



of South Florida, Inc.

2010 Notcher

User's Manual



**Computerized
Letter
Notcher**

CLN 2010 Notcher

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Chapter 1

Introduction, Requirements & Safety

- 1. Introduction**
- 2. Systems logic**
- 3. Requirements**
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- 5. Caution labels**

1. Introduction

Everyone at CLN of South Florida, Inc. wants to thank you for purchasing the CLN Brand notching machine, we understand that you had a choice and you picked ours. Before you get started, there are a few things that we need to go over. First thing, read this manual and pay close attention to the safety segment.

2. Systems logic

The main purpose of the CLN program is to translate a DXF file. The program tells the machine how to lay out the return based on the information in the file. The program moves through the file one control point at a time, making complicated calculations as it travels from one point to the next.

- When the job is uploaded to your machine and you select the letter you wish to process, then “Run Tool” the first thing the computer will do is look for the Homing Switch.
- If the material is under the switch, the switch is closed and lets the machine know that there is material in the machine.
- The next thing the machine will do is find the lead edge of the material. It does this by backing the material out of the machine until the material has cleared the Homing Switch causing the switch to open.
- Then the machine will slowly move the material forward and close the switch, thus letting the computer know exactly where the material is in the machine.
- The next thing the computer looks for is the distance from home to start (Start is the center of the 30 degree notcher) and makes that move.
- Next the computer looks at what Tab Setting we have set up in the program. If we have a leading tab the machine will move the material forward $\frac{3}{4}$ ” and then engage the 30 degree notcher. If you have a trailing tab then the machine will just start to process the letter.
- The drive system uses a step motor with an auxiliary encoder. If the material slips while being pushed through the machine then there will be an error. The encoder keeps track of this and makes sure that the error is corrected automatically.

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3. Requirements

A. Compressed air

Air compressor with a minimum capacity of 3 CFM at 80 PSI

B. Electricity

120 V 10 Amp 60 Hz.

230 V 7 Amp 50 Hz.

C. Information

Software capable of producing DXF files see “File preparation”

D. Space

Maintain an area 2 feet behind the machine for maintenance and service. 4 feet in front of the machine, 2 feet on the right side for coil clearance, and 10 feet on the left for a catch table.

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4. Safety

Your Responsibilities Are:

As an operator of the CLN machine, you are responsible to follow all safety procedures. Any person who operates or does any maintenance on this machine must be aware of all safety procedures.

Personal safety precautions:

1. Do not wear any loose fit clothing such as scarves or hanging jewelry.
2. Do not put hands in or on any moving parts at any time.
3. Do not operate machinery while under the influence of alcohol, drugs or any other substance that may impair or alter your judgment.
4. Always wear gloves when handling sharp materials.
5. Always wear eye and hearing protection when operating equipment.
6. Do not operate the machine without the cover in the closed position.
7. Keep hands, head and body out of the way of moving parts, such as the cover.
8. When doing maintenance work on the machine always unplug the incoming electric power and disconnect the compressed air supply. Make sure that the air is completely drained out of the system.
9. Be sure to stay clear of the cover when turning on the air supply, the Cover will open quickly during the initial connection.

Removing the rear access cover

When removing the rear access cover. You must first unplug the machines electricity. Disconnect the compressed air line and completely drain the air out of the system. **If you do not disconnect the electric power and the compressed air line and drain the system you will put yourself at serious risk causing permit damage to yourself or death.**

Follow the safety rules at all time. Under no circumstance should equipment be used for anything other than what it is designed to do. Any person who operates or does maintenance on this equipment should be aware of all safety and operation procedures. It is extremely important that this equipment is handled with care! Distractions such as horseplay, carelessness, loud noises and sudden movements can result in unsafe conditions, therefore should be avoided at all times when operating equipment.

It is important to always keep the work area clean! Oil, water or debris on the floor or around the work area can cause unsafe conditions. Always keep the work area free of hazardous obstructions. Return tools and other items used during operation to their proper storage when finished. The CLN is equipped with very sharp cutting mechanisms and should be handled with care. Failure to follow safety precautions could result in serious injury.

When installing equipment parts, the person handling the installation must read and understand all the operation schematics prior to connecting the machine to the local power source. Connecting the wrong voltage will void the warranty and cause serious injury or death. Place all switches in the off position before connecting power. Always turn off the machine, when left unattended.

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5. Caution labels

Cover operates automatically

As this equipment is programmed it may start unexpectedly. Operators and other shop personnel need to be aware of this. The cover opens and closes automatically under pneumatic control.



Understand owner's manual before operating this equipment

Read the owners manual completely before using this machine, if you are confused about anything stop and get help from the manufacturer.



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Pinch point

This label means there is an extreme danger of your hand or fingers being cut off.



Electrical Shock

Electrical shock is possible with any machine. Only authorized certified personnel should service the machine.



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Chapter 2

Machine Setup

- 1. Location**
- 2. Assembly**
- 3. Electric power**
- 4. Compressed air**
- 5. Ethernet connection**

1. Location

- Maintain an area 2 feet behind the machine for maintenance and service. 4 feet in front of the machine, 2 feet on the right side for coil clearance, and 10 feet on the left for a runoff table.
- Set the height of your runoff table, below the lowest part of the output hole on the machine. Table should be 8' to 10' long.

2. Assembly

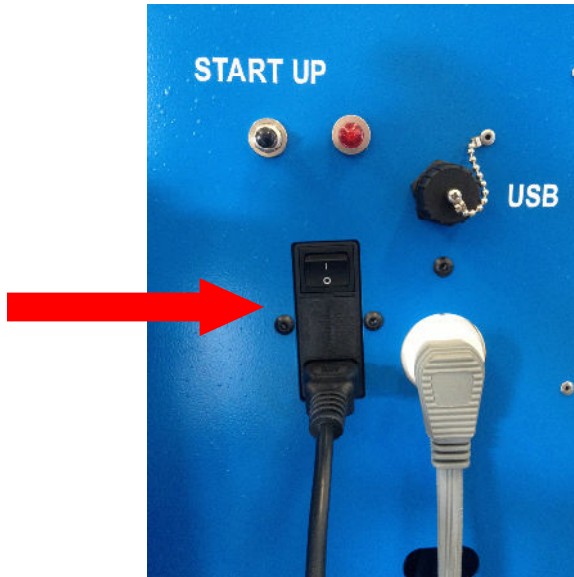
- Thread in the leveling feet into the legs of the machine, there will be threads cut into the bottom of the leg. Don't put them in the hole used for shipping.
- Bolt the monitor arm to the right side of the machine, then the monitor to the monitor arm, set the key board in place along with the mouse. Plug in the keyboard and mouse to the computer. Plug the power cable and the video cable into the back of the monitor.
- Bolt Power Feed Decoiler on the right side of the machine. Use the supplied hardware. The bolts are usually threaded in the machine where the part needs to be bolted. Bolt the limit switch rod to the Decoiler. Take the cord that is attached to the Power Feed Decoiler and plug it into the receptacle that is on the machine.
- Install the air filter regulator to the right side of the machine and push the air hose into the push connect fitting located on the air filter regulator.



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3. Electric Power

Plug the main power cord into the AC power module located on the right side of the machine. (See requirements B. electricity) Make absolutely sure that there is no AC voltage coming out of the neutral side of the power outlet. There are two fuses located inside the power module for the machines internal protection.



4. Compressed Air

The machine uses compressed air to power cylinders that are needed to operate tools in the machine. Connect air supply to regulator on the machine, set gauge at 80 PSI. **CAUTION, COVER WILL OPEN QUICKLY WHEN AIR IS TURNED ON!** Your machine is now under pressure.



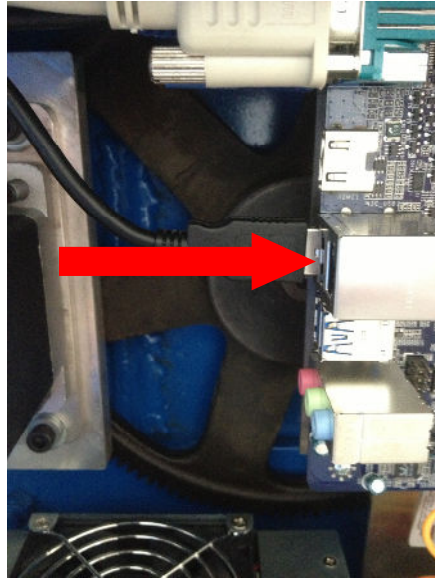
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5. Ethernet connection

Observe all safety precautions when doing this next step (Read Chapter 1 Section 4).

Connecting to other computers by using the internal inherent connection is your responsibility.

Remove the rear access cover for access to the computer.



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Chapter 3

System Overview

A. Power Feed Decoiler

The power feed decoilers purpose is to manage the coiled stock material. Making sure that the machine doesn't have to pull it off the coil. When the machine requires more material the material pulls the rod connected to the limit switch, which turns on the Decoiler motor and maintains an even loop in the coil.



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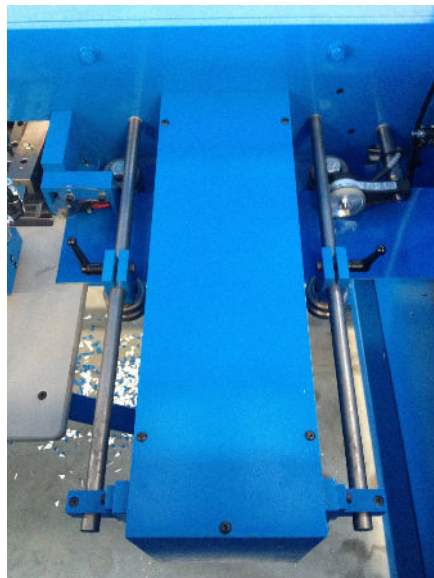
B. Straightener

The Straightener removes the memory from the coiled stock. There are three rollers that make up the straightener, two on the bottom and one on top. The one on top is attached to a cam that is connected to a lever. The lever can be pushed down and lock into place for more tension between the rollers.



C. Drive Box

The drive box moves the material through the machine. The idler roller in the drive box releases pressure, when the cover is opened for easy loading.



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D. Homing Cell

This is an electric switch located about two inches to the right of the thirty-degree Notcher. The condition of the switch tells the machine which way to move the material. When the coiled stock moves out from under the switch causing the switch to open that tells the machine, that material is not present. Then the machine moves the material slowly back under the switch until it closes the switch. This is how the machine locates the edge of the channel letter return.



E. Encoder

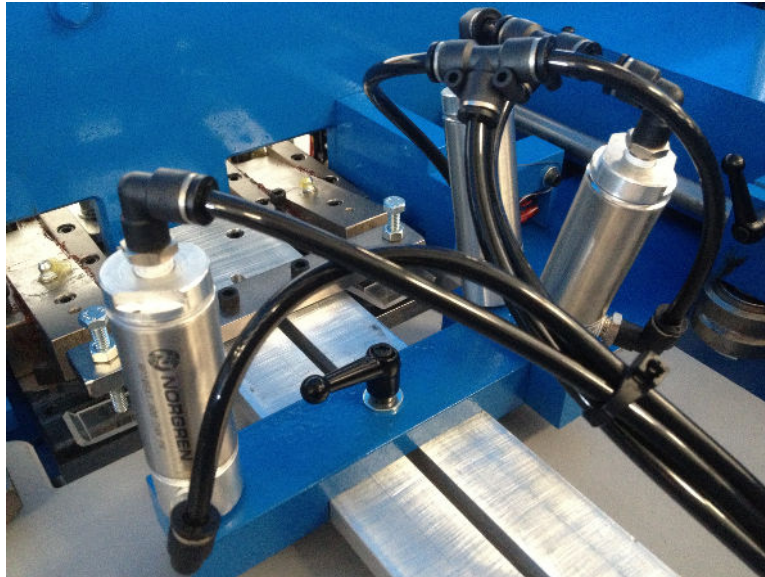
When the step motor feeds material through the machine, the encoder keeps track of all the measurements. If there is a discrepancy the encoder tells the motor to make a correction.



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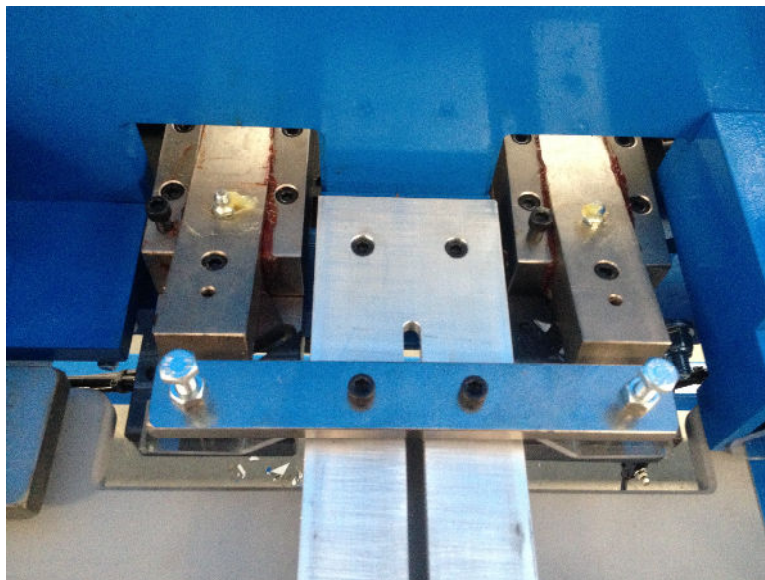
F. Dimpling Tools

The dimpling tools are located directly in front of the Notchers. The double dimple tool lines up with the 30 degree Notcher. The single dimple tool lines up with the 100 degree Notcher. A reverse or *negative* break bend receives two dimples and a forward or *positive* break bend receives a single dimple.



G. Notching Station

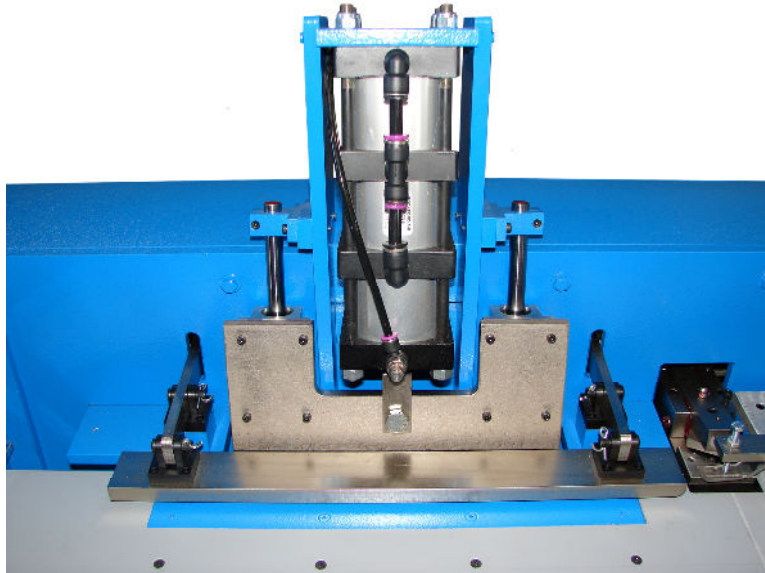
The Notcher on the right is a 30-degree Notcher assembly. The Notcher on the left is a 100-degree Notcher assembly. The 30 degree Notcher is for negative break bends, radius bends and a relief notch that is needed for the flanging station. The 100 degree is for positive break bends and the tab.



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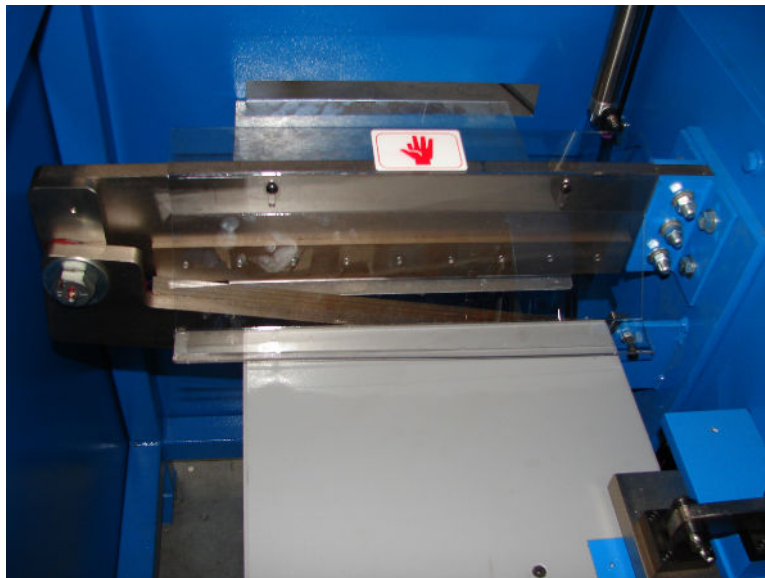
H. Flanging Station

The flanging station consists of a clamp and a ram. They work together to form a 90 degree bend on the edge of the material. The clamp comes down first it holds the material down, and then the ram pushes the material over a die. This is done in 12" increments. That is why the Notcher puts a relief notch every 12".



I. Shear

The shear cuts the return from the coiled stock .It is located all the way to the left of the machine. It has two removable dies that can be sharpened.



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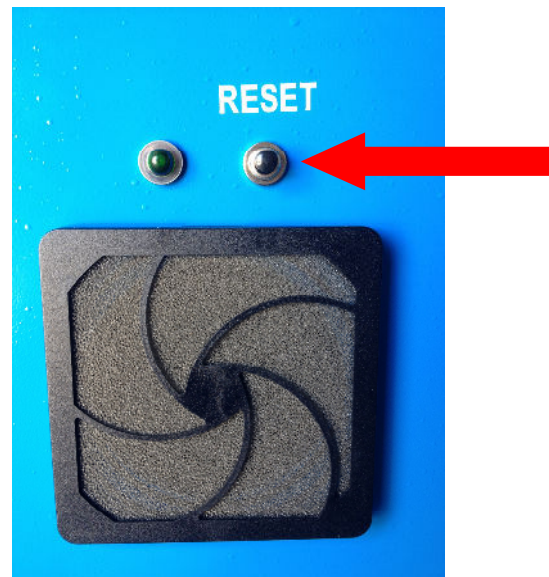
J. External USB Port

The external USB port is a convenient way to transfer data directly to the machines hard drive.



K. Reset Button

The reset button resets the controller that runs the machine. It causes the controller to start over to a power up condition



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L. Emergency Stop switch

The purpose of the emergency stop switch is to shut down all power to the machine in the event of a dangerous situation. There are two on the Auto Bender one on each side. To release the switch pull it out or twist.



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Chapter 4

DXF File Generation

A DXF file is used to record X and Y coordinates. Some programs export better than others. Our CLN program uses the information in the file to calculate the letter or shape that you need to process. If the DXF file is not consistent and predictable you will have problems.

You have to think about this machine, as if it was a router table. If you tell your router table to cut a 12-inch letter, with the proper tool path the letter will measure 12 inches. Your router table just did what you told it to do. It is no different than sending a DXF file to the CLN software.

File Direction

The best way to explain file direction is to compare it to your router table it is the direction that the router bit cuts, as it goes around the letter. It is not the tool path distance that is called the offset it would be the direction of the tool path. For normal use the outside of a letter needs to travel clockwise and the inside goes counterclockwise. This can be tested before you click run tool and make a letter backwards. By clicking rotate start point + the start point should toggle clockwise around the outside of a letter and counterclockwise around an inside of a letter. The direction is generated by the DXF module of the cad program that you are using.

Artwork Problems

If there is three or four control points all bunched together in the same place, the program may give false directional dimple and or wrong notch, but it won't shorten the total length. There is a control point filter in the program but it doesn't catch everything. What you need to remember, is that the system will do what you tell it through the DXF file. "Garbage in garbage out"

NOTE: See the CLN step by step art work set-up procedure guide hand book.

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Chapter 5

Machine Start up Procedure

- 1. Power up**
- 2. Loading coil stock**

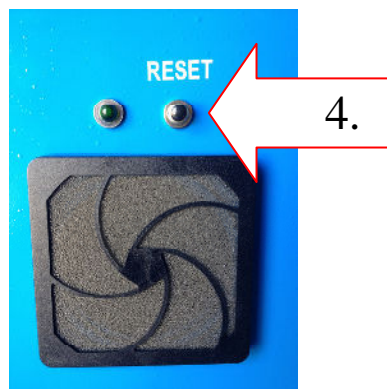
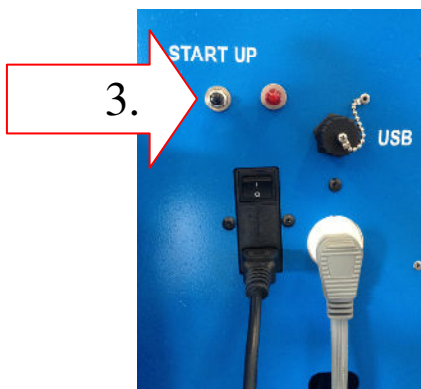
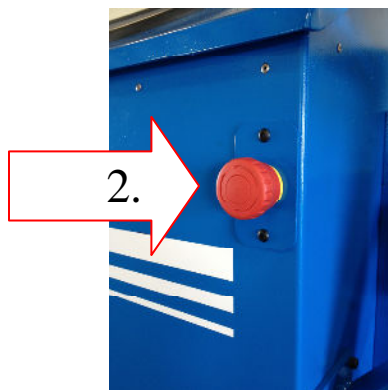
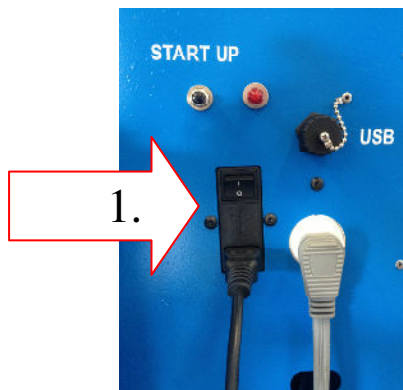
1. Power Up

A. Compressed air

Turn on Compressed air supply. **Caution**, the cover will open rapidly.

B. Electricity

Turn on main (1) Power switch, and then pull out the red (2) Emergency stop button. Turn on (4) computer and monitor if they have not already turned on. Wait until the computer becomes stable. Press (3) Reset on the rear of the machine. Now start the CLN program. If the program starts with no error message you now are powered up and the machine is ready.



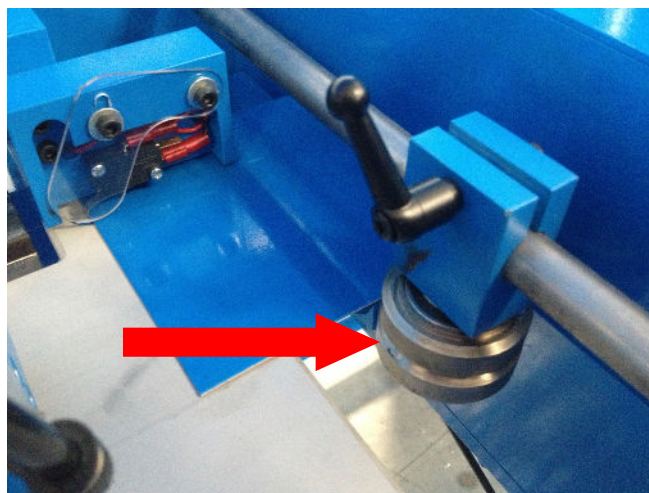
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2. Loading coil stock

1. Push the Cover Open button in CLN program if cover is not already open.
2. Loosen the V groove bearing located on each side of the drive box and pull them toward the front of the machine.
3. Put the coil stock in the Power Feed Decoiler, flushed against the guide rollers that are toward the back of the machine.
4. Slide both guides' rollers against the coil stock and tighten.
5. Pull about 6 feet of coiled stock material straight up and feed it carefully into the machine. Make sure that the material is on top of the limit switch rod, if the power is on and it usually is, the Power Feed Decoiler will spin the coil stock. Be sure **not to smack the encoder** when pushing it in the machine. Push it through the drive box and be careful **not to side swipe the Homing Switch**. The Homing Switch is very sensitive and can be easily broken or damaged and your machine will no longer function properly. Slide the material straight under the switch, stop around the first Notcher. It is not critical where the edge of the material is.



6. Slide the V groove bearings against the materials edge and tighten the levers. Move material left and right, make sure it is secure in the V groove bearings, and all four bearings should roll, if not, retighten until they do.



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Chapter 6

CLN Operator Software

The purpose of the CLN software is to give the operator, a way to view the artwork that was sent via, DXF and convert it so that the machine can process the information correctly. You can alter the start point, split the letter into two parts but that's it. It has nothing to do with artwork generation or modification; it is only a DXF translator.

Break Bends

- A break bend is two lines meeting together with one point. The program calculates the two adjacent lines and provides an angle.
- If the angle is a positive 90 degrees or less, the program tells the machine to use the 100-degree Notcher and notch one time at the break bend location.
- If the angle is a positive 90 degrees or greater the program tells the machine to use the 100 degree Notcher and notch 1/4" before the bend one at the bend and one 1/4" after the bend. This is so that the flange will not collide into itself.
- If the angle is a negative bend of any degree the program tells the machine to use the 30-degree Notcher and notch one time at the break bend location.

Radius Bends

When the program reads a radius it calculates the size of the radius and tells the 30-degree Notcher to notch accordingly. For small radiuses the notches will be closer together and for larger radiuses the notches will further apart, but not to exceed the maximum *radius notch distance* setting in located in *tools setup*.

Curfing loss

Curfing loss occurs when the router cuts the letter back the router bit can't cut a sharp corner down in the crotch of letters like W or V. This routine calculates what the router bit can't cut and compensates for it by subtracting out the difference from the two lines that create a negative angle. The setting is in *tools setup* it is called *Router Bit size*.

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Program Definitions

File \ Open: Brings you into an open screen so you can open DXF files.

File \ Exit: Closes the program.

Tools \ Run: This function is used for notching and flanging a strip of material. A dialog box will pop up, inside you can type the total length and the distance between the notches that you need. The machine uses the 30-degree Notcher for this feature.

Tools \ Uncalibrated Move: This function moves the material to a desired distance, but does not use the aid of the encoder.

Tools \ Setup: This is where you can make changes to the CLN program. These settings are unique to your machine. These settings are stored in Setup.dat and if an update is sent to you these settings will not change as long as Setup.dat is not disturbed. So make a copy of the whole Notcher folder ASAP and put it some ware safe.

Dialog box definitions:

- **Comport:** Communication port, enter the port number that is assigned to the RS 232 comport. Valid ports are 1 through 4.
- **Distance from bender to sheer:** Left side of flanging blade to shear blades. This is ware you are able to make adjustments the location of the shear cut. The cut should be centered in the last notch.
- **Distance between Notchers:** Distance from the center to center of both Notchers.
- **Radius notch distance:** Controls maximum arc notch distance. The distance will be no greater than this setting for a radius.
- **Control point filter:** Helps eliminate excess notching and marking. If there is a cluster of control points in one area the program executes the first one, moves the distance and skips the next dimple and notch instructions within this distance.
- **Steps per inch:** Converts step motor steps, to inches. Used for model 3 and under.
- **Router bit size:** When the router cuts the back out, the bit can't get down in the crotch of some letters, like W or V. We calculate that difference and subtract it out from each side of the crotch. Insert the router bit size that you used to cut the backs out with. The program will automatically do the calculations for you.
- **X Offset:** Positing of graphics (setting used to match monitors resolutions for left and right)
- **Y Offset:** positing of graphics (setting used to match monitors resolutions for up and down)

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- **Rewind Distance:** The distance from the 30-degree Notcher and the shear. This is only used in machines that do not have a homing cell. It is used to bring the material back to the start position, which is centered on the 30 degree Notcher. Used only for model 1.
- **Home to 30-degree Notcher:** The distance from the home cell to the center of the 30-degree Notcher. This adjusts the start of the letter.
- **Distance between photocells:** The distance from home cell to the calibrate cell this setting is used to calibrates the material feed in machines that do not have an encoder. Used for model 2 and under.
- **Bender Output: 1=YES 0=NO** If bender output is turned on, the program will add Ten inches to the end of the return, this is for the Auto Bender. The Auto Bender requires this extra piece so that it can control the return towards the end of the letter. However this is not necessary all of the time. The CLN program knows if Auto Bender requires it or not, if it is not necessary it won't add it to the return.
- **Closed Figure: 1=YES 0=NO** This setting allows an open path to be sent to the machine. Some DXF files will require this setting to be altered you will know it, if the art work is missing parts or if you send an open path and the CLN program closes the path.
- **Notch/Flange: 1=NO 0=YES** This turns on and off the notching stations and the flanging station. This is used for reverse channel letters.
- **Model:** Machine version, type the number in the dialog box that matches your machine features.
- Model 1: 2 Notchers, Dimpling
Model 2: 2 Notchers, Dimpling, 2 Photo Cells
Model 3: 2 Notchers, Dimpling, Encoder Old Controller Card
Model 4: 2 Notchers, Dimpling, Encoder New Controller Card
Note: Must have tools that are listed above in model type or this program will not work.

Tools \ Move: Moves the material with the aid of the encoder.

Tool \ Sheer: Cycles the shear one time.

Tool \ 100-degree notch: Cycles the 100-degree Notcher one time.

Tools \ 30-degree notch: Cycles the 30-degree Notcher one time.

Tools \ Indicate: Cycles the Double dimples one time.

Tools \ Flanger: Cycles the flanger one time.

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Options \ Divide character: Separates the character into two sections, the feature turns off after each time you touch run tool, or you do anything to the program, even touching the screen will turn it off. If dividing the letter into more than two sections are needed, than you can do this in your cad program and send it as an open path. You may need to turn on open path in “*tools setup*”.

Options \ Image Length: Calculates the total length around the letter, it does not include the tab or bender output distance. This feature is what works along with Segments on /off.

Options \ Segment length on Most of the time the operator will only need to check the overall length of a letter so by clicking image length you can do that, however if you want to break down the letter by dimensions then you can use this feature. This feature works with the image length dialog box. This allows you to view the dimensions of the image, it displays the dimensions accumulatively and segmented. By clicking image length and then click OK, it opens note pad in your computer and displays the values. This is a very important tool when you are having problems. These dimensions can be used to prove the machine right or wrong. If the return, does not match these dimensions the machine is at fault, if it does, it means the DXF file is incorrect.

Options \ Segment length off: This is the default setting for the image length, for when you want to look at the image length without looking at the dimensions.

Options \ Job Length: Calculates the total length of everything on the screen, it does not include the tab, or bender output distance.

Options \ Continuous Job Processes the whole job continuously. Set the start points where you want them. Touch continuous job and then touch run tool. The images on the screen will be processed in the order that they were exported. They will automatically highlight themselves so the operator knows what letter s being processed.

Options \ Repeat Image Count: Processes one letter multiple times. Touch the up or down button in the dialog box to the desired number of letters that you want to process. Then touch run tool, the number of letters that you selected will be processed.

Options \ Change Tab: Allows you to alter the tab location. There are four tab selections lead tab which is needed for a letter with a top right starting position. Trail tab which is needed for a top left starting position. The both tabs button is for tabs on each side of the return and no tabs for no tab on the letter.

Options \ View log: This is a record of the machines output functions and the material that was ran through it. It also has a timer code that is set at the factory it will not be cleared until the machine is paid for in full.

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Image \ Control Points On: Turns on the ability to view the control points.

Image \ Control Points Off: Turns off the ability to view the control points.

Image \ Select next: Selects the next letter in the file.

Image \ Start Point Plus: Moves the start point around letter clockwise. Start point alteration cannot be saved in the CLN program. If you want to save the start point location, than you have to do it in the cad program before you export it.

Image \ Start Point Neg.: Moves the start point around letter counterclockwise. Start point alteration cannot be saved in the CLN program. If you want to save the start point location, than you have to do it in the card program before you export it.

Help \ About: Information about the program.

Shortcut keys

- **Next:** Selects the next letter in the file.
- **Start Point Plus:** Moves the start point around letter clockwise.
- **Start Point Neg.:** Moves the start point around letter counterclockwise.
- **Zoom +:** Enlarges the image.
- **Zoom -:** Decreases the image.
- **Run Tool:** Begins processing the letter or letters that you selected.
- **Reset tool:** Closes the pneumatic cover and enables the machine. The machine will not respond if you do not press this first.
- **Cover open:** Opens the pneumatic cover.

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Chapter 7

Calibrations

- 1. Material feed**
- 2. Tool timing**
- 3. Mechanical adjustments**

1. Material feed

The drive system uses a step motor with an auxiliary encoder. If the material slips while being pushed through the machine then there will be an error. The encoder keeps track of this and makes sure that the error is corrected automatically. Here's how it works, let's say the step motor moves the material 100 inches. The encoder keeps track of this move, if the material does not move correctly the first time, then the encoder tells the step motor to make a correction until the encoder agrees with 100 inches. Making adjustments to the step motor will eliminate any extra moves. Making adjustments to the encoder will make the material measure correctly.

Is Calibration needed?

Get the image length that is generated from the CLN program and then measure the parts that are coming out of the machine if they match then no calibration is needed. If not then you will need to calibrate the machine. Remember the tab or the bender output part is not included in the CLN image length.

When doing a calibration test, look for two things, error corrections that the encoder picked up and the overall length. If you did not see any error corrections and the material moved exactly 48" then there is no need for adjustment. If the machine did not move correctly then follow these steps.

Helpful tip

A fast and easy way to see if the machine is measuring correctly is to measure the 12" relief notch used for the flange. They will be in multiples of 12 inches on center. Pull a tape measure along the return and see if there is a notch every 12 inches.

Setup 2.dat

You need to know how to use **Setup 2.dat**. Setup 2.dat is where adjustments can be made to the machine. It is a file that opens in note pad go to **C:\> Notcher > Setup 2.Dat** Double click on it. Be careful not to accidentally change anything. If you are not sure about a change, then close without saving changes and start over.

We highly recommend that you make a back up file of the Notcher folder it will have your current unique settings. So if your computer malfunctions you will have the most current set of settings for your machine.

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How to calibrate the machines encoder

1. Load material into the machine past the 30 degree Notcher. Press reset on the screen to close the lid and lock the material in place.

2. Use a Squaring tool and bump it up against the straightener draw a line on the coil put a number 1 next to it for future reference. Get help with this next step, hold a tape measure flat and straight, also burn an inch on the tape. This is the distance that you are going to calibrate to, so make sure it is done correctly. Now measure 48" to the right of the coil and apply a second line on the coil put a number 2 next to it for future reference.

3. Now go to **Tools > Move**, 48" will appear in the drop down box. Now press OK. The material will move, look to see if the material moved exactly 48" by holding the square to the straightener and looking at the line labeled 2. Line 2 should have moved up to where line 1 was. If line 2 does not line up exactly, then mark that spot on the coil and measure that actual move distance then go to step 4.

4. Close the CLN Software

Go to the Windows Explorer then go to **C:\> Notcher > Setup 2.Dat** Double click on setup.dat it will open in note pad. Change the **CPI #XXXX.X**

This is a formula that will help you calculate the error.

Commanded Move / Actual Move * Current CPI = New CPI Value

- Commanded Move is the value you entered in the program.
- Actual Move is what the material traveled.
- Current CPI is the value in setup.dat.
- The new CPI number gets entered in the current CPI number.

Note: Making the CPI number larger will make the material move further.

After you change the CPI number, close the **Setup 2.Dat** and save the changes. **You must close the CLN program and reopen it.** The information in the setup.dat file is downloaded to the controller when the CLN program is started.

5. Retest and go back to steps 1 thru 3

Once you have calibrated the machines encoder now run the same test, but this time use **Uncalibrated move**, instead of **Move**, to move the material through the machine. The steps are exactly the same as calibrating the encoder. The differences are the command that moves the material and the value that you alter for the resolutions. Follow the steps in, **How to calibrate the machines step motor.**

CLN 2010 Notcher

How to calibrate the machines step motor

1. Load material into the machine past the 30 degree Notcher. Press reset on the screen to close the lid and lock the material in place.

2. Use a Squaring tool and bump it up against the straightener draw a line on the coil put a number 1 next to it for future reference. Get help with this next step, hold a tape measure flat and straight, also burn an inch on the tape. This is the distance that you are going to calibrate to, so make sure it is done correctly. Now measure 48" to the right of the coil and apply a second line on the coil put a number 2 next to it for future reference.

3. Now go to **Tools > Uncalibrated Move**, 48" will appear in the drop down box. Now press OK. The material will move, look to see if the material moved exactly 48" by holding the square to the straightener and looking at the line labeled 2. Line 2 should have moved up to where line 1 was. If line 2 does not line up exactly, then mark that spot on the coil and measure that actual move distance then go to step 4.

4. Close the CLN Software

Go to the Windows Explorer then go to **C:\> Notcher > Setup 2.Dat** Double click on setup.dat it will open in note pad. Change the **SPCNT #XX.XXX**

This is a formula that will help you calculate the error.

$\text{Commanded Move} / \text{Actual Move} * \text{Current SPCNT} = \text{New SPCNT Value}$

- Commanded Move is the value you entered in the program.
- Actual Move is what the material traveled.
- Current SPCNT is the value in setup.dat.
- The new SPCNT number gets entered in the current SPCNT number.

Note: Making the SPCNT number larger will make the material move further.

After you change the CPI number, close the **Setup 2.Dat** and save the changes. **You must close the CLN program and reopen it.** The information in the setup.dat file is downloaded to the controller when the CLN program is started.

5. Retest and go back to steps 1 thru 3

The uncalibrated has to be very close to the calibrate move preferably a little long by about a 1/64 of an inch. In the CLN program we will always look back to the encoder for the true measurements and make any corrections at the time of the move. However if we can get both movements close there we be minimum error corrections and that makes the machine work faster.

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2. Tool timing

Tool timing is the time it takes for the tools to make one complete cycle. There are two timing settings. The first timing setting is for how long it takes for the tool to fully extend. The second timing setting is for how long it takes for the tool to retract before the machine begins feeding again. These settings may need some adjustment, due to a restricted airflow to the machine or your air compressor can't keep up with the machines factory settings. Slowing the timing settings down slightly is not usually noticeable, only a few tenths of a second is all that is needed to make the machine work properly.

Adjusting timing cycle

1. Close **all** open programs
2. Go to **C:\>Notcher > Setup 2.Dat** and change the tool that needs adjustment. Making the number larger will add more time to the cycle. The values are in milliseconds 1000=1 second

For example:

30 Degree Notcher down delay
down 30 = 75

You will need to change the 75 to 80 to give the Notcher more time to move down through the material.

After you change a delay value, close the **Setup 2.Dat** and save the changes. **You must close the CLN program and reopen it.** The information in the setup.dat file is downloaded to the controller when the CLN program is started.

Pneumatic flow controller

Another way to adjust the tool timing is by a flow controller. A flow controller is a metering device that regulates the air that is being exhausted out of the cylinder. It is how the speed of the cylinder is controlled. There is one on the flanging cylinder, two on the clamp cylinders, one on the shearing cylinder and four on the cover cylinders. To adjust the flow controllers you must loosen the jam nut and turn the center screw until the cylinder speed is satisfactory then retighten the jam nut.



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3. Mechanical adjustments

Observe all safety precautions when doing mechanical adjustments
(Read Chapter 1 Section 4).

Encoder tension

1. Remove the rubber cap with your fingers.
2. Insert a 3/32 hex L key into the setscrew on the spring adjustment collar. Using the hex key for leverage, rotate the collar around the pivot shaft in the direction necessary to increase the spring force that holds the measuring wheel against the surface to be measured. While maintaining pressure, tighten the setscrew very securely to avoid lose of spring pressure. (A torque of 15-18 in-lbs is recommended, however a torque wrench is not required as long as the setscrew is good and tight.) You should be able to lift the wheel 1/8 to 1/4 of an inch above the material.



Flange alignment

1. Loosen the V groove guide bearing that are on adjustable slides and pull them toward you.
2. Measure the distance from the die angle and the back plate of the machine, measure each side and record these measurements.
3. Push the return into the machine almost to the shear. The return is going to act as a straight edge.
4. The material should over hang the die by 1/2 of an inch use the measurements that you recorded to help you with this by subtracting a 1/2 of an inch from the measurements. You are trying to establish a parallel distance off of the die and set the material to it.
5. Loosen the V groove guide bearings that are mounted in the rear of the machine. On older models the bearings are mounted on an eccentric post. With a 5/16 hex L key rotate both posts until the V groove bearing aligns the material in parallel to the die and then tighten the jam nut. On newer models the L bracket that holds the V groove is on a slide attached to a jack bolt. Loosen the L bracket and adjust the jack bolt.
6. Load the coil back in the machine and then run a 24" return. Inspect the flange, it should be 1/2 of an inch and most importantly parallel.

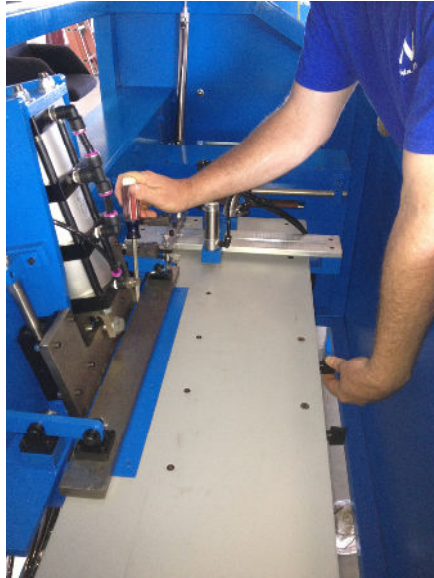
CLN 2010 Notcher

Flange angle

1. Reach under the die plate and loosen the four thumb bolts that hold the bottom of the flanging assembly.
2. Turn the two thumb bolts located at the edge of the die plate clockwise to increase the flange angle and counterclockwise to decrease the flange angle. Stick a large screwdriver between the die and the flange blade. Apply slight pressure this will keep any backlash out of the adjustment.

Usually a ¼ turn is all it needs.

3. Retighten the four thumb bolts, then run the machine and inspect the flange angle.



Notcher Depth

1. Disconnect the compressed airline and the electricity by unplugging the electric cord from the machine, and then remove the rear cover.
2. Loosen the bolts that are attached to the rear angle supports.
3. Loosen the bolts that are holding the Notcher to the Notcher cross bar.
4. Move the Notcher to the desired location and then retighten. Replace the cover and then reconnect the power. Run the machine and inspect notch depth.

CLN 2010 Notcher

Notcher Die Replacement

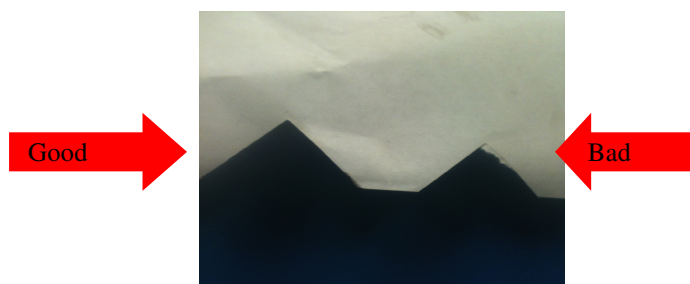
1. Put on safety glasses, disconnect the air and unplug the electrical cord on the machine.
2. Remove the rear cover.
3. Loosen the set bolt and remove the ½ inch round pivot pin in the notcher, lift the upper notching arm up and toward you.
4. Remove the punch, sharpen and replace if necessary.
5. Remove the two lower dies, sharpen and replace if necessary.
6. Remove the rod adapter. (Fig1.) Put a wrench on the flats of the cylinder rod and a second wrench on the jam nut loosen the jam nut. Keep turning until the rod adapter is all the way out.
7. Replace the upper notching arm **without the rod adapter just for now**.
8. Push the upper arm down so that the upper punch is below the two dies.
9. Tighten the lower die bolts about 50%.
10. **(Put on safety glasses)** Use a small steel hammer, very lightly tap the lower die and set the die spacing carefully. Test the fit by cutting paper (Fig 2.) Cycle the upper notcher arm by hand. You may need a pair of vice grips clamp to the back side of the arm for leverage. You should be able to cut paper cleanly. The paper test will tell you what part of the die needs to move. (Fig3.)
11. Tighten the die bolts to max torque, then test again just to be sure they are set correctly.
12. Loosen the set bolt and remove the ½ inch round pivot pin on the notcher, lift the upper notching arm up and toward you.
13. Replace the rod adapter. Thread it all the way down. Put a wrench on the flats of the cylinder rod and a second wrench on the jam nut and tighten the jam nut down to the cylinder rod. Make sure that the top of the nut touches the bottom of the roll pin.
14. Replace the upper notching arm. The cylinder rod will turn so you can align the rod adapter to the upper notching arm. For the final adjustment turn the rod clockwise, so you won't accidentally loosen the jam jut.



(Figure 1.)



(Figure 2.)



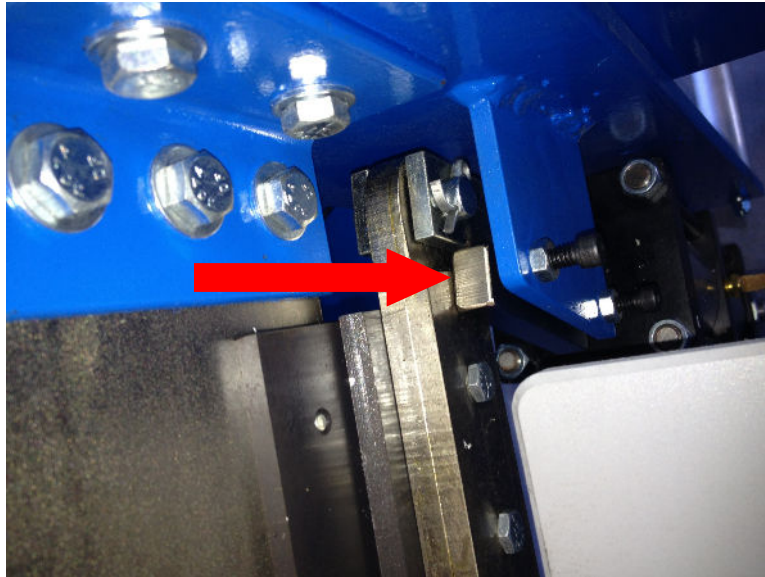
(Figure 3.)

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Shear blade tolerance

The shear blades should barely touch each other as they slide against each other. The shear tension plate ensures that the blades stay together and make a clean cut while in the middle of a shearing cycle.

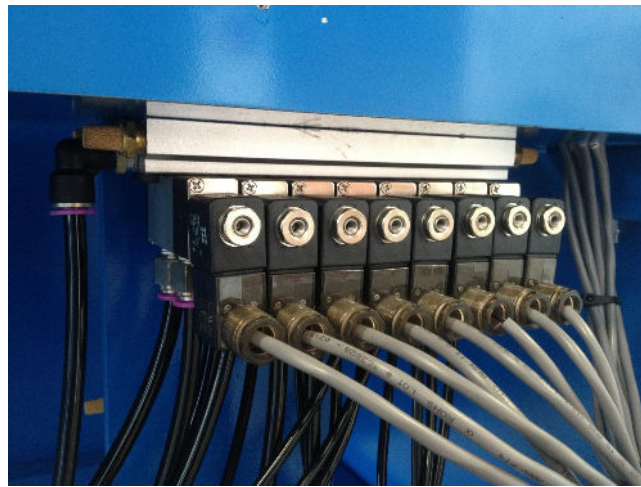
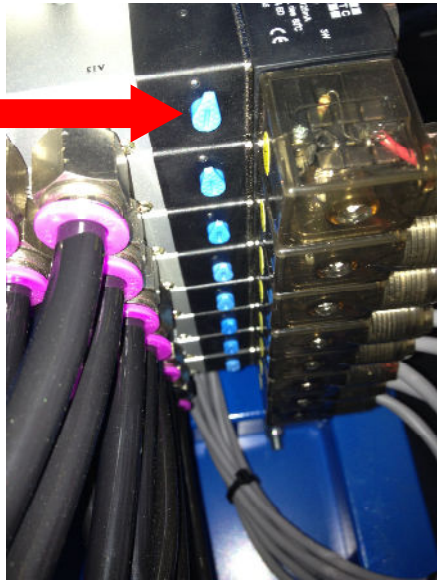
1. Manually close the shear.
2. Loosen the $\frac{1}{4}$ -20 jam nut with a 7/16 wrench.
3. Turn the bolt clockwise until the blades just touch each other then retighten the jam nut.
4. Cycle the shear manually and listen for any grinding noise. If you hear any grinding noises stop! You over tightened the tension plate, back off on the adjustments.



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Valve manifold and stations

Most of the tools, in the machine are controlled by compressed air. The controller will send an electrical signal to the coil at that time the LED in the coil connector will light up, letting you know that the electrical signal is present. The coil operates a small valve called the operator valve the operator valve is what controls the pilot valve. The pilot valve shifts back and forth allowing compressed air to operate the tool. There is a manual override button on each valve pressing it will manually operate the operator valve and bypass the coil. Sometimes a station may hang up because of sitting for a long time. Pressing these buttons will clear out the containments that are causing the valve to stick.



CLN 2010 Notcher

Chapter 8

Maintenance

- 1. Weekly**
- 2. Monthly**
- 3. Six months**

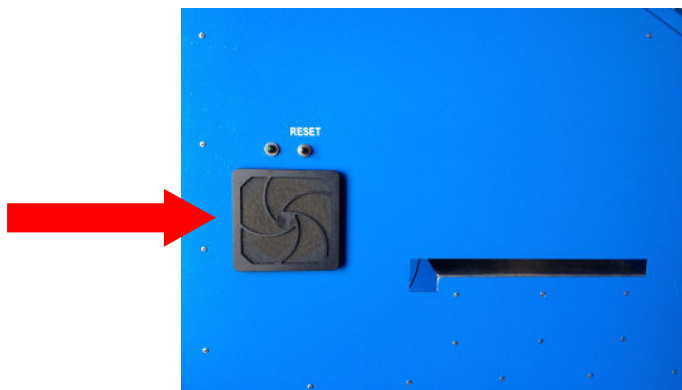
Observe all safety precautions when doing this next step (Read Chapter 1 Section 4).

1. Weekly

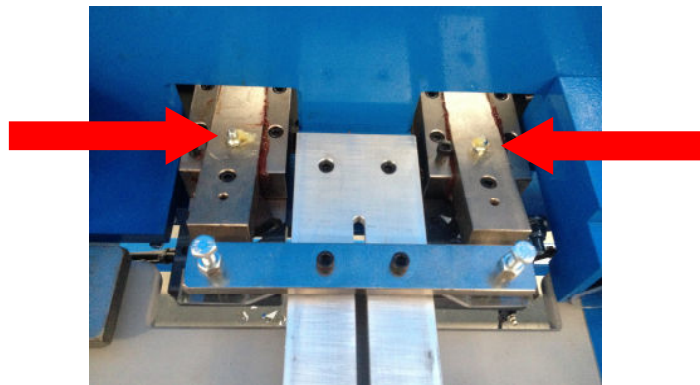
1. Oil notching dies, flange blade, shear blades and the tension plate. Use lightweight oil such as WD-40.
2. Drain water separator.

2. Monthly

1. Clean the fan filter



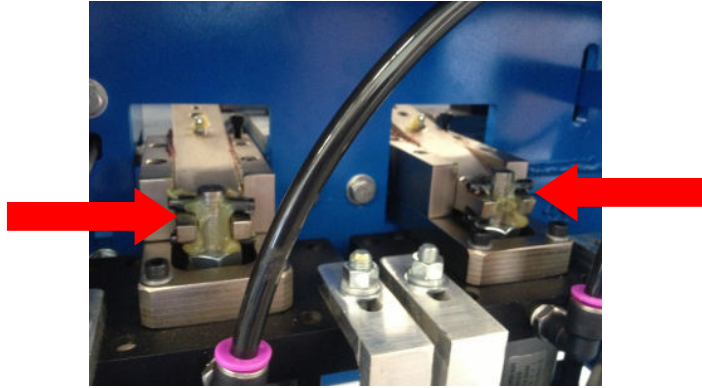
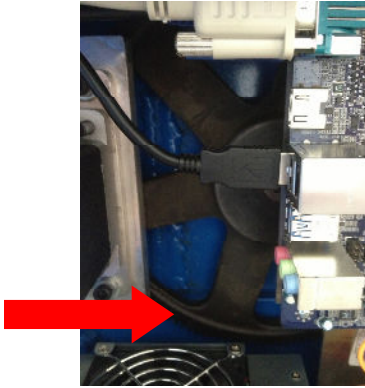
2. Use a grease gun and grease both Notcher upper arms and the shear pivot.



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3. Six Months

1. Use a grease gun and grease the Power Feed Decoiler bearings, total four.
2. Remove the drive box cover, use a grease gun and grease all four bearings.
3. Disconnect the compressed airline and the electricity by unplugging the electric cord from the machine. Remove the rear cover and apply a light coat of grease with a brush to the drive gear, also apply grease to the Notcher adapters.



4. While the cover is off, check all connections air and electrical. Look the machine over for any suspicious potential problems. If you see something that doesn't look right call the factory at 561-996-9600 for technical assistance.

CLN 2010 Notcher

Chapter 9

Troubleshooting

Problem: Return does not fit the router back.

Answer:

- The DXF file is outlined is incorrect.
- Calibrate the machines encoder.
- The router cut the part wrong.

Problem: The material is hanging up in one of the Notchers.

Answer:

- Oil the dies, the aluminum may be built up on them.
- There is a lack of airflow to the machine, increase the tool timing.
- Check the plastic strip plate, adjust down if necessary.
- Sticky air valve. Manually activate the valve by pressing the override button if the tool is not responsive then replace the valve.

Problem: The shear is not cutting all the way through the material.

Answer:

- There is a lack of airflow to the machine, increase the tool timing.
- Oil the dies, the aluminum may be built up on them.
- The cylinder may be out of travel adjust the rod clevis.

Problem: When running a letter the material runs out of the machine from right to left.

Answer:

- The machines home switch is open and the machine thinks there is no material under it. Therefore your switch never made contact with your material and needs a height adjustment, or your switch has been damaged or broken and needs to be replaced.

Problem: The material moves out of the machine from left to right and never begins to process the letter.

Answer:

- The machines home switch is closed and the machine thinks there is still material in the machine that needs to be cleared. This means that your Homing Switch is either stuck in the closed position and needs adjustment, or your Homing Switch has been damaged or broken and needs to be replaced.

CLN 2010 Notcher

Problem: The shear cut the material then the machine pushed the material forward into the shear.

Answer:

- The machines home switch is open and the machine thinks there is no material under it. Therefore your switch never made contact with your material and needs a height adjustment, or your switch has been damaged or broken and needs to be replaced. Even though the letter uses the same routine in the beginning of the letter it is possible that the switch is set a bit too high and it is right on the border line of failure. While material is loaded in the machine try to push on the material and see if you can hear the switch shift positions.
- Check the wire connections between the home switch and the break outboard. Then check the connections between the Galil board and the breakout board.
- Go to Tools > Move and move the material back and forth. This will tell you if the step motor is malfunctioning.

Problem: The artwork appears scrambled on the screen or a domain error message appears.

Answer:

- Look for control points on top of each other or points that form a loop.
- The size of the file is to large keep it under 50KB.

Problem: The file is not on the screen or is partially on the screen.

Answer:

- The artwork needs to be moved so that the lower X and Y corner is at zero or just a little bit up and to the right of zero.

Problem: The Leading Tab does not measure $\frac{3}{4}$ of a inch or the first part of the letter is off.

Answer:

- The “Distance from Home to Start” needs to be adjusted. To do so, in the CLN software, go to Tools > Settings and then adjust the Home to Start distance accordingly.

Problem: The machine is not shearing in the center of the last notch.

Answer:

- Check the encoder calibration run a calibration test.
- The distance from “Bender to Shear” could be off but not likely because the shear and the flanger are bolted to the machine. However to make adjustments, in the CLN software, go to Tools > Settings and then adjust the Bender to Shear distance accordingly.

Problem: One or both sides of the flange are not a full 90 degree bend.

Answer:

- Make sure the flanging clamp is coming down before the flanging blade.
- The flanging blade needs adjustment.

CLN 2010 Notcher

Problem: Open path files are being closed or parts of the letter are missing in the CLN program.

Answer:

- Go to Tools > Set up and change the Closed Figure value “1=YES 0=NO” This setting allows an open path to be sent to the machine. Some DXF files will require this setting to be altered you will know it, if the art work is missing parts or if you send an open path and the CLN program closes the path.

Problem: Air is leaking from the exhaust ports on the manifold.

Answer:

- It could be a sticky air valve, try manually operating the valve by pushing in the blue button a few times. If you have an older machine then you will have a red screw, turn it with a screwdriver back and forth a few times. That may clear any foreign objects that build up in the valve. Go to valve manifold and stations in the system overview section of this manual.
- Air could be blowing through a cylinder or through a valve and traveling out the exhaust port. Unplug the return air line at the manifold and see if air is coming out of the hose that goes to the cylinder or if air is coming from the valve. If air is coming out of the hose then replace the cylinder. If air is coming out of the valve then replace the valve.

Problem: Air is leaking around the air connections.

Answer:

- Disconnect the house air supply. Unplug the air line by pushing in the ring around the connector and pull out the line. Cut off about an inch off of the end of the air line and reconnecting the line back into the air connector.
- Replace the connector.

Problem: The sharp bends line up with the letter back on straight letters perfectly, but does not line up with the letter back around the radius. Like the letter “S”

Answer:

- The problem lies in the radius portion of the letter. Run a calibration test on the machine. If it passes then, run a letter check to see if the letter length is the same as the “image length” in the CLN program. If they do not match, then the machine is not doing what it is commanded to do. If all of that checks out to be okay then try the fowling.
- When the 2010 Notcher notches the material it is causing the encoder to vibrate on the material and thus causing the material lengths to be inaccurate. Try slight tension on the straightener this will take the vibration out of the material.
- Check the encoder tension it should only be able to lift up 3/16 to a 1/4 of an inch.
- The acceleration rate in the Notcher is set to fast, and the encoder is slipping on the material as the machine stops and starts. This is possible if the material is oily.

CLN 2010 Notcher

Error Messages: Error Initializing Comport left mouse click and close program.

This message means that the CLN program can't access the computer's comport. If you receive an error message you must press reset on the machine before trying to start the program again.

- Go to Tools Setup, and change the comport setting the program. The program will only work on com 1 through 4. This is a common problem when you change computers. If you are using a USB comport adapter make sure you load the adapters driver. This problem has nothing to do with the machine it is between the computer and the program.
- Check for another open program that is using the same com port.

Error Message: Error commutating with controller left mouse click and close program.

This message means that the controller is not responding correctly to the commands that the CLN program is sending it, however it mean that the comport setting is good.

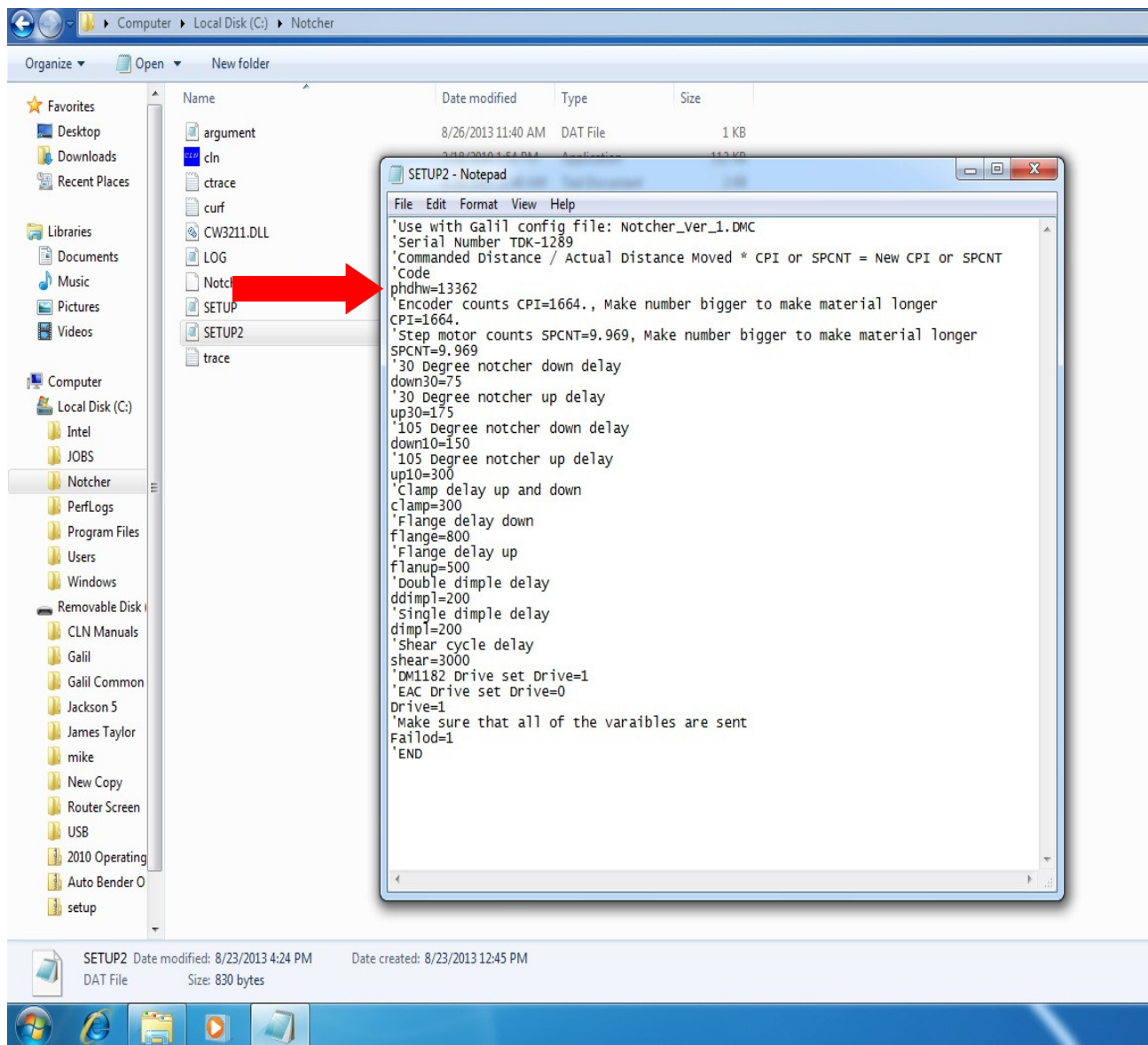
- When Windows starts, the first thing it does is reach out and looks for any devices that is plugged into the computer. When that happens, Windows leaves a little bit of computer language behind we call it junk, and then we start the CLN software we send a command to the controller along with the junk left behind from Windows. To prevent this from happening just press reset on the machine before starting the program. **Pressing reset on the machine only needs to be done once after the machine is powered up.** Or you can click the screen to close the CLN program then try to open the CLN program again it will start up.
- Open back cover and locate the 9 pin RS232 cable from the computer to the control board and check the connections.
- Replace the 9 pin RS232 cable from the computer to the control board.
- Make sure that the controller is powered up. Check for LED lights on the board.

CLN 2010 Notcher

Error Message: Update Registration Code left mouse click and close program.

This message means that the machine is under a finance agreement, and the machine is not paid in full. It will work for 4 months under one code after that all you will see is this message. To change the code click on setup 2.DAT located in the folder that the program is located in. The file will open in note pad make the changes and then save and exit. The changes will take affect when you reopen the CLN program.

1. Call the finance company and have the machines serial number ready.
2. If it is paid in full call CLN of South Florida Inc. and have the machines serial number ready they will issue a permanent code.



CLN 2010 Notcher

Error Message: Warning the machine detected that the clock is being tampered with.

If the date in the computer is manually turned back, as little as one day, and the program tries to connect to the machine, the program will not work.

If the date is set forward, the program will work, however you cannot set the clock back from that point.

1. If you receive this message then set the date back to the correct date.
2. If you own the machine outright then you will have a permanent code, and you will never see this message.

Technical support

If you need further assistance call 561-996-5900. Please be prepared to explain exactly what is not working properly. Gather as many details on the problem as you can, so that the technician can help you more efficiently.

Remote in service

Connect the machines computer to the internet and then start the Cross Loop program, and then contact CLN of South Florida Inc. at 561-996-5900. A technician will need to remote into the machine to diagnose the problem. Be prepared to have a phone at the machine.

CLN 2010 Notcher

Chapter 10

Glossary

Return: The sidewall of a channel letter or the strip of metal that the gets processed in the machine.

Material: The sidewall of a channel letter or the strip of metal that the gets processed in the machine.

Coiled Stock: The sidewall of a channel letter or the strip of metal that the gets processed in the machine.

Notcher: Tool that is controlled by an air cylinder used to notch the material.

Flange: 90 degree bend that is put in the edge of the material, it is used to fasten the back to the return.

Dimple: Dimple is a small dent used to identify the bending direction in the return.

Decoiler: Device used to uncoil coiled stock material.

Segment: Segment is one dimension of many.

Accumulative: Accumulative is all of the dimensions added up.

Straightener: Device used for removing the memory out of the coiled stock.

Calibrate: Way of making measurements true and exact.

Step motor: Type of motor, which turns by incremental movements, called steps.

Encoder: The encoder is a device used for measuring.

Controller: Circuit board that stores data that is used to operate and control other devices.

CLN 2010 Notcher

Chapter 11

Factory Machine Settings

- 1. Tools \ Setup**
- 2. Setup2.dat**

Factory Machine Settings

When your machine was built it was fully functional in our factory. At that time we took a screen shot of the calibration settings, and inserted them into the bottom of the manual. In the event you lose your settings or your computer goes down, CLN will send you the programs that, runs the machine but can only get close to you calibration settings. So keep these factory settings some ware safe also make a copy of the Notcher folder and save it some ware safe.