discharge belt</b>	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.
<b>Control panel</b>	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.
<b>Discharge safety shield</b>	Provides residual risk protection to operator when feeder is running.

# Control Panel Components



## Control Panel Feature Descriptions

Feature	Description
<b>AC power cordset connector</b>	Cordset plugs into this IEC320 connector to provide feeder with power from a grounded/fused outlet. Switchable for either 115- or 230-VAC.
<b>Feed/flight trigger connector</b>	The remote flight-detect sensor plugs into this 4-pin connector to provide the "start" signal to begin a feed cycle.
<b>Power On/Off</b>	Toggles AC power On or Off.
<b>Fuse holder</b>	Contains two replaceable GMD3, 3-Amp, 5-mm fuses. <i>IMPORTANT: Always make sure power module is replaced exactly as removed. Failure to follow this caution can result in damaged electrical parts.</i>
<b>Reset button/fault indicator</b>	Labeled <b>Reset</b> , the primary purpose of this pushbutton switch/indicator is to reset the feeder after: 1) a "time-out" occurs or, 2) the discharge safety shield is opened or, 3) "miss-feed" occurs. Time-outs occur: 1) during a misfeed or, 2) when the hopper runs out of product; or 3) <i>flashing</i> during "miss" condition. Built-in indicator illuminates: 1) <i>steady</i> during a time-out condition; 2) <i>flashing</i> during an "open" discharge safety shield.
<b>Variable speed control</b>	This dial switch (labeled <b>Speed</b> ) allows the feeder speed to be synchronized with an inserter, or infeed conveyor. Turning counter-clockwise decreases speed; clockwise increases speed.
<b>Cycle button</b>	This pushbutton switch (labeled <b>Cycle</b> ) is primarily used during preparation and test, this is used to manually start (or run) a feeder cycle. To "start" a cycle, push <b>Cycle</b> completely in and then release.
<b>Batch count thumbwheels</b>	<i>Note: Batch count feeders only.</i> These two wheels allow you to select a number from 1 to 99 to which the feeder will always count and then stop.
<b>Fault output connector</b>	The fault output I/O cable plugs into this connector to provide the host system interface.
<b>Fault configuration selector switch</b>	This switch allows the operator to select between stopping the feeder or sounding an alarm only when a fault is detected.

# 2 Preparing for Operation

---



When performing initial 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: Photo sensor adjustment
- 5: Manual test to verify

---

## STEP 1: Gate Assembly Adjustment



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



*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.*



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

## 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 product does not move freely, then the gate assembly is too tight. This can lead to premature wear of the O-rings or feed belts.*

## TIP

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

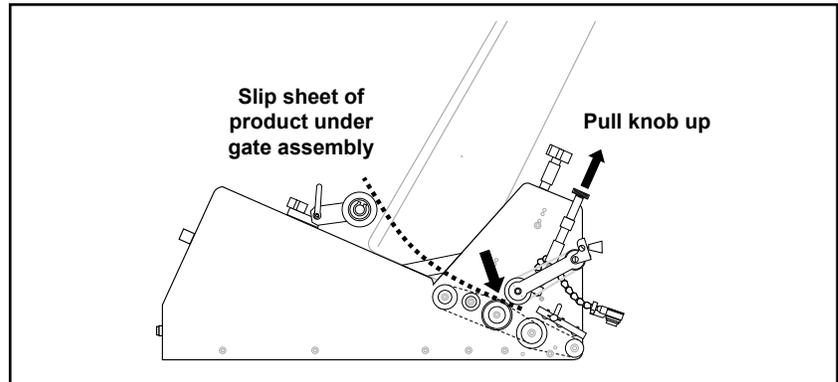
## NOTE

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

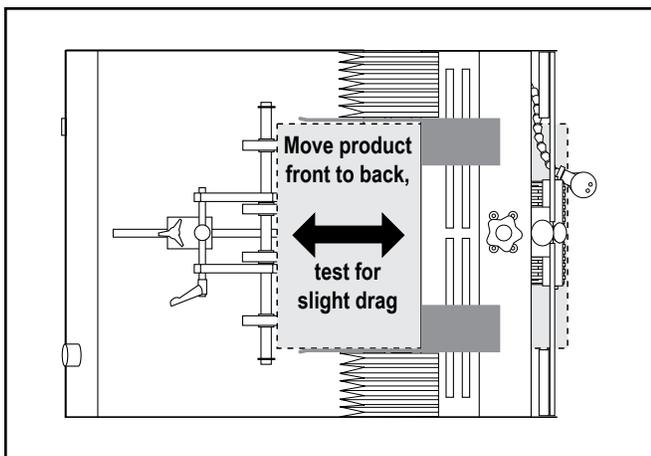
## Procedure

To adjust the gate assembly for proper gap:

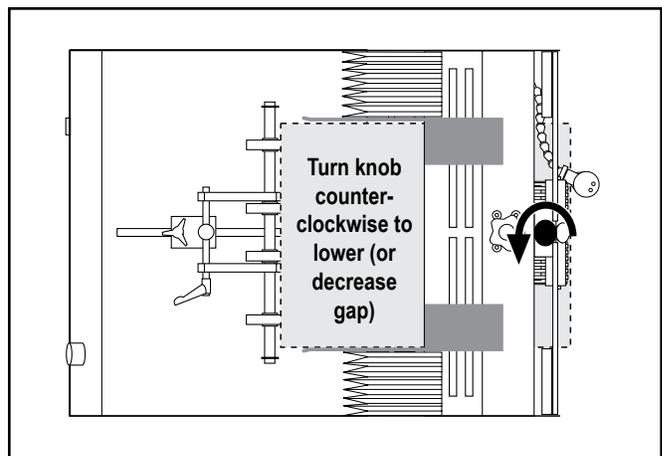
1. Slide a single sheet of test product under the gate assembly. It may be necessary to pull up on the adjustment knob to allow the piece to be inserted.
2. Test the piece for clearance. Grasp the product with two hands and slide it front-to-back under the gate assembly. A proper adjustment allows a 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)

## NOTE

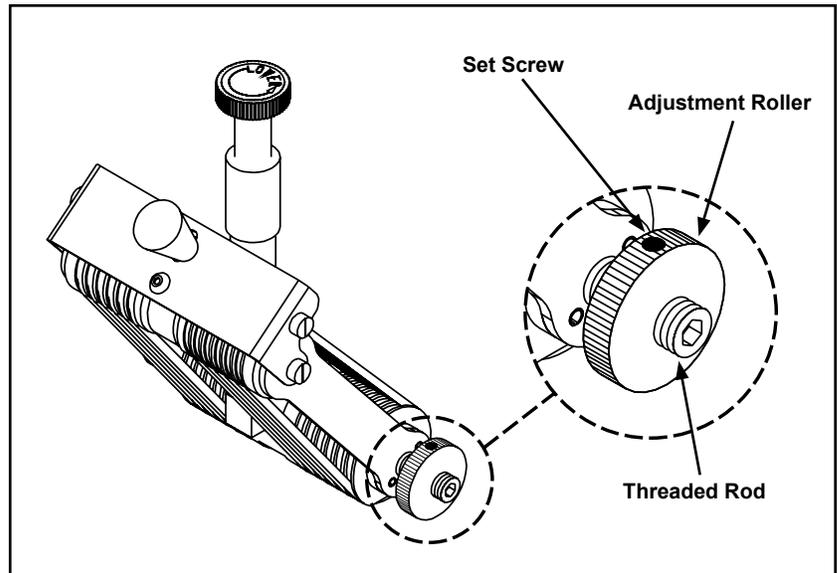
When feeding product with varying thickness throughout, it may be necessary to turn both adjustment rollers 1-2 **full turns** counterclockwise to compensate for the differential thickness. This procedure allows the gate horizon to "float."

## IMPORTANT

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

To adjust the gate for effective product 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 product.
3. To compensate for greater drag on one side of the product, 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



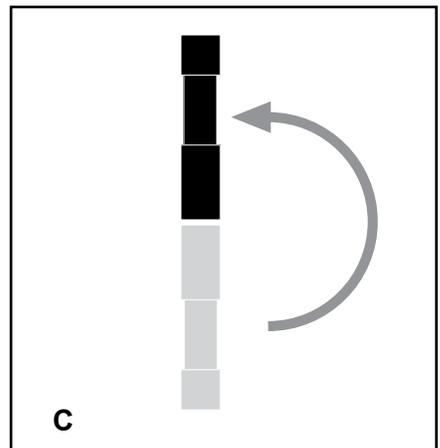
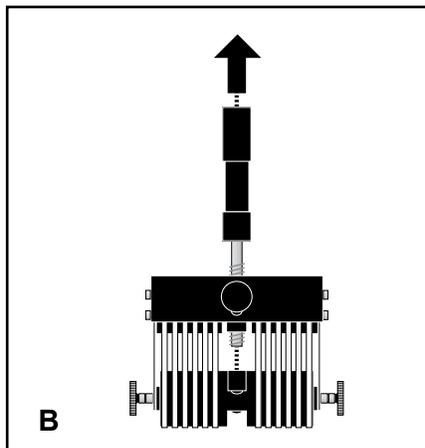
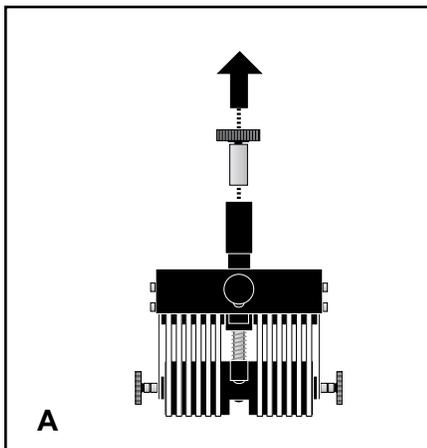
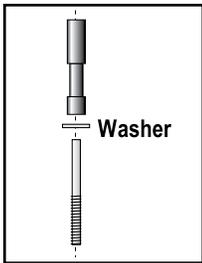
Excessive lowering of the gate assembly can damage product or lead to premature wear of the O-rings or feed belts.

## IMPORTANT

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



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



Adjusting Gate Assembly for Low-Tension

## 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 products, 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

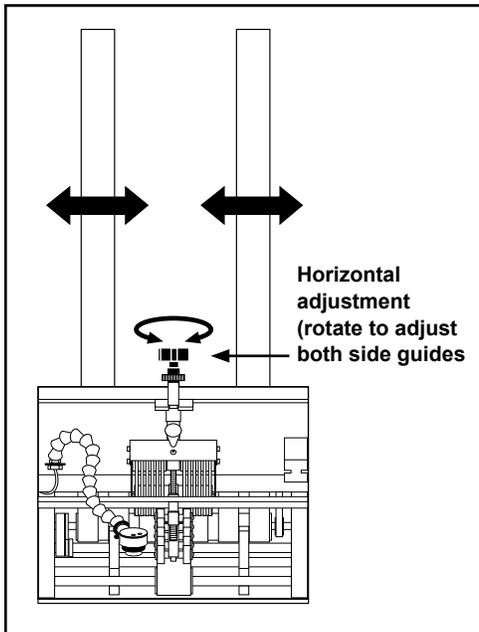
To change the spring from a *high* to a *low* spring tension, follow these steps:

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).

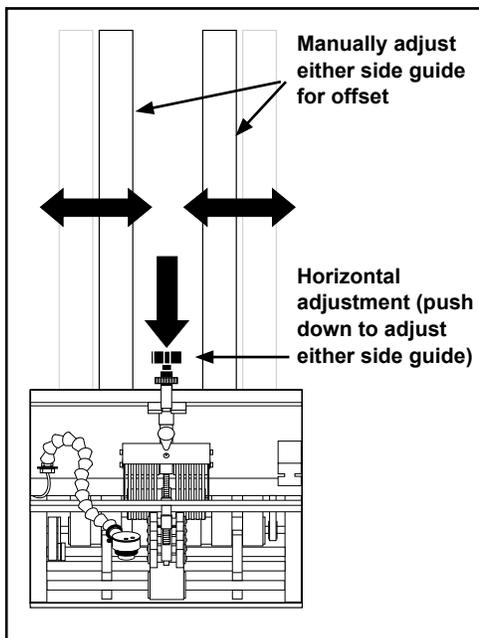
## STEP 2: Side Guides Setting

### 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



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.



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

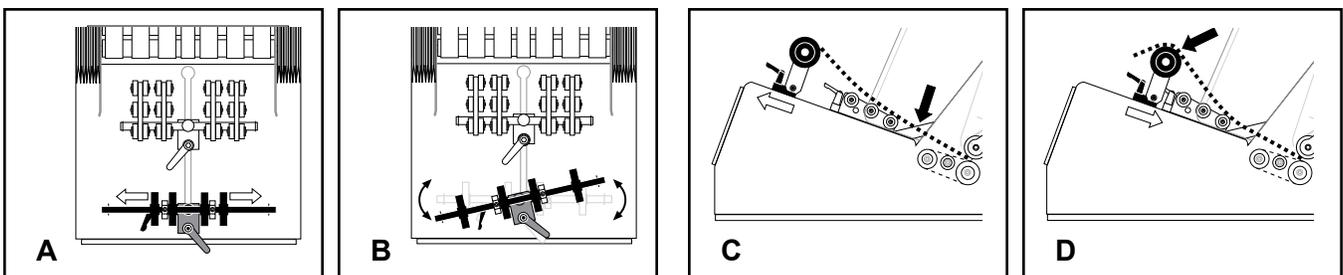
The back wedge provides proper lift to the product to help keep it off the table top and feed belts, and it creates the force necessary to push product against the gate assembly. By adjusting it back and forth from the gate assembly or pivoting side to side, you can create the lift and force necessary 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)

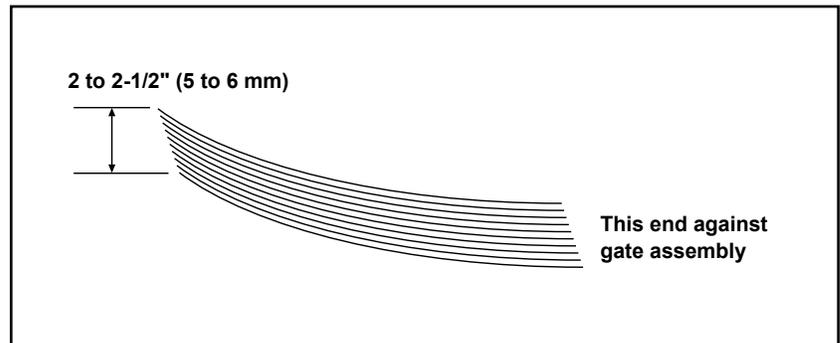
### Objective

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

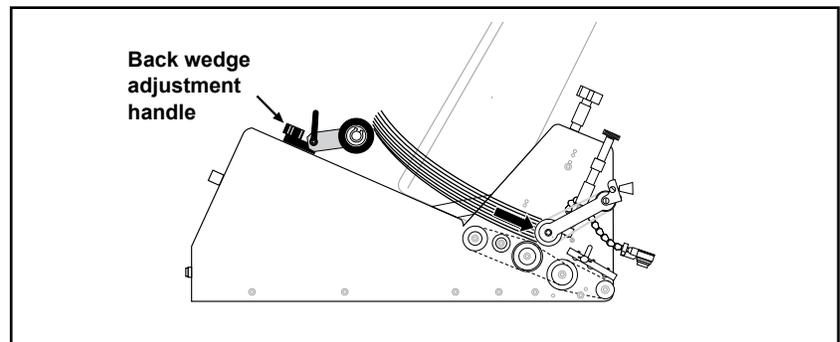
### Procedure

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 product 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 Product By Hand



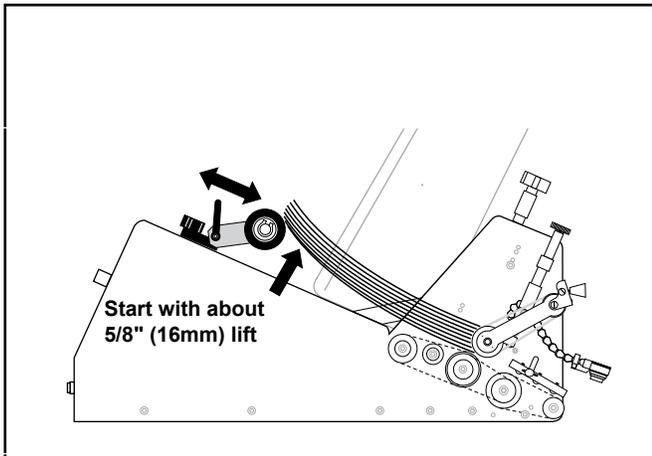
Positioning Product Prior to Loosening Back Wedge

## STEP 3: Back Wedge Adjustment (continued)

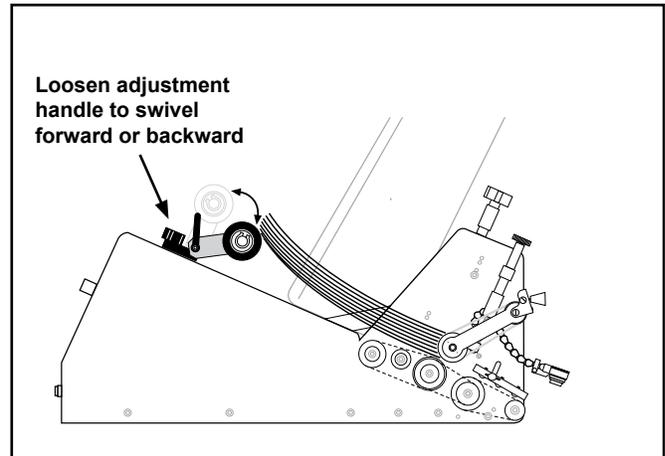
### NOTE

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).

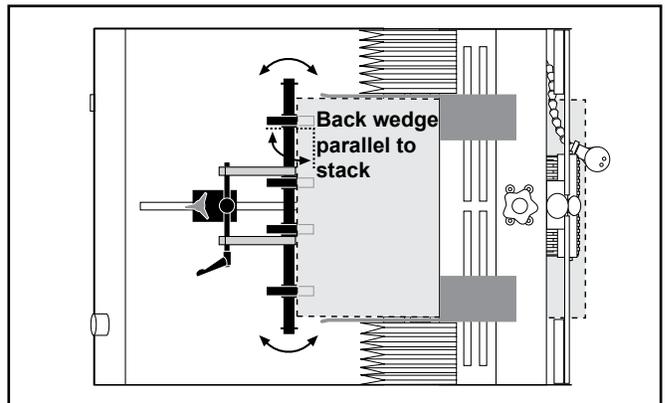


Adjusting Back Wedge for Proper Lift



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.



Adjusting Back Wedge for Parallel

## STEP 4: Photo Sensor Adjustment



Standard photo sensor shipped from the factory is a diffuse reflective detector. No adjustment for gain is required or necessary. In preparing for operation, properly position the Sheet-Detect photo sensor first.



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



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

### IMPORTANT

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



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



Avoid light colored backgrounds in the discharge area.

## Review

The **Sheet-Detect** photo sensor is mounted on the flexible arm extension assembly to detect the leading edge of a product about to be ejected so as to turn the feeder Off.

The **Flight-Detect** photo sensor is mounted on the line to detect a target (for example, a conveyor lug) so as to eject a product.

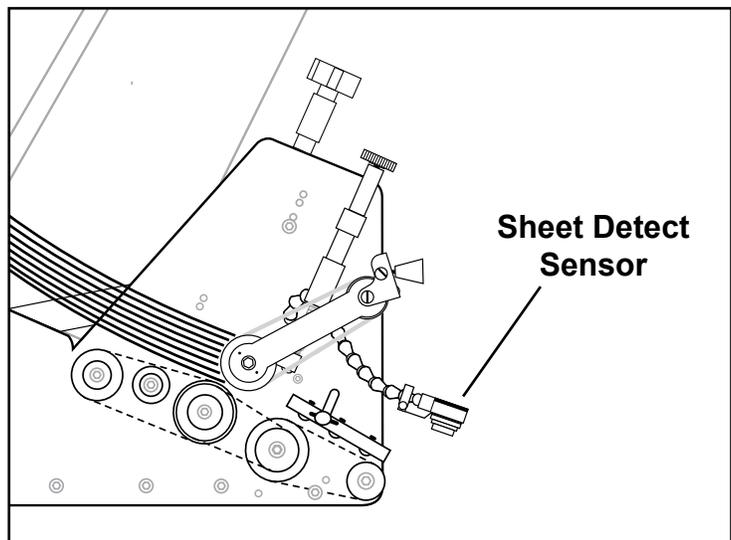
## Objective

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

## Procedure

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

1. Aim and align the photo sensor straight toward (perpendicular to) the product. If the photo sensor is at an angle, the light will not be reflected straight back to the receiver.



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

## STEP 5: Manual Test to Verify

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

Prepare your test by loading the hopper with approximately 2 to 2.5 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.*

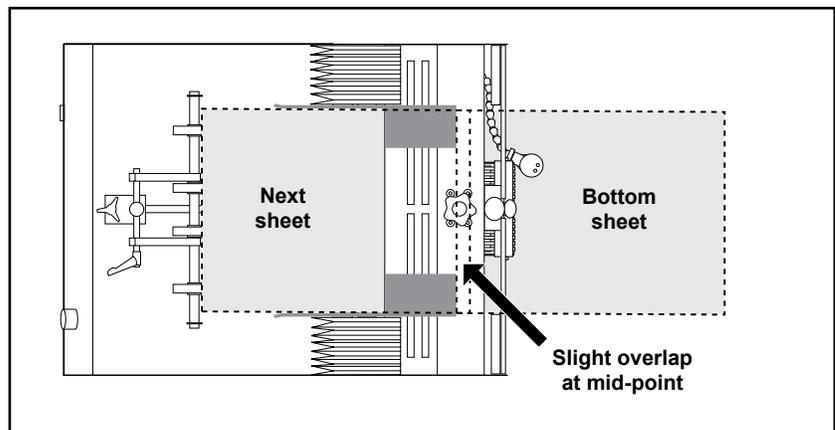
### NOTE

*For certain types of products, you may have to position the product “off-center” to prevent any skewing affect.*

### TIP

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

1. Manually feed several sheets of product slowly through the gate assembly area. Move the drive belts by pressing your thumb against the discharge belt.
2. Observe how individual product enters and exits the gate assembly area. Remember, a properly set gap will allow each new sheet to enter at about the center line of the cylinder while the bottom sheet is exiting the gate assembly area (Figure 2-16). Ideally, this means a slight overlap of both the first sheet and the second sheet (.125 in., or 3 mm) at the gate assembly area. The overlap occurs as the bottom sheet is exiting and the next sheet is entering.
3. If feeding doubles, move the wedge in toward the gate assembly. Test again.
4. If sheets are overlapping excessively or, if the machine is feeding doubles, reduce the gap slightly by moving the knob about 1/8 turn counterclockwise. Test again.
5. As product moves through the hold-down area, check for any skewing or jamming. Also check for damage to the product.
6. If this or other feeding problems still persist (slipping, skewing, jamming), then review all the adjustment procedures in Section 2, Preparing for Operation.



Optimum Overlap and Separation of Product

# 3 How to Operate

## Sequence of Operation

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

- 1: Loading product in the hopper
- 2: Determining stack height
- 3: Powering On feeder
- 4: Setting/adjusting speed
- 5: Running test cycles
- 6: Final check

### STEP 1: Loading Product in the Hopper

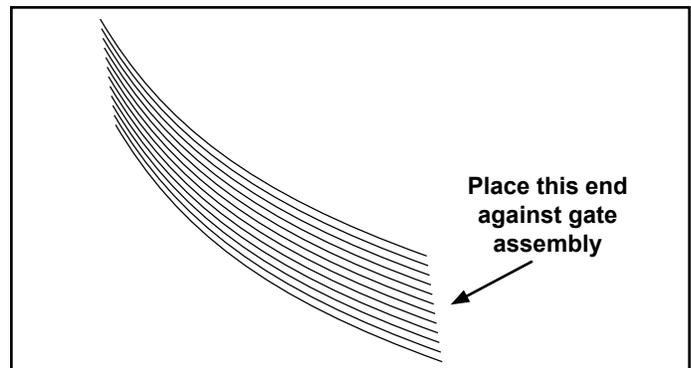


*Preshingling prevents multiple sheets from jamming under the gate assembly at startup.*

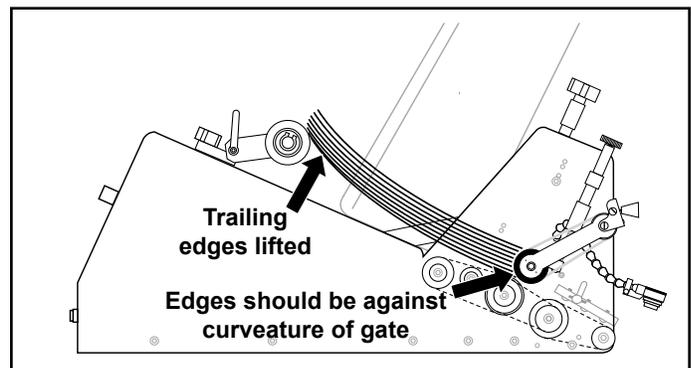


*Stack height affects the downward pressure on the feed belts. Greater downward pressure can increase the chances for misfeeds or double feeds.*

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



Preshingle the product



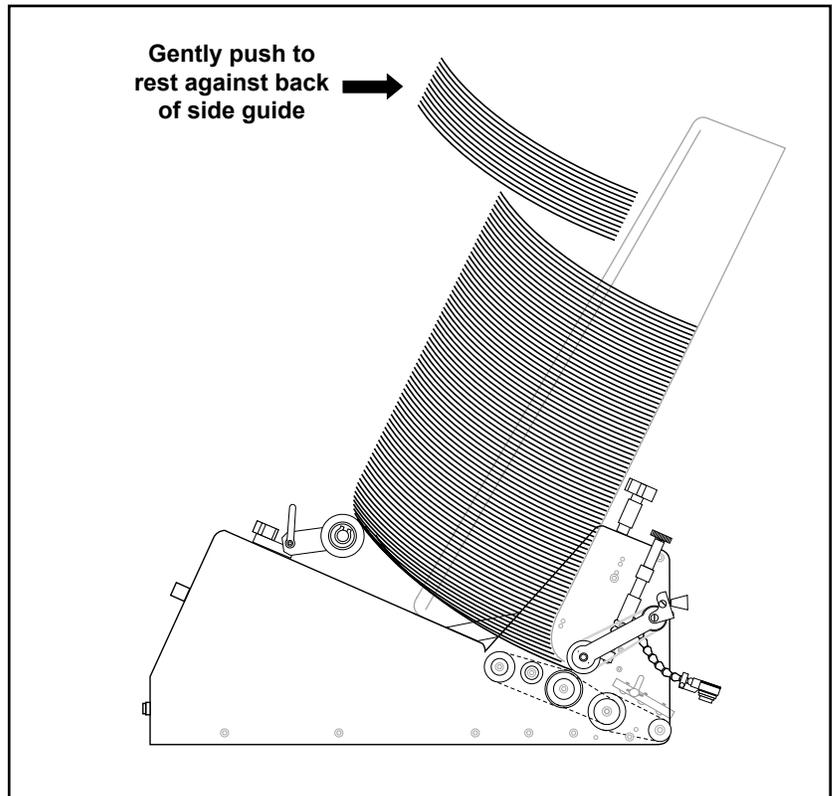
Leading Edges Against Gate Bracket Assembly and Side Guides

## STEP 2: Determining Stack

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

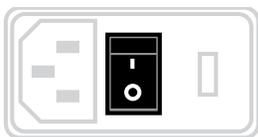
### TIP

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



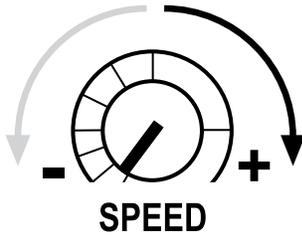
Adding More Product to Hopper

## STEP 3: Powering On Feeder



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

## STEP 4: Setting/Adjusting Speed



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

## STEP 5: Running Test Cycles

### TIP

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

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

## STEP 6: Final Check

Make sure:

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

## Clearing a Jam



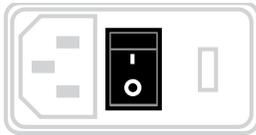
*Reposition photo sensor (as required).*

If a jam occurs during operation, follow these steps:

1. Open the discharge safety shield (interlock switch prevents feeder from starting while shield is in the “open” position).
2. Remove jammed product from feeder. While doing so, try to determine the cause of the jam (see Section 4, Operational Troubleshooting).
3. Verify whether any adjustments are loose. If so, refer back to Section 2, Preparing for Operation, for proper adjustment procedures.
4. Close the discharge safety shield and reset the feeder by pressing the reset/fault indicator button (labeled **Reset**).

---

## Shutdown



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

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

# 4 Operational Troubleshooting

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
<b>No AC power to feeder</b>	<ol style="list-style-type: none"> <li>1. On/Off switch in "Off" (or "O" position).</li> <li>2. Power cord loose or not plugged into outlet (or AC power source).</li> <li>3. Female end of power cable loose or not plugged into AC power inlet at rear of feeder.</li> <li>4. Faulty external run input connection or cable.</li> <li>5. No voltage is being applied to the external run input connection.</li> <li>6. Faulty safety interlock switch.</li> <li>7. Blown fuse.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check that the switch is pressed to "On" (or "___" position).</li> <li>2. Check and secure power cord at AC outlet.</li> <li>3. Check and secure cord at AC power inlet (rear of feeder).</li> <li>4. Check and secure cable connections. Replace if necessary.</li> <li>5. Consult with a qualified technician.*</li> <li>6. Consult with a qualified technician.*</li> <li>7. Consult with a qualified technician.*</li> </ol>
<b>Feeding doubles</b>	<ol style="list-style-type: none"> <li>1. Gate assembly improperly adjusted (possibly more than one sheet thickness).</li> <li>2. Back wedge improperly adjusted.</li> <li>3. Worn O-rings (or if applicable, angled edge).</li> <li>4. Product interlocking.</li> <li>5. Static buildup.</li> </ol>	<ol style="list-style-type: none"> <li>1. Review gate assembly adjustment in Section 2, Preparing for Operation.</li> <li>2. Review back wedge adjustment in Section 2, Preparing for Operation.</li> <li>3. Rotate O-rings. Or, if applicable, replace angled edge (see Section 5, Inspection and Care, for procedure). If wear is excessive, consult with a qualified technician.*</li> <li>4. Check product and source.</li> <li>5. Check product and source.</li> </ol>
<b>Continuous feeding and timing out</b>	<ol style="list-style-type: none"> <li>1. Possible overlapping.</li> <li>2. Photo sensor not adjusted properly; may be "seeing" background objects.</li> </ol>	<ol style="list-style-type: none"> <li>1. See "Feeding Doubles" above.</li> <li>2. Review photo sensor adjustment in Section 2, Preparing for Operation.</li> </ol>
<b>Feed belts are operating, but product not feeding</b>	<ol style="list-style-type: none"> <li>1. Product stack weight is too low when stack height is down, resulting in reduction of down pressure.</li> <li>2. Binding in side guides.</li> <li>3. Slippery feed belts (product buildup).</li> <li>4. Sheet adhesion or interlocking between the bottom and next sheet.</li> <li>5. Gate assembly may be down too tight.</li> <li>6. Too much weight in hopper.</li> </ol>	<ol style="list-style-type: none"> <li>1. Review loading the product in Section 3, How to Operate.</li> <li>2. Adjust the side guides farther apart to allow freedom of movement between sheets.</li> <li>3. Consult with a qualified technician.*</li> <li>4. Review loading the product in Section 3, How to Operate, or review back wedge adjustment in Section 2, Preparing for Operation.</li> <li>5. Review gate assembly adjustment in Section 2, Preparing for Operation.</li> <li>6. Remove product from stack. Test again.</li> </ol>

## Operational Troubleshooting (continued)

<b>Problem</b>	<b>Cause</b>	<b>Solution</b>
<b>Feed belts not operating; continuous alarm sound</b>	<ol style="list-style-type: none"> <li>1. Feeder operation was stopped due to a "time-out" fault (i.e., miss, jam, no product in hopper).</li> </ol>	<ol style="list-style-type: none"> <li>1. Check if reset button/fault indicator is illuminated. Press Reset button.</li> </ol>
<b>Feed belts not operating; intermittent alarm sound</b>	<ol style="list-style-type: none"> <li>1. Discharge safety shield not closed completely.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check if reset button/fault indicator is blinking. Press Reset button.</li> </ol>
<b>Feed belt(s) not tracking on rollers</b>	<ol style="list-style-type: none"> <li>1. Excessive weight in hopper.</li> <li>2. Excessive down pressure on gate assembly.</li> <li>3. Off-centered product from center point of machine.</li> <li>4. Stack is bearing down on edge of belt.</li> <li>5. Belt wear.</li> <li>6. Rollers out of adjustment.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reduce weight. Test again.</li> <li>2. Rotate clockwise 1/8 turn to increase gap and manually test. Also, review gate assembly adjustment in Section 2, Preparing for Operation.</li> <li>3. Review side guides setting in Section 2, Preparing for Operation.</li> <li>4. Move stack away from belt, even if this causes stack to be aligned off center from center line of feeder.</li> <li>5. Review gate assembly adjustment and back wedge adjustment in Section 2, Preparing for Operation. Also see Section 5, Inspection and Care. If wear is excessive, consult with a qualified technician.*</li> <li>6. Consult with a qualified technician.*</li> </ol>
<b>Jamming occurs during operation</b>	<ol style="list-style-type: none"> <li>1. Improper adjustment of any of the following areas: <ol style="list-style-type: none"> <li>a. Gate assembly.</li> <li>b. Back wedge.</li> </ol> </li> </ol>	<ol style="list-style-type: none"> <li>a. Turn the Power switch to "Off" by pushing the circle ("O").</li> <li>b. Removed jammed product from feeder. While doing so, try to determine the cause of the jam.</li> <li>c. Verify each adjustment by reviewing Section 2, Preparing for Operation.</li> </ol>
<b>Product skewing</b>	<ol style="list-style-type: none"> <li>1. Back wedge not aligned properly.</li> <li>2. Hold-down spring tension either too loose or too tight.</li> </ol>	<ol style="list-style-type: none"> <li>1. Review back wedge adjustment in Section 2, Preparing for Operation.</li> <li>2. Review hold-down spring installation in Section 2, Preparing for Operation.</li> </ol>
<b>Product too far from gripper jaw (inserter application only)</b>	<ol style="list-style-type: none"> <li>1. Photo sensor "staging" leading edge of product too far from hopper plate.</li> <li>2. Gripper jaw adjusted too far from edge of hopper plate.</li> </ol>	<ol style="list-style-type: none"> <li>1. Review photo sensor adjustment in Section 2, Preparing for Operation.</li> <li>2. Adjust gripper jaw as required per insert owner's manual.</li> </ol>
<b>Product too deep in gripper jaw (inserter application only)</b>	<ol style="list-style-type: none"> <li>1. Photo sensor "staging" leading edge of product too far past hopper plate.</li> <li>2. Gripper jaw adjusted too close to edge of hopper plate.</li> </ol>	<ol style="list-style-type: none"> <li>1. Review photo sensor adjustment in Section 2, Preparing for Operation.</li> <li>2. Adjust gripper jaw as required per inserter owner's manual.</li> </ol>

# 5 Inspection and Care



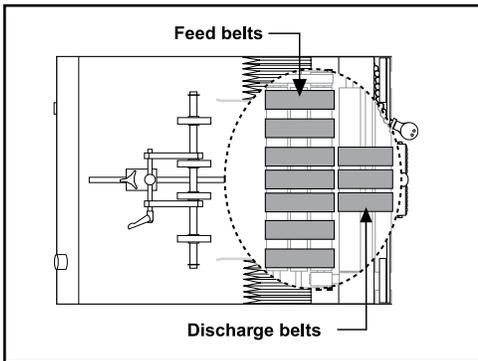
When performing initial adjustments prior to operation, always make sure you turn Off the main power switch, open the discharge safety shield (to disengage the interlock), and disconnect feeder from the electrical power source. Failure to do so can expose you to a potential start-up and moving parts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

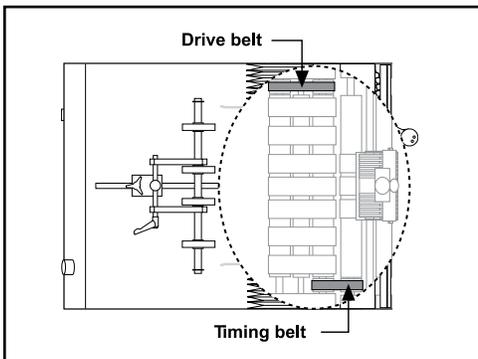


Inspecting Feed and Discharge Belts

## Checking for Feed and Discharge Belt Wear

Check for visual signs of:

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



Inspecting Timing Belt and Drive Belt

## Checking for Timing and Drive Belt Wear

Check for visual signs of:

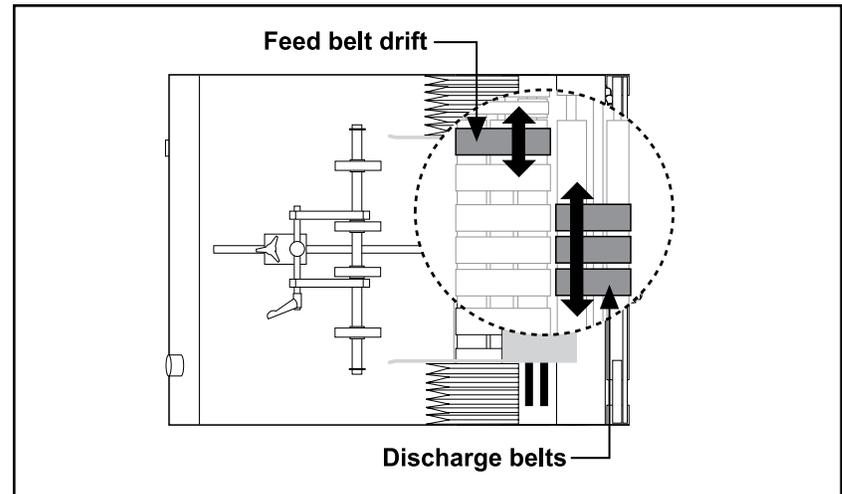
- Fraying. Replace as required.
- Missing teeth. Replace as required.
- Cracking. Replace as required.
- Paper residue buildup. Clean from belts, especially in grooves. For more information, see “Preventive Care,” to follow.

## Visual Inspection (continued)

### Ensuring Proper Feed and Discharge Belt Tracking

Check for visual signs of:

- Stretching.
- Improper roller adjustment.

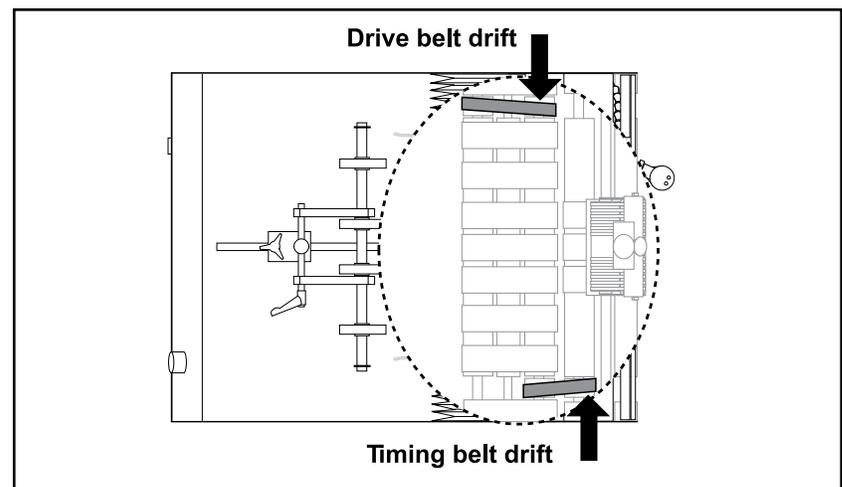


Ensuring Proper Feed Belt Tracking

### Ensuring Proper Timing and Drive Belt Tracking

Check for visual signs of:

- Misaligned timing pulleys.



Ensuring Proper Drive Belt Tracking

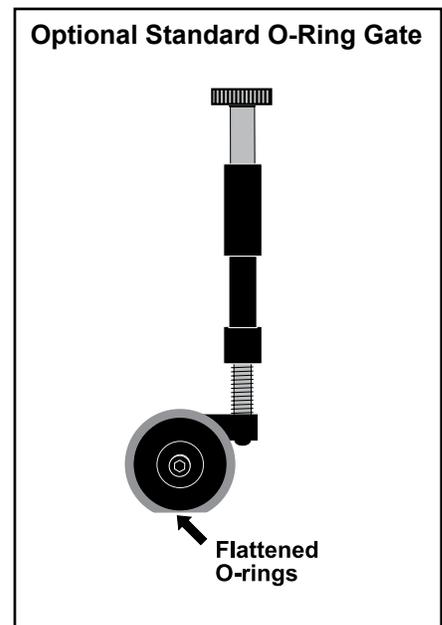
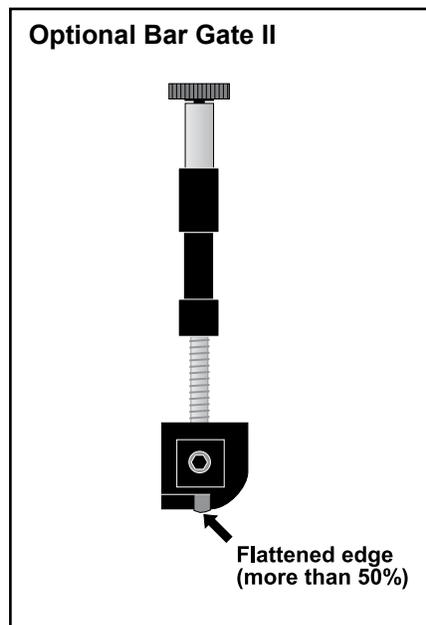
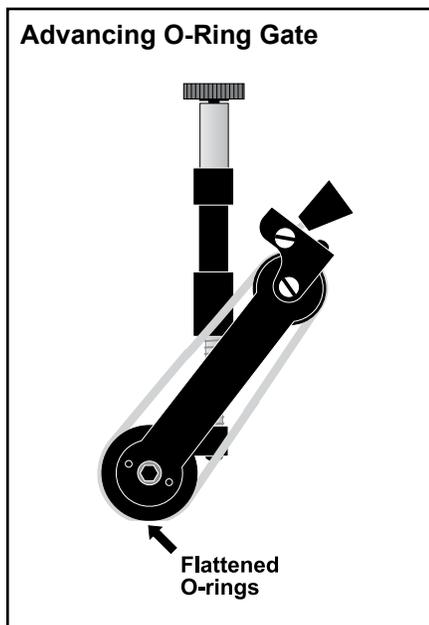
## Visual Inspection (continued)

### Checking for Gate Assembly Wear

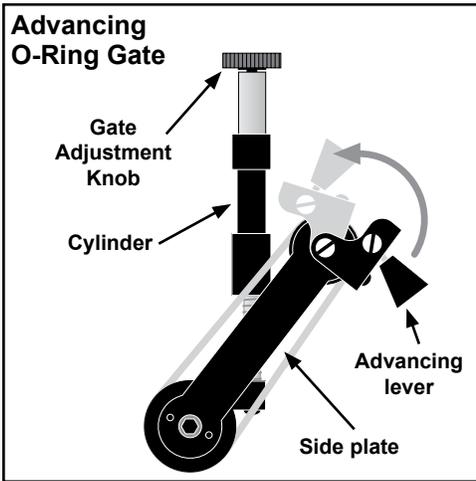
Check for visual signs of wear:

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

See “Preventive Care” to follow.



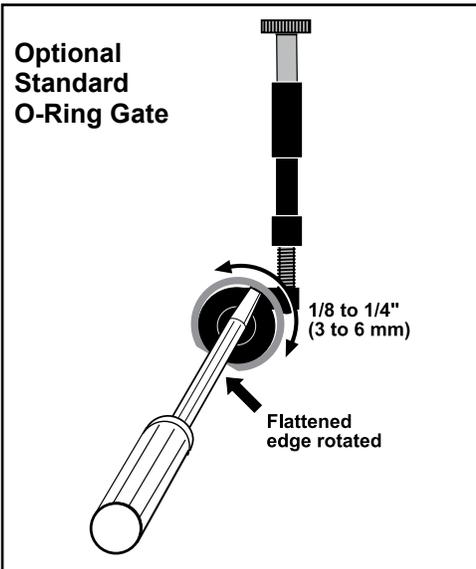
# Visual Inspection (continued)



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

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

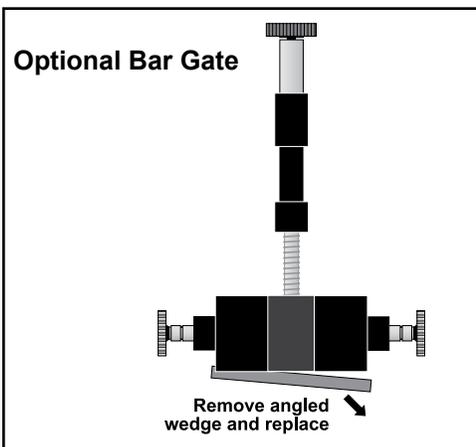
1. Turn Off feeder and remove power cord from outlet.
2. Remove gate assembly from gate plate.
3. Lower advancing lever away from gate adjustment knob.
4. Rotate O-rings by grasping advance knob and pushing toward gate cylinder about 1/8 to 1/4 in. (3 to 6 mm).
5. Lower advancing lever to resting position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



## 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.



## Replacing Worn Bar Product

To replace a worn bar product:

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

*Cleaning schedule for various materials:*

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

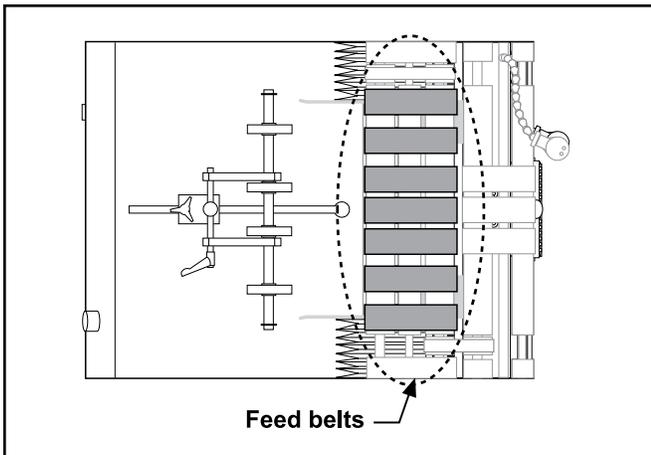
# Cleaning Feed and Discharge Belts

To clean feed belts:

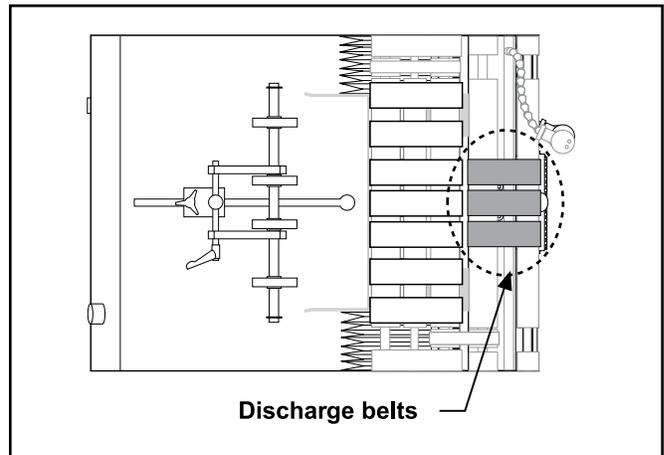
1. Turn Off feeder and remove power cord from outlet.
2. Open discharge safety shield.
3. Remove gate assembly from gate plate for easier access to belts.
4. Apply a small amount of isopropyl alcohol to a soft cloth.
5. Use your hand to move the feed belt, start with one feed belt at a time and carefully press the moistened area of the cloth to the belt. As you rotate the belt, use moderate pressure to wipe across the belt, making sure to wipe in direction of grooves. After several rotations of the belt, repeat for each belt.
6. 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.
7. Reinstall gate assembly, close discharge safety shield, and restore power.

To clean discharge belts:

1. Turn Off feeder and remove power cord from outlet.
2. Open discharge safety shield.
3. To access discharge belts, move top roller hold-down assembly away from discharge belts by loosening two T-nuts on either side of shaft. Lift up on top roller assembly.
4. Repeat steps 4-6 above. Repeat for each belt.
5. Reinstall gate assembly, return roller hold-down assembly to original position, close discharge safety shield, and restore power.



Cleaning Feed Belts



Cleaning Discharge Belts

# Preventive Care (continued)

 NOTE

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

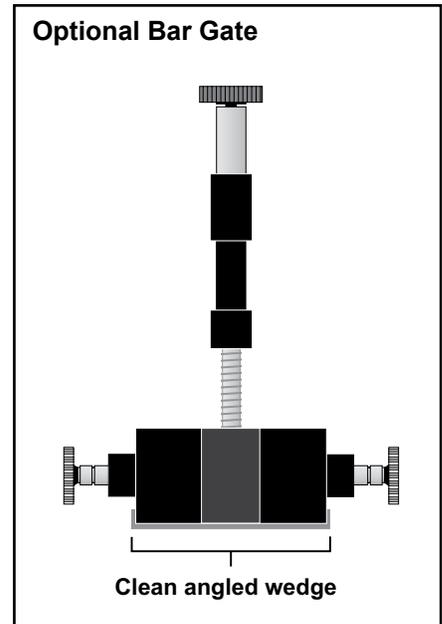
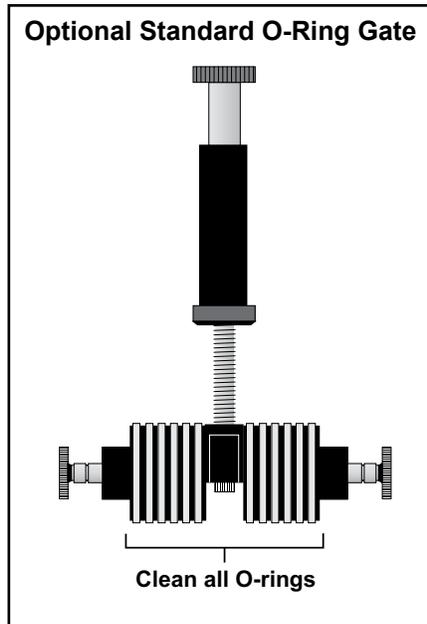
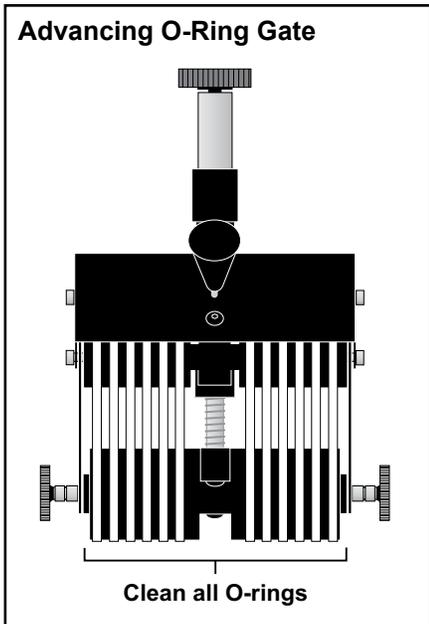
<i>Cleaning schedule for various materials:</i>
<ul style="list-style-type: none"><li>• Typical: <i>every month</i></li><li>• Dusty: <i>after every shift</i></li><li>• High ink or varnish: <i>1 time per shift</i></li></ul>

## 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 product.

To clean gate assemblies:

1. Turn Off feeder and remove power cord from outlet.
2. Open discharge safety shield to access gate.
3. Remove gate assembly from gate bracket assembly.
4. Apply a small amount of isopropyl alcohol to a soft cloth.
5. Wipe across O-rings (Figures 5-13 or 5-14), or angled wedge if applicable (Figure 5-15). First wipe in one direction, then the other.
6. Taking a dry portion of the cloth, go back and wipe all surfaces to ensure they are dried.
7. Reinstall gate assembly, close discharge safety shield, and restore power.



## Preventive Care (continued)

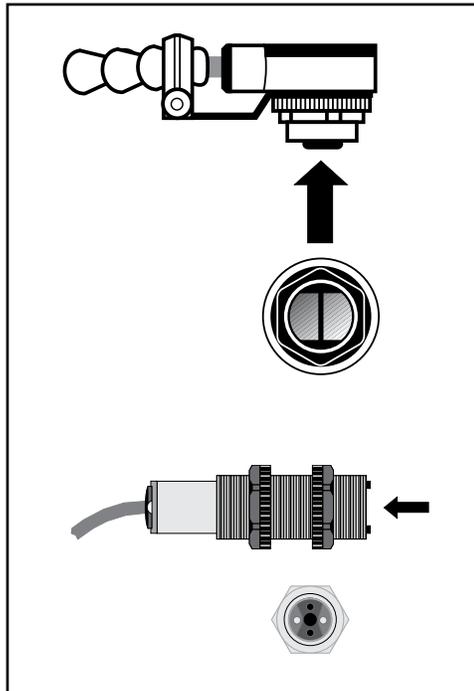


*Do not use any solvents or cleaning agents when cleaning the photo sensor lenses. This can result in surface damage and eventual faulty performance.*

### Cleaning Photo Sensors

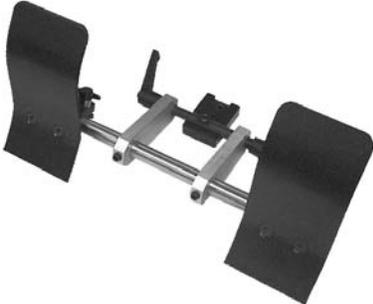
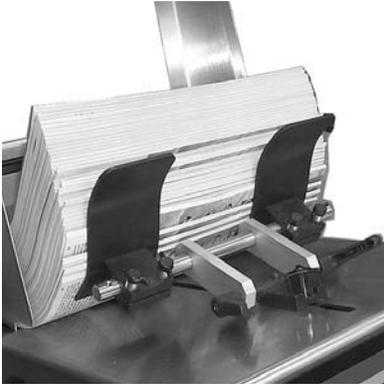
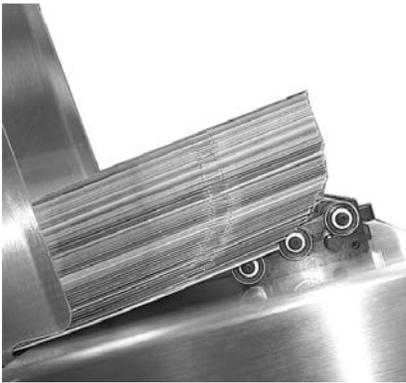
To clean the photo sensor lenses:

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.

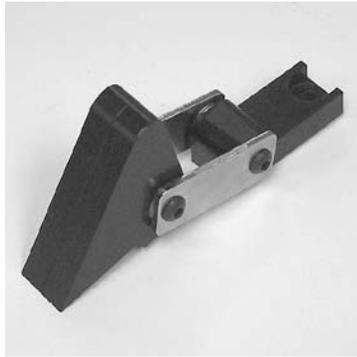


# 6 Wedge Applications

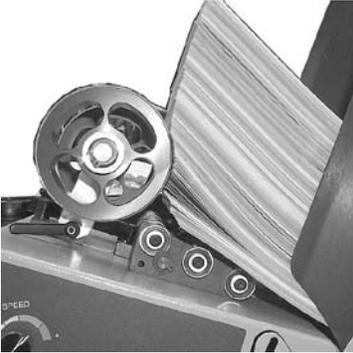
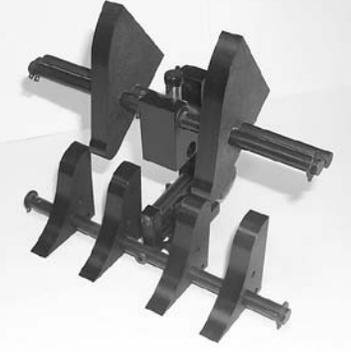
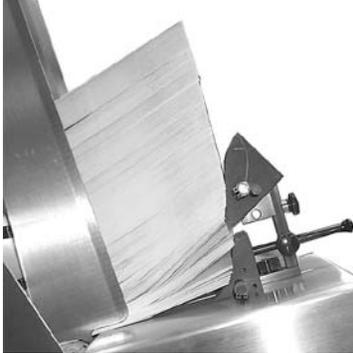
There is a variety of wedges that may be utilized for feeding various products of differing properties. A wedge may be used either alone or in combination with another wedge depending upon the size and/or properties of the product that is being fed. The following will help to identify which wedge to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

Part Number	Description/Setup Example	Product Usage
<p>63311214 (Standard)</p> 	<p>Large Triangle (5 inches wide)</p> 	<p>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.</p>
<p>63311025 (Standard)</p> 	<p>Double "S"</p> 	<p>Light to heavy weight products from 4 to 14 inches in length such as large envelopes, flat sheets, card stock and folded products.</p>
<p>63311050 (Standard)</p> 	<p>Low Profile</p> 	<p>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.</p>

## Wedge Applications (continued)

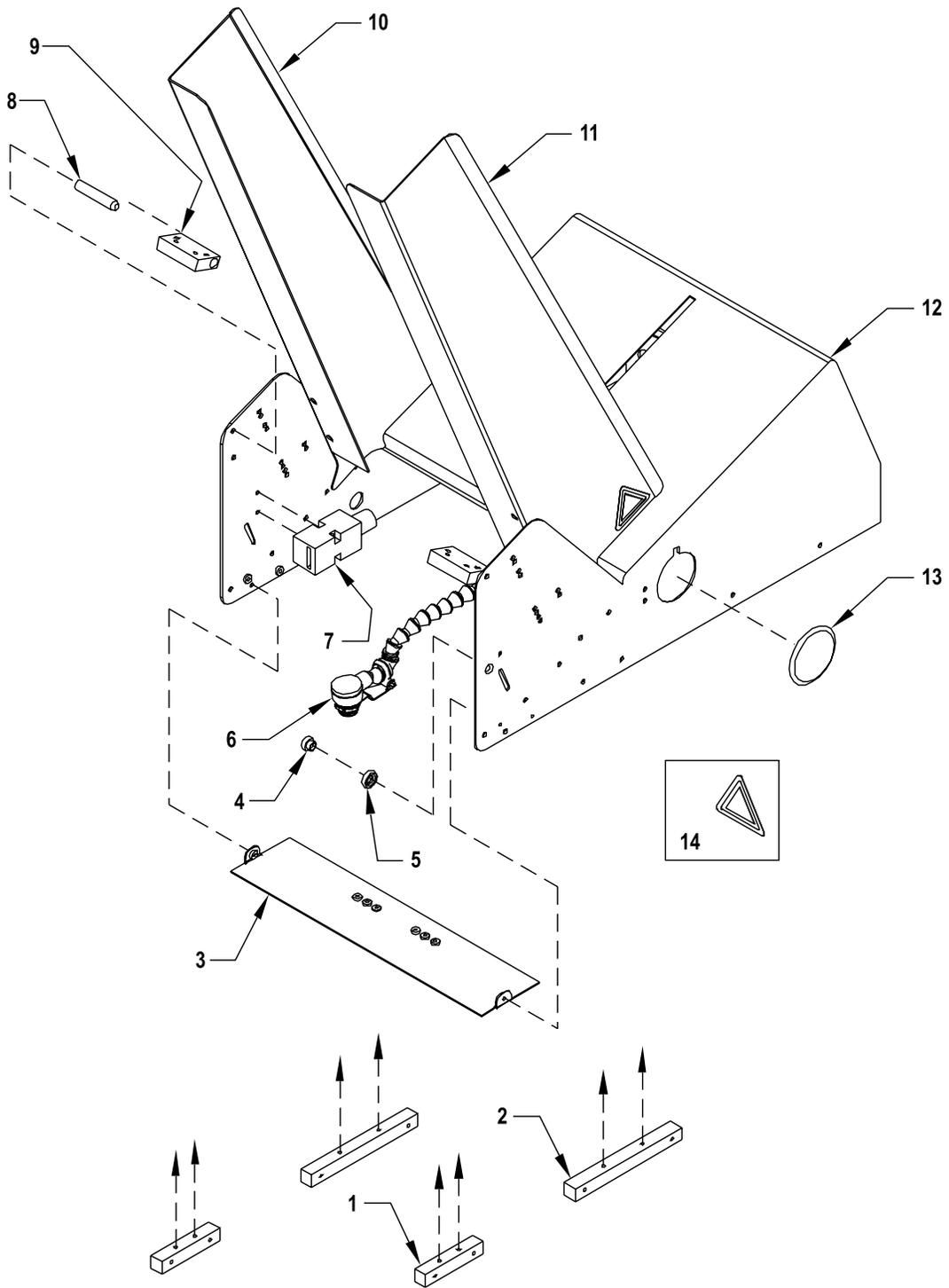
Part Number	Description/Setup Example	Product Usage
<p>63311017 (Optional)</p> 	<p>Small Triangle (4 inches wide)</p> 	<p>Light to medium weight products from 3 to 6 inches in length such as Z-fold and C-fold letters, business reply cards, and small booklets.</p>
<p>63311710 (Optional)</p> 	<p>Medium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

## Wedge Applications (continued)

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

# 7 Mechanical Components

## BASE FEATURES

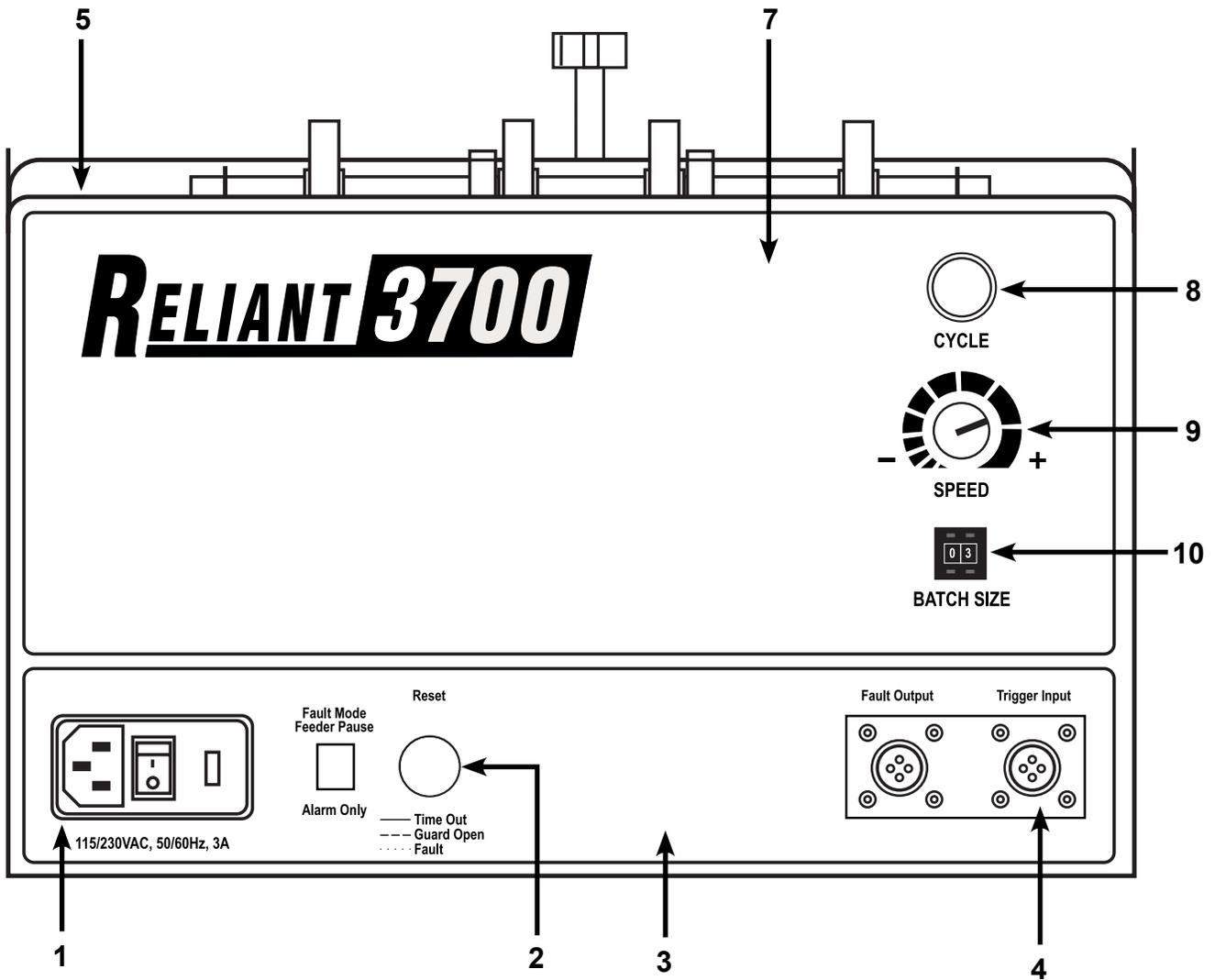


## BASE FEATURES

ITEM	QTY.	PART NUMBER	DESCRIPTION
1	2	44675003	MOUNT FRONT BASE PLATE
2	2	44675004	MOUNT BACK BASE PLATE
3	1	44675022	COVER BOTTOM PROTECTIVE
4	1	44640009	BRACKET RUBBER SPACER
5	1	43555068	SUPPORT O RING COVER
6	1	64911011	SENSOR ST SHEET ASSEMBLY
7	1	64911009	SWITCH SAFETY INTERLOCK ASSEMBLY
8	2	44640011	SHAFT TOP COVER HINGE MOUNT
9	2	44909023	HINGE TOP COVER MOUNT
10	1	44640018	SIDE GUIDE RIGHT 1424
	1	53500609	LABEL WARNING
11	1	44640017	SIDE GUIDE LEFT 1424
	1	53500609	LABEL WARNING
12	1	44675001	SHELL RELIANT
13	1	44500061	PLUG 2 HOLE COVER
	1	44500071	LABEL
14	1	53500609	LABEL WARNING (FOR PROTECTIVE COVER)
NS	1	23511290	BELT TENSIONER ASSEMBLY
NS	2	44600001	GUARD ACCORDION REAR
NS	1	63011038	SENSOR FLIGHT ASSEMBLY

NS = NOT SHOWN

# BASE FEATURES

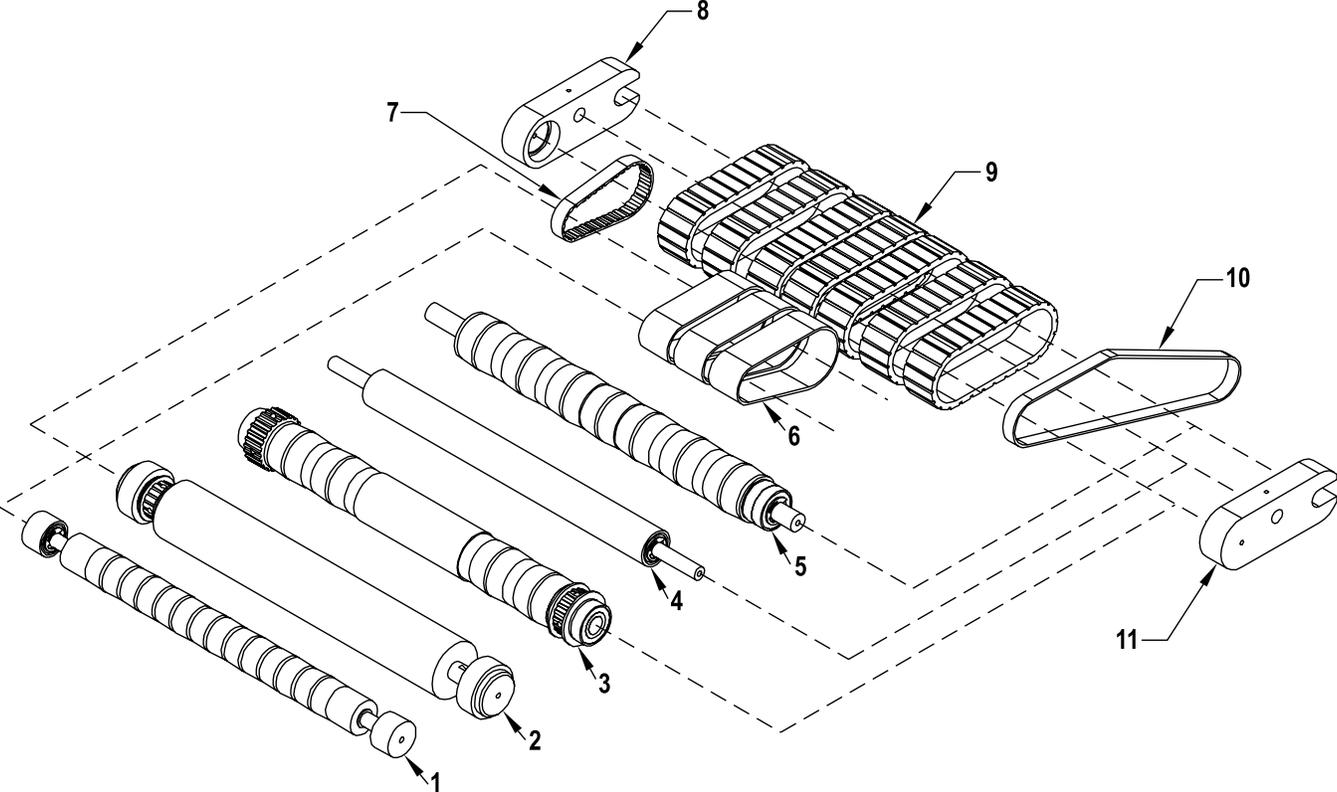


## BASE FEATURES

ITEM	QTY.	PART NUMBER	DESCRIPTION
1	1	44649034	MODULE AC POWER ENTRY (W/O FUSE)
	2	53500006	FUSE 3A 250V SLO-BLO GMD 5 X 20MM
2	1	67511034	HARNESS FAULT/RESET SWITCH ASSEMBLY
3	1	44699017	GRAPHIC STANDARD LOWER
4	1	64911005	HARNESS FLIGHT TRIGGER
5	1	44699016	COVER PLATE
6	1	69911066	MISS DETECT ASSEMBLY
7	1	44699010	GRAPHIC STANDARD UPPER
8	1	69911002	HARNESS CYCLE BUTTON ASSEMBLY
9	1	67511030	HARNESS POTENTIOMETER ASSEMBLY
10	1	69911001	THUMBWHEEL ASSEMBLY (APPLICABLE MODELS ONLY)

**CARRIAGE ASSEMBLY**

**Assembly # : 67511162**

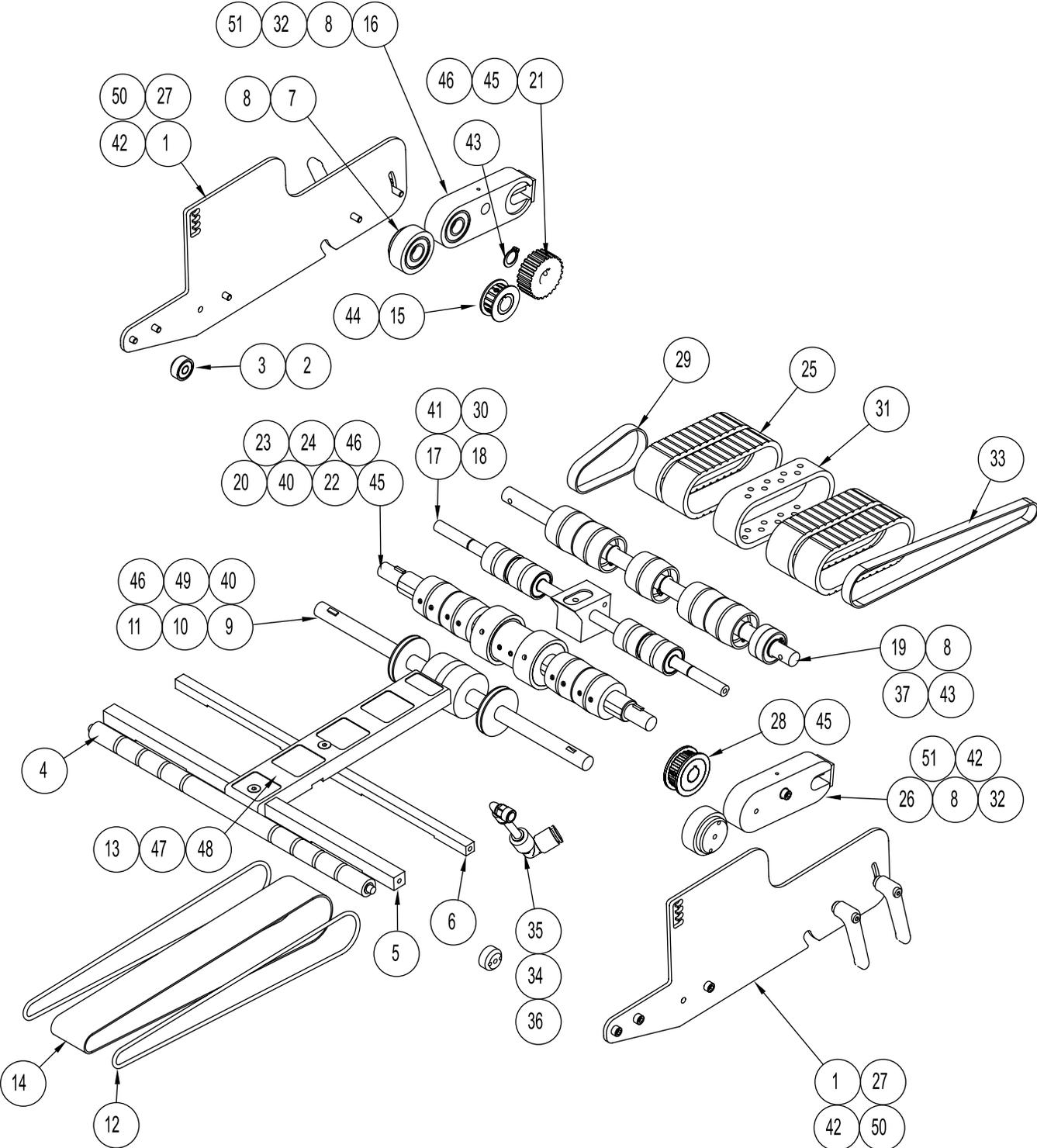


**CARRIAGE ASSEMBLY**  
**Assembly # : 67511162**

ITEM	QTY.	PART NUMBER	DESCRIPTION
1	1	311-0234	ASSY, FRONT DISCHARGE SHAFT
	1	44675012	SHAFT FRONT DISCHARGE
	2	23560121	DOUBLE DETECT BEARING CUP HOLDER
	2	23500095	BEARING BALL R6
2	1	311-0235	ASSY, REAR DISCHARGE SHAFT
	1	44675046	SHAFT REAR DISCHARGE
	1	43560097	PULLEY 16T 1/2 BORE W/FLANGE
	2	23500032	HOLDER OUTBOARD BEARING CUP
	2	23500094	BEARING BALL R8
	2	00003352	SCREW SOCKET SET 10-32 X 1/8" LG
	1	00003351	KEY WOODRUFF 1/8 X 3/8
3	1	311-0236	ASSY, DRIVE SHAFT
	1	44630019	SHAFT DRIVE
	1	23500097	PULLEY 20T 1/2 BORE W/FLANGE DRIVEN
	1	43560098	PULLEY 24T 1/2 BORE FLANGELESS
	2	00001155	CLIP E 1/2 WALDES
	2	23500094	BEARING BALL R8
	3	00002217	SCREW SOCKET SET 10-32 X 5/16" LG (1 FOR FLANGED PULLEY, 2 FOR FLANGELESS PULLEY)
	1	00002216	SCREW SOCKET SET 10-32 X 1/4" LG (FOR FLANGED PULLEY)
	2	00003351	KEY WOODRUFF 1/8 X 3/8
4	1	311-0237	ASSY, DISCHARGE FEED ROLLER SHAFT
	1	43550036	SHAFT DISCHARGE FEED ROLLER
	1	44630003	BELT SUPPORT TUBE
	2	23500095	BEARING BALL R6
	2	00001150	CLIP E 3/8 WALDES
5	1	311-0238	ASSY, IDLER SHAFT
	1	43555047	IDLER SHAFT
	1	44630004	TUBE DRIVEN
	4	23500094	BEARING BALL R8
	3	00001155	CLIP E 1/2 WALDES
6	3	44675015	DISCHARGE BELT CLEAR 1W
7	1	23560078	BELT DRIVE TIMING 78XL037
8	1	44485005	HOLDER CARRIAGE RIGHT SIDE
9	7	23500162	BELT FEED TAN GROOVED COMPOSITE
10	1	44675021	DRIVE BELT 190XL037
11	1	44485006	HOLDER CARRIAGE LEFT SIDE

**ADJUSTABLE TRANSPORT ASSEMBLY**

**Assembly # : 37001101**



## ADJUSTABLE TRANSPORT ASSEMBLY

**Assembly # : 37001101**

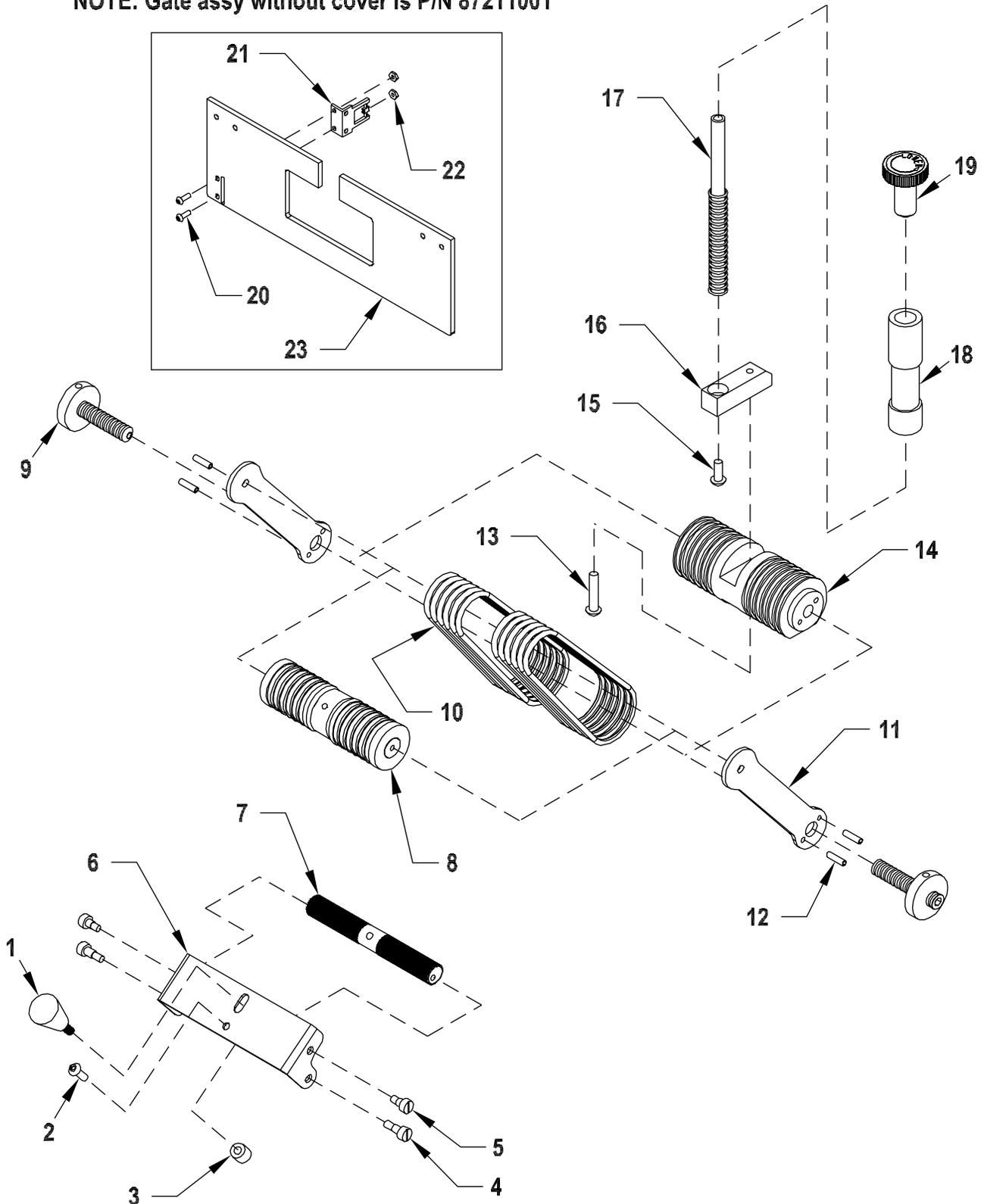
ITEM	QTY.	PART NO.	DESCRIPTION
1	2	44675112	EXTENSION, SIDE PLATE
2	2	44846050	HOLDER, R4 BEARING CUP
3	2	44582021	R4 BEARING
4	1	51330010	SHAFT, LOWER DISCHARGE
5	1	51330013	BAR, HOLD DOWN SUPPORT
6	1	51330005	BAR, SUPPORT
7	2	23500032	HOLDER, R8 BEARING CUP
8	6	23500094	BEARING, R8
9	1	51330020	SHAFT, DISCHARGE
10	2	51330014	PULLEY, O-RING
11	1	23560106	1-5/8 CROWN PULLEY W/SET SCREW
12	2	51330012	BELT, O-RING
13	1	51330007	BLOCK, HOLD DOWN SUPPORT
14	1	51330001	BELT, DISCHARGE
15	1	43560097	16T TIMING PULLY
16	1	44485005	HOLDER, CARRIAGE
17	1	44841056	VACUUM CARRIAGE SHAFT
18	8	23511030	ROLLER, SUPPRT DRIVEN
19	1	43555147	IDLER SHAFT
20	1	43555205	SHAFT, DRIVE 3/4
21	1	43560098	PULLEY, TIMING
22	4	23560208	ROLLER, CROWN DRIVE
23	2	23500126	ROLLER, FEED .75 INCH
24	1	23560206	ROLLER, FLAT DRIVE
25	4	23500162	FEED BELT TAN GUM
26	1	44485006	HOLDER, CARRIAGE
27	4	43555097	HANDEL 10-32
28	1	23500097	PULLEY, 20T TIMING
29	1	23560078	BELT, TIMING 78XL037 KEVLAR
30	1	44485001	MANIFOLD
31	1	44485003	VACUUM BELT
32	2	44485004	VAC BELT TENSION
33	1	44675021	BELT, TIMING
34	1	51476004	1/4" TUBE VACUUM
35	1	51476006	ELBOW, UNEQUAL UNION
36	1	51476007	ELBOW. MALE
37	5	33511028	CROWN DRIVEN ROLLER
NS	1	23500079	MOUNT, CABLE ADHESIVE C TYPE

ITEM	QTY.	PART NO.	DESCRIPTION
40	3	103296B18	1/8 X 3/8 WOODRUFF KEY
41	8	103274B04	SNAP RING 3/8
42	6	102688B02	SHCS #10-32 X 3/8
43	11	103274B05	SNAP RING 1/2
44	2	102732B01	SSSCPPT #10-32 X 1/8
45	11	102732B03	SSSCPPT #10-32 X 1/4
46	5	102732B04	SSSCPPT #10-32 X .31
47	1	102637B03	FHCS #10-32 X 1/2
48	1	102637B14	FHCS #10-32 X .88LG
49	2	102733B07	SSSCPPT 1/4-20NC X .50
50	2	102688B26	SHCS 10-32 X .31LG
51	2	102688B05	SHCS #10-32 X .75

# ADVANCING O-RING GATE ASSEMBLY

Assembly # : 67511028

NOTE: Gate assy without cover is P/N 87211001



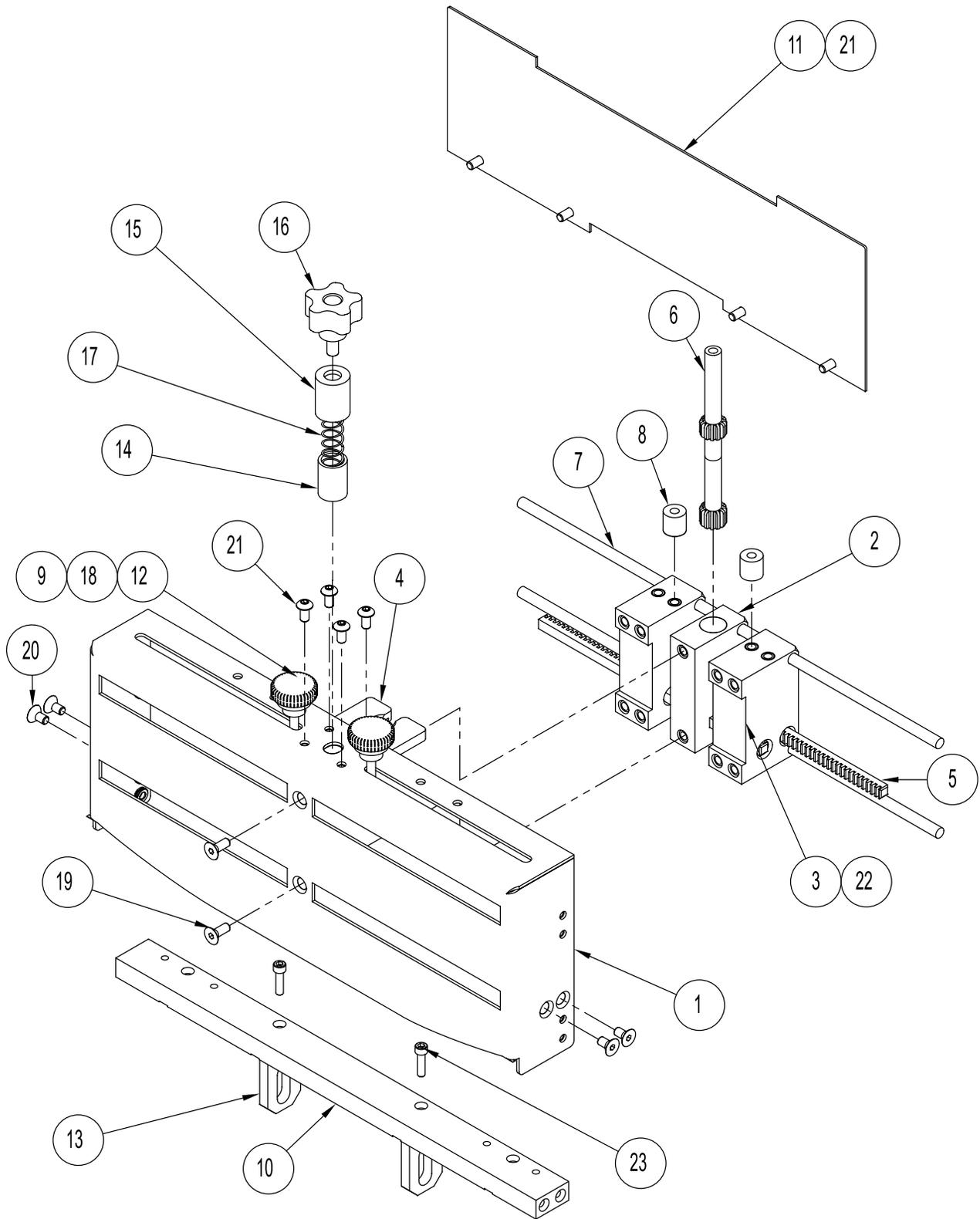
## **ADVANCING O-RING GATE ASSEMBLY**

**Assembly # : 67511028**

<b>ITEM</b>	<b>QTY.</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	1	44657007	HANDLE STUDDED 10-32 X 1/2"
2	1	00002302	BHCS 8-32 X 1/2" LG
3	1	44657010	SPACER BELT INDEXER .312 X .375
4	2	00003320	SCREW SHOULDER 8-32 SLOTTED
5	2	00003321	SCREW SHOULDER 8-32 X 1/8
6	1	44657005	BELT INDEXER BRACKET
7	1	44657003	PINCH ROLL CAM
8	1	44657008	BELT INDEXER SHAFT
	2	44657002	O RING TAKE UP ROLLER
	1	44657009	BELT INDEXER CENTER HUB
	2	00001155	CLIP E 1/2 WALDES
	2	00002211	SCREW SOCKET SET 8-32 X 5/16 CUP POINT
9	2	44872003	ROLLER
	2	44872005	ADJUSTMENT SCREW
	2	44872007	SCREW SOCKET SET 10-32 X 3/8" LG NYLON TIP
10	12	44657006	O RING ADVANCING
11	2	44872002	SIDE PLATE ADJUST
12	4	00001161	PIN ROLL 1/8 X 1/2
13	1	00002340	BHCS 10-32 X 1" LG
14	1	44872004	GATE CYLINDER W/HORIZON (NOT SOLD SEPARATELY)
15	1	00002334	BHCS 10-32 X 1/2" LG
16	1	15000001	MOUNT GATE LIFT SHAFT
17	1	23560084	SHAFT GATE LIFT
	1	23500083	SPRING GATE COMPRESSION
18	1	23500019	CYLINDER GATE SPRING TENSION
19	1	23511037	ADJUSTMENT KNOB ASSEMBLY FOR GATE
20	2	00002302	BHCS 8-32 X 1/2" LG
21	1	44649010	KEY SAFETY INTERLOCK
22	2	00002121	NUT KEPS 8-32
23	1	44675028	COVER ADVANCING GATE PROTECTIVE

# **SOLID GATE PLATE ASSEMBLY**

**Assembly # : 64011004**



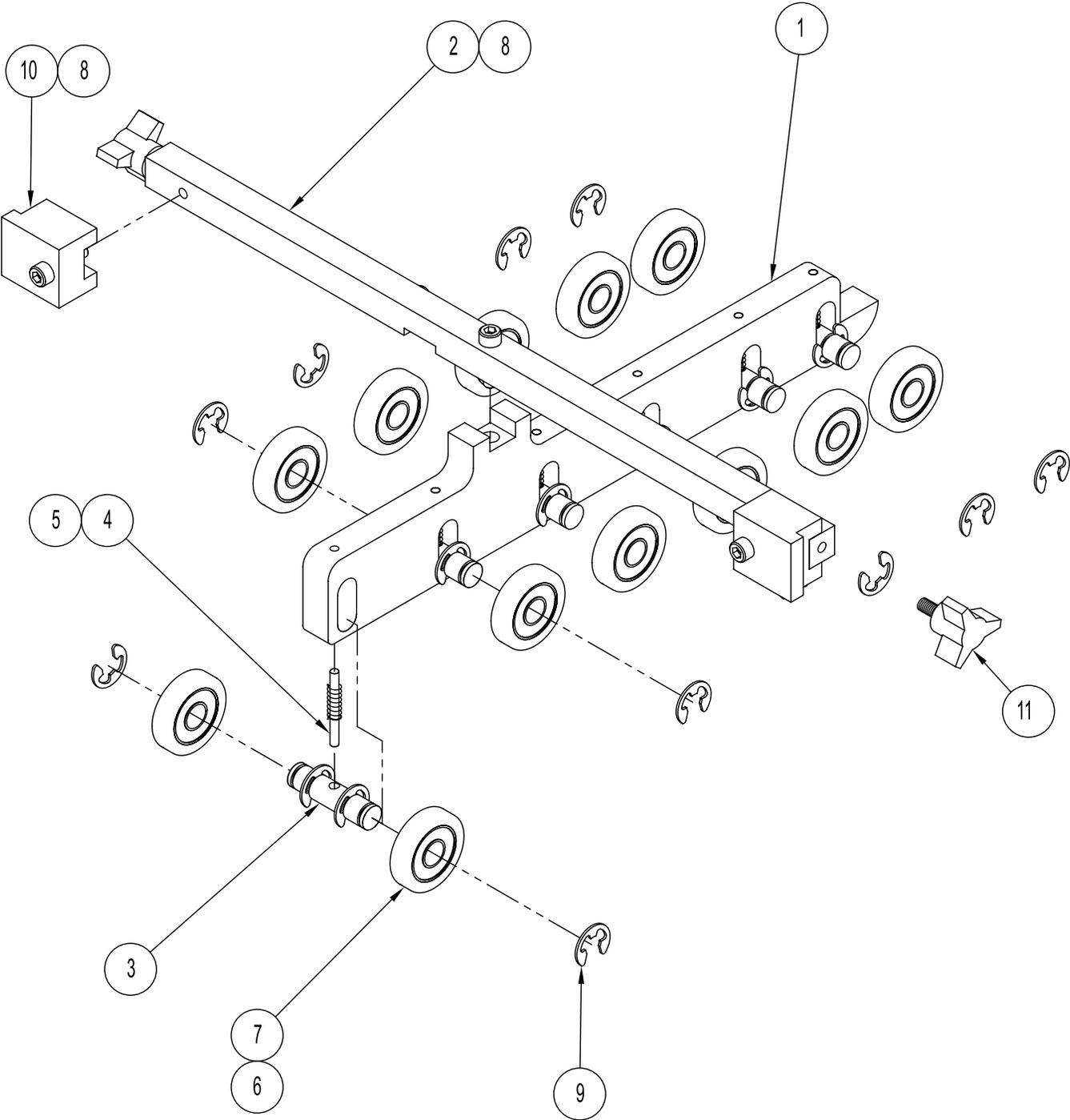
## SOLID GATE PLATE ASSEMBLY

**Assembly # : 64011004**

ITEM	QTY.	PART NUMBER	DESCRIPTION
1	1	44640004	PLATE, SOLID GATE
2	1	44646002	BLOCK, SIDE GUIDE
3	2	44646001	BLOCK, SIDE GUIDE ADJUSTING
4	1	44646004	BLOCK, ADJUSTMENT REFERENCE
5	2	44646010	RACK
6	1	44646005	SHAFT, PINION ADJUSTMENT
7	2	44646006	GUIDE, RAIL SIDE SUPPORT
8	2	44646015	SPACER, LOWER
9	2	44646016	SPACER, UPPER
10	1	44646003	BAR, LOWER GATE SUPPORT
11	1	44646012	COVER, GUIDE ADJUSTMENT
12	2	44681021	KNOB
13	2	15000007	GATE "J" HOOK
14	1	44646007	RETAINER, LOWER SPRING
15	1	44646008	RETAINER, UPPER SPRING
16	1	44646009	KNOB, 5 LOB 1-1/4
17	1	44646013	SPRING, COMPRESSION
18	2	102732B13	SET SCREW, #10-32 X 1.50
19	2	102916B03	FHCSS/S 10-32 X .50
20	4	102637B02	FHCS #10-32 X 3/8
21	8	102957B02	BHCSS/S 10-32 X .38
22	2	102733B03	SSSCPPT 1/4-20NC X .25
23	2	102685B04	SHCS 8-32 X 5/8

**6" ADJUSTABLE TRANSPORT HOLD DOWN ASSEMBLY**

**Assembly # : 13301102**

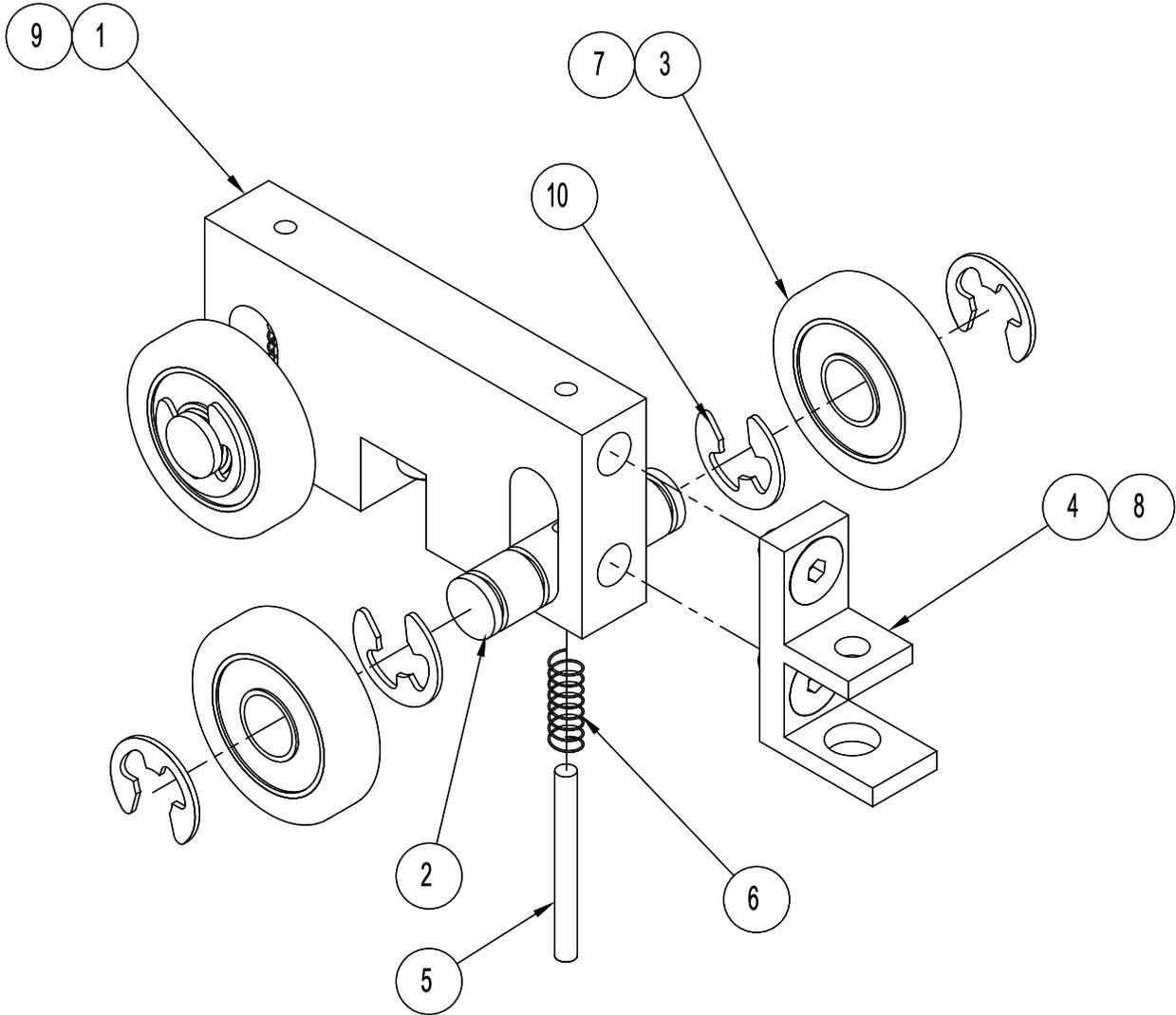


## **6" ADJUSTABLE TRANSPORT HOLD DOWN ASSEMBLY**

**Assembly # : 13301102**

<b>ITEM</b>	<b>QTY.</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	1	51330006	BLOCK, HOLD DOWN
2	1	51385032	BAR, HOLD DOWN
3	6	51277052	SHAFT, HOLD DOW
4	6	51312003	PIN, SPRING 1/8 IN
5	6	51328001	SPRING, HOLD DOWN
6	12	23500095	BEARING, BALL
7	12	51277087	COLLAR, DISCH ROLLER
8	3	102688B05	SHCS #10-32 X .75
9	24	104308B04	E CLIP 3/8
10	2	51330019	BLOCK, HOLD DOWN SUPPORT
11	2	23500092	KNOB, 3 LOBE

**HOLD DOWN ASSEMBLY**  
**Assembly # : 67511024**

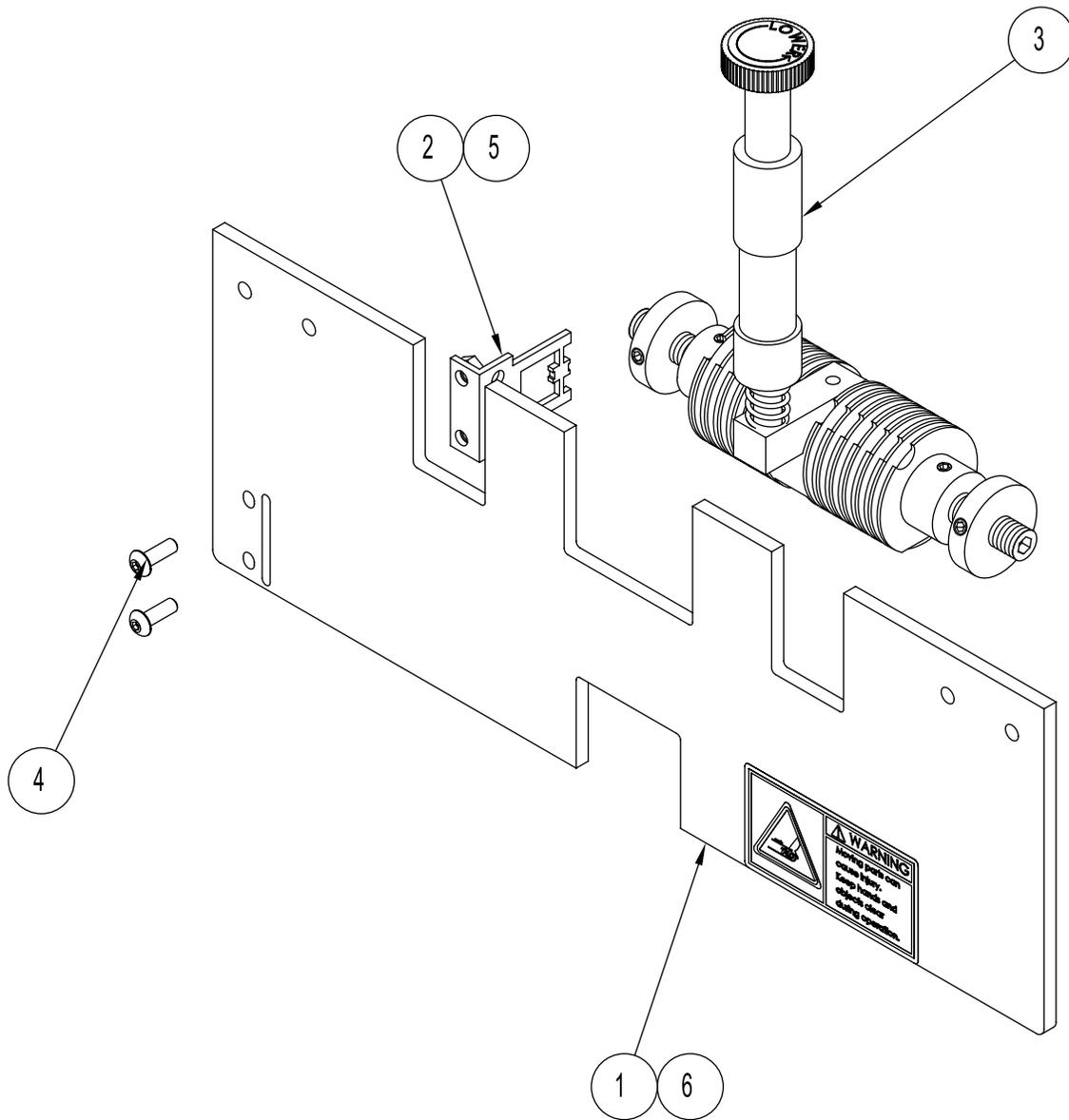


## **HOLD DOWN ASSEMBLY**

**Assembly # : 67511024**

<b>ITEM</b>	<b>QTY.</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	1	51328002	BLOCK, HOLD DOWN
2	2	51277052	SHAFT, HOLD DOWN
3	4	51277087	COLLAR, DISCH ROLLER
4	1	51312001	MOUNT, HOLD DOWN
5	2	51312003	PIN, SPRING 1/8 IN
6	2	51328001	SPRING, HOLD DOWN
7	4	23500095	BEARING, BALL
8	2	102637B02	FHCS #10-32 X 3/8
9	1	102937B05	SHCSS/S 10-32 X .75
10	8	104308B04	E CLIP 3/8

**STANDARD O-RING GATE ASSEMBLY**  
**Assembly # : 67511020**



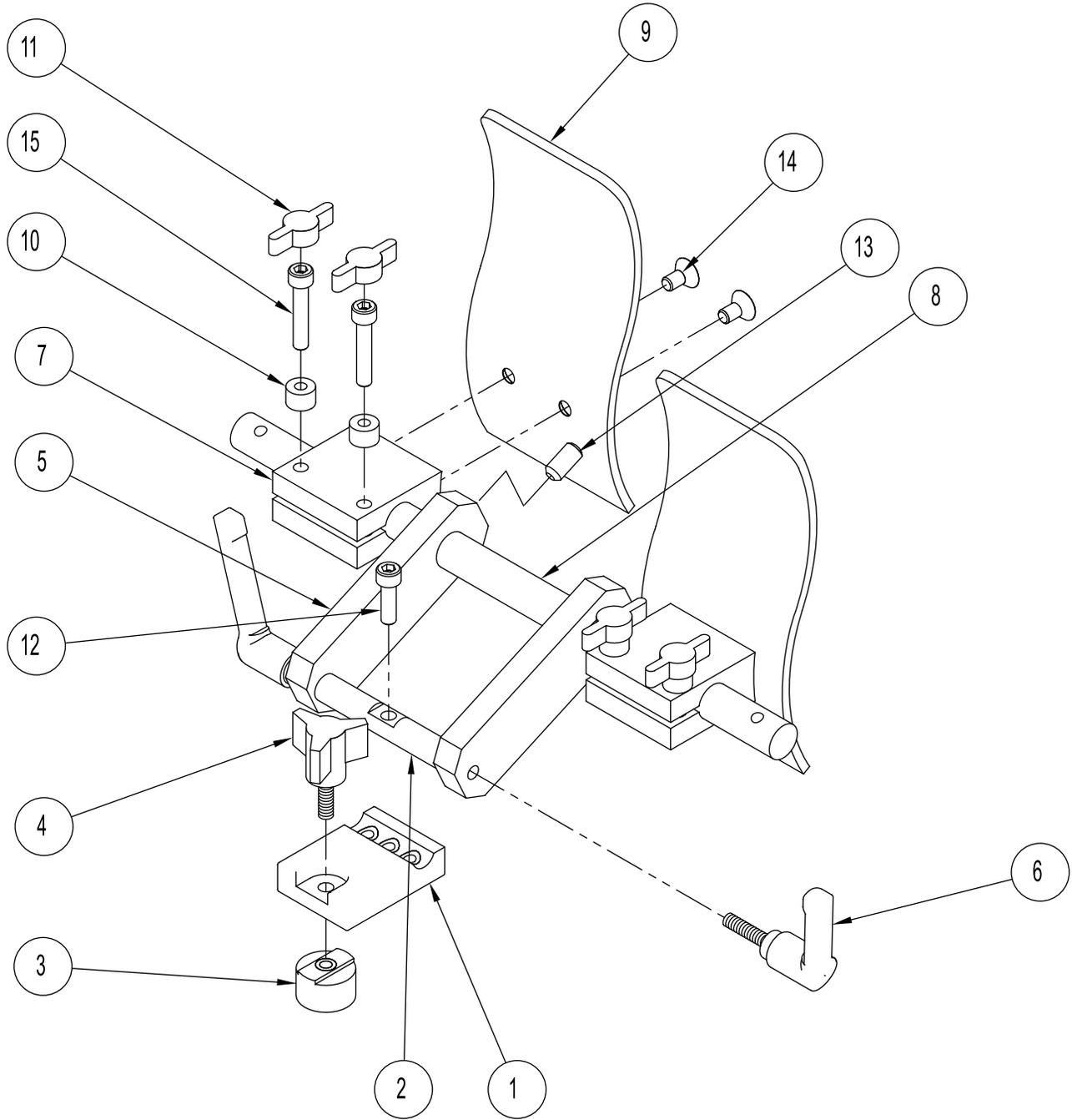
**STANDARD O-RING GATE ASSEMBLY**

**Assembly # : 67511020**

<b>ITEM</b>	<b>QTY.</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	1	44675013	COVER, TOP PROTECT
2	1	44649010	KEY, SAFETY INTERLOCK
3	1	13511872	ASSY, STANDRAD O-RING
4	2	102706B03	BHCS #8-32 X 1/2
5	2	103333B07	KEP NUT #8-32
6	1	53500609	LABEL, WARN INJURY 2.7 X 1.4

# DOUBLE S WEDGE ASSEMBLY

Assembly # : 63311025



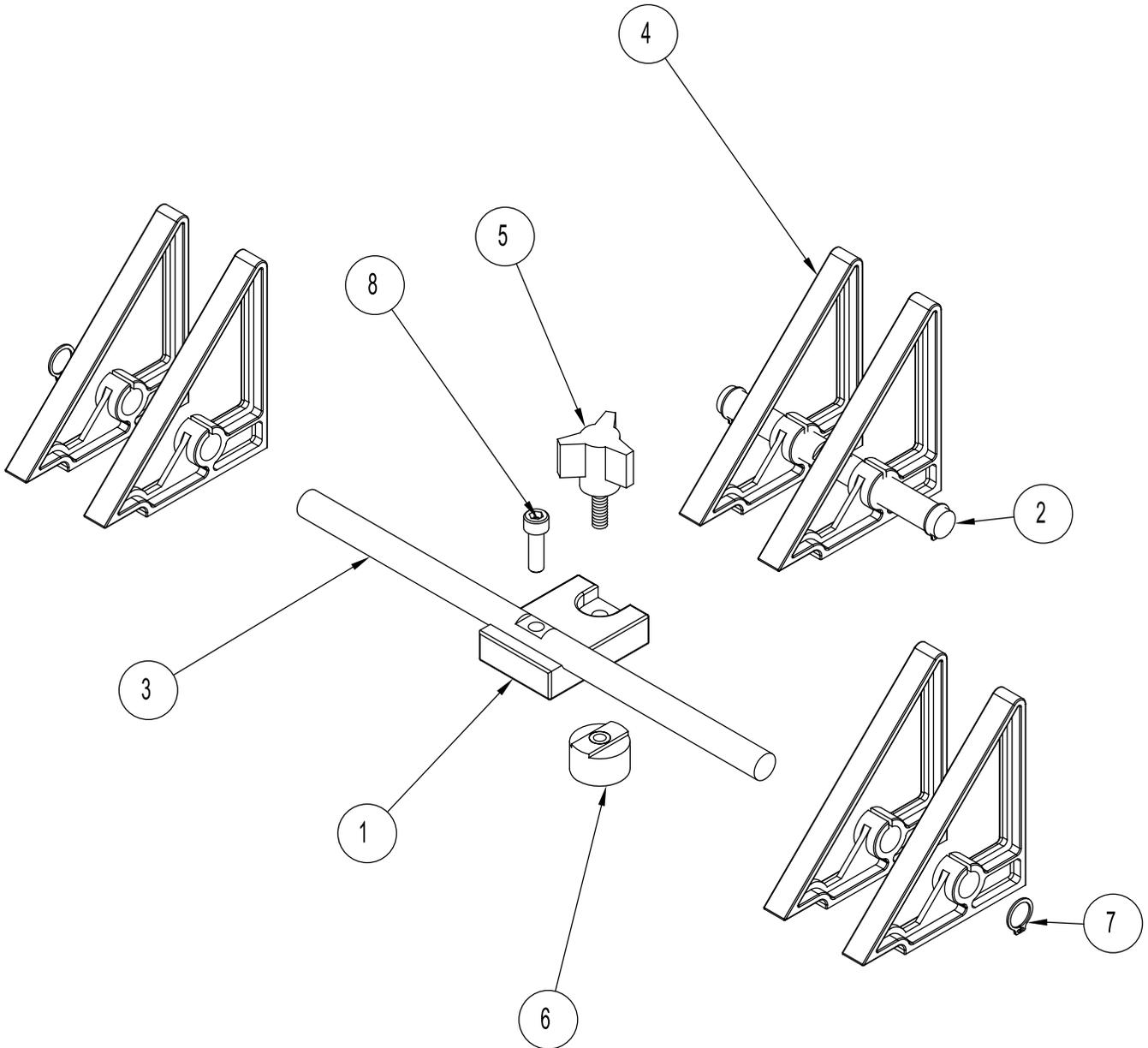
## **DOUBLE S WEDGE ASSEMBLY**

**Assembly # : 63311025**

<b>ITEM</b>	<b>QTY.</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	1	44633014	WEDGE BLOCK
2	1	44633010	ROLLER WEDGE SHAFT
3	1	44633016	ROUND T-NUT
4	1	44633033	KNOB, 3 ARM
5	2	44633024	ROLLER WEDGE
6	2	43555098	HANDLE 10-32 X .75
7	2	44633026	BLOCK MOUNTING
8	1	23560147	SHAFT, IDLER
9	2	44633025	S WEDGE
10	4	44633027	SPACER
11	4	23500076	WING KNOB
12	1	102688B04	SHCS #10-32 X 5/8
13	2	102733B07	SSSCPPT 1/4-20NC X .50
14	4	102637B02	FHCS #10-32 X 3/8
15	4	102688B07	SHCS #10-32 X 1

# TRIANGLE WEDGE ASSEMBLY

Assembly # : 63311214



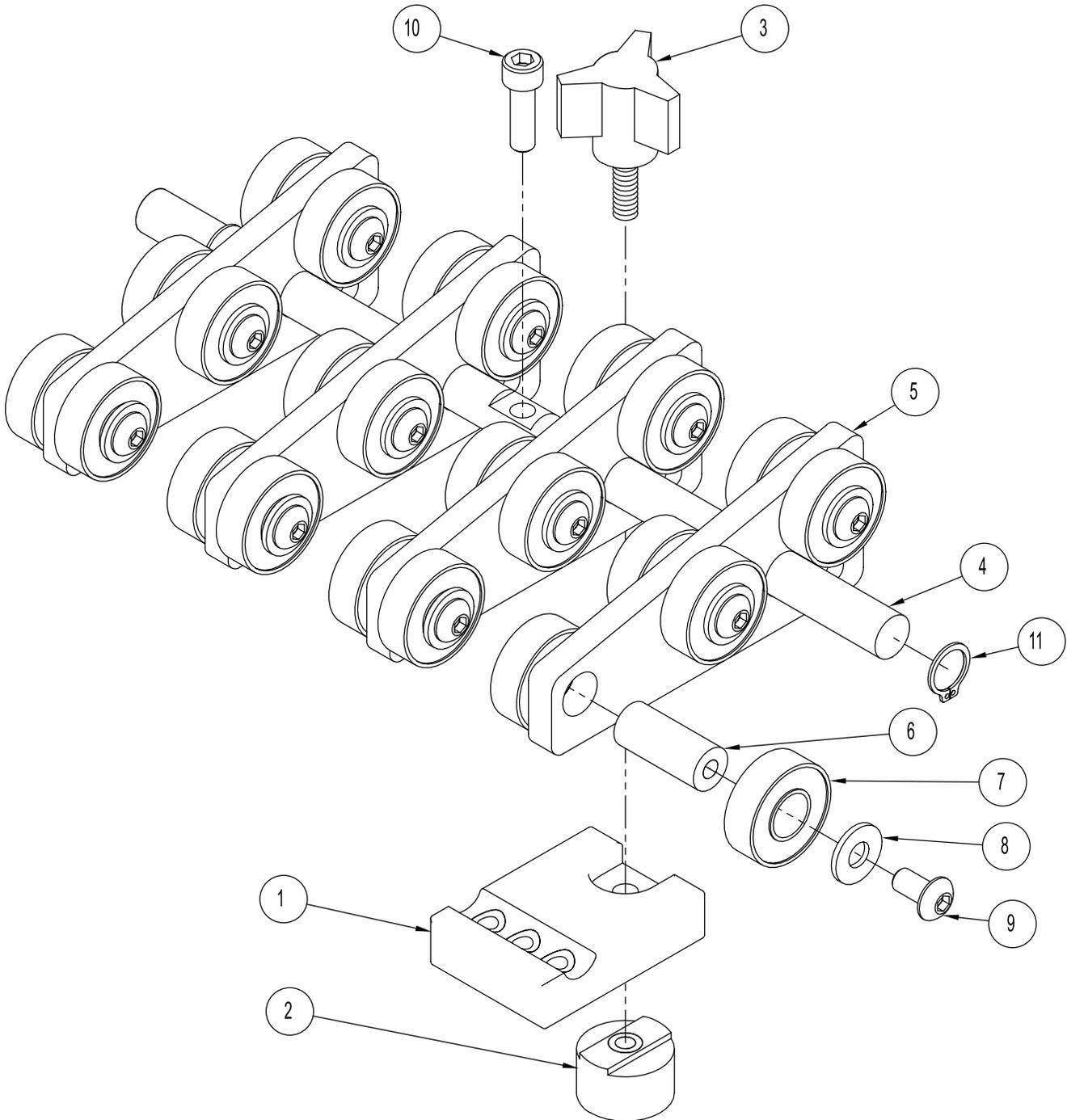
## **TRIANGLE WEDGE ASSEMBLY**

**Assembly # : 63311214**

<b>ITEM</b>	<b>QTY.</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	1	44633014	WEDGE BLOCK
2	1	44633017	SHAFT, WEDGE GUIDE
3	1	44633018	WEDGE GUIDE SHAFT
4	6	43560212	WEDGE, MATERIAL SUPPORT
5	1	44633033	KNOB, 3 ARM
6	1	44633016	ROUND T-NUT
7	4	103274B04	SNAP RING 3/8
8	1	102688B04	SHCS #10-32 X 5/8

# **LOW PROFILE WEDGE ASSEMBLY**

**Assembly # : 63311050**

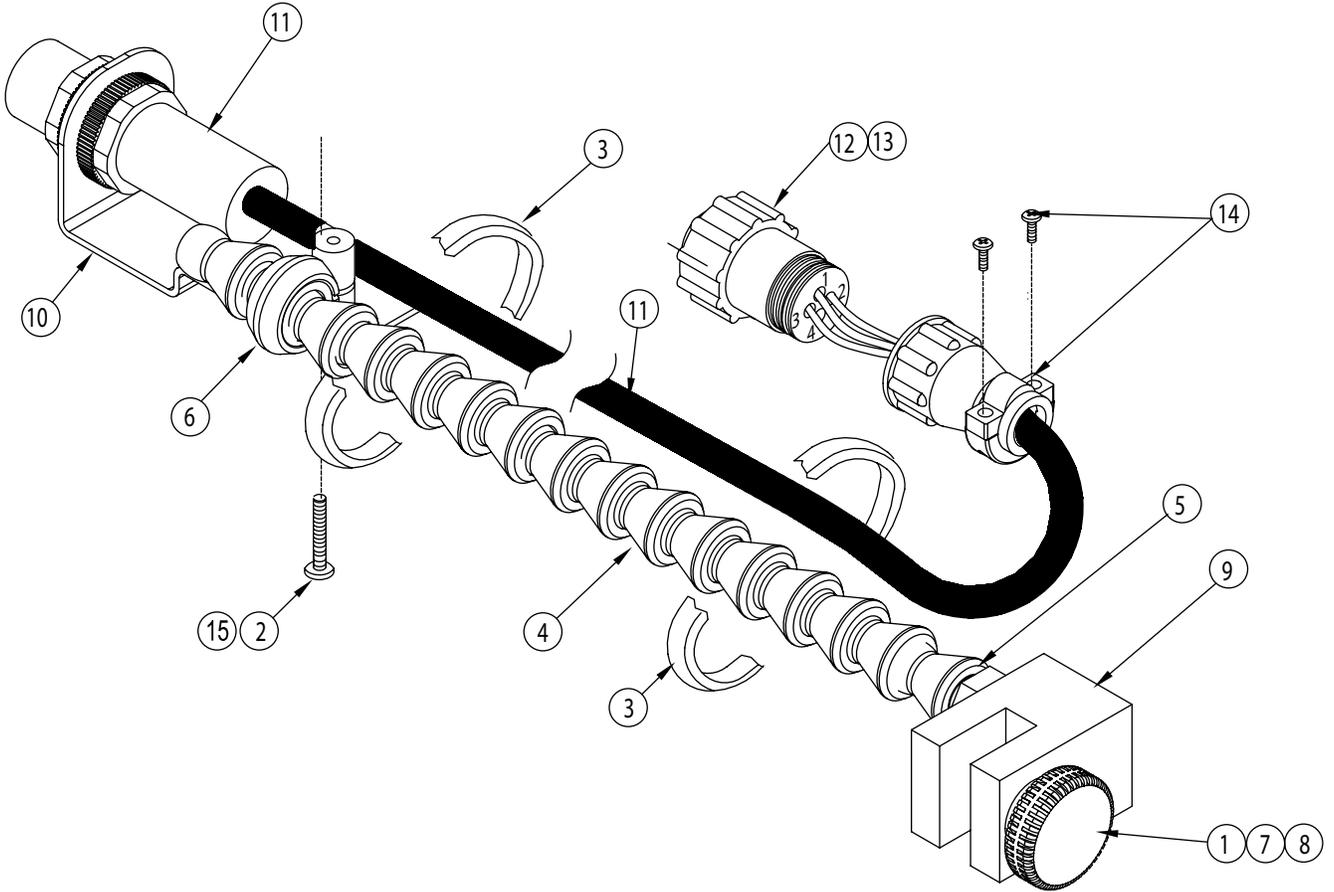


## **LOW PROFILE WEDGE ASSEMBLY**

**Assembly # : 63311050**

<b>ITEM</b>	<b>QTY.</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	1	44633014	WEDGE BLOCK
2	1	44633016	ROUND T-NUT
3	1	44633033	KNOB, 3 ARM
4	1	44633018	WEDGE GUIDE SHAFT
5	4	43560050	NARROW ROLLER
6	9	33500020	BELT TENSION
7	24	23500095	BEARING, BALL
8	24	103240B04	FW #10
9	24	102708B02	BHCS #10-32 X 3/8
10	1	102688B04	SHCS #10-32 X 5/8
11	2	103274B04	SNAP RING 3/8

**FLIGHT SENSOR ASSEMBLY**  
**Assembly # : 63011038**

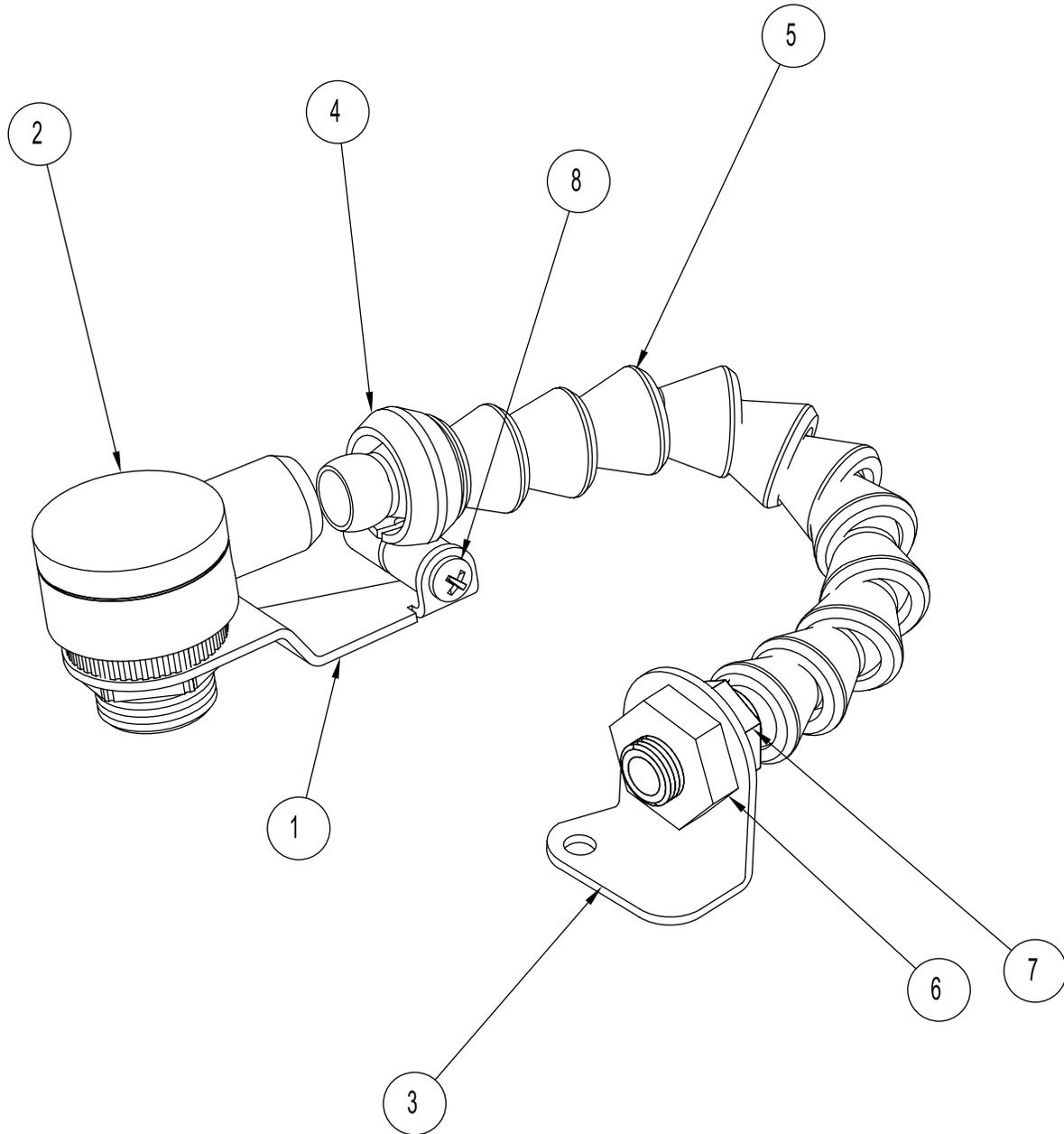


## **FLIGHT SENSOR ASSEMBLY**

**Assembly # : 63011038**

<b>ITEM</b>	<b>QTY.</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	1	00002216	SCREW, SSSCPPT 10-32 X 1/4
2	1	00002614	SCREW SHCS 6-32 X 3/4
3	2	435SO263	TIE, CABLE BLACK
4	14	44608041	LOCLINE ADJUSTABLE
5	1	44608042	BRACKET SENSOR MOUNTING
6	1	44640016	COLLAR, LOCLINE 1/4 MOUNTING
7	1	44681020	SCREW SSSNYLTIP 10-32 X 3/4
8	1	44681021	KNOB, 1" DIA 10-32 W/O SCREW
9	1	44699007	BLOCK BRUSH MOUNTING
10	1	44846052	BRACKET SENSOR MOUNTING
11	1	53500038	SENSOR MINI BEAM RETROFLECTIVE
12	4	53500502	PIN MALE
13	1	53500504	PLUG 4 PIN
14	1	53500506	CLAMP CABLE CIRCULAR 4 PIN AMP
15	1	00002604	FLAT WASHER, #6

**SHEET SENSOR ASSEMBLY**  
**Assembly # : 13301101**  
**(for Adjustable Transport only)**



**SHEET SENSOR ASSEMBLY**  
**Assembly # : 13301101**  
**(for Adjustable Transport only)**

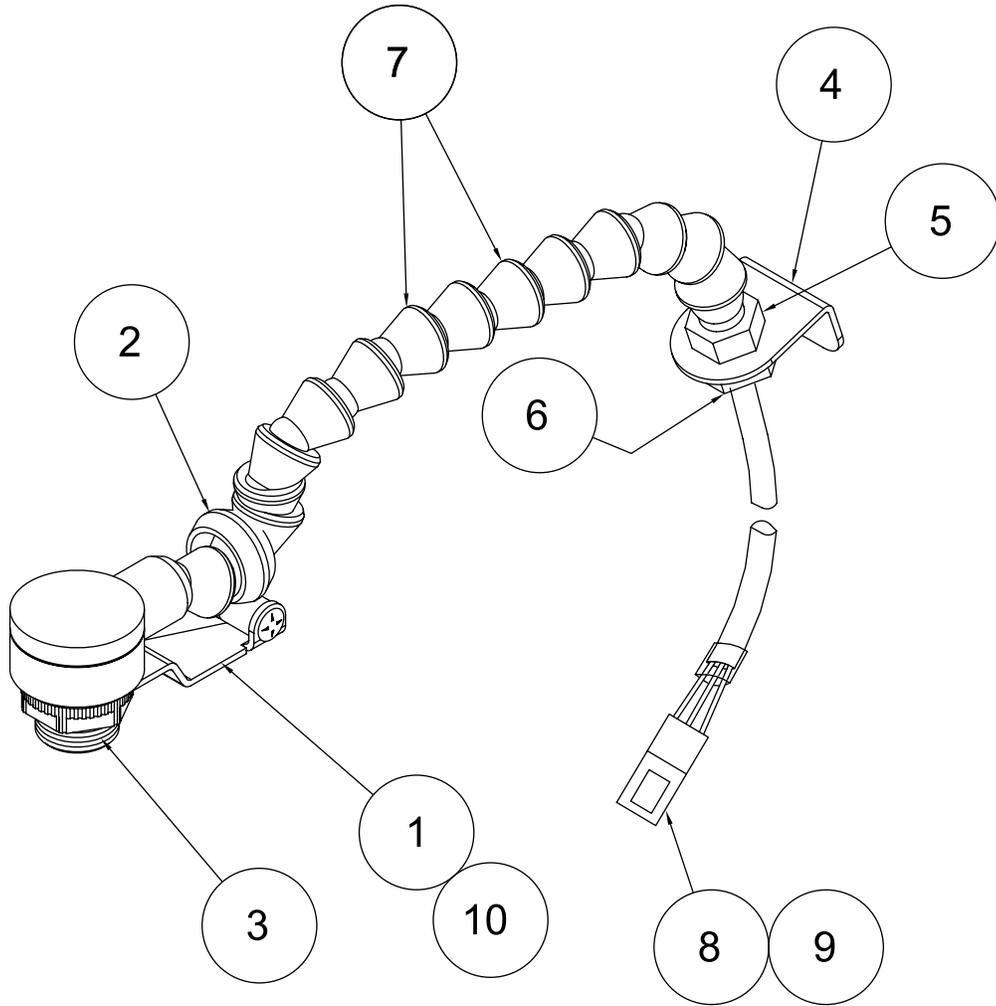
ITEM	QTY.	PART NUMBER	DESCRIPTION
1	1	44640014	BRACKET, SENSOR STABILIZER
2	1	44649011	SENSOR, PNP DIFFUS
3	1	44640015	MOUNTING BRACKET
4	1	44640016	COLLAR, LOCLINE 1/4 MOUNTING
5	12	44608041	LOCLINE ADJUSTABLE 1/4
6	1	44608046	NUT, HEX 1/8 NPT
7	1	44608042	LOCKLINE NPT CONNECTOR 1/4 X 1/8
8	1	102760B09	PHMSPH #6-32 X .75
NS	1	44649012	HOUSING, CONNECTOR 3 PIN
NS	1	44649013	PIN, MALE CONNECTOR MOLEX

NS = NOT SHOWN

# **SHEET SENSOR ASSEMBLY**

**Assembly # : 64911011**

**(for Reliant 3700 without Adjustable Transport)**



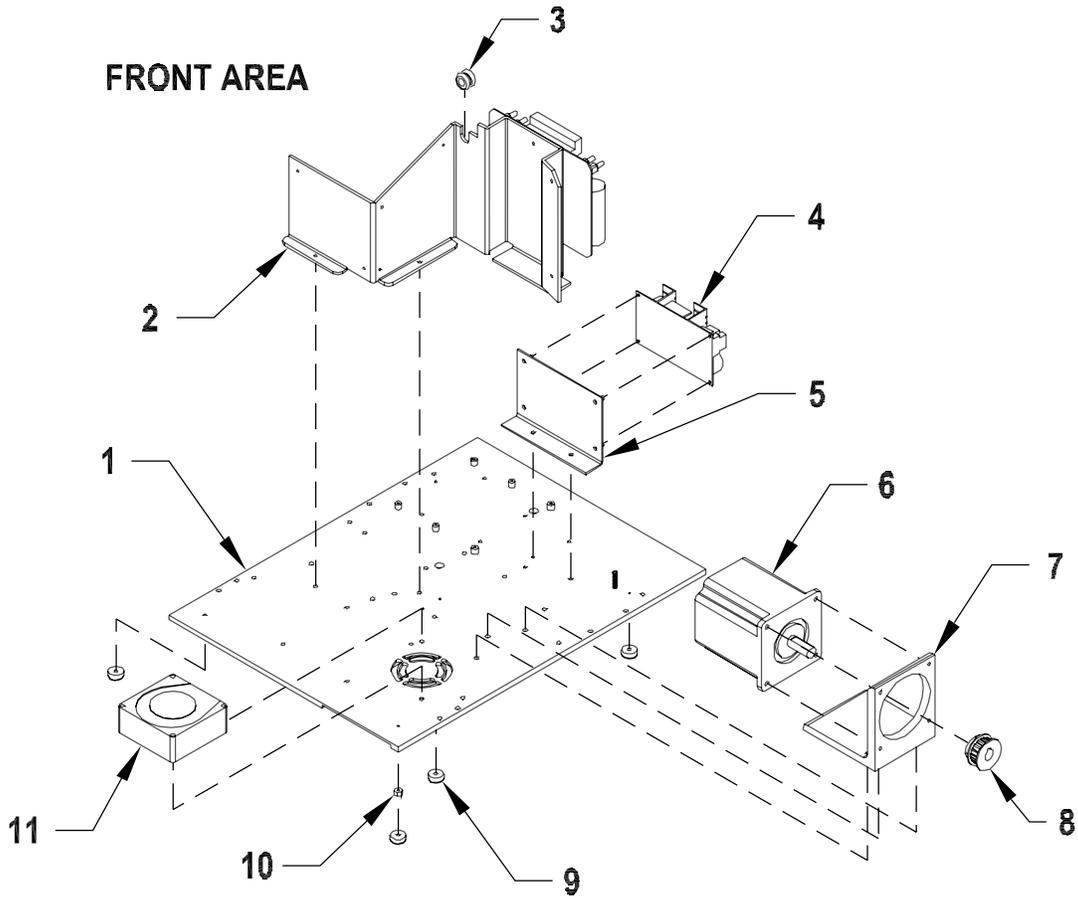
**SHEET SENSOR ASSEMBLY**  
**Assembly # : 64911011**  
**(for Reliant 3700 without Adjustable Transport)**

ITEM	QTY.	PART NUMBER	DESCRIPTION
1	1	44640014	SENSOR BRACKET
2	1	44640016	LOCLINE 1/4 MOUNTING COLLAR
3	1	44649011	SENSOR PNP DIFFUSE REFLECTIVE RIGHT ANGLE
4	4	44640015	SENSOR MOUNTING BRACKET
5	1	44608042	SOLID LOCLINE NPT CONNECTOR 1/4 X 1/8
6	1	44608046	SOLID NUT HEX 1/8 NPT
7	14	44608041	SOLID LOCLINE HOSE ADJUSTABLE 1/4
8	1	44649012	HOUSING CONNECTOR 3 PIN MALE MOLEX
9	3	00003365	SCREW, PHTCSPH 6-32 X 3/4 LG
NS	0.5"	53500982	TUBING, HEAT SHRINK

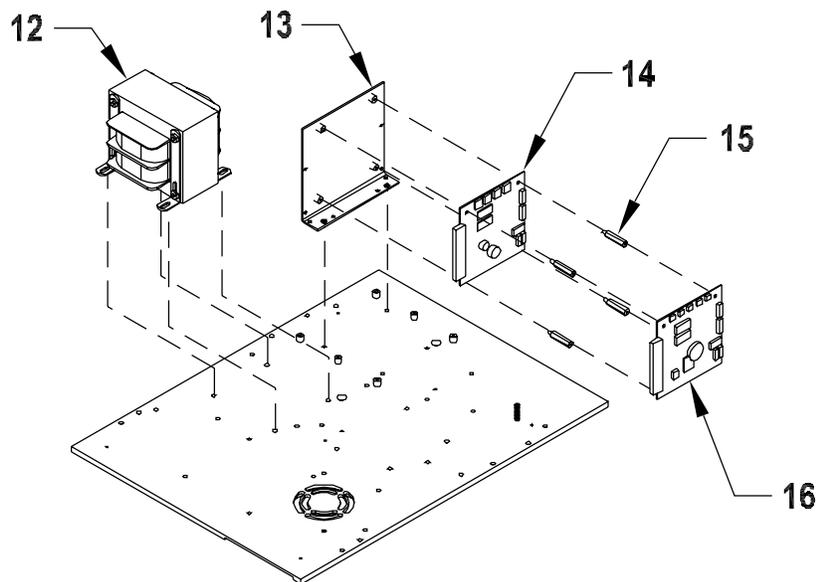
NS = NOT SHOWN

# ELECTRICAL COMPONENTS

Assembly # : 67511002



## **REAR AREA**



## ELECTRICAL COMPONENTS

**Assembly # : 67511002**

ITEM	QTY.	PART NO.	DESCRIPTION
1	1	44630002	BASE PLATE
2	1	44649030	BOARD STEPPER DRIVE BLD72-5
3	1	44649054	GROMMET 3/4 X 3/8 X1/2
4	1	44649033	BOARD POWER DC 5V & 12V 2.5 X 4.25
5	1	44649036	BRACKET POWER SUPPLY MOUNTING
6	4	53511390	MOTOR STEPPER ASSY
7	3	44630011	MOTOR MOUNT
8	1	44350053	PULLEY 18T 1/2 BORE W/FLANGE & HUB
	2	00003352	SCREW SOCKET SET 10-32 X 1/8" LG
9	4	44642042	FOOT RECESSED 5/8
10	1	00002113	NUT HEX 6-32 ZINC
11	1	64911035	FAN ASSEMBLY
12	1	44683025	TRANSFORMER 300VA
13	1	44649038	BRACKET MOUNTING CPU BOARD
14	1	44675035	BOARD I/O EXPANSION
15	4	44649048	STANDOFF MALE/FEMALE 6-32 X 1
16	1	44675037	BOARD ES CPU
NS	16	435SO263	CABLE TIE WRAP
NS	2	44649046	TERMINAL FEMALE
NS	34	44649085	SHEATHING #0 HP BLACK
NS	1	44675036	CABLE RIBBON 2 INCH 50 PIN
NS	4	53500045	TERMINAL DISCONNECT FEMALE 22-18 GA
NS	4	53500152	JOINT WIRE CRIMP STYLE
NS	2	53500254	TERMINAL DISC FEMALE .020 22-18 AWG
NS	1	63011006	CABLE DC POWER SUPPLY ASSY AC INPUT
NS	1	63011007	CABLE GROUND WIRE ASSEMBLY
NS	1	64911001	HARNESS SAFETY INTERLOCK
NS	1	64911002	HARNESS SHEET SENSOR
NS	1	64911003	HARNESS DC POWER SUPPLY
NS	1	64911007	HARNESS DRIVE CONTROL
NS	3	23500079	HOLDER ADHESIVE WIRE
NS	3	435SO263	CABLE TIE WRAP
NS	1	53511020	POWER CORD (115V MODELS ONLY)
NS	1	53522210	POWER CORD / ALLEN WRENCH SET (230V ONLY)

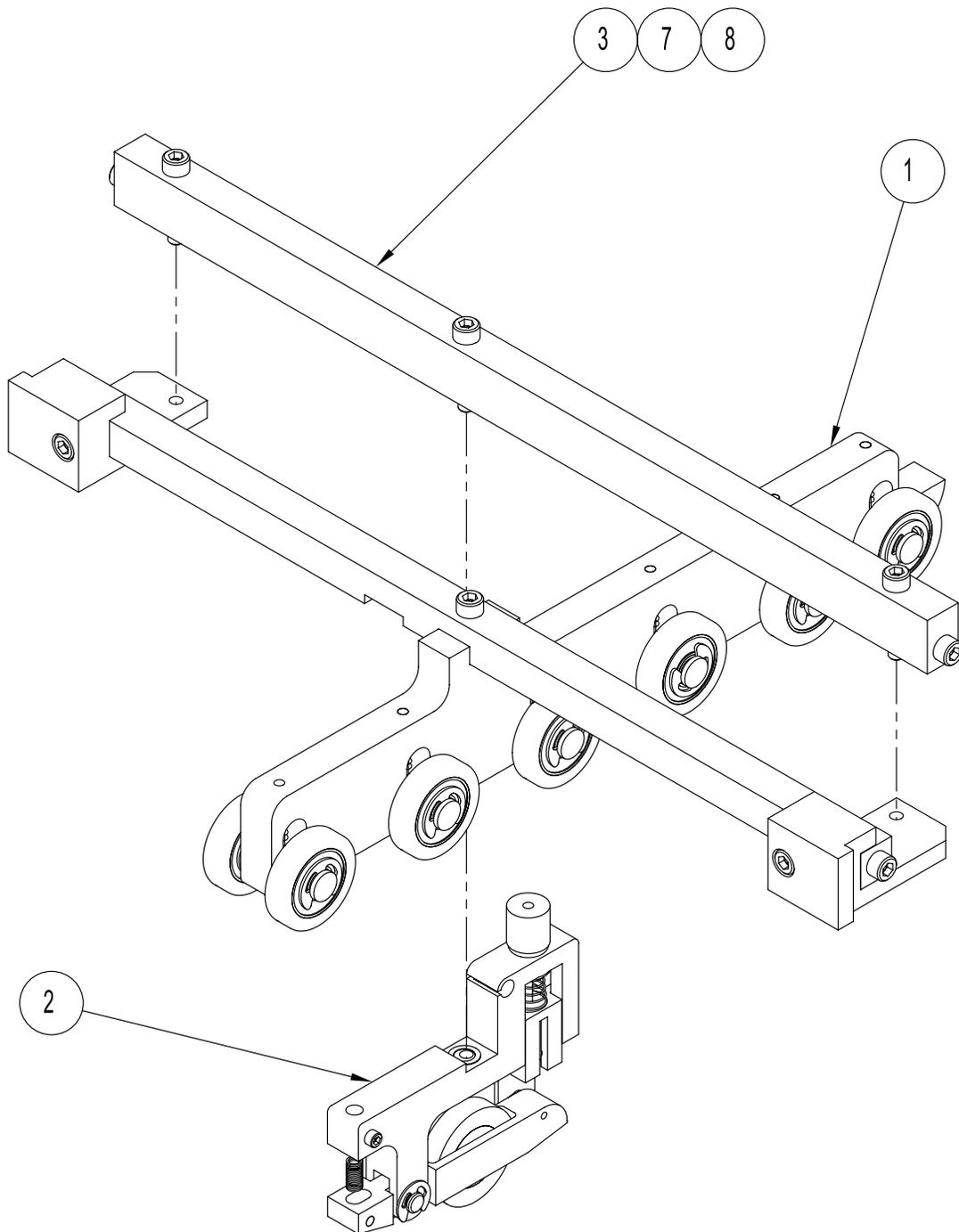
NS = NOT SHOWN

# 8 Optional Components

---

## QUICKSET DOUBLE DETECT ASSEMBLY

Assembly # : 63011097



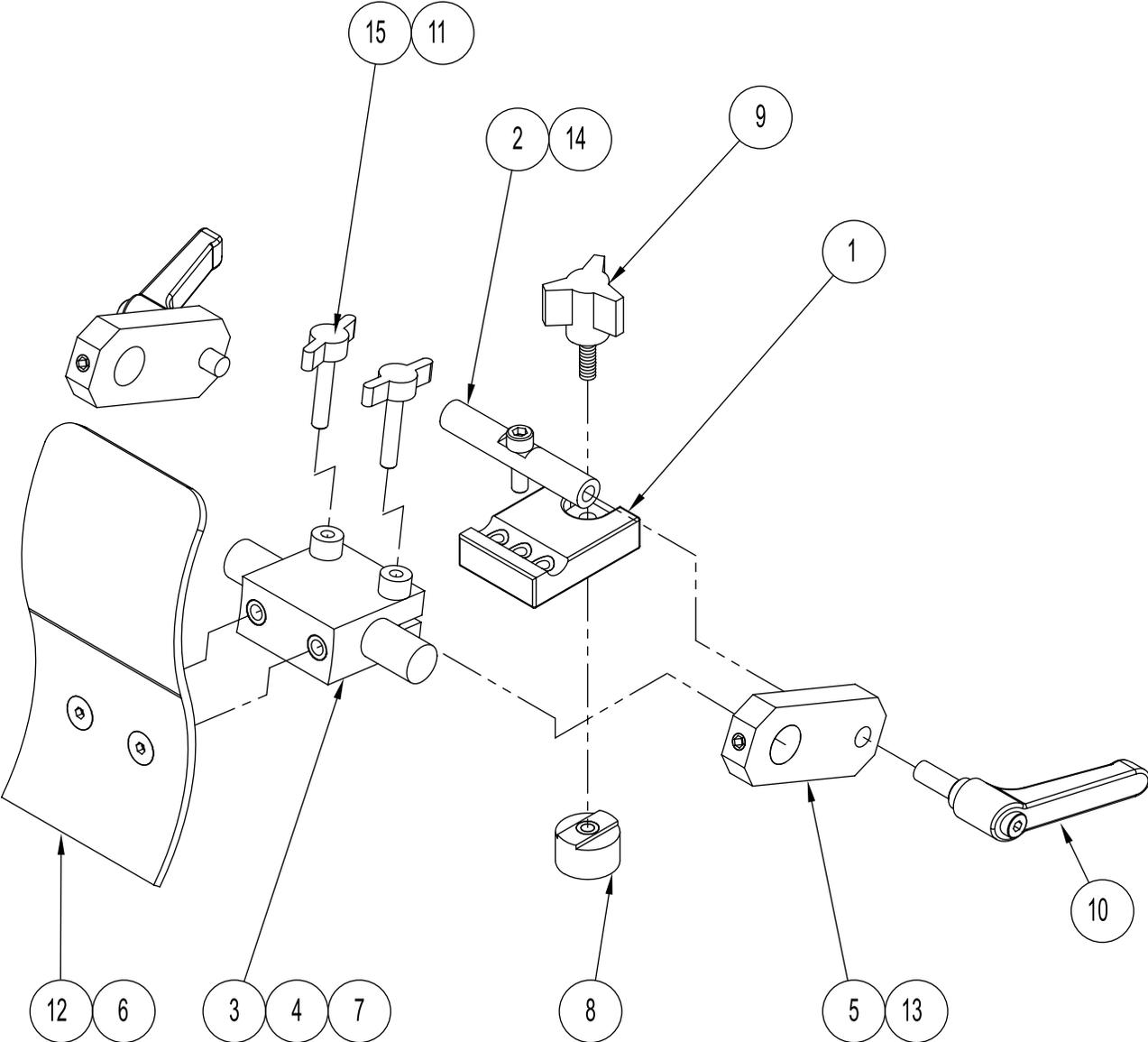
**QUICKSET DOUBLE DETECT ASSEMBLY**

**Assembly # : 63011097**

<b>ITEM</b>	<b>QTY.</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	1	14380008	ASSY, HOLD DOWN DD
2	1	14380009	ASSY, QUICKSET DD
3	1	51438016	BAR, CROSS EXT DISCHARGE
4	1	14380005	ASSY, HARNESS QUICKSET DD
5	1	14380006	ASSY, CBLEXTENQCKST DD
6	1	900459	MANUAL, QUICKSET DBLDETECT
7	3	102688B07	SHCS #10-32 X 1
8	4	102937B02	SHCSS/S 10-32 X .38

**SINGLE S WEDGE ASSEMBLY**

**Assembly # : 63311026**



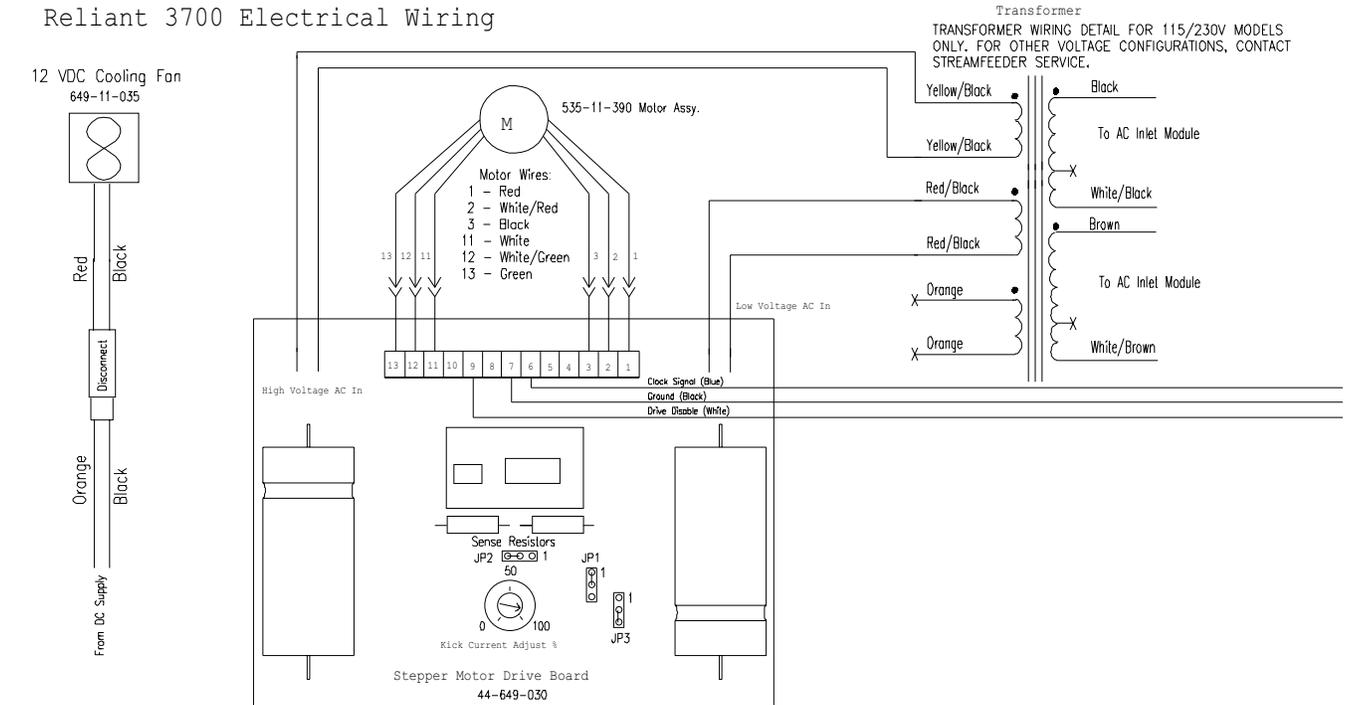
## **SINGLE S WEDGE ASSEMBLY**

**Assembly # : 63311026**

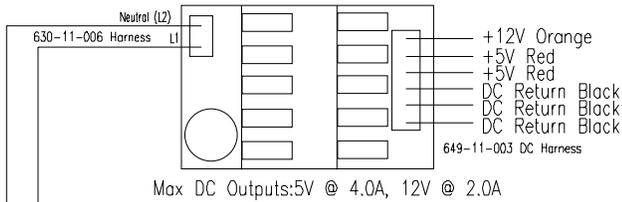
<b>ITEM</b>	<b>QTY.</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	1	44633014	WEDGE BLOCK
2	1	44633032	SHAFT, WEDGE GUIDE
3	1	44633026	BLOCK MOUNTING
4	1	44633028	SHAFT PIVOT BLOCK
5	2	44340013	BRACKET, ROLLER
6	1	44633025	S WEDGE
7	2	44633027	SPACER
8	1	44633016	ROUND T-NUT
9	1	44633033	KNOB, 3 ARM
10	2	44340015	RATCHET HANDLE, 1/4
11	2	23500076	WING KNOB
12	2	102637B02	FHCS #10-32 X 3/8
13	2	102733B03	SSSCPPT 1/4-20NC X .25
14	1	102688B04	SHCS #10-32 X 5/8
15	2	102688B07	SHCS #10-32 X 1

# 9 Electrical Components

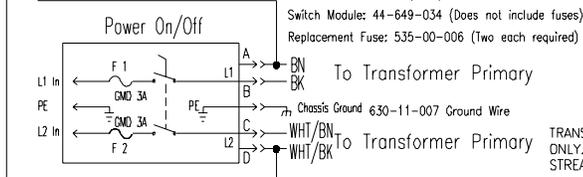
## Reliant 3700 Electrical Wiring



### 5 & 12 volt DC Power Supply 44-649-033



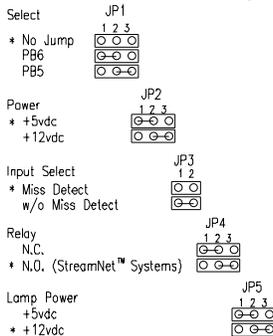
### Filtered AC Input/Switch Module



### Expansion Board

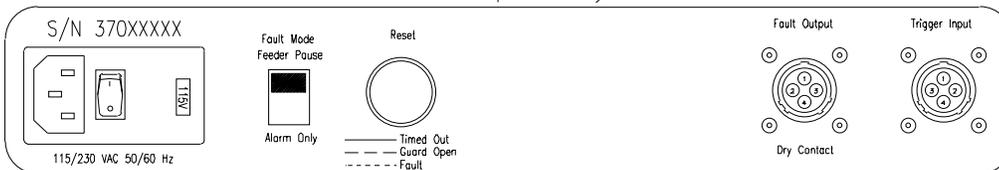
#### Optional Jumper Settings

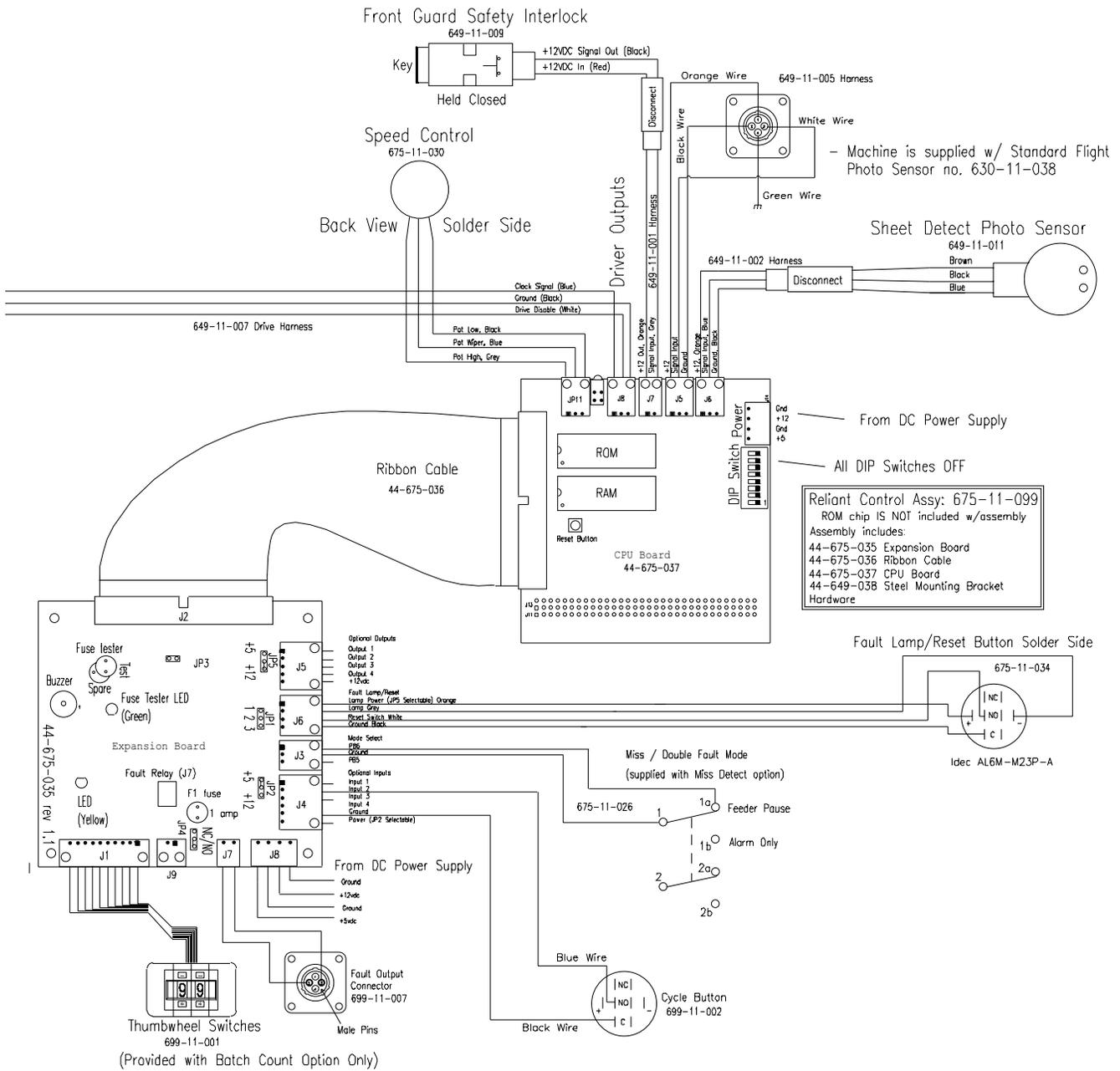
\* = Factory Default Jumper Settings



TRANSFORMER WIRING DETAIL FOR 115/230V MODELS ONLY. FOR OTHER VOLTAGE CONFIGURATIONS, CONTACT STREAMFEEDER SERVICE.

### Graphic Overlay



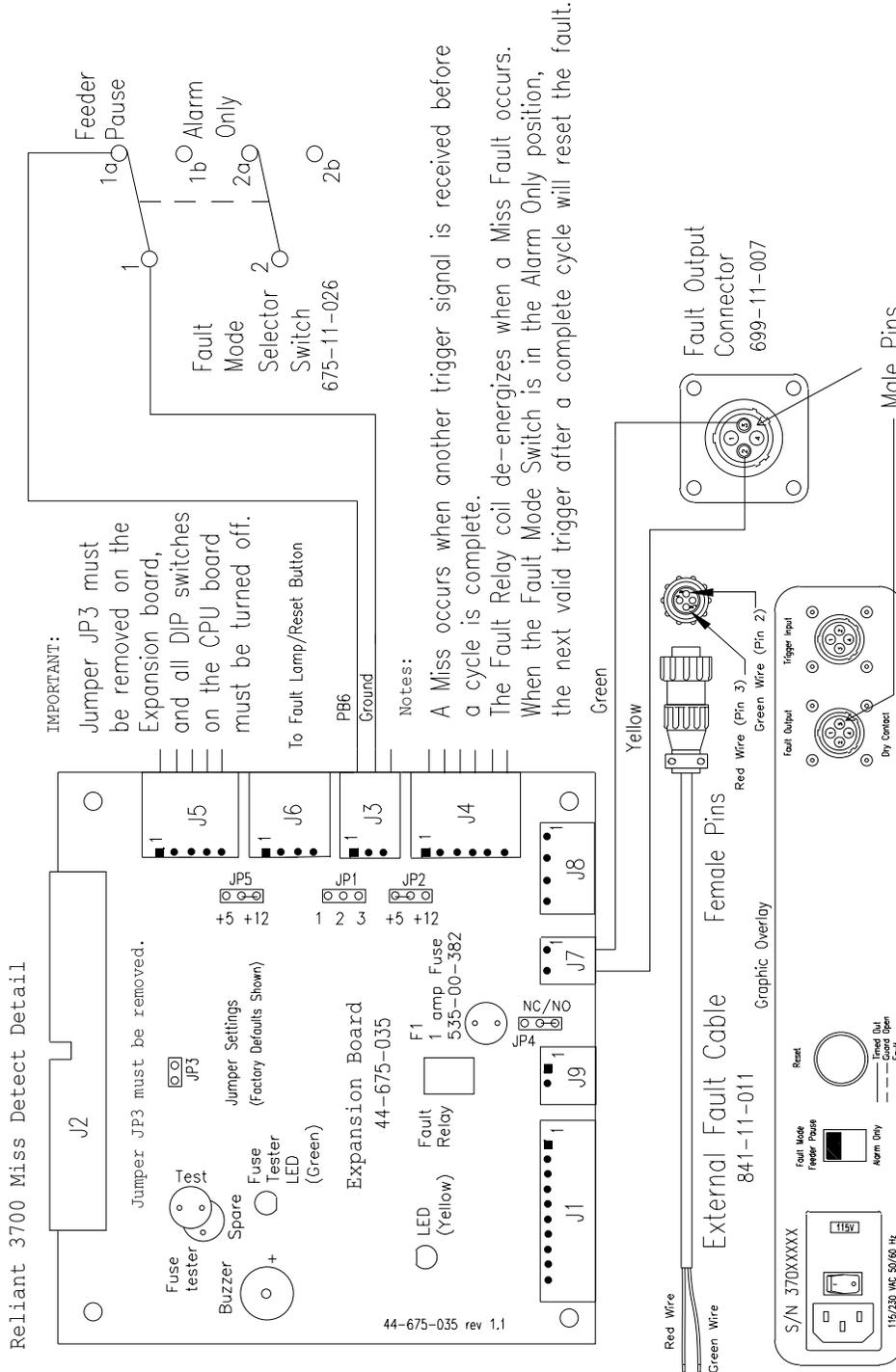


Reliant 3700 Series Electrical Wiring Diagram

Controlled Document No. 44-699-100

Rev  
A

# Reliant 3700 Miss Detect Detail



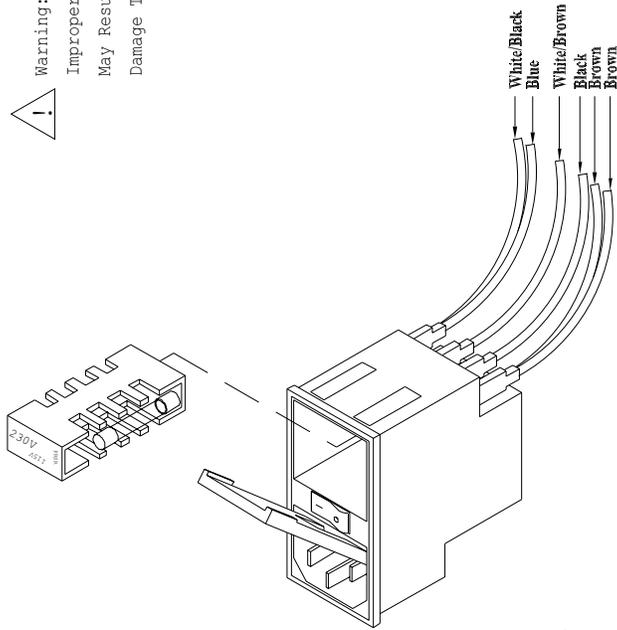
Reliant 3700 Miss Detect Option Detail

Rev: A

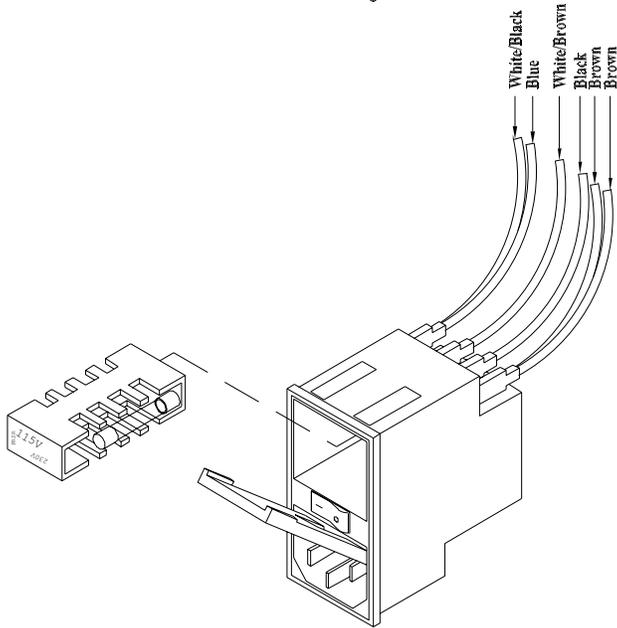
Controlled Document No. 44-699-101

# Power Entry Module Part Number 44649034

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



230 Volt Configuration

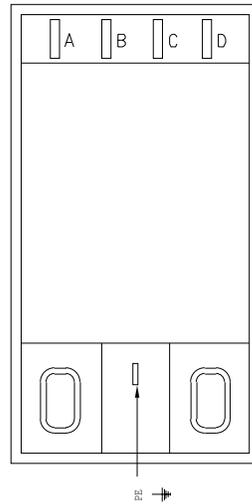


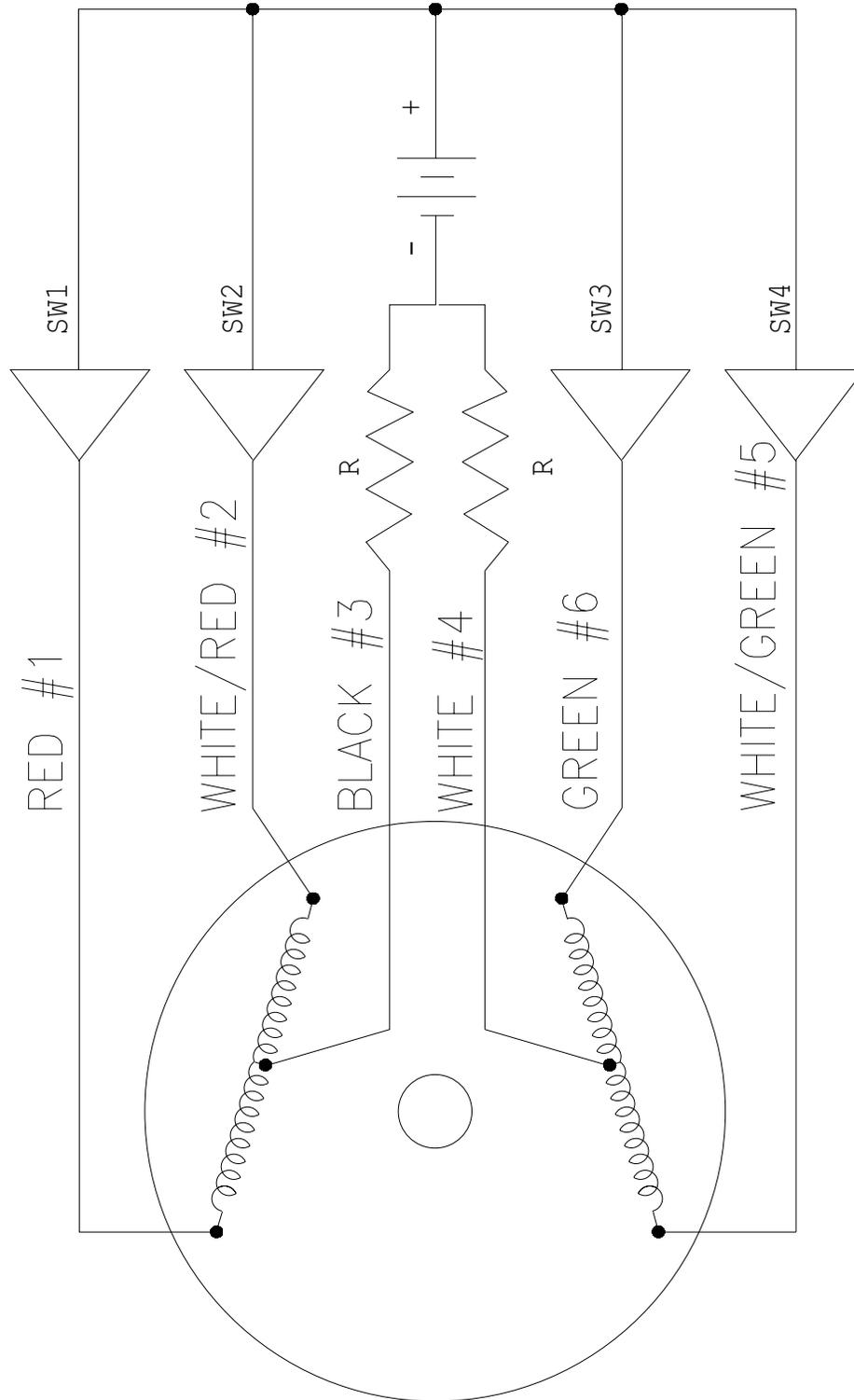
115 Volt Configuration

## AC Input Module Connections

Pin # - Color - Function

- A - Brown - To transformer & 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





Assignments

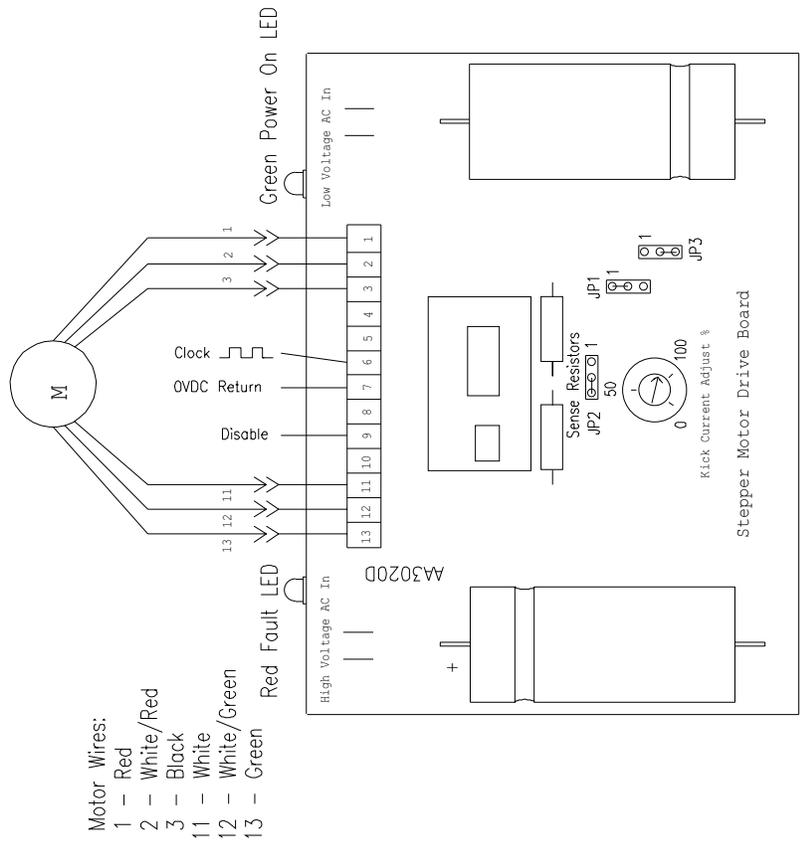
- 1 - Motor Phase 1
- 2 - Motor Phase 3
- 3 - Phases 1 & 3 Common
- 4 - Not Used
- 5 - Not Used
- 6 - Clock Input
- 7 - 0 VDC/Ground
- 8 - Not Used
- 9 - Motor On/Off (Active Low)
- 10 - Not Used
- 11 - Phases 2 & 4 Common
- 12 - Motor Phase 2
- 13 - Motor Phase 4

Jumper Settings

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

Fault Detection Protection LED Indication

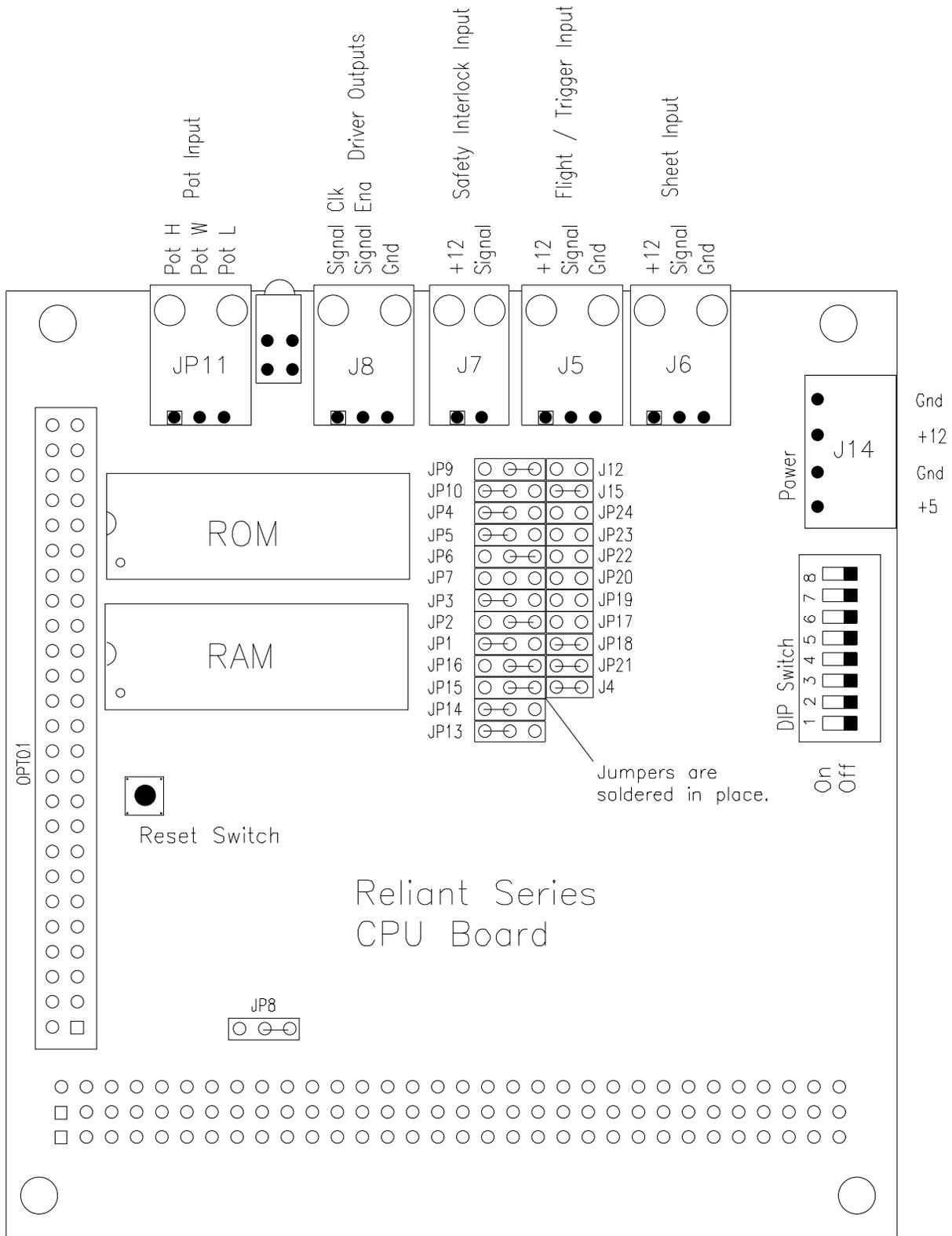
1	Red LED - Slow Blink	Short in Motor, Cable, or on Board
2	Red LED - Fast Blink	Open in Motor, Cable or on Board
3	Red LED - On Steady	Ground Fault (Voltage shorted to 0 volts)



- Motor Wires:
- 1 - Red
  - 2 - White/Red
  - 3 - Black
  - 11 - White
  - 12 - White/Green
  - 13 - Green

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

**Reliant Series CPU Board** Part Number 44675057



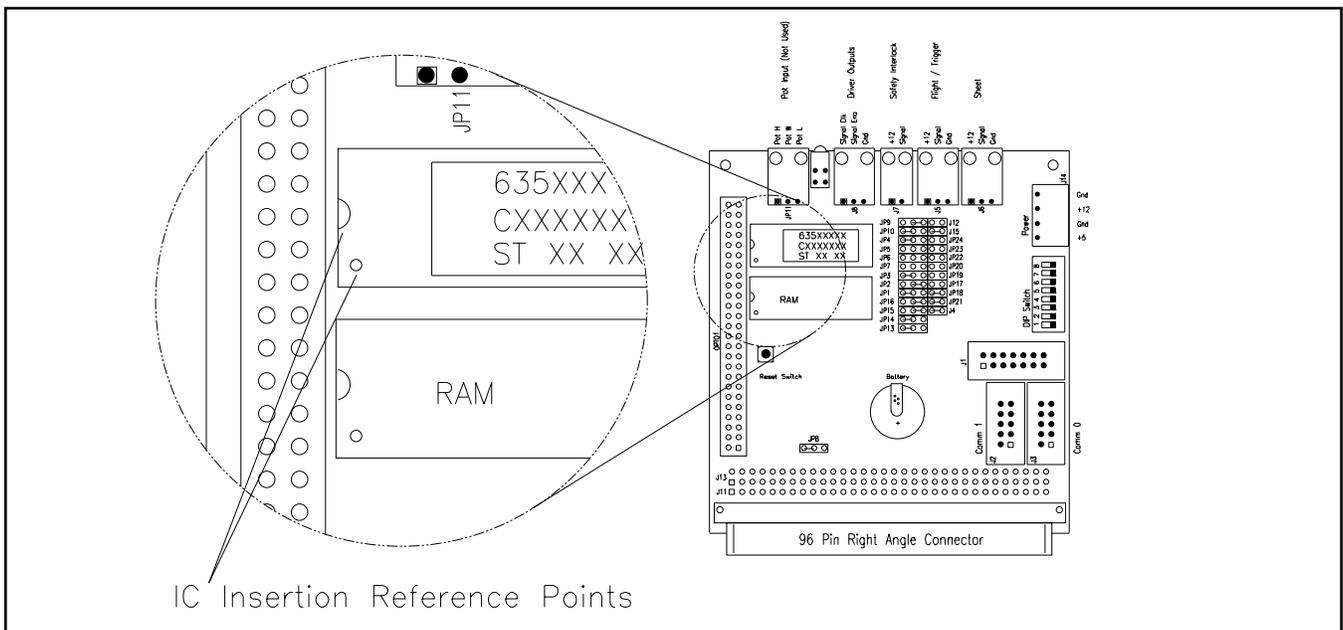
# EPROM Replacement



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

When replacing the EPROM on the CPU board, please take the following precautions:

1. Always discharge yourself when handling any electronic component (CPU board or EPROM).
2. When removing the EPROM from the socket, be very careful not to bend any pins on the IC.
3. When inserting the EPROM:
  - a. Verify the orientation (as shown in figure 8-1). The notch should be on the side closest to the 50 pin ribbon cable connection.
  - b. Make sure all the pins on the EPROM are in the socket before applying pressure to completely seat the IC.



EPROM Location on CPU Board

Pin #	Function	Wire Color
1	No connection	White
2	Contact common	Green
3	Contact N.O. or N.C	Red
4	No connection	Black

\* Selectable N.O. or N.C. contact rated at 1 amp maximum; internally fused.

## Fault Output (Dry Contact) Pin-Outs

# 10 Technical Troubleshooting

---

## General Troubleshooting Terms



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

The “drive” consists of the AC power supply (transformer), the stepper motor drive board, and the motor. The “controls” consist of the DC power supply and the control assembly. This control assembly consists of the CPU board, the I/O expansion board, and any ribbon cables and wiring harnesses. Once it is determined that you have a drive problem, a controls problem, or both, the first thing to check is the power supply for that section.

---

## The Fault Lamp Reset Button

The Fault Lamp Reset Button will indicate each type of fault with a unique blinking routine. The audible beeper on the Expansion board will also sound in parallel with the blink routine. There are four possible blink/beep routines, as follows:

1. Lamp/Beep Steady On. This routine indicates the feeder has “timed out.” A time out occurs when the sheet sensor does not sense the leading edge of a piece of fed material within about 2 seconds between sheets after a cycle begins. Keep in mind that the feeder must be set up correctly, evidenced by good separation between sheets. The sheet sensor must see a gap between fed sheets. If there is trouble with this routine, refer to the section titled “*Steady beep is heard, reset button is illuminated, and pressing button does not reset fault.*”
2. Lamp/Beep alternates On/Off. This routine indicates that the front safety shield is open. The safety shield must be closed at all times during feeder operation. If there is trouble with this routine, refer to the section titled “*On/Off beeping sound is heard, reset button blinks, and pressing button does not reset fault.*”
3. Lamp/Beep, On/Off combined with a Low Tone/High Tone. This routine indicates a miss has been detected. This is supplied with Miss Detect, evidenced by the presence of a fault output connector. A miss is detected if another trigger signal is given before a feed cycle has been completed.
4. Short duration Lamp/Beep followed by a longer duration Lamp/Beep. This routine indicates a double has been detected. This should only occur if the Double Detect option is installed.

Problem	Solution
<p><b>No power to feeder when power switch is turned on</b></p> <div data-bbox="152 394 298 457" style="border: 1px solid black; padding: 2px; margin: 10px 0;">  <b>NOTE</b> </div> <p><i>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.</i></p>	<ol style="list-style-type: none"> <li>1. Make sure there is power present at the AC main where the feeder is plugged in.</li> <li>2. Check three-wire AC power cord for integrity at all three points.</li> <li>3. Remove power cord from AC input switch module and disconnect the four space connector leads located on the back of the module inside the feeder.</li> <li>4. Check the two fuses located inside the feeder's input power module. BOTH fuses must be present and test good. <ol style="list-style-type: none"> <li>a. Observe the voltage label showing through the window on the fuse housing for the proper orientation when the holder is re-inserted.</li> <li>b. A small screwdriver inserted under the tab will allow you to pry open the fuse housing. Remove the red fuse holder. If the smaller 5mm x 20mm fuse is present, verify that the metal tab "finger" is holding the fuse in the forward position. Make sure it has not allowed the fuse to slide back toward the outside of the feeder and away from where contact with the metal pressure points inside the module body is made.</li> <li>c. Use an ohmmeter to test the fuses. A visual inspection will not always be sufficient to determine fuse integrity. If necessary, replace with fuses of the same rating only.</li> </ol> </li> <li>5. Reconnect power cable and, with power switch turned "on", check for presence of AC at the output spade connectors on the back of the module where the transformer primary lead connections are made.</li> <li>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.</li> </ol>
<p><b>Fuses blow on power up</b></p> <div data-bbox="152 1119 298 1182" style="border: 1px solid black; padding: 2px; margin: 10px 0;">  <b>NOTE</b> </div> <p><i>A fuse failure indicates a problem with the last item connected before failure occurs.</i></p>	<ol style="list-style-type: none"> <li>1. Install known good fuses of same rating only.</li> <li>2. Disconnect all AC loads from the input: <ol style="list-style-type: none"> <li>a. The transformer primary.</li> <li>b. The DC supply's AC input leads.</li> <li>c. Remove the red and yellow wire pairs from the stepper motor drive board.</li> </ol> </li> <li>3. Reconnect AC loads one item at a time while alternately applying power between new connections. Connect each load as follows one at a time to determine the faulty part: <ol style="list-style-type: none"> <li>a. Connect the transformer primary leads to the AC input module.</li> <li>b. Connect leads to the two-pin AC input connector of the DC power supply.</li> <li>c. Connect the red and yellow wire pairs of the transformer secondary to the stepper motor drive board.</li> </ol> </li> </ol>

Problem	Solution
<p><b>Decreased power experienced after fuse is replaced</b></p>  <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>
<p><b>Decreased power experienced after drive board is replaced</b></p>	<p>The drive board must have its “kick current” dial set to at least 90%.</p>
<p><b>Motor does not run, is noisy, makes a “growling” sound, or runs in reverse</b></p> <div data-bbox="152 940 297 1003" style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">  <b>NOTE</b> </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"> <li>1. 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 approximately 4.5 VAC to 5.5 VAC across red pair of wires. If green LED is not illuminated and the transformer voltages test good, replace drive board. Otherwise, continue with next step.</li> <li>2. Look at the red LED on the stepper motor drive board. Is it illuminated? <ol style="list-style-type: none"> <li>a. If yes, go to section titled “Drive board red LED illuminated,”</li> <li>b. If no, continue with next step.</li> </ol> </li> <li>3. Remove white wire from pin 9 of the stepper motor drive board 13-pin connector. 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.</li> <li>4. 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 with next step.</li> <li>5. 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 13-terminal connector to the drive board. <ol style="list-style-type: none"> <li>a. Power-up the feeder and verify the reset button is not illuminated. If a reset cannot be accomplished refer to the section titled “On/Off beeping sound is heard, reset button is illuminated, and pressing button does not reset fault.”</li> <li>b. Verify signal is present on pins 6 and 7. When the speed control knob is fully CCW, no pulse or a very low pulse frequency will be measured. When the speed control is fully CW, the frequency could be measured as high as 8.2 kHz. It is recommended to set the run speed at about 50% where the frequency measured should be somewhere between 3000 and 4000 Hz.</li> </ol> </li> </ol>

Problem	Solution
<p><b>Motor does not run, is noisy, makes a “growling” sound, or runs in reverse (continued)</b></p>	<ul style="list-style-type: none"> <li>c. Check integrity of both ends of drive wiring harness between the CPU board connector J8 and the 13-terminal connector to the drive board.</li> <li>d. Using a digital multimeter or an oscilloscope, measure the amplitude of the pulse train and verify that it is at least 2.3VDC.</li> <li>e. If pulse test results are good, replace the stepper motor drive board. If the pulse tests results are negative, the pulse output on connector J8 of the CPU board is bad, and the control assembly must be replaced.</li> </ul>
<p><b>Drive board red LED illuminated</b></p> <div style="border: 2px solid black; padding: 2px; text-align: center; font-weight: bold; font-size: 1.2em;">IMPORTANT</div> <p><i>The stepper motor drive board has been designed to protect itself if motor problems occur. If a problem with the motor wires or motor is found and corrected, the board will still drive a good motor after correction is made. However, the board cannot protect itself from transient voltage spikes and/or power sags or brown-outs. It is highly recommended that 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>	<ul style="list-style-type: none"> <li>1. Slow Blink: (about once per second) indicates a SHORT in motor, motor cable, or drive power component. <ul style="list-style-type: none"> <li>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.</li> <li>b. If wires look OK, go to section titled “Testing stepper motor drive board output pins.”</li> <li>c. If stepper motor drive board test results are positive, replace the motor. For further information, see the section titled “Testing motors.”</li> </ul> </li> <li>2. Fast Blink: (multiple times per second) indicates an OPEN in motor, motor cable, or drive component. <ul style="list-style-type: none"> <li>a. Check integrity of motor wires and/or cable. None of the wires should measure open, or be disconnected or loose from their terminals.</li> <li>b. If wires check OK, go to section titled “Testing stepper motor drive board output pins”.</li> <li>c. If stepper motor drive board test results are positive, replace the motor. For further information, see the section titled “Testing motors.”</li> </ul> </li> <li>3. On Steady: indicates a ground fault (wire shorted to zero volts). <ul style="list-style-type: none"> <li>a. Remove ground fault.</li> </ul> </li> </ul>
<p><b>Testing stepper motor drive board output pins</b></p> <div style="border: 1px solid black; padding: 2px; display: inline-block;">  NOTE </div> <p><i>A digital multimeter is required for these tests.</i></p> <div style="border: 1px solid black; padding: 2px; display: inline-block;">  NOTE </div> <p><i>Measuring zero volts drop across one of these pins may be evidenced by blowing fuses on power-up. See section titled “Fuses blow on power up.”</i></p>	<ul style="list-style-type: none"> <li>1. Remove 13-terminal plug-in motor wire coupler from the drive board.</li> <li>2. Test motor phase pins. <ul style="list-style-type: none"> <li>a. Set the multimeter to Diode Test.</li> <li>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 jumper JP2.</li> <li>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 to 0.55V, then the unit is faulty and must be replaced.</li> </ul> </li> <li>3. Test motor common pins: <ul style="list-style-type: none"> <li>a. Touch the BLACK meter lead to the positive lead of the large blue capacitor on the left side of the board, which is located below the red fault indicator LED.</li> <li>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 to 0.55V, then the unit is faulty and must be replaced.</li> </ul> </li> </ul>

Problem	Solution
<p><b>Fan does not operate/Test- ing DC power supply</b></p> <p> <b>NOTE</b> <i>The DC supply has dual out-puts: 5 and 12 volts DC.</i></p> <p> <b>NOTE</b> <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> <p> <b>IMPORTANT</b> <i>Continued operation of the machine without the cooling fan working properly will cause further damage to the internal electronic components.</i></p>	<ol style="list-style-type: none"> <li>1. Refer to the DC power supply board diagram. Remove 6-pin DC wiring harness connector from output of DC supply. Measure the supply's output pins for the presence of DC power. <ol style="list-style-type: none"> <li>a. If voltages are not present, verify AC power is being applied to AC input.</li> <li>b. Also check the fuse on the supply's AC input. If the fuse is bad, and replacing it causes fuse failure to occur again, replace the supply.</li> <li>c. If the fuse is good, AC power is being applied, and DC power cannot be measured, replace supply.</li> </ol> </li> <li>2. Verify good electrical connections to pins in DC wiring harness 6-pin quick disconnect plug. Reconnect harness.</li> <li>3. Check for shorted wires in the DC wiring harness on output of supply. A short will cause the supply to shut down. The power supply should operate normally after the short is removed.</li> <li>4. Test DC wire harness 4-pin plug in connectors to the CPU and Expansion Boards for the presence of 5 and 12 volts DC.</li> <li>5. Test wire harness to fan quick-disconnect plug for the presence of 12VDC.</li> <li>6. Replace fan.</li> </ol>
<p><b>CPU board "heartbeat" pulse not present</b></p>	<ol style="list-style-type: none"> <li>1. Two LEDs are located on the CPU board. The "heartbeat" LED is the green LED. The green LED should blink at regular intervals under normal operation when the feeder is powered on. Make sure the front safety shield is closed completely, and no error conditions are present.</li> <li>2. Check output of DC power supply. See section titled "Fan does not operate/Testing DC power supply."</li> <li>3. Verify ribbon cable integrity between CPU board and Expansion Board.</li> <li>4. Check that the ROM and RAM chips are seated properly in their sockets. Improperly seated chips may cause the CPU board to indicate a problem by illuminating the red LED located next to the green "heartbeat" LED. The red LED should not illuminate.</li> <li>5. Replace Reliant Control Assembly.</li> <li>6. Replace ROM chip.</li> </ol>

Problem	Solution
<p><b>On/Off beeping sound is heard, reset button blinks, and pressing button does not reset fault</b></p> <p> <b>NOTE</b></p> <p><i>Power must be on during the following tests. Exercise caution.</i></p> <p> <b>NOTE</b></p> <p><i>The following steps assume the output of the DC power supply is working and both 5 and 12 volts are present at the CPU and Expansion Board input connectors. If not, see section titled "Fan does not operate/Testing DC power supply."</i></p> <p> <b>NOTE</b></p> <p><i>The following steps assume the blinking green "heartbeat" LED is present on the CPU board. If not, see section titled "CPU board 'heartbeat' pulse not present".</i></p>	<ol style="list-style-type: none"> <li>1. Remove reset button harness from Expansion Board connector J6.</li> <li>2. Using a small metal blade screwdriver, short pins 3 and 4 together on Expansion Board connector J6.</li> <li>3. Did shorting these pins reset the feeder? <ol style="list-style-type: none"> <li>a. Yes: The reset switch harness assembly is faulty. Repair or replace as necessary.</li> <li>b. No: Verify continuity at reset button closure, reconnect the reset button harness to the Expansion Board connector J6. Press the reset button after trying each of the following steps:</li> </ol> </li> <li>4. Verify that the discharge safety shield is closed completely.</li> <li>5. Is E-Stop option installed? <ol style="list-style-type: none"> <li>a. Yes: Go to step 6.</li> <li>b. No: Go to step 7.</li> </ol> </li> <li>6. Verify E-Stop switch is out of the locking stop position by twisting and pulling the red knob out.</li> <li>7. Remove the safety interlock harness from connector J7 of the CPU board.</li> <li>8. Using a small metal blade screwdriver, short pins 1 and 2 together on CPU board connector J7, keep them shorted, and press the reset button. Does pressing the reset button reset feeder? <ol style="list-style-type: none"> <li>a. Yes: Go to step 9.</li> <li>b. No: Go to step 10.</li> </ol> </li> <li>9. Connector J7 input is good. Check the integrity of safety interlock harnesses and the safety interlock switch. If E-Stop option is installed, check the integrity of this harness and switch assembly as well. Repair or replace as necessary.</li> <li>10. Replace Reliant Control Assembly.</li> <li>11. Replace ROM chip.</li> </ol>
<p><b>Steady beep is heard, reset button is illuminated, and pressing button does not reset fault</b></p> <p> <b>NOTE</b></p> <p><i>Power must be on during the following tests. Exercise caution.</i></p>	<ol style="list-style-type: none"> <li>1. Verify firm connection and that the integrity of the ribbon cable connected between the CPU and Expansion Boards is intact.</li> <li>2. Remove reset button harness from Expansion Board connector J6.</li> <li>3. Using a small metal blade screwdriver, short pins 3 and 4 together on Expansion Board connector J6. Did shorting these pins reset the feeder? <ol style="list-style-type: none"> <li>a. Yes: The reset switch harness assembly is faulty. Repair or replace as necessary.</li> <li>b. No: Verify reset switch integrity, reconnect to Expansion Board connector J6 and go to step 4.</li> </ol> </li> </ol>

Problem	Solution
<p><b>Steady beep is heard, reset button is illuminated, and pressing button does not reset fault (continued)</b></p> <div data-bbox="164 365 310 428" style="border: 1px solid black; padding: 2px; margin-bottom: 10px;">  <b>NOTE</b> </div> <p><i>The following steps assume the output of the DC power supply is working and both 5 and 12 volts are present at the CPU and Expansion Board input connectors. If not, see section titled "Fan does not operate/Testing DC power supply."</i></p> <div data-bbox="164 747 310 810" style="border: 1px solid black; padding: 2px; margin-bottom: 10px;">  <b>NOTE</b> </div> <p><i>The following steps assume the blinking green "heartbeat" LED is present on the CPU board. If not, see section titled "CPU board 'heartbeat' pulse not present".</i></p>	<ol style="list-style-type: none"> <li>4. Verify the sheet sensor's power-on green LED is illuminated. Is the green LED illuminated? <ol style="list-style-type: none"> <li>a. Yes: Go to step 5.</li> <li>b. No: Go to step 7.</li> </ol> </li>   <li>5. Verify the sheet sensor's yellow LED sensing indicator illuminates when the sensor is covered, and goes dark when the sensor is uncovered. Is the yellow LED illuminated when the sheet sensor is covered, and dark when the sensor is uncovered? <ol style="list-style-type: none"> <li>a. Yes: Go to step 6.</li> <li>b. No: Go to step 7.</li> </ol> </li>   <li>6. Cover the sensor so that the yellow sensing LED is illuminated and press the reset switch. Did the feeder reset? <ol style="list-style-type: none"> <li>a. Yes: The feeder times-out as it should. Go through feeder setup and make sure the sensor sees the leading edge of the next sheet shortly after a piece of sheet material is removed from the feeder. If the leading edge of the next piece of material is not detected in time, the feeder "times-out" and stops, causing the steady audible beep and reset button lamp to illuminate.</li> <li>b. No: Go to step 7.</li> </ol> </li>   <li>7. Remove the sheet detect sensor harness from CPU connector J6 and measure for the presence of 12VDC across pins 1 and 3 of connector J6 on the board. Is the voltage present? <ol style="list-style-type: none"> <li>a. Yes: Go to step 8.</li> <li>b. No: Go to step 9.</li> </ol> </li>   <li>8. Test sheet sensor input. Using a small metal blade screwdriver, short pins 1 and 2 together on CPU board connector J6, keep them shorted, and press the reset button. Does the feeder reset? <ol style="list-style-type: none"> <li>a. Yes: The sheet sensor input on the CPU board is good. Repair faulty sheet sensor harness and/or replace sheet sensor.</li> <li>b. No: Go to step 9.</li> </ol> </li>   <li>9. Replace Reliant Control Assembly.</li>   <li>10. Replace ROM chip</li> </ol>

Problem	Solution
<p><b>Feeder Will Not Cycle: Testing the Trigger and/or Cycle Button Inputs</b></p> <p> <b>NOTE</b>  <i>The terms “flight sensor” and “trigger sensor” are synonymous.</i></p> <p> <b>NOTE</b>  <i>Power must be on during the following tests. Exercise caution.</i></p> <p> <b>NOTE</b>  <i>The following steps assume the output of the DC power supply is working and both 5 and 12 volts are present at the CPU and Expansion Board input connectors. If not, see section titled “Fan does not operate/Testing DC power supply.”</i></p> <p> <b>NOTE</b>  <i>The following steps assume the blinking green “heartbeat” LED is present on the CPU board. If not, see section titled “CPU board ‘heartbeat’ pulse not present”.</i></p> <p> <b>NOTE</b>  <i>The following steps assume the drive board green LED is illuminated and the red LED is NOT illuminated. If this is not true, see section titled “drive board red LED illuminated.” Also, the following steps assume the drive output pins test good. See the section titled “Testing stepper motor drive board output pins.”</i></p>	<p><b><u>The Trigger Input</u></b></p> <ol style="list-style-type: none"> <li>1. Verify the flight or trigger sensor’s power-on green LED is illuminated. Is the green LED illuminated? <ol style="list-style-type: none"> <li>a. Yes: Go to step 2.</li> <li>b. No: Go to step 3.</li> </ol> </li> <li>2. Verify the trigger sensor’s yellow LED sensing indicator illuminates when the sensor is covered, and goes dark when the sensor is uncovered. Is the yellow LED illuminated when the trigger sensor is covered, and dark when the sensor is covered? <ol style="list-style-type: none"> <li>a. Yes: Go to step 3.</li> <li>b. No: Go to step 4.</li> </ol> </li> <li>3. Remove the trigger sensor wire harness from CPU connector J5 and measure for the presence of 12VDC across pins 1 and 3 of connector J5 on the board. Is the voltage present? <ol style="list-style-type: none"> <li>a. Yes: Go to step 4.</li> <li>b. No: Go to step 5.</li> </ol> </li> <li>4. Test trigger sensor input. Using a small metal blade screwdriver, short pins 1 and 2 together on CPU board connector J5. Does the feeder trigger? <ol style="list-style-type: none"> <li>a. Yes: The trigger sensor input on the CPU board is good. Repair faulty trigger sensor wire harness and/or replace trigger sensor.</li> <li>b. No: Go to step 5.</li> </ol> </li> <li>5. Replace Reliant Control Assembly.</li> <li>6. Replace ROM chip.</li> </ol> <p><b><u>The Cycle Button Input</u></b></p> <ol style="list-style-type: none"> <li>1. Remove the cycle button wiring harness connector from the Expansion Board at Connector J4.</li> <li>2. Using a piece of wire, carefully short pin 2 to pin 5 of connector J4 on the Expansion Board. Shorting these two pins together should cause the feeder to run. Does the feeder cycle when the pins are shorted to one another? <ol style="list-style-type: none"> <li>a. Yes: The cycle button input on the Expansion Board is good. Repair faulty cycle button wire harness and/or replace cycle button.</li> <li>b. No: Go to step 3.</li> </ol> </li> <li>3. Replace Reliant Control Assembly.</li> <li>4. Replace ROM chip.</li> </ol>

Problem	Solution
<p><b>Testing the Fault Output Connector</b></p>	<ol style="list-style-type: none"> <li>1. Remove fuse F1 from the Expansion Board and measure across its pins for continuity. If continuity is not measured, replace the fuse.</li> <li>2. Fuse F1 is connected in series with a set of contacts inside the mini relay located on the Expansion Board. These contacts are brought out through connector J7. Jumper block JP4 selects the normally open or normally closed set of contacts. The normally open contacts close when the machine is powered on. Test the contacts: <ol style="list-style-type: none"> <li>a. Set jumper block JP4 in the N.O. position</li> <li>b. Using an ohmmeter, measure across pins 1 and 2 of connector J7. You should measure an open load.</li> <li>c. Power on the machine. The contacts should close and you should measure continuity across J7. If not, replace the Expansion Board.</li> </ol> </li> </ol>
<p><b>Testing Motors</b></p>	<p>Refer to the wiring diagram of the 6-lead DC Stepping Motor found elsewhere in this manual.</p> <p>These motors are NOT repairable, and should never be opened.</p> <p>The motors used in the Reliant Series of feeders have two windings: three leads associated with each winding, for a total of six leads. Each winding has a wire at each end of the winding, with a wire connected also 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"> <li>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 that the motor is bad and needs to be replaced.</li> <li>2. Since there are two separate windings, they need to measure electrically separate from each other. For example, 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 it must be replaced.</li> <li>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 it must be replaced.</li> </ol>



**Thiele**  
**Technologies** | **Streamfeeder**  
**PRODUCT LINE**

315 27th Avenue NE · Minneapolis, MN 55418 · USA  
TEL: (763) 502-0000 · FAX: (763) 502-0100  
EMAIL: [service@streamfeeder.com](mailto:service@streamfeeder.com)  
WEB: [www.streamfeeder.com](http://www.streamfeeder.com)

