Operating Manual

Please Read Before Operating Unit

Model CS800 Automatic Cutter & Stripper

Please Call for Service or Spare Parts

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Model CS800 Automatic Cutter & Stripper
OPERATING INSTRUCTIONS

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1 - INTRODUCTION

The Eraser cut and strip machine accurately measures, cuts, strips and counts wire. The user friendly micro-processor based programming prompts the operator through each step of the operating parameters. Frequently run applications can be quickly stored and retrieved from 67 batch locations. The CS800 processes wire from 30 to 10AWG (.25mm to 2.58mm) with strip lengths up to 4" (10.2cm), wire application dependent. You will obtain the optimum performance from your CS800 Automatic Cutter & Stripper by reading, understanding and following the instructions within this manual.

CS800

CS800 AUTOMATIC CUTTER & STRIPPER

Always Moving Forward®

Made In The U.S.A.

2 - SPECIFICATIONS, OPERATING ENVIRONMENT AND ORDERING INFORMATION

Specifications:
Weight ....52lbs (23.6 kg)
Dimensions............................. Height 9.9" (251mm)
Width 12.8" (325mm)
Depth 14.5" (368mm)
Power .... 120V - 2.9A max 50/60Hz
Consumption .... 500 Watts
Wire Diameter.............................30 AWG to 10AWG
(.254mm to 2.58mm - wire dependent)
Wire lengths.....................65,530 inches {99,999cm}
Strip Lengths .... to 4.0" (to 10.2cm - wire dependent)
Batch Storage...67 batches
Fuse... 5x20mm, 4A@120V

Operating Environment
Operating Temperature................ 32°-95°F (0°-35°C)
Airflow........................Use in a well-ventilated space
with no obstructions.

Ordering Information:
AR7201................................... Wire Cut & Strip 120V

Required Parts
IR1791 ....Standard Bushing Set .035" (0.89mm)
IR1792 ....Standard Bushing Set .047" (1.19mm)
IR1797 ....Standard Bushing Set .057" (1.45mm)
IR1793 ....Standard Bushing Set .098" (2.49mm)
IR1794 ....Standard Bushing Set .116" (2.95mm)
IR1798 ....Standard Bushing Set .151" (3.84mm)
IR1799 ....Standard Bushing Set .203" (5.16mm)
IR1795 ....Standard Bushing Set .250" (6.35mm)

NOTE: Bushing set dimensions refer to the minimum ID of the bushing.

Optional Parts and Accessories
IR1786 ....Replacement "V" Blade Set
IR1787 ....Optional Carbide "V" Blade Set
IR1769...Alignment Tool
PR1187 ....Feed Belts (4 per machine)

3 - SAFETY INSTRUCTIONS

IMPORTANT! DO NOT OPERATE MACHINE UNTIL YOU HAVE READ THOROUGHLY, AND UNDERSTAND COMPLETELY, ALL PRECAUTIONS, INSTRUCTIONS AND INFORMATION ON THESE PAGES. THIS MANUAL CONTAINS IMPORTANT SAFETY AND OPERATING INSTRUCTIONS. IT SHOULD BE RETAINED WITH THE MACHINE FOR FUTURE REFERENCE.

SAFETY PRECAUTIONS - MECHANICAL

! DO NOT OPERATE UNIT WITHOUT GUARDS IN PLACE OR WITH DAMAGED GUARDS.

! DO NOT DEFEAT ANY OF THE SAFETY FEATURES.

! DO NOT PLACE FINGERS OR APPENDAGES NEAR MOVING PARTS OR IN OR NEAR OPENINGS IN GUARDS.

SAFETY PRECAUTIONS - ELECTRICAL

! ALWAYS UNPLUG UNIT FROM POWER SUPPLY PRIOR TO ANY MAINTENANCE.

! DO NOT RUN UNIT WITH INCORRECT LINE VOLTAGE.

! NEVER RUN MACHINE WITH DAMAGED OR WORN POWER CORD.

! NEVER MODIFY THE PLUG PROVIDED. IF IT WILL NOT FIT INTO THE OUTLET, HAVE THE PROPER OUTLET INSTALLED BY A QUALIFIED ELECTRICIAN.

GROUNDING INSTRUCTIONS. Grounding provides a common return path for electric current to reduce the risk of electric shock. This machine is supplied with an electric cord with an equipment-grounding conductor and a grounding plug. The plug must be plugged into a matching outlet that is properly installed and grounded in accordance with all local codes and ordinances.

Improper connection of the equipment-grounding conductor can result in a risk of electric shock. Check with a licensed electrician if in doubt as to whether the machine is properly grounded.

SAFETY FIRST - USE BEST PRACTICES

ALWAYS USE SAFETY GLASSES. Everyday eyeglasses only have impact resistant lenses; they are NOT safety glasses. Also use face or dust mask

if cutting operation is dusty.

REMOVE ADJUSTING KEYS AND WRENCHES. Form a habit of checking to see that keys and adjusting wrenches are removed from machine before turning it on.

KEEP WORK AREA CLEAN. Cluttered areas and benches invite accidents. Always leave at least 12" (305 mm) of space around all sides and top of unit.

DON'T USE IN DANGEROUS ENVIRONMENTS. Do not use or locate machine in high-humidity environments, or expose to rain. Keep work areas well lighted.

WEAR PROPER APPAREL. Do not wear loose clothing, such as gloves, neckties, rings, bracelets, necklaces or any other clothing or jewelry that might get caught in moving parts. This is not an all-inclusive list. Wear protective hair covering to contain long hair. Non-slip footwear is recommended.

DON'T OVERREACH. Maintain proper footing and balance at all times.

MAINTAIN BLADES WITH CARE. Keep blades sharp and clean for optimal performance. Follow instructions for lubricating and changing blades and all accessories.

DISCONNECT MACHINE FROM POWER SUPPLY. Unplug the unit before servicing and when changing accessories.

DO NOT EXCEED THE UNIT'S MAXIMUM MATERIAL SPECIFICATIONS. Eraser's warranty will be null and void if machine has been used in any manner that is contrary to these instructions.

CHECK FOR DAMAGED PARTS. Before continued use of the machine, the guard and all moving parts should be carefully inspected to ensure that nothing is damaged.

Ensure proper alignment of moving parts. Check for any binding of moving parts, breakage of parts, and any other condition(s) that may affect operation. Any damaged part(s) should be properly repaired or replaced prior to any continued use of the machine.

ONLY ALLOW TRAINED AND QUALIFIED PERSONNEL TO OPERATE UNIT. Always keep these instructions within reach of the machine.

USE RECOMMENDED ACCESSORIES ONLY. Consult this operating manual for recommended accessories. Use only parts supplied by The Eraser Company, Inc. Use of improper accessories will void Eraser's warranty and may increase risk of injury.

ALL REPAIRS SHOULD BE PERFORMED BY AN

ERASER COMPANY REPRESENTATIVE ONLY. Unauthorized disassembly of machines will void Eraser's warranty.

WHEN USING MACHINERY, ALL SAFETY PRECAUTIONS – INCLUDING, BUT NOT LIMITED TO, THOSE LISTED ABOVE - SHOULD BE FOLLOWED TO REDUCE THE RISKS OF FIRE, ELECTRIC SHOCK, AND PERSONAL INJURY, AND DEATH.

IMPORTANT: NO LIABILITY WILL BE INCURRED BY THE ERASER CO. FOR INJURY, DEATH, OR PROPERTY DAMAGE CAUSED BY A PRODUCT WHICH HAS BEEN SET UP, OPERATED, AND/OR INSTALLED CONTRARY TO ERASER'S WRITTEN OPERATING MANUAL, OR WHICH HAS BEEN SUBJECTED TO MISUSE, NEGLIGENCE, OR ACCIDENT, OR WHICH HAS BEEN REPAIRED OR ALTERED BY ANYONE OTHER THAN THE ERASER COMPANY, OR WHICH HAS BEEN USED IN A MANNER OR FOR A PURPOSE FOR WHICH THE PRODUCT WAS NOT DESIGNED.

4 - OPERATOR CONTROLS
4.1 Key descriptions

Numerical data entries. ① ② ③

Keys 0-9: ④ ⑤ ⑥

● : Decimal point placement ⑦ ⑧ ⑨

EDIT: Allows parameter editing. Entry to system menu.

ESC/PAUSE: Return to previous menu. Pause machine during batch execution.

+ : Increments some selected parameters (i.e. rates, blade position) or jog wire from left to right.

- : Decrements some selected parameters or jog wire from right to left.

JOG: Initiate step by step cycle in ***BATCH START menu or change password in ***EDIT SYSTEM menu.

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CUT: Cut wire, initiate blade calibration in ***SYSTEM SUPPORT menu or run single cycle in ***BATCH START menu. [CUT]

BACKSPACE: Delete previous entry (digits and decimal point only). [BACK SPACE]

ENTER: Accept parameter entry. Advance to next parameter. [ENTER]

RUN: Start batch. Advance to next menu. [RUN]

4.2 Other controls
Power Switch: Located on rear, left of machine.
Emergency Stop: (*red button located on top of machine*) Push to halt all movement and actions. Pull to reset
Safety Guard: Removal of clear, front guard halts all movements and action except during calibration and step by step operating mode.
Wire Jam: (Optional) Interface to a Prefeeder to halt operation if wire does not feed.

5 - SET UP
5.1 Installing & Changing Bushings
The CS800 requires the correct sized bushing set to be installed for the unit to operate properly. Bushing sizing should be determined through the Eraser Certification Program. For bushing sizes, refer to the Required Parts section on page 3.

The bushing size should be the smallest diameter that can accommodate the insulation diameter. To install, loosen the locking screws on the top of the bushing holding blocks (both the movable input bushing block and the fixed output bushing block - ***See picture #1, page 16***). Install the longer input bushing into the movable bushing block and secure with the locking screw. Repeat this for the smaller output bushing. Insert the cone shaped end away from blades and towards right feed belts. The operator adjusts the input bushing while looking through the outside end of either bushing to the middle of the machine. The lower adjustment screw should be turned until the bushings are aligned with each other. Lock the lower adjustment screw with the locking nut.This adjustment is not required when changing different sizes of input guides. If the CS800 experiences a wire jam at the blade, check the alignment of the bushings and adjust as necessary. *(See picture #2, page 16).*

5.2 Loading Wire
To load wire, the machine must be powered up, have a batch entered (see section 6 Operation) and the operator must choose either the step-by-step operating or single cycle modes from the ***BATCH START menu:

```
*** BATCH START:
STEP BY STEP - JOG
SINGLE CYCLE - CUT
RUN BATCH   - RUN
```

(Press the [JOG] key)

(Press the [CUT] key)

```
*** STEP BY STEP:
JOG WIRE       -+/-
CUT WIRE       -CUT
RUN STEPS      -RUN
```

or

```
*** SINGLE CYCLE:
JOG WIRE       -+/-
CUT WIRE       -CUT
SINGLE CYCLE   -RUN
```

To load wire:
(See picture #1, page 16). Feed belt pressure is adjusted with the knobs located directly above each feed belt assembly. Open left feed belts, lift the wire sensor fin, push a length of straightened wire ½ way through the left feed belts (making sure the wire is located in the middle of the belt), tighten the left feed belts (see section 5.3) and press the [+] key. If the wire misses the input bushing, simply press the [-] key and back the wire out, re-straighten (if necessary) and repeat. Once the wire is inside the input guide tube, the wire should feed through the machine.

5.3 Adjusting Feed Belts
Close each belt enough to hold the wire in place (without slippage). Apply minimal pressure for normal operation. Over tightening will cause the wire to slip out of the belts. **NOTE**: Slipping is more likely to occur with "hard-to-remove" insulations causing the pull length to be shorter than specified. Wire should be advanced beyond the blades. Press the [CUT] key once to manually cut the wire. The unit

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is now setup for batch processing.

5.4 External Communication
The CS800 can interface to an external device for intergration within a fully automated environment. Please contact a sales representative for details.

6 - OPERATION
• Plug-in AC power cord.
• Connect communication cable if you are planning to use a prefeeder.

Overview:
The CS800 processes wire in batches. A batch is one set of wire stripping and cutting parameters repeated a specified number of times. The CS800 stores up to 67 batches, each with an independent set of parameters (e.g. wire length, wire diameter, strip length, pull length, quantity, etc.). Batches and the batch numbers are created sequentially (i.e. if 18 batches were created, they are numbered 1 - 18). The next new batch number is restricted to batch #19. To begin processing wire, the operator determines the parameters. The operator needs to enter wire length, conductor diameter and quantity parameters. The control system selects a value for the remaining 12 processing parameters. To achieve more specific wire processing results, the operator needs to specify a greater number of parameters (i.e. enter in parameters instead of accepting the default values).

The basic procedure for wire processing with the CS800 is:
1) Determine and enter batch parameters. (*Section 6.3*)
2) Setup and load wire (install bushings, load wire - *Sections 5.1 & 5.2)*
3) Check setup: Step through the first piece following screen prompts. Examine and make adjustments to blade movement as necessary when in step by step mode.
4) Begin running batch.The operator advances through a number of menus as parameters are entered. (*Section 6.2, 6.3 or 6.4*)

The control system makes a number of decisions based on the inputted parameters, the physical limitations of the machine and the physical limitations of stripping wire itself. For example, if the operator enters a wire length of 12" and enters a right strip length of 2", the control system will strip the right end in 2 or more separate cut and pull sequences to reduce the force necessary to pull a long slug over a length of conductor. The control system will determine if a certain parameter is possible and display an appropriate error message to alert the operator. See section 6.4 for details.

6.1 Power up
The power switch is located on the back of the machine. When switched on, the model number and software version are displayed while the cutter blades "find home" (move to the open position):

```
* * * * * * * * * * * * * * * * * *
THE  ERASER COMPANY
CS800_[Firmware Revision Date]
* * * * * * * * * * * * * * * * * *
```

There will be an approximately 2 second delay before the main batch select menu appears:

```
DO ONE OF THESE: 0
ENTER 0 FOR NO BATCH
ENTER KNOWN BATCH
ENTER NEW BATCH #5
```

6.2 Run an existing batch
• Quick Start Feature: If you input an existing batch number and press the (RUN) key, the control software will directly jump to the *** BATCH START menu where you can adjust, test and run the batch immediately.
• If you press (ENTER) you will go through the sequence of menus while viewing the batch parameters. You can change any batch parameter with the (+) or (-) keys, but to save it you have to pass through the last batch menu. To do this, continue pressing the (ENTER) or (RUN) key until all parameters have been displayed.

6.3 Creating a new batch
• If you input the batch number from the last line of the screen "ENTER NEW BATCH #5", a new batch will be created and the default batch parameters will be applied (i.e. feed rate, guide, left pull, right pull, left strip, right strip, etc).

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6.4 Process wire without saving data in memory

• Batch #0 is the default number at startup and is a temporary batch. The set of batch parameters in batch #0 are temporary and erase when the machine is powered down. Simply press the (RUN) or (ENTER) key after power up to select the temporary batch.

INPUT ERROR DIAGNOSTICS:

The control software assists the operator when an incorrect key press occurs by sounding an extended beep and displaying a single letter in the lower right corner indicating the cause of the error:

```
DO ONE OF THESE: 6
ENTER 0 FOR NO BATCH
ENTER KNOWN BATCH
ENTER NEW BATCH #5( R )
```
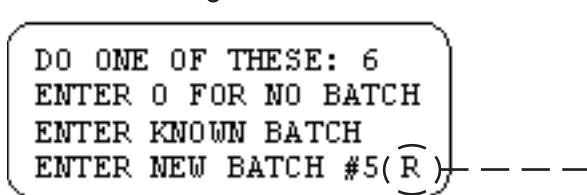
The corresponding diagnostic character appears in the right bottom corner of the screen:
'R' = data out of range.
'D' = too many decimals entered.
'W' = no value, just decimal point.
'N' = nothing to delete (BACKSPACE key was
        pressed too many times).
'L' = data length out of range.
'F' = too many characters behind the decimal.

6.5 First Batch Parameter Menu

Once an existing batch is selected (except for quick start) or a new batch is created, the control system goes to the batch parameter editing screens.

The first of these menus:

```
UNITS        in    #2
WIRE LENGTH  .0
CONDUCTOR    .0
QUANTITY     0
```
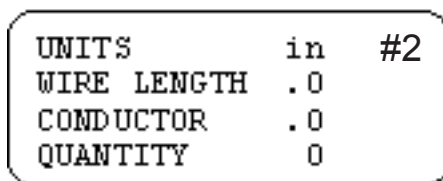
For all batch parameter menus, the current batch number is in the right upper corner of the screen after # symbol. The above menu is displayed when creating a new batch. Pressing the (RUN) key accepts the displayed values and the screen advances to the next menu. Pressing the (ENTER) key allows the operator to scroll through the parameters one at a time. The (ESC PAUSE) key press returns the screen to the previously displayed menu.

UNITS: The cursor is found at the first editable parameter, the units parameter. The cursor blinks at the unit of measure parameter and is ready to change this parameter or to move to the next parameter.The operator presses the (ENTER) key to accept this value or enters another value. The (+) and (-) keys toggles the unit of measure between inches and centimeters.

If the operator simply presses the (RUN) key to advance to the second batch parameter menu without entering a value, the software will display the following error message after the fourth batch parameter edit menu (but before reaching the *** BATCH START menu):

```
ERROR!   NO DATA!
CHECK - WIRE LENGTH
      - CONDUCTOR
      - QUANTITY
```
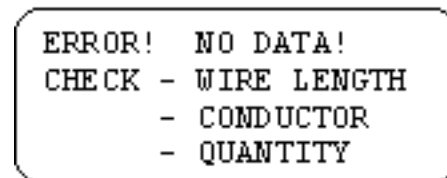
The software returns the operator back to the first batch parameter menu to enter the missing values.

WIRE LENGTH: If wire length is less than 2.43" the control software will use a different strip program that requires the removal of the output bushing, fixed output bushing block *(See picture #1, page 16)* and (possibly, according to the situation) the removal of the right feed belts and pulleys (*Section 7.1*). It issues the following message:

```
WARNING!

SHORT PIECE MODE
```
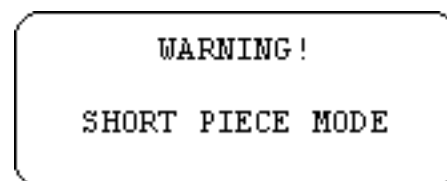
These short pieces must be collected underneath and just forward of the blades instead of underneath and forward of the right feed belts.

CONDUCTOR:

The conductor diameter, as entered in the first batch parameter screen, is a starting point, and would be adjusted as necessary by using step by step cycle. A wire size to diameter table and scale are located on the top of the machine (behind the feedbelt adjusting knobs) to aid in length verifications. If the blade cut depth is adjusted during the initial check, the adjusted value is substituted for the parameter entered in the first batch parameter menu. Stranded

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and solid conductor diameters can vary by as much as 20%, depending on the construction.

QUANTITY: Enter the desired quantity of pieces for the batch. First batch parameter menu descriptions, initial values and ranges:

|	Description	min	Default	max
UNITS	Units inch/cm		In*	
WIRE LENGTH	Wire piece length	0.50"(1.2cm)	0	32,000"(81,000cm)
CONDUCTOR	Conductor diameter	0.005"(.013cm)	0	0.150"(.381cm)
QUANTITY	Quantity of pieces	1	0	99999

The default unit is determined by the PRIMARY UNIT variable in the ***EDIT SYSTEM menus.

6.6 Second Batch Parameter menu
After pressing the (RUN) key or the (ENTER) key on the last parameter of the first menu batch, the software brings the second batch parameter menu to the screen.

```
LEFT STRIP   .25    #2
LEFT PULL    .125
RIGHT STRIP  .25
RIGHT PULL   .125
```
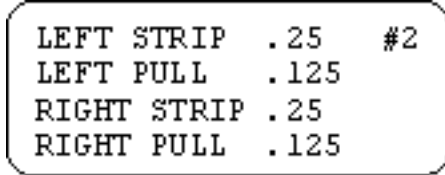
These values determine the actual strip length and modes. A label fixed to the top of the CS800 provides a visual definition of these parameters:
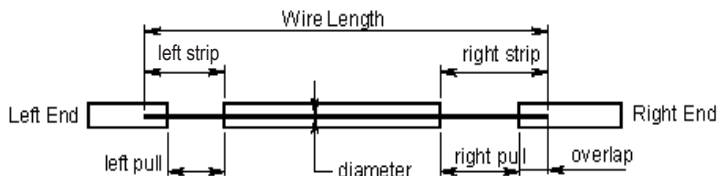
The default values are 1/4" strip and 1/8" pull. The operator can choose to simply use these parameter values and move to the third batch parameter screen by pressing the (RUN) key or individually edit and/or accept the values by pressing the (ENTER) key to advance through each parameter.The pull length has a subtle restriction. If the slug is pulled too far off of the conductor (i.e. if the overlap is too small to hold the slug to the conductor), the slug has a greater chance of falling off of the wire and jamming the machine. The CS800 evaluates the conductor

diameter to compare the minimum allowable overlap with the actual overlap (based on the strip/pull parameter entered).

The default slug overlap factor is set at 1.5 and is an editable system parameter. If the strip length and pull length fail, the screen will display:

```
ERROR!
RIGHT
SLUG OVERLAP IS
TOO SMALL
```
```
ERROR!
LEFT
SLUG OVERLAP IS
TOO SMALL
```

To remedy this error, reduce the pull length or increase strip length. To completely remove the insulation slug from the conductor, enter 0 for the pull length. Any non-zero pull value that passes the maximum allowable pull length test will result in a semi-strip (slug pulled only partially off). If RIGHT STRIP is more than MAX PULL parameter (see Section 6.8), multi-step right strip mode will be initiated. In this case nonzero RIGHT PULL value will determine the last slug overlap. Control software does not support multi-step left strip and if the LEFT STRIP is more than the MAX PULL parameter, an error screen will appear:

Second batch parameters, descriptions, defaults and possible ranges:

|  | Description | min | Initial | max |
|---|---|---|---|---|
| LEFT STRIP | Left strip length | 0 | 0.250 | 1.000 |
| LEFT PULL | Left pull length | 0 | 0.125 | 1.000 |
| RIGHT STRIP | Right strip length | 0 | 0.250 | 4.000 |
| RIGHT PULL | Right pull length | 0 | 0.125 | 4.000 |

## 6.7 Third Batch Parameter Menu
After pressing the (RUN) key or the (ENTER) key on the last parameter in second batch menu, the software brings the third batch parameter menu to the screen:

```
CUT RATE       10 #2
FEED RATE      8
STRIP RATE     5
LENGTH ADJUST  0
```
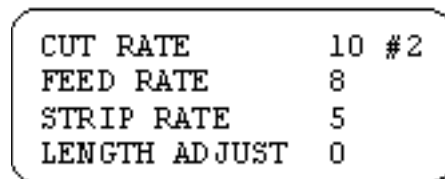
The rate values are on the scale of 1 to 10 and they correspond to 10% to 100% of full speed. The higher these values are, the greater the speeds and production rates. Using higher speeds reduces the

amount of available torque and force.

CUT RATE:
This cut rate parameter allows the operator to adjust the speed and force to cut a given conductor. Thicker conductors made from materials other than copper might be harder and require more force. Blade condition can play a factor (an operator can partially compensate for dull blades by slowing down the cut speed, which increases cut force).

FEED RATE:
The feed rate parameter relates to the speed and pull force of the left feed belts. This parameter can be adjusted to accommodate the force needed to pull the wire into the CS800. The lower the speed, the greater the pull force. An 80 pound spool of wire without a powered prefeed system requires greater force than a 3 pound spool of wire. Establishing proper feed rates maximizes production rates while retaining accuracy. An incorrect feed rate can result in slippage and inaccurate cut lengths. A high speed setting with a heavy spool or inadequate prefeed system can result in a deficiency in required torque. If this occurs the operator will hear a sound similar to grinding gears. This scenario will not damage the unit but will result in length inaccuracies. Slow the feed rate until the wire length accuracy is within a desired tolerance.

STRIP RATE:
The feed rate adjustment also applies to the strip rate adjustment. Different insulations require varying amounts of force to pull the slug. Teflon, for example, requires a greater force than PVC insulations found on typical hook-up wire. This rate can be adjusted to increase productivity or set up an effective pull force based on insulation.

LENGTH ADJUSTMENT:
Several methods can be used to adjust the wire lengths. One possible way is to compensate for error by adjusting the length parameter to negate the error (e.g. if a 8.00" length is targeted and the average length that exits the machine is 7.92", then the operator would re-enter the wire length parameter as 8.08"). In addition, an error correction can be achieved through the length adjustment parameter found on the last line in the third batch parameter menu. The range of adjustment is -10% to +10% in 1% increments. The operator can adjust the value by pressing either the (+) or (-) key

and pressing the (ENTER) key to accept the value.

Third batch parameters, descriptions, defaults and possible ranges:

	Description	min	Default	max
CUT RATE	Cutter head speed (relative)	1	10	10
FEED RATE	Belt speed during feed (relative)	1	8	10
STRIP RATE	Belt speed during strip (relative)	1	5	10
LENGTH ADJUST	% of Total Length	-10	0	10

6.8 Fourth Batch Parameter Menu
After pressing the (RUN) key or the (ENTER) key on the last parameter in third batch menu, the software brings the fourth batch parameter menu to the screen:

```
RELEASE     .025    #2
MAX PULL    .75
GUIDE UP    no
```

RELEASE BLADE SETTING:
The RELEASE parameter is the distance that the blades open after cutting wire insulation but just before pulling the slug. Too great a distance and the blades will scrape the insulation and fail to remove the slug. If the RELEASE value is too small, the conductor will be scraped during the slug movement. The RELEASE value needs to be big enough so that the stripped wire conductor is free from scrape marks but small enough so that the blade can pull the slugs (only a slightly larger value than the conductor diameter itself).

Smaller diameter wire may require smaller (less release) blade openings, larger wire may need greater clearance (more release) blade openings.

MAX PULL PARAMETER:
The MAX PULL parameter is the greatest length that can be stripped at a time. A 2 inch strip length requires quite bit of force to pull and the CS800 is capable of stripping this length with multiple pulls. The right side will do a long strip in multiple pulls if necessary. The left slug must be completed in one pull and is limited to the value in the MAX PULL parameter. If the LEFT PULL value exceeds the MAX PULL value, the control system displays the following error message and returns to the forth

parameter menu (to facilitate parameter correction):

```
    ERROR!
LEFT STRIP LENGTH
EXCEEDS MAX PULL
     LENGTH
```

GUIDE UP:
The input bushing (called "input guide" in this section only) is automatically activated by the control system when the left slug is completely removed. The control system doesn't require operator input to activate the input guide under these circumstances. This may be useful to prevent wire jams. It is possible that thin, flimsy wire will get caught on the edge of this guide on a semi-strip setup (partial strip of slug) when stripping left (trailing) end of wire and wire feeds to left. The operator may opt to engage the guide lift mechanism to alleviate this problem. The (+) or (-) keys toggles this value, when the cursor is blinking at the GUIDE UP parameter. Pressing the (ENTER) key press stores this value and advances the display to the *** BATCH START menu.

Fourth batch parameters, descriptions, defaults and possible ranges:

	Description	min	initial	max
RELEASE	Open blades after cut insulation	0.001	0.020	0.010
MAX PULL	Maximum pulling length of slug for current wire	0.250	1.000	1.500
GUIDE UP	Turn input guide up (no/yes)		no	

6.9 Batch Start menu
Once the final batch parameters have been entered, we need to confirm the settings before running the batch. There are 3 choices in the next menu:

```
*** BATCH START:
STEP BY STEP - JOG
SINGLE CYCLE - CUT
RUN BATCH   - RUN
```

• STEP BY STEP mode is designed to allow the operator to slowly go through a complete cycle step by step. To adjust the blade depth when cutting insulation (i.e. when the cutter cuts through insulation but doesn't touch the conductor) select the step by step choice in the batch start menu.

To begin, press (JOG) key and the ***STEP BY STEP menu will appear.

```
*** STEP BY STEP:
JOG WIRE      -+/-
CUT WIRE      -CUT
RUN STEPS     -RUN
```

The operator may run through the steps, one at a time, to check the quality of the processed pieces and adjust the blade depth or simply by pressing the (ESC PAUSE) key to return to the *** BATCH START menu.

```
RETURN       - ESC
NEXT STEP    - RUN
```

Press (RUN) key to execute each step individually. Some steps appear as though nothing happens. Step through until the following screen appears:

```
USE +/- TO ADJUST
BLADES POSITION
RETURN        - ESC
STORE NEW VALUE- RUN
```

This menu indicates the step where the blade has moved into the position to cut the insulation. The (+) key closes the blades, the (-) key opens them. Press the (RUN) key to store the result and (ESC PAUSE) key to leave previous value. Passing through this menu a few times will be enough to adjust them for satisfactory results (as close to the conductor without scraping).

Press the (ESC PAUSE) key to return to the *** BATCH START menu and run one complete single cycle at speed.

• SINGLE CYCLE mode completes one cycle (piece) at speed to check for proper tolerances.

The operator presses the (ESC PAUSE) key from the STEP BY STEP menu to go back to the *** BATCH START screen and may run one complete cycle at speed (recommended) by pressing the (CUT) key followed by the (RUN) key:

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```
*** SINGLE CYCLE:
JOG WIRE        -+/-
CUT WIRE        -CUT
SINGLE CYCLE    -RUN
```

One piece runs through the cycle at the speed determined by the batch parameters and the machine stops, waiting for user input. If the wire is processed correctly, press [ESC PAUSE] to get back to the ***BATCH START menu and then press [RUN] to start the batch.

• RUN BATCH: Press [RUN] to process the programmed batch.

Helpful Hints:

• If you are planning to strip small conductor wire (30AWG - for example), verify inputs by operator by using the STEP BY STEP procedure without wire. At the cut insulation step, observe the gap between the blades and setup the correct blade distance. After step by step verfication of parameter setting, feed material into machine and begin normal operation. This step will reduce or eliminate the debugging process when blades cut fine wire instead of just severing the insulation.

• To determine the cut depth provided by initial set-up, bend the wire at the point in the insulation where the blades have penetrated.

Adjust blade depth as needed. Try to eliminate any nick on the conductor. Set-up a minimum value for the RELEASE variable. This value is achieved when there are no visable scratches on the conductor surface.

• If conductor strands were crushed in the gap between right slug and wire, decrease output feeder pressure.

• Decrease strip rate if you are hearing a knocking or "gear grinding" noise during a pull operation. It will increase pulling force and prevent the feed motors from losing steps.

• If jamming of the wires occurs, decrease the feed rate to stop the wire jamming condition.

6.10 Fault checking

• The control system monitors for six possible faults: EMERGENCY STOP, OVERHEATING, LOWER DC, WIRE JAM, GUARD OPEN, and MATERIAL OUT.
  Each fault has a unique diagnostic screen.

• When a fault is corrected, a special restore screen will appear. Push the [RUN] key to return back to the interrupted job or the operator can feed and/or cut manually until the machine is ready to run.

```
JOG WIRE        -+/-
CUT WIRE        -CUT

CONTINUE        -RUN
```

• The control system checks for EMERGENCY STOP and OVERHEATING LOWER DC continuously.

• When the EMERGENCY STOP button is depressed the software immediately stops execution of the program and waits for the button to be reset. Additionally, the internal power to the feed and cutter motors is shut down until the EMERGENCY STOP button is reset.

```
EMERGENCY STOP!

RELEASE BUTTON
```

• If OVERHEATING fault occurs, the corresponding screen and buzzer will sound (see Section 8).

```
OVERHEATING!
LOWER DC

TURN OFF POWER!
```

• If connected to an external prefeeder device (Section 5.4), a fault in the feed system will halt the wire processing, and the unit will display the following error message:

```
PREFEEDER JAM!
```

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• If you selected STEP BY STEP mode, the system does not check GUARD OPEN fault. You can still open the guard and observe a process of stripping.

• For SINGLE CYCLE and RUN, the system checks all faults. If the GUARD OPEN fault occurs, attach the guard and push (RUN) key to return back to the interrupted job.

```
GUARD OPEN!
```

• If MATERIAL OUT fault occurs, reload the wire, push (RUN) key to return back to the interrupted job.

```
MATERIAL OUT!
```

7 - MAINTENANCE

7.1 Belt Change - See picture #4, page 16
Eventually, the feed belts will develop a groove through the center of the belt. To change the feed belts (Part# PR1187), remove the knurled nuts from one pulley associated with each feed belt (4 per machine).   Remove the pulley and belt simultaneously.

Place the new feed belt onto the removable pulley (making sure that the belt ribs are seated into the pulley teeth) and gently push the belt onto the fixed pulley while pushing the removable pulley onto its shaft. The orientation of the feed belt and the removable pulley isn't important. Reinstall knurled nuts.

7.2 Blade Change/Blade Calibration
The blades can become dull and require changing if you are unable to cut heavier wire. Ripped or frayed insulation or the inability to remove the cut insulation slug by hand are indications of dull or chipped blades.

The blades require blade calibration whenever they are removed and replaced for any reason. The steps to calibrate the blades are:

A. Remove the bushings from both the input and output blocks (to allow for insertion of the calibration tool and observation of the alignment and calibration) (Section 5.1)
See picture #2, page 15.
B. Loosen blade holder screws. Remove the blades.
See picture #2, page 15.
C. Install new blades. The blades are identical and can be placed in the upper or lower position. Hand tighten the blade holder screws. The upper blade should be completely flat in the channel but should remain loose enough so that the blade can move from side to side. Tighten the bottom blade after both blades have been installed. The upper blade must remain loose for the calibration step.
D. At the main menu "DO ONE OF THESE:", press the (EDIT) key to bring the *** SYSTEM SUPPORT menu up:

```
*** SYSTEM SUPPORT:

EDIT SYSTEM    - EDIT
CALIBRATION    - CUT
```

Choose the item CALIBRATION by pressing the (CUT) key:

```
USE +/- TO ADJUST
BLADES POSITION
RETURN            - ESC
STORE NEW VALUE- RUN
```

The blades will close to the calibration depth (approximately). Open the right hand belt feed to allow entry of the calibration tool. Insert the brass calibration tool through the output feed belts and the output bushing block to the blades. Press the (-) key to open and the (+) key to close (the operator will hear continuous beeping, each beep corresponds to a blade movement of approximately 0.0003"). If the blades are too close to allow entry of the calibration tool, open them by pressing the (-) key until the opening is large enough to allow easy entry of the calibration tool.

1) Insert the tool.
2) Align the "V" of the top blade with the "V" of the bottom blade. Using the square end of the calibration tool, turn the tool to match the "V" in the blade.
3) Press the (+) key (to close the blades tight

to the tool), the operator closes the blades until the tool is held firmly by the blades.

E. Tighten the blade holder screw on the top blade.

F. Press the (RUN) key to store the new blade opening parameter to the memory. Press the (ESC PAUSE) key to exit the calibration menu without storing the calibration value. With either key press, the blades move to the home position and the *** SYSTEM SUPPORT menu is displayed on the screen again:

```
*** SYSTEM SUPPORT:

EDIT SYSTEM    - EDIT
CALIBRATION    - CUT
```

G. Remove the calibration tool. Check the calibration with sample wire and repeat as necessary. When finished, press (ESC PAUSE) to go back to the main menu:

```
DO ONE OF THESE: 0
ENTER 0 FOR NO BATCH
ENTER KNOWN BATCH
ENTER NEW BATCH #5
```

7.3 Fan Filters

The CS800 has two fans and filters (located on back of machine). The filters should be cleaned once a month to ensure proper airflow and prevent overheating of the unit. Rinse the filters under warm water or by a stream of compressed air. Filters must be completely dry before reinstallation.

7.4 Feeder Backlash Adjustment

The feed belts and the internal drive belts have an inherent backlash effect that comes from various pull and feed pressures and numerous changes in direction. This effect shows up in the pull and strip lengths. If the pull and/or strip lengths are consistently incorrect, the CS800 has a feature to compensate for this. In the ***SYSTEM EDIT menu, (press the (EDIT) key from DO ONE OF THESE menu) there exists a menu to compensate for the backlash effect.

```
BCKLSH STRIP L    .02
BCKLSH STRIP R    .0
BCKLSH PULL L     .05
BCKLSH PULL R     .09
```

To resolve difference in actual strip and pull lengths and to achieve required strip lengths (i.e. to correct the output of CS800) follow these steps:

1) Run a sample of 5 (use the most common wire) pieces and determine the average strip (the length of the slug) and pull lengths (the length of the bared conductor). Subtract the actual lengths from the required lengths (your specfifcations, the values entered in the second batch parameter menu).

Note these differences:
(targeted length) - (actual length) = correction value

2) The correction value is added/subtracted from the corresponding backlash value found in the fourth system variable. Test this adjustment with sample wire and repeat as necessary.

An example:
A batch is entered into the CS800: 5.5" length, 0.250" strip each side, 0.125" pull each side (the default values). The processed pieces are averaging 5.5" in length and 0.260" strip lengths and 0.100" pull lengths.

We calculate:
Left strip: 0.250" - 0.260" = -0.010 (the correction value for left strip length, a negative number) The right strip length correction value would be the same here.
Left pull: 0.125" - 0.100" = 0.025" (the correction value for left pull length) Again, due to the symmetry of the data (and for the sake of simplicity), we have the same correction value for the right pull length.

3) At the main screen, "DO ONE OF THESE:", press the (EDIT) key to arrive at the *** SYSTEM EDIT menu:

```
*** SYSTEM SUPPORT:

EDIT SYSTEM    - EDIT
CALIBRATION    - CUT
```

4) Again, press the (EDIT) key to select the SYSTEM EDIT menu and the operator will be prompted for a password:

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```
PASSWORD      <      >
```

5) Enter the password and press (EDIT) key:
(Contact the Eraser Company for password)

```
*** EDIT SYSTEM:
EDIT DATA      -EDIT
CHANGE PSW     -JOG
CLEAR BATCHES -CUT
```

6) Again, press the (EDIT) key to select the EDIT DATA menu. The first system variable menu arrives:

```
TIME DELAY      100
CLEARANCE       1.0
OPENING FACTOR  2.5
SLAG OVERLAP    2.5
```

7) The operator presses the (RUN) key three times to get to the fourth system variable menu:

```
BCKLSH STRIP L  .01
BCKLSH STRIP R  .01
BCKLSH PULL L   .05
BCKLSH PULL R   .05
```

Above, the values given are the default values when the CS800 is shipped from the factory menu. According to the example calculations, we should subtract 0.010" from the two backlash (compensation) strip values and add 0.025" to the backlash (compensation) pull values. Every time, finish input by pressing (ENTER) key.

The operator runs some samples to confirm these adjustments and repeats as necessary.

8) Press the (ESC PAUSE) key until the main screen "DO ONE OF THESE:" appears.

IMPORTANT NOTE ON SYSTEM EDIT FOR BACKLASH COMPENSATION
Changes performed in the system edit menu will affect all saved batches.

8 - TROUBLESHOOTING

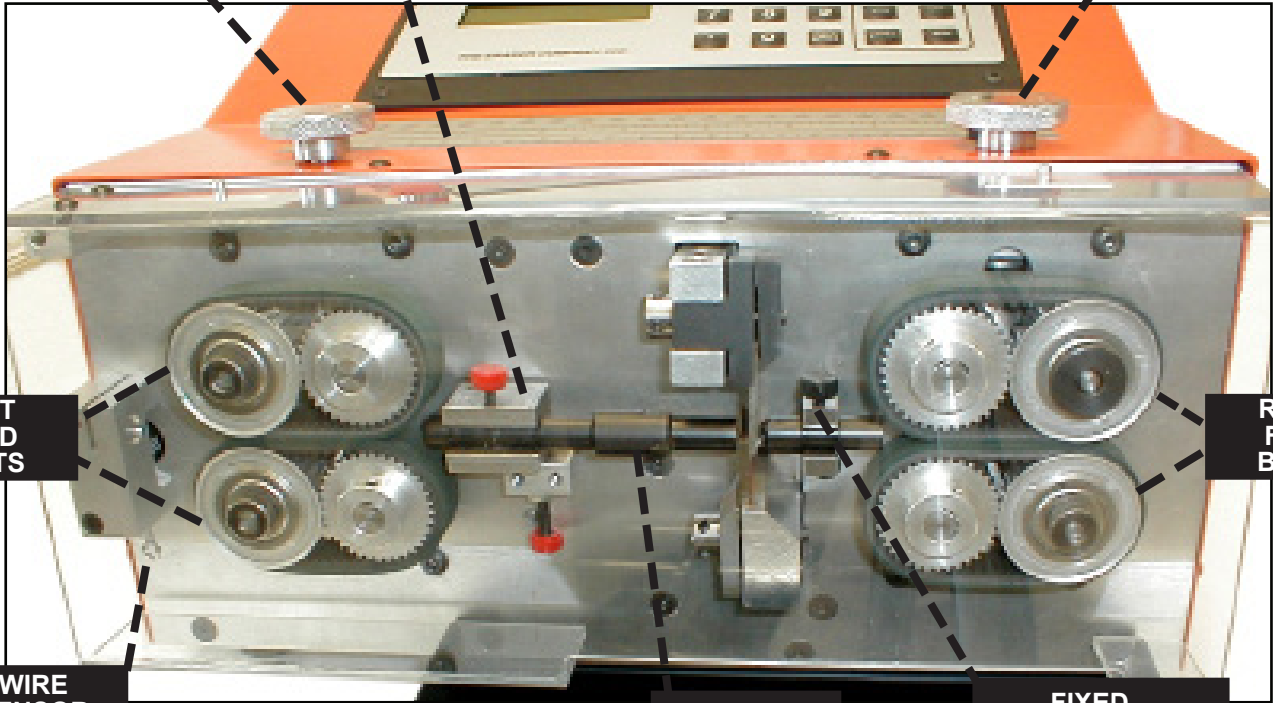| Problem	Possible Cause	Possible solution
Conductors cut	Conductor diameter setting too small	Increase the conductor diameter setting (see section 6.5)
Wire not cut through	Dull blades or conductor is too heavy for the cutting head	Change blades or/and decrease the cut rate (see section 6.7)
Both ends slugs not pulling off	Blades do not cut insulation	Inspect blades alignment (See section 7.2)
		Inspect blades integrity. If they have broken, dull cutting edges, change them (See section 7.2)
		Decrease the conductor diameter setting (see section 6.5)
	Too much releasing during the pull	Decrease the release blade setting (see section 6.8)
Conductors scraped	Release Blade Setting too small	Increase the release blade setting (see section 6.8)
	Conductor diameter setting too small	Increase the conductor diameter setting (see section 6.5)
Right strip slug not pulling correctly	Pull length not set correctly	Set strip and pull length to the correct values (See section 6.6)
	Wire slipping in left belt feeder	Tighten left feed belts (See section 5.3)
Left strip slug not pulling correctly	Pull length not set correctly	Set strip and pull length to the correct values (See section 6.6)
	Wire slipping in right belt feeder	Tighten Right feed belts (See section 5.3)
Right strip bent back when exiting the machine	Strip hits a right feeder belts	Use a Wire Straightener (AR3950)
	Too much conductor exposed	Leave the insulation slug on the wire (semi-strip)
		Decrease the right pull (see section 6.6)
		If the process calls for a long strip and a short strip, put the long strip on the left end.
Small gauge Teflon wire not stripping	Dull cutting blades	Inspect cutting blades, if dull replace (See section 7.2)
	Blades out of alignment	Align the cutting blades (see section 7.2)
		Use different combinations of blade and blade release settings
Wire lengths not accurate	Wire slipping in left feed belts	Tighten left feed belts (See section 5.3) to prevent slippage
	Too much friction on dereeling system	Readjust dereeling system to prevent tugging on the reel
	Wire Straightener too tight	Reduce the Wire Straightener tension (AR3950)
		Check feed rate, slower speed have greater torque which result in better accuracy
Feed belts stall when trying to feed wire	Wire Straightener too tight	Reduce the Wire Straightener tension (AR3950)
	Too much friction on dereeling system	Readjust dereeling system to prevent tugging on the reel.
		Decrease the feed belts pressure
		Check feed wire speed, slower speed have greater torque which result in better accuracy
Wire hits blade and jams	End of the wire deviates widely from the center line	Use a Wire Straightener (AR3950)
		Install the next smallest bushing (See section 5.1)
		Check bushing alignment
		Decrease the feed rate
Left wire end hits input bushing and jams	Left wire end of the wire deviates widely from the center line	Use a Wire Straightener (AR3950)
		Install the next smallest wire output bushing (See section 5.1)
		Check input bushing alignment
		Decrease the feed rate
		Force the input bushing to lift up
Right wire end hits output bushing and jams	Right wire end of the wire deviates widely from the center line	Use a Wire Straightener (AR3950)
		Install the next smallest input bushing (See section 5.1)
		Check output wire guide alignment
		Decrease the feed rate
Unit Overheats	Clogged fan filter	Remove fan filters, clean (See section 7.3)
	Ambient Temperature to high	Refer to Section 2 (Operating Environment). Also, see Section 3.

9 - CS800 PHOTOS WITH COMPONENT IDENTIFICATION

Picture 1

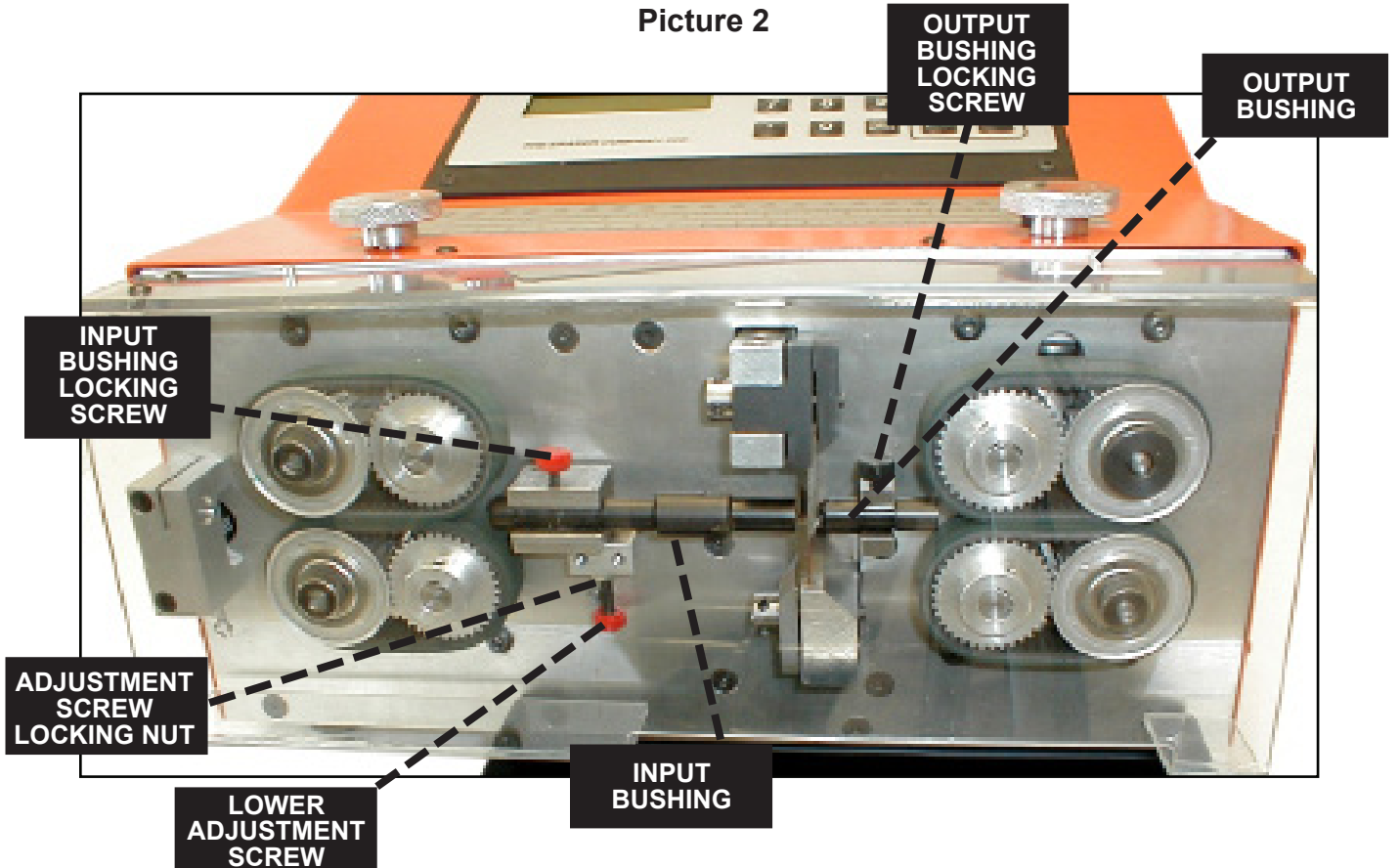LEFT FEED ADJUSTMENT KNOB
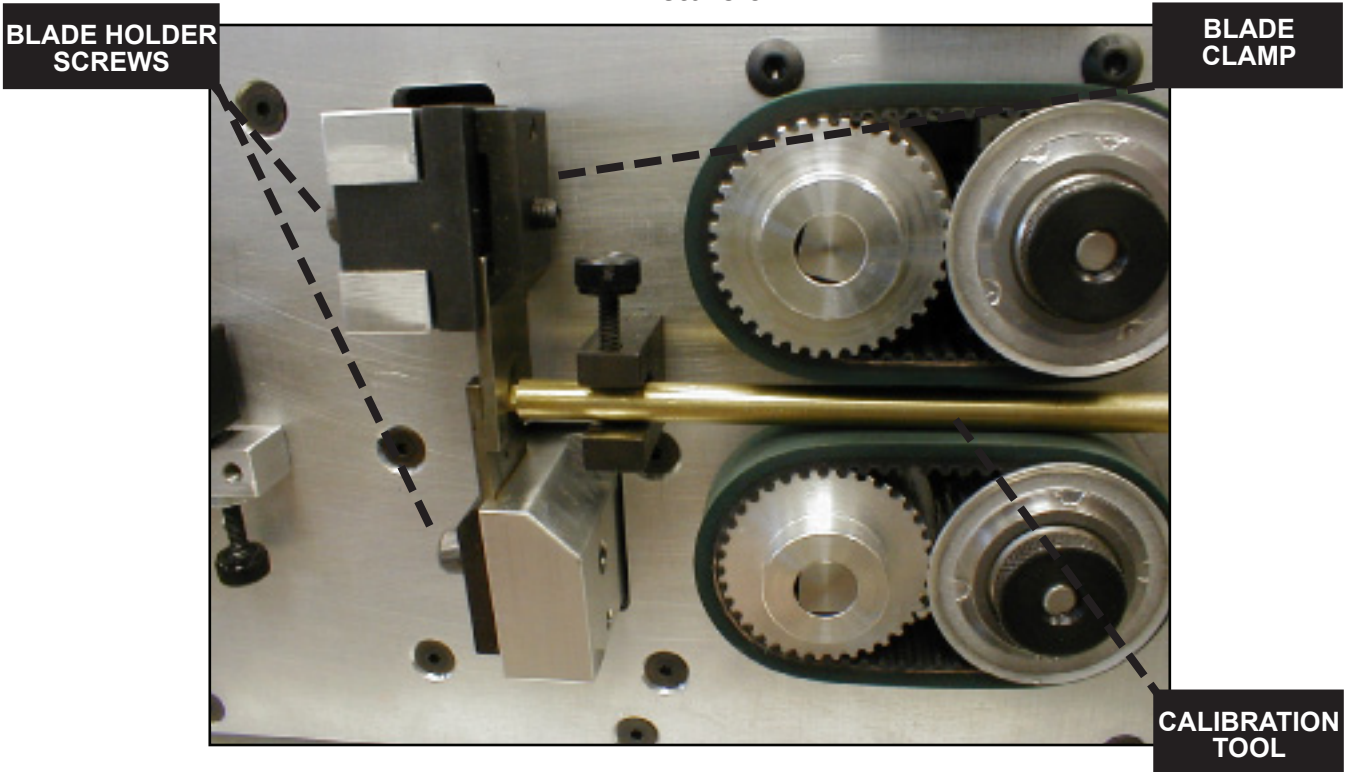
MOVEABLE INPUT BUSHING BLOCK

RIGHT FEED ADJUSTMENT KNOB

LEFT FEED BELTS

RIGHT FEED BELTS

WIRE SENSOR FIN

INPUT BUSHING

FIXED OUTPUT BUSHING BLOCK

Picture 2

OUTPUT BUSHING LOCKING SCREW

OUTPUT BUSHING

INPUT BUSHING LOCKING SCREW

ADJUSTMENT SCREW LOCKING NUT

LOWER ADJUSTMENT SCREW

INPUT BUSHING

Picture 3

BLADE HOLDER SCREWS
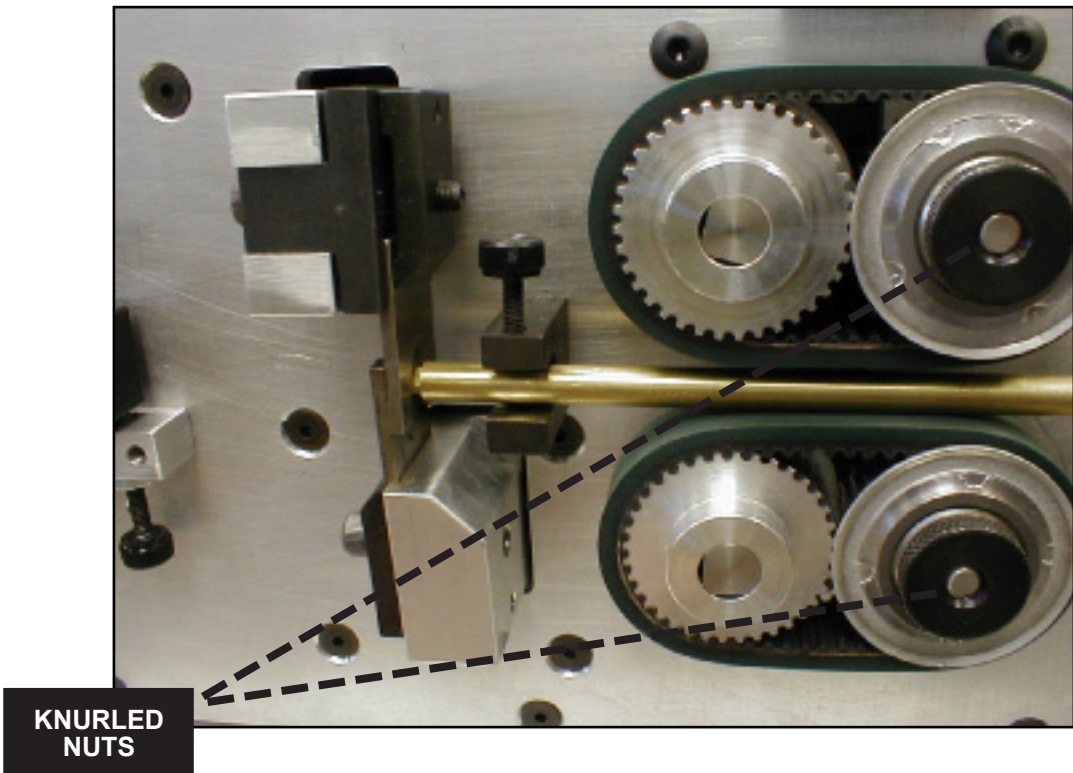
BLADE CLAMP

CALIBRATION TOOL

Picture 4

KNURLED NUTS

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