

GBC STL1000 Semi- Automatic Twin Loop Binding Machine

Instruction Manual



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**GENERAL
CORPORATION**

BINDING

**AUTOMATED
DIVISION**

FINISHING

**STL-1000 SEMI-AUTOMATIC TWIN
LOOP BINDER**

60 Hz. SERVICE MANUAL REV 1.0

Section: pg.

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FOR YOUR SAFETY

Marty Moore

Your safety as well as the safety of others is important to us at GBC. In this Service Manual and on the STL1000 itself are important safety messages. *Please read these message carefully.*



The Safety Alert symbol precedes each safety message in this manual. This symbol indicates a potential safety hazard that could injure you or others, as well as cause product or property damage.

This safety message means that you could be seriously hurt or killed if you open the electrical enclosure and expose yourself to hazardous voltage:

This safety message means that your hands could be crushed and cut if you place your hands in the area of moving parts:

The following ISO and IEC symbols appear on this product.. Their meaning is:

“I” means Power On

“O” means Power Off

“ ! “ means emergency stop

“ O “ means dereel



Do not connect electrical power to the STL1000 or attempt to operate it before reading this Operators Manual or you have been fully trained as an operator.



Save the operator’s manual for future use and referral.



Keep hands, long hair, neckties, and loose articles away from moving parts.



Never override or attempt to defeat electrical or mechanical interlock devices



Never insert objects or spill liquids into the STL1000. They may contact dangerous voltage or short out components, resulting in fire or dangerous shock.



Connect the STL1000 only to the electrical supply shown in the machine specification section of this manual and the Serial/Rating label on the equipment. Connect to a power outlet installed near the equipment and easily accessible.



Connect the plug only to a matching receptacle, contact a qualified electrician to have one installed.



Turn the STL1000 power “Off” (O) at the end of each day.



Do not attempt to service the STL1000. Contact an authorized GBC service representative if any of the conditions listed below are encountered:

?? Liquid has been spilled into the STL1000 has been exposed to rain or water.
?? STL1000.

?? The STL1000 has been dropped, bumped, or dented.
?? The product does not operate normally when following the operating instructions.

WARNING:

SUPERVISORS PLEASE NOTE:

***THESE PRECAUTIONS MUST BE FOLLOWED
WHEN OPERATING OR SERVICING THIS MACHINE.***

- ?? ALL OPERATORS MUST BE PROPERLY TRAINED PRIOR TO USING THIS EQUIPMENT.**
- ?? READ INSTRUCTION MANUAL BEFORE OPERATING OR SERVICING THIS MACHINE.**
- ?? ONLY A TRAINED, QUALIFIED TECHNICIAN SHOULD SERVICE THIS MACHINE.**
- ?? DO NOT ATTEMPT SET-UP CHANGES UNLESS FULLY TRAINED.**
- ?? FOLLOW ALL STATE, LOCAL AND FEDERAL POWER LOCKOUT / TAGOUT STANDARDS WHEN SERVICING THIS EQUIPMENT.**
- ?? HAVING MACHINE UNDER POWER WHILE MAKING ALTERATIONS CAN RESULT IN SERIOUS BODILY INJURY. ALWAYS DISCONNECT ELECTRICAL POWER AND AIR SUPPLY BEFORE MAKING ALTERATIONS.**
- ?? NEVER OPERATE MACHINE WITHOUT ALL GUARDS IN OPERATING POSITION.**
- ?? SAFETY GLASSES SHOULD BE WORN AT ALL TIMES WHEN OPERATING THIS MACHINE OR MANUALLY CLIPPING WIRE.**

- **KEEP HANDS AND LOOSE CLOTHING AWAY FROM ALL MOVING PARTS.**

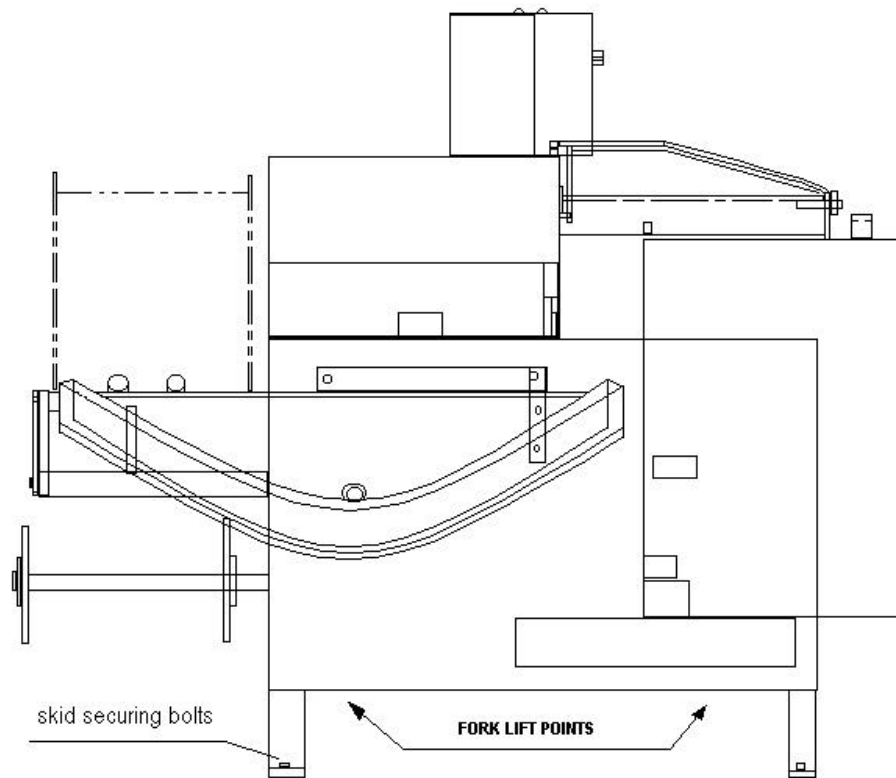
1. Installation and setup Preparation

Use this section to properly unpack ,set into place, and setup the **STL1000**.

- 1.1 Inspect the shipping container for any visible damage while the trucking company is still there . If you see any damage, file a damage claim with that trucking company immediately . Otherwise you may be responsible for any needed repairs.
- 1.2 Remove the cardboard slip cover and dispose of in accordance with local regulations.
- 1.3 Cut the banding material securing the output conveyor to the shipping skid. Remove conveyor from shipping skid and move to the location where the STL1000 is to be located in your facility .
- 1.4 There are four bolts securing the STL1000 to the shipping skid (REF. FIG. 1A). These bolts are located one in each foot pad of the STL1000. Use a ¼” Allen wrench to remove these bolts and discard.
- 1.5 Locate the orange colored foot pedal secured to the shipping skid. Remove the fasteners that secure the foot pedal to the skid and discard fasteners. Place foot pedal on the table top of the STL1000 . **CAUTION** Make sure the foot pedal will not fall off the table top. It may damaged by falling.
- 1.6 Refer to fig. 1A for fork lift points of the STL1000. Using a fork lift with a lift capacity of 700kg/2000lbs. , lift the STL1000 from the shipping skid and transport it to the operating location.
- 1.7 Have your electrician hook up the appropriate power requirements. Refer to section 3 of this manual to find the right requirements for your machine **CAUTION DO NOT APPLY POWER TO THE STL1000 !!** A GBC technician will check to insure proper power is present when installation is scheduled . **YOU WILL VOID YOUR WARRANTY IF YOU APPLY POWER.**
- 1.8 You will need to supply compressed air to the STL1000. Refer to section 3 of this manual for minimum air requirements . A quick connect is supplied on the air regulator located on the rear of the machine..
- 1.9 Be sure that you have TWIN LOOP WIRE and enough prepunched books to run your machine for at least one hour . Please contact your sales representative if you have any supply needs.
- 1.10 Contact GBC National service to schedule a technician to complete your installation.



FIGURE 1A



2.1 General

This manual is intended as a training and reference document for persons responsible for installation, service and maintenance of the STL-1000 binder. It is assumed the reader has basic mechanical and electrical troubleshooting abilities.

This Service Manual, revision (A), covers 220 Volt, 3 Phase, 60 Hz STL-1000, version 1 system.

2.2 Document Control

It is intended that future revisions of this document will be published, please refer to the revision number on the top of this page to determine the most recent.

2.3 Problem Solving

The path for solving problems with the STL-1000 should proceed in the following sequence:

- 1) Find the description of the problem in the table in section 16
- 2) Evaluate the list of possible causes for the probable one.
- 3) Proceed to the referenced section (see 4) for further diagnosis. Part replacement instructions (section 18 or 19) or adjustment instructions (section 6 thru 14).
- 4) If problem is not properly described in the problem column of the troubleshooting tables of section 16, reread the Theory of Operation (section 4) for insight.
- 5) If the problem is unsolved call for support with a clear description of the problem and the results of any unsuccessful solution you have tried.
- 6) ***Fill out and Fax the Problem Report Form*** (section 20) after solving the problem. A strong feedback loop from service personnel is the best way to improve the design and manufacturing of our products.

3. Specifications

Use this section to determine proper installation requirements as well as the capabilities of the STL-1000.

3.1 Purpose

The STL-1000 is designed to automatically supply spool fed Twin Loop elements cut to a specified length and is automatically staged for the next book to be bound.

Operator hung pre-punched documents are transported to the closing area, bound and are transported from the bind area to a stacking conveyor.

3.1.1 Dimensions

Machine only: 85" L x 56" W x 50" H (2.16M x 1.42M x 1.27M).

Smallest doorway machine will fit through 40" (1.016M) wide (with the removal of the spool holder assembly). NOTE: This unit should only be removed by a GBC service tech.

Recommended work area: 10 ft. x 10 ft. (3.05M x 3.05M).

Shipping: 65" x 91" x 60" high (1.65M x 2.31M x 1.52M).

3.2.2 Weight

Weight (machine only): 1200 lbs. (545.6Kgms.)

Shipping weight: 1350 lbs. (613.6Kgms.)

3.3 Electrical Power

2.3.1 Voltage	2.3.2 PHASE	2.3.3 Current	2.3.3 Short circuit interrupt
220 VAC, 60Hz	3	15 amps	capacity: 2000 A



3.4 Compressed Air

8 cfm at 80 psi (227L/min @ 522K Pa)

3.5 Environment

Ambient air temperatures, 41 degrees F to 104 degrees F. (5 degrees C to 40 degrees C.)

Altitude rating, up to 3280 feet (1000 meters).

3.6 Noise Generation

TBD

3.7 Initial Year of Manufacturing: 1999

3.8 Productivity

3.8.1 Cycle Time

The time the system takes to bind a placed document until it is ready to accept the next document, independent of the operator, is dependent on the specified length of the Twin Loop element.

The STL-1000 is capable of up to 1,000 books per hour.

3.8.2 Throughput

The number of documents produced in a given time period depends on element length, document punching quality, but most importantly operator proficiency.

3.9 Book Thickness

3.9.1

The STL-1000 can successfully bind documents within the capacity of each given Twin Loop element size. Use the element size chart supplied by your Twin Loop sales representative to determine the appropriate element for the book to be bound. If book size is at the maximum for a given size use the next larger size to insure quality closure of the bound book.

3.9.2 **Bind Length**

The STL-1000 is capable of a book bind length of a minimum of 3 inches (76mm) and with a maximum of 13 inches (330.2mm).

3.9.3 **Book Width**

The STL-1000 is capable of transporting books with the unbound edge width of 3 ½' (85.75mm)to 12' (304.2mm).

3.9.4 **Hole Quality**

The holes must be pre-punched in the paper and be of 2 to 1 or 3 to 1 punch pattern. The quality of the holes has a direct relationship on the success of the operators ability to load books on to waiting Twin Loop elements. Cleaner , crisp holes that align well from one page to the next will speed up the process of loading books on to the STL- 1000.

4. Theory of Operation of the STL-1000

Conditions at Power up of the STL-1000

1. Closing guard must be closed to actuate the closing guard interlock switch IS-1. IS-1 has two switches in one housing.
 - A. One side of the IS-1 breaks main power to the E-stop.
 - B. The other side of IS-1 is used to monitor 24 volts to the P.L.C. at X7 Which shouldn't be illuminated.
2. P.L.C. is in ready condition should have at least X0, X13 and Y12, or Y13.

Conditions After Power up of the STL-1000

1. Series of events after the depression of the foot switch (FS).
 - A. X6 on the P.L.C. will illuminate.
 - B. Y2 to energize Sol-2 (pusher) to advance book to closing area.
 - C. Y6 to energize 1CR to turn on 1M (feed motor) to feed element to be cut.
 - D. Y10 to energize 3CR to turn on 3M (belt) to advance element is cut.
2. During element feed cycle:
 - A. Either the signal from X4 (count prox 2:1) or X10 (count prox. 3:1) will be used to count the number of element legs to the number entered into the keypad.

- B. Once the entered number is reached Y6 (feed 1M) is turned off.
- C. Y4 energized Sol-4 (cut) which charges the air cylinder to swing the knife and drop the pawl into the element stop gear to stop rotation of the element feed shaft. At this point the feed shaft should be stopped so the knife can cut a stationary element. Through P.L.C. timer Sol-4 is deenergized through Y4 to release the knife and pawl.

Conditions After Power up of the STL-1000 (Continued)

- 3. Series of events during the book transport and closing cycle:
 - A. After pusher has advanced LS-2 (forward 1) will close and illuminate X1 on the P.L.C.
 - B. Y5 will energize Sol 1 (door) closing doors on the closing area guard. This will also open IS-2 at X13 and close IS-2 at Y3. (NOTE: IS-2 has two sets of switches in one housing).
 - C. Y3 energizes to fire Sol-3, which charges the closing air cylinder to actuate the closing ram to full down stroke.
 - D. When the ram reaches its full down stroke LS-3 (close) actuates and illuminates X2 on the P.L.C. and releases Sol-3 through Y3 to let the ram return to its home position. NOTE: Home position is fully up.
 - E. Sol-1 is deenergized through Y5, which opens the guard doors.
 - F. Sol-2 is deenergized through Y2. The pusher returns home and actuates LS-1, which illuminates X0 on the P.L.C.
 - G. Y11 energized 4CR (conveyor 4M) to advance conveyor to a predetermined distance through an entry from the keypad.

Conditions on a Need Basis

- 1. Dereel Unit

- A. When dereel switch is on auto, spool prox X3 illuminates when no element is present Y7 illuminates to fire 2CR which turns on 2M (dereel).
- B. When dereel switch is on manually pressing the green button will illuminate X15 then Y7 on the P.L.C. to turn on 2CR (dereel) which turns on 2M.

2. Pitch Selection

- A. When pressing 2:1 on the keypad Y12 on the P.L.C. will illuminate and fire Sol-5 to change the air cylinder to shift the feed sprocket. At this time X4 on the P.L.C. is being used to count 2:1 by prox switch.

Conditions on a Need Basis (Continued)

- B. When pressing 3:1 on the keypad Y13 will illuminate on the P.L.C. and fire Sol-6 to charge the air cylinder to shift the feed sprocket. At this time X10 is being used to count 3:1 by prox switch.

5. STL-1000 OPERATING INSTRUCTIONS FOR KEYPAD

MAIN MENU

When you first power up the machine you should see the following two lines on the Keypad.

B.COUNTER 0 (any number may appear)
SETUP MENU 0

Line 1: **“B. COUNTER:”** = Batch Counter. This counter will count the number of books, which are bound on the STL1000 and display a running total.

To reset this counter, use the ↵ arrow key to move the cursor over. When blinking, key in “0” from the numeric section of the keypad then press “ENTERS”. The value “0” will be displayed.

Line 2: **SETUP MENU:”** The Setup Menu will allow you to make other adjustments to control the STL1000. Use the ↵ arrow key to move the cursor over to the ↵ arrow. Press the “ENTER” key to get into the Setup menu.

Line 3: **“SERVICE MENU:”** The Service Menu will allow our service Technicians to monitor the STL1000 when making service calls. There is no useful information in this menu for the operator or setup person. You can get into the Service Menu in the same manner as the Setup Menu.

SETUP MENU

Line 1: **“NO. OF LOOPS:”**= Number of Loops required to bind your book.

Use the numeric keypad to key in the number of desired loops and press “Enter”.
The range of amount of loops is limited from five (5) through forty-two (42).

Line 2: “**CONVEYOR STEP:**” = The amount of travel desired on the Output conveyor. Use the numeric keypad to key in the amount of desired travel and press “ENTER”. The range of travel is limited to one (1) through six (6) inches.

Line 3: “**GOTO MAIN MENU:**” = This will bring you back to the Main Menu so the operator can view the batch count as they run the STL1000.
Press the “ENTER” key to return to the main menu.

Line 4: “**SERVICE MENU:**” = The Service Menu will allow our Service Technicians to monitor the STL1000 when making service calls. There is no useful information in this menu for the operator or setup person. You can get into the Service Menu in the same manner as the Setup Menu.

FUNCTION KEYS (fig. 1 Section 5)

There are six “Function Keys” on the keypad, which will allow you to activate certain functions of the STL1000 during the setup process.

PUSHER ADVANCE / HOME: This key will allow you to transport a prehung book into the closing area or to discharge a bound book onto the conveyor. Press this key again to return the Pushers back to the home position. NOTE: A red light will illuminate above the **PUSHER** key and the message “**AUTOMATIC CYCLE IS NOT READY!!!**” will appear on the display on the keypad. Make sure the pushers are in the home position and the display doesn’t read “**AUTOMATIC CYCLE IS NOT READY**” to run in automatic mode.

RAM DOWN / UP: This key will allow you close the element of the book in the closing area. Press this key again to return the Ram to the up position.

NOTE: A red light will illuminate above the **RAM DOWN / UP** key, also the message “**AUTOMATIC CYCLE IS NOT READY**” will appear on the display on the keypad when the RAM is in the down position.

3:1 This key will shift a gear in the feed area so you can run with 3:1 pitch elements.

2:1 This key will shift a gear in the feed area so you can run with 2:1 pitch elements.

FEED ELEMENT: This key will feed and cut an element to the desired length.

CUT ELEMENT: This key will cycle the cut unit, can be used to test knife block height setting or if an element didn’t cut in the auto cycle mode.

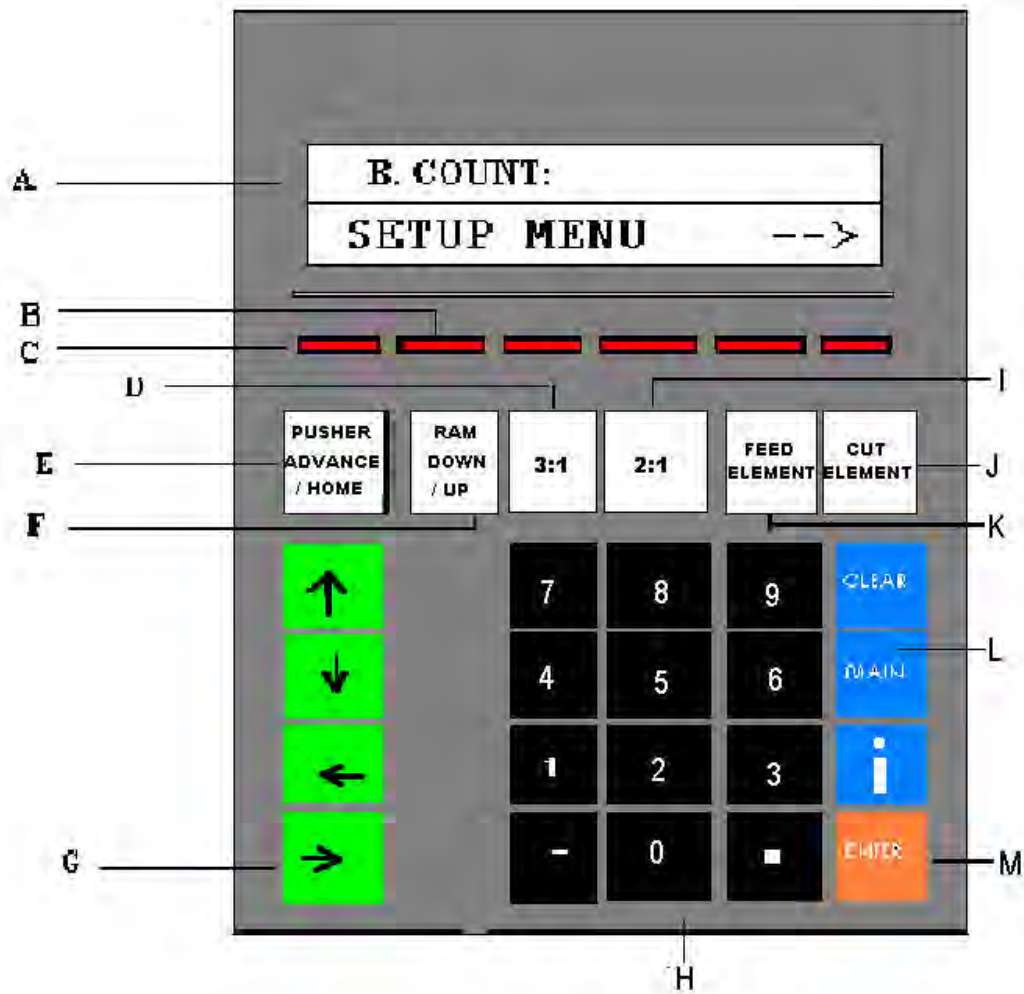


FIGURE 1

6. Spool and Supply Chute Loading the Spool

When viewing from the back of the machine, the spool of Twin Loop wire will rotate in a clockwise direction (See *figure 6-1*). For loading a new spool, the following steps are recommended:

1. Place the spool onto the two rollers with the wire unspooling from the top of the spool.
2. Make sure the end boards of the spool are riding between the flanges of the idler roller (See Figure 6-2). This will place the end boards on the knurled portion of the drive rollers.
3. Unspool approximately 5 feet of wire from the top of the spool. Place the wire over the top of the cross bar and between the two side guides (See Figure).

Note:

To unspool the wire, twist the collar on the despool button located on the top of the control box to manual, then push the green button until the desired length has been acquired.

IMPORTANT: Be sure to return the selector collar to auto on the despool button to feed wire automatically.

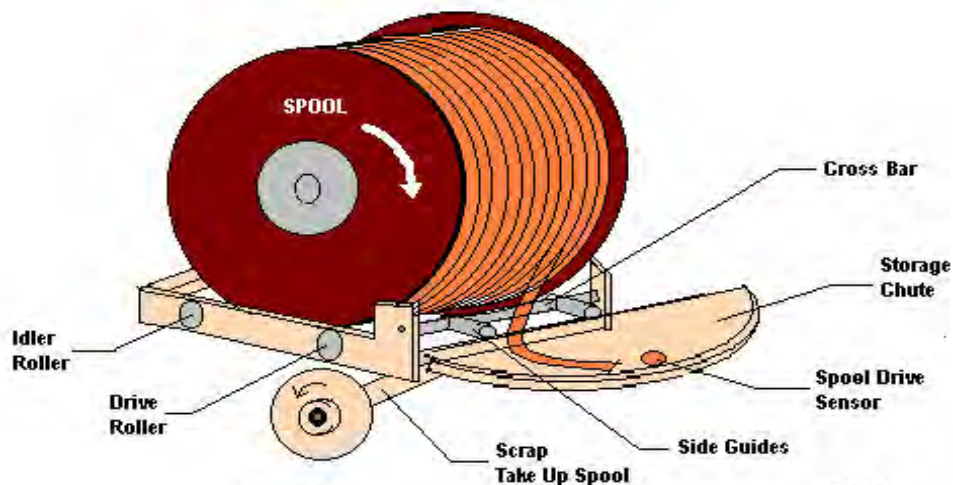


Figure 6-1

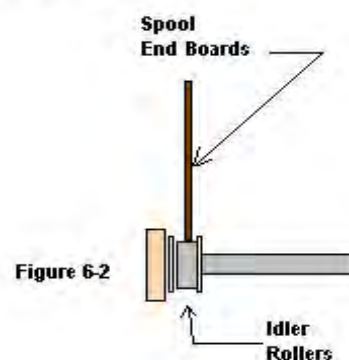


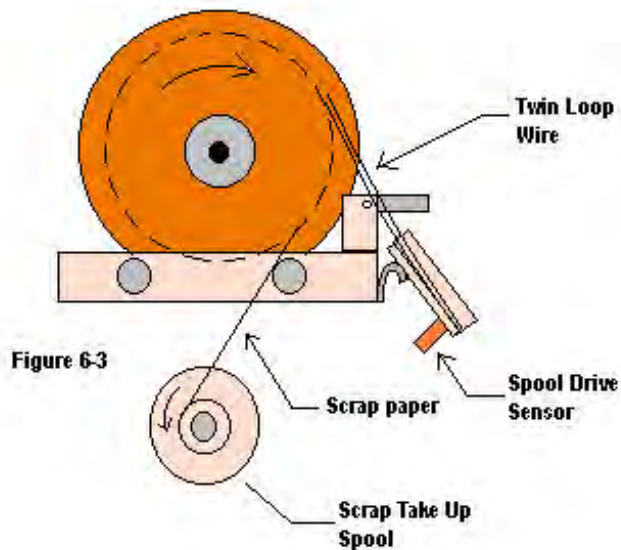
Figure 6-2

SPOOL AND SUPPLY CHUTE LOADING THE SPOOL (CONTINUED)

4. Lay the wire inside the storage chute and thread the scrap paper between both drive rollers and wind it up on the scrap take-up spool in a counter-clockwise direction (See *Figure 6-3*).

Notes:

1. The scrap paper should be wound taunt to prevent it from breaking when the spool drive starts up.
2. The storage chute has a sensor at the bottom to control the spool drive. The sensor will start and stop the spool drive on demand to replenish the supply of wire to the storage chute.



7. Spool and Supply Chute Adjusting the Supply Chute

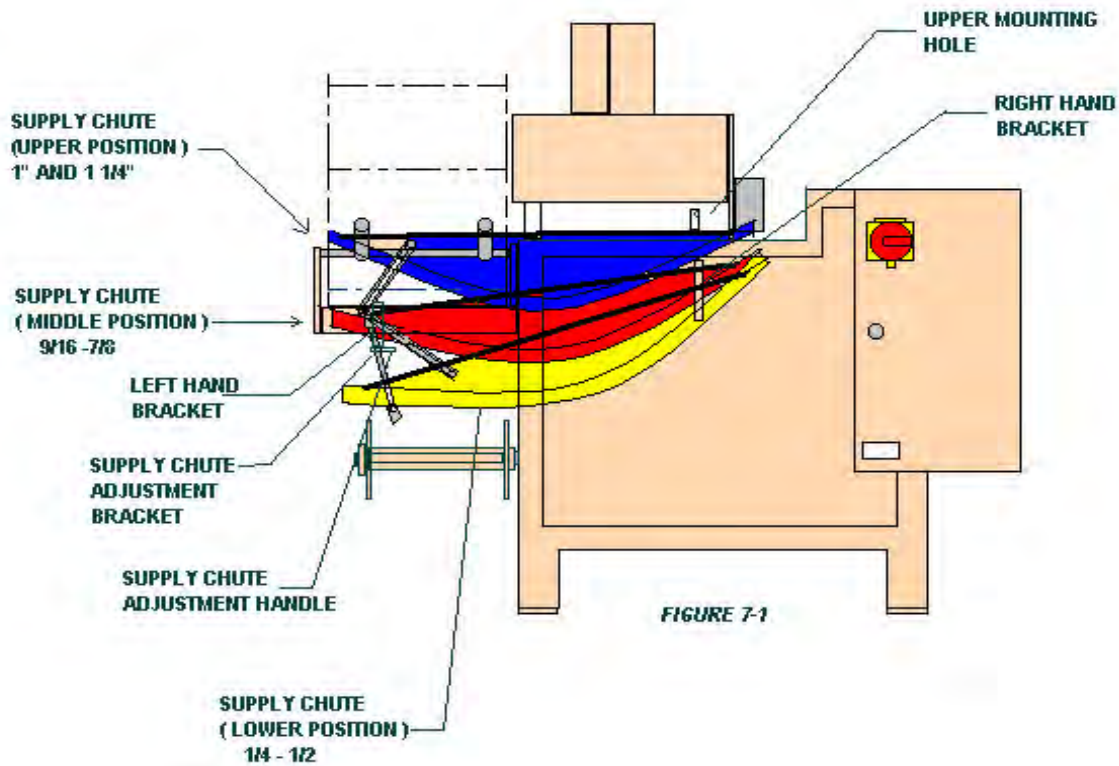
The supply chute is designed to be used in three different positions (see figure 7-1). The upper position is for larger size wire - 1" and 1 1/4". The middle position is for medium sizes 9/16" through 7/8". The lower position is for the small size wire - 1/4" through 1/2". The smaller sizes need more weight inside the supply chute to prevent the wire from unspooling on the bottom side of the spool. On the other hand, the larger and medium sizes will stretch too much, causing misfeeds in the feed area if left in the lower position.

For the Small and Medium Sizes:

1. Loosen the handle and slide the storage chute to the required position.
2. Tighten the handle to secure the storage chute.

For the Larger Sizes:

1. Remove the right and left -hand supply chute brackets and replace them with brackets #4270035 and #4270036, which are, include with the machine.
2. Fasten the right hand bracket to the upper mounting hole (see figure 7-1).
3. On the left side, swing the supply chute adjustment bracket over and fasten the left bracket as shown in figure 7-1.



8. Feed and Cut Feed Wheel Guide Adjustment

The outboard guide on the feed wheel (see Figure 8-1) should be adjusted so that there is approximately 1/16" (.06) clearance for the wire. Make sure the outboard guide does not rub against the feed wheel. See figure 8-1 for the correct orientation of the wire.

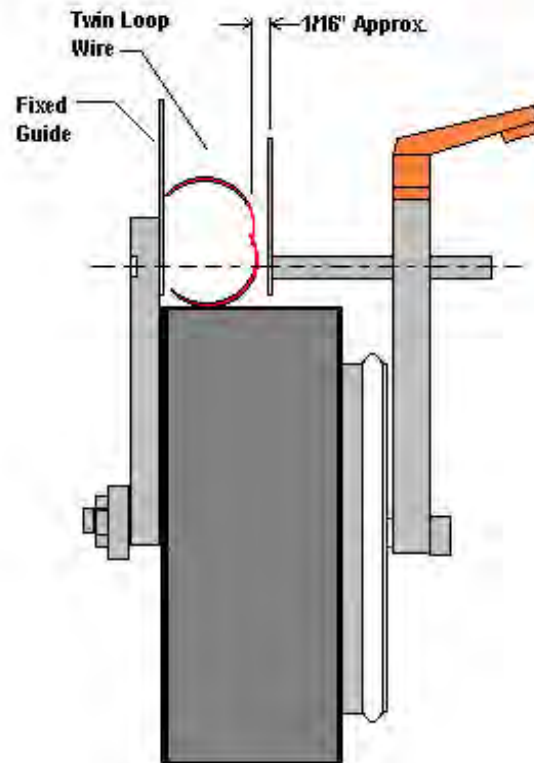
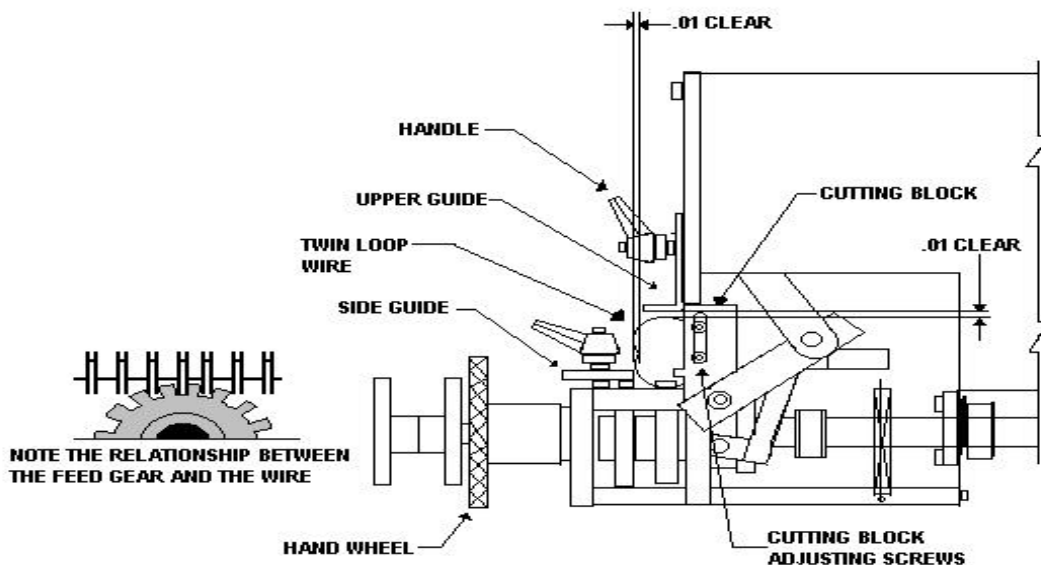


Figure 8-1

9. Feed and Cut Height and Width Adjustment of Guides

The upper and side guides should be adjusted so that the Twin Loop wire will travel back and forth freely (see Figure 9-1) but without too much room to move around. *The following steps are recommended:*

1. Cut a 12" long piece of Twin Loop wire element from the supply chute and use it as a set-up Sample.
2. Loosen the two adjustable handles for the upper guide and the side guides (see Figure 9-1).
3. Insert the 12" long sample as shown in Figure 9-1.
4. To set the .01 clearance, use three sheets of 20# bond paper as a gauge. Hold the open side of the wire up against the sideplate of the feed assembly. Insert the three sheets of paper and slide the side guide up against the paper. Tighten the handles to secure the guide and remove the paper.
5. Repeat step 4 for the upper guide.



FEED AND CUT HEIGHT ADJUSTMENT OF CUTTING BLOCK

Using a 5/32 hex key, loosen the two (2) screws which secure the cutting block (see Figure 9-1). Adjust the height of the cutting block to allow the Twin Loop wire to pass freely under it. Tighten the screws to secure the cutting block. **Note:** The height of the cutting block must be adjusted for each wire size.

The set-up of the feed area is now complete. To double check, insert the 12" long sample piece again, into the guides. Slide the sample forward until the feed sprocket stops it. Now rotate the handwheel (see Figure 9-1) in the clockwise direction and continue feeding the sample all the way through and past the cutting block. If the element does not go through freely, repeat step #4 in the "Height and Width Adjustment of Guides" section or repeat the above step.

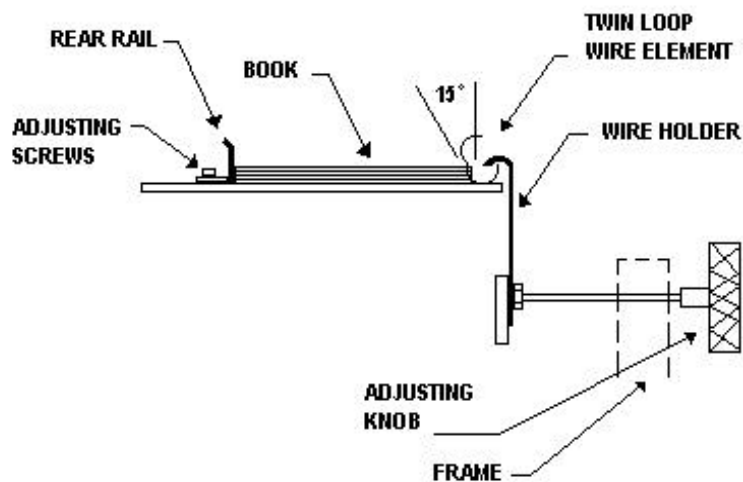
10. Loading Area

Before you load a book for binding, you need to make a few adjustments to the loading area. The following steps are recommended:

Select either the large or small wire holder, the small wire holder should be used for element size no larger than 5/16. Use the large wire holder for all other sizes. Part number for the large support guide is 460003900, and the part number for the small support-guide is 0460004000.

Adjusting the wire holder: using your 12" long sample piece of wire feed it through the feed assembly by turning the hand wheel (see figure 9-1) right up to the loading area. Adjust the height of the wire holder (see 10-1) by loosening the two adjusting knobs located on the backside of the machine which hold the holder in place. Slide the holder up or down to allow for free movement of the wire. Enough room should be provided so the wire sits back on a 15-degree angle as shown in figure 10-1. This angle will

make it easier to load the book. Tighten the two adjusting knobs to secure the wire holder. Load book onto element and adjust rear rail in the book loading area. To adjust, loosen adjusting screws and slide up to book loosely. Tighten adjusting screws.



11. Book Transport Area

At this time, check to see if the pusher will hit the rear rail or be pushed down because of rear rail interference (see figure 11-1). To prevent the interference, push the pusher foot down below the table top and tighten the set screw located on the top of the pusher foot (see figure 11-2) to lock in place.

Note: If you lock down one of the pusher feet, you must lock down the foot directly in front of it or it will crash into the closing rail.

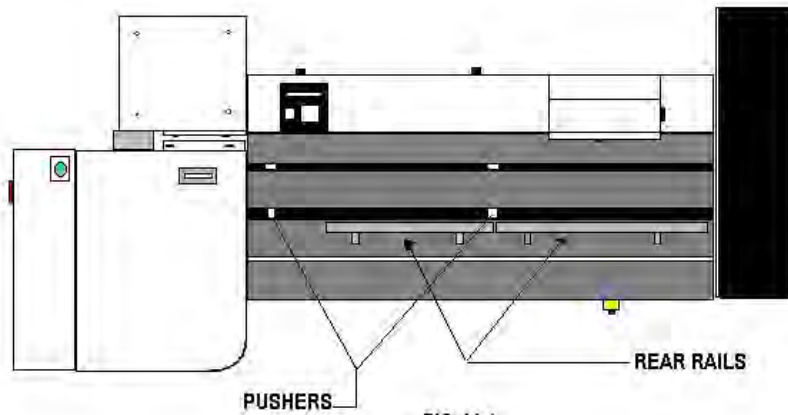


FIG.11-1

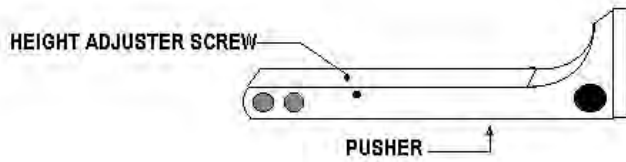


FIG.11-2

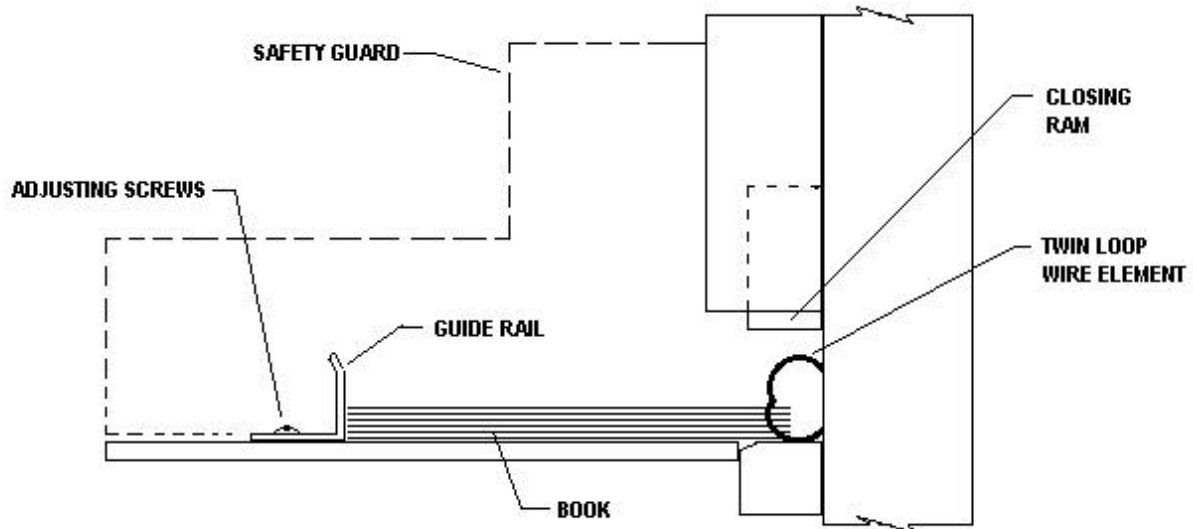
12. Closing Area

Adjusting the closing rail (For the following see figure 12-1).

1. Open closing guard and prop open with prop rod.
2. Loosen the adjusting screws, which secure the closing rail located in front of the closing area
And slide toward the front of the machine.

3. Close the closing guard.
4. Twist the red emergency stop button located on the front of the machine to supply power to the machine.
5. Using the hand wheel on the upper right hand side of the closing head, turn hand wheel until the indicator points the proper wire size to be closed.
6. Push the pusher advance/home button on the control panel and advance the book under Closing ram (a red light will illuminate above button).
7. Open closing guard.
8. Adjust the closing rail forward so the open side of the wire element is up against the back of the closing area. Do not apply pressure to the book. Tighten the adjusting screws to lock the Closing rail into position.
9. Close closing guard.
10. Press ram down/up button and close wire. Press ram down/up button to release the closed wire. Adjust wire closure with hand wheel and reclose wire until proper closure is attained.
11. Press pusher advance/home button to return pushers to their home position.

Figure 12-1



13. CLOSING HEIGHT ADJUSTMENT

To adjust height of the closing ram, the following steps are recommended:

1. The pointer for the Twin Loop Size Gauge (see Figure 13-1) will move up or down. A hand wheel is provided on the right side of the closing area. This hand wheel is to be used to adjust the height.

- The size gauge is used to accurately adjust the closing height. After closing a sample book, you may need to make further fine adjustments to get the proper closing of the wire. See figure 13-2 for proper closing of Twin Loop elements.
- Never cycle the closing ram under power without checking the size gauge first.

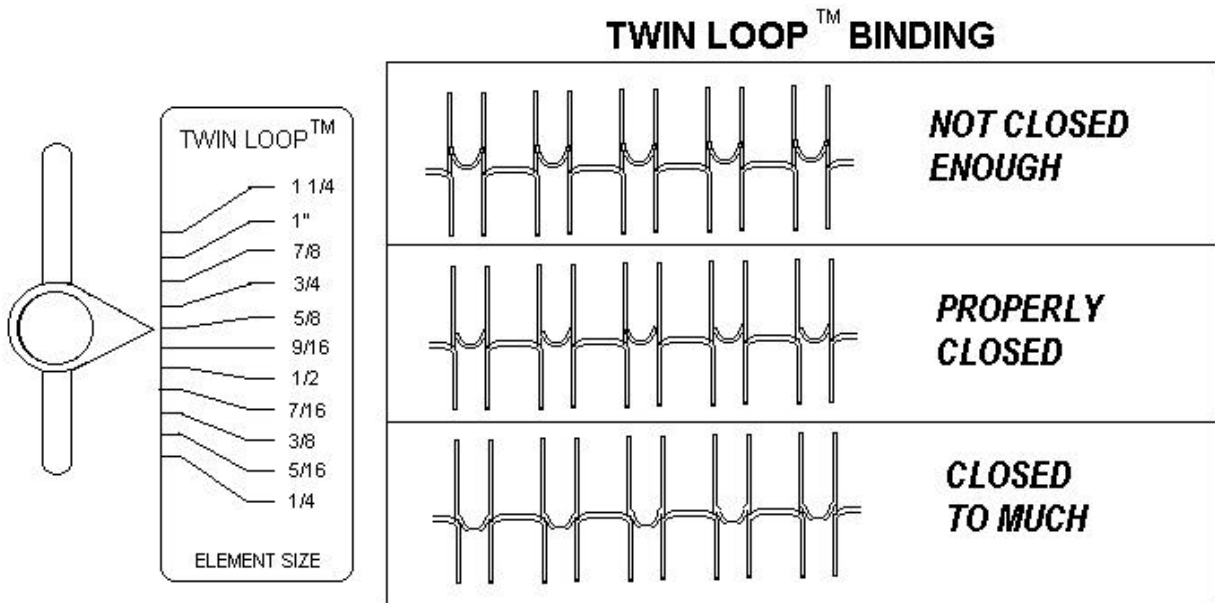


FIGURE 13-1

FIGURE 13-2

14. Loading the Book

Books with 2-Piece Flush Cut Covers:

Stack the books with the front covers up; rotate the back cover to the top (see Figure 14-1). This ensures that the wire loop closure will be inside and in the back of the book.

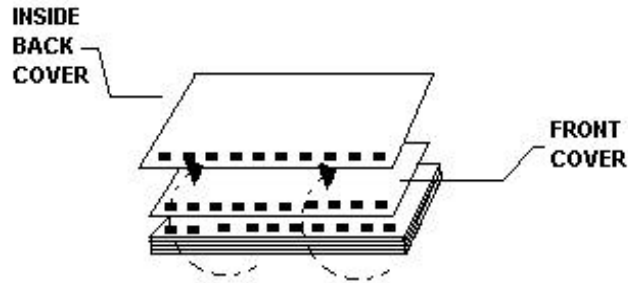


FIGURE 14-1

Pick up the two covers and the body of the book; jog it on the side with the binding edge down. The back page (not the back cover) should face the operator (see figure 14-2).

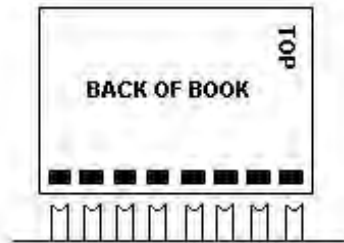


FIGURE 14-2



Align the holes with the Twin Loop tines and lay the book toward you (see figure 14-3) and press the foot pedal to cycle the STL1000.

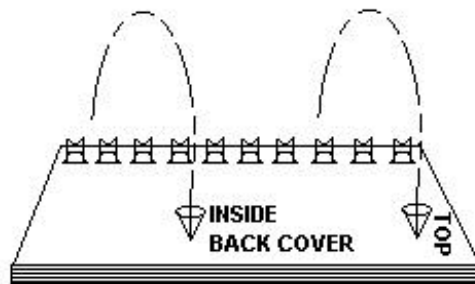
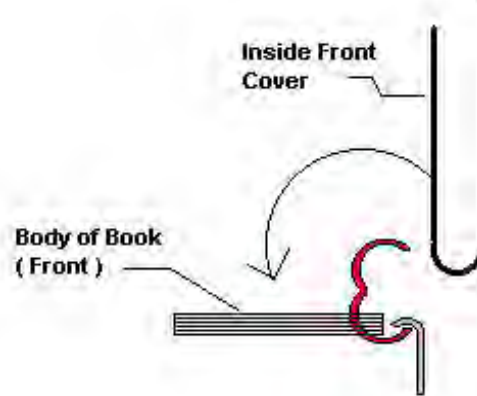


FIGURE 14-3

Loading The Book (continued)
Books With Oversized or Wrap-Around Covers:

Due to its design, the STL-1000 is well suited for non-standard cover styles.

Load the body of the book (front) onto the Twin Loop tines, then load the covers (folded back to back) on the tines and push the foot pedal.



15. Air Solenoid Explanation

This write up is to understand the location and function of the five air solenoids (see fig 15-1) on the STL1000.

To get to the solenoids to either replace or adjust, the rear panel must be removed. Once the panel is removed, the air solenoids will be before you, working left to right.

Solenoid # 1 *Guard Solenoid* is responsible for opening and closing guard doors to allow entrance and exit of books into the closing area .

Solenoid # 2 *Pusher* is responsible for the transporting the book from loading station to closing area and to the conveyor.

Solenoid # 3 *Closing Head Solenoid* is responsible for the actuation of the closing ram.

Solenoid # 4 *Cutter Solenoid* is responsible for the actuation of the element cutting knife.

Solenoid #5&6 *Feed Sprocket Selection* is responsible for the selection of 2:1 to 3:1 feed sprocket. Solenoid #5 for 2:1, solenoid #6 for 3:1. This solenoid is different from solenoid #1 through 4 because it is a dual circuit solenoid to prevent crushing of the element on power down.

Controlling actuation speed adjusts consist of regulating air being discharged through adjusting screws on the exhaust mufflers (see figure 15-2). To slow down actuation, loosen jam nut on muffler and screw in setscrew. To speed up action, back setscrew out. Once desired actuation speed has been achieved, tighten jam nut.

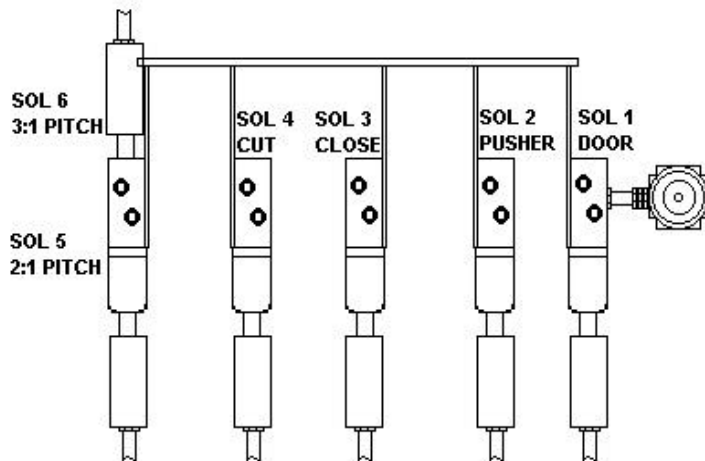


FIGURE 15-1

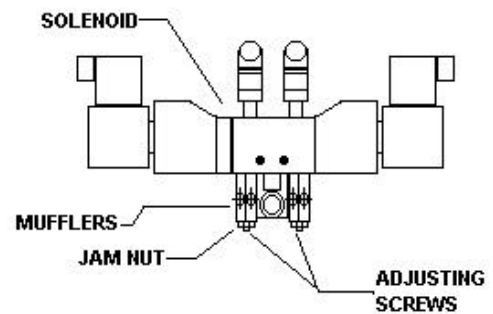


FIGURE 15-2

16. *Trouble Shooting Guide*

PROBLEM	PROBABLE CAUSE	SOLUTION
Dereel unit won't run.	Dereel switch on manual.	Turn collar of dereel switch to auto.
Dereel unit runs on.	Wire not properly routed along supply shoot. Wire tangled with scrap paper. Check height of spool prox switch. Faulty spool prox switch.	Route wire from top of spool to supply chute and up to wire cutting unit. Make sure wire is routed to pass in front of prox switch located on the supply chute. Adjust supply chute height to prevent wire from tangling with scrap paper. The face of the prox switch should be flush or slightly protruding on the supply chute. Replace prox switch.
Wire stretching or sagging on the bottom of spool.	Supply chute.	Adjust supply chute height to accommodate wire size.
Wire not traveling smoothly through wire feed and cutting unit.	Wire guides too tight.	Check width of feed wheel guide. Check side and upper guides, also knife cutting block height.

PROBLEM	PROBABLE CAUSE	SOLUTION

Feed sprocket not turning.	Worm gear clutch pad. Needs adjustment or clutch pads need cleaning. Lockout pawl too low.	Remove collar, spring, pressure collar, key and worm gear. Clean all parts with alcohol and reassemble. Adjust tension spring to full compression. With the air on, adjust height of lockout pawl and adjust with height adjustment nut to just clear lockout gear.
Scrap paper tearing.	Scrap paper take up spool.	Adjust tension spring behind panel in line with paper take up spool. Adjust to have slight pressure.
Scrap paper not being spooled.	Scrap paper take up spool.	Adjust tension spring behind panel in line with paper take up spool. Adjust to have slight pressure.
Improper number of loops.	Air pressure. Water separator Airline oiler Locking pawl.	Make sure a constant air supply is maintained at 100 PSI. Make sure the air regulator on the STL-1000 is set at 80 psi. Empty water separator. Check airline oiler. Check height of locking pawl. Should just clear the locking gear.

PROBLEM	PROBABLE CAUSE	SOLUTION

<p>Improper number of loops. <i>(continued)</i></p>	<p>Locking gear.</p> <p>Counting gear.</p> <p>Counting prox sensor.</p>	<p>Check screws in locking gear for tightness.</p> <p>Loosen setscrew on counting gear and slightly advance clockwise and test. Repeat until proper count has been achieved. NOTE: Disregard first element after each adjustment</p> <p>Rotate counting gear and check for flashing light on the PLC. Inside the control box. Check x4 for 2:1 and x10 for 3:1. If not flashing, prox switch should be replaced.</p>
<p>Cut length's tails uneven.</p>	<p>Locking pawl.</p>	<p>Disconnect air. With wire in machine, seat locking pawl into lockout gear. Check position of wire in relation to the cutting block to cut in the center of the wide leg of the element. If adjustment is needed, loosen screw on the side of locking pawl. Push pawl into locking gear and rotate until ideal position has been acquired. Tighten screw. NOTE: Screw can be accessed through side plate.</p>

PROBLEM	PROBABLE CAUSE	SOLUTION
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Uneven wire closure.	Anvil adjustment.	Loosen two socket head screws at the back of the anvil. Adjust anvil with the two hex head bolts underneath the anvil to achieve even end to end closure. NOTE: Tighten socket head screws after each adjustment to insure accurate closure. Also tighten jam nuts on the hex head after final adjustment.
Wire closing with an over or under bite.	Table straps.	Utilize one of two table straps to control over or under bite. There are two sizes of table straps and two different locations to mount them. Experiment with the different straps and locating positions. The straps elevate the binding edge of the book to control the books influence in proper closure of wire elements.
Pushers won't advance when foot switch is depressed.	Main power. E-STOP or Interlock switches. Main air supply.	Check main power switch located on the main power box is in the ON position. Check E-STOP to insure it is in the ON position and also check all guards to be sure that they are in their full closed position. Check airline connections. Check air regulator is set at 80 psi.
PROBLEM	PROBABLE CAUSE	SOLUTION

<p>Pushers won't advance when foot switch is depressed. (continued)</p>	<p>LS1 home switch.</p>	<p>Remove center panel on the tabletop (section 18 drawing 2 detail #23). Located LS1 on the left side of the air cylinder Loosen the clamp, which secures LS1 to the air cylinder. Slide LS1 to the left or right until the LED on LS1 illuminates. Tighten clamp to secure to air cylinder. Depress foot switch and test for a completed cycle. Replace tabletop.</p>
<p>Pushers advance then stop.</p>	<p>LS2 needs to be adjusted.</p>	<p>Remove center panel on tabletop (section 18 drawing 2 of 3 detail #23). Locate LS2 on the right side of the air cylinder). Loosen the clamp, which secures LS2 to the air cylinder. Close safety hood, turn power on, press pusher advance key on the keypad. This will advance the pushers to the right. Slide LS2 to the right or left until the LED on LS2 illuminates. Tighten clamp to secure LS2 to the air cylinder. Depress pusher key to return the pushers to their home position. Depress foot switch and test for a complete cycle. Replace tabletop.</p>
<p>Pushers advance, safety doors close, cycle stops.</p>	<p>Door switch IS2.</p>	<p>Check closing doors for any obstruction.</p>
<p>PROBLEM</p>	<p>PROBABLE CAUSE</p>	<p>SOLUTION</p>

<p>Pushers advance, safety doors close, cycle stops <i>(continued)</i></p>	<p>Door switch IS2.</p>	<p>This adjusting screw located on the exit door is used to set IS2, which completes the circuit for PLC numbers, X13 and Y3. X13 must be illuminated before Y3 circuit can be completed.</p>
<p>Pushers advance, safety doors close, closing head comes down and machine cycle stops.</p>	<p>Book thickness.</p> <p>LS3 needs adjustment.</p>	<p>Failure to adjust closing unit height. Book is too thick and not letting the closing ram make LS3.</p> <p>Remove rear cover on closing area. Locate the air cylinder). Mounted on the air cylinder is LS3. Turn power on. Depress the ram down key on the keypad. Loosen the clamp that secures LS3 to the air cylinder and slide LS3 to the right or to the left until the LED illuminates. Tighten clamp. NOTE: There shouldn't be any books or wire under closing ram during this adjustment. Depress ram up key and test cycle.</p>

17. MAINTENANCE REQUIREMENTS FOR THE STL1000

1. **EMPTY WATER SEPARATOR DAILY**

A. To empty water separator, loosen bleeder valve located on the bottom of the water separator.

2. **CHECK AIR LINE OILER WEEKLY**

A. Fill only with a good quality air tool oil.

B. To fill with air tool oil:

- 1) Disconnect air supply.
- 2) Remove oil reservoir cup by turning a 1/4 turn, and then pull cup downward.
- 3) Fill reservoir with good quality air tool oil to max line.
- 4) Install oil reservoir.
- 5) Connect air supply.

3. **OIL PUSHER AXLES BI-WEEKLY**

A. To oil pusher axles:

- 1) Remove center tabletop by removing two end screws.
- 2) Locate pusher axles.
- 3) Apply two or three drops of 3&1 oil the length of each axle.
- 4) Return center table and tighten in place.

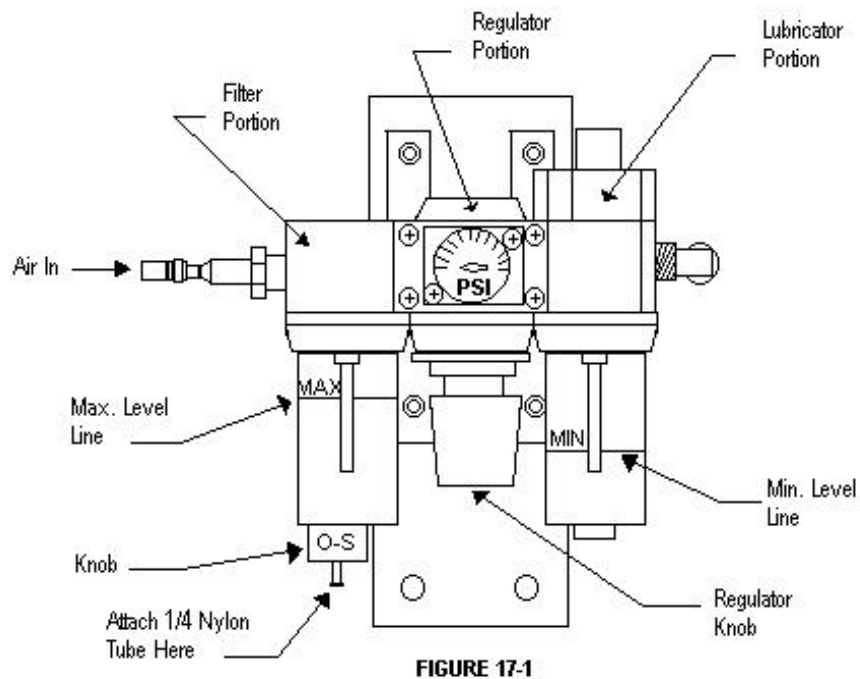
WARNING: DO NOT APPLY GREASE OR HEAVY OIL. THIS WILL DESTROY THE LINAR BEARINGS!!!

FILTER/REGULATOR/LUBICATOR (FRL)

The filter portion (see Figure 17-1) of the FRL is used to remove moisture from the compressed air supply. Before the water level reaches the “MAX LEVEL” line (see figure 17-1), you should drain the water. How often you have to drain depends on the amount of humidity in the air. To drain the filter, turn the knob on the bottom of the filter in the “O” (open) direction. Turn the knob in the “S” (shut)

direction after all of the water has drained. **NOTE:** a ¼ inch soft nylon tube can be attached to the end of the drain so that the water can be emptied into a container.

The regulator portion (see figure 17-1) of the FRL is used to regulate the air pressure being supplied to the machine. The proper setting is 80 PSI. To adjust the pressure, pull the regulator knob down and turn clockwise to reduce the pressure and turn counter-clockwise to increase the pressure. Push the knob back up to lock it into position.



WORN PARTS FEED AND CUT AREA

The only wear item in the feed area is the knife blade (see figure 17-2). If the wire has a burr on it after cutting, or, if a groove has worn into the cutting edge of the knife, it is time to rotate the blade. The knife blade has four cutting edges on it. **To switch to a new cutting edge, the following steps are recommended:**

- A. Disconnect air and electrical power from the machine.
- B. Remove feed cover.
- C. Using a 5/32" hex key, loosen and remove the two screws, which secure the cutting block.
- D. Loosen the jam nut and remove the pivot screw.
- E. Flip the blade over to a new cutting edge.
- F. Apply grease to the pivot screw and the mating surfaces of the cutting block and the knife blade.
- G. Install the knife blade by tightening the pivot screw enough so the blade pivots freely with zero clearance to the cutting block.
- H. Tighten the jam nut to secure the pivot screw.
- I. Apply grease to the pin for the upper pivot joint and attach the knife blade
USE CAUTION! KNIFE BLADE IS VERY SHARP!!
- J. Mount the cutting block.

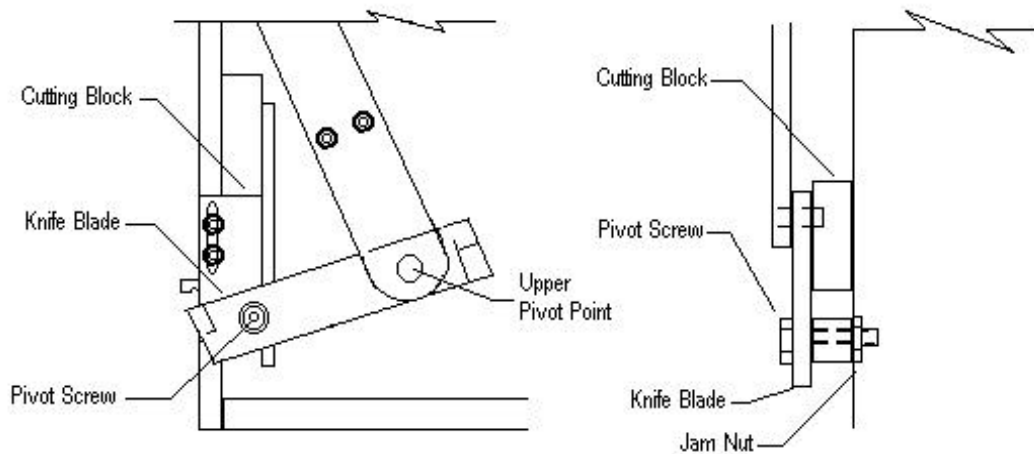


Figure 17-2

18.

**Exploded
Assembly
And
Parts
List**

