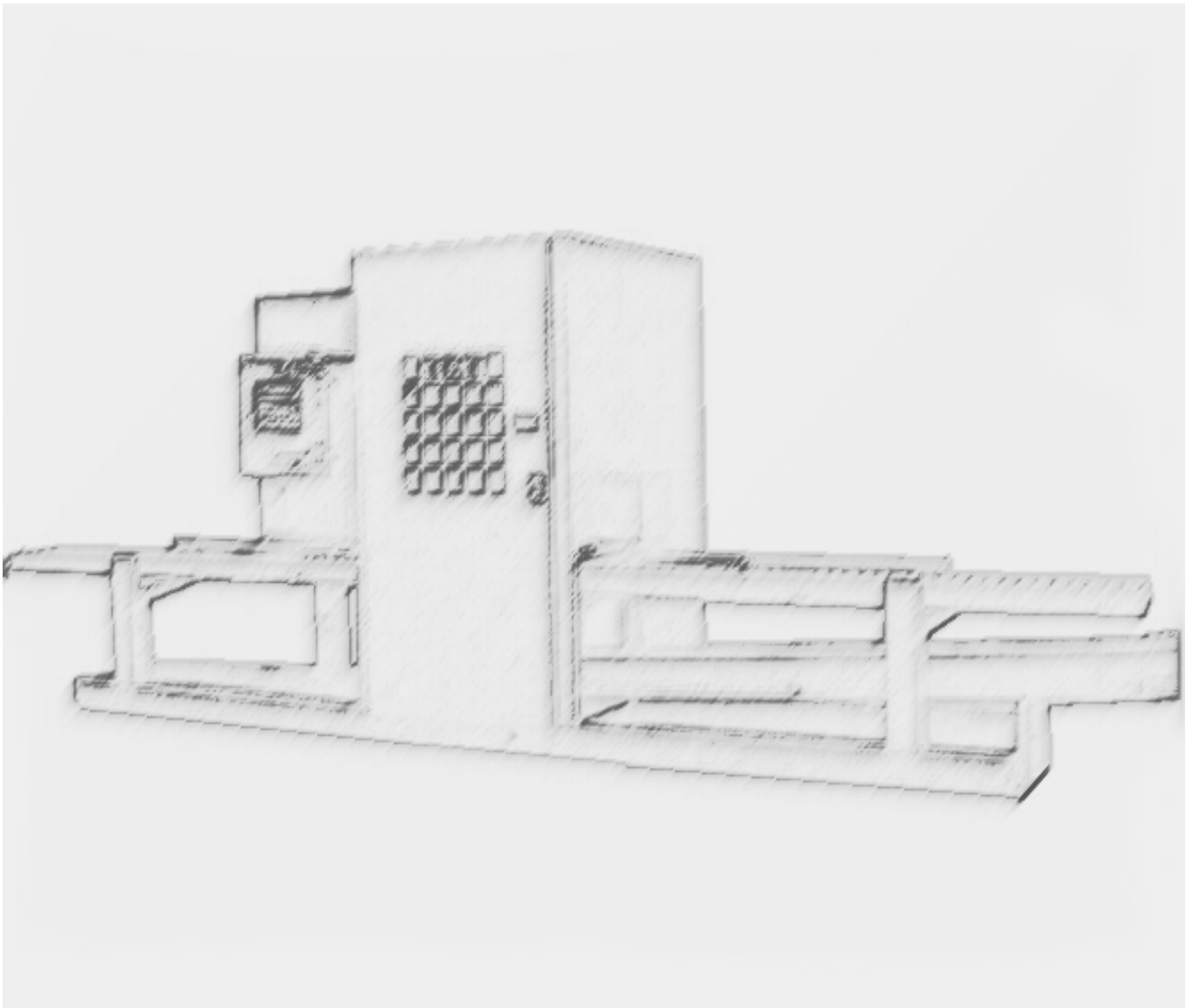
Automating the Truss Industry Since 1999

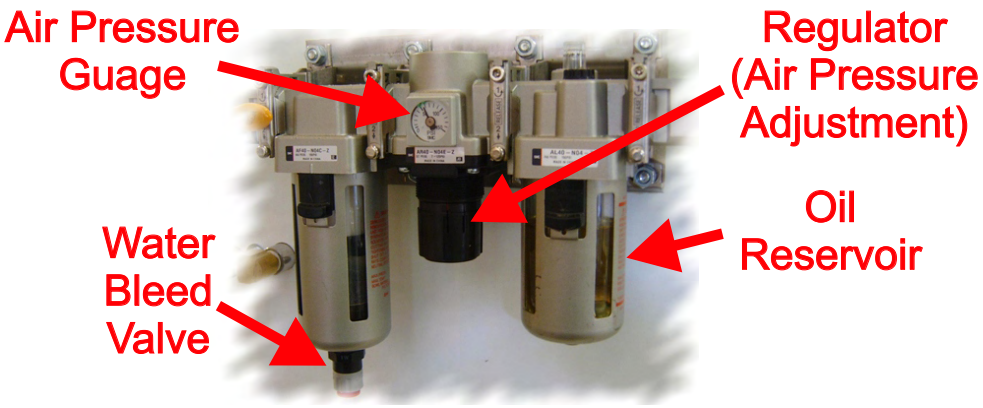
Linear-Feed Saw

Models 1150-1200



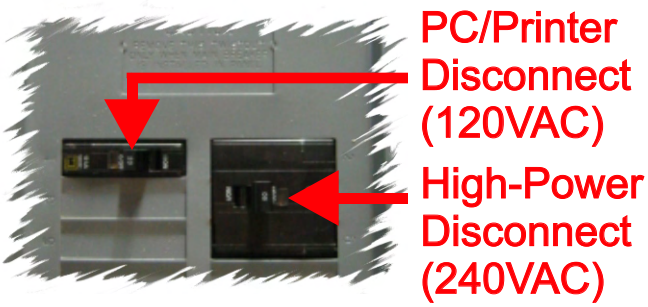
1217 Robie Ave, Mt. Dora, FL 32757 - Ph: 352-735-5070 Fax: 352-735-5071 - www.tctwebsaw.com

Starting the Saw



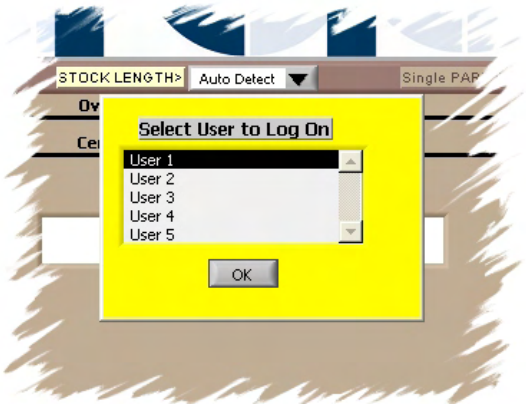
Check that water is properly bleeding from the regulator and check that the oil reservoir contains oil. Check that you have operational air pressure on your regulator. The normal operational range for Model 1150 saws is 55-60PSI, for Model 1200 saws it is 70-80PSI.

Carefully clean the cooling system filter (avoid damaging the filter element). Replace the element **at least** monthly (Purolator Part#: A40004, or equivalent).



Activate the main power disconnects (make sure both circuit-breakers are turned on). Wait for the PC to finish loading Microsoft Windows, then double-click the shortcut to start the saw's operating software (usually "WebSaw Interface") located on the Windows desktop.

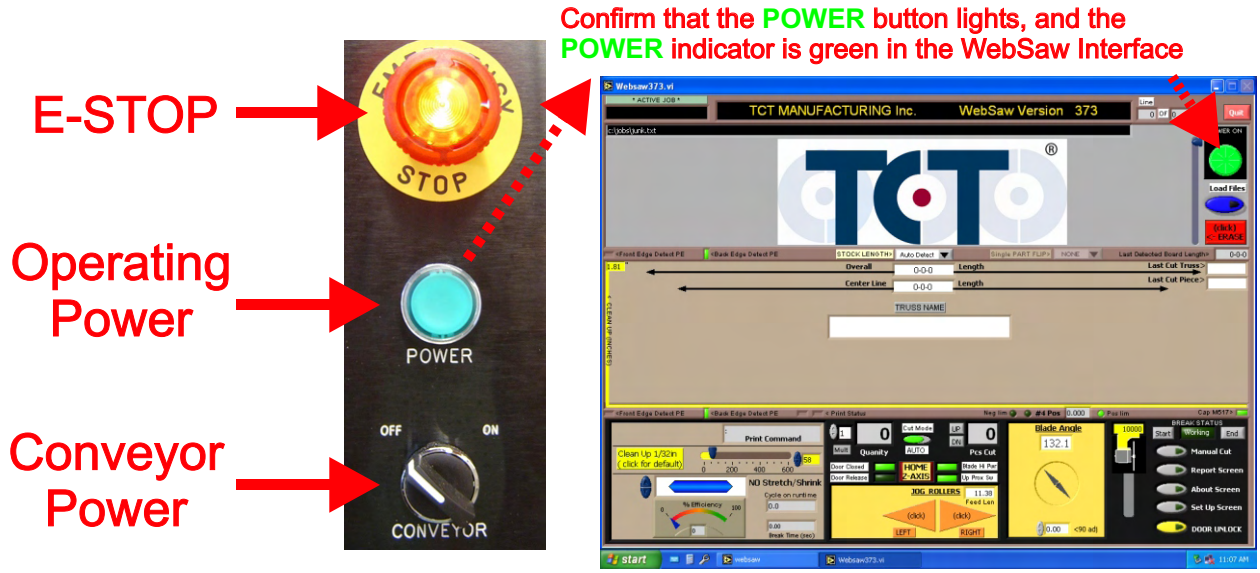
After the software loads, it will display the Select User to Log On screen. This screen may show "User 1" through "User 5", or it may display the names of the saw's operators. Choose the correct user-name, then click OK to proceed.



(Note: If your location plans to assign only one operator to the saw, you can leave the selection on "User 1", and click OK. This will still allow combined statistics to be tracked on the Report Screen.)

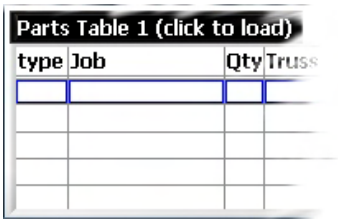
1.1

Operating the saw

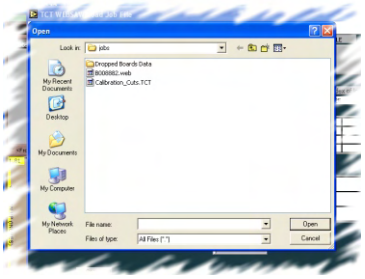


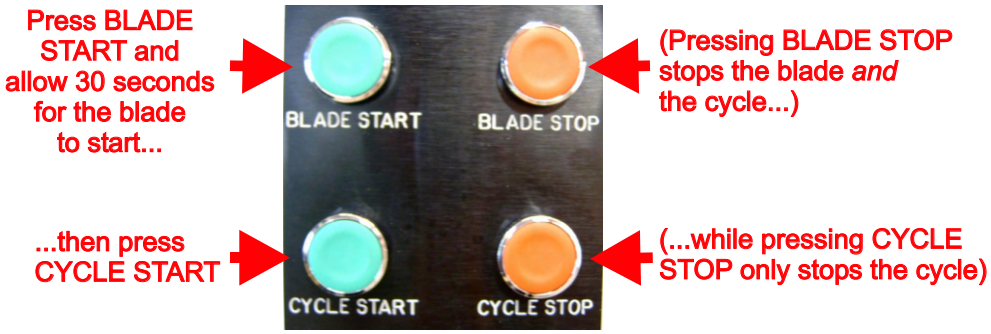
Make certain that the saw's cage door is closed and latched! Check that the E-STOP button is not engaged, and that its light is not active. Activate the machine by pressing the green **POWER** button. Turn the CONVEYOR switch to ON to activate the waste conveyor.

Insert your Memory Stick into an empty port on the USB hub and run the WebSaw Production Utility to load the job (see the WebSaw Production Utility documentation for instructions on using the program).



Click the "Load Files" button (in the upper-right corner of the WebSaw Interface). You will be presented with the Parts Table List. Click the **Parts Table 1 (click to load)** heading to display the **Open** window. Select the job-file you wish to cut, then click the Open button. Parts Table 1 should now show the contents of the job-file you selected. Click anywhere in the grid to highlight the table (it should turn green), then click the Select the Active Job button at the top of the screen.





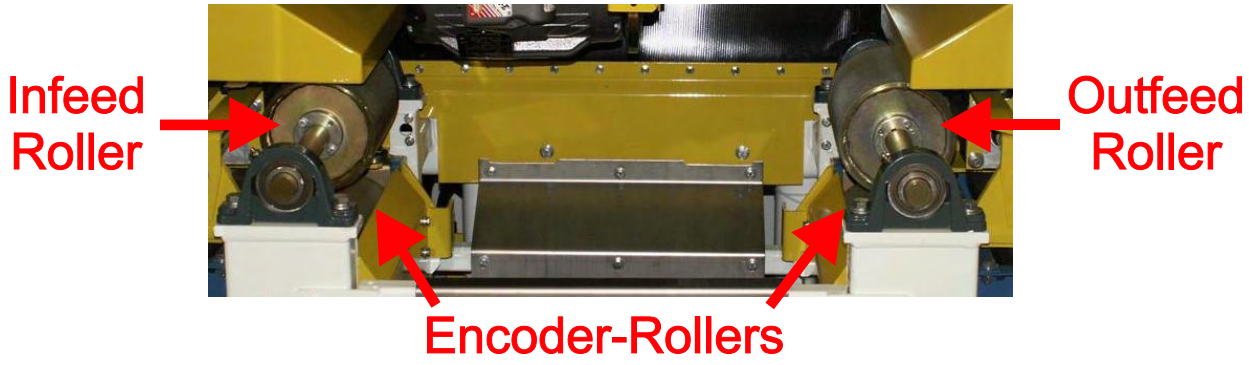
Start the blade by pressing the BLADE START button and wait a few seconds for blade to reach full speed. Press the CYCLE START button to start the "Auto Cycle". When the green "Insert..." message appears, feed one piece of lumber into the machine.

NOTE: Never attempt to start the blade-motor while the blade is spinning. Always allow the blade to come to a complete stop before attempting to restart the blade-motor.

Overview

Feed-Rollers

Infeed- and Outfeed-Rollers are used to move wood through the WebSaw. They determine the accuracy of the lengths of cut boards.

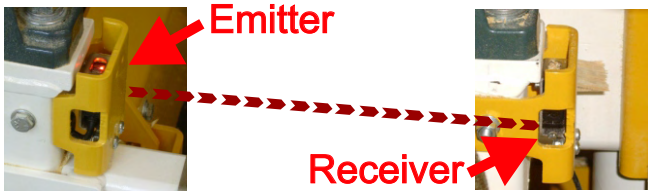


It is important that the rollers keep firm traction on the lumber. Spring tension should be adjusted so that the feed-rollers apply the right amount of pressure on boards. The feed-rollers and encoder-rollers should be cleaned **at least** at the end of each shift. DO NOT use WD-40 or similar solvents to clean the rollers, as it leaves a slippery film, and can actually damage certain sensors. TCT recommends the use of denatured-alcohol to soak the rollers before cleaning them with a stiff wire-brush.

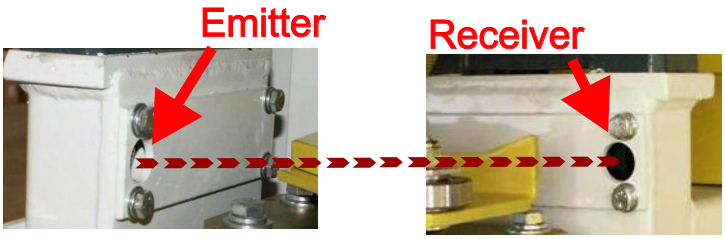
Thru-Beam Sensors

The Thru-Beam sensors are used to detect when a board enters the saw. When the sensors detect lumber, the software triggers the machine to begin cutting. It is important that the path between these sensors is kept clear of sawdust and wood particles.

Model 1150

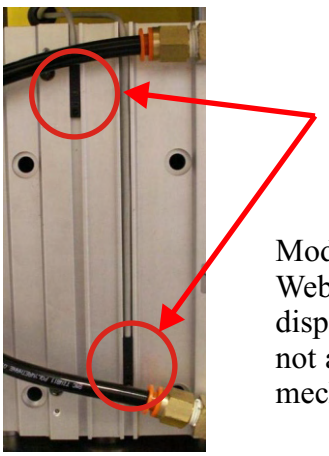


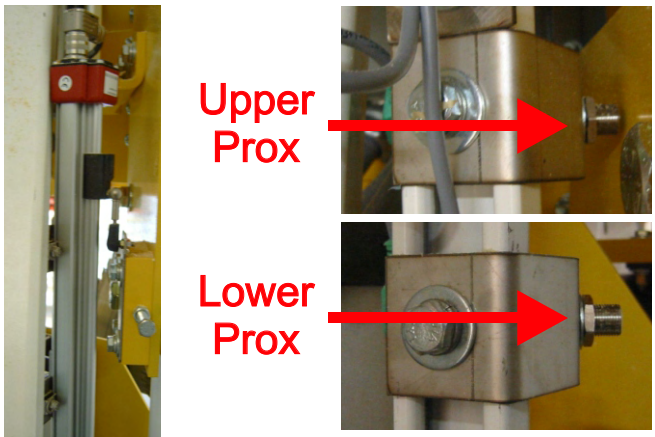
Model 1200



Linear-Encoder/Vertical-Limit Sensors

Model 1150 saws use a linear-encoder sensor to determine the carriage position, and two proximity sensors to double-check the linear-encoder's operation. The linear-encoder allows the carriage to drop only as far as needed to complete a cut, saving time during the cycle.



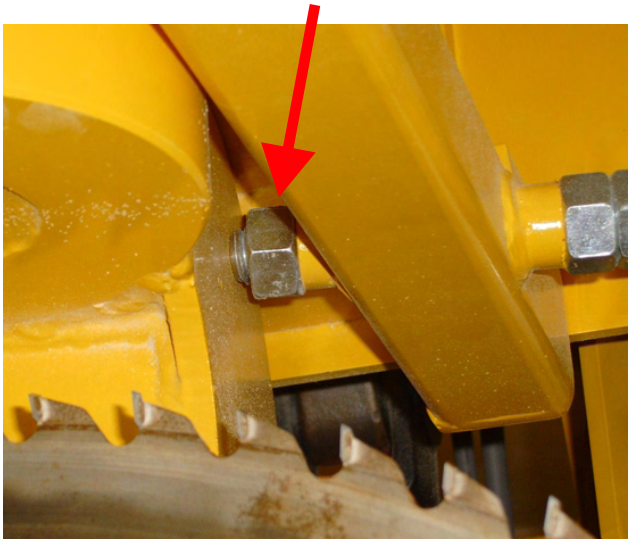


Model 1200 saws use only upper and lower position sensors mounted to one lift-cylinder. The WebSaw Interface shows the position of the carriage with an icon in the lower-right of the display. The icon will move down and up as the saw cycles. If the icon indicates the carriage is not at it's up position, the air-supply may have diminished, or there may be an electrical or mechanical problem with the machine.

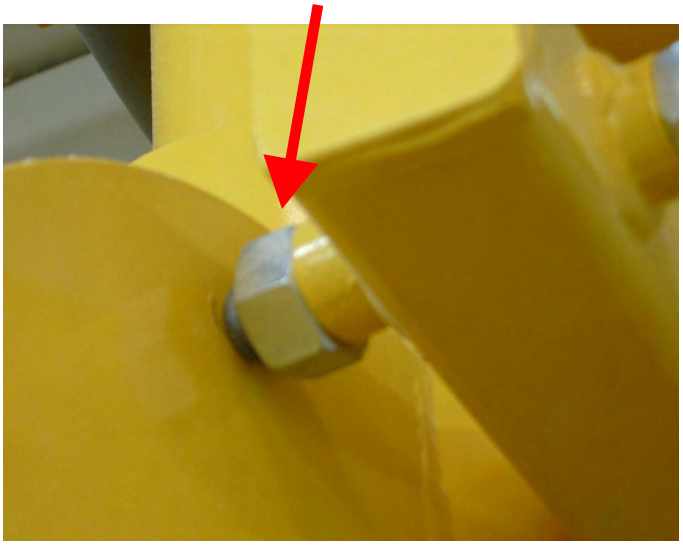
Hardstop (1150 saws)

The Hardstop protects the carriage pivot from traveling past its designed limits. If the pivot is required to "Home" before running the machine (some 1150 versions), the inner Hardstop stud sets the base home position. Minor adjustments to the angulation can be made in the saw software.

Homing Stud



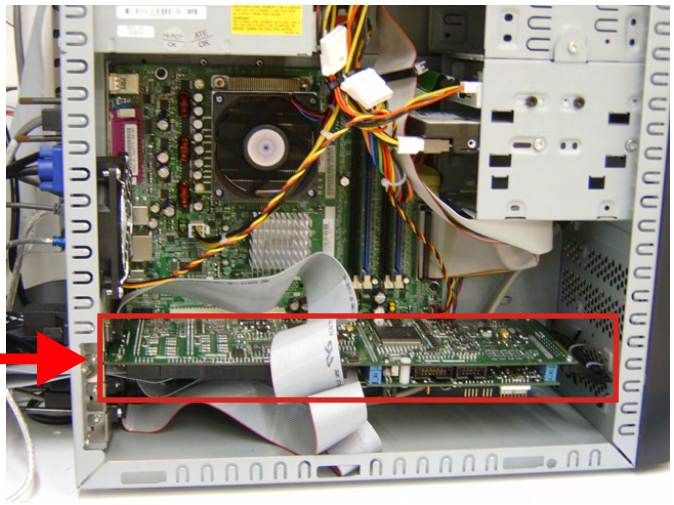
Overtravel Stud



Motion Control

The saw uses two computers to control its operations. One is a standard desktop-style PC running Microsoft Windows XP. In addition to this a second computer (called a PMAC Motion Control card) is located inside the PC. The PMAC card is a 16-bit computer running a real-time operating system, and is the bridge between the saw's software-interface and it's physical components.

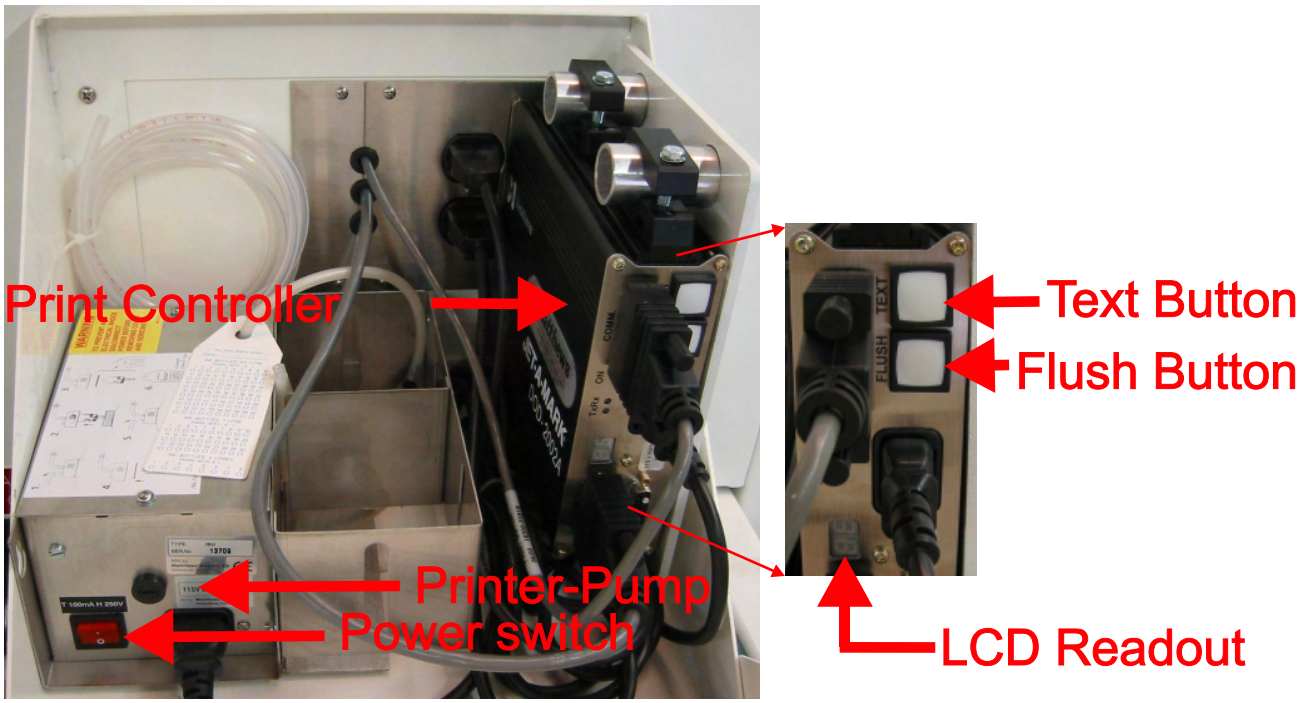
PMAC Motion Control Card



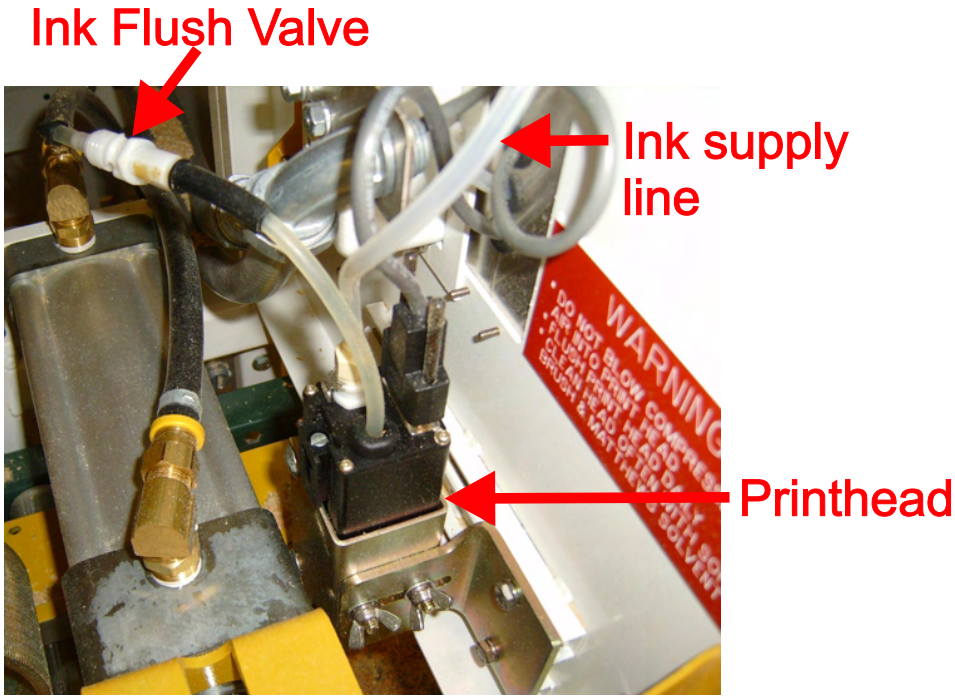
Standard PC

Printing-System (Piece-Marking System)

The saw utilizes a Matthews Jet A Mark© marking system to label each piece as it is cut. The printer consists of three parts: the Printer-Pump, the Print Controller, and Printhead.



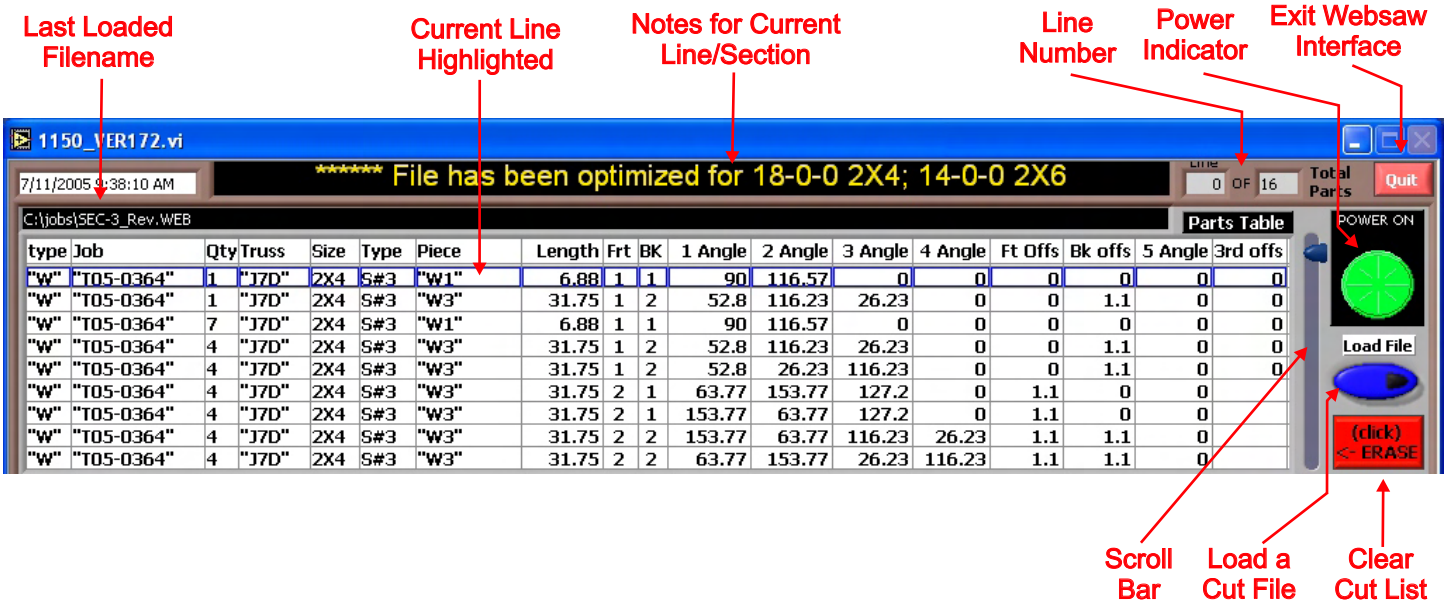
NOTE: If you press the **TEXT** *button on the controller, the LCD screen should show* 00. *If not, you must wait five seconds, then press and hold the* **TEXT** *button until the LCD shows* 00. *The printing system will not respond if the LCD shows any other number than* 00. *Avoid pressing the* **TEXT** *button during normal flush operations.*



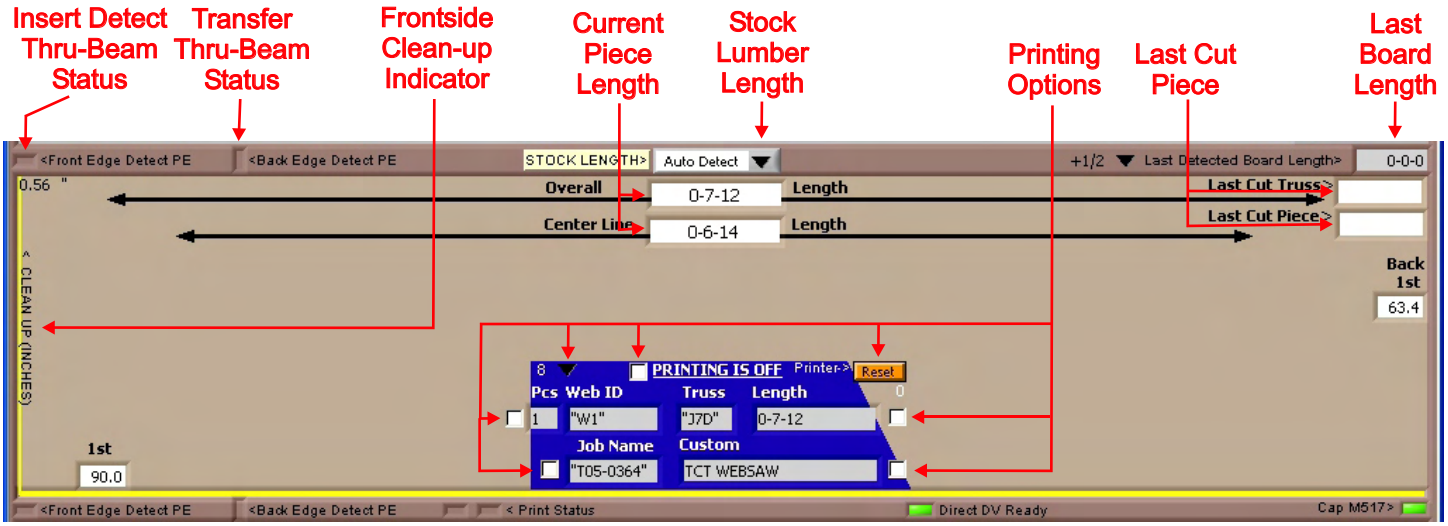
NOTE: The Printhead must be cleaned daily, or more often if necessary. If the printing system will not be used for 2 or more days, the line must be flushed with Matthews cleaner (see "Printer" page 13 for further information).

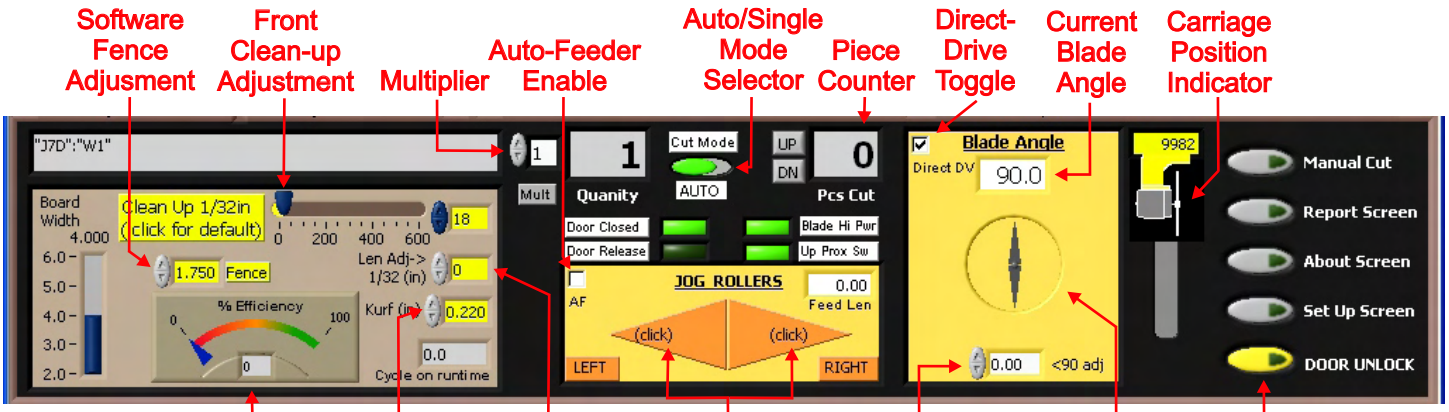
WebSaw Interface and Software

The WebSaw Interface is a Windows application that provides control center for the operator of the saw. Many processes are run in the background, out of sight of the operator, that control how the machine works. The version 172 WebSaw Interface is show below, separated into its three major parts.

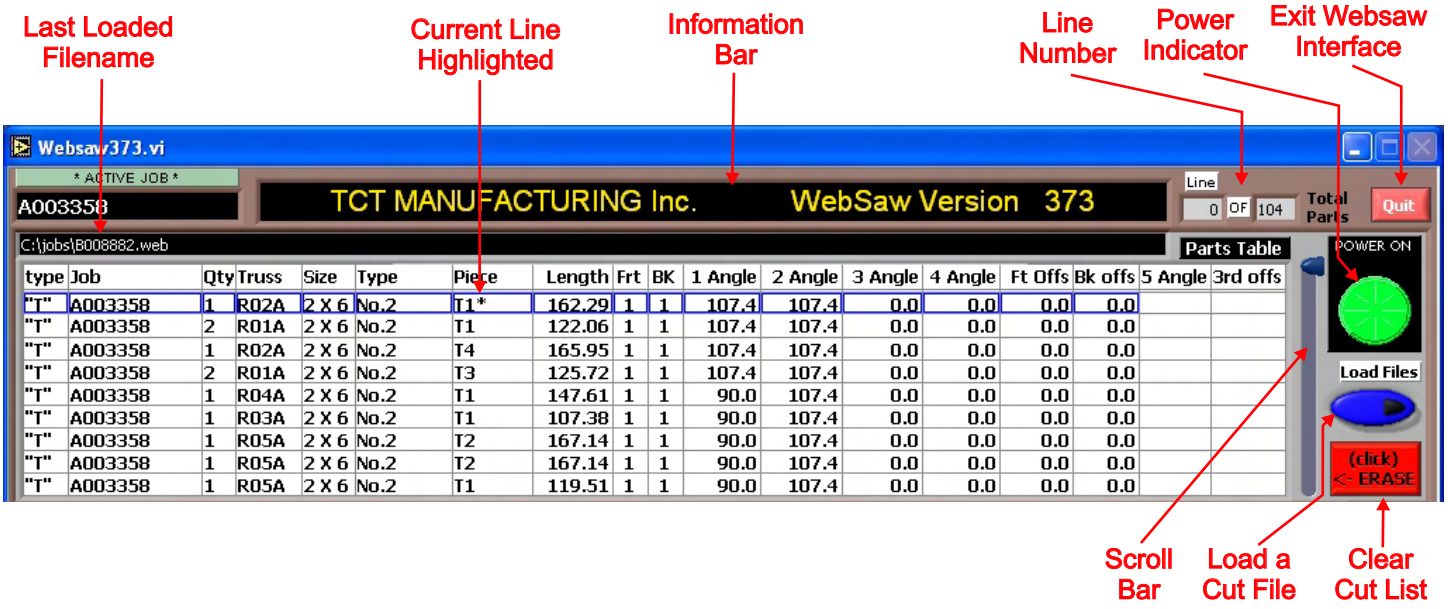


type	Job	Qty	Truss	Size	Type	Piece	Length	Frt	BK	1 Angle	2 Angle	3 Angle	4 Angle	Ft Offs	Bk offs	5 Angle	3rd offs
"W"	"T05-0364"	1	"J7D"	2X4	S#3	"W1"	6.88	1	1	90	116.57	0	0	0	0	0	0
"W"	"T05-0364"	1	"J7D"	2X4	S#3	"W3"	31.75	1	2	52.8	116.23	26.23	0	0	1.1	0	0
"W"	"T05-0364"	7	"J7D"	2X4	S#3	"W1"	6.88	1	1	90	116.57	0	0	0	0	0	0
"W"	"T05-0364"	4	"J7D"	2X4	S#3	"W3"	31.75	1	2	52.8	116.23	26.23	0	0	1.1	0	0
"W"	"T05-0364"	4	"J7D"	2X4	S#3	"W3"	31.75	1	2	52.8	26.23	116.23	0	0	1.1	0	0
"W"	"T05-0364"	4	"J7D"	2X4	S#3	"W3"	31.75	2	1	63.77	153.77	127.2	0	1.1	0	0	
"W"	"T05-0364"	4	"J7D"	2X4	S#3	"W3"	31.75	2	1	153.77	63.77	127.2	0	1.1	0	0	
"W"	"T05-0364"	4	"J7D"	2X4	S#3	"W3"	31.75	2	2	153.77	63.77	116.23	26.23	1.1	1.1	0	
"W"	"T05-0364"	4	"J7D"	2X4	S#3	"W3"	31.75	2	2	63.77	153.77	26.23	116.23	1.1	1.1	0	

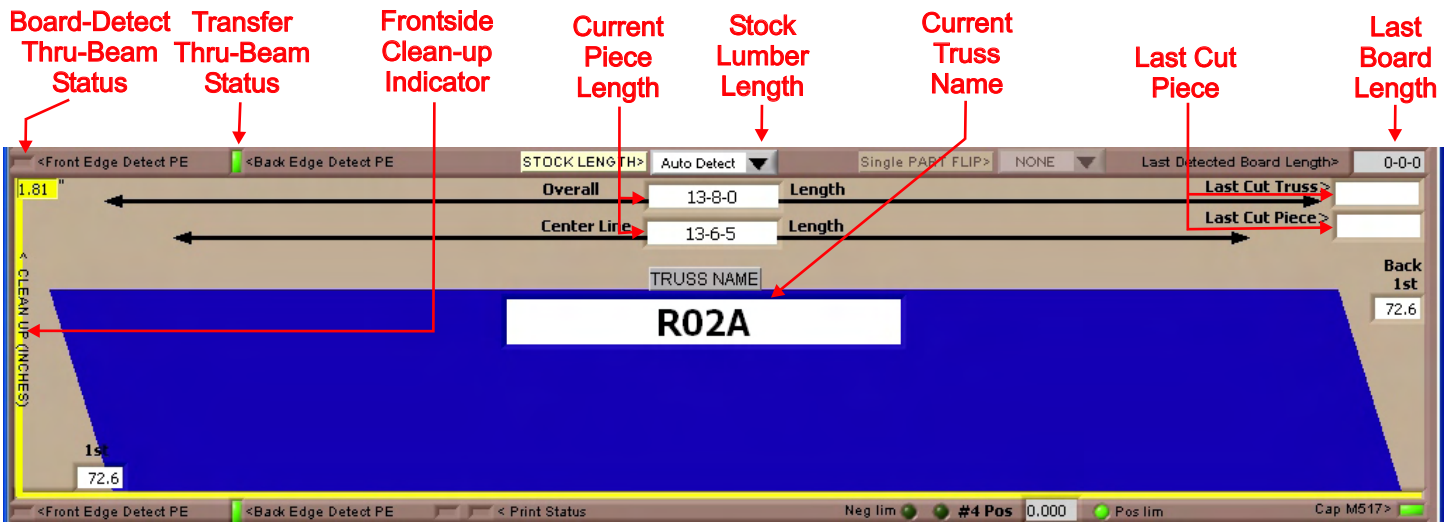


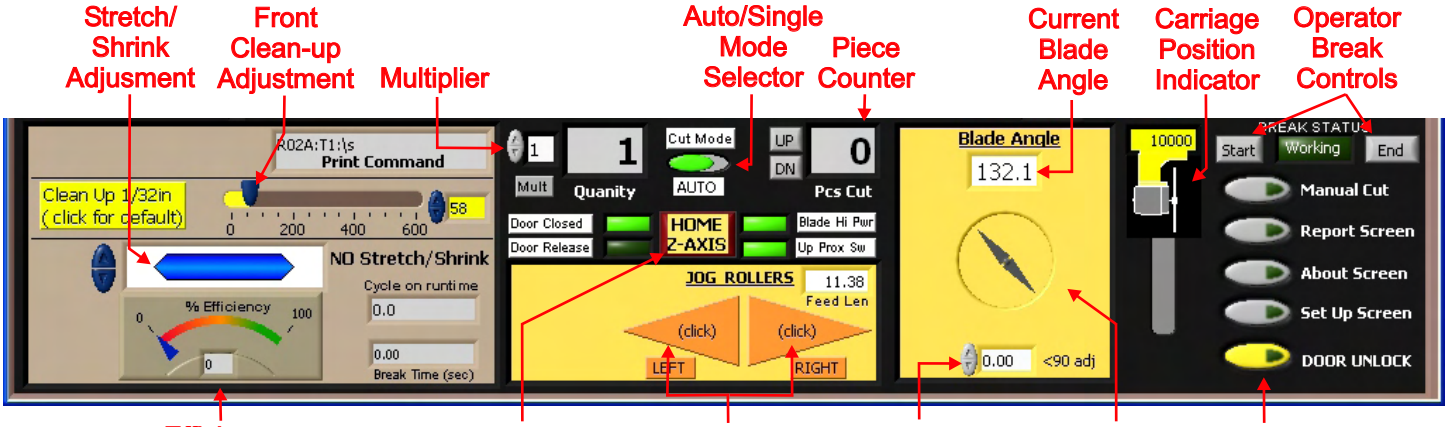


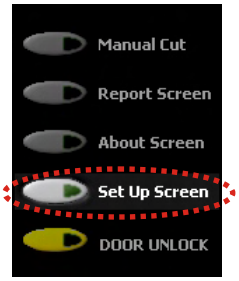
For version 350 and above, certain controls have been moved off the main screen and onto the Set Up screen. The printer settings are now available on the Set Up screen, as are the Fence and Kurf adjustments. The Length adjustment has been replaced with the Stretch/Shrink modifier; this makes it simple to add or subtract a little from the length of cut pieces. The three major sections are shown below.



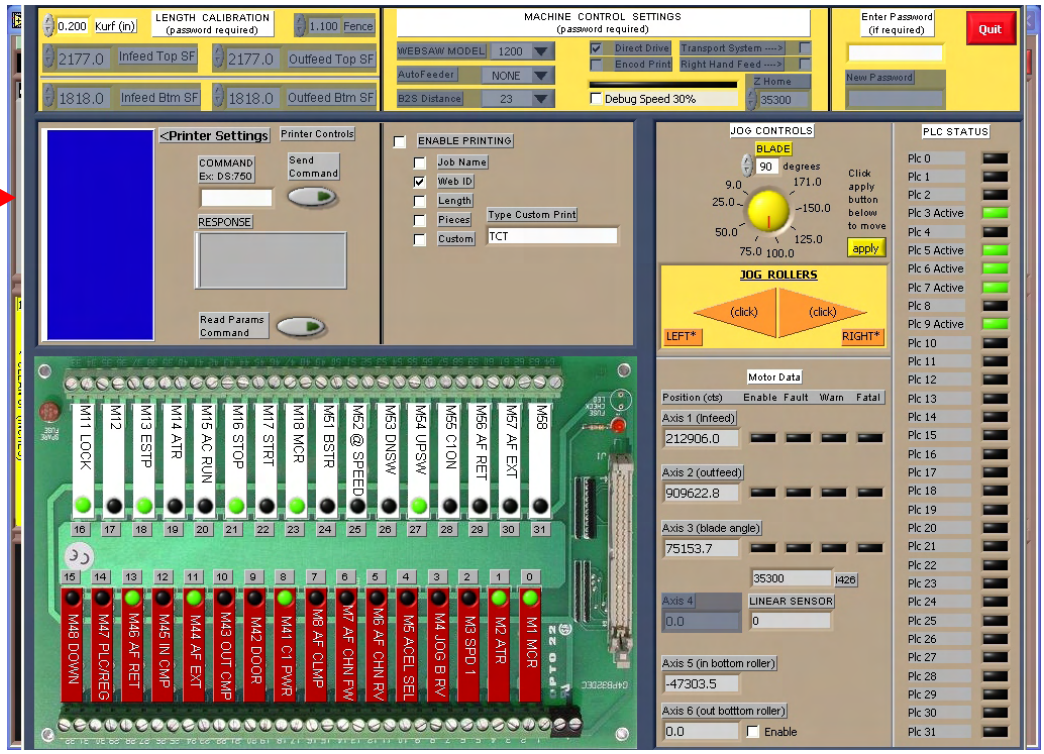
type	Job	Qty	Truss	Size	Type	Piece	Length	Frt	BK	1 Angle	2 Angle	3 Angle	4 Angle	Ft Offs	Bk offs	5 Angle	3rd offs
"T"	A003358	1	R02A	2 X 6	No.2	T1*	162.29	1	1	107.4	107.4	0.0	0.0	0.0	0.0		
"T"	A003358	2	R01A	2 X 6	No.2	T1	122.06	1	1	107.4	107.4	0.0	0.0	0.0	0.0		
"T"	A003358	1	R02A	2 X 6	No.2	T4	165.95	1	1	107.4	107.4	0.0	0.0	0.0	0.0		
"T"	A003358	2	R01A	2 X 6	No.2	T3	125.72	1	1	107.4	107.4	0.0	0.0	0.0	0.0		
"T"	A003358	1	R04A	2 X 6	No.2	T1	147.61	1	1	90.0	107.4	0.0	0.0	0.0	0.0		
"T"	A003358	1	R03A	2 X 6	No.2	T1	107.38	1	1	90.0	107.4	0.0	0.0	0.0	0.0		
"T"	A003358	1	R05A	2 X 6	No.2	T2	167.14	1	1	90.0	107.4	0.0	0.0	0.0	0.0		
"T"	A003358	1	R05A	2 X 6	No.2	T2	167.14	1	1	90.0	107.4	0.0	0.0	0.0	0.0		
"T"	A003358	1	R05A	2 X 6	No.2	T1	119.51	1	1	90.0	107.4	0.0	0.0	0.0	0.0		



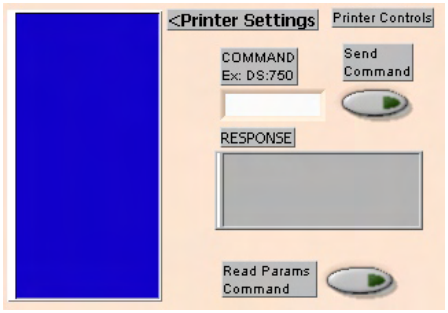




Click the “Set Up Screen” button on the WebSaw Interface main screen to show the Set Up screen (Version 350 shown...).



The Set Up Screen allows the operator to check the status of the systems of the saw, and to change certain settings relating to the way the machine operates.

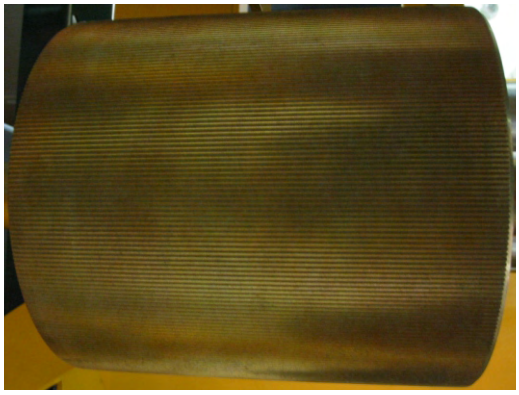


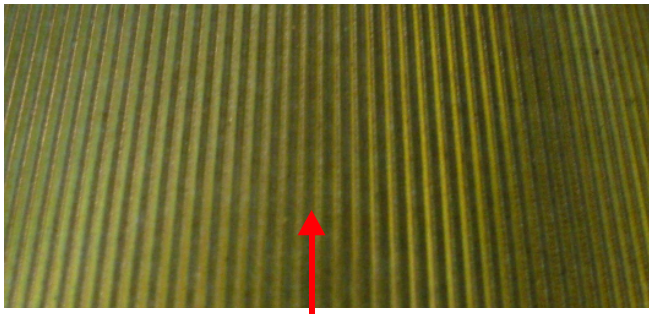
Printer quality settings can be adjusted using the “Printer Settings” section of the Set Up screen. You can disable the printing system and select which fields to print under the ENABLE PRINTING area of the Set Up Screen. Refer to “Configuring the Printer” later in this manual for further information.

Most of the software adjustments and settings for the saw can be found on the Set Up screen. For details on updating the saw’s operating software see the section titled Software.

General Maintenance

Feed Rollers
The saw's Feed- and Encoder-Rollers must be cleaned each shift for them to keep traction on the lumber. TCT recommends soaking the rollers with denatured alcohol while blowing the sawdust from the rest of the saw, then cleaning the rollers (top AND bottom) with a stiff wire-brush.

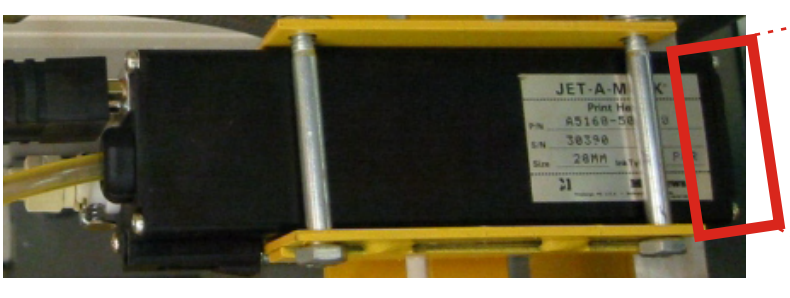




Keep sawdust from collecting in the grooves

Printhead cleaning
Clean the Printhead at the end of every shift. Using a mister-type bottle filled with Matthews Cleaner, gently mist the nozzles of the Printhead. If necessary, a small, soft brush can be used to carefully brush away any ink and sawdust buildup on the Printhead. Do not dip the brush into the Printer's cleaner bottle; this can contaminate the cleaner, and will damage the Printhead.

NOTE: The Printhead must be cleaned at least daily. If the printing system will not be used for 2 or more days, the ink line must also be flushed with Matthews cleaner (see pg. 2.5 for further information).



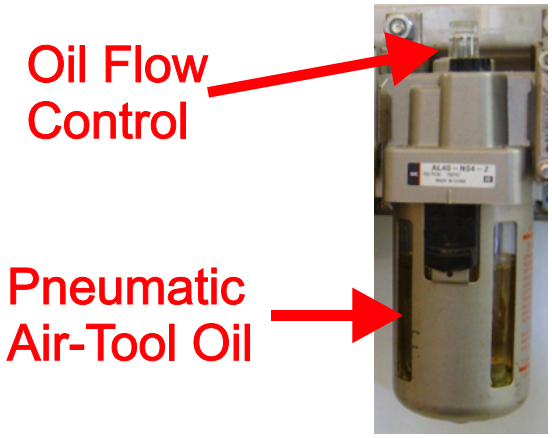
Clean at the end of every shift

Air Pressure
Operational range for Model 1150 saws is from 55-60PSI and Model 1200 saws operate at 70-80PSI. Observe the air-pressure as the saw runs. It should not drop more then 10PSI while running (reasons for this behavior include insufficient air supply, i.e. compressor or air lines too small, or too many tools connected to the same line). If necessary, add an additional compressor.

NOTE: The recommended size for the incoming air-hose is 3/4" I/D.

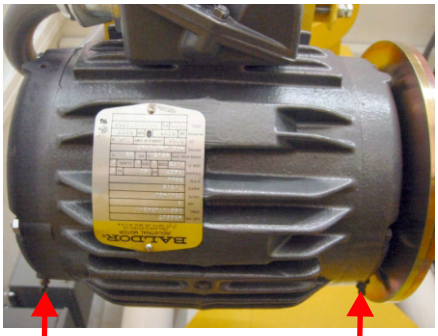
Air Pressure

Regulator Adjustment

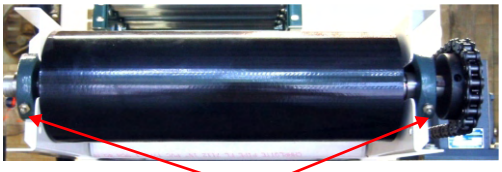


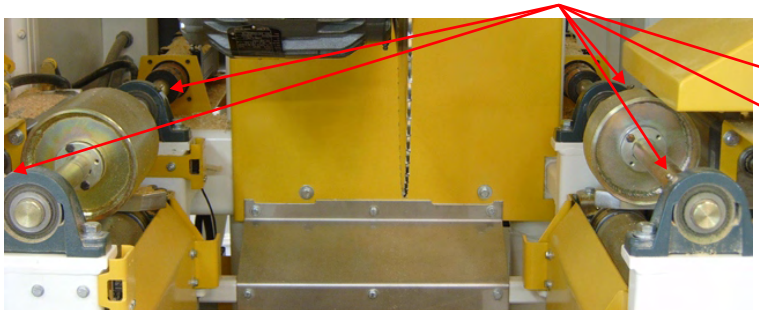
Pneumatics
Keep oil reservoir supplied with approved pneumatic oil. Adjust oil flow control till the oil in the reservoir lasts between 2-3 weeks each time it is filled (when properly adjusted, you should see one drop of oil through the flow control knob for every 5 strokes of the carriage).

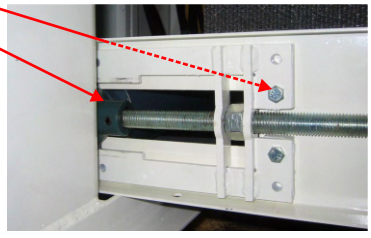
Blade Motor
Grease the blade motor once every 12 months, using two pumps of a standard grease-gun per grease fitting. **DO NOT** over-grease the motor. The saw blade nut is right-hand (standard) thread. Be sure to use only the approved wrench when removing or installing the blade. Clean the threads and apply a light amount of oil to them before installing the blade and tightening the blade-nut.



Bearing Pillow Blocks
Once every 3-6 months, lightly grease each pillow block, using two pumps of a standard grease-gun per grease fitting. **DO NOT** over-grease bearings.



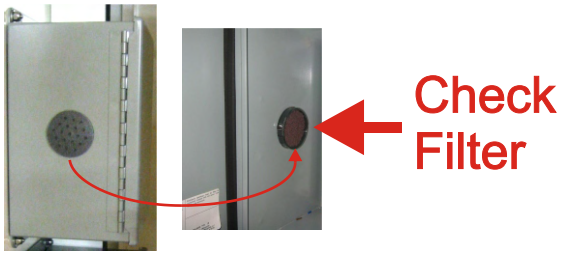




2.2

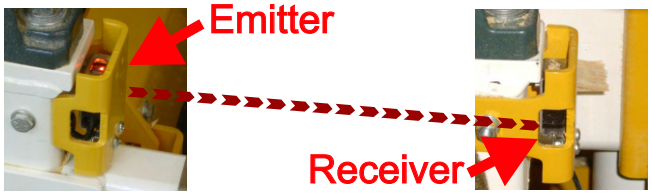
Bolts and Set-Screws
Periodically check for any loose bolts, nuts, or set-screws. Tighten all sensor mounting brackets, encoder stabilizer brackets, and the two Lovejoy couplings (it may be necessary to remove the sleeve covering the Lovejoy couplings to inspect their set-screws). A common cause of length issues is loose Lovejoy set-screws.

Electrical
Regularly check that all panel doors are secure and that the ventilation-fan is operating and the filter is clean. Continuously check all conduit for tightness and signs of wear. *NOTE: Loose wires should be routed and tied back to minimize wear or damage.*

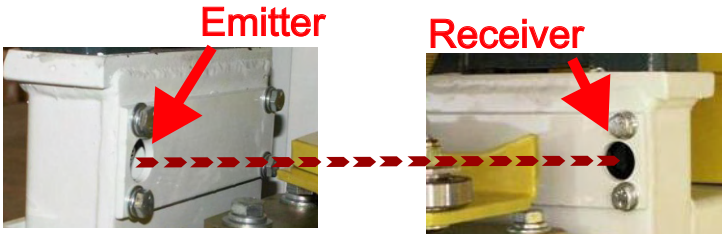


Thru-Beam Sensors
The saw utilizes Thru-Beam sensors to detect when a board is inserted into the machine. The performance of these sensors is greatly reduced when sawdust is allowed to collect in front of the'window' of the sensors. Make sure the path between the sensors is kept clear of sawdust, wood scraps, and solids of any type. The most common symptom that results from a dirty or blocked Thru-Beam sensor is that the saw will not accept lumber from the operator. Simply check for sawdust on the faces of the sensors.

Model 1150



Model 1200



2.3

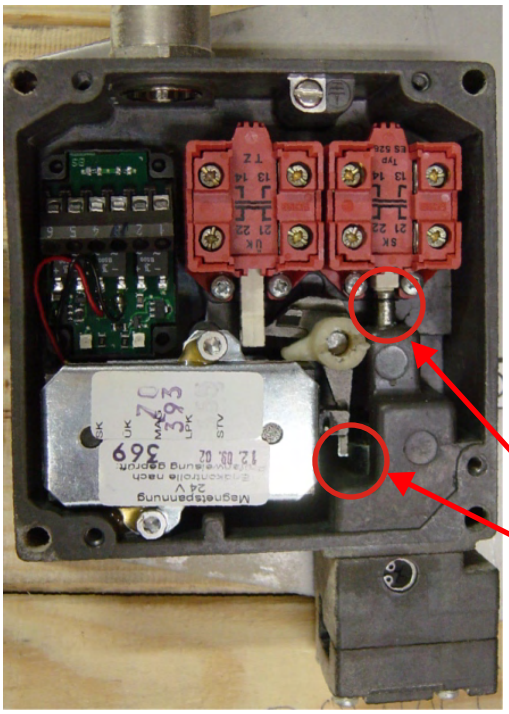
Door-Lock

Clean the door interlocking mechanism at the end of each shift by gently brushing away any saw dust buildup. Avoid using compressed air; this can jam the mechanism. Lubricate the lock with a lightweight, dry silicon. If the door lock does not operate properly, remove the cover and carefully lubricate the plunger and all moving parts.

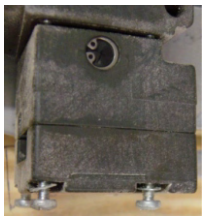
Key *(used to open door with no power)*

Keep Clean

Every 6 months (or as needed), disassemble the door-lock, and clean and lubricate it as shown below.



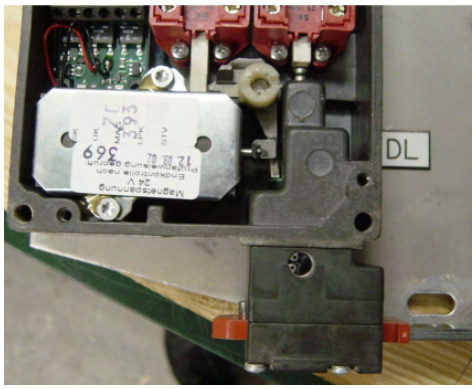
Lubricate carefully...



...Remove screws...

...Gently separate halves...

...Clean and lubricate carefully...



...Reassemble

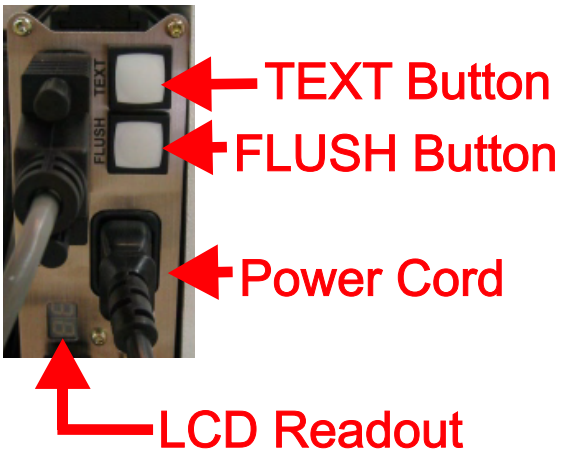
PRINTER CONFIGURATION

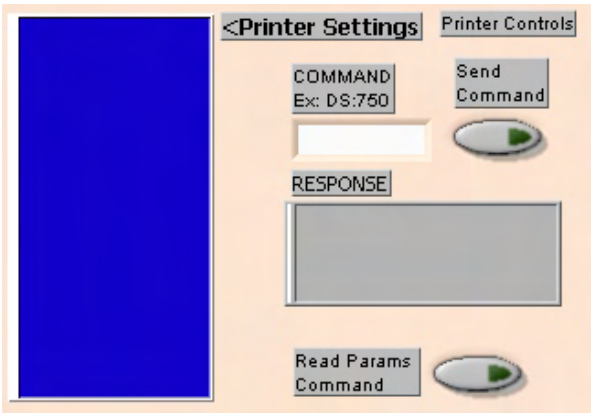
Controller Configuration

Unplug the power cord, press and hold the TEXT button, then plug the power cord in. Continue holding the TEXT button until the LCD shows “88”, then release the button. Use the TEXT button to navigate the settings, and use the FLUSH button to view the value. Confirm the following settings.

F7=B2
F8=D3
FA=01
FC=H1

While holding the FLUSH button, use the TEXT button to cycle through the possible values. Unplug the power cord, then reconnect it, when you are finished.





Software Configuration

Use the Set Up screen’s Printer Settings section to change software settings relating to printing style.

Click the Read Params Command button. This will verify communication with the printing system, and will display a list of the current settings in the blue box.

To change a setting, type the parameter name, a colon (:), and the value you wish to assign to that parameter, then press [ENTER] or click Send Command.

Ex: **DS:750**

The parameter list will refresh, and your new value should be displayed in the blue box. If you need to change another parameter, repeat the steps above.

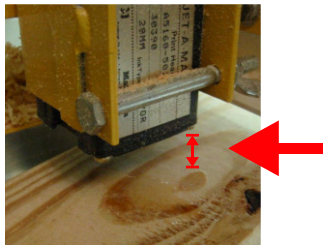
Default Print Settings

M1 :	<	PRINT DIRECTION	Direction, set to backwards (<)
SE :	-	SPEED-ENCODER	Enables print encoding
D1 :	0	PRINT-DELAY	Delay, used to adjust print starting point
DS :	650	DOT-SIZE	Size of ink dots produced
PS :	3500	PRINT SPEED	Shrinks or stretches print

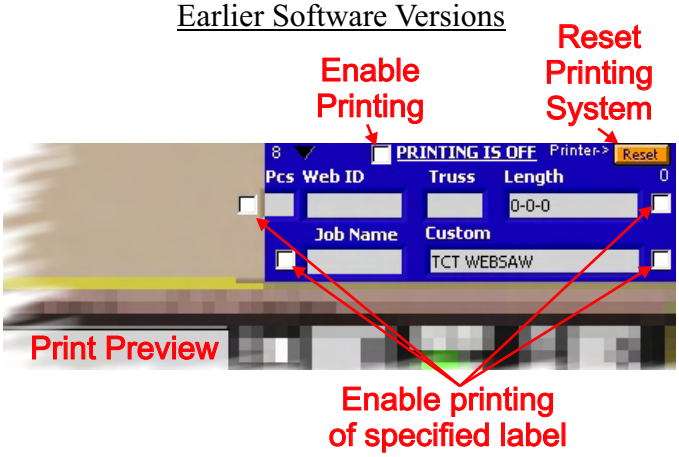
The saw always prints the Truss Name on cut pieces if printing is enabled. Also, versions lower than 350 automatically print the member name (Web ID) if the printing system is activated. All other printing options may be turned on or off to suit an individual plant's needs via the Set Up Screen.

If the Printing Is... (earlier software versions) or the Enable Printing (later software versions) checkbox is unchecked, the machine will pause printing indefinitely. This is useful if the parts you wish to cut have been designed in the Manual Cut (Build Part) screen, since all manual cut parts are given the same label, or for jobs where you simply do not want to waste ink. A preview of what will be printed on the next board is shown in the gray area to the lower-left of the blue board preview in the center of the screen.

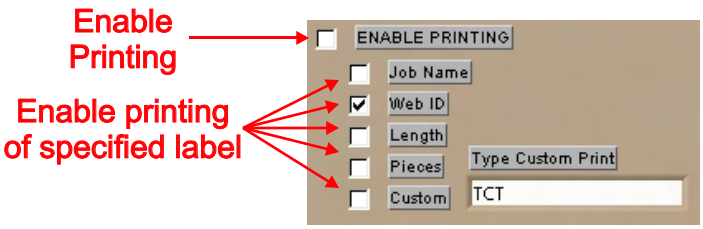
Always maintain about 1/4" gap between boards and the face of the Printhead, as shown below.



Earlier Software Versions



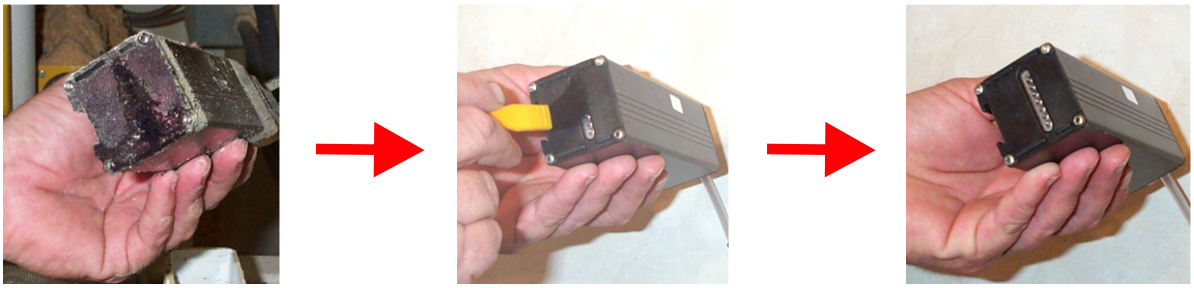
Later Software Versions



2.6

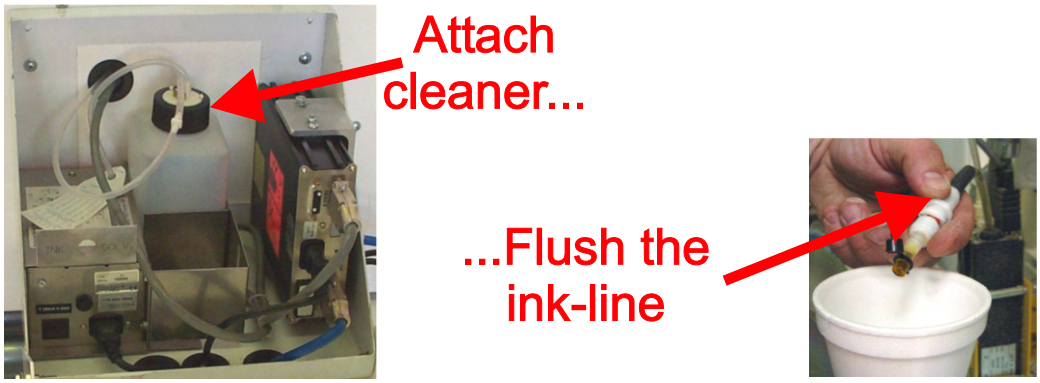
Cleaning the Printing System

The printhead should be cleaned (as shown) at least once per 8 hour shift. The entire printing system should be flushed anytime the printer will not be used for more than two days.



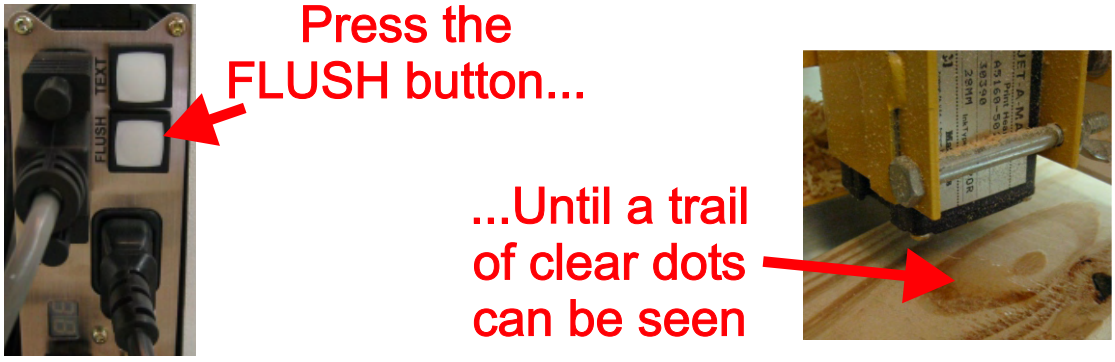
Cleaning the Printhead

Unlock and open the saw's cage door and carefully remove the printhead. Using a soft paintbrush and Matthews Cleaner, gently brush away any ink and sawdust residue. DO NOT force the bristles into the jets; this will damage the printhead, and will require a repair.



Flushing the Printing System

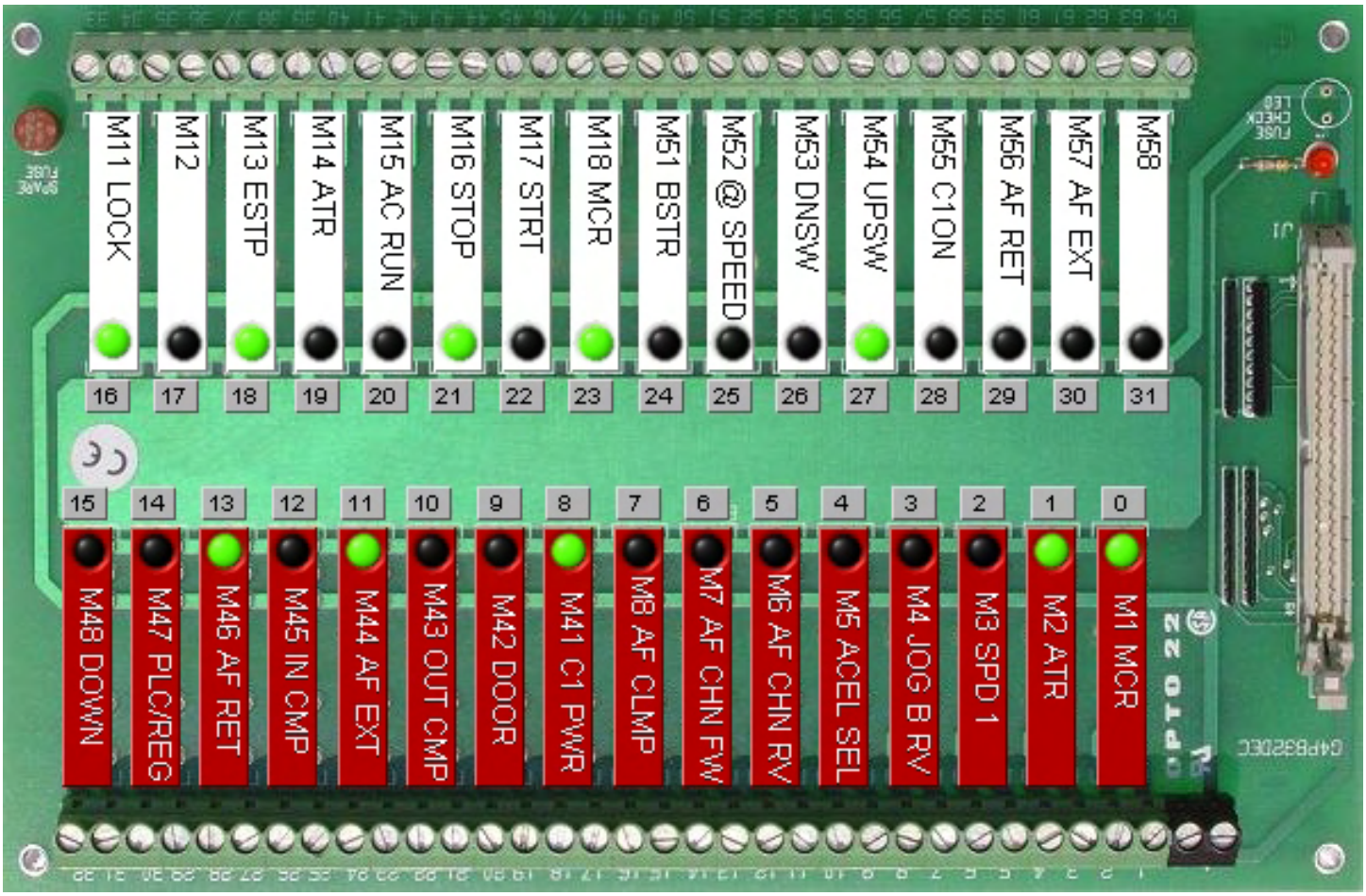
Remove the cap and filter from the ink bottle and attach it to a fresh bottle of Matthews Cleaner (a separate bottle from the one used to dip the cleaning brush into). Use the bleeder valve to flush the ink tubing and the printhead until the fluid that emits from the valve is clear.



Then, insert a board under the printhead. Press the FLUSH button on the print controller and remove the board briskly at the same time. Repeat until clear fluid comes out of the print head jets.

After cleaning and flushing the printing system, it is now safe to leave the printing system unattended for extended periods of time (weekends, holidays, etc.).

WARNING: NEVER use compressed air to clean the Printhead, as severe damage will occur. This type of damage is not covered under warranty (minium repair charge is $750).

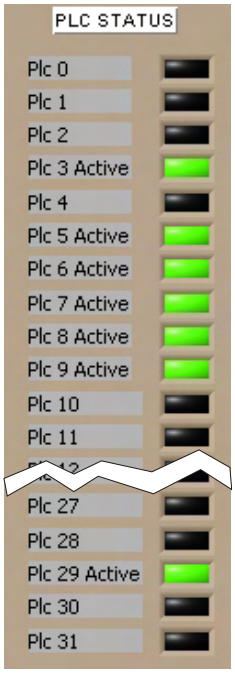


IOTB (Input/Output Modules and Terminal Board)
The Set Up screen shows a picture of the IOTB in the electrical cabinet. This Input/Output Terminal Board contains white Input Modules (top) and red Output Modules (bottom). Both Input and Output modules have a status LED (light) on them, that indicates whether they are on or off. Input Modules will be lit if they are receiving a signal from their associated circuit, whereas Output Modules will be lit if they are sending a signal to their associated circuit.

Output Modules also have brown fuses attached (example is near the top left of the picture). If a particular circuit is not functioning, but the associated Output Module's LED is lit, its fuse may be blown. Check the fuse by removing it from the module, and inserting it into the socket labeled FUSE CHECK LED, near the top right of the IOTB. If the LED lights, the fuse is good.

The Set Up screen shows the status of all the modules on the IOTB. If a white Input Module has a green light, the software senses a signal from that module's inputs. If a red Output Module is shows a green light, the software is sending a signal to that particular module on the IOTB. Output Modules can still be blown even if a light is showing on the Set Up screen, since the software cannot detect that a signal was successfully transmitted through the module. However, it is rare for Input AND Output Modules to fail.

NOTE: Input and Output modules are not interchangeable with each-other, and as such, if a module needs replacement, you must replace it with the same color module.



PLCs

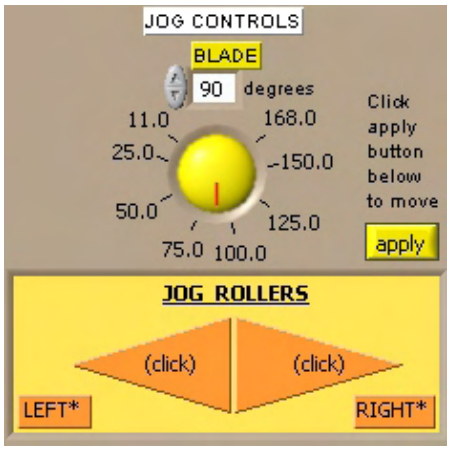
PLCs are extremely fast-running small code segments that run on the PMAC motion controller. They control time critical operations and start and stop the motion of the saw. At any given point in the saw's operation, some PLCs will be active and some will be idle (they turn on and off as required, depending on the current state of the machine). Many of them run too fast to see. Normally when the saw is first powered-up, PLCs 3,5,6,7, and 9 will be active. PLC 29 is related to the optional Auto-Feeder function, so it may or may not be on at startup.

The diagram at the left is from an earlier version of the software, where PLC 8 was always running; PLC 8 is no longer used, so it may or may not be running on your machine, depending on its software version.

NOTE: If the machine behaves improperly, check that PLCs 3, 5, 6, 7, and 9 are active (green). If these PLCs are not active, restart the machine. If they still are not active after a restart, you may have a corrupt software configuration. At this point may be best to contact TCT Manufacturing, Inc. at (352) 735-5070 to speak with a Service Technician.

Jog Controls

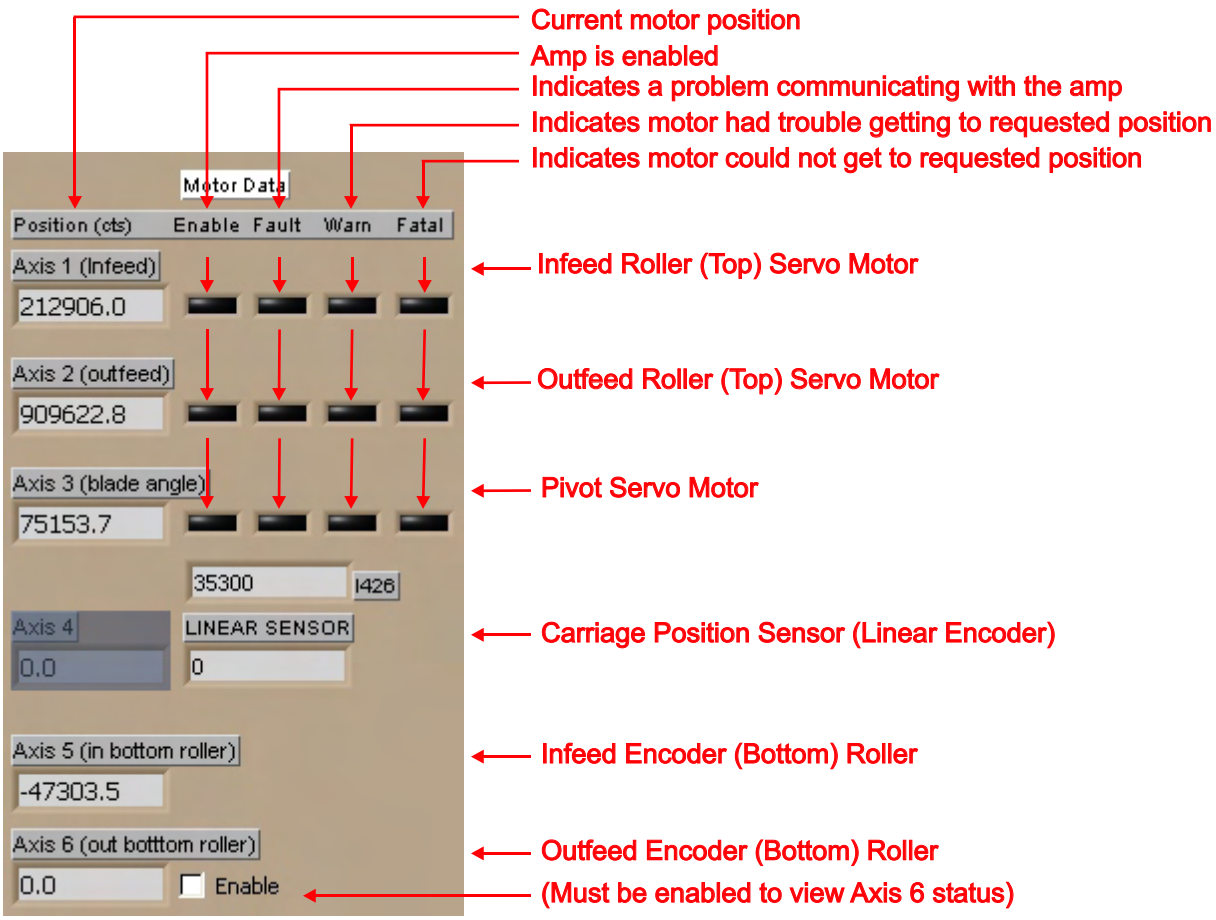
Use the JOG CONTROLS section of the Set Up screen to verify communication between the servo motors and the software.



To angulate the blade, use the **degrees** box under the BLADE section, or drag the knob-pointer to the desired angle, then click the apply button. The blade should move to the angle you instructed it to; if not, there may be a communication problem.

Use the JOG ROLLERS section to manually jog the feed-rollers. Both the Infeed- and Outfeed-Rollers should turn in the same direction for as long as you hold the respective jog arrow.

NOTE: The cage-door must be shut, the POWER button pressed, and the Power indicator on the main saw screen must be green for the functions on this page to work properly.

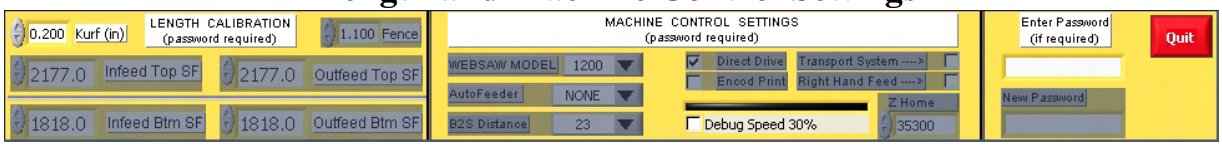


Motor Data

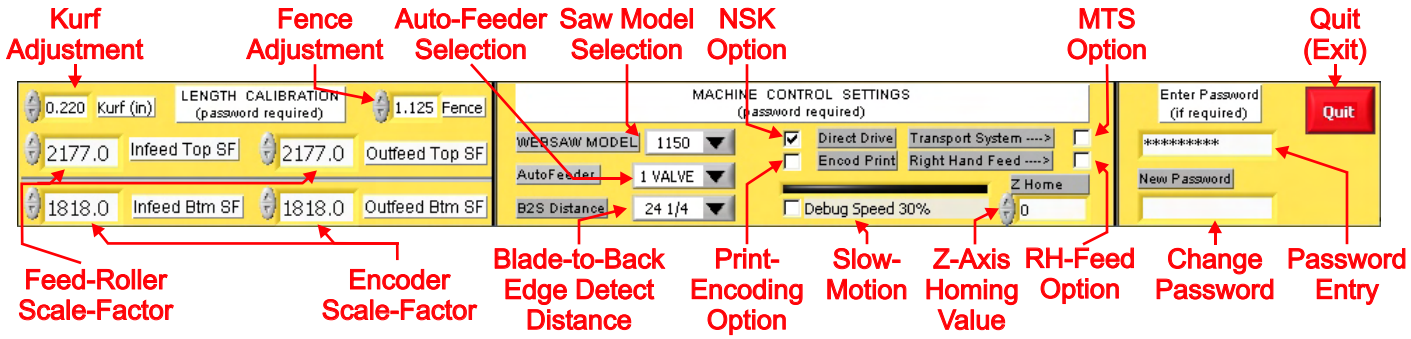
The Motor Data section of the Set Up screen allows the operator to see the status of all axes of the saw. This can be used for troubleshooting servo related issues and for servo information in general.

The Warn and Fatal indicators for axes 1, 2, and 3 tell the operator that a servo-motor has experienced a following-error. Following errors signify that a servo-motor encountered a problem while attempting to move to its requested position. Following errors are generally caused by a jammed motor or a damaged power or resolver (feedback) cable (all servo motors have two cables connected to them). Inspect the cables, connectors, and mechanical assemblies periodically for signs of wear or damage. Serious problems can sometimes be avoided altogether by observing the machine and its operation regularly and taking appropriate actions when necessary.

Length and Machine Control Settings



When you first enter the Set Up screen, most of the options at the top are disabled. Type the password in the 'Enter Password (if required)' box (the default password is **tctwebsaw**) to allow access to these settings. If desired, the password can be changed to safeguard the settings in this section: after you have successfully entered the correct password--type the new password in the New Password box and press [ENTER] to save it. *NOTE: It is normally not recommended to experiment with the settings on this page.*



Length Calibration Settings

Scale Factors - The SF in this section refers to Scale Factor. The Scale-Factor is the base number of counts that the servo-motor needs to move the feed-roller to equal exactly one inch of board movement. The Infeed Top SF and Outfeed Top SF numbers refer to the feed-roller scale-factor; the Infeed Bottom SF and Outfeed Bottom SF numbers refer to the scale-factor for the encoder-rollers, which are the rollers that measure underneath boards in the machine. These numbers set the length calibration for the saw, and while they may change gradually over time, normally they will need no adjustment.

Kurf (in) - Sets the kerf adjustment for the saw. Kerf is the amount of material that is removed by the blade (in the saw's case, turned into sawdust). See the Calibration section for information on testing the kerf setting.

Fence - Sets the fence adjustment. This setting will affect the centerline of cut boards. Note that this setting cannot correct for misaligned fence halves, thus there is no substitute for a properly adjusted fence. This feature simply allows you to tell the software where the fence is positioned.

Machine Control Settings

WEBSAW MODEL - This option allows the machine to run in Model 1100 mode (without using the encoder-rollers). While this mode can help with troubleshooting, it reduces accuracy of the machine, and thus should only be used in special situations.

AutoFeeder - Sets the control type of TCT's optional Auto-Feeder, if so equipped. This option should be set to NONE if the saw is not equipped with an Auto-Feeder

B2S Distance - Specifies the physical distance from the Blade to the Back-Edge-Detect sensors.

Debug Speed 30% - Enables Slow-Motion mode. This option will slow the machine's servo operations to 30% of their normal speed. This is vital for troubleshooting and length calibration. This setting does not affect any air-powered parts of the saw (air-cylinders will still move at their normal speeds).

Direct Drive - Specifies whether the saw is using a Direct-Drive pivot servo motor. For compatibility with select Model 1150 saws.

Encode Print - Specifies whether Encoder-Printing is used. For compatibility with select Model 1150 saws.

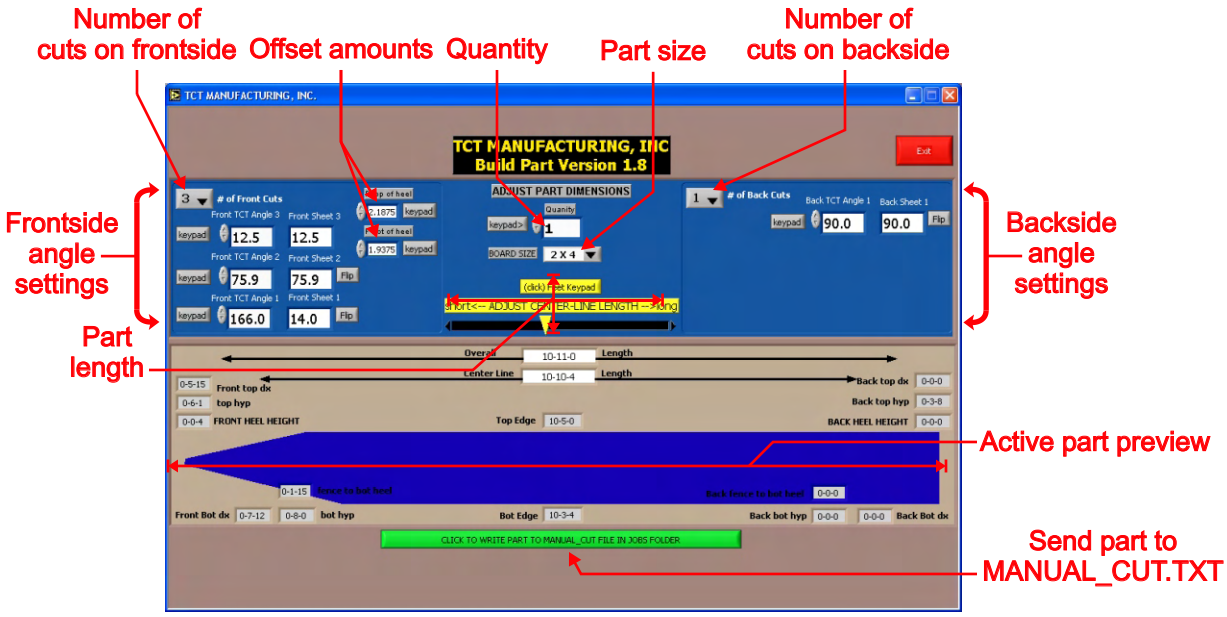
Transport System - Specifies control of TCT's optional MTS (Material Transporter System), if so equipped. This should not be checked if your site is not using an MTS system.

Right Hand Feed - Specifies that this saw is a right-hand feed machine. This should not be checked if the saw is left-hand feed

.

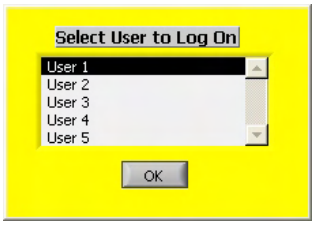
Z Home - Sets the Z-Axis homing value.

2.11



Manual Cut (Build Part)

The Manual Cut (Build Part) screen allows you to design a piece to be cut by the saw while actually standing at the saw. This screen can also be helpful for troubleshooting parts that don't cut right as they are sent from the batching software. To design a part, set the quantity, length, number of angles, angle amounts, and angle offsets for the piece you wish to create, then click the green button at the bottom of the window to save the part to the hard drive. You will then find the part in the MANUAL_CUT.TXT file located in the saw's Jobs folder. You should load this file just like any standard job file, and your new part will be at the bottom of the list following any boards you've designed before. Deleting the MANUAL_CUT.TXT file will remove all previous manual-cuts, and allow you to start clean.

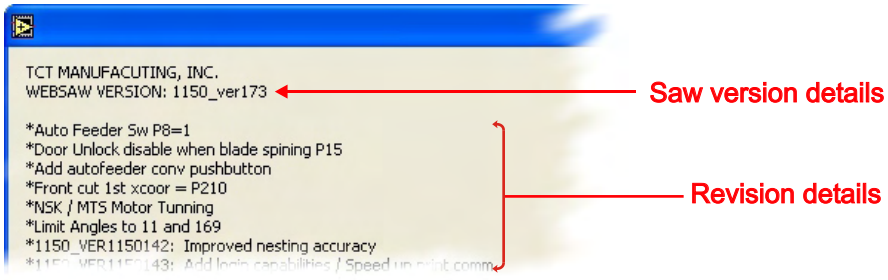


Log On/Off

The Select User to Log On box will appear each time the software is started. You are required to "Log On" every time the program is run. Logging onto the machine allows the software to keep track of the production of up to 5 different operators. This data can be found in the Report screen, accessible from the main saw screen. If you do not need these advanced logging features, you can simply leave the highlight on User 1, and click OK. Cut statistics will still be tracked on the Report screen, for your convenience.

About Screen

The About screen shows you the software version and some of the specific changes to the software.



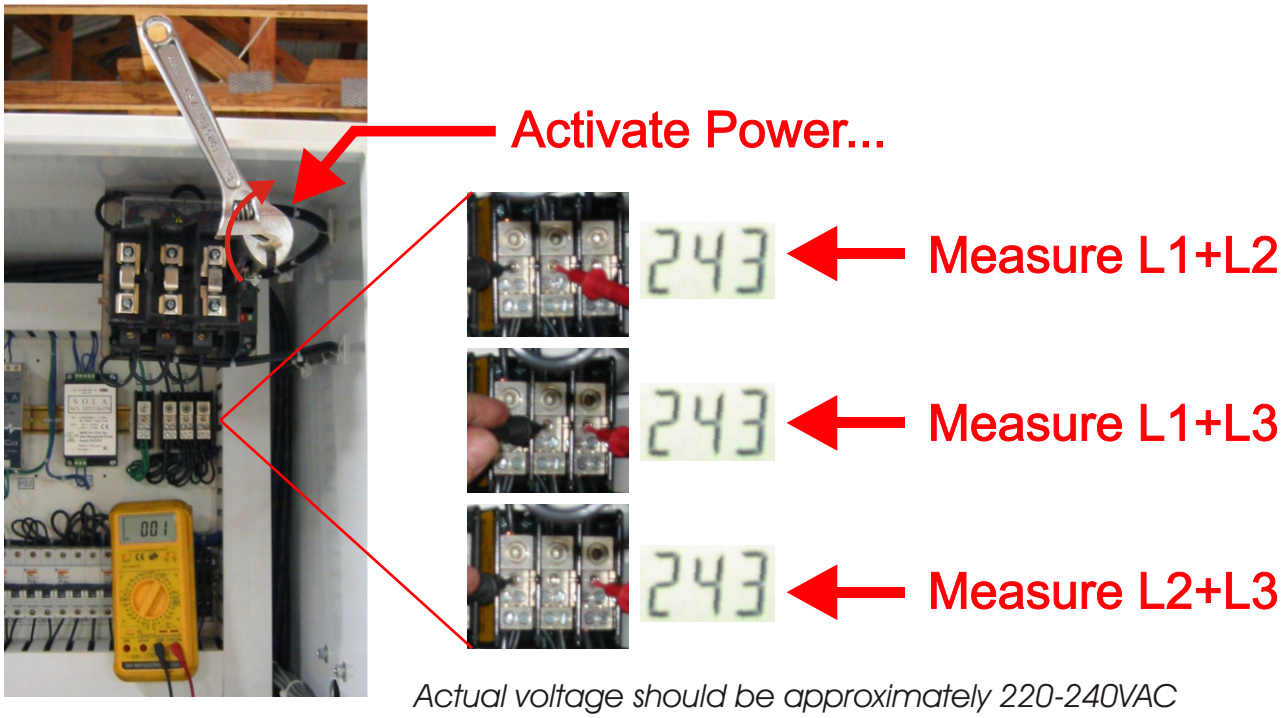
2.12

TCT Linear-Feed Saw Troubleshooting Guide

Does restarting the saw resolve the problem?
QUIT the WebSaw Interface and shutdown the saw's computer (START -> Shut Down). Once the screen has gone blank (or says 'No Signal'), turn off both circuit-breakers to the left of the electrical cabinet and allow the machine to reset for 5 minutes (this allows the power to drain from the system). *NOTE: Do not simply restart Windows, as this does not reset the entire machine!*

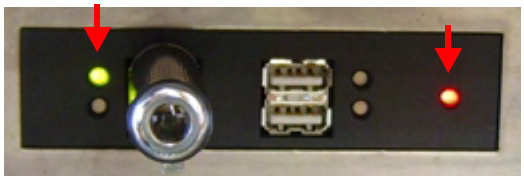
After 5 minutes, start the saw again, then check to see if the problem still exists.

Is 3-phase power present? (***DANGER: High-Voltage, Use Extreme Caution***)
If a phase of the incoming 3 phase power is lost, the saw may appear to operate normally, but some systems will not function properly. Measure the voltage across each phase, as shown below. If any problems are found, have a qualified electrician inspect the saw immediately.



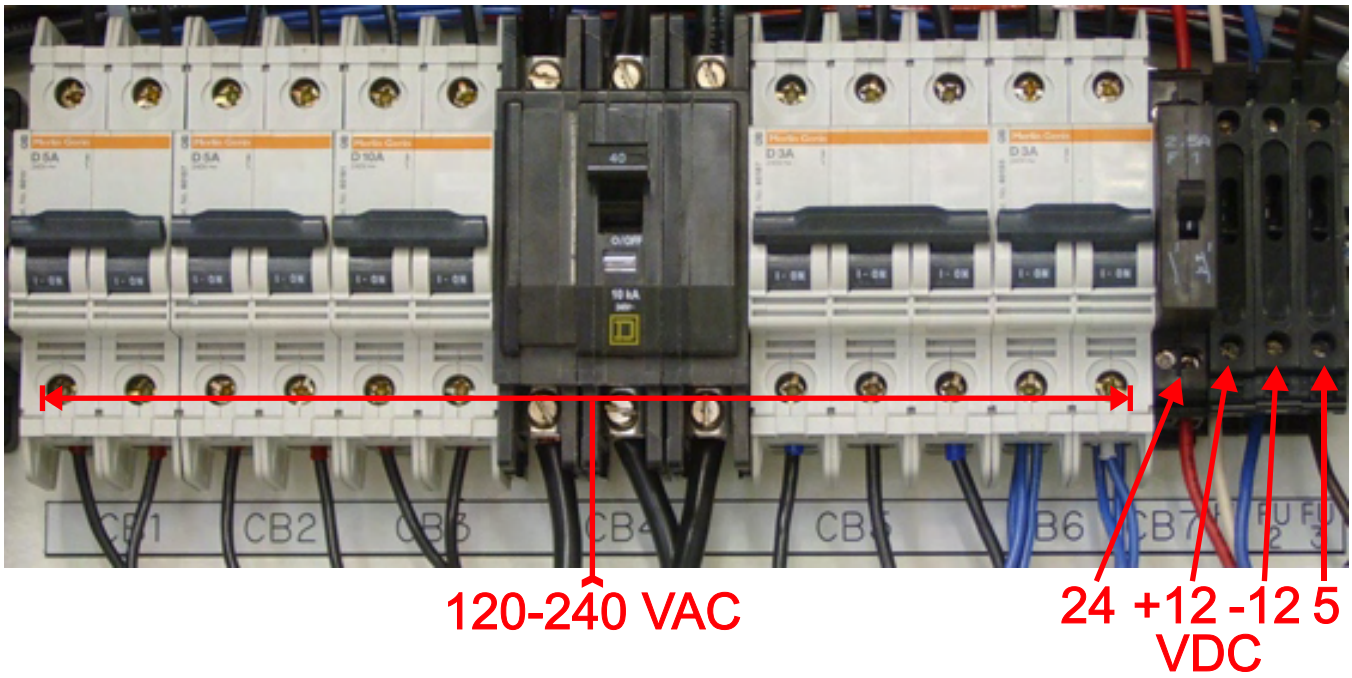
Actual voltage should be approximately 220-240VAC

Is the cut file located on the saw's hard disk?
Only load cut-files that have been copied to the **C:\JOBS** folder on the saw's computer. Attempting to load files directly from a flash-drive or a network location can slow the operation of the software, and may cause some functions to fail.



Is the flash-drive accessible?
If you are unable to copy files from a flash-drive, the drive may not have been initialized properly. After inserting the flash-drive, double-click My Computer on the Windows desktop and look for an item named 'Removable Disk', and a drive letter in parentheses. If it exists, double-click on this item and attempt to open a file located on the drive. If the 'Removable Disk' item does not appear, check that the red LED on the USB hub is on, and that the green LED by the USB port your flash-drive is using is lit. Remove the drive and insert it into a different port if necessary. Click View in the menu bar of the My Computer window, then Refresh. If the drive still does not appear, restart the saw as explained above, and attempt to access the drive once more. The USB ports on the saw's computer can be used in the event the USB hub fails to operate properly.

Do other parts cut correctly?
Attempt to cut a different part. If this part cuts properly, the problem may be with the orientation or details of the part that fails to cut. If not, create a web in the Build Part screen (see pg. 2.12), and attempt to cut it.



Are any circuit-breakers or fuses tripped/blown? (*WARNING: USE EXTREME CAUTION*)
Measure the voltage on the bottom side of each breaker and fuse (use the diagram above). Find the cause of any tripped breaker, and replace any fuses that are blown.

Is the machine overheating
Check that the ventilation fan and PC cooling-fans are running. Clean the ventilation-filter or replace it if necessary (should be replaced once per month, or more often if required).

Is the air-supply adequate?
The air-pressure should read 55-60PSI or 70-80PSI (see pg. 1.1) at the regulator, depending on the model of the saw. Pressure should not drop more then 10 PSI during the saw's cycle.

Are all of the default PLCs running?
PLCs 3, 5, 6, 7, and 9 should be active (see pg. 2.9).

Is the machine in an E-STOP condition?

1) **Check E-Stop Button**
   Check that the E-Stop button has not been engaged.

2) **Cage door is open**
   Check that the WebSaw's door is closed, and that the computer is receiving a signal from the door-lock.

3) **E-Stop lost 24VDC**
   Check that the ESR relay is getting 24VDC; if not, check the 24VDC circuit-breaker.

Disengage
E-STOP button
(Turn clockwise)

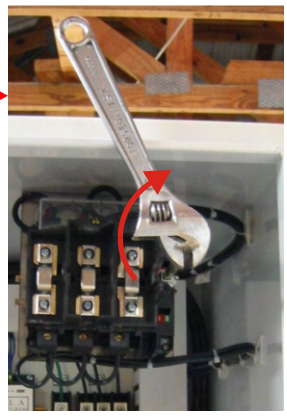
Motor Faults

If lumber feeds into the WebSaw and either: 1) the board stops before making a cut, or 2) the saw cuts one or more cuts on the front side of the board, then ejects the board, open the Set Up screen and look for a Fault, Warn, or Fatal indication in the Motor Data section (see pg. 2.10). If one of these indicators is lit, visually check for anything that would cause the board to jam, and correct any problems found. If nothing obvious is found, inspect the cables that connect to the feed and pivot servo motors for damage or signs of damage or wear.

If the cycle won't start at all, try to rotate the blade and jog the feed-rollers manually using the controls on the Set Up screen. If there is a problem with any servo system, the saw may refuse to run altogether.

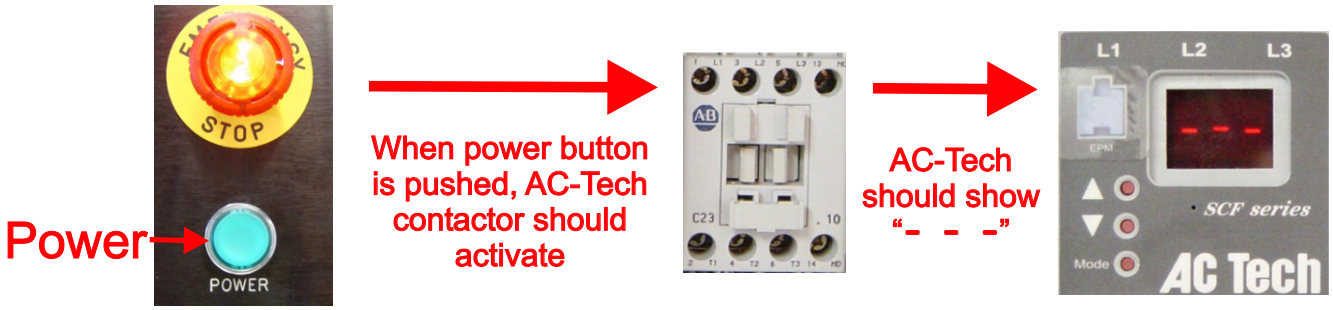
AC - Tech VFD Configuration

WARNING: HIGH-VOLTAGES PRESENT--USE EXTREME CAUTION

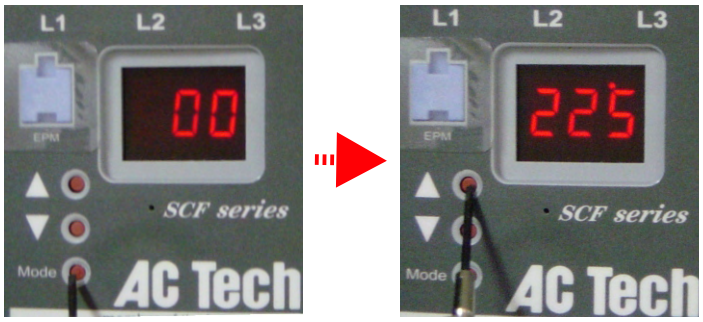


Open electrical cabinet door and reactivate power
With the cabinet door open it is necessary to use a wrench to turn the power disconnect to the on position.

Press the POWER button and note that the POWER light activates



Enter Password
Press the Mode button on the AC-Tech (the display should show 00) and use the Up Arrow button to scroll up to 225, the default password. Press Mode again to enter the password and proceed to the parameter listing.



Change Parameters
The first parameter (P01) will appear on the display. Press Mode to view the current setting for P01, or press the Up or Down Arrow buttons to scroll through the parameter listing. If a setting change is needed, press the Mode button to view the current setting, and use the scroll arrows to change the value as needed. Pressing Mode once at this point will put the AC-Tech back into standby mode (---); press Mode once more to return to the parameter listing. When all changes have been made, press Mode until the display shows ---.

3.4

AC-Tech Error Codes

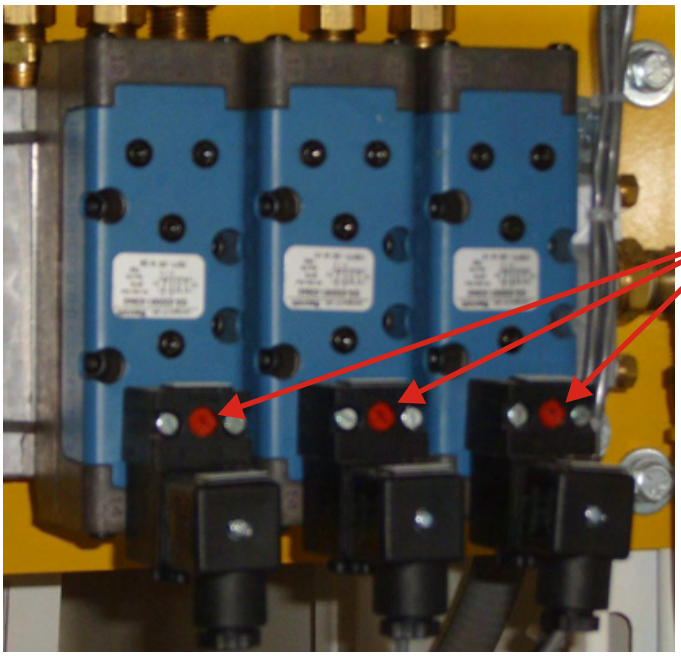
Fault	Description & Possible Causes
AF	*High Temperature Fault*: Ambient temperature is too high; Cooling fan has failed (if equipped).
CF	*Control Fault*: A blank EPM , or an EPM with corrupted data has been installed. Perform a factory reset using Parameter 48 - PROGRAM SELECTION.
cF	*Incompatibility Fault*: An EPM with a different parameter version has been installed. Either remove the EPM or perform a factory reset (Parameter 48) to change the parameter version of the EPM to match the parameter version of the drive.
dF	*Dynamic Braking Fault*: The drive has sensed that the dynamic braking resistors are overheating and shuts down to protect the resistors.
EF	*External Fault*: TB-13A and/or TB-13C is set as an External Fault input and TB-13A and/or TB-13C is open with respect to TB-2. Refer to Parameter 10 and/or 12.
GF	*Data Fault*: User data and OEM defaults in the EPM are corrupted.
HF	*High DC Bus Voltage Fault*: Line voltage is too high; Deceleration rate is too fast; Overhauling load. For fast deceleration or overhauling loads, dynamic braking may be required.
JF	*Serial Fault*: The watchdog timer has timed out, indication that the serial link has been lost.
LF	*Low DC Bus Voltage Fault*: Line voltage is too low.
OF	*Output Transistor Fault*: Phase to phase or phase to ground short circuit on the output; Failed output transistor; Boost settings are too high; Acceleration rate is too fast.
PF	*Current Overload Fault*: VFD is undersized for the application; Mechanical problem with the driven equipment.
SF	*Single-phase Fault*: Single-phase input power has been applied to a three-phase drive.
UF	*Start Fault*: Start command was present when the drive was powered up. Must wait 2 seconds after power-up to apply Start command if START METHOD is set to NORMAL.
F1	*EPM fault*: The EPM is missing or damaged.
F2-F9, Fo	*Internal Faults*: The control board has sensed a problem - consult factory.

NOTE: See page 48 of AC-Tech manual for more details.

Pneumatic Ceram-Valves

Pneumatic valves are used to control the clamps and carriage cylinders. It is imperative that the air supply has minimum moisture content to ensure their long term operation. If maintenance is required, the manual override buttons can be used to test the valve's mechanical function, bypassing the electrical system (also useful when the machine is not powered). The machine's oiler should be applying one 'drop' of oil Make sure you are consuming oil as described in the section titled "Maintenance".

NOTE: Recommended oil for maintenance is standard Pneumatic Tool Oil, available at most hardware and automotive stores..



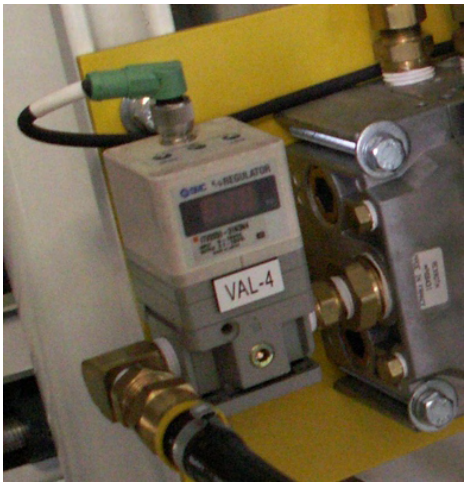
Manual Override:

Allows you to bypass the electronic control circuit and manually activate each valve. Push in and turn 1/8 turn to the right to lock. Turn to the left to unlock.

Electronic Regulator

The electronic regulator switches the clamp-cylinder's air supply between 25 and 65PSI. When boards need to move while clamped, the regulator switches to 25PSI. Otherwise the unit applies the full 65PSI to the clamp cylinders.

The regulator has two presets. F1 should equal 25, and F2 should be 65. If either of these are different, you may need to contact TCT Manufacturing, Inc.



Servo Amp Diagnostic Indicators

MARK (RED)

This is an ouptput that comes ON at the resolver zero position and can be used in conjunction with alignment procedures. The zero position is about .5 degrees.

CURRENT (BI-COLOR)

This is a bi-color LED that can be either red or green as a function of load. Red indicates postive torque and green indicates negative torque. The intensity increases with load.

There are eight faults that will disable the amplifier.

LED	INDICATION
CONTINUOUS	If a load condition exists that causes the amplifier to produce more than its continuous rating, this fault occurs.
STATOR SHORTS	If stator shorts or most major wiring errors of the stator occur, this fault occurs.
AMPLIFIER THERMAL	An 85° C thermostat is mounted to the amplifiers IGBT heat sink. If an excess temperature is sensed, this fault occurs.
FEEDBACK WIRING	For most resolver wiring errors, defective resolvers or tracking rate errors caused by the resolver, this fault occurs.
MOTOR THERMAL	If an exxcess thermal condition exists in the motor, this fault occurs.
HI-BUS	If excess DC voltage or a failure of the shunt circuit occurs, this fault occurs.
RESET	During the first second of power up or it the reset input is active, this LED will be ON. If either of the limit inputs are ON, This LED will be ON.

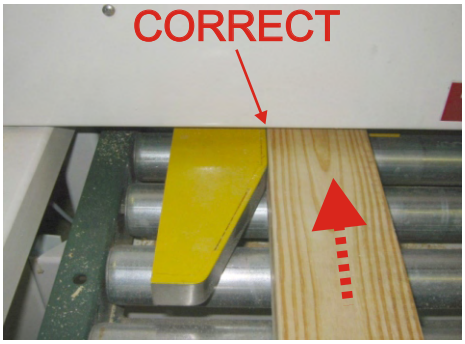
POWER (GREEEN)

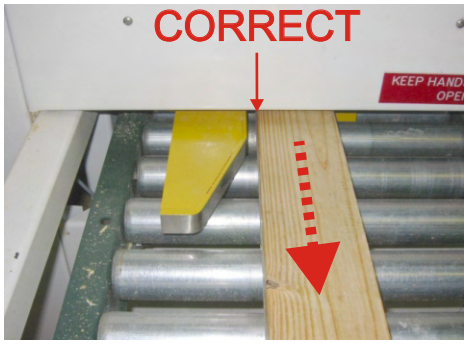
If Logic +5 Vdc is ON, then this Led is ON

TCT Linear-Feed Saw Calibration Guide

Fence Setup (Model 1150)

This section describes the steps required to setup a fence that has lost its calibration. Find a straight board, which is as long as possible *(This test requires long lumber; short boards will not give accurate results)*. Align the board with the fence and jog the feed rollers to the right, stopping before the board leaves the outfeed roller. The board should stay adjacent to the fence, and not move away from it.



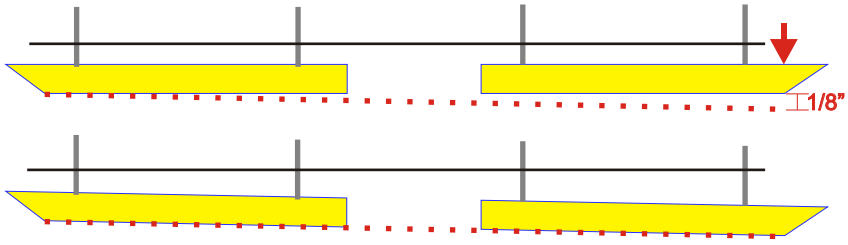


Next, jog the board left, towards the operator station. If the fence is correctly angled, the board will travel away from the fence just slightly as it is moved backwards through the machine.

If the board moves away from the fence more than ½" in 10', the fence's angle may be too steep. Adjustment consists of moving the outfeed side of the fence so that it is about 1/8" closer to the front of the WebSaw than the infeed side. NOTE that if an adjustment is made, you may need to realign the fence halves (using a long straight-edge).

1) Fully loosen all four (4) outfeed fence mounting nuts, and slide the fence towards the back of the machine.
2) Adjust the infeed fence right-hand (inner) stud to obtain the correct starting measurement of 7 ¼" from the fence mounting point in the frame to the face of the fence (in-line with the stud).
3) Carefully insert a 6' straight-edge along the face of the infeed fence, centering it in the saw.
4) Actuate the infeed clamp by pushing in and turning the RED button on the infeed pneumatic-valve solenoid.
5) Adjust left-hand (outer) infeed stud till the distance from the leftmost mounting point to the left end of the straight edge should be 1/8" less than the measurement from the rightmost mounting point to the right end of the straight edge.
6) Remove the straight edge, and cut a board with 45° and 135° angles on the front side. Is only necessary to cut the front side of the board. Verify center of cut is correct (1 3/4" from the edge that was against the fence). If not, adjust the two infeed fence studs equally to achieve proper center of cut.
7) Clamp the straight-edge in the infeed side again. Bring the outfeed fence up so that the face of the fence touches, but DOES NOT DEFLECT, the straight edge.
8) Insert a long board into the infeed side, against the fence, and jog it part-way through the saw (stop jogging before the board leaves the outfeed roller). The board should stay near the fence as it travels right through the saw. Then jog the board back out to the left. The board should move away from the fence 3/8" to 5/8" after moving about 6'. If the board does not stay against the fence, or it moves away too far during the return, it may be necessary to tweak the fence angle.
9) Remove the long board and insert a 3' board into the machine, against the fence, and jog into the saw. Note whether it travels straight, or pivots toward the rear of the saw (left end moves away from the fence, right end moves toward the fence). If the board pivots significantly, the infeed encoder roller will need to be realigned to "aim" the board so that it moves straight into the saw.

NOTE: It is very important that the two fence halves be aligned correctly with each-other, otherwise the saw may have difficulty moving boards through itself.

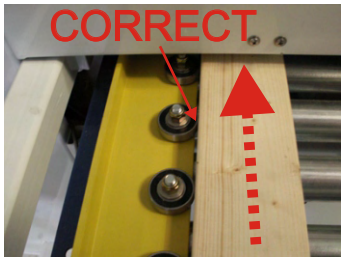


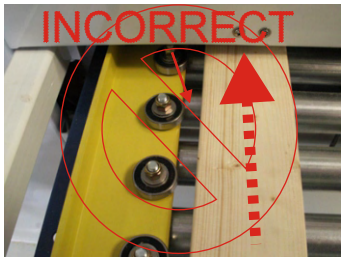
4.1

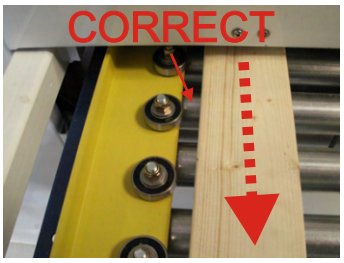
Fence Setup (Model 1200)

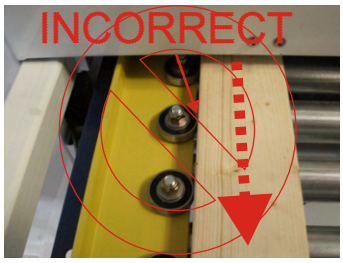
This section describes the steps required to setup and align a fence that is improperly calibrated. Find a straight board with few blemishes. This board should be as long as possible *(This test requires long lumber; short boards will not give accurate results; 18-20'boards work best)*.

Align the board with the fence-rollers and jog the board through the saw, away from the operator (the procedure is the same whether the saw is standard or right-hand feed), stopping before the board leaves the outfeed-roller. The board should move gently toward the fence-rollers and stay adjacent with the fence.







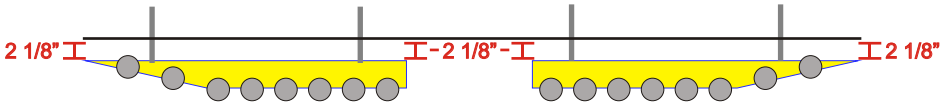


Next, jog the board back toward the operator station. The board should travel away from the fence just slightly as it is moved back through the machine. There should be no more than about 1/2"gap between the fence-rollers and the face of the board.

Infeed Fence Setup

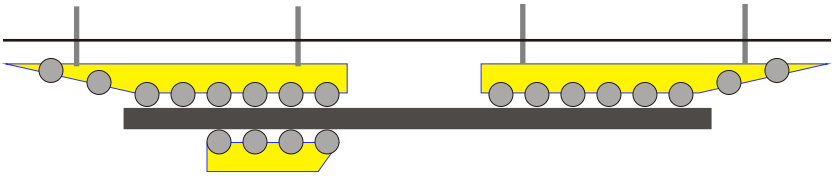
Loosen the outfeed fence nuts and move the fence toward the back of the machine at least 1". Measure the distance from the back edge of the fence body to the 2x2 frame of the machine (do this at BOTH fence studs). The gap should be 2 1/8". If not, loosen the infeed fence nuts at the frame and move the fence enough to make the gap 2 1/8". Once you are satisfied with the measurement, carefully tighten the infeed fence nuts. Make certain the distance doesn't change as you tighten the nuts.

Navigate to the Set Up screen *(see pg. 1.8)*, enter the password, and set the Fence adjustment to 1.000. Then navigate to the Manual Cut screen *(see pg. 2.12)* and design a board with 2 angles on the front end--45^{0} and 135^{0}--and one angle on the back end--90^{0}. Make this board 3' long, and make certain it is a 2x4. Is only necessary to cut the front side of the board. Verify center of cut is correct (1 3/4" from the edge that was against the fence). If not, adjust the two infeed fence studs equally to achieve proper center of cut.



Outfeed Fence Setup

Once the infeed fence is setup properly, you can use it's position to align the outfeed fence. Insert an accurate straight-edge (a 6' level *in good condition* works well) into the infeed side, as though you were inserting a board (make sure your straight-edge is less than 1 1/2" thick or it can be damaged by the feed-rollers). Use the infeed-clamp override *(see page 3.6)* to clamp the straight-edge in place.



Bring the outfeed fence up so that the face of the fence touches, but does NOT bend, the straight edge. Carefully tighten the fence-nuts to lock the fence in place. Continuously check that the straight-edge is not being flexed by the fence.

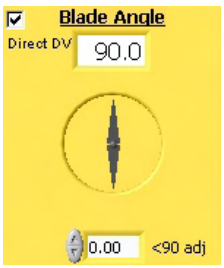
After setting the outfeed fence, jog your straight board through the saw, and back to the operator station, then repeat multiple times. Check for smooth movement of the board back and forth; this reduces the chance of boards jamming during production.

NOTE: It is very important that the two fence halves be aligned correctly with each-other, otherwise the saw will have difficulty moving boards through during its cycle.

90° Angle Adjustment

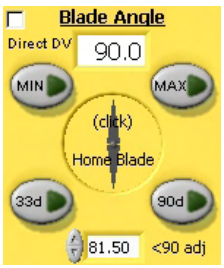
Determine Pivot Motor Type (1150 Models)

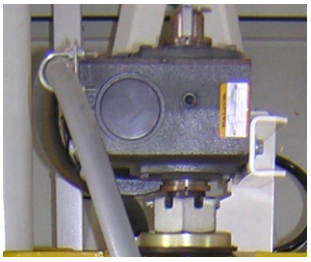
For Model 1150 saws, it is important to identify the type of pivot system that is installed on the saw. Open the cage-door, and physically look at the top of the carriage. You will see either of the following types: (be sure the Direct DV checkbox in the Blade Angle section matches the pivot system installed on your machine)



Direct-Drive (NSK) Type (1200 & 1150)

- OR -





Worm-Gear Type (Some 1150 Models)

Calibration:

Use the Manual Cut screen to design a board with a 90° angle on each end. Insert a board 4' long into the saw and allow the first cut to be made, then stop the cycle and jog the board back toward the operator station. Check the angle with a large, accurate carpenter's square.

If the cut was less than 90°, increase the '90 adj' value (ten clicks equal 1°). If the cut was greater than 90°, decrease the adjustment. When you are finished, the adjustment normally should be within 1°-2° of 0.00° (adjustment can be negative). Then QUIT the WebSaw Interface (using the button at the top-right) and open it again to apply the new value. *NOTE: On this type of pivot-motor setup, the '90 adj' value is only applied after the WebSaw Interface is restarted.*

Hardstop (1150 Models Only)

To check that the hardstop is set correctly, open the cage door, and rotate the blade by hand clockwise till the head meets the inner hardstop stud (the face of the blade should be toward you). The 'Blade Angle' indicator should show a number between 8.5° and 9.5°. If not, adjust the inner stud. Then rotate the blade counter-clockwise till the head meets the outer hardstop stud. The 'Blade Angle' indicator should now show a number between 170.5° and 171.5°. If not, adjust the outer stud.

Once the hardstop is set, check that the outfeed roller is centered between the blade's two extremes.

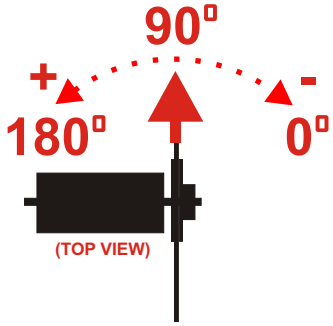
Calibration:

When the blade is homed, it pivots clockwise till it meets the homing (inner) hardstop stud. This stud is set to about 8.5° on Model 1150 saws The blade then pivots counter-clockwise by the amount specified in the '90 adj' box (usually around 81.5°), and sets this new position as 90°.

Use the Manual Cut screen *(see pg. 2.12)* to design a board with a 90° angle on each end. Insert a board 4' long into the saw and allow the first cut to be made, then stop the cycle and jog the board back toward the operator station. Check the angle with a large, accurate carpenter's square.

If the cut was less than 90°, increase the '90 adj' value (ten clicks equal 1°). If the cut was greater than 90°, decrease the adjustment. When you are finished, the adjustment normally will be approximately 81.5°. Home the blade to apply the new value, then repeat the 90° test to verify the adjustment was successful. *NOTE: On this type of pivot-motor setup, the '90 adj' value is only applied after the saw's blade has been homed.*

Because the hardstop plays a critical role in the accuracy of angles on this type of pivot-motor setup, it is not recommended that the hardstop be adjusted. If you need to adjust the hardstop, it is best to contact TCT Manufacturing, Inc and speak with a service technician.

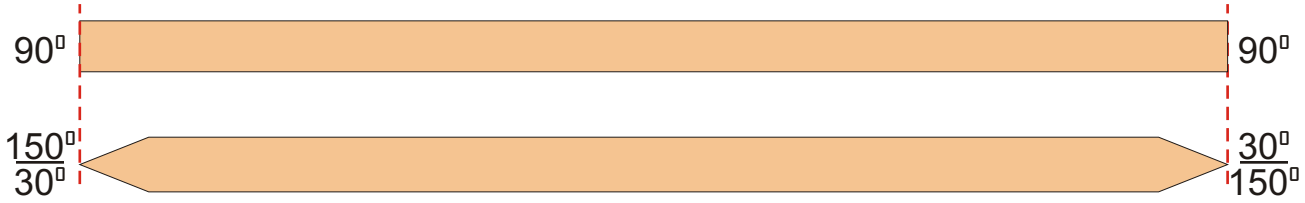


4.3

Kerf Adjustment

The kerf adjustment tells the saw how thick its blade is, and thus how much material will be removed from the board by the blade during each cut. Four-angle webs will be affected more by the kerf adjustment than simple 90/90 boards. This adjustment should be checked if you notice a difference between three- or four-angle webs and two-angle parts.

Cut two 4' long parts: one with 90° angles on both ends, and one with a 30° and a 150° angle on each end, as pictured below.

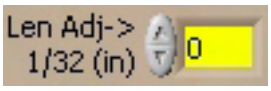


Compare the length of the two parts you cut. It is not important yet that the parts are cut exactly 4; however, both parts should be identical in length.

If the pointed (30°/150°) board is shorter than the 90° board, increase the kerf adjustment; if the pointed board is longer then the 90° board, reduce the adjustment. It is important to not make large changes to this number; generally it will be between 0.210 and 0.230 for Model 1150 saws (or any saw with a 24" blade), and 0.180 and 0.200 for Model 1200 saws. Repeat the test and make another adjustments if necessary.

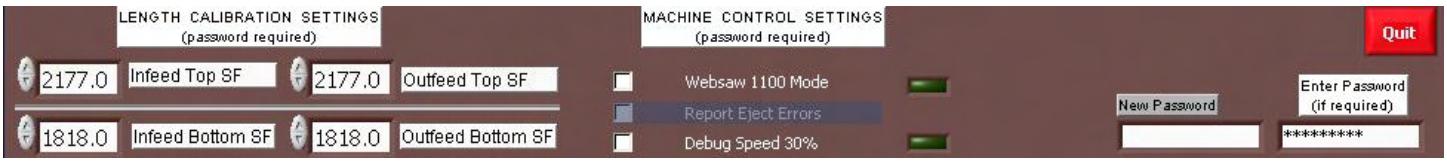
Length Calibration (Software Versions Prior to 349)

When the WebSaw is first calibrated, the length adjustments are set to give the best accuracy. Over time, you may find that an adjustment will help the saw to cut more accurately. You can adjust for minor length variations by adjusting the 'Len Adj' on the main WebSaw screen. Each 'tick' of the adjustment will add or subtract 1/32" from all parts that are cut on the machine.



In some situations, such as when long parts are cut short or long by more than 1/4", it may be necessary to adjust the Length Calibration Settings on the Set Up screen. As these numbers affect the entire machine's operation, it is suggested that the 'Len Adj' section be used unless it is absolutely necessary to change the Scale Factors.

To calibrate for length variations, start by setting the 'Len Adj' value to zero (0). Cut a 13' 10" board from 14' stock. Then measure the board, and note how much the length differs from what it should be. Click the Set Up Screen button on the main WebSaw screen, type the password in the white box in the upper-right (the default password is **tctwebsaw**), then press [ENTER]. The LENGTH CALIBRATION SETTINGS will become active.



Adjust the Infeed Bottom SF, one or two 'ticks' at a time, to add to or subtract from the length (primarily affects long boards). After making the adjustment, click the Quit button in the upper-right of the Set Up screen. Cut a 13' 8" board from the 13' 10" board you cut before, and measure its length. If the length still is not correct, repeat the above steps. (The picture above shows the default values for the Length Calibration Settings. Start with similar numbers if you have adjusted the settings significantly and do not remember what the originals were.

Once your long board cuts correctly, cut a 5-0-0 board from an 8' board or longer, and measure its length. If the length is not correct, use the 'Len Adj' on the main WebSaw screen to add to or subtract from the length (affects all boards evenly), then cut a 4-10-0 board from the 5' board you cut before, and measure its length.

If an adjustment is made to the 'Len Adj' value, you will need to repeat the long board test above once more. If the length is acceptable, the lengths should then be correct for all boards cut on the saw.

NOTES:
- The LENGTH CALIBRATION SETTINGS section of the Set Up screen primarily affects longer boards. A change in these numbers will barely show a change on short boards. To add or subtract from the length of all boards by the same amount, use 'Len Adj' on the main WebSaw screen.
- Also, it is important to use high-quality lumber for these tests, as warped lumber or lumber with too many imperfections will give poor results, and may cause you to make unnecessary adjustments.

Length Calibration (Software Versions 349 and Above)

Infeed-Roller Scale-Factor

Navigate to the Set Up screen and enter the password *(see pg. 1.8)*. Set both Infeed-Bottom Sf and Outfeed-Bottom SF to 1059 (for saws with 6" encoder-rollers) or 1818 (for saws with 3 1/4" encoder-rollers). Return to the Main screen. Set Stretch/Shrink adjustment to 0. Use the Manual Cut screen *(see pg. 2.12)* to design a 13-0-0 2x4 with a single 90° angle on both ends. Cut this board 3 times, using 16' long 2x4 stock lumber.

Measure the boards and take note of the amount of difference between them. If the average length is 13-0-0 +/- 1/32", then the Infeed-Roller Scale Factor needs no adjustment. If the average length of the three boards does not fall within these measurements, navigate to the Set Up screen once again, and enter the password. Adjust the Infeed Bottom SF to change the length calibration. For this test, one click (0.5) equals approximately 1/32" of change in the board's length. You may go higher or lower with this number, depending on the result of the test cuts. DO NOT adjust the Outfeed Bottom SF at this time. Exit the setup screen, and start at the beginning of this section to retest the Infeed-Roller Scale-Factor

Outfeed-Roller Scale-Factor

After setting the Infeed-Roller Scale-Factor, design a board similar to the first test, but 12-6-0 long. Cut three of these boards using the 13-0-0 boards you cut in the first test. Measure the boards and take note of the amount of difference between them. If the average length is 13-0-0 +/- 1/32", then the Outfeed-Roller Scale Factor needs no adjustment. If the average length of the three boards does not fall within these measurements, navigate to the Set Up screen once again, and enter the password. Adjust the Outfeed Bottom SF to change the length calibration. For this test, one click (0.5) equals approximately 1/32" of change in the board's length. You may go higher or lower with this number, depending on the result of the test cuts. DO NOT adjust the Infeed Bottom SF at this time. Exit the setup screen, and start at the beginning of this section to retest the Outfeed-Roller Scale-Factor

Z-Axis Calibration (1200 Models)

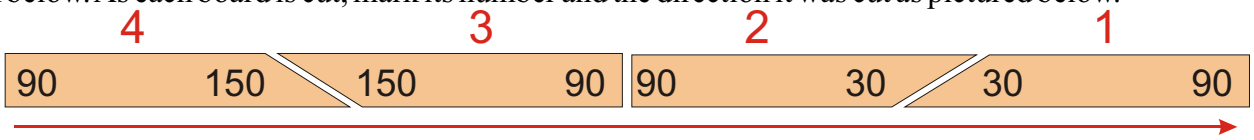
1) Verify Z-axis proximity sensor positions. There are three proximity sensors that control the Z-axis calibration and safety parameters. Locate the three sensors--they are found inside the saw cage on top of the Z-axis slide-rails.
2) Verify the position of the front limit sensor by physically pulling the carriage all the way forward (pull the blade motor toward you till it stops). Then move the carriage toward the back slightly, about 3/16". Inspect the sensors. The front limit sensor should be activated (the end of the sensor should be illuminated). If not, the sensor needs to be moved. Loosen the front sensor bracket, then pull the sensor toward you. Slowly move it away from you until the end illuminates. Move the sensor left or right to leave a 1/8" gap between the carriage 'flag' and the sensor, then carefully tighten the bracket. Double-check for the 1/8" gap.
3) Verify the position of the back limit sensor by physically pushing the carriage all the way back (push the blade motor away from you till it stops). Then move the carriage toward the you slightly, about 3/16". Inspect the sensors. The back limit sensor should be activated (the end of the sensor should be illuminated). If not, the sensor needs to be moved. Loosen the back sensor bracket, then push the sensor away from you. Slowly move it toward you until the end illuminates. Move the sensor left or right to leave a 1/8" gap between the carriage 'flag' and the sensor, then carefully tighten the bracket. Double-check for the 1/8" gap.
4) Verify the position of the home (middle) proximity sensor. It should be located as close to the back sensor as possible. Verify the gap between the carriage flag and the sensor face (should be 1/8", adjust if necessary).
5) Navigate to the Set Up screen *(see pg. 1.8)* and enter the password. Set the Fence adjustment (upper-left of the screen) to 1.0000. Set the Z Home adjustment to 60000 (sixty-thousand).
6) Return to the Main screen, and make sure the cage door is closed and latched. Press the POWER button on the operator station and click the HOME Z-AXIS button (lower-middle of the screen). Allow the #4 POS indicator (above the blade-angle indicator) to reach 0.000 before proceeding.
7) Use the Manual Cut screen *(see pg. 2.12)* to design a 6-0-0 2x4 board with one 171° angle on the front end (the back end does not matter). Cut the front cut of this part and stop the cycle. Jog the board back out to the operator station.
8) Verify that the blade cut completely through the back side of the board. If not, navigate to the Set Up screen, enter the password, and reduce the Z Home value. 8192 counts equals 1/16" difference in the cut (i.e. if your starting value is 60000, reducing the value to 51808 will start the blade back 1/16" from where it was). Repeat from **step 6** until the blade cuts **cleanly** through the back side of the board.
9) User the Manual Cut screen to design a 4-0-0 2x4 with two angles on the front end: 45° and 135°. Cut these two front cuts, and stop the cycle. Jog the board back to the operator station.
10) Use a large, accurate framing square to measure the distance from the back side of the board (the side that rides against the fence) to the centerline of the cut (the point where the two angles meet). The measurement must be exactly 1 3/4". If not, modify the Fence adjustment on the Set Up screen. If the centerline measured less than 1 3/4", **decrease** the Fence adjustment by the amount of difference (Ex: centerline measures 1 1/2"... Decrease the Fence adjustment by 0.250). **Lowering the Fence adjustment moves the centerline away from the fence, toward the operator. Raising the adjustment moves the centerline toward the fence, away from the operator.**
11) Repeat from step 9 until the centerline is exactly 1 3/4". Repeat the test at least three times to eliminate any possibility of error.

'30-150' Testing Guide

The '30-150' test is a cut sequence designed to show that the TCT WebSaw is calibrated correctly and cutting accurately. The saw is correctly calibrated if, and only if, the parts are cut identically. If the boards aren't equal, this section will help diagnose which area(s) of the WebSaw needs adjustment.

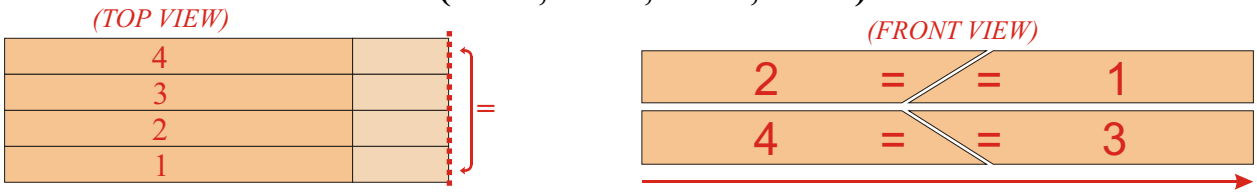
Testing the 30-150

You MUST use straight, high-quality lumber that is *exactly* 3 ½" wide for this test, or the results will not be valid! Use one stock board to cut all four parts. Cut a series of two 90-30 and two 90-150 boards, each one 18" long , as shown below. As each board is cut, mark its number and the direction it was cut as pictured below.



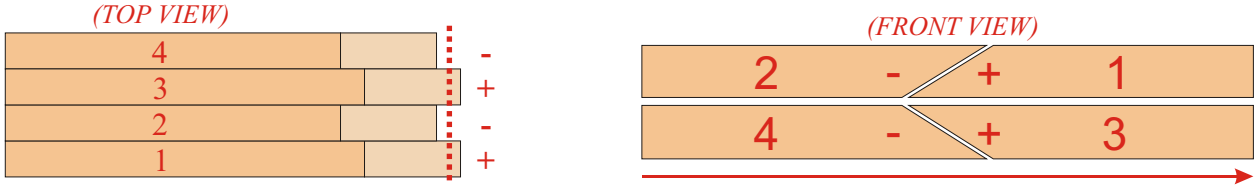
Now stack the boards vertically (as shown below) in the order they were cut (1, 2, 3, then 4) on a FLAT, CLEAN SURFACE. Compare the stack with the following scenarios to determine if any adjustment is needed or what adjustment needs to be made. (NOTE that the 30° and 150° angles must be correct, or the test will not be valid)

#1 (Same, Same, Same, Same)

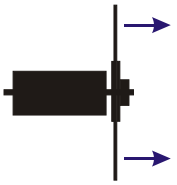


All parts are the same. The WebSaw is calibrated correctly; no adjustments are needed.

#2 (Long, Short, Long, Short)

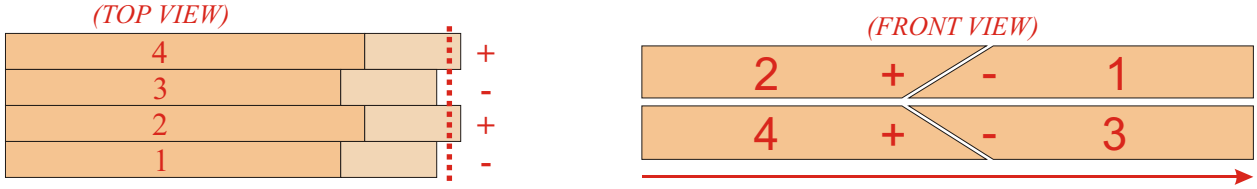


1 and 3 are long; 2 and 4 are short.

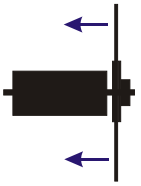


Resolution: Blade is too far to the left. Adjust the blade motor to the right, half the amount of difference between the boards.

#3 (Short, Long, Short, Long)

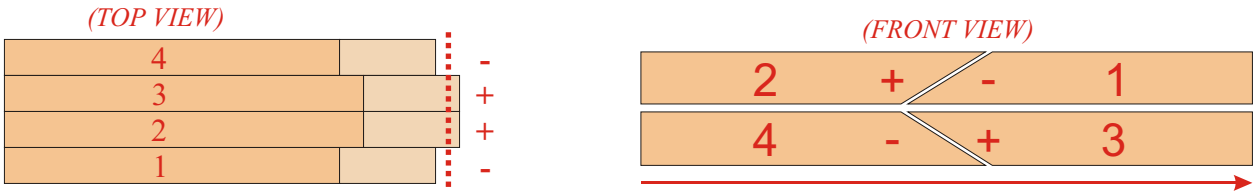


1 and 3 are short; 2 and 4 are long.



Resolution: Blade is too far to the right. Adjust the blade motor to the left, half the amount of difference between the boards.

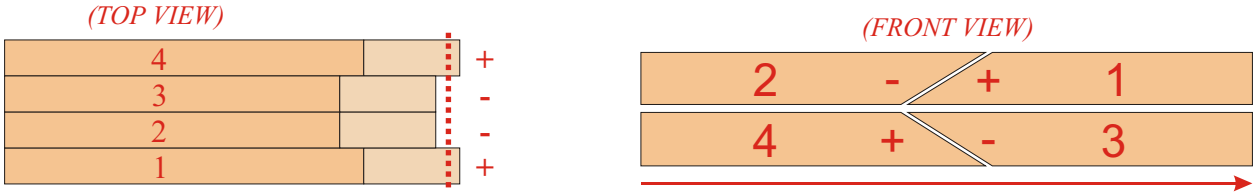
#4 (Short, Long, Long, Short)



1 and 4 are long; 2 and 3 are short.

Resolution: Fence is too far towards the front of the WebSaw. Perform the Centerline Calibration test to determine how far to move the fence.

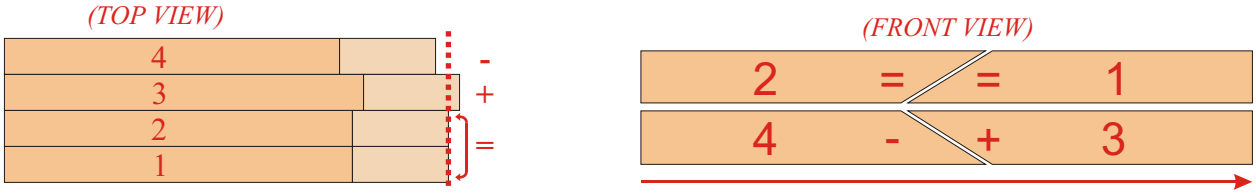
#5 (Long, Short, Short, Long)



1 and 4 are short; 2 and 3 are long.

Resolution: Fence is too far away from the front of the WebSaw. Perform the Centerline Calibration test to determine how far to move the fence.

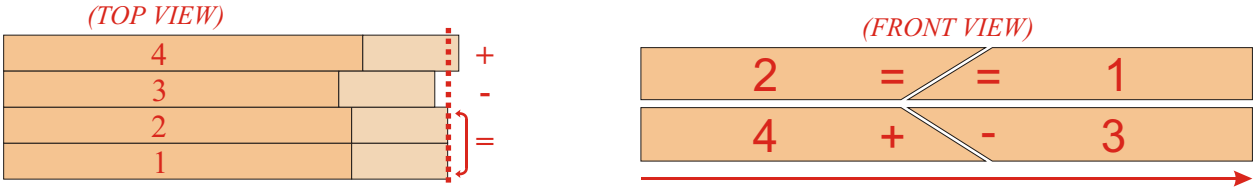
#6 (Same, Same, Long, Short)



1 and 2 are equal; 3 is long and 4 is short.

Resolution: This is a combination of Scenario #5 (the fence is too far away from the front of the WebSaw), and Scenario #2 (the blade is too far to the left). Perform the Centerline Calibration test to determine how far to move the fence, repeat the 30-150 test, then adjust the blade motor the correct amount.

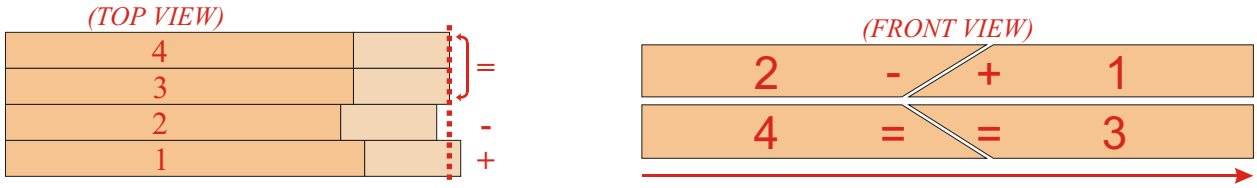
#7 (Same, Same, Short, Long)



1 and 2 are equal; 3 is short and 4 is long.

Resolution: This is a combination of Scenario #4 (the fence is too far toward the front of the WebSaw), and Scenario #3 (the blade is too far to the right). Perform the Centerline Calibration test to determine how far to move the fence, repeat the 30-150 test, then adjust the blade motor the correct amount.

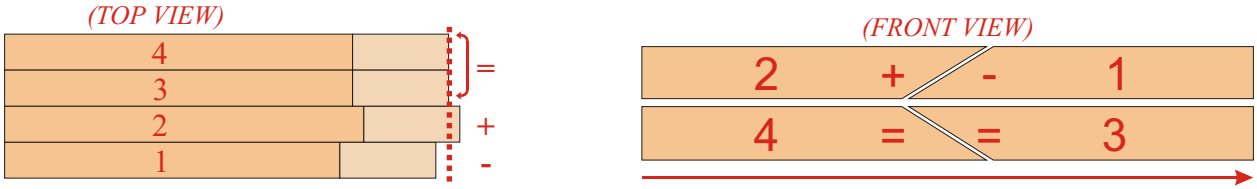
#8 (Long, Short, Same, Same)



1 is long and 2 is short; 3 and 4 are equal

Resolution: This is a combination of Scenario #4 (the fence is too far toward the front of the WebSaw), and Scenario #2 (the blade is too far to the left). Perform the Centerline Calibration test to determine how far to move the fence, repeat the 30-150 test, then adjust the blade motor the correct amount.

#9 (Short, Long, Same, Same)



1 is short and 2 is long; 3 and 4 are equal

Resolution: This is a combination of Scenario #5 (the fence is too far toward the front of the WebSaw), and Scenario #3 (the blade is too far to the right). Perform the Centerline Calibration test to determine how far to move the fence, repeat the 30-150 test, then adjust the blade motor the correct amount.

Chord Calibration (Model 1200)

1) Use the Manual Cut screen *(see pg. 2.12)* to design a bottom chord with the following configuration:
   Two angles on front end: 90.0 and 26.6, Front Bottom of Heel: 0.5000
   Two angles on back end: 153.4 and 90.0; Back Bottom of Heel: 0.5000
   Length: at least 12-0-0; Width: 2x4; Quantity: 3
   Cut at least three of these and use the average of the results.
2) Measure the angle of the scarf cuts with a large, accurate framing square. Both front and back scarf cuts should be 6/12 pitch.
3) If the angle is less than or greater than 6/12, make a small adjustment (less than 0.50° at a time) to the 90 Adj value on the Main screen (below the blade-angle indicator). If the front angle is less than 6/12 pitch, increase the 90 Adj value. If the front angle is greater than 6/12 pitch, decrease the 90 Adj value. DO NOT make large adjustments to this value.
4) Quit the software (QUIT button in the upper-right of the screen), and re-open it. Cut the test chord from above again three times and verify their angle accuracy. Repeat Steps 3 & 4 if necessary.
5) Measure the heel heights of the last test chords. If the heel heights average within 1/16" of what they should be (in this case, 1/2"), no further adjustment is necessary.
6) If both front and back heel heights average smaller than 7/16", decrease the Fence adjustment on the Set Up screen *(see pg. 1.8)* by 0.062. If both heel heights average larger than 9/16", increase the Fence adjustment by 0.062.
7) Cut the test chords once again and check the heel heights. Repeat Steps 5-7 until heel heights are within 1/16" of perfect.

If the front and back heel heights consistently differ from each-other, you may need to make a slight fence adjustment.

8) If the back heel is smaller than the front heel, adjust the outer Outfeed fence stud nuts 1/2 turn or less clockwise to move that end of the fence toward you, and tighten the nuts down again. If the back heel is larger, adjust the fence stud nuts 1/2 turn or less counter-clockwise, and tighten them again.
9) Cut the test chords again, and check their accuracy Repeat Steps 8 & 9 no more than twice. If the results are not satisfactory then **check the mechanics of the saw,** and **restart calibration from the beginning**.