

The Next Generation of the Industry's Leading Linear Saw

Building on reliability and accuracy, the latest version of the linear saw is engineered to meet the demands of today's component manufacturers. The **Alpine ALS 5.0** offers the potential for significant increases in production throughput with overall speed enhancements and optimized workflow.

This is not only an operation manual, but a tool that can be utilized to gain the maximum potential from your **ALS 5.0** linear saw. Each plant runs differently and the **ALS 5.0** stands up to the challenge — providing ultimate flexibility in setup and operation.



IMPORTANT! DO NOT DESTROY!

It is the customer's responsibility to have employees read and understand this manual.
Read Instructions completely before using the equipment.

ALS 5.0

Product Manual

Read the following safety information before using this equipment:

In this installation guide, the words **WARNING**, **CAUTION** and **NOTE** are used to emphasize important safety information as follows:

⚠ WARNING

Hazards or unsafe practices that could result in severe personal injury, death or substantial property damage.

⚠ CAUTION

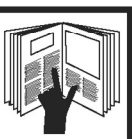
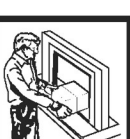
Hazards or unsafe practices that could result in minor personal injury, product or property damage.

NOTE

Important installation, operation or maintenance information.

⚠ WARNING

Read the following warnings before using this equipment.

 READ THE MANUAL Before operating equipment, read and understand all safety, operation and maintenance information provided in the operation manual.	 ELECTRICAL EQUIPMENT High voltage equipment is utilized. Arcing in areas of flammable or combustible materials may occur. Personnel are exposed to high voltage during operation and maintenance.	 WEAR SAFETY GLASSES Failure to wear safety glasses with side shields could result in serious eye injury or blindness.
 OPERATOR TRAINING All personnel must be trained before operating equipment.	Protection against inadvertent arcing that may cause a fire or explosion is lost if safety circuits are disabled during operation. Loose electrical connections could cause damage to components on your Alpine Equipment. Electrical shock can occur while working in the electrical cabinet.	 CLOTHING AND JEWELRY Loose clothing could be caught on moving machine parts. Jewelry, including rings, should never be worn when operating equipment.
 KNOW WHERE AND HOW TO SHUT OFF THE EQUIPMENT IN CASE OF AN EMERGENCY	 AUTOMATED EQUIPMENT With automatic equipment, the hazard of an unannounced startup is present.	 CUTTING EQUIPMENT Cutting hazards are present with Alpine Linear and Component Saws. Be aware of sharp equipment edges and spinning blades.
 INSPECT EQUIPMENT DAILY Broken or worn machine parts can cause damage to equipment.	 KEEP EQUIPMENT GUARDS IN PLACE Do not operate the equipment if the safety devices have been removed.	 ASSEMBLY EQUIPMENT Crush hazard is present with Alpine assembly systems. Failure to inspect safety systems could increase the probability of a crush hazard occurring.
 NEVER MODIFY EQUIPMENT Modification could damage equipment or cause it to operate improperly. Modified equipment could cause a safety risk to operators.	 DE-ENERGIZE, DEPRESSURIZE, DISCONNECT AND LOCK OUT ALL POWER SOURCES DURING MAINTENANCE Failure to de-energize, disconnect and lock out all power supplies before performing equipment maintenance could cause serious injury or death.	 PINCH POINTS Moving equipment, sliding doors and clamping devices can cause pinch points for operators and maintenance staff.
 EQUIPMENT MISUSE HAZARD Equipment misuse can cause the equipment to rupture, malfunction, or start unexpectedly and result in serious injury.		 HOT SURFACE HAZARD Contact may cause burns. Allow to cool before servicing.

For more information, see Alpine Manual M1002—"Equipment Safety Precautions". Additional copies of the safety procedures can be ordered by calling 800-521-9790.

IT IS THE RESPONSIBILITY OF THE EMPLOYER TO PROVIDE THIS INFORMATION TO THE OPERATOR OF THE EQUIPMENT. ADDITIONAL COPIES ARE AVAILABLE, CALL ALPINE EQUIPMENT CUSTOMER SERVICE: 800-521-9790.

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1 GENERAL INFORMATION

1.1 BASICS

1.1.1 E-Stop Locations

There are three E-stops for the saw system. One is located on the HMI, another on the saw cabinet, and the final is located on the stabilizer on the infeed assembly.

1.1.2 E-Stop Recovery

When the machine suffers an Emergency Stop, the recovery process is to clear the cause for the E-Stop, make sure the E-Stop has been released, and then press the "Power Reset" button on the front of the saw cabinet.

1.1.3 Power Reset

The indicator light on the HMI that shows the power state of the saw will not turn green until the saw program has been opened on the computer. Merely powering on the cabinet will no longer cause the light to engage.

1.1.4 Shutting Down the System

When shutting down the saw and computer, ALWAYS remember to power down the computer in the HMI fully before turning the main disconnect on the saw cabinet to the 'OFF' position. Failure to do so risks damaging the computers and saw.

1.1.5 Saw Cabinet Door

The door of the saw cabinet is linked to the safety devices of the saw. The key and sensor on the cabinet door determines the state of the door and if it can be opened. This device must receive 24V to unlock the cabinet door. This means once the saw is fully powered down, the door cannot be opened. If you need to access the internal components of the cabinet, be sure to open the door before turning off the main disconnect. The cabinet door also cannot be opened while the saw blade is in motion.

1.1.6 Blade Fault

When the saw blade encounters an error that causes a fault with the Servo Blade Motor, an error code will appear on the servo motor screen. To clear this error and resume running, the "Saw Blade Reset" button on the right side of the saw cabinet must be pressed for 10-15 seconds.

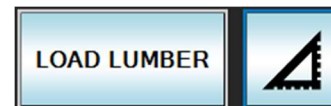
1.1.7 Software Limits

Software limits are a set of digital parameters the axes will not stray from and protect the saw from damage and crashes. If the axes do leave the allowed range, disabling the limits may be necessary to move the axis to an acceptable value. Software limits should only be disabled for troubleshooting purposes and certain maintenance. Limits should always be reenabled at the earliest opportunity. Failure to do so has the potential to damage the assemblies and saw as a whole.

1.1.8 Interactable Areas

Areas within the program that can be interacted with are designated as buttons, hyperlinks, toggles, dropdowns, and text boxes. If one of these buttons appears to be 'Greyed-Out' then the function is currently unavailable. It may be locked behind permissions or deactivated due to network limitations.

- ◆ **Buttons**-Contains either text or an image.



- ◆ **Hyperlinks**-[Blue Text](#) opening other windows.



- ◆ **Text Boxes**-Areas for users to input data.

600
1400
600
600

- ◆ **Toggles**-Chooses between mutually exclusive states.

☐ Open	☒ Closed
----------------------------	---

- ◆ **Dropdown Box**- Contains predetermined values to be chosen by user.

Semi Auto
Manual
Semi Auto
Ranger

- ◆ **Greyed Out**-Indicates when a value can no longer be actively changed by user.

Details	ACTIVE
Limits	INACTIVE -0.25, 8.8
Speed	15 %, 100 %
Errors	ACTIVE
Position	
Calibration	0
Home	INACTIVE 0
Current	0
Cycles	ACTIVE 0
Temperatures	

FRONT MIN	ACTIVE	1-2-0
FRONT MAX		1-8-0
FRONT MIN	INACTIVE	1-2-0
FRONT MAX		1-8-0

1.1.9 User Interface Screen

The user interface screen is used often for inputting data throughout the program. Most often it is used for measurements, and these measurements can be input in three different formats.

- ◆ Feet – Inch – 1/16th of an inch.
- ◆ Decimal Foot
- ◆ Decimal Inch

Once a value with a decimal has been selected, a toggle will appear to designate Dec. IN or Dec. Ft

FIGURE 1 USER INTERFACE SCREEN

1.1.10 Measurements

A few things to remember when taking piece measurements are

- ◆ Make sure to use the same tape/framing square every time to eliminate any variance between different tools.
- ◆ Always measure from either the back or the bottom of the pieces. These sides are held by the clamp and pusher assemblies during cutting process and will give the most accurate measurement especially with lumber variation.

1.1.11 Dead Reckoning Inventory System

(Standard Pieces)

This is a simple, common-sense system for making sure that the Standard Piece function produces enough, but not too much, of the pieces you need. Let's look at a sample Standard Piece List:

Standard Pieces Maintenance Screen				
Active	Size	Piece Image	Priority Order	
☒	2x4	Qty: 99 Cut: 0 Length: 3-0-0	1	
☒	2x4	Qty: 99 Cut: 0 Length: 2-4-4	2	
☒	2x4	Qty: 99 Cut: 0 Length: 2-4-4	3	
☐	2x4	Qty: 99 Cut: 0 Length: 2-8-11	4	
☒	2x4	Qty: 99 Cut: 0 Length: 2-0-0	5	
☒	2x4	Qty: 99 Cut: 0 Length: 0-11-0	6	

FIGURE 2 DEAD RECKONING STANDARD PIECES

There are two controls that are used in the Dead Reckoning Inventory Control System, and both are

on this list.

1. **Priority** – Note that the highest priority has been assigned to the longest pieces in the set. That way, these longer pieces will be cut as often as possible. Since they are the longest pieces, they would not be chosen as frequently if the shorter pieces had a higher priority.
2. **Active** – Also note that one of the pieces (4) is unchecked on the active column. If that box is unchecked, that piece will not be cut.

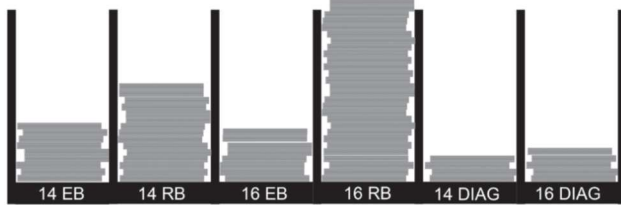


FIGURE 3 STANDARD PIECES BIN SORTING

The "Standard Piece List" example would need six bins (refer to the diagram above) to store the Standard Pieces when they are cut by the ALS.

When you load a job into the ALS, it looks for any of these pieces. If they are present the saw will automatically mark them all as already cut, on the assumption you have enough staged to build the job. This is also only possible if you have the "Mark Standard Pieces Cut" function turned on.

Each time the assembly crew builds a job that needs some of these pieces, they go to these bins and get what they need. But if one of the bins is full, and you don't need any more of those pieces for a while, you clear the box under the 'Active' column on the standard pieces list. The Standard Pieces feature will

not cut any more of that piece until you check the active box. In the example above, the bin for 16RB is full. That's why the active box is unchecked on the Standard Piece List.

Conversely, let's say one of the bins is chronically low, like the 14DIAG and 16DIAG above. You can correct that situation by setting the priority for that piece higher. That's why these pieces are priority 1 and 2 on the example of the Standard Piece List. If that fails to cut enough of those pieces to keep the assembly line supplied, it probably means that the piece is not a good candidate for the Standard Piece feature. Remove it from the Standard Piece list, and the ALS program will cut it with every job when called for.

You can make changes to the priority or active at any time and as often as necessary. There will be a period of "tuning" the process to find the combination that works best for your operation. After that, frequent changes will probably not be necessary.

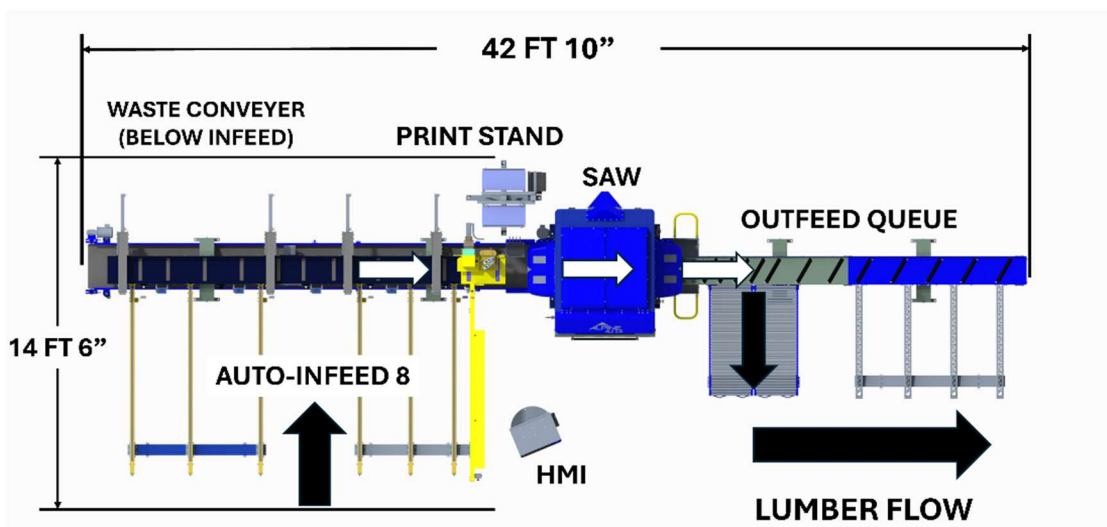
Using this simple Dead Reckoning Inventory system, you will be able to keep an adequate supply of Standard Pieces, but you won't have to maintain a detailed inventory management system. Just keep an eye on the Standard Piece bins and make some adjustments when necessary.

If you try to open StdPcs.trs as a job, all the pieces will be marked cut, and you will not be able to restore them very easily. If this ever happens go to the Standard Piece tab in options. Turn the "Mark Found Pieces Cut" toggle to off, go back to the StdPcs.TRS job file and use the "Restore Job" function to remove the pieces as marked cut.

1.2 EQUIPMENT SPECIFICATIONS

Equipment	Description	High Performance (H/HB)	Tolerance (If Applicable)
Saw Blade	Diameter	Custom 20.5"	N/A
Spindle Motor (S-axis)	Max RPM	2800 rpm	N/A
Infeed (L1-axis)	Max Speed	140 in/sec	±1/16in
Outfeed (L2-axis)	Max Speed	140 in/sec	±1/16in
Translate Cutting (L1-T1)	Max Speed	28 in/sec	
Angle (A-axis)	Travel	-0° to +270°	±0.1°
Bevel (B-axis) (optional)	Travel	5° (bevel) to 70° (very sharp bevel)	±0.1°
Traverse (T-axis)	Travel	-10" to +14" (0 at the back fence)	N/A
Vertical (Z-axis)	Travel/Stroke Max Speed	9.00in 13 in/sec	N/A
Human Machine Interface (HMI)	PC Monitor Communications	Industrial PC w/ Windows 10 Enterprise OS 22" Touchscreen flat panel Ethernet	N/A
Operating Temperature		41° F to 104°F	N/A
Humidity		10% - 95% non-condensing	N/A
Max Altitude		6500 ft	N/A
Shipping Weight		3500lbs	N/A
Foundation Requirements		≥4" thick	N/A
Power Requirements		480VAC 3PH,WYE, 60 Hz/FLA 55.35A @460VAC	N/A
Air Requirements		35 CFM @100 PSI	N/A

Footprint



ALS 5.0 HB Model shown with 8ft infeed, L-R Flow and Standard Outfeed, Waste conveyor on Left.

1.3 SERVICE REQUIREMENTS

1.3.1 Electrical

(THE USE OF A QUALIFIED ELECTRICIAN IS REQUIRED TO ENSURE THE FOLLOWING SERVICE SPECIFICATIONS ARE MET)

- Main Service
 - 480VAC, 80A, 3PH, 60HZ (50 Hz Optional)
 - Y-configuration preferred (delta acceptable)
 - Phase Voltage Imbalance – 6 V
 - $e(V_t) - \leq 50 \text{ Vsec} @ \leq 1 \text{ occurrence per half hour}$
- $V_t = V_i \times t$
- Where:
- V_t = Transient Voltage (Vsec)
- V_i = Instantaneous Voltage (V)
- T = time (sec)
- Secondary Service
 - 120VAC, 20A, 1PH, 60Hz (50Hz optional)
 - This must be a dedicated line
 - Line conditioner is recommended

1.3.2 Air

(INTRODUCTION OF OIL TO THE AIR SYSTEM WILL CAUSE DAMAGE TO SEALS.)

- Place coalescer immediately prior to machine to ensure dry, oil-free air.
- Machine has a factory installed filter with pressure regulator.
- The saw needs two separate $\frac{3}{4}$ in airlines.
- The main line needs a minimum of 110 PSI

1.4 CUT TYPES

- Chords
- Webs
- Scissor bottom chords.
- Wedges
- Sliders
- Single and double beveled ends (Only if the saw is equipped with optional bevel axis.)
- Ripped valley bottom chords (Only if the saw is equipped with optional bevel axis.)
- Floor truss webs (Only if the saw is equipped with optional bevel axis.)

1.5 SINGLE STACK CUTTING

Lumber sizes from 2x3 to 2x12

1.6 DOUBLE STACK CUTTING

Lumber sizes 2x4 and 2x6's only

1.7 PIECES

- **Minimum:** 1" (25mm) for all pieces with four angle cuts
- Maximum Recommended Scarf: 104 inches at 8°

1.8 PRINTING

- Prints standard print fields on top face of lumber, support of true type fonts and Unicode sets.
- Prints connector plate outlines, plate size and Jig Marking on top face of lumber with the upgraded print system.
 - Connector plate size of up to 6" in width on top face of lumber.
- Edge printing during double stack operations.
 - Prints standard print fields on side face of lumber
- Wall panel - stud marking on side face of lumber.

1.9 SMALL PARTS TRANSFER

Transfer of short pieces from 6" to 21" in length to the outfeed queue

1.10 PARTS LIST

Suggested Stocking Parts:

Description	Alpine #
L1/L2 LPS Emitter	40050
L1/L2 LPS Receiver	40049
Door Switch	38207
Door Switch Key	38208
Module E-Stop	25990
Lower Infeed LPS	40060
Upper Infeed LPS	42556
Printer LPS	40060
SMC Valves Solenoid	47027
50mm Linear Bearings	29987
Fence Bearings	34615
Roller Bed Rollers	34325
Clamp Rollers	29718
Pusher Cylinder	29761
Belt L1 & L2	29107
Blade Kit:	35127
Blade	
Screws (30-35 ft-lb = Torque Setting)	
Nyloc Nuts	
Torx Bit	

Motion Control Components:

Description	Alpine #
Servo Drive 3/12 amp (Used in T Axis)	37288
Servo Drive 6/18 amp (Used in A, B & L1P Axis)	41075
Servo Drive 10/30 amp (Used in L1, L2 & Z Axis)	41068
Servo Motor 1.78 amp (Used in T Axis)	41010
Servo Motor 3.91 amp w/o brake (Used in A & L1P Axis)	41009
Servo Motor (Used in B Axis)	40578
Servo Motor 3.91 amp w/ brake (Used in Z Axis)	41023
Servo Motor 7.69 amp (Used in L1 & L2)	41020
Blade Motor Drive (Mitsubishi)	41032
Blade Motor (Mitsubishi)	41027
Blade Motor Power Cable (Mitsubishi)	38471
Blade Motor Feedback Cable (Mitsubishi)	38472
Cable, Power, LXM 52 16.4ft (Used in T & Z Axis)	41037
Power Cable, LXM 52, 16.4 ft (Used in L1 & L2)	41039
Power Cable, LXM 52, 19.68ft (Used in A Axis)	41040
Power Cable, LXM 52, 22.96ft	41041
Power Cable, LXM 52, 32.80ft (Used in L1P Axis)	41043
Feedback Cable LXM52, 16.4 ft (Used in L1, L2, T, Z Axes)	39177
Feedback Cable LXM52, 19.68 ft (Used in A Axis)	41036
Feedback Cable LXM52, 22.96 ft (Used in B Axis)	37245
Feedback Cable LXM52, 32.8 ft (Used in L1P Axis)	41043

Quick reference:

Description	Alpine #
Computer	48001
SSD	48002
Belt – B1 & A1	28979
Small Parts VFD	41069
Safety sticker set	35194

All parts can be conveniently ordered from our website. Visit: **shop.alpineitw.com**

Or email your order to Order@alpineitw.com

2 GETTING TO KNOW THE ALS 5.0

2.1 SYSTEM OVERVIEW

The individual systems of the ALS 5.0 will be discussed in detail in subsequent sections. From start to finish, there is the Infeed, Cabinet, Outfeed, and Waste Conveyor. The infeed is where lumber is staged, and handles loading the lumber into the cabinet. The cabinet contains the components that perform the cutting of the lumber and eject the pieces onto the outfeed. The outfeed is where all but a few small pieces will end up staged for sorting. The waste conveyor handles the removal of all waste ejected from the cabinet.

2.2 AXES OF MOTION

L1P	Printer	Feeds lumber under the printer and into L1
L1	Infeed	Feeds lumber and measures length
L2	Outfeed	Coordinates with L1 to feed lumber and measure length, and eject pieces onto the outfeed
A	Angle	Sets the cut angle
B	Bevel	Sets the bevel angle (optional)
T	Traverse	Controls where the center point of angled cuts will be across the board.
Z	Vertical	Raises and lowers the blade
S	Blade Motor	Spins the saw blade (not shown, motor located inside enclosure)
SP1	Small Parts	Transfer short lumber pieces to the outfeed

Figure 4 gives a visual as to the direction of axis rotation.

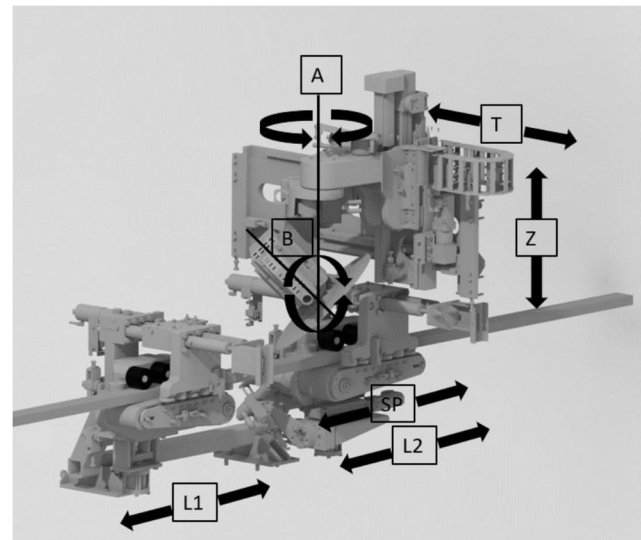


FIGURE 4 AXES OF MOTION

2.3 INFEEED ASSEMBLY

The infeed assembly is responsible for staging lumber and loading them into the saw cabinet. The live deck holds the lumber and moves it to the infeed conveyor. When the LPSS sensor detects lumber, the grippers extend, grab the lumber, and move it against the back fence. The L1P then takes the board and feeds it into the saw where the L1 assembly takes control of the board.

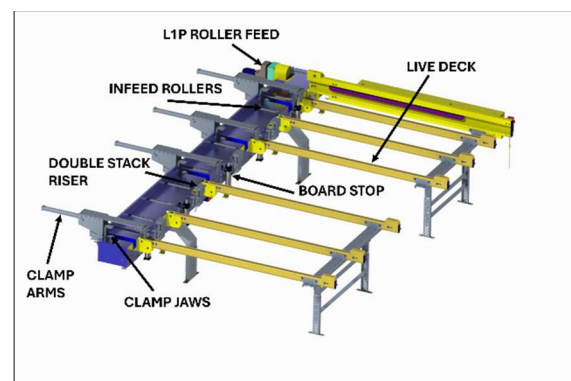


FIGURE 5 INFEEED ASSEMBLY

2.3.1 Live Deck

There are six strands on the infeed system, and they are referred to collectively as the live deck. This is

where lumber stock is staged to be loaded into the saw. The strands can be 8 or 16 feet long and have adjustable roller chains for moving the stock.

2.3.2 Stabilizer Assembly

The stabilizer assembly is the 'Wall' against which the end of the lumber is placed when loading the live deck. The stabilizer assembly contains sensors for lumber position as well as controls on the far end. One of the controls raises and lowers a set of rollers that hold the lumber in position while allowing it to move forward. This is helpful when shorter boards are in front of longer boards in the queue, as the longer boards will attempt to rotate around the shorter ones. The other controls are for the lumber stop, chains forward, chains reverse, chain stop, and an E-Stop is located here as well.

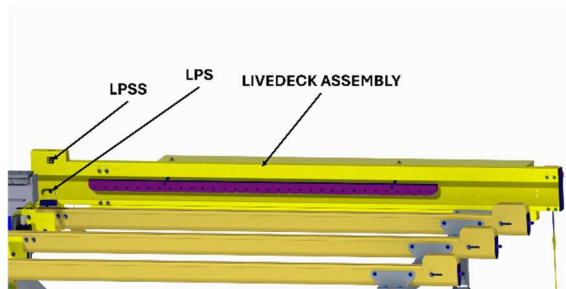


FIGURE 6 STABILIZER

2.3.3 Lumber Stops

There are a total of five board stop cylinders mounted on the ALS 5.0 infeed. These posts rise to create a stop against the lumber moving forward. Primarily used for loading the live deck fully before starting a job, as well as during double stacking functionality.

2.3.4 Double Stack Riser & Clamp

There are a total of five double stack riser cylinders, and four double stack clamps mounted on the ALS 5.0 infeed conveyor. These assemblies are only used for double stack functionality. Lumber stock moves against the lumber stops, triggering the sensor. The risers lift the stock to the clamps, which close and hold the lumber against the lumber stops. The risers then lower and the next stock piece is moved forward against the lumber stops. Once L1P LPS is clear then the grippers will come out and clamp onto the two boards. The lumber stops will come down

and the grippers will retract bringing the board up against the infeed.

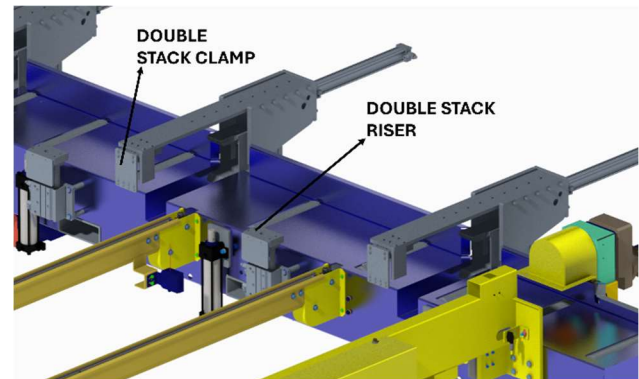


FIGURE 7 DOUBLE STACK RISERS

2.3.5 Gripper Assemblies

There are four gripper assemblies on the infeed conveyor, each containing two cylinders to aid in moving the lumber. These assemblies move forward when triggered by the Lumber Present Sensor Single. Once they have, the jaws of the grippers close on a board and then the grippers retract, pulling the board against the back fence of the infeed. Then the jaws open allowing the loading process to continue.



FIGURE 8 GRIPPER ASSEMBLY

2.3.6 L1P

The L1P engages the lumber stock before the grippers release it. The L1P roller then feeds the stock into the saw cabinet where the L1 assembly takes over movement.

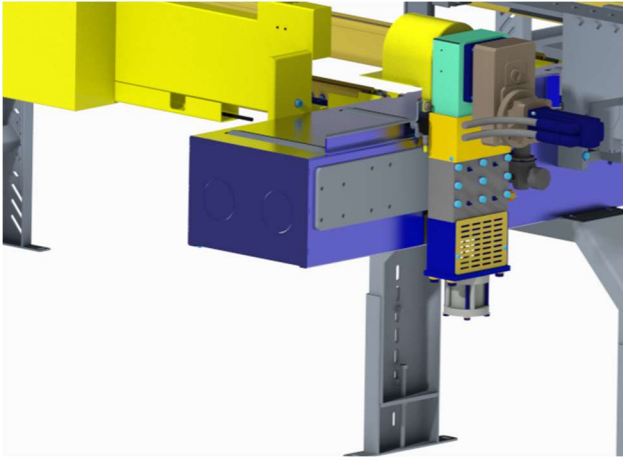


FIGURE 9 L1P ASSEMBLY

2.3.7 Printer

The print heads are located directly after the L1P wheel and apply the printed information to the lumber stock as it passes by on its way to L1. The printer can be raised for the allowance or double stacked lumber, and prints on both the top face and the edge of the lumber to allow both stocks to be printed on.

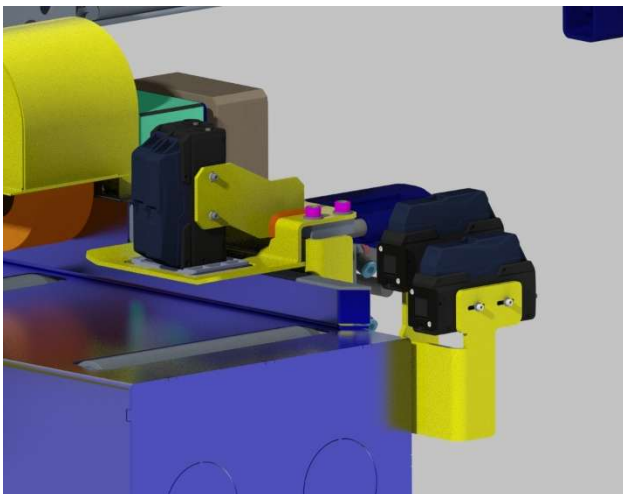


FIGURE 10 PRINTER

2.3.8 Sensors

There are three sensors on the Infeed assembly. They are the LPSS, LPSSD, and the L1 LPS.

Lumber Present Sensor Single (**LPSS**) - is located on the stabilizer and used for detecting when lumber is present at the point the grippers can engage and grab it.

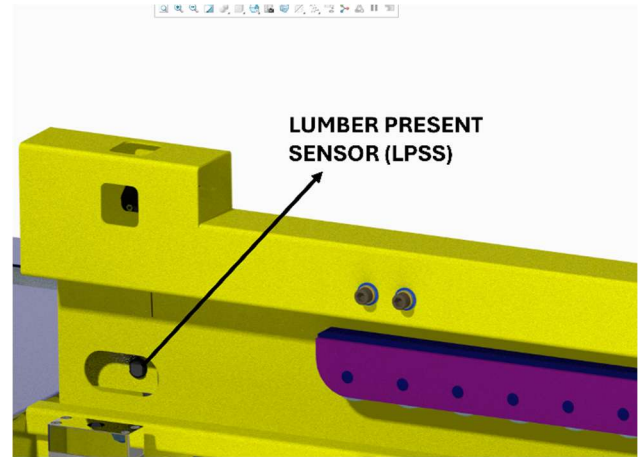


FIGURE 11 LPSS

Lumber Present Sensor Double (**LPSSD**) - is located above the LPSS and detects the top stock of lumber when two stocks are stacked vertically on top of each other for double stack functionality.

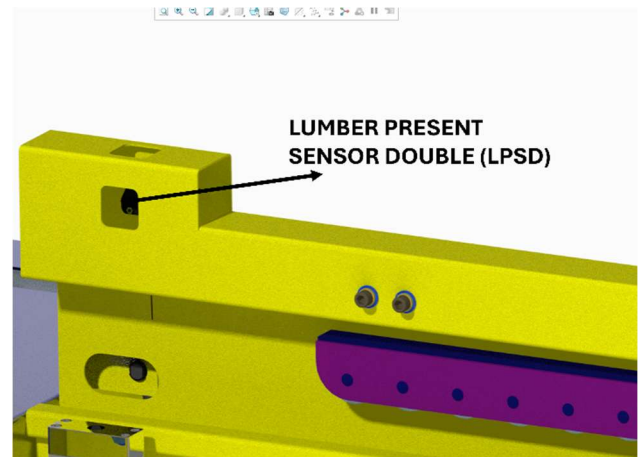


FIGURE 12 LPSSD

Print Trigger (**L1 LPS**) - Located near the L1P and used for determining when to engage the L1P for lumber feeding and printer timing.

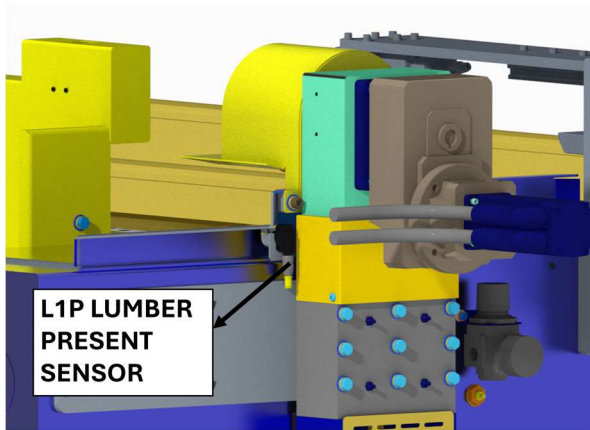


FIGURE 13 L1P LPS

2.4 OUTER SAW CABINET

2.4.1 Left Side of Cabinet

On the left side of the cabinet is the gearmotor for the sorting conveyor and the Vortec cooler, as well as two openings. The upper allows for boards to move in/out of the saw, while the lower is for waste or small parts ejection.

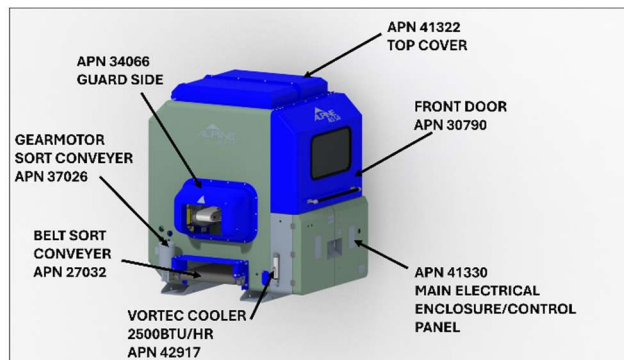


FIGURE 14 CABINET LEFT

2.4.2 Front of Cabinet

The front of the cabinet has two accessible sections, the internal components behind the front door at the top and the main electrical panel behind two double doors at the bottom. The electrical panel doors have the Power Reset and Main Disconnect on them.

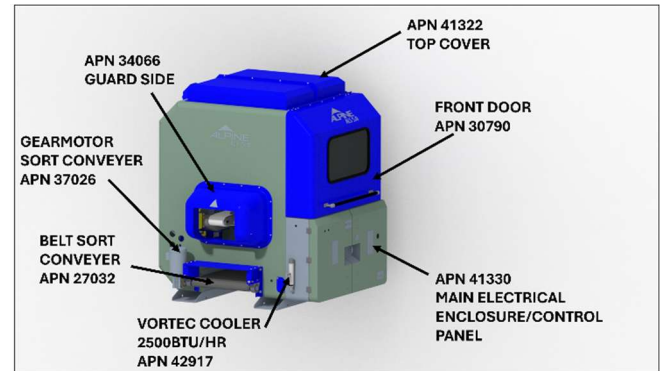


FIGURE 15 FRONT OF CABINET

2.4.3 Right Side of Cabinet

On the right side of the cabinet is the air regulator, air pressure safety device, and the Vortec cooler filter. These each need a dedicated airline. There is also the Blade Reset button, as well as two openings. The upper allows for boards to move in/out of the saw, while the lower is for waste or small parts ejection.

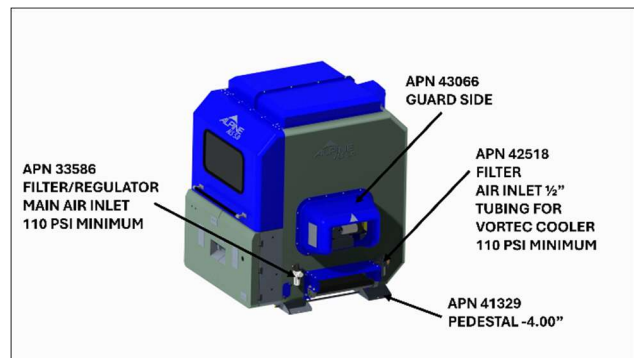


FIGURE 16 CABINET RIGHT

2.4.4 Back of Cabinet

The back of the cabinet contains grease ports and connections for a vacuum system.

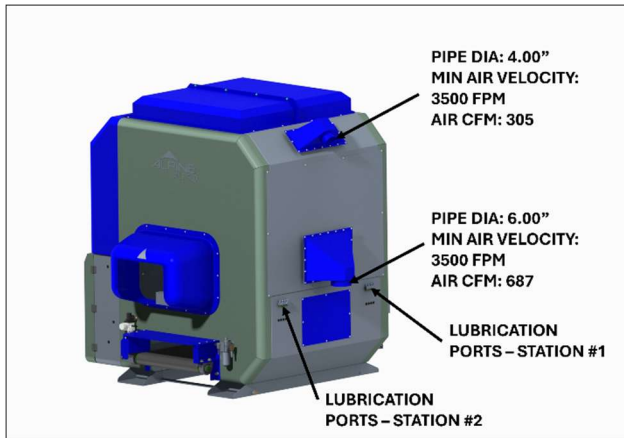


FIGURE 17 BACK OF CABINET

2.5 SAW CABINET ASSEMBLIES

2.5.1 L1 & L2 Assembly

The L1 assembly is near the opening that allows feeding of boards from the infeed. It is a mirror of the assembly which is on the opposite side and feeds pieces to the outfeed. The assemblies are comprised of a roller bed and belt, clamp, pusher, and sensors.

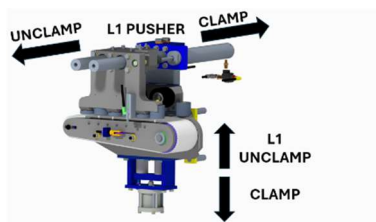


FIGURE 18 L1 ASSEMBLY

2.5.1.1 Roller Bed and Belt

The roller bed is comprised of seven rollers with the belt tensioned over them. This is what moves the lumber forwards and backwards and ensures that the lumber length is accurate by calculating revolutions to length.

2.5.1.2 Clamp

The clamp is a set of rollers that roll along the top face of the board. There is a pancake cylinder at the bottom of the assembly that engages to hold the board between the rollers and the belt. The pressure from this engagement ensures the accuracy of board movements.

2.5.1.3 Pusher

A set of bearings that push the board against the bearings on the back fence of the assembly. The bearings allow the board to move freely forward and backwards, while the pressure ensures the board does not move side to side.

2.5.1.4 Sensors

There are two IO-Link sensor sets in the ALS 5.0, and they are used to control the feeding and clamping of the lumber.

2.5.1.4.1 Edge Detect Sensor (EDS)

This is a set of through-beam sensors located in the L1 assembly. The receiver, shown on the left in the picture below, is embedded in the rollers of the L1 Pusher Assembly.

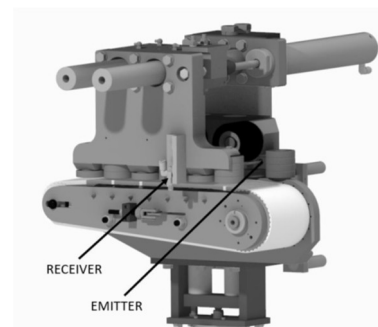


FIGURE 19 EDS

The emitter, on the right, is in the rollers of the back fence directly opposite the receiver. When lumber passes through the assembly, it breaks the LED beam between the emitter and receiver which signals to the program that the leading edge of the lumber has entered L1. The program then moves the board back until the beam is unbroken and thus determines where the edge of the board is. This allows for accurate movement of the board to ensure length measurements.

2.5.1.4.2 Lumber Present Sensor (LPS)

This is a set of through-beam sensors located in the L2 assembly. The lumber presence sensor detects the presence of lumber in the L2 drive. The beam and emitter are placed identically across L2 as they are on L1.

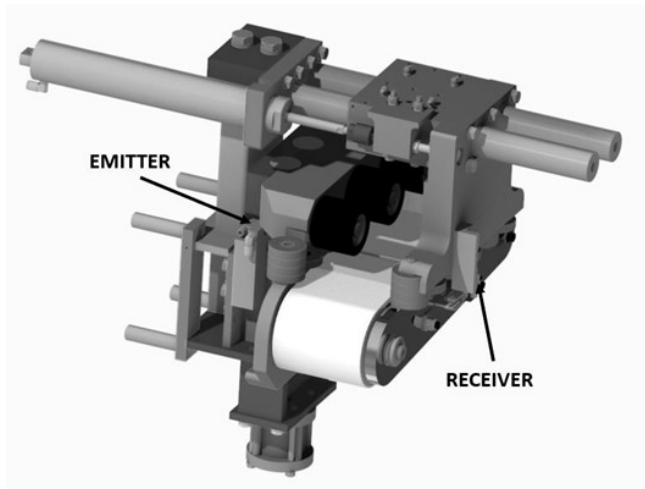


FIGURE 20 LPS

The sensors determine both when a board has entered the L2 assembly and when the board has left the assembly. If the sensor detects an obstruction there will be pauses before loading the next board, as the program attempts to eject the piece present in L2. If the sensor never detects the board as present, then the pusher assembly will not engage and hold the board.

2.5.2 Saw Head Assembly

This assembly consists of the T1, Z1, B1 (when applicable), and A1 axes, as well as the blade assembly.

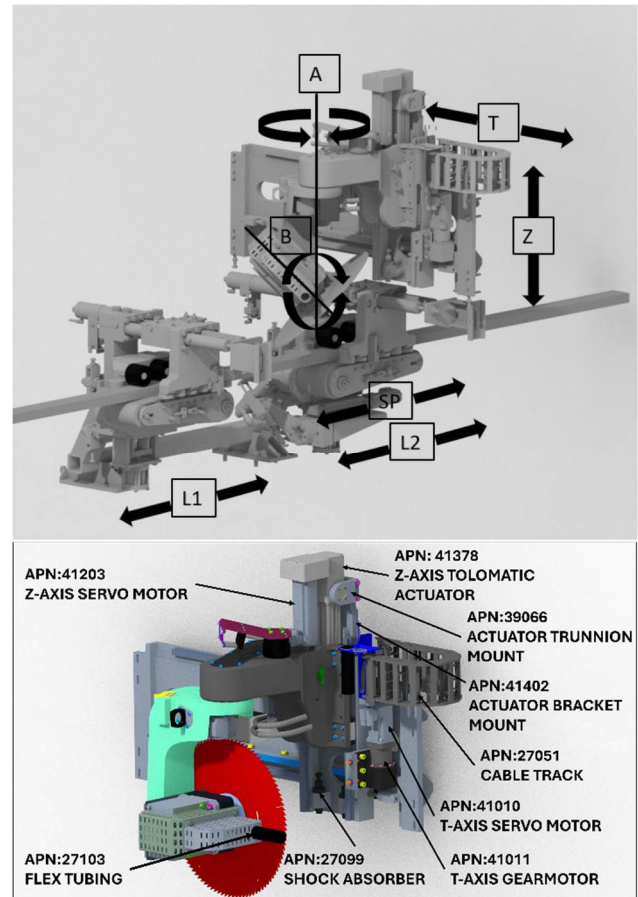


FIGURE 21 SAW HEAD ASSEMBLY

2.5.2.1 T1 Axis

Controls the 'Travel' of the assembly, forwards and backwards. Forwards moves towards the door of the saw and backwards moves towards the back of the cabinet.

2.5.2.2 Z1 Axis

Controls the 'Plunge' of the assembly, raising and lowering in regard to the lumber.

2.5.2.3 B1 Axis (Optional)

Controls the 'Bevel' of the blade, rotating it to allow for bevels and rip valleys.

2.5.2.4 A1 Axis

Controls the 'Angle' of the blade, spinning the blade to perform different angled cuts on the lumber.

2.5.2.5 Blade Assembly

The Blade assembly consists of the saw blade, motor, and mandrel mount.

2.5.3 Sorting Conveyor

The sorting conveyor is located at the bottom of the saw cabinet and is used to sort the pieces that fall to the bottom. Sawdust and waste material cut from the lumber will be ejected from the cabinet and onto the waste conveyor. Any small pieces that cannot be grabbed by the Small Parts Transfer Assembly will fall as well, and these will be ejected out of the opposite side of the cabinet into a bin for the small parts. The direction of "Waste" and "Small" parts all on dependent on which side of the cabinet is elected for the waste conveyor.

2.5.4 Small Parts Handler

The ALS 5.0 is equipped with a "Small Parts Handler" that is used to transfer short pieces onto the outfeed conveyor. The pieces range in length from a minimum of 6 inches to a maximum of 21 inches. The small parts transfer assembly will transfer the short pieces to the L2 assembly. They will then be ejected onto the same outfeed queue as other long pieces. This feature helps in sending all the cut pieces to the same outfeed location for easier sorting.

There are some limitations to the type of short pieces that could be transferred, most straight 90-90 short pieces that are in length from 6" to 21" can be transferred to the outfeed queue. Some angled cut pieces cannot be grabbed and will fall to the sort conveyor below.

The small parts handler is located under the L2 clamp. When the small parts transfer arm is not used during cutting operation, it will be parked in its home position with the pivot arm retracted and linear slide retracted as shown in Figure 22

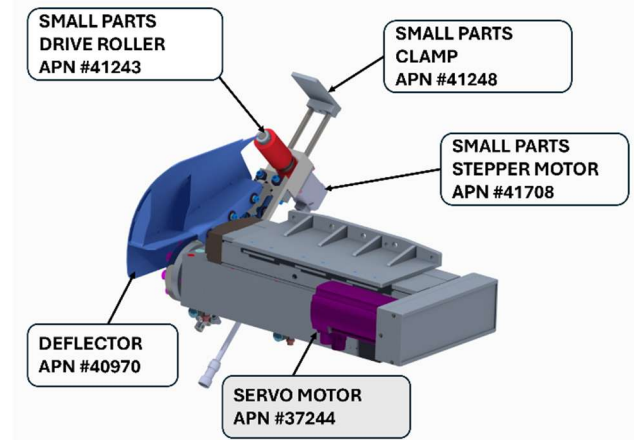


FIGURE 22 SMALL PARTS HANDLER

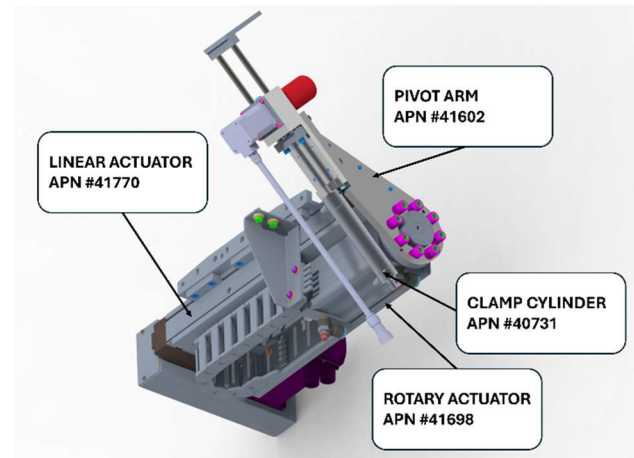


FIGURE 23 SMALL PARTS TRANSFER ASSEMBLY

2.6 OUTFEED ASSEMBLY

The outfeed conveyor is the staging area for cut pieces to be sent. It consists of the outfeed conveyor that has a series of rollers that are connected by a common belt and driven by an AC motor under the conveyor. The rollers are used to move the pieces away from the cabinet and towards the roller beds. There are two large roller beds for smaller pieces to go onto and four stabilizing arms with rollers for the larger pieces to lay across.

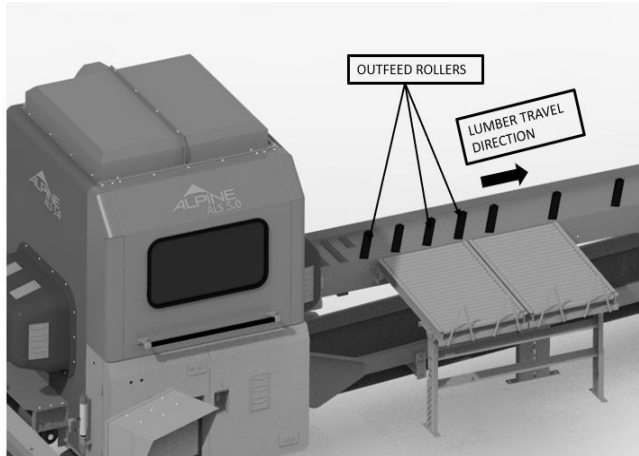


FIGURE 24 OUTFEED ASSEMBLY

2.7 WASTE CONVEYOR

Ejected waste goes onto the waste conveyor. It can be attached to either side of the saw, according to the customer preference. Waste comes from the sorting conveyor and is then moved to either a bin, or to an optional incline conveyor.

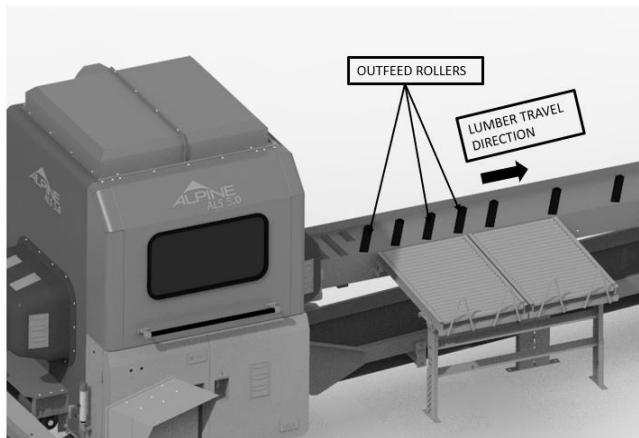


FIGURE 25 FILLER WASTE CONVEYOR

2.7.1 Incline Conveyor

The incline conveyor is an optional conveyor that raises ejected waste to a height that allows for the use of a larger waste bin. The incline conveyor's controls and power are linked to the "Waste Conveyor".

2.8 HMI

The HMI (Human Machine Interface) is where all major functions of the Saw can be controlled. It consists of a touchscreen, keyboard, mouse, and has a Power indicator light as well as a USB port and E-Stop.



FIGURE 26 HMI

2.8.1 Getting Data to the Saw

Cutting information must be in the format of TRS files. TRS v3.0 files are required to cut bevels on the HB model saw. H model saws can be operated using TRS v2.0 files as they are not equipped to cut bevels. All major truss engineering software can develop these files automatically. Contact the supplier for details. Alpine can supply the file specification if necessary.

2.8.2 Network

An ethernet cable runs from the computer in the back of the HMI through a sheath and into the main electrical cabinet on the saw. The saw can be connected to any network using Cat 5 Ethernet cable, routed into the cabinet. Alpine will not provide the equipment to connect the saw to a network connection by any other means (fiber-optic, wireless, etc.) Alpine recommends that the network cable be installed and connected by a network professional.

If TRS files are sent to the **ALS 5.0** over a network connection, it is mandatory that the saw computer have permission to "Write" to files on the network. This permission allows the program to write pieces and jobs as complete. If this is a problem for a

network administrator, have them contact Alpine Equipment Customer Service for more information.

It is also recommended that the saw computer has internet access. This will allow for remote access by Alpine for troubleshooting and diagnostic evaluation.

2.8.3 USB Device

Sometimes called 'jump drives' or 'thumb drives,' these devices are necessary if the saw is not connected to a network. The ALS 5.0 has a dustproof USB port mounted on the front panel of the operator's console for these devices, or any other USB device. The ALS 5.0 program communicates with these devices in the same manner as it would to a hard drive or network connection.

3 ALS 5.0 SOFTWARE

The ALS 5.0 software has multiple different screens for users to interface with. The home screen is the default screen that opens with the program. There are also Auto, Semi Auto, Cut Screens, Manual Controls, and System Option screens.

3.1 ALS 5.0 HOME SCREEN



FIGURE 27 HOME SCREEN

The top bar of the screen is present during most operations of the program. It allows navigation to other parts of the program without closing the currently opened screen. QUIT (12) is available from any screen, although Alpine recommends returning to "Home Screen" before closing the program.

3.1.1 AutoMode

Automatic saw operation mode. Data is read from the saw computer, USB drive, or network location (Refer to Section 3.2)

3.1.2 SemiMode

Semi-automatic saw operation mode. Allows operator entry for cutting data (Refer to Section 3.3).

3.1.3 Indicator Lights

These lights indicate various information about the saw. "System" will always be green, showing the program is running. Motion indicates that the saw is cleared for movement. Error shows if an error is present.

3.1.4 Sercos State

Shows the current state of the "Sercos System," the digital interface for communicating between controls, I/O, motion devices, etc. "Sercos State" should register as 4 for full communication across systems.

3.1.5 Remote Support

Opens the designated support program window for connecting remote users to assist with troubleshooting.

3.1.6 Tool Tips

Clicking this icon will show the name of the icons on that screen and what it does. Once clicked it will highlight in red showing it is active. When this button is active, all other icons will display their name. This icon needs to be de-activated for all other icons to do their function.

3.1.7 Alarm

If there are any errors triggered by the machine, the ALARM icon will flash RED to indicate that there is an error that is present and needs to be cleared before resuming saw operations.

3.1.8 E-Stop

E-Stop icon will flash red if there is an E-Stop condition is active

3.1.9 Infeed State

Shows the current state of the "Infeed System." Will read as none until cutting begins. Then it will show what step of the load lumber process the Infeed is currently in.

3.1.10 Manual Controls

Opens the Manual Screen and Axes Calibration menu (Refer to Section 3.5)

3.1.11 Options

Opens the Options Menu (Refer to Section 3.6)

3.1.12 Exit

Close/Shutdown the ALS 5.0 program.

3.2 AUTO SCREEN

Open the auto screen (Figure 28) to view jobs to be cut.

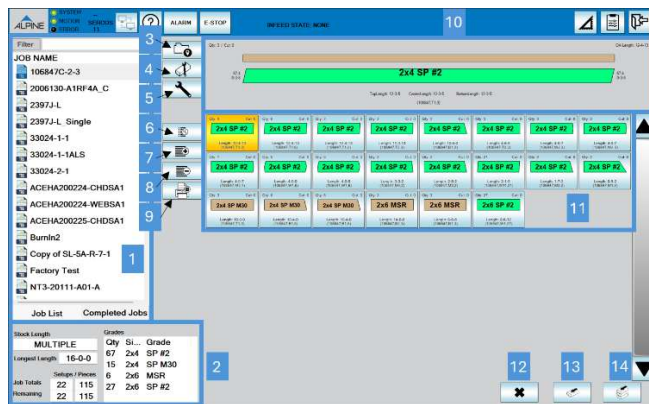


FIGURE 28 AUTO SCREEN

3.2.1 Job Select Menu

Indicates all the available TRS files within the Jobs directory. Selecting a JOB file in this area (1) will display all the PIECES that are contained within the JOB file as shown in area marked (11). Selecting the JOB File will also populate the "Inventory" panels to show the lumber necessary to complete the job.

3.2.2 Inventory

THE PROGRAM MUST FIND A SOLUTION IN THE LUMBER DEFINITIONS THAT EXACTLY MATCH THE DEFINITION OF THE PIECE TO BE CUT IN THE TRS FILE. IF IT IS UNABLE TO DO SO THE PIECE WILL BE SKIPPED. CURRENTLY, THE PROGRAM ALLOWS FOR A MAXIMUM OF 112 DIFFERENT COMBINATIONS OF LENGTH, GRADE, AND SIZE OF LUMBER.

- ◆ **STOCK LENGTH** – Selecting this box will open the pop up "Lumber Editor" Screen (Refer to Section 3.2.2.1) where inventory designation is made.
- ◆ **LONGEST LENGTH**- Shows the longest piece to be cut from the job. Aids in selecting lumber inventory.
- ◆ **JOB TOTAL** – The total number of setups and

pieces in the TRS file.

- ◆ **REMAINING**- The number of setups and pieces left before the job is completed.
- ◆ **GRADES**- The quantity, size, and grade of stock that will be required for the TRS file to be completed.

3.2.2.1 Lumber Editor

Opened by selecting the "Stock Length" option (Refer to Figure 29 Lumber Editor) this window allows the user to input all variations of their lumber inventory. The program will use this inventory to optimize the pieces to be cut into a configuration with the least amount wasted lumber.

The top row has different tabs where the user can designate different widths for sorting the lumber list.

When opening the "Lumber Editor" screen, any stock that is needed to perform the currently opened job will be highlighted for addition to the list.



FIGURE 29 LUMBER EDITOR

3.2.2.2 Lumber List

This shows all the lumber currently added to the list. The first column is used to designate the presence of the lumber, marked with a check for active, or an empty box to show the lumber is not present. The other columns show the size, grade, length, and designated material speed.

3.2.2.3 Add to List

Selecting this button opens another screen where stock can be added to the list. The user must input the width, length, and grade of the new stock. Material speed is also present on this screen, with the default being 100%.

3.2.2.4 Edit Inventory

Selecting this button opens a screen nearly identical to the “**Add to List**” button, except this is prepopulated by the currently highlighted inventory. This screen allows alterations to the selected stock.

3.2.2.5 Delete Inventory

Completely removes the selected stock from the inventory list. Recommend using the “Active” column to designate inventory availability instead, to avoid having to re-enter the stock in the future.

3.2.2.6 Close

Closes the window and reverts to the “Auto Screen”.

3.2.3 Change Job Path

Selecting button 3 allows the user to specify the computer path to the location where the jobs are stored. This path can be any location that is accessible from the saw computer such as the hard drive, USB, or a network drive.

3.2.4 Piece Utility

Allows the user to access the piece utility function which has options for altering the pieces within the job.



FIGURE 30 PIECE UTILITIES

- ◆ **MARK PIECE CUT** – Will mark the piece you have selected as completely cut. The label for the piece will turn red. On the top right corner of the piece's icon, is a cut count. This will match the quantity when marked as cut. The next piece in line will then be highlighted, and **-MARK CUT-** can be repeatedly selected to continue marking in a line down the piece list.
- ◆ **RESTORE PIECE** – Removes any stored cut information for the selected piece restoring it to uncut status and quantity. The previous piece in line will then be highlighted, and

“Restore Piece” can be selected repeatedly to remove cut information up the piece list.

- ◆ **RESTORE PARTIAL PIECES** – Restores only the desired amount of the piece back to uncut status.
- ◆ **CHANGE PIECE QUANTITY** – Allows user to change the quantity of the selected piece. Selecting this option will cause the screen below to open. If the selected piece is used in more than one location, the user will need to choose the designation to change. When that is done, a screen will appear that will allow you to set the quantity for that piece to whatever you need.

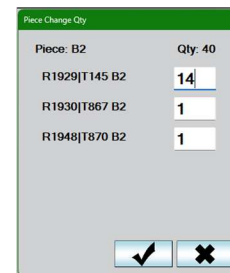


FIGURE 31 PIECE CHANGE QTY

- ◆ **ADD TO STANDARD PIECES** – Will automatically add the selected piece to the list of standard pieces. (Refer to Section 3.6.10)
- ◆ **PRINT LABELS** – If the ALS 5.0 is equipped with a Label Printer, the user can print identification labels for the pieces.
- ◆ **Undo Skip**- When the program opens the TRS file, it will scan the job for any pieces the saw cannot cut. A window will appear asking if the user would like to skip those pieces, and selecting this button will negate that ‘skip’ decision.
- ◆ **CANCEL** – Will cancel out of this screen and leave all cut data intact.

3.2.5 Job Utility

Allows the user to access the job utility function which has options for altering the job.

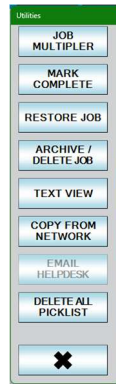


FIGURE 32 JOB UTILITIES

- ◆ **JOB MULTIPLIER** - Allow users to input multiples of the selected Job to be run. Click or touch on this icon will bring this screen up where the user can input the value.

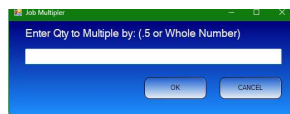


FIGURE 33 JOB MULTIPLIER

- ◆ **MARK COMPLETE** - Selecting the job and then "MARK COMPLETE" will cause all the piece labels contained within that job to turn **RED** and set their cut count to match the quantity. Additionally, this will trigger the "End of Job" option as well. (Refer to Section 3.6.3.3)
- ◆ **RESTORE JOB** - Allows users to restore the job to uncut conditions. The piece labels in the job will return to a **CYAN** background to indicate that they have been restored.
- ◆ **ARCHIVE/DELETE JOB** - Allow users to save the selected job in the designated file location or alternatively delete it from the job list. (Refer to Section 3.6.3)
- ◆ **TEXT VIEW** - Selecting this icon will bring up a screen that will display all the data about the piece contained in the TRS file. The user can cycle through all the pieces within the JOB.

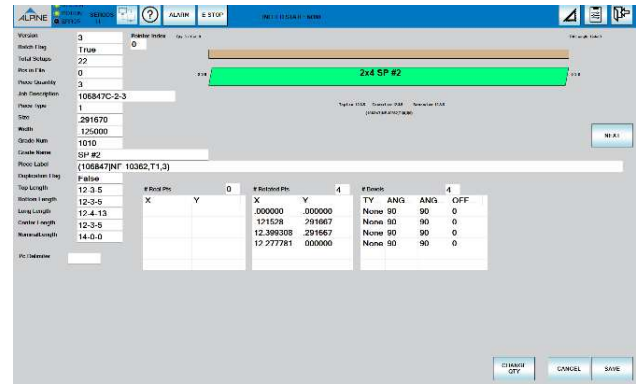


FIGURE 34 TEXT VIEW

- ◆ **COPY FROM NETWORK** - Copies job files from the Network Path to the Job Directory.
- ◆ **EMAIL HELPDESK** - Allows users to send information to Alpine Help desk for review and customer support.
- ◆ **DELETE ALL PICKLIST** - Click or touch on this icon will delete all picklist created from the TRS job files.

3.2.6 Graphical View

(ONLY PRESENT AFTER SELECTING CREATE PICK LIST)

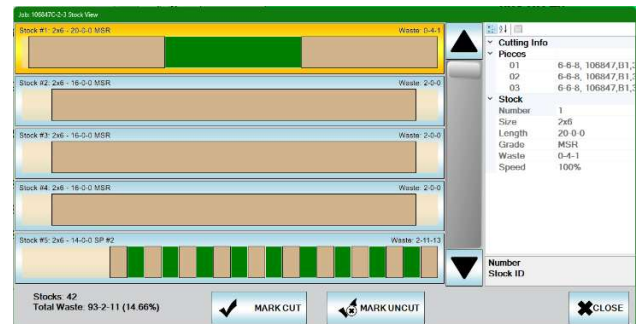


FIGURE 35 GRAPHICAL VIEW

Shows the user how the pieces will be configured on each piece of stock, as well as how much waste will be left on each piece of stock. Also allows the marking of cut and uncut by the stock, instead of pieces. Screen to the right also shows any pertinent information of the selected stock. The pieces are numbered in cut order with their overall length and piece number. The size, length, and grade of the stock can be seen here, as well as the amount of waste generated and the speed at which the stock is to be cut.

3.2.7 Create Pick List

Selecting **-Create a Pick List-** will have the program compile a cut order for the current job based off the optimization options selected. Then the program will generate the pick list containing all the stock in the order it needs to be cut.

You can create the pick list at the saw in regular operating mode or in the office in "Office Mode." (Refer to Section 3.6.1.1) When using "Office Mode" be sure that all options and settings are identical to the options on the program linked to the saw. If there are discrepancies, there is a risk of creating a pick list in "Office Mode" that differs from the optimization that the saw will create.

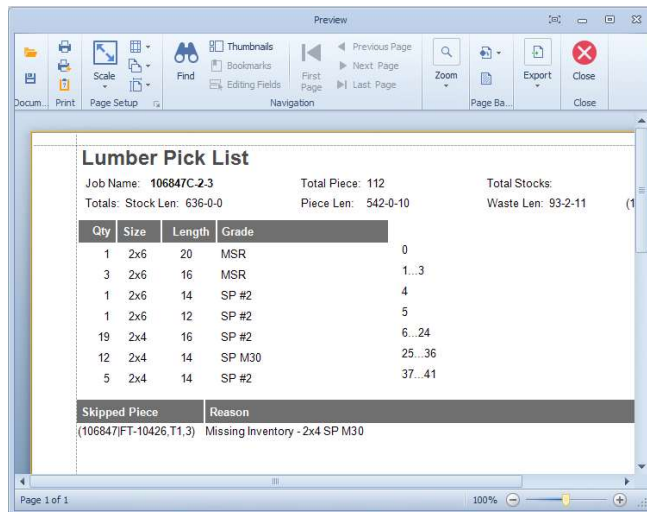
3.2.8 Delete Pick List

(ONLY PRESENT AFTER SELECTING CREATE PICK LIST)

Deletes the current pick list. Any options changed with a pick list open will ONLY affect the opened pick lists. All changes will revert to their previous states when the pick lists are closed. Alpine recommends always closing a pick list when it is no longer in use.

3.2.9 View/Print Pick List

(ONLY PRESENT AFTER SELECTING CREATE PICK LIST)



Qty	Size	Length	Grade	
1	2x6	20	MSR	0
3	2x6	16	MSR	1...3
1	2x6	14	SP #2	4
1	2x6	12	SP #2	5
19	2x4	16	SP #2	6...24
12	2x4	14	SP M30	25...36
5	2x4	14	SP #2	37...41

Skipped Piece	Reason
(106847)FT-10426.T1.3	Missing Inventory - 2x4 SP M30

FIGURE 36 PICK LIST

Opens the lumber list for viewing. All stock will be listed in the order it is going to be cut by the saw. Skipped pieces will also be marked as well as the reason that the program skipped the piece. The pick list can also be sent to the designated print system. (Refer to Section 3.6.4.3)

3.2.10 Piece Details

Selecting a piece **(11)** will display the details of the piece above the area. Quantity, length, angles, grade, and the piece identification are all listed.

3.2.11 Pieces Within Job

Shows all the pieces within the job. A visual of the shape of the pieces along with information regarding length, width, grade, and piece identification are present. Selecting a piece here will display additional information in the area above. **(10)**

3.2.12 Run Piece

Allows the user to cut the quantity of a single piece. Selecting **-Run Piece-** causes the cut screen to open, with the full quantity of the selected piece as the cut list. (Refer to Section 3.4)

3.2.13 Run All

Allows the user to run more the whole job. Selecting **-Run All-** causes the cut screen to open, with the full job as the cut list. (Refer to Section 3.4)

3.2.14 Close

Selecting this button closes the window and reverts to the "Home" screen.

3.3 SEMI AUTO

Open the semi auto screen **(Figure 37)** to manually design a piece to be cut.

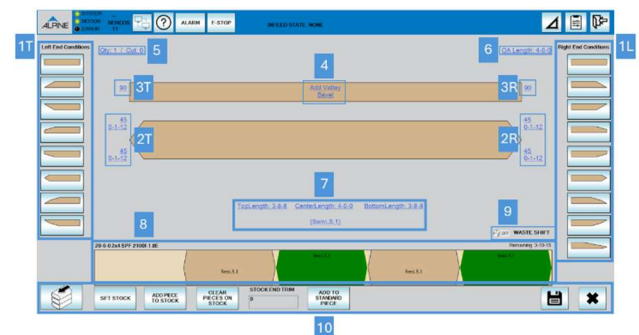


FIGURE 37 SEMI AUTO SCREEN

The first time this selection is made after opening the program the "Select Stock" screen will open

asking the user to select their desired lumber from the list. Highlight the correct stock from the list and select the **-Confirm-** button. This will close the screen and continue to the **-Semi Auto-** screen.

(This screen is identical the **-Lumber Editor-** screen, but without the ability to add, edit, or delete.)

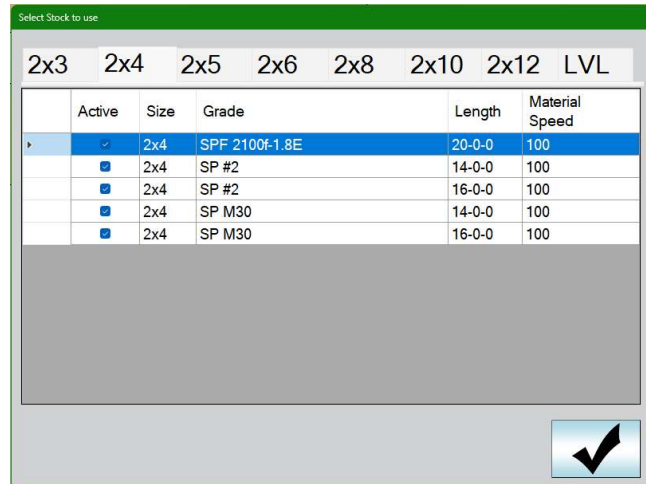


FIGURE 38 SELECT STOCK

3.3.1 End Conditions T & L

(T & L REFER TO TRAILING AND LEADING EDGES OF BOARDS)

Select the images that most closely match the desired ends of the piece. The panel on the left side **(1T)** controls the trailing end of the board. The panel on the right **(1L)** controls the leading edge of the board.

3.3.2 Miter Angle & Height Options T & L

(T & L REFER TO TRAILING AND LEADING EDGES OF BOARDS)

Select the current Height and Angle values, the **BLUE** text **(2T & 2L)**, to open the screen for adjustment **(Fig 27)**. Select inside the "Angle" box to open the user entry screen. Enter the desired value for the angle and select **-Confirm-** to accept.

The height box operates similarly. The height value will reflect either the overall height of the board, when selecting a 90° cut (changeable only by selecting different stock), or if a mitered cut is selected, it will display the centerline. Only the lower heights can be adjusted, and the upper heights will adjust to reflect changes. Enter the desired value for the height and select **-Confirm-** to accept.

Once all values are adjusted select the **-Confirm-** to accept the changes, or the **-Cancel-** to revert to original values.



FIGURE 39 ANGLE & HEIGHT

3.3.3 Bevel Angles T & L

Select the **BLUE** text **(3T & 3L)** to open the bevel adjustment window. Select the box beside the angle to change the current value.

Once all values are adjusted select the **-Confirm-** to accept the changes, or the **-Cancel-** to revert to original values.



FIGURE 40 BEVEL SELECTION

3.3.4 Add Valley Bevel

Select the **BLUE** text "Add Valley Bevel" **(4)**. This type of cut is also often referred to as RIP VALLEY CUTS. The image of the stock will update dynamically to show the valley bevel on the lumber by turning the affected area either **ORANGE** (Front Face) or **GREEN** (Back Face).



FIGURE 41 BEVEL FOR BOTTOM RIP CUT

3.3.5 Quantity

Select the **BLUE** text "QTY" **(5)** to open the user input screen and select the number of pieces to be added to the stock with this configuration. **(Refer to Section 3.3.8)**

3.4 CUT SCREEN

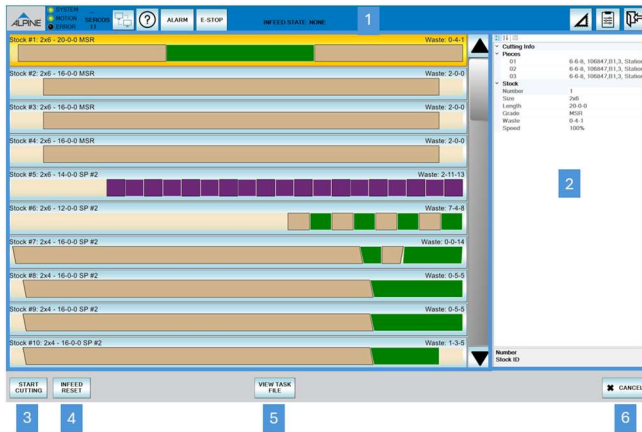


FIGURE 45 CUT SCREEN

3.4.1 Graphic Stock List

The stocks and pieces to be cut are all laid out in cut order here. The stocks are numbered and their information shown above the stock to the far left. The waste remaining on each stock is listed above it and to the right. Each stock has an image of the pieces to be cut out of it placed over it.

3.4.2 Information Screen

This screen shows the name of the pieces to be cut from the selected stock and the order they will be cut. The length and piece name are also visible here. Below the piece information is the stock information, showing width, length, grade, as well as waste and cutting speed.

3.4.3 Start Cutting

This selection will cause the program to begin cutting. The infeed will begin loading lumber into the saw.

3.4.4 Infeed Reset

Resets the state of the infeed.

3.4.5 View Task File

Opens the task file with information regarding the axes positions for each piece to be cut. Primarily used by Alpine Tech Support for aid in troubleshooting.

3.4.6 Cancel

Selecting this button closes the cut screen without sending lumber to the saw and reverts to the previous screen.

3.5 MANUAL CONTROL SCREEN

The primary purpose of this screen is to provide visual indication of the status of components on the ALS and give manual control of them. The Infeed Assembly, Saw Cabinet Assemblies, Outfeed Assembly, and Waste Conveyor can all be manipulated from this screen.

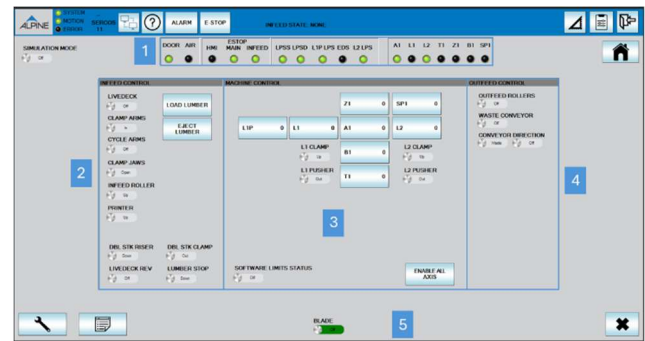


FIGURE 46 MANUAL CONTROL SCREEN

3.5.1 Indicator Lights

(Refer to Figure 34 (1))

Before we discuss manual controls, note the **GREEN** and **BLACK** indicator lights at the top of the screen.



FIGURE 47 INDICATOR LIGHTS

This array of indicator lights gives the status of all sensors, E-Stops and axes on the machine. **BLACK** light indicates off, **GREEN** light indicates on. This information is useful when diagnosing problems with the ALS. It is normal for these indicator lights to change during saw operations. If sensors act erratically or erroneously, check for any blockages, check for damage to sensor and cables, and replace damaged components if needed. Contact Alpine Customer Support if issues persist.

3.5.1.1 Door & Air Sensor

There are two Indicator Lights in this box. The door indicator light displays the status of the saw cabinet door. A **GREEN** light indicates the door is shut. When the door is open the indicator light will be **BLACK**. The air indicator light displays the status of the air pressure sensor. The normal system pressure ranges from 80-110 PSI. If the pressure falls outside of that range, the air pressure safety sensor will engage, and the indicator light will turn black to notify the user to check the air pressure at the regulator.

3.5.1.2 E-Stop Sensors

There are three indicator lights in this box. The saw system has three E-Stop buttons, one each located on the HMI, saw cabinet (Main) and on the stabilizer (Infeed). If the E-Stops are inactive the indicator lights will all be **GREEN**. Once an E-stop is activated, the corresponding E-Stop indicator light will turn **BLACK**, and the saw will be non-operational until the E-Stop is cleared and the "Power Reset" button is pressed.

3.5.1.3 Proximity Sensors

There are five proximity sensor indicator lights in this box. There are two sensors located on the infeed stabilizer, one on the infeed conveyor by the L1P, and two sets of sensors located in the saw. The indicator lights show whether the sensors are currently detecting an obstruction. **GREEN** indicates that the sensor is registering something being present, while **BLACK** indicates that the sensors are unobstructed. The operations of the infeed assembly sensors (Refer to Section 2.3.8) and the saw cabinet sensors (Refer to Section 2.5.1.4) are each described in previous sections.

3.5.1.4 Saw Axes States

There are seven axes indicator lights in this box. A **GREEN** indicator light means that the axis is active, and **BLACK** indicates that the axis is disabled.

3.5.2 Infeed Control

(Refer to Figure 34 (2))

This section consists of the manual controls for operating the functions of the infeed assembly.



FIGURE 48 INFEED CONTROL

3.5.2.1 Live Deck

Default position is "Off" and selecting the toggle will switch this to the "On" position. This will turn on the live deck motor and the chain will begin to move in the forward direction. This will begin to move any lumber towards the infeed conveyor. Selecting the toggle again will revert it to "Off" and the chains will stop.

3.5.2.2 Clamp Arms

Default position is "In" and selecting the toggle will switch this to the "Out" position. This will cause the four clamp arms to extend out towards the live deck. Selecting the toggle again will revert it to "In" and the arms will retract.

3.5.2.3 Cycle Arms

Default position is "Off" and selecting the toggle will switch this to the "On" position. This causes the four clamp arms to make repeated cycles of their "In" and "Out" positions. Selecting the toggle again will revert it to "Off" and the cycling will stop.

3.5.2.4 Clamp Jaws

Default position is "Open" and selecting the toggle will switch this to the "Closed" position. This will cause the four clamp jaws to close. Selecting the toggle again will revert it to "Open" and the jaws will reopen.

3.5.2.5 Infeed Roller

Default position is "Up" and selecting the toggle will switch this to the "Down" position. This will cause

the L1P roller to drop down. Selecting the toggle again will return it to "UP" and the L1P will lift.

3.5.2.6 Live Deck Rev

Default position is "OFF" and selecting the toggle will switch this to the "ON" position. This will turn on the live deck motor and the chain will begin to move in the reverse direction. This will begin to move any lumber away from the infeed conveyor. There are stops built into the strands to stop lumber from falling off the live deck. Selecting the toggle again will revert it to "OFF" and the chains will stop.

3.5.2.7 Double Stack Riser

Default position is "DOWN" and selecting the toggle will switch this to the "UP" position. This will cause all four riser blocks to rise. Selecting the toggle again will revert it to "DOWN" and the risers will lower back down.

3.5.2.8 Double Stack Clamp

Default position is "OUT" and selecting the toggle will switch this to the "IN" position. This will cause all four clamp plates to pull in. Selecting the toggle again will revert it to "OUT" and the clamp will move back out.

3.5.2.9 Lumber Stop

Default position is "DOWN" and selecting the toggle will switch this to the "UP" position. This will cause all five board stop cylinders to rise. Selecting the toggle again will revert it to "DOWN" and the cylinders will lower back down.

3.5.2.10 Load Lumber

Selecting this icon will begin the load lumber sequence, and the first board on the live deck will be placed into the L1 assembly and held by the clamp and pusher assemblies.

3.5.2.11 Eject Lumber

Selecting this icon will start the eject lumber sequence. Any lumber present in the saw will be ejected onto the outfeed conveyor.

3.5.3 Machine Controls

(Refer to Figure 34 (3))

This section contains the individual axes of the machine for control, as well as the manual controls for the L1 & L2 assemblies.

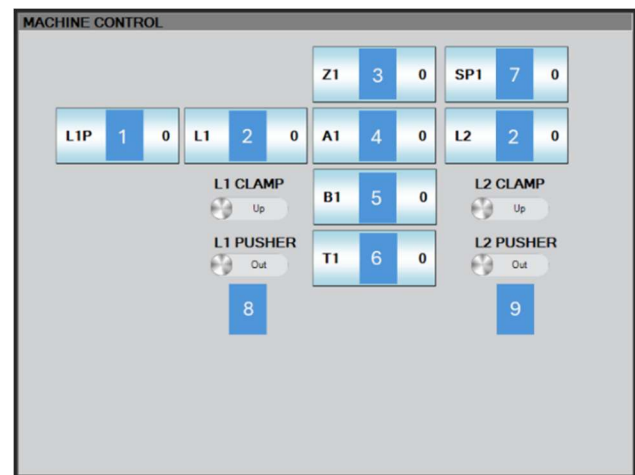


FIGURE 49 MACHINE CONTROL

3.5.3.1 L1P AXIS

This shows the current position of the L1P axis. Selecting this button will open the "L1P Manual Control" screen from which the user can manually control the L1P Axis.

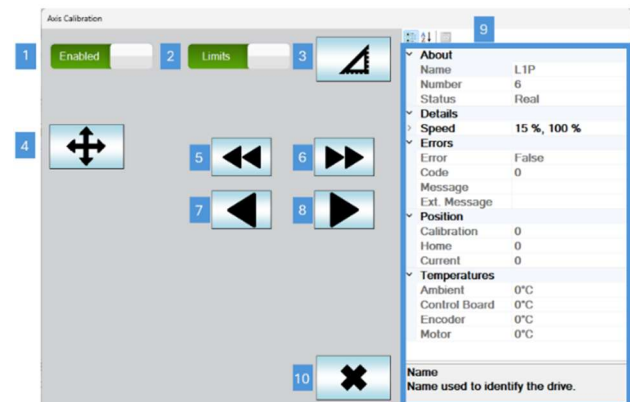


FIGURE 50 L1P CONTROLS

3.5.3.1.1 Enabled

Toggles the **Enable/Disable** state for the axis. A disabled axis will not respond to any commands.

3.5.3.1.2 Limits

Toggles the **Enable/Disable** software limits for the axis. Software limits protect the saw assemblies from crashing and causing damage. When moving axes with software limits off, it is recommended to choose the slower jogging options. Software limits should

only be disabled for troubleshooting purposes and certain maintenance processes. Limits should always be reenabled at the earliest opportunity.

3.5.3.1.3 Calibrate

Calibrate the axis at the current position. The position and calibration point are visible in the Parameters Screen.

3.5.3.1.4 Move to Position

Opens the "User Interface" screen and allows for the input of an absolute value for the axis to move to.

3.5.3.1.5 Jog Backward Fast

Selecting this button will move the L1P roller backwards at a higher speed.

3.5.3.1.6 Jog Forward Fast

Selecting this button will move the L1P roller forward at a higher speed.

3.5.3.1.7 Jog Backward Slow

Selecting this button will move the L1P roller backwards at a lower speed.

3.5.3.1.8 Jog Forward Slow

Selecting this button will move the L1P roller forward at a lower speed.

3.5.3.1.9 Axis Parameters

Shows parameters linked to the axis. Selecting shown values will give a description of the field in the text box at the bottom.

About – Shows the name, assigned drive number, and the real/digital state of the axis.

Details – Gives the limits for the axis and the speed percentages for Slow/Fast which can be adjusted.

Errors – Shows error state along with the code and message text.

Position – Shows the calibration point, home point, and current position of axis.

Temperatures – Shows the temperatures of the environment and drives of the axis.

(EACH AXIS WILL HAVE ITS OWN RANGE FOR SOFTWARE LIMITS AS WELL AS CALIBRATION AND HOMING POSITIONS)

3.5.3.1.10 Close

Closes the window and reverts to the "Manual Control" screen.

3.5.3.2 L1/L2 Axis

This shows the current position of the L1/L2 axis. Selecting this button will open the "L1/L2 Manual Control" screen from which the user can manually control the L1/L2 Axis.

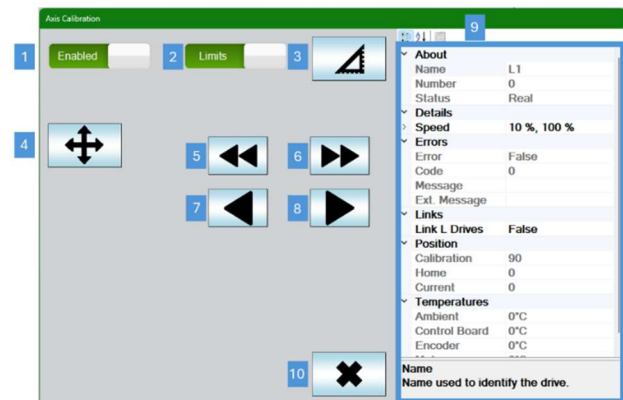


FIGURE 51 L1/L2 AXIS CONTROL SCREEN

3.5.3.2.1 Enabled

Toggles the **Enable/Disable** state for the axis. A disabled axis will not respond to any commands.

3.5.3.2.2 Limits

Toggles the **Enable/Disable** software limits for the axis. Software limits protect the saw assemblies from crashing and causing damage. When moving axes with software limits off, it is recommended to choose the slower jogging options. Software limits should only be disabled for troubleshooting purposes and certain maintenance processes. Limits should always be reenabled at the earliest opportunity.

3.5.3.2.3 Calibrate

Calibrate the L1 & L2 axes together based off commanded and measured cut values. Available from each axis screen.

3.5.3.2.4 Move to Position

Opens the "User Interface" screen and allows for the input of an absolute value for the axis to move to.

3.5.3.2.5 Jog Backward Fast

Selecting this button will move the belt backwards at a higher speed. Link L1 & L2 in "Axis Parameters" to move their belts together.

3.5.3.2.6 Jog Forward Fast

Selecting this button will move the belt forward at a higher speed. Link L1 & L2 in "Axis Parameters" to move their belts together.

3.5.3.2.7 Jog Backwards Slow

Selecting this button will move the belt backwards at a lower speed. Link L1 & L2 in "Axis Parameters" to move their belts together.

3.5.3.2.8 Jog Forward Slow

Selecting this button will move the belt forward at a lower speed. Link L1 & L2 in "Axis Parameters" to move their belts together.

3.5.3.2.9 Axis Parameters

Shows parameters linked to the axis. Selecting shown values will give a description of the field in the text box at the bottom. Most pertinent areas are the details, errors, and position fields.

About – Shows the name, assigned drive number, and the real/digital state of the axis.

Details – Gives the limits for the axis and the Slow/Fast Jog speeds.

Errors – Shows error state along with the code and message text.

Links – Linking of the L1 & L2 axes. Available from each axis screen, allows the belts to be jogged together. Automatically unlinks when closing the axis control screen.

Position – Shows the calibration point, home point, and current position of axis.

Temperatures – Shows the temperatures of the environment and drives of the axis.

(EACH AXIS WILL HAVE ITS OWN RANGE FOR SOFTWARE LIMITS AS WELL AS CALIBRATION AND HOMING POSITIONS)

3.5.3.2.10 Close

Closes the window and reverts to the "Manual Control" screen.

3.5.3.3 Z1 Axis

This shows the current position of the Z1 axis. Selecting this button will open the "Z1 Manual Control" screen from which the user can manually control the Z1 axis.

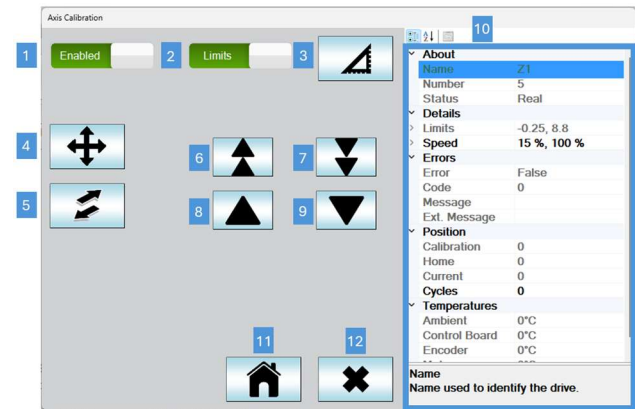


FIGURE 52 Z1 AXIS CONTROL SCREEN

3.5.3.3.1 Enabled

Toggles the **Enable/Disable** state for the axis. A disabled axis will not respond to any commands.

3.5.3.3.2 Limits:

Toggles the **Enable/Disable** software limits for the axis. Software limits protect the saw assemblies from crashing and causing damage. When moving axes with software limits off, it is recommended to choose the slower jogging options. Software limits should only be disabled for troubleshooting purposes and certain maintenance processes. Limits should always be reenabled at the earliest opportunity.

3.5.3.3.3 Calibrate

Calibrate the axis at the current position. The position and calibration point are visible in the Parameters Screen.

3.5.3.3.4 Move to Position

Opens the "User Interface" screen and allows for the input of an absolute value for the axis to move to.

3.5.3.3.5 Cycle Z1

Clicking or touching this icon will cause the saw blade assembly to make full cutting stroke cycles. The number of cycles can be set in the Axis Parameters section. The saw blade will move down

to its lower limit and then move up to its upper limit to complete one full cycle.

3.5.3.3.6 Jog Up Fast

Selecting this button will move the saw head assembly up at a higher speed.

3.5.3.3.7 Jog Down Fast

Selecting this button will move the saw head assembly down at a higher speed.

3.5.3.3.8 Jog Up Slow

Selecting this button will move the saw head assembly up at a lower speed.

3.5.3.3.9 Jog Down Slow

Selecting this button will move the saw head assembly down at a lower speed.

3.5.3.3.10 Axis Parameters

Shows parameters linked to the axis. Selecting shown values will give a description of the field in the text box at the bottom.

About – Shows the name, assigned drive number, and the real/digital state of the axis.

Details – Gives the limits for the axis and the speed percentages for Slow/Fast which can be adjusted.

Errors – Shows error state along with the code and message text.

Position – Shows the calibration point, home point, and current position of axis. On Z1 the cycles value is also present and controls how many cycles will be performed with the "Cycle Z1" function.

Temperatures – Shows the temperatures of the environment and drives of the axis.

(EACH AXIS WILL HAVE ITS OWN RANGE FOR SOFTWARE LIMITS AS WELL AS CALIBRATION AND HOMING POSITIONS)

3.5.3.3.11 Home Axis

Commands the axis to move to its home value in "Axis Parameters."

3.5.3.3.12 Close

Closes the window and reverts to the "Manual Control" screen.

3.5.3.4 A1 Axis

This shows the current position of the A1 axis. Selecting this button will open the "A1 Manual Control" screen from which the user can manually control the A1 axis.

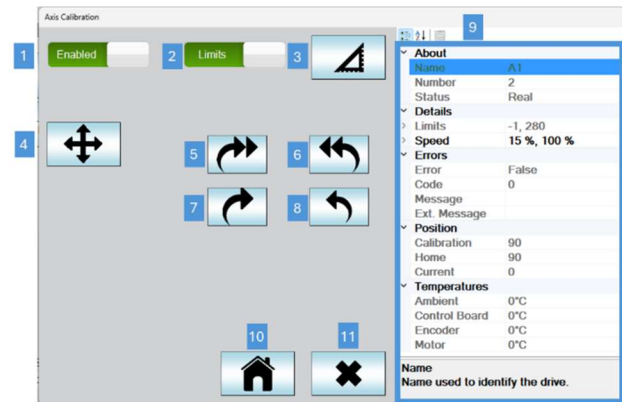


FIGURE 53 – A1 AXIS CONTROL SCREEN

3.5.3.4.1 Enabled

Toggles the **Enable/Disable** state for the axis. A disabled axis will not respond to any commands.

3.5.3.4.2 Limits

Toggles the **Enable/Disable** software limits for the axis. Software limits protect the saw assemblies from crashing and causing damage. When moving axes with software limits off, it is recommended to choose the slower jogging options. Software limits should only be disabled for troubleshooting purposes and certain maintenance processes. Limits should always be reenabled at the earliest opportunity.

3.5.3.4.3 Calibrate

Calibrate the axis at the current position. The position and calibration point are visible in the Parameters Screen.

3.5.3.4.4 Move to Position

Opens the "User Interface" screen and allows for the input of an absolute value for the axis to move to.

3.5.3.4.5 Jog Clockwise Fast

Selecting this button will move the saw head assembly clockwise at a higher speed.

3.5.3.4.6 Jog Counterclockwise Fast

Selecting this button will move the saw head assembly counterclockwise at a higher speed.

3.5.3.4.7 Jog Clockwise Slow

Selecting this button will move the saw head assembly clockwise at a lower speed.

3.5.3.4.8 Jog Counterclockwise Slow

Selecting this button will move the saw head assembly clockwise at a lower speed.

3.5.3.4.9 Axis Parameters

Shows parameters linked to the axis. Selecting shown values will give a description of the field in the text box at the bottom.

About – Shows the name, assigned drive number, and the real/digital state of the axis.

Details – Gives the limits for the axis and the speed percentages for Slow/Fast which can be adjusted.

Errors – Shows error state along with the code and message text.

Position – Shows the calibration point, home point, and current position of axis.

Temperatures – Shows the temperatures of the environment and drives of the axis.

(EACH AXIS WILL HAVE ITS OWN RANGE FOR SOFTWARE LIMITS AS WELL AS CALIBRATION AND HOMING POSITIONS)

3.5.3.4.10 Home Axis

Commands the axis to move to its home value in "Axis Parameters."

3.5.3.4.11 Close

Closes the window and reverts to the "Manual Control" screen.

3.5.3.5 B1 Axis

This shows the current position of the B1 axis. Selecting this button will open the "B1 Manual Control" screen from which the user can manually control the B1 axis.

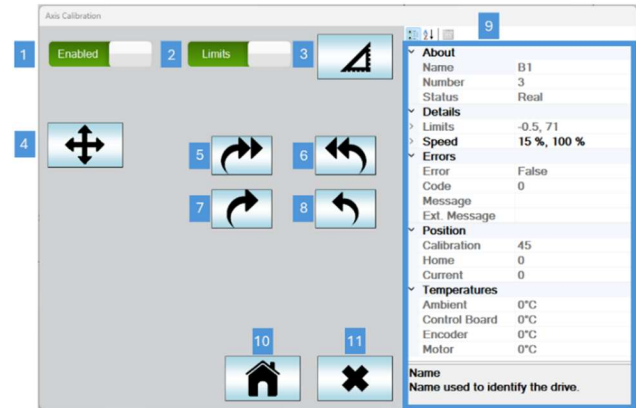


FIGURE 54 – B1 AXIS CONTROL SCREEN

3.5.3.5.1 Enable:

Toggles the **Enable/Disable** state for the axis. A disabled axis will not respond to any commands.

3.5.3.5.2 Limits:

Toggles the **Enable/Disable** software limits for the axis. Software limits protect the saw assemblies from crashing and causing damage. When moving axes with software limits off, it is recommended to choose the slower jogging options. Software limits should only be disabled for troubleshooting purposes and certain maintenance processes. Limits should always be reenabled at the earliest opportunity.

3.5.3.5.3 Calibrate

Calibrate the axis at the current position. The position and calibration point are visible in the Parameters Screen.

3.5.3.5.4 Move to Position

Opens the "User Interface" screen and allows for the input of an absolute value for the axis to move to.

3.5.3.5.5 Jog Clockwise Fast

Selecting this button will tilt the saw head assembly clockwise at a higher speed.

3.5.3.5.6 Jog Counterclockwise Fast

Selecting this button will tilt the saw head assembly counterclockwise at a higher speed.

3.5.3.5.7 Jog Clockwise Slow

Selecting this button will tilt the saw head assembly clockwise at a lower speed.

3.5.3.5.8 Jog Counterclockwise Slow

Selecting this button will tilt the saw head assembly counterclockwise at a lower speed.

3.5.3.5.9 Axis Parameters

Shows parameters linked to the axis. Selecting shown values will give a description of the field in the text box at the bottom.

About – Shows the name, assigned drive number, and the real/digital state of the axis.

Details – Gives the limits for the axis and the speed percentages for Slow/Fast which can be adjusted.

Errors – Shows error state along with the code and message text.

Position – Shows the calibration point, home point, and current position of axis.

Temperatures – Shows the temperatures of the environment and drives of the axis.

(EACH AXIS WILL HAVE ITS OWN RANGE FOR SOFTWARE LIMITS AS WELL AS CALIBRATION AND HOMING POSITIONS)

3.5.3.5.10 Home Axis

Commands the axis to move to its home value in "Axis Parameters."

3.5.3.5.11 Close

Closes the window and reverts to the "Manual Control" screen.

3.5.3.6 T1 Axis

This shows the current position of the T1 axis. Selecting this button will open the "T1 Manual Control" screen from which the user can manually control the T1 axis.



FIGURE 55 – T1 AXIS CONTROL SCREEN

3.5.3.6.1 Enable:

Toggles the **Enable/Disable** state for the axis. A disabled axis will not respond to any commands.

3.5.3.6.2 Limits:

Toggles the **Enable/Disable** software limits for the axis. Software limits protect the saw assemblies from crashing and causing damage. When moving axes with software limits off, it is recommended to choose the slower jogging options. Software limits should only be disabled for troubleshooting purposes and certain maintenance processes. Limits should always be reenabled at the earliest opportunity.

3.5.3.6.3 Calibrate:

Calibrate the axis at the current position. The position and calibration point are visible in the Parameters Screen.

3.5.3.6.4 Move to Position

Opens the "User Interface" screen and allows for the input of an absolute value for the axis to move to.

3.5.3.6.5 Jog Forward Fast

Selecting this button will move the saw head assembly forwards at a higher speed.

3.5.3.6.6 Jog Backward Fast

Selecting this button will move the saw head assembly backwards at a higher speed.

3.5.3.6.7 Jog Forward Slow

Selecting this button will move the saw head assembly forwards at a lower speed.

3.5.3.6.8 Jog Backward Slow

Selecting this button will move the saw head assembly backwards at a lower speed.

3.5.3.6.9 Axis Parameters

Shows parameters linked to the axis. Selecting shown values will give a description of the field in the text box at the bottom.

About – Shows the name, assigned drive number, and the real/digital state of the axis.

Details – Gives the limits for the axis and the speed percentages for Slow/Fast which can be adjusted.

Errors – Shows error state along with the code and message text.

Position – Shows the calibration point, home point, and current position of axis.

Temperatures – Shows the temperatures of the environment and drives of the axis.

(EACH AXIS WILL HAVE ITS OWN RANGE FOR SOFTWARE LIMITS AS WELL AS CALIBRATION AND HOMING POSITIONS)

3.5.3.6.10 Home Axis

Commands the axis to move to its home value in "Axis Parameters."

3.5.3.6.11 Close

Closes the window and reverts to the "Manual Control" screen.

3.5.3.7 SP1 Axis

This shows the current position of the SP1 axis. Selecting this button will open the "SP1 Manual Control" screen from which the user can manually control the SP1 Axis.

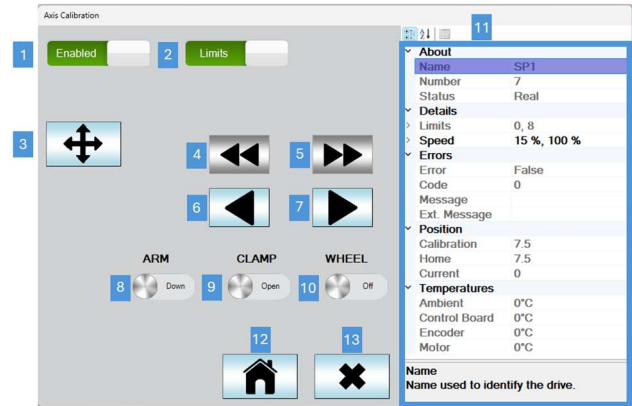


FIGURE 56 – SP1 AXIS CONTROL SCREEN

3.5.3.7.1 Enable:

Toggles the **Enable/Disable** state for the axis. A disabled axis will not respond to any commands.

3.5.3.7.2 Limits:

Toggles the **Enable/Disable** software limits for the axis. Software limits protect the saw assemblies from crashing and causing damage. When moving axes with software limits off, it is recommended to choose the slower jogging options. Software limits should only be disabled for troubleshooting purposes and certain maintenance processes. Limits should always be reenabled at the earliest opportunity.

3.5.3.7.3 Move to Position:

Opens the "User Interface" screen and allows for the input of an absolute value for the axis to move to.

3.5.3.7.4 Jog Out Fast

Selecting this button will move the L1P roller backwards at a higher speed.

3.5.3.7.5 Jog In Fast

Selecting this button will move the L1P roller forward at a higher speed.

3.5.3.7.6 Jog Out Slow

Selecting this button will move the L1P roller backwards at a lower speed.

3.5.3.7.7 Jog In Slow

Selecting this button will move the L1P roller forward at a lower speed.

3.5.3.7.8 Arm

Toggles the small parts arm up and down.

3.5.3.7.9 Clamp

Toggles the small parts arm clamp open and close.

3.5.3.7.10 Wheel

Toggles the small parts roller wheel on and off.

3.5.3.7.11 Axis Parameters

Shows parameters linked to the axis. Selecting shown values will give a description of the field in the text box at the bottom.

About – Shows the name, assigned drive number, and the real/digital state of the axis.

Details – Gives the limits for the axis and the speed percentages for Slow/Fast which can be adjusted.

Errors – Shows error state along with the code and message text.

Position – Shows the calibration point, home point, and current position of axis.

Temperatures – Shows the temperatures of the environment and drives of the axis.

(EACH AXIS WILL HAVE ITS OWN RANGE FOR SOFTWARE LIMITS AS WELL AS CALIBRATION AND HOMING POSITIONS)

3.5.3.7.12 Home Axis

Commands the axis to move to its home value in "Axis Parameters."

3.5.3.7.13 Close

Closes the window and reverts to the "Manual Control" screen.

3.5.3.8 L1/L2 Clamp

The L1/L2 Clamp default position is "**UP**" where the set of black polyurethane coated rollers are raised to allow lumber to pass under it. Selecting the toggle will change it to "**DOWN**" and cause the L1/L2 clamp rollers to lower down onto the top face of the stock if present.

3.5.3.9 L1/L2 Pusher

The L1/L2 pusher default position is "**OUT**" where the moving end of the pusher assembly is open to

allow the lumber to pass through. The pusher assembly is wide enough to allow 2x12 boards through this opening. The pusher assembly has a series of steel bearing rollers that facilitate board movement. Selecting the toggle will change it to "**IN**" and cause the L1/L2 pusher to close towards the back fence, or edge of the stock if present.

3.5.4 Outfeed Controls

(Refer to Figure 34 (4))

This section consists of manual controls for operating the functions of the outfeed assembly.



FIGURE 57 OUTFEED CONTROLS

3.5.4.1 Outfeed Rollers

Default position is "**OFF**" and selecting the toggle will switch this to the "**ON**" position. This will cause the rollers to spin and any pieces on the conveyor will begin to move away from the cabinet and to the outfeed rollers. Selecting the toggle again will revert it to "**OFF**" and the rollers will stop.

3.5.4.2 Waste Conveyor

Default position is "**OFF**" and selecting the toggle will switch this to the "**ON**" position. This will cause the waste belt to turn on and move anything on it away from the saw. Selecting the toggle again will revert it to "**OFF**" and the belt will stop. If there is also an incline conveyor installed, it will turn off and on with the waste conveyor.

3.5.4.3 Conveyor Direction

This controls the sorting conveyor in the saw cabinet. There are two toggles present, the first controlling the direction the conveyor belt moves. The default position is "**WASTE**" and will cause the conveyor belt to run towards the waste conveyor. Selecting this toggle will switch it to "**SMALL PARTS**" and the conveyor belt will move in the opposite direction to the small parts bin. The second toggle controls the

small parts conveyor motor, and its default position is **"OFF"** and the conveyor belt will not move until this toggle is switched to **"ON."**

3.5.5 Additional Functions

(Refer to Figure 34 (4))

This section consists of all other functions on the Manual Controls Screen.

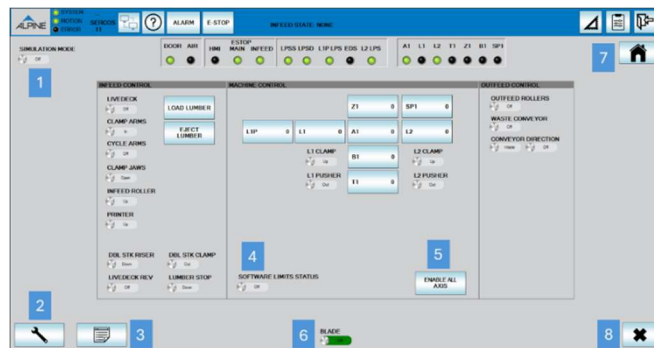


FIGURE 58 ADDITIONAL FUNCTIONS OF MANUAL CONTROL

3.5.5.1 Simulation Mode

Default position is **"OFF"** and selecting the toggle will switch this to the **"ON"** position. This will put the saw into simulation mode. When selecting "Start Cutting" (Refer to Section 3.4.3) the program will perform normally, except no lumber will be loaded and the saw blade will not spin. This is a useful troubleshooting tool and allows the user to check the program operations without using lumber to look for anomalies or errors. Selecting the toggle again will revert it to **"OFF"** put the saw back into normal operations mode.

3.5.5.2 Run Diagnostics

Selecting this button will bring up a screen to confirm the user wishes to run diagnostics. Choose **"OK"** to proceed or **"CANCEL"** to return to manual control screen. The diagnostic program will then run and present any errors discovered.

3.5.5.3 Machine Parameters

Selecting this button will bring up the "Machine Parameters" screen. Here the user can view various parameters of the system and axes. No changes can be made on this screen without an admin login.

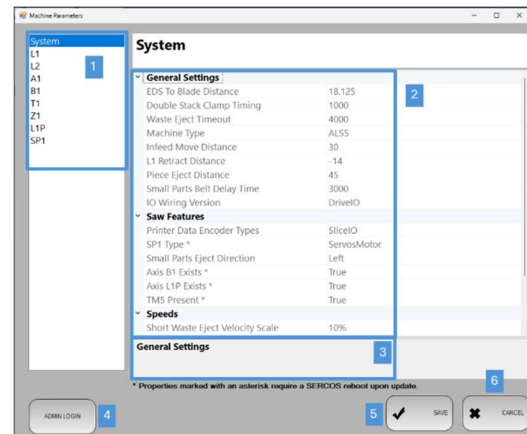


FIGURE 59 MACHINE PARAMETERS

3.5.5.3.1 Selection

A selection made in this box will show the information and settings available under that section in the main display.

3.5.5.3.2 Main Display

Shows all parameters of the selected. Selecting a field will display a description below the display.

3.5.5.3.3 Description

Shows additional information regarding the selected parameter.

3.5.5.3.4 Admin Login

Necessary to make any changes and should only be used by Alpine Personnel.

3.5.5.3.5 Save

Used to save any changes made and send them to the controller.

3.5.5.3.6 Cancel

Closes the window and reverts to the "Manual Control" screen.

3.5.5.4 Software Limit Status

This controls the Disable Software Limits feature. Default position is set to **"OFF"** meaning all limits are enabled. Selecting this toggle will change it to **"ON"** and disable ALL software limits on the saw. In this state the axes can move outside their designated range for position and speed. Be careful when moving axes in this state as the software limits exist to prevent collision, damage, and unsafe operations. When moving axes with software limits off, it is recommended to choose the slower jogging options. Software limits should only be disabled for troubleshooting purposes and certain maintenance processes. Limits should always be reenabled at the earliest opportunity. Selecting the toggle again reverts to the **"OFF"** position and reengages the limits.

3.5.5.5 Enable All Axis

Selecting this button reenables the drives of all axes.

3.5.5.6 Blade

Default position is set to **"OFF,"** and means that the saw motor is off and the blade is stationary. In this state the Saw blade will remain stationary. Selecting the toggle will change it to **"ON"** and the motor will engage and reach its maximum rotation speed set in the software parameters. Selecting the toggle again reverts to the **"OFF"** position and the blade will coast to a stop.

3.5.5.7 Home System

Selecting this button will send every axis to its designated home position.

3.5.5.8 Close

Selecting this button closes the window and reverts to the previous screen.

3.6 SYSTEM OPTIONS

The available options and settings for the program. There are settings locked behind the admin login, and these should only be altered by Alpine Personnel.



FIGURE 60 SYSTEM OPTIONS

3.6.1 General

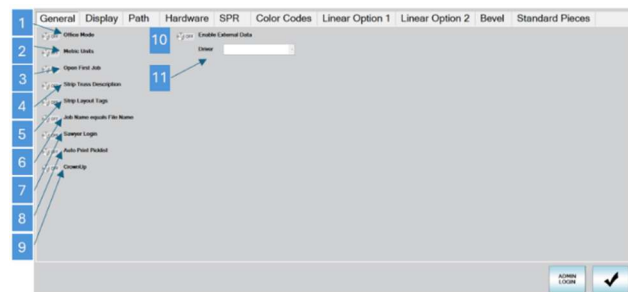


FIGURE 61 GENERAL OPTIONS

3.6.1.1 Office Mode

Default position is **"OFF"** and selecting the toggle will switch this to the **"ON"** position. When set to **"ON"** the program will still function but will not communicate with the saw and controller. Select the toggle again to revert to **"OFF"** position. Used on computers that are not connected to a saw.

3.6.1.2 Metric Units

Default position is **"OFF"** and selecting the toggle will switch this to the **"ON"** position. When set to **"ON"** the program will be able to receive and display in metric units. Select the toggle again to revert to **"OFF"** position.

3.6.1.3 Open First Job

Default position is **"OFF"** and selecting the toggle will switch this to the **"ON"** position. When set to **"ON"** the first job will open every time the "Auto" screen is opened. Select the toggle again to revert to **"OFF"** position.

3.6.1.4 Strip Truss Description

Default position is **"OFF"** and selecting the toggle will switch this to the **"ON"** position. When set to **"ON"** the truss description from the TRS file will be stripped. Used when names become too long or contain characters that interfere with the operation of the ALS program. This option and "Strip Layout Tags" are mutually exclusive. If you desire no truss description printed, change that option in "Printer" options. Select the toggle again to revert to **"OFF"** position.

3.6.1.5 Strip Layout Tags

Default position is **"OFF"** and selecting the toggle will switch this to the **"ON"** position. When set to **"ON"** the layout ID is removed, and most companies opt to have this turned on. The cut data file (*.TRS) contains two truss ID's, one is automatically assigned by the VIEW Layout Program and the other is assigned by engineers in the customer office. Select the toggle again to revert to **"OFF"** position.

3.6.1.6 Job Name Equals File Name

Default position is **"OFF"** and selecting the toggle will switch this to the **"ON"** position. When set to **"ON"** the job name that prints out and shows on the screen will be the same as the name of the TRS file. Select the toggle again to revert to **"OFF"** position. Additionally this will affect what prints in the filename field for the printer.

3.6.1.7 Sawyer Login

Default position is **"OFF"** and selecting the toggle will switch this to the **"ON"** position. When set to **"ON"** the program will require the sawyer to login using the established credentials. Select the toggle again to revert to **"OFF"** position.

3.6.1.8 Auto Print Picklist

Default position is **"OFF"** and selecting the toggle will switch this to the **"ON"** position. When set to **"ON"** the picklist will automatically print whenever it is created. Select the toggle again to revert to **"OFF"** position. When **"OFF"** the picklist will only be printed when told to do so.

3.6.1.9 Crown Up

Default position is **"OFF"** and selecting the toggle will switch this to the **"ON"** position. When set to

"ON" the saw software will not flip top and bottom chords for nesting. This option is useful so all board labeling will be facing up during assembly on the tables. Select the toggle again to revert to **"OFF"** position.

3.6.1.10 Enable External Data

Default position is **"OFF"** and selecting the toggle will switch this to the **"ON"** position. When set to **"ON"** it allows the use of external job communication programs, such as eShop. Programs are designated in "Driver." Select the toggle again to revert to **"OFF"** position.

3.6.1.11 Driver

Dropdown for selecting which external job communication program is to be used.

3.6.2 Display

This tab contains options related to the display of pieces and the user interface.

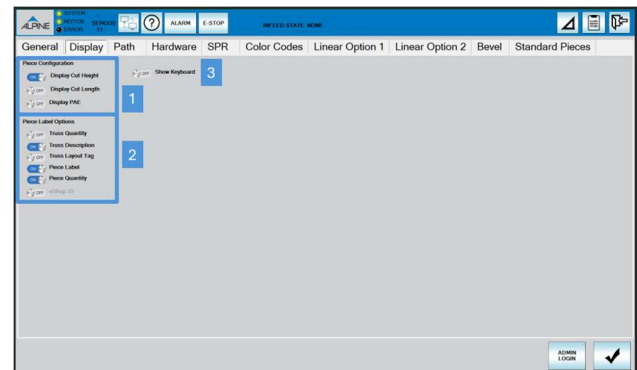


FIGURE 62 DISPLAY OPTIONS

3.6.2.1 Piece Configuration

Options for choosing the display configuration for piece details (Refer to Section 3.2.10) on the auto screen.

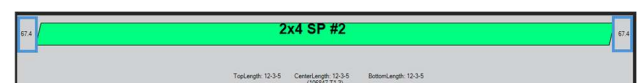


FIGURE 63 DISPLAY NO PIECE CONFIGURATION

3.6.2.1.1 Display Cut Height

Default setting is **"ON"** and will display the cut height as shown below in piece details on the auto

screen. This is the vertical height of the cuts on both ends as shown.



FIGURE 64 DISPLAY CUT HEIGHT

3.6.2.1.2 Display Cut Length

Default setting is "OFF" and selecting the toggle will switch it to "ON" and then display the angled cut length as shown below in piece details on the auto screen. On any 90° cut the vertical cut length and angled cut length will be the same. On any other angled cut the lengths will differ depending on the angle.



FIGURE 65 DISPLAY CUT LENGTH

3.6.2.1.3 Display Pivot Axis Elevation (PAE)

Default setting is "OFF" and selecting the toggle will switch it to "ON" and then display additional information on the cuts on both ends of the pieces as shown below in piece details on the auto screen.



FIGURE 66 DISPLAY PAE

3.6.2.2 Piece Label Options

Options for choosing the label configuration of pieces. Affects the piece details on the auto screen as well as the information to be printed on the pieces. (Refer to Sections 3.2.10 & 3.2.11)

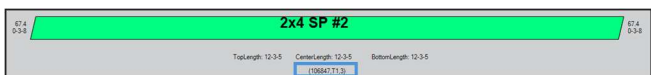


FIGURE 67 PIECE DETAILS WITH DEFAULT LABELS

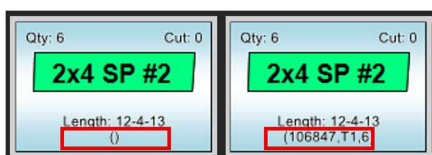


FIGURE 68 PIECE WITH NO LABEL & DEFAULT LABELS

3.6.2.2.1 Truss Quantity

Default setting is "OFF" and selecting the toggle will switch it to "ON" and then display the total number of trusses within a trs job file when viewed on the auto screen as shown below.

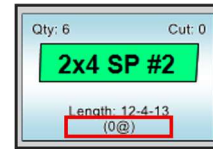


FIGURE 69 TRUSS QUANTITY

3.6.2.2.2 Truss Description

Default setting is "ON" and selecting the toggle will switch it to "OFF" and then remove the truss description from the piece details on the auto screen as shown below.

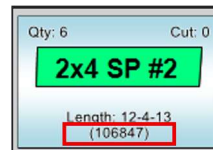


FIGURE 70 TRUSS DESCRIPTION

3.6.2.2.3 Truss Layout Tag

Default setting is "OFF" and selecting the toggle will switch it to "ON" and then display the truss layout tag when viewed on the auto screen as shown below.

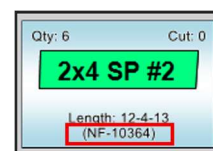


FIGURE 71 TRUSS LAYOUT TAG

3.6.2.2.4 Piece Label

Default setting is "ON" and selecting the toggle will switch it to "OFF" and then display the piece label when viewed on the auto screen as shown below.

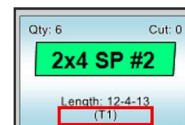


FIGURE 72 PIECE LABEL

3.6.2.2.5 Piece Quantity

Default setting is **"ON"** and selecting the toggle will switch it to **"OFF"** and then display the piece quantity when viewed on the auto screen as shown below.

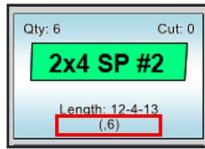


FIGURE 73 PIECE QUANTITY

3.6.2.2.6 eShop ID

If the ALS 5.0 Software has eShop software installed, turning this to **"ON"** will display the eShop ID on the pieces in the Auto Screen.

3.6.2.3 Display Keyboard

Default setting is **"OFF"** and selecting the toggle will switch it to **"ON"** and the "User Interface" (**Refer to Section 1.1.9**) will open when selecting text fields.

3.6.3 Path

This tab allows the user to designate the paths for storing, retrieving, repackaging, and archiving job files.

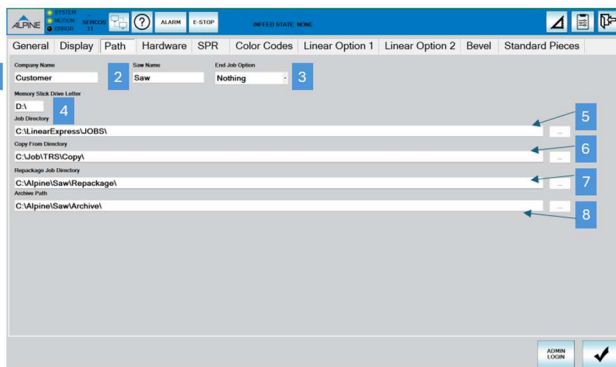


FIGURE 74 PATH OPTIONS

3.6.3.1 Company Name

The name of the customer should be present in this box.

3.6.3.2 Saw Name

Allows for naming the saw for differentiating between multiples.

3.6.3.3 End Job Option

Contains a dropdown with four options for determining how the program reacts to a job once completed.

3.6.3.3.1 Nothing

The program will not take any action after the job is completed.

3.6.3.3.2 Prompt

The program will prompt the user to choose what action to take once the job is complete.

3.6.3.3.3 Archive

The program will archive jobs in the designated storage area once the job is complete.

3.6.3.3.4 Delete

The program will delete the job once it has been completed.

3.6.3.4 Memory Stick Drive Letter

This text box allows the user to designate the drive letter for using a memory stick, or thumb drive.

3.6.3.5 Job Directory

This text box allows the user to designate the location where the job files will be viewed from. Can be input manually or the button to the right can be selected and the "File Explorer" opened and the job directory selected, and the path automatically added.

3.6.3.6 Copy From Directory

This text box allows the user to designate a file location where jobs will be copied from and added to the job directory. Can be input manually or the button to the right can be selected and the "File Explorer" opened and the desired folder selected, and the path automatically added. This function allows for jobs in the network to be automatically copied and added to local storage to eliminate network lag.

3.6.3.7 Repackage Job Directory

This text box allows the user to designate a file location where jobs will be added to for repackaging.

purposes. Can be input manually or the button to the right can be selected and the "File Explorer" opened and the desired folder selected, and the path automatically added. This function compiles necessary files, dependencies, and configurations related to specific job files into a single package and sending it to the desired location. The package can then be sent to alternate systems for testing or to Alpine Support Personnel for troubleshooting purposes.

3.6.3.8 Archive Path

This text box allows the user to designate a file location where jobs will be moved upon their completion. Can be input manually or the button to the right can be selected and the "File Explorer" opened and the desired folder selected, and the path automatically added. Job files will only be sent to the designated folder when the "End Job Option" is set to do so.

3.6.4 Hardware

This tab contains options related to the hardware installed on the saw along with their configurations.

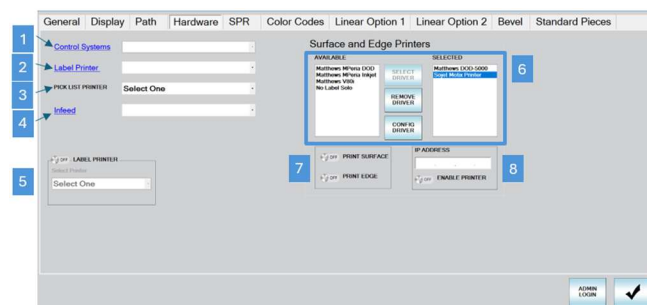


FIGURE 75 HARDWARE OPTIONS

3.6.4.1 Control Systems

The default ALS 5.0 Control System is set to "SCHNEIDER," if the ALS 5.0 is equipped with a different control system, that option will be listed in the drop-down selection box. Once a controller is selected, the **BLUE** hyperlink "Control Systems" can be selected to show the configuration screen. Here the controller address can be viewed and altered.



FIGURE 76 CONTROLLER CONFIGURATION

3.6.4.2 Label Printer

If the ALS 5.0 is equipped with a label printer, the user can access the options for the label printer with a drop-down selection box. Once an option is selected, the **BLUE** hyperlink "Label Printer" can be opened to show the "Label Editor" screen. The "Default" and "Advanced" windows are shown and described below. Functions common across the two windows are numbered identically for reference.

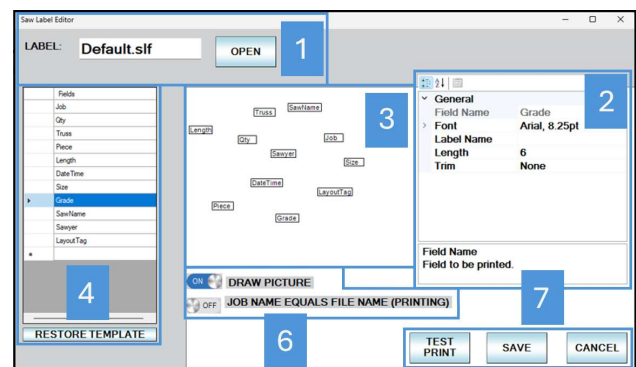
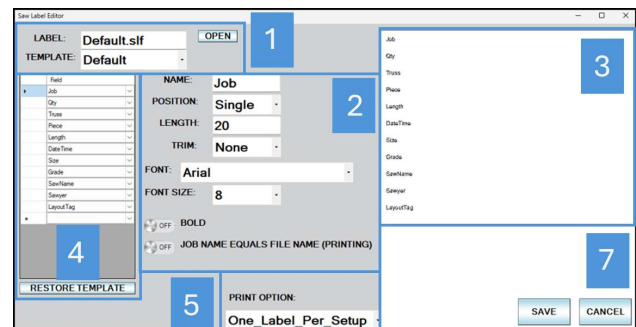


FIGURE 77 LABEL OPTIONS DEFAULT & ADVANCED

3.6.4.2.1 Label

This option allows the opening of a saved label (and template on the default option).

3.6.4.2.2 Formatting

Shows and allows for the alteration of font formatting choices.

3.6.4.2.3 Label Image

This shows the current layout of the label. On the ADVANCED window the text and images can be dragged and moved to a desired location.

3.6.4.2.4 Template Layout

This area contains the template options that can be added to the label image. "Restore Template" reverts any changes made to the template.

3.6.4.2.5 Print Option

(DEFAULT ONLY)

Drop down designating the print frequency of the label.

3.6.4.2.6 Label Options

(ADVANCED ONLY)

Toggle selection for having an image of the piece on the label, and another to designate making the job name be set to the file name.

3.6.4.2.7 Finalization

The buttons in this area are used to save the current layout or cancel all changes made. In the advanced window there is also a button to perform an immediate test print of the created label.

3.6.4.3 Pick List Printer

This drop-down selection allows the user to designate a printer to be used for printing the pick list. The printer must be connected to the same network to use it. When the auto print pick list option is selected, (Refer to Section 3.6.1.8) this is the printer that will be used whenever the pick list is created.

3.6.4.4 Infeed

This drop-down selection allows the user to designate the infeed configuration installed with the ALS 5.0. There are three options, manual, semi-auto, and Ranger. Manual is used when there is no powered infeed. Semi-auto is the standard infeed assembly as listed in Section 2.3. The third option is the Ranger system, which is an automated system for loading lumber stock onto the live deck. When using the Ranger system, the BLUE hyperlink text "Infeed" can be selected to open the Ranger configuration window.

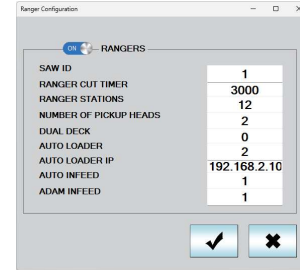


FIGURE 78 RANGER CONFIGURATION

3.6.4.5 Label Printer

Contains a toggle for designating if label printing is "ON" or "OFF" as well as a drop-down menu for the user to select the label printer to be used.

3.6.4.6 Surface and Edge Printers

◆ Available

Contains all printer drives available on the ALS 5.0

◆ Selected

Shows the printer drives that are selected for use with the ALS 5.0

◆ Select Driver

Selecting this button moves the highlighted drive from the Available window to the Selected window.

◆ Remove Driver

Selecting this button moves the highlighted drive from the Selected window to the Available window.

◆ Config Driver

Selecting this opens the window for configuring the layout of the print options as shown below. Depending on the selected print driver the config menu may look different.

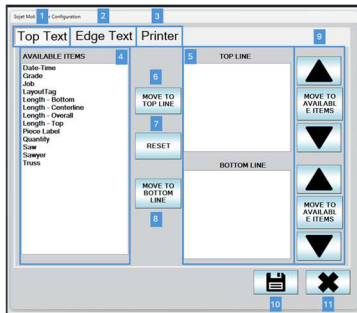


FIGURE 79 PRINTER CONFIGURATION

3.6.4.6.1 Top Text

This tab contains the options and controls for configuring the edge printer. This layout will be the one used as an example going forward.

3.6.4.6.2 Edge Text

This tab contains the options and controls for configuring the edge printer. Identical to the top text tab, except there is no bottom line.

3.6.4.6.3 Printer

This tab contains the DPI settings for the printer system.

3.6.4.6.4 Available Items

This window shows the items that can be added to the text lines.

3.6.4.6.5 Item Line Windows

This window shows the items to be printed and their order.

3.6.4.6.6 Move to Top Line

This button moves the item selected from the "Available Items" window to the "Top Line" window.

3.6.4.6.7 Reset

This button clears all selected items from the Top and Bottom Line window.

3.6.4.6.8 Move To Bottom Line

This button moves the item selected from the "Available Items" window to the "Bottom Line" window.

3.6.4.6.9 Move Items in Window

The arrow buttons move the selected item in the Line window in the direction indicated. The "Move to Available Items" removes the selected item back to the Available window.

3.6.4.6.10 Save

Saves all alterations made to the order and placement of items.

3.6.4.6.11 Close

Closes the window and reverts to the "Hardware" tab on the "Options" screen.

3.6.4.7 Print Selections

Toggles for turning the surface and edge printers "ON" and "OFF."

3.6.4.8 Ink Jet Printer IP Address

The user can set the IP address for the printer in this box.

3.6.5 Saw Production Reporter (SPR)

An acronym for "Saw Production Reporter" is the collection of data logging programs that are used for reporting the various metrics that are tied to production.

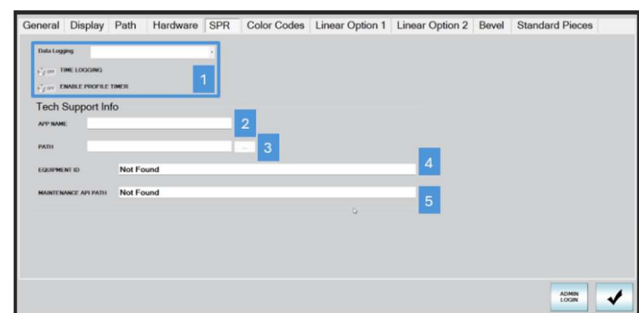


FIGURE 80 SPR OPTIONS

3.6.5.1 Debug Options

This area is used primarily for debug operations by Alpine Technical Support.

- ◆ Data Logging

Drop-down selection box containing three options, “Off” tells the program to not log, “Datalog” saves the data as a text file in .txt format, and the final option “Saw Production Reporter” causes the data to be logged to the SPR application as a .mbd file.

◆ Time Logging

Toggle selection for turning on the tracking of time of alerts and events within the SPR application.

◆ Enable Profile Timer

Toggle selection for turning on the data tracking to measure how long specific functions or processes within the software take to execute.

3.6.5.2 App Name

The designation of the SPR application to be sent the collected data for review.

3.6.5.3 Path

The designation of the preferred storage path for the files to be sent to the SPR application.

3.6.5.4 Equipment ID

The designation of the application to be used for maintenance data collection and monitoring.

3.6.5.5 Maintenance API Path

The designation of the preferred storage path for files to be sent to the Maintenance Application Programming Interface.

3.6.6 Color Codes

This tab contains the options where the user can assign color codes to various grades of lumber for identification within the lumber list and piece details.

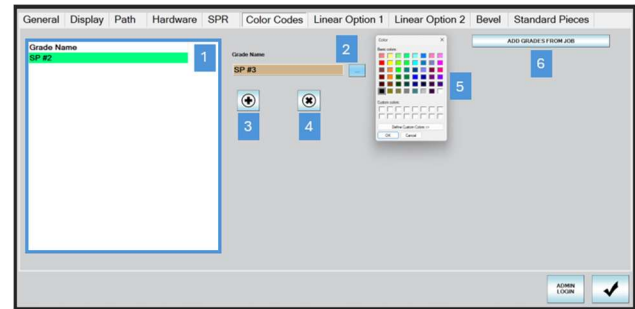


FIGURE 81 COLOR CODE OPTIONS

3.6.6.1 Grades List

This window shows the listed grades with their color designation.

3.6.6.2 Grade Name

This is where a grade can be selected for editing or a new grade configured before adding to the “Grade List.” Selecting the button to the right opens the color palette.

3.6.6.3 Add to Grades List

This button adds the configured grade in the “Grade Name” text box to the “Grades List.”

3.6.6.4 Remove From Grades List

This button removes the selected grade in the “Grades List” from the window.

3.6.6.5 Color Palette

The color palette is used to designate a color to be associated with the grade in the “Grade Name” text box.

3.6.6.6 Add Grades From Job

Adds all grades from the currently open job on the “Auto” screen to the “Grades List.” They can then be selected and edited from the “Grade Name” text box.

3.6.7 Linear Option 1

This tab contains options for waste, marking, distance, timers, and adjustment values.


FIGURE 82 LINEAR OPTION 1

3.6.7.1 Waste Options

THE WASTE SHIFT OPTIONS LISTED ARE USED FOR TROUBLESHOOTING AND SHOULD ONLY BE ADJUSTED WITH THE ASSISTANCE OF ALPINE EQUIPMENT CUSTOMER SERVICE.

(DATA MAY BE ENTERED IN FT-IN-16TH OR A DECIMAL VALUE. ALL VALUES ARE SHOWN IN FT-IN-16TH)

3.6.7.1.1 Waste Range 1

◆ FRONT MIN (FT)

Lowest value of the first range of waste length with the potential to cause issues when dropped into the sorting conveyor and must use the waste shift feature to move the waste length beyond the range.

◆ FRONT MAX (FT)

Highest value of the first range of waste length with the potential to cause issues when dropped into the sorting conveyor and must use the waste shift feature to move the waste length beyond the range.

3.6.7.1.2 Waste Range 2

◆ FRONT MIN (FT)

Lowest value of the second range of waste length with the potential to cause issues when dropped into the sorting conveyor and must use the waste shift feature to move the waste length beyond the range.

◆ FRONT MAX (FT)

Highest value of the second range of waste length with the potential to cause issues when dropped into the sorting conveyor and must use the waste shift feature to move the waste length beyond the range.

3.6.7.1.3 Shift Length

The length of waste to be shifted to move waste material beyond the ranges listed above.

3.6.7.2 HOD Options

Options used for marking pieces for use with post-cut automation.

3.6.7.2.1 Turn On

Toggles for turning the function “ON” and “OFF.”

3.6.7.2.2 Flipped Top Bottom

Marking designation to show that a piece was flipped from top to bottom with regards to how the piece was created in TRS file and then cut in the saw.

3.6.7.2.3 Not Flipped Top Bottom

Marking designation to show that a piece was not flipped from top to bottom with regards to how the piece was created in TRS file and then cut in the saw.

3.6.7.2.4 Rotated Left to Right

Marking designation to show that a piece was rotated from left to right with regards to how the piece was created in TRS file and then cut in the saw.

3.6.7.2.5 Not Rotated Left to Right

Marking designation to show that a piece was not rotated from left to right with regards to how the piece was created in TRS file and then cut in the saw.

3.6.7.3 Grip distance:

(DATA MAY BE ENTERED IN FT-IN-16TH OR A DECIMAL VALUE. ALL VALUES ARE SHOWN IN FT-IN-16TH)

3.6.7.3.1 L1 (FT)

The distance from the center of the L1 clamps to the edge of the blade at A1=90° and B1=0°

3.6.7.3.2 Minimum Transfer (FT)

The minimum length of a piece for transfer across the L1 assembly to the L2 assembly. Necessary for stock to be held during the cutting process.

3.6.7.4 Maintenance Options

3.6.7.4.1 Effective Cut Factor

Width of the saw blade, used for the kerf value in program calculations.

3.6.7.4.2 Z1 Max Down

This is the maximum stroke the Z-Axis will travel down to from home position.

3.6.7.5 Pivot Point Info

3.6.7.5.1 Width

Width measurement for rotation of the pivot point.

3.6.7.5.2 Height

Height measurement for rotation of the pivot point.

3.6.7.6 Livedeck Timers

The settings in this section control timers of the live deck assembly. These are set by and should only be adjusted with the assistance of Alpine Equipment Customer Service.

3.6.7.6.1 Run After LPS (MS)

This setting controls the time delay between the L1 LPS detecting lumber on the live deck and the live deck operations.

3.6.7.6.2 Arms Retract (MS)

This setting controls the time delay for the gripper arms retracting.

3.6.7.6.3 Double Stack (MS)

This setting controls the time delay before the double stacking sequence begins.

3.6.7.6.4 Board Stops (MS)

This setting controls the time delay before the board stops engage.

3.6.7.7 Saw Settings

3.6.7.7.1 Infeed to Saw

This value represents the distance the L1P must move lumber stock into the saw cabinet for the L1 assembly to take control.

3.6.7.7.2 EDS to Blade Distance

The distance from the center of the L1 clamps to the edge of the blade at A1=90° and B1=0°.

3.6.7.7.3 Min Crown Up Length

This setting controls the minimum value at which the saw will ignore the "CROWN UP" setting even when toggled "ON." (Refer to Section 3.6.1.9)

3.6.7.8 Adjustments

3.6.7.8.1 Short 4 Cut Length

This setting controls the minimum length value allowed for a 4-cut piece.

3.6.8 Linear Option 2

This tab contains options related to sorting, nesting, and optimization.



FIGURE 83 LINEAR OPTION 2

3.6.8.1.1 Flip Rotate

Default setting is "ON," and this gives permission to the program to flip and rotate pieces on the stock to allow for nesting pieces of like angles together. This feature aids in reducing waste. The HOD Options (Refer to Section 3.6.7.2) are used to mark the boards to indicate what manipulation was used.

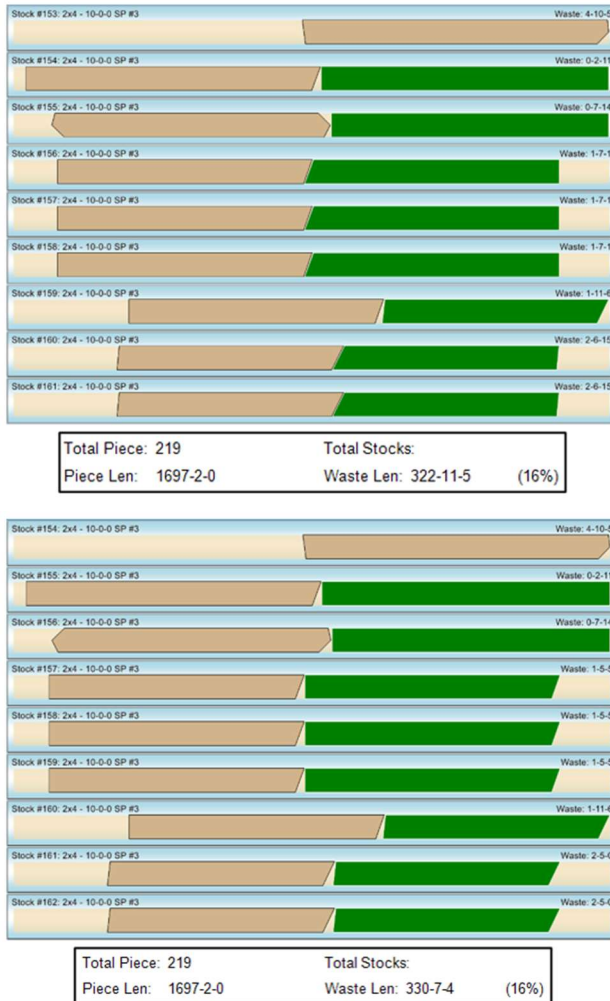


FIGURE 84 FLIP ROTATE ON & OFF

3.6.8.1.2 Double Stack

Default setting is **"OFF"** and selecting the toggle will switch it to **"ON"** which will then cause the program to look for stocks with identical piece layout for use with the double stack function. When the identified stocks are to be loaded from the live deck, the lumber will be stacked vertically before entering the saw cabinet.

3.6.8.1.3 Combine Stocks in Picklist

Default setting is **"OFF"** and selecting the toggle will switch it to **"ON"** which will then combine the pieces of the same grade within the TRS job files. When the user creates a pick list it will combine all pieces of the same width and grades together.

3.6.8.1.4 Square Cut Long Waste

Default setting is **"OFF"** and selecting the toggle will switch it to **"ON"** which will then cause the program to trim long waste with a 90° cut. This feature allows waste of a great enough length to be used as stock for other jobs.

3.6.8.1.5 Length Accuracy Alert

Default setting is **"OFF"** and selecting the toggle will switch it to **"ON"** which will then cause the program to alert the user when it detects that stock loaded from the infeed does not match the stock length requested by the program.

3.6.8.1.6 Use Double Spacing

Default setting is **"OFF"** and selecting the toggle will switch it to **"ON"** which will then place a distance between nested pieces equal to the value designated in the "Double Spacing" text box. When this option is toggled **"OFF"**, the pieces will only be separated by the kerf thickness.

3.6.8.1.7 Optimize Method

(THE FIGURES FOR EACH METHOD ARE USING THE SAME LUMBER LIST AND TRS FILE FOR VALID COMPARISON.)

This section will explain in detail the four optimization methods available on the ALS 5.0 program. There is a dropdown selection containing the choices to designate for optimization and a toggle selection for use in conjunction with "Cut by Truss."

- ◆ No Optimize (Cut in Order)

This method will cause the program to cut all pieces as they are listed in the job file. Pieces are placed on the stock from leading to trailing edge in the order they appear within the job. This mode tends to leave the greatest amount of waste.

Lumber Pick List						
Job Name: TrussSingle		Total Piece: 58		Total Stocks:		
Totals: Stock Len: 540-0-0		Piece Len: 432-5-13		Waste Len: 108-0-9 (20%)		
Qty	Size	Length	Grade		OPTIMIZE METHOD:	
12	2x4	20	SPF #1/#2	0.0	No Optimize (Cut in Order)	
1	2x4	20	SPF Stud	0		
2	2x4	20	SPF #1/#2	0.0		
1	2x4	20	SP #3	0		
1	2x4	20	SPF Stud	0		
4	2x4	20	SPF #1/#2	0.0		
1	2x4	20	SPF Stud	0		
4	2x4	20	SPF #1/#2	0.0		
1	2x4	20	SPF Stud	0		

FIGURE 85 PICK LIST NO OPTIMIZE

◆ Optimize

This method will cause the program to fully optimize the cut order to reduce lumber waste as much as possible. The process is explained in depth in [Section 3.7](#), but a broad explanation is that the program searches the entire job for pieces that best utilize the available stock. Pieces are placed on the stock from leading to trailing end and the longest piece in each selection is placed on the leading end of the stock. Grade requirements are maintained during the selection process. "Optimize" is the preferred method.

Lumber Pick List					
Job Name: TrussSingle		Total Piece: 58		Total Stocks:	
Totals: Stock Len: 540-0-0		Piece Len: 432-5-13		Waste Len: 108-1-13 (20%)	
Qty	Size	Length	Grade	OPTIMIZE METHOD:	
4	2x4	20	SPF Stud	Optimize	
22	2x4	20	SPF #1/#2		
1	2x4	20	SP #3		

FIGURE 86 PICK LIST OPTIMIZE

◆ Cut by Truss

This method will cause the program to cut pieces sorted by truss, provided the trs file contains labeling for trusses. The program will cut all the pieces listed under the first truss and then move on to cutting all the pieces for the next truss and proceed to do so until all pieces are cut. When creating a pick list or attempting to run the job, the user is given a list of the trusses present and the option to select the desired trusses and alter their place in the cut order. Does not work with "Sort Order" options.

Lumber Pick List					
Job Name: TrussSingle		Total Piece: 58		Total Stocks:	
Totals: Stock Len: 540-0-0		Piece Len: 432-5-13		Waste Len: 107-11-1 (20%)	
Qty	Size	Length	Grade	OPTIMIZE METHOD:	
1	2x4	20	SPF Stud	Cut by Truss	
12	2x4	20	SPF #1/#2		
1	2x4	20	SPF Stud		
2	2x4	20	SPF #1/#2		
1	2x4	20	SP #3		
1	2x4	20	SPF Stud		
4	2x4	20	SPF #1/#2		
1	2x4	20	SPF Stud		
4	2x4	20	SPF #1/#2		

FIGURE 87 PICK LIST CUT BY TRUSS

◆ Truss Selection Pop-up

Screen used for selecting trusses under both the "Cut by Truss" optimization methods. The window on the left of the pop-up shows available trusses in the TRS file. The window on the right of the pop-up shows the trusses selected from the TRS file. The single arrows in the middle move the selected truss in the direction indicated. The double arrows move all trusses in the direction indicated. The arrows on the far right move all trusses in the direction indicated. The checkmark confirms selections, and X closes the pop-up screen.

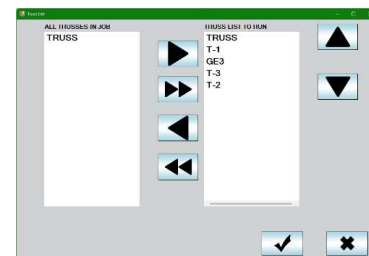


FIGURE 88 TRUSS SELECTION

◆ Cut by Truss (Single)

This method will cause the program to cut pieces sorted by truss, provided the trs file contains labeling for trusses. The major difference that comes with the (Single) method is that the program will separate the trusses further by quantity. If a truss requires ten pieces and there is a quantity of five trusses the program will no longer optimize the fifty pieces together. The ten required pieces will be optimized and placed in the cut order. This will be repeated identically four more times until the truss quantity is satisfied. Then the program will move on to the next truss and cut its requirements individually until the second truss quantity is satisfied. The program will proceed as such until all trusses are cut. When creating a pick list or attempting to run the job, the user is given a list of the trusses present and the option to select the desired trusses and alter their place in the cut order the same as "Cut by Truss." Does not work with "Sort Order" options.

Lumber Pick List					
Job Name: TrussSingle		Total Piece: 58	Total Stocks:		
Totals: Stock Len: 720-0-0		Piece Len: 432-5-13	Waste Len: 288-6-8 (40%)		
Qty	Size	Length	Grade	OPTIMIZE METHOD:	
13	2x4	20	SPF Stud	Cut by Truss (Single Truss)	
22	2x4	20	SPF #1/#2		
1	2x4	20	SP #3		

FIGURE 89 PICK LIST CUT BY TRUSS (SINGLE)

◆ Look Ahead Last Stock

This setting will cause the program to begin the next truss in the waste of the final stock of the current truss.

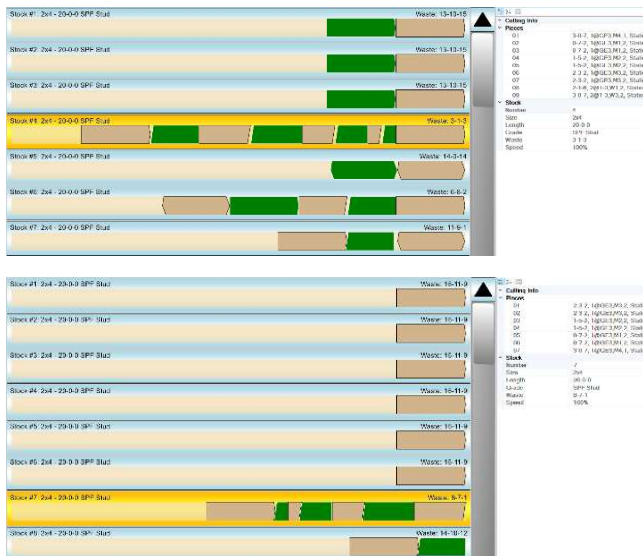


FIGURE 90 WITH AND WITHOUT LOOK AHEAD LAST STOCK

3.6.8.1.8 Use Small Parts Handler

- ◆ Default setting is **"OFF"** and selecting the toggle will switch it to **"ON"** which will then utilize the small parts handler (SPH) assembly located under the L2 assembly. The SPH transfers short pieces that are within the small parts range onto the L2 belt.
- ◆ The small parts range is used to designate which pieces will trigger the SPH to engage and move pieces to L2.

3.6.8.1.9 Sort Order

(DOES NOT WORK WITH "CUT BY TRUSS" OPTIMIZATION)

METHODS. ALL SORT SELECTIONS SHOULD BE DELETED IF USING ONE OF THE "CUT BY TRUSS" METHODS.)

This setting controls the order that pieces appear in the pick list and can be overruled by the "Combine Stocks in Picklist" option. The **(+)** button will open the screen below to add sort options to the window. The **(X)** button will remove a value selected from the window, while the arrow keys will move the selected value in the direction indicated.

FIGURE 91 CREATE SORTING WINDOW

This window contains a dropdown box with four selections for the user to choose from. Beside the dropdown as an area for selecting the sort style, "Descending" or "Ascending." Selecting the checkmark confirms the selection and adds it to the sort window, while the **(X)** will close the screen without adding the selection.

(DESCENDING-STARTS WITH GREATEST VALUE AND PROCEEDS TO LEAST.)

(ASCENDING-STARTS WITH LOWEST VALUE AND PROCEEDS TO GREATEST.)

- ◆ **Length:** Sorts pick list stock by length with the corresponding sub option for direction.
- ◆ **Width:** Sorts pick list stock by width with the corresponding sub option for direction.
- ◆ **Grade:** Sorts pick list stock by with the corresponding sub option for direction.
- ◆ **LongestCutPiece:** Selecting this option causes the optimizer to look through the job for the longest uncut piece that will fit on the stock each time it places a piece for cutting. This is helpful when files are not sorted long to short and so the longer pieces can be cut first for stacking purposes. When this option is off, the optimizer places the first uncut piece in the file that will fit on the stock regardless of length.

3.6.9 Bevel

(BEVEL ADJUSTMENTS SHOULD ONLY BE MADE AFTER THE MACHINE IS FULLY CALIBRATED.)

(Refer to Section 4.1)

FIGURE 92 BEVEL OPTIONS

This tab contains options that control adjustments made to cutting bevels. Default values should be set to 0 and then adjusted until the centerline and length measurements are correct. The bevel options are grouped by the type of end cut they are placed on.

Always cut three or four like pieces before deciding the amount of adjustment to be made. Warped lumber can significantly affect both centerlines and overall length of bevel pieces. Marking the stock to designate the top and bottom faces will assist in selecting the correct direction for the adjustments to be made. No bevel adjustment (aside from rip valley) should exceed a value over an inch, and many should be significantly less. Contact Alpine Customer Support if bevel adjustments need to be made greater than this, to ensure there are no other factors at play.

When measuring the centerline, always measure from the bottom of the piece. The bottom of the piece is held against the roller bed and should have the least amount of variance from the lumber.

3.6.9.1 90 Deg Bevel Adjustments

A 90° bevel refers to a bevel performed on the end of the piece that is set at a 90° flush cut. A double bevel is a pair of bevels on opposite faces of the stock, while a single bevel is performed only on one face of the stock.

FIGURE 93 90 DEG BEVEL ADJUSTMENTS

3.6.9.1.1 Dbl Bevel Leading Edge

These settings control the adjustments for double bevels performed on the leading edge of the stock, when it is set to a 90° flush cut. Length adjusts the overall length of the stock, height adjusts the height of the centerline, and Height adjust sweep, adjusts the height of the centerline when the machine uses a sweep technique to perform the bevel. Select the text box and input the desired adjustment with the user interface or keyboard. Positive values add length or height, and negative values subtract.

3.6.9.1.2 Dbl Bevel Trailing Edge

These settings control the adjustments for double bevels performed on the trailing edge of the stock, when it is set to a 90° flush cut. Length adjusts the overall length of the stock and height adjusts the height of the centerline, Select the text box and input the desired adjustment with the user interface or keyboard. Positive values add length or height, and negative values subtract.

3.6.9.1.3 Single Bevel Leading Adjustments

These settings control the adjustments for single bevels performed on the leading edge of the stock, when it is set to a 90° flush cut. Front Face refers to the bevel that can be seen from the top of the stock, and Back Face refers to a bevel that is visible from the bottom of the stock. The adjustments affect the overall length of the piece when a bevel is present. Select the text box and input the desired adjustment with the user interface or keyboard. Positive values add length or height, and negative values subtract.

3.6.9.1.4 Single Bevel Trailing Adjustments

These settings control the adjustments for single bevels performed on the leading edge of the stock, when it is set to a 90° flush cut. Front Face refers to the bevel that can be seen from the top of the stock, and Back Face refers to a bevel that is visible from the bottom of the stock. The adjustments affect the overall length of the piece when a bevel is present. Select the text box and input the desired adjustment with the user interface or keyboard. Positive values add length or height, and negative values subtract.

3.6.9.2 Non 90deg Bevel Adjustments

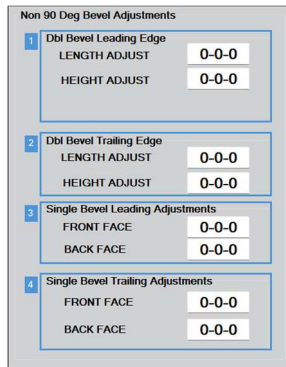


FIGURE 94 NON-90 BEVEL ADJUSTMENTS

3.6.9.2.1 Dbl Bevel Leading Edge

These settings control the adjustments for double bevels performed on the leading edge of the stock, when it is set to a non-90° end cut. Length adjusts the overall length of the stock, height adjusts the height of the centerline, and Height adjust sweep, adjusts the height of the centerline when the machine uses a sweep technique to perform the bevel. Select the text box and input the desired adjustment with the user interface or keyboard. Positive values add length or height, and negative values subtract.

3.6.9.2.2 Dbl Bevel Trailing Edge

These settings control the adjustments for double bevels performed on the trailing edge of the stock, when it is set to a non-90° end cut. Length adjusts the overall length of the stock and height adjusts the height of the centerline, Select the text box and input the desired adjustment with the user interface

or keyboard. Positive values add length or height, and negative values subtract.

3.6.9.2.3 Single Bevel Leading Adjustments

These settings control the adjustments for single bevels performed on the leading edge of the stock, when it is set to a non-90° end cut. Front Face refers to the bevel that can be seen from the top of the stock, and Back Face refers to a bevel that is visible from the bottom of the stock. The adjustments affect the overall length of the piece when a bevel is present. Select the text box and input the desired adjustment with the user interface or keyboard. Positive values add length or height, and negative values subtract.

3.6.9.2.4 Single Bevel Trailing Adjustments

These settings control the adjustments for single bevels performed on the leading edge of the stock, when it is set to a non-90° end cut. Front Face refers to the bevel that can be seen from the top of the stock, and Back Face refers to a bevel that is visible from the bottom of the stock. The adjustments affect the overall length of the piece when a bevel is present. Select the text box and input the desired adjustment with the user interface or keyboard. Positive values add length or height, and negative values subtract.

3.6.9.3 Bevel Spacing

Controls the amount of space between pieces when they are laid out on the stock where at least one of the pieces has a bevel condition. Leave this value at 0 unless you are having trouble with bevel cuts that encroach on adjacent pieces. The spacing is categorized into single and double bevel spacing.

3.6.9.4 Adjustments

- ◆ **Floor Web Length Adjust-** This adjusts the overall length of a piece that has a double bevel on both ends.
- ◆ **Cut Single Floor Backface-** Also referred to as a "CAT Cut" and refers to

3.6.9.5 Rip Valley Adjustments

(ALSO REFERRED TO AS VALLEY BEVEL)

- ◆ **Rip Valley Length Adj-** Allows for the adjustment of the overall length of the rip valley.

- ♦ **Rip Valley Offset-** Allows for the adjustment of the location of the rip valley. Used to control the edge of the valley, to create a sharp point or a rounded edge per customer preference.

3.6.10 Standard Pieces

Standard pieces is a software option that will automatically cut frequently used pieces. It even works without optimizing or nesting. Examples of standard pieces might include chords and webs for short jacks, heel wedges and sliders, blocks for floor trusses, even floor truss webs.

How it works

Once pieces that are used frequently across cutting operations have been identified, they can be set as standard pieces. Doing so will add them to a list used by the ALS 5.0 software. What makes this feature unique is that it does not add lumber stock to the cutting jobs. Using the standard pieces function places pieces on the list onto any leftover lumber within the job. Using standard pieces will make the best use of material waste, so that the least amount of lumber is left unused.

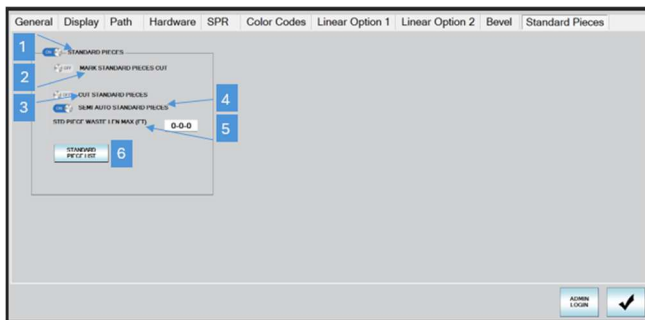


FIGURE 95 STANDARD PIECES OPTIONS

3.6.10.1 Standard Pieces

This toggle controls whether the machine will cut standard pieces from waste or not. Setting the toggle to **"ON"** will allow standard pieces to be added, and **"OFF"** will not allow them, and lock out all functions below it.

3.6.10.2 Mark Standard Pieces

This toggle controls whether the program will still cut standard pieces from jobs. When it is set to **"ON"** any pieces that appear within a job file and

the standard piece list will be marked as cut and not added to the cut list when running the job. This is to allow the stockpile of standard pieces to be used and avoid cutting more of the standard pieces than is needed.

3.6.10.3 Cut Standard Pieces

This toggle controls whether the program will add standard pieces to jobs cut on the auto screen.

3.6.10.4 Semi Auto Standard Pieces

This toggle controls whether the program will add standard pieces to jobs cut on the semi-auto screen.

3.6.10.5 Std Piece Waste Len Max (FT)

This setting allows the user to input the desired maximum waste size to be used for standard pieces. Anything over the set length will be allowed to exit the saw for use as stock.

3.6.10.6 Standard Piece List

This button opens the "Standard Pieces List" screen where users can toggle the standard pieces as active or inactive, as well as assign their priority. Double clicking the current priority order, the user can type in a new value. Selecting elsewhere will update the positioning of the pieces. Alternatively, the user can drag and drop the pieces into the desired order.

Pieces can be added to the "Standard Pieces List" screen from either the "Piece Utilities" on the auto screen (Section 3.2.4) or on the semi-auto screen (Section 3.3.10.5)

3.6.11 Admin Login

This button opens the login screen for admin controls. Once the correct password is entered, options that were previously 'greyed-out' and inaccessible will now be available for alteration.

3.6.12 Accept

Selecting this button accepts all changes made, closes the screen, and then reverts to the screen that was open before selecting the options button.

3.7 OPTIMIZATION

3.7.1 Introduction

The ALS optimizer is an innovative software feature designed to maximize cutting and reduce waste. Using this feature can result in 8-10% savings in material required by the saw to complete the job. As each plant is run differently, the optimizer is flexible and can be set up to maximize lumber usage, resulting in a reduction in waste. This section will outline all the options available to set up the optimizer. Before setting up the optimizer it is important to evaluate how lumber is purchased. Linear saws differ greatly from component saws in the way jobs are cut. A series of cuts are set up on a board within the software prior to the stock advancing into the saw. The optimizer function will nest pieces together on stock to maximize lumber usage. Longer lumber stock will accommodate a greater amount of nesting on each board. This being the case, Alpine recommends feeding the ALS 5.0 the longest length of lumber available. This will allow the optimizer to nest more pieces on each board.

3.7.2 How it Works

For a given length of stock, the optimizer looks through a cutting file for a combination of pieces that can be cut from that stock with minimum waste. The computer will analyze thousands of combinations and return the best solution in a fraction of a second. Shown in Figure 84 are examples of cuts made using the optimizer:



FIGURE 96 OPTIMIZED CUTS

If the pieces shown were to be cut on a component saw, an 8' stock would be required for the 7-4-5 piece and a 10' stock would be required for the 8-4-12 piece. The resulting waste would be 2-2-15. By placing both these pieces on a 16-0-0 stock the waste is reduced to 0-5-4. This is a reduction of 1-7-9, or 9.1%. The pieces in the examples are "nested," meaning they overlap on the stock. Nesting allows the computer-generated length to be greater than the actual stock length. After pieces have been

nested on the stock, the computer recalculates the extra material made available by the nesting process and searches the file again for additional pieces that can be added to that stock. Many times, the pieces that can be added are rather short. That is one reason why the optimizer yields better waste reduction when the job contains a mix of short and long pieces.

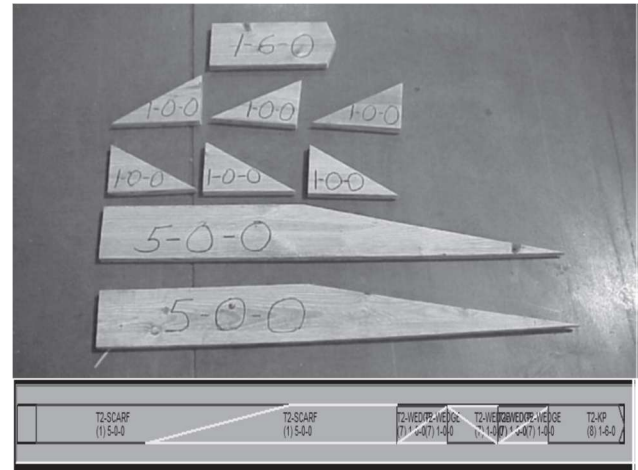


FIGURE 97 NESTING CUTS

Figure 85 shows a layout combination of 2 pieces (5-0-0), 6 pieces (1-0-0), and 1 piece (1-6-0) totaling 17-6-0 in length. The ALS optimizer automatically combined all these pieces with nesting and cut them from a single piece of lumber measuring 12-0-0.

Using the optimizer, cutting potential is maximized while waste is minimized. Below is a comparison of an ALS 5.0 and a component saw. The two photos highlight the advantage of using the optimizer feature on the ALS 5.0.

Example: The job chosen for this comparison contained 11 trusses and 121 pieces.	
ALS 4.0 Stock lengths of 14, 16, and 18 ft. were used.	Component Saw Stocks lengths of 8, 10, and 12 ft. were used in all three runs. The job was cut three times with waste longer than 2-0-0, 2-9-0, and 3-0-0 respectively recycled back through the component saw or a radial arm saw.
	
ALS 4.0 WASTE = 0.68%	COMPONENT SAW WASTE Recycle 2-0-0: 9.31% Recycle 2-9-0 (above): 11.79% Recycle 3-0-0: 13.87%

FIGURE 98 LINEAR VS COMPONENT COMPARISON

4 MAINTENANCE

4.1 CALIBRATION AND ALIGNMENT

4.1.1 Turn Off Power

When maintenance requires someone to enter the saw cabinet be sure to fully power down the machine and follow "Lockout-Tagout" safety practices.

- ◆ Turn off the program and shut down the computer.
- ◆ Open the saw cabinet door (will lock and cannot be opened when powered down)
- ◆ Turn the main disconnect to the "OFF" position and remove the air supply if needed.
- ◆ While in the saw cabinet be sure that the main disconnect is locked out and tagged per Osha procedures. (i.e. OSHA 29 CFR 1910.147)

4.1.2 L1/L2 Belt Feeder Alignment

Step 1 – Use a straight edge (aluminum bar is recommended) on the belt and against the back fence. Refer to Figure 87.

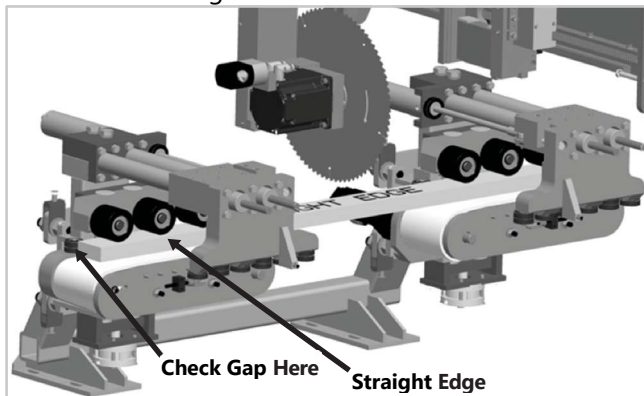


FIGURE 99 BELT ALIGNMENT

Step 2 – Place the straight edge on the side plates and ensure the straight edge has no more than a

.010" (.25mm) gap between both side plates. Refer to Figure 88.

Step 3 – With a level on both side plates ensure both L1 and L2 feeders are level. Refer to Figure 88.

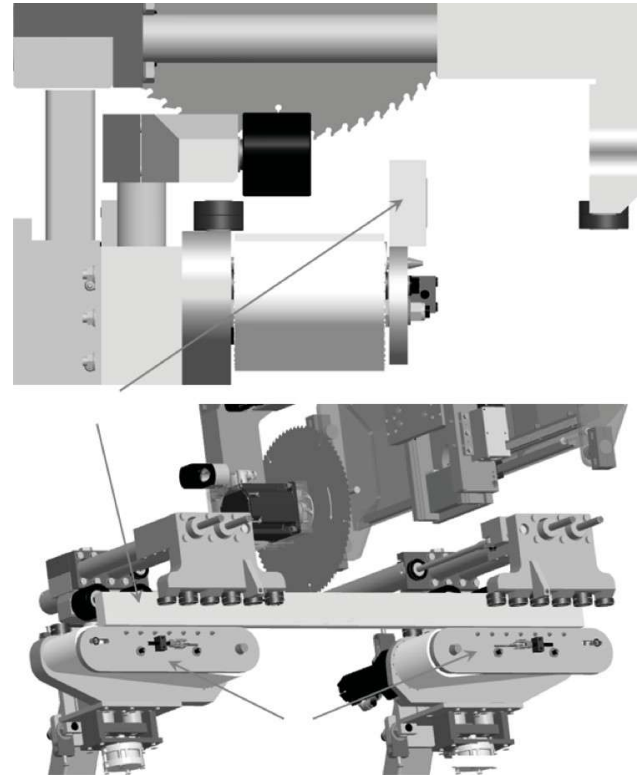


FIGURE 100 ALIGNMENT ON SIDE PLATES

4.1.3 L1/L2 Belt Tension Adjustment

To keep the ALS 5.0 running smoothly, it may be necessary to adjust the belt tension from time to time.

Step 1 – Loosen the idler sprocket bolts on both the front and back sides of the drive assembly, then loosen the locknuts.

Step 2 – Using a 9/16" wrench, adjust the belt tension assembly so that the belt can only be pulled away from the rollers by 1/4". Torque the adjustment nut to 40 in-lbs.

Step 3 – Once the belt has been properly tensioned, tighten the idler sprocket bolts on **both sides** of the drive assembly and the two lock nuts

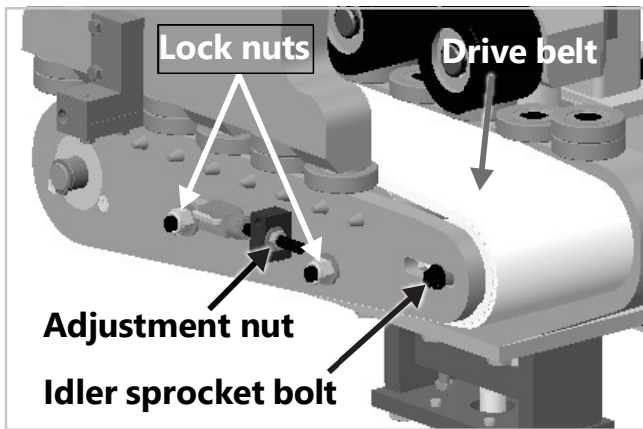


FIGURE 101 SIDE PLATE NUTS

4.1.4 Infeed & Outfeed Alignment

The back fence of the infeed, L1 assembly, and L2 assembly must all be aligned to ensure proper transfer of lumber from the L1 drive to the L2 drive.

4.1.4.1 Infeed

Begin by using a straight piece of lumber (preferably LVL) of the greatest length available. Then place the lumber across L1 and L2 with the excess resting on the infeed. Engage the pushers and clamps on both the L1 and L2 assemblies. Then measure the distance between the lumber and the back fence. The measurement of the gap should be 1/8th in down the length of the board. Adjust the infeed by loosening the shoulder bolts on the strands and the bolts holding the infeed to the anchored legs.

4.1.4.2 Outfeed

Begin by using a straight piece of lumber (preferably LVL) of the greatest length available. Then place the lumber across L1 and L2 with the excess resting on the outfeed. Engage the pushers and clamps on both the L1 and L2 assemblies. Then measure the distance between the lumber and the back fence. The measurement should be less than 1 in down the length of the board and never close enough to rub the back fence. The lower corner of the rollers makes a good reference point to align the outfeed against. Adjust the outfeed by loosening the bolts holding

the rollers to anchored legs as well as the ones holding the outfeed to the anchored legs.

If adjustment is required, please contact Alpine Equipment Customer Service for assistance in completing this procedure.

4.1.5 Check Alignment of the T/Z Slide

Step 1 – Place a piece of machined lumber that is at least 7.25" wide across the L1 and L2 belts.

Step 2 – Engage the L1 & L2 pushers by toggling the "L1 Pusher" and "L2 Pusher" buttons on the manual control screen to the "IN" position.

Step 3 – Engage the L1 & L2 clamps by toggling the "L1 Clamp" and "L2 Clamp" buttons on the manual control screen to the "DOWN" position.

Step 4 – Move B1 to "0" using the "Move to" button on the axis control screen.

Step 5 – Move A1 to "90" using the "Move to" button on the axis control screen.

Step 6 – Move T1 to "-2" using the "Move to" button on the axis control screen.

Step 7 – Move Z1 to "2" using the "Move to" button on the axis control screen.

Step 8 – Start the blade by toggling the "Blade" button to "ON" on the manual control screen.

Step 9 – Use the "Jog Forward" button on the axis control screen to manually jog T1 forward until a groove is cut across the full width of the lumber.

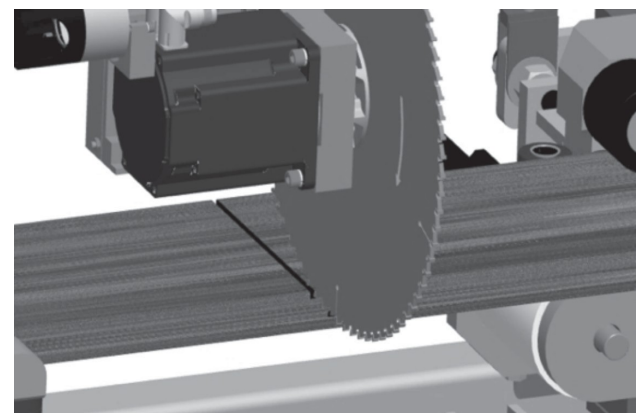


FIGURE 102 T/Z SLIDE CHECK

Step 10 – Move Z1 back to “0” using the “Move to” button on the axis control screen.

Step 12 – Stop the blade by toggling the “Blade” button to “OFF” on the manual control screen.

Step 13 – Release the L1 & L2 clamps by toggling the “L1 Clamps” and “L2 Clamp” buttons on the manual control screen to the “OUT” position.

Step 14 – Release the L1 & L2 pushers by toggling the “L1 Pusher” and “L2 Pusher” buttons on the manual control screen to the “OUT” position.

Step 15 – Use a framing square on the edge of the board that was against the fence to check the groove as shown.



FIGURE 103 VERIFYING GROOVE FOR SLIDE CHECK

Step 16 – If the cut is square, the calibration procedure has been successfully completed. If not, then please contact Alpine Equipment Customer Service for assistance.

4.1.6 Calibrate Bevel Axis(B1)

Step 1 – Place a magnetic digital angle gauge on the Z1 linear rails.

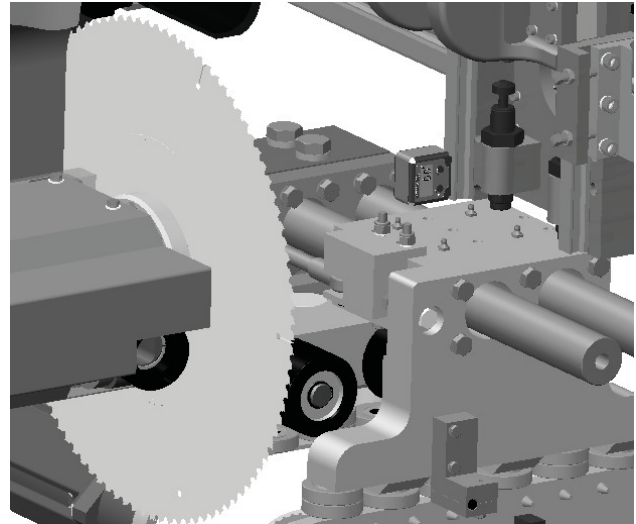


FIGURE 104 ZERO DIGITAL ANGLE GAUGE

Step 2 – Select the “zero” button on the gauge to set the angle to 0.0.

Step 3 – Once the gauge has been set to 0.0, remove the gauge from the rail and place it on the blade as shown.

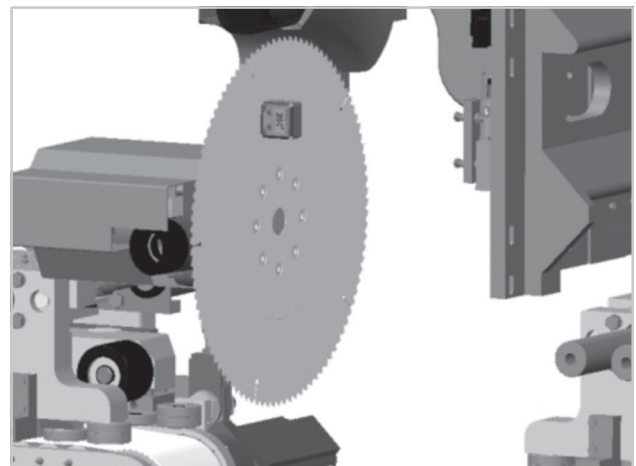


FIGURE 105 DIGITAL ANGLE GAUGE ON BLADE

Step 4 – Close the saw door and clear the E-Stop.

Step 5 – Locate the blade breaker CB 122 and switch to the ‘OFF’ position to disable power to the blade motor.

Step 6 – On the manual control screen, verify that B1 is registering “0.0”.

Step 7 – Read the screen of the digital angle gauge. Depending on the design it should show either 180° or 0°, and if so then the axis is calibrated. If not use the

jog buttons on the B1 axis control screen to jog until the gauge reads a parallel value and select the calibrate button.

Step 8 – Remove the gauge.

Step 9 – Switch breaker CB 122 back to the 'ON' position.

4.1.7 Calibrate the Cut Angle (A1)

Step 1 – Place the widest piece of stock available onto the live deck.

Step 2 – On the "Semi" screen, select the stock in use and set the "Overall Length" to 1/4in.

Step 3 – Add the piece to stock and perform the cut.

Step 4 – Once the stock is ejected check the 90° cut with a framing square, referencing from back fence side of the board.

Step 5 – If the cut is square then the calibration of the A1 is complete – proceed to the next section. If not, continue to Step 6.

Step 6 – If the cut was not square to the framing square, determine if the cut is more or less than 90° by observing the location of the gap next to the blade of the framing square. If the gap is on the inside corner of the square (near the back fence edge of the board), then the cut is more than 90°. Subtract the value of the gap from 90° and input that value with the "Move to" button on the A1 axis control screen. If the gap is near the front of the board, away from the inside corner of the square, then the cut is less than 90°. Add the value of the gap to 90° and input that value with the "Move to" button on the A1 axis control screen.

Step 7 – Once the correct value has been added, select the calibrate button. Then repeat steps 1-6 as necessary until the framing square is flush with the 90° cut.

4.1.8 Calibrate Center of Rotation

The width of the Center of Rotation cut must be 15/32" (11.91mm). This dimension is twice the kerf (width of the cut made by the saw blade).

Step 1 – Place a 2x4 stock onto the live deck.

Step 2 – Select the "Load Lumber" button on the manual control screen. Once the board is loaded

into L1, link L1 & L2 from one of their axis control screens and jog them forward until the stock is across L2 as well.

Step 3 – Engage the L2 pusher and then the clamps by toggling the "L2 Pusher" to "IN" and the "L2 Clamp" to "DOWN" on the manual control screen.

Step 4 – Move T1 to "1.75" using the "Move to" button on the T1 axis control screen.

Step 5 – Confirm Z1 is at "0.0".

Step 6 – If the saw is equipped with a bevel axis, confirm that B1 is at "0.0".

Step 7 – Move A1 to 90° using the "Move to" button on the A1 axis control screen.

Step 8 – Start the blade by toggling the "Blade" button to "ON" on the manual control screen.

Step 9 – Jog Z1 down using the "Jog Z1 Down Slow" button on the Z1 axis control screen until it cuts 3/8in into the stock.

Step 10 – Move Z1 back to "0.0" using the "Move to" button on the Z1 axis control screen.

Step 11 – Move A1 to 270° using the "Move to" button on the A1 axis control screen.

Step 12 – Jog Z1 down using the "Jog Down Slow" button on the Z1 axis control screen until it cuts 1/4in into the stock.

Step 13 – Move Z1 back to "0.0" using the "Move to" button on the Z1 axis control screen.

Step 14 – Stop the blade by toggling the "Blade" button to "OFF" on the manual control screen.

Step 15 – Select the "Eject Lumber" button from the manual control screen.

Step 16 – Measure the total width of the cuts. If the cut measures exactly 15/32" it is correct, and the calibration of the Center of Rotation is complete – proceed to the next section. If not, continue to Step 18.

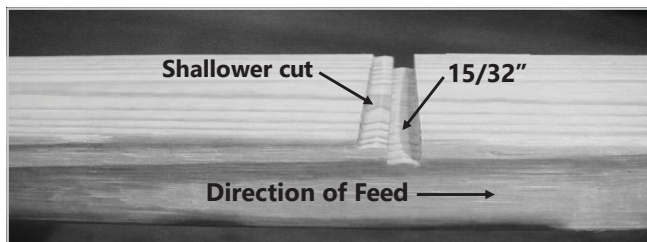


FIGURE 106 CENTER OF ROTATION CUTS

Step 18 – Open the door to the saw cabinet and perform the shutdown process outlined in [Section 4.1.1](#).

Step 19 – Loosen the four bolts shown in Figure 107.

If the saw does not have bevel capability, remove the B-axis cover plate for access to the fourth motor mount bolt.

If the saw does have bevel capability, rotate B1 until the 4th motor mount bolt is accessible (approximately 35°).

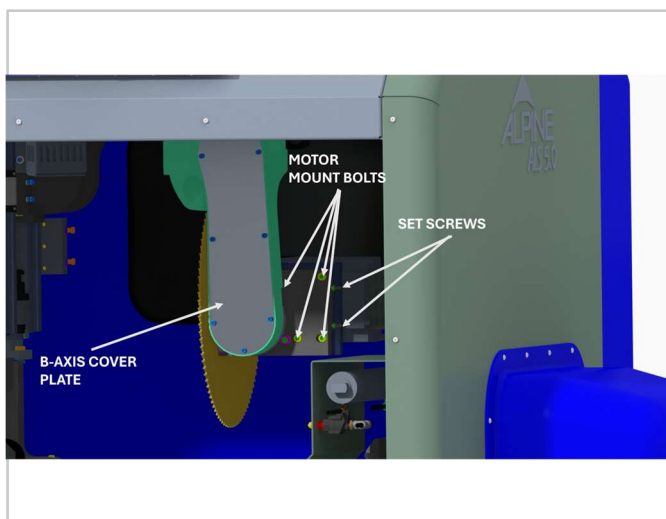


FIGURE 107 MOTOR BOLT LOCATIONS

Step 20 – Use the set screws to move the motor one half the amount of the difference between the measurement taken and the required 15/32". Be careful to move the motor in the correct direction. With A1 at 90°, move the motor towards L2 if the Center of Rotation cut is too narrow and towards L1 if it is too wide.

Step 21 – Tighten the motor mount bolts.

Step 22 – Remove the lockout/tagout.

Step 23 – Power on the ALS 5.0 and follow Steps 1-16 until correct value is measured.

4.1.9 Calibrate Centerline (T1)

Step 1 – Place a 2x4 stock onto the live deck.

Step 2 – Select the **"Load Lumber"** button on the manual control screen. Once the board is loaded into L1, link L1 & L2 from one of their axis control screens and jog them forward until the stock is across L2 as well.

Step 3 – Engage the L2 pusher and then the clamps by toggling the "L2 Pusher" to **"IN"** and the "L2 Clamp" to **"DOWN"** on the manual control screen.

Step 4 – Move T1 to "1.75" using the **"Move to"** button on the T1 axis control screen.

Step 5 – Confirm Z1 is at "0.0".

Step 6 – If the saw is equipped with a bevel axis, confirm that B1 is at "0.0".

Step 7 – Move A1 to 45° using the **"Move to"** button on the A1 axis control screen.

Step 8 – Start the blade by toggling the "Blade" button to **"ON"** on the manual control screen.

Step 9 – Jog Z1 down using the **"Jog Down Slow"** button on the Z1 axis control screen until it cuts 3/8in into the stock.

Step 10 – Move Z1 back to "0.0" using the **"Move to"** button on the Z1 axis control screen.

Step 11 – Move A1 to 135° using the **"Move to"** button on the A1 axis control screen.

Step 12 – Jog Z1 down using the **"Jog Down Slow"** button on the Z1 axis control screen until it cuts 1/4in into the stock.

Step 13 – Move Z1 back to "0.0" using the **"Move to"** button on the Z1 axis control screen.

Step 14 – Stop the blade by toggling the "Blade" button to **"OFF"** on the manual control screen.

Step 15 – Select the **"Eject Lumber"** button from the manual control screen.

Step 16 – Measure the distance from the back fence side of the lumber to the middle of the centerline cut using a framing square. This dimension should be

1.75" (45mm). If so, it is calibrated – proceed to the next section. If not continue to Step 17.



FIGURE 108 CENTER POINT CUTS FOR T1

Step 17 – If the centerline is off, determine if the measured value is over or under the desired.

Step 18 – If the measured value is over, subtract the difference from 1.75. If it is under, add the difference to 1.75.

Step 19 – Move B1 by inputting the calculated value with the “Move to” button on the T1 axis control screen and then calibrate.

Step 20 – Repeat steps 1-16 until correct value measured.

4.1.10 Calibrate Cut Length (L1/L2)

Step 1 – On the semi auto screen, set a piece to be cut one inch shorter than the greatest length of stock available.

Step 2 – Reduce the cut length by one inch and repeat the cut.

Step 3 – If both cuts are accurate, the cut length is calibrated, proceed to the next section.

If “Cut 1” and “Cut 2” are both long/short by the same amount proceed to the next step.

If the two cuts are off by different amounts, contact Alpine Equipment Customer Service for additional guidance, as this will not be resolved by calibration.

Step 4 – To calibrate L1/L2, select either of their axis control screens, and then the calibrate button.

Step 5 – Enter the commanded distance (the length input) and the actual measured distance.



FIGURE 109 CALIBRATE LENGTH

Step 8 – Repeat steps 1-3 until the commanded and measured distances are identical.

4.2 PARTS IDENTIFICATION

Visual aid for identifying parts on the ALS 5.0 along with Alpine Part Numbers for ordering ease.

4.2.1 Infeed Assembly

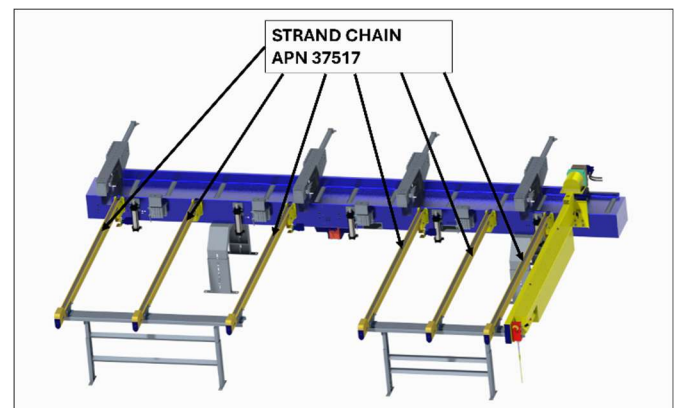


FIGURE 110 INFED STRANDS

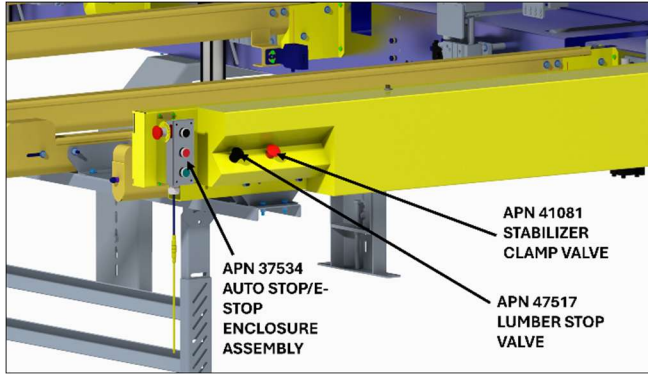


FIGURE 111 INFEED CONTROLS

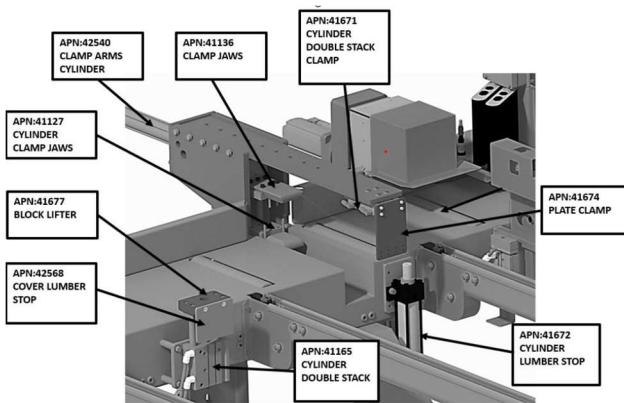


FIGURE 112 INFEED CLAMPS, GRIPPERS, RISERS, & STOPS

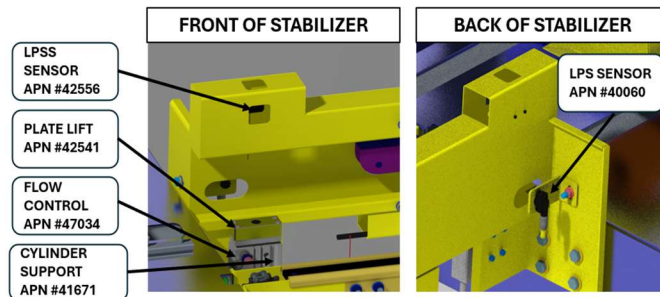


FIGURE 113 INFEED STABILIZER SENSORS

4.2.2 Outer Saw Cabinet

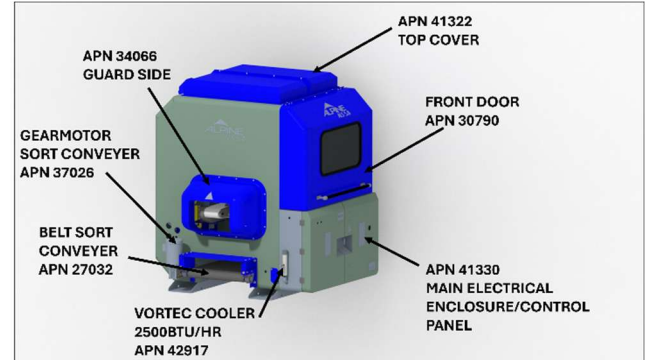


FIGURE 114 CABINET LEFT & FRONT

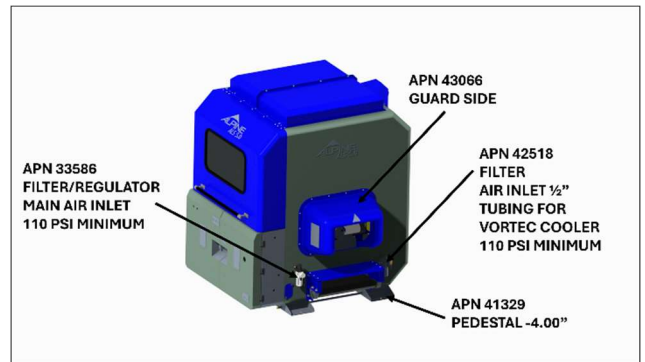


FIGURE 115 CABINET RIGHT SIDE

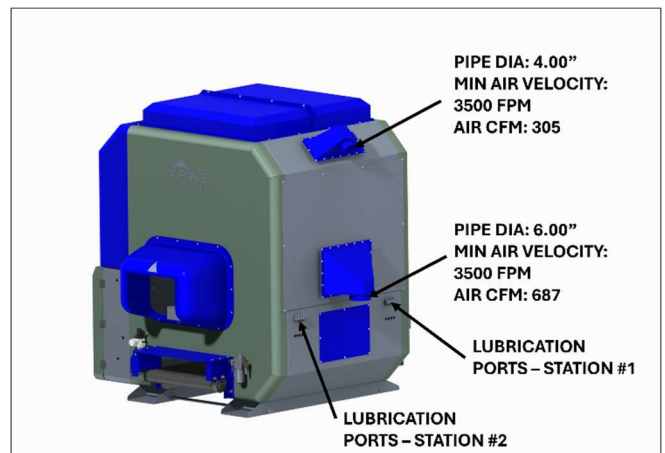


FIGURE 116 BACK OF CABINET

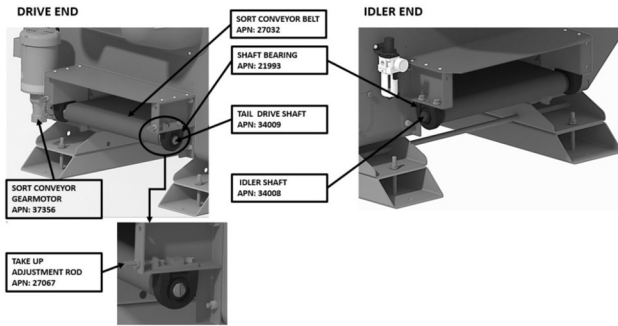


FIGURE 117 SORTING CONVEYOR

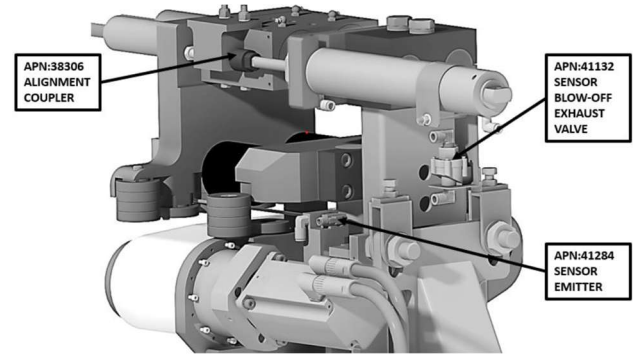


FIGURE 120 L1/L2 REAR VIEW

4.2.3 Saw Cabinet Assemblies

4.2.3.1 L1/L2 Assembly

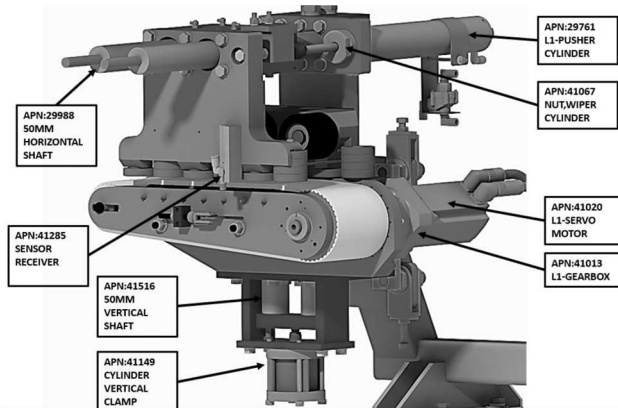


FIGURE 118 L1/L2 ASSEMBLY

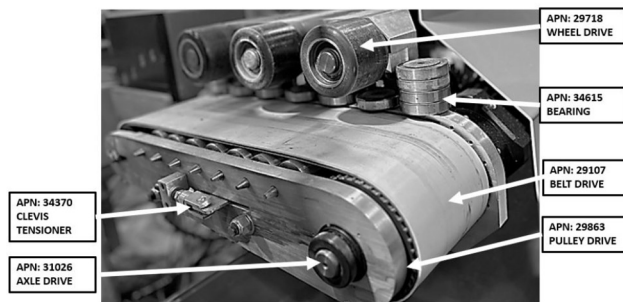


FIGURE 119 L1/L2 BELT ASSEMBLY

4.2.3.2 Saw Head

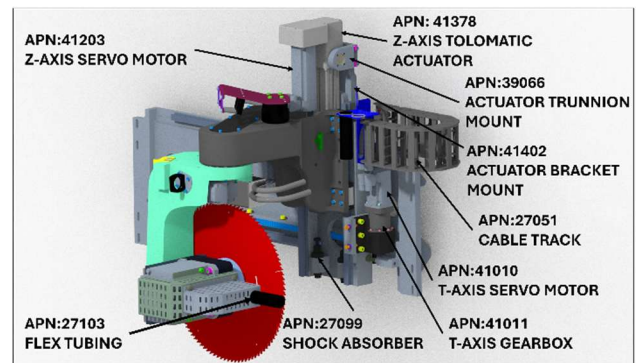


FIGURE 121 SAW HEAD AXES ASSEMBLY

41011 GearBox, 10:1 T-Axis

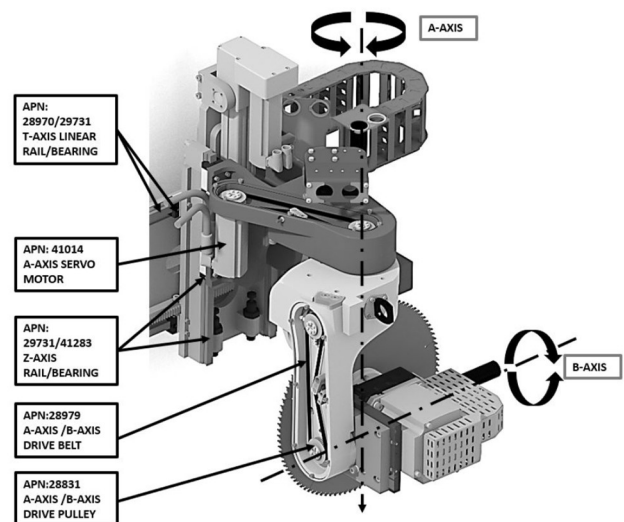


FIGURE 122 SAW ASSEMBLY BELTS AND RAILS

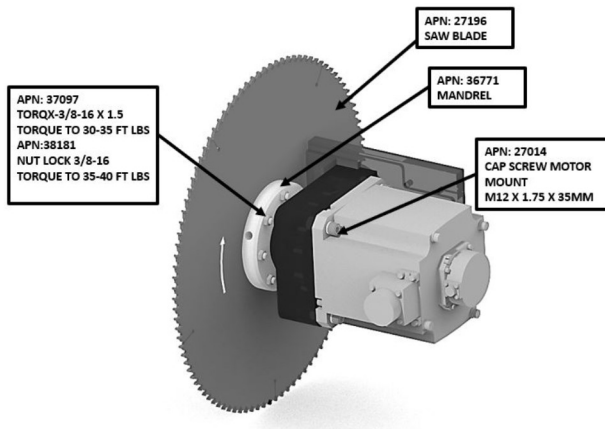


FIGURE 123 SAW BLADE ASSEMBLY

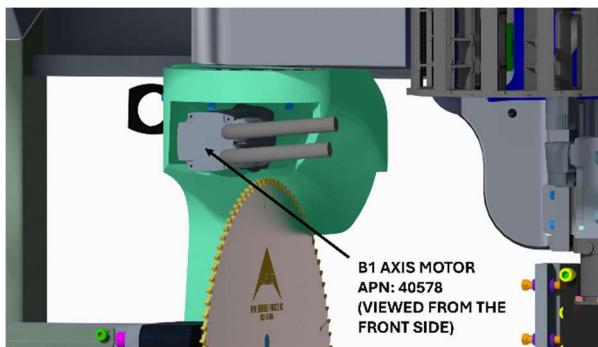


FIGURE 124 B1 AXIS BRAKING MOTOR

4.2.4 Outfeed Assembly

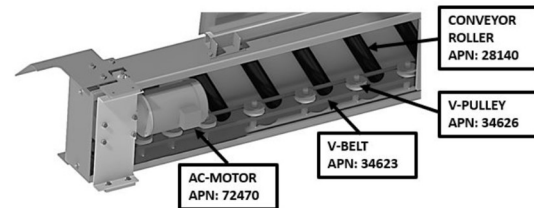
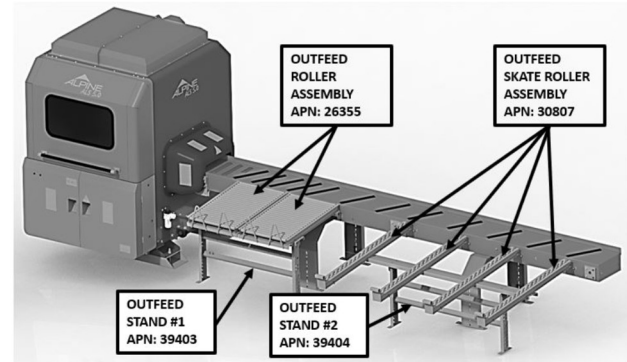


FIGURE 125 OUTFEED

4.2.5 Waste Conveyor

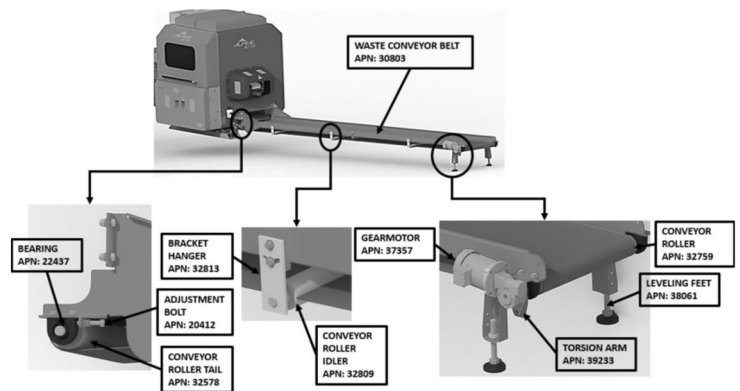


FIGURE 126 WASTE CONVEYOR

4.2.6 Saw Electrical Cabinet

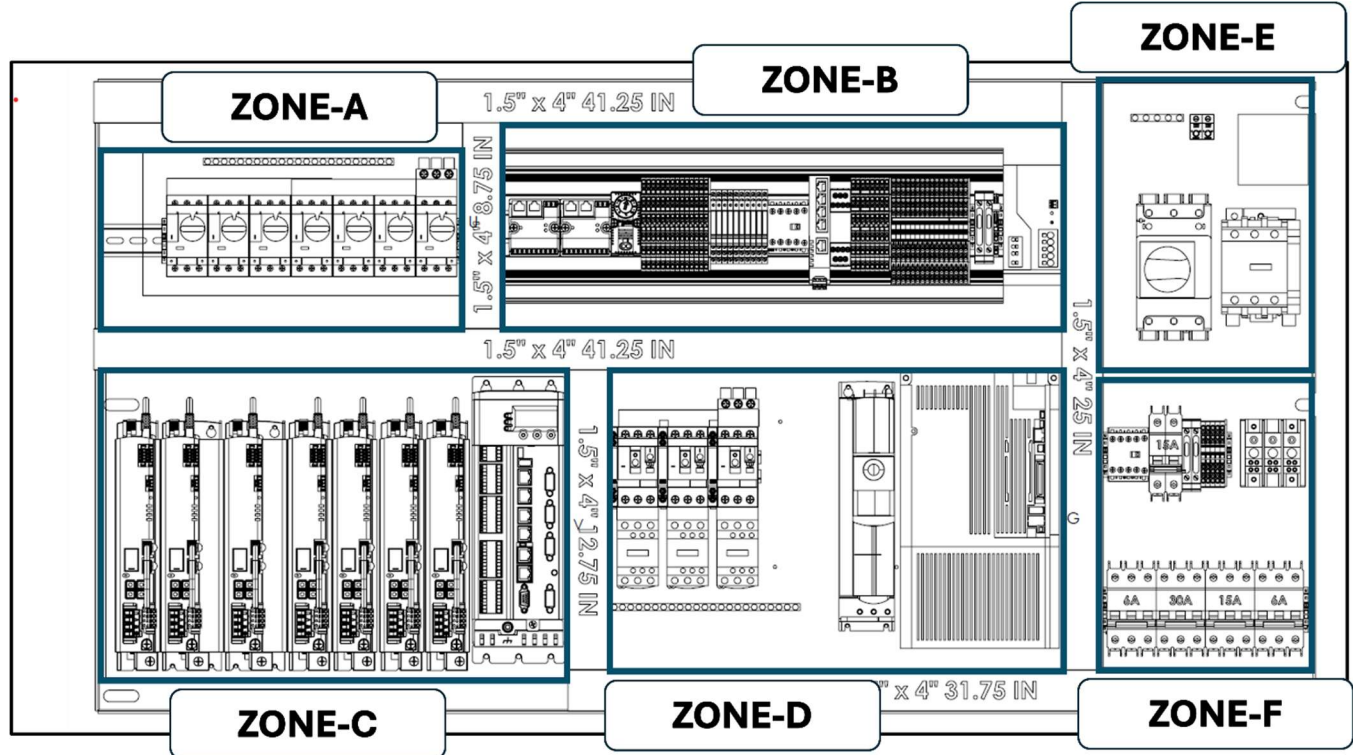


FIGURE 127 ELECTRICAL CABINET

ZONE A – Circuit breakers for servo drives – See Figure 128

ZONE B – Machine I/O, Safety, Network, and Power Supply – See Figure 129

ZONE C – Servo drives and Controller – See Figure 130

ZONE D – Motor overloads, sorting VFD, and saw motor drive – See Figure 131

ZONE E – Main circuit breaker and power switch – See Figure 132

ZONE F – Circuit breakers for 24V power supply, conveyors, and blade servo – See Figure 133

4.2.6.1 Zone A

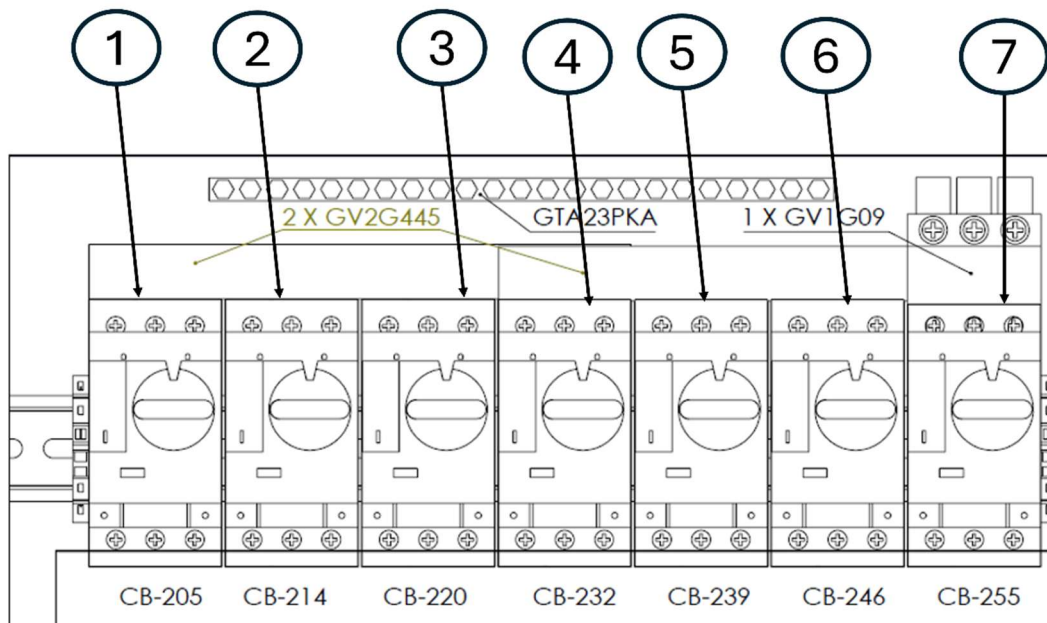


FIGURE 128 ZONE A

No.	TAG No.	Description	APN	Circuit
1	CB 205	CIRCUIT BREAKER-24A-32A/690V	40058	L1P Drive
2	CB 214	CIRCUIT BREAKER-24A-32A/690V	40058	L1 Drive
3	CB 220	CIRCUIT BREAKER-24A-32A/690V	40058	L2 Drive
4	CB 232	CIRCUIT BREAKER-24A-32A/690V	40058	A1 Drive
5	CB 239	CIRCUIT BREAKER-24A-32A/690V	40058	T1 Drive
6	CB 246	CIRCUIT BREAKER-24A-32A/690V	40058	Z1 Drive
7	CB 255	CIRCUIT BREAKER-24A-32A/690V	40058	B1 Drive

4.2.6.2 Zone B

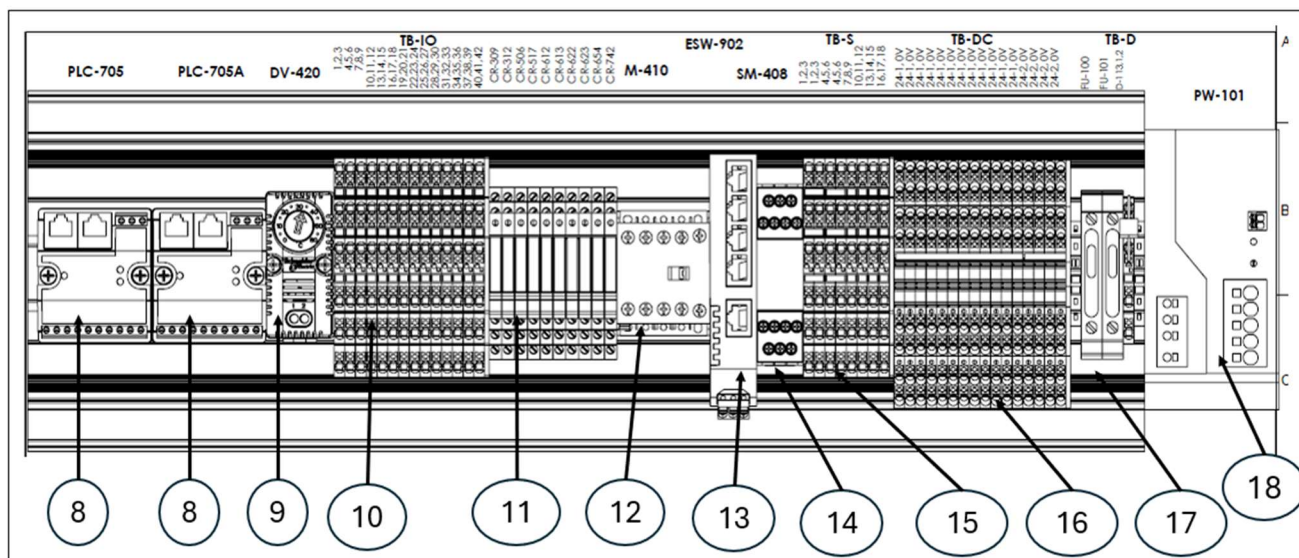


FIGURE 129 ZONE B

No.	Tag No.	Description	APN	Circuit
8	PLC-705/705A	IO LINK-4 CHANNEL	41326	L1/L2/ Bow Sensors
9	DV-420	THERMOSTAT	-	Vortec Cooling
10	TB-IO	TERMINAL BLOCK	-	-
11	CR-309	RELAY, 1PDT, 24VDC, 6AMP	41695	-
12	CR-410	CONTACT, 600VAC, 6AMP, IEC	37971	E-Stop
13	ESW-1202	ETHERNET SWITCH 5 PORT	39046	Network
14	SM-408	E-STOP SAFETY MODULE-24V	25990	E-Stop
15	TB-S	TERMINAL BLOCK	42087	-
16	TB-DC	TERMINAL BLOCK	42085	-
17	FU-100	FUSE, 10AMP, 125VAC	40038	-
18	PS-101	POWER SUPPLY-24VDC/20A	39473	-

4.2.6.3 Zone C

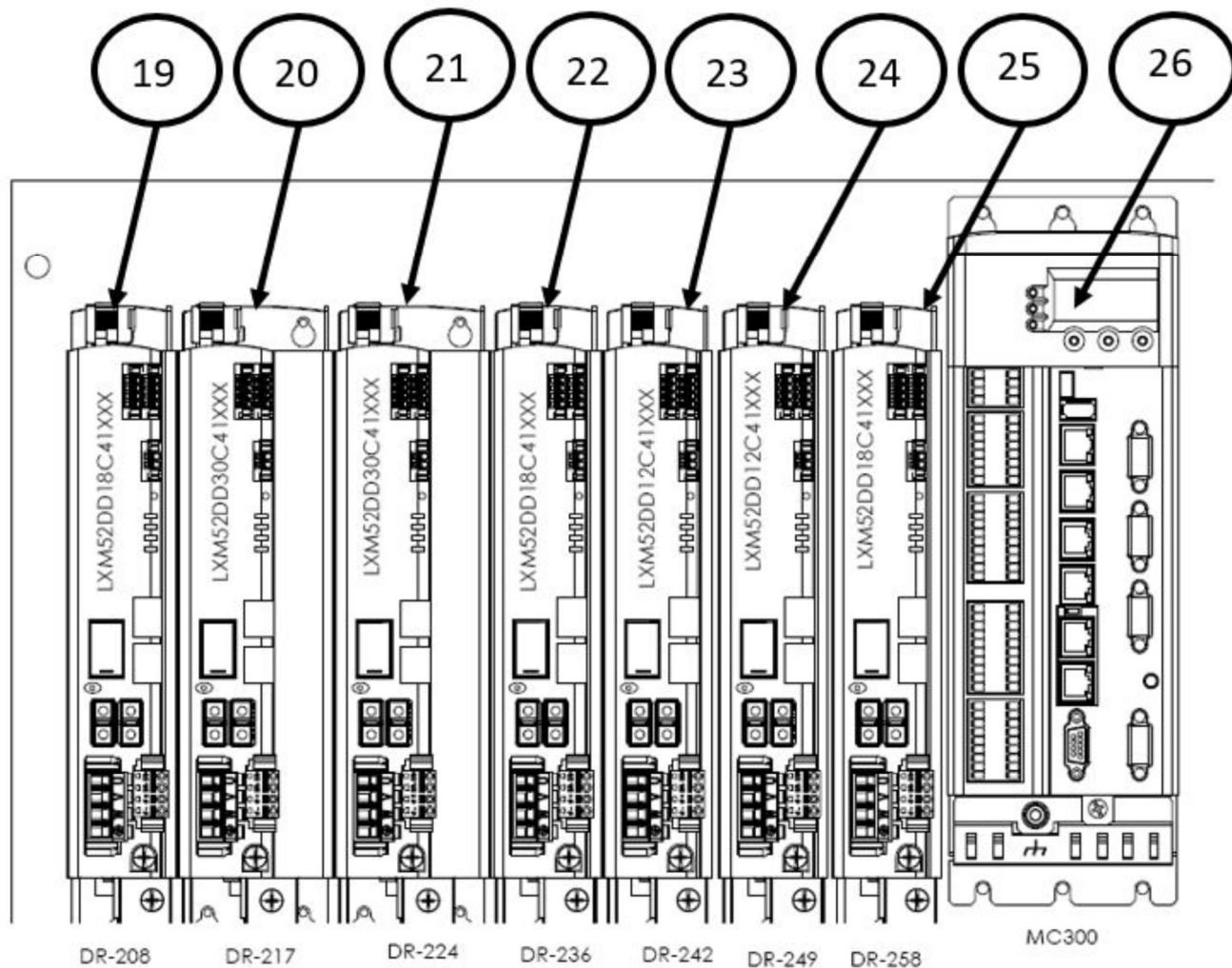


FIGURE 130 ZONE C

No.	Tag No.	Description	APN	Circuit
19	DR 208	SERVO DRIVE 18 AMP PEAK	41075	L1P
20	DR 217	SERVO DRIVE 30 AMP PEAK	41068	L1
21	DR 224	SERVO DRIVE 30 AMP PEAK	41068	L2
22	DR 236	SERVO DRIVE 12 AMP PEAK	37288	A1
23	DR 242	SERVO DRIVE 12 AMP PEAK	37288	T1
24	DR 249	SERVO DRIVE 12 AMP PEAK	37288	Z1
25	DR 258	SERVO DRIVE 18 AMP PEAK	41075	B1
26	MC 324	CONTROLLER-802	37243	SERCOS/Network

4.2.6.4 Zone D

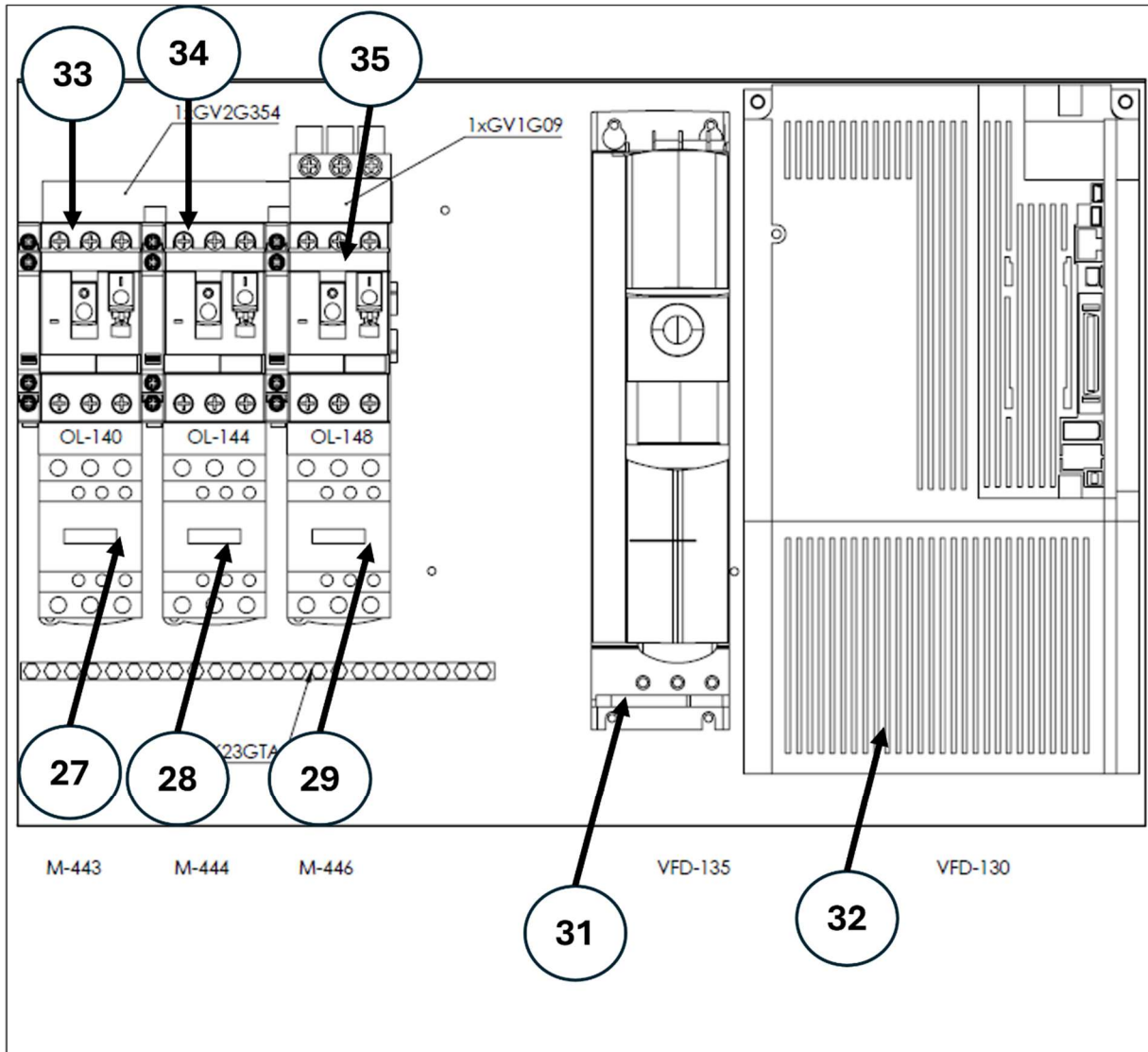


FIGURE 131 ZONE D

No.	Tag No.	Description	APN	Circuit
27	OL-140	OVERLOAD MOTOR 1.6AMP/480VAC	42511	OUTFEED CONVEYOR
28	OL-144	OVERLOAD MOTOR 1.6AMP/480VAC	42511	INCLINE CONVEYOR
29	OL-148	OVERLOAD MOTOR 1.6AMP/480VAC	42511	TRASH CONVEYOR
31	VFD-135	VFD AC DRIVE, 380-500 VAC 3HP	41069	SORTING CONVEYOR
32	VFD-130	SERVO DRIVE-7KW	41032	SAW BLADE
33	M443	CONTACTOR 3 POLE/80AMP/600VAC/24VDC COIL	37220	OUTFEED CONVEYOR
34	M444	CONTACTOR 3 POLE/80AMP/600VAC/24VDC COIL	37220	INCLINE CONVEYOR
35	M446	CONTACTOR 3 POLE/80AMP/600VAC/24VDC COIL	37220	TRASH CONVEYOR

4.2.6.5 Zone E

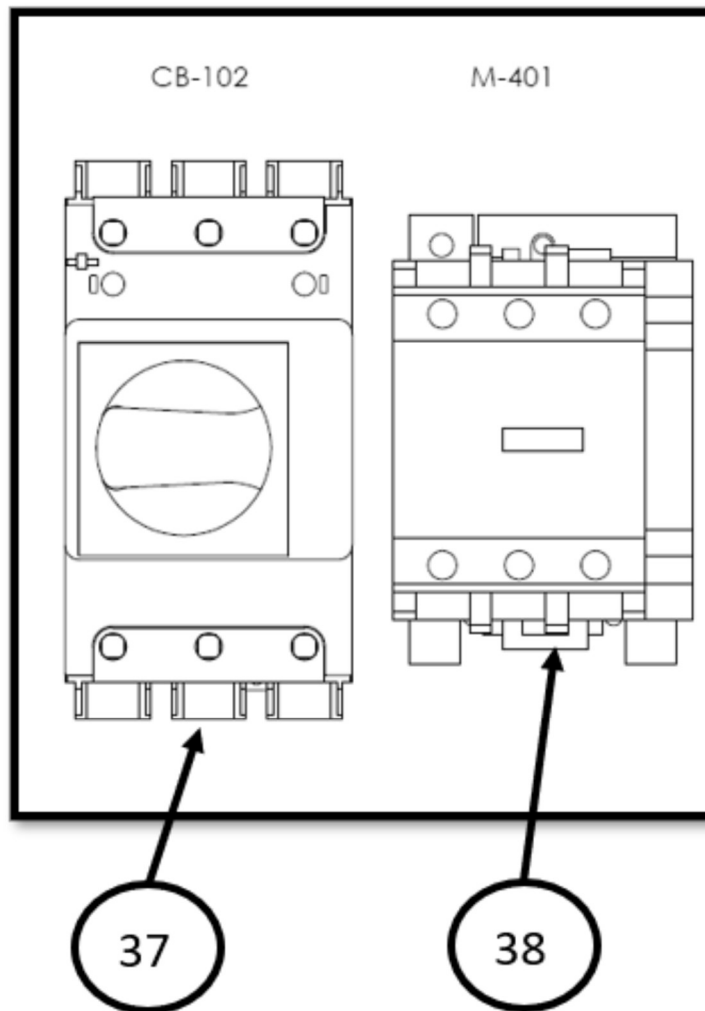


FIGURE 132 ZONE E

No.	Tag No.	Description	APN	Circuit
37	CB-102	MOLDED CASE CIRCUIT BRKR 600Y/347V 80A	40054	MAIN POWER IN
38	M-401	CONTACTOR 3 POLE/80A/600VAC/24VDC	41445	MAIN POWER IN

4.2.7 Infeed Electrical Cabinet

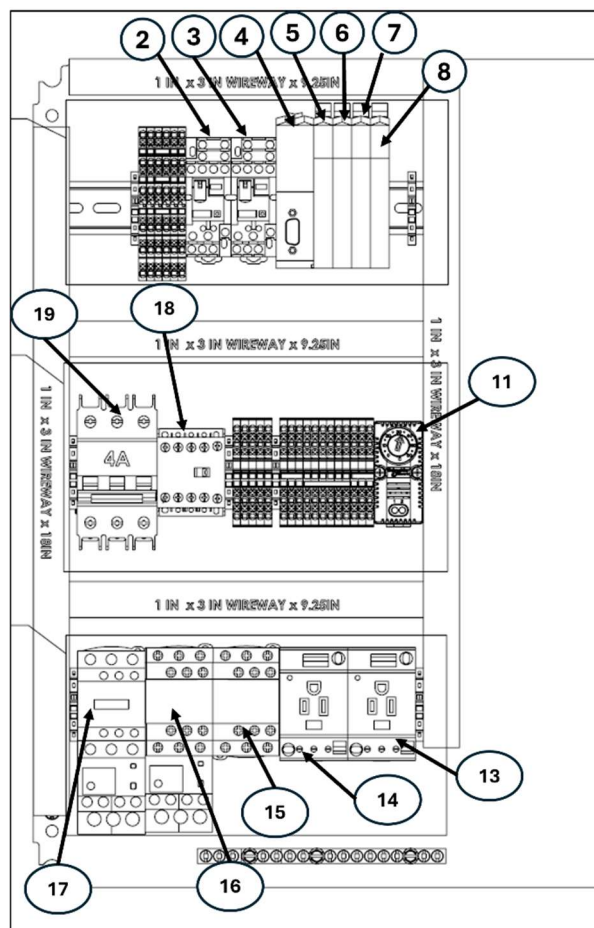


FIGURE 134 INFEEED ELECTRICAL CABINET

No	Tag No.	Description	APN	Circuit
2	CR-835	RELAY, 4PDT, 6AMP, RECT PLUG-IN, 14PIN, 24VDC	42542	LIVEDECK FORWARD
3	CR-820	RELAY, 4PDT, 6AMP, RECT PLUG-IN, 14PIN, 24VDC	42542	L1P LPS
4	PLC BASE	SERCOS III FIELDBUS INTERFACE MODULE	39886	PLC-SERCOS
5	PLC-849	POWER DISTRIBUTION MODULE, TM5, I/O, 24V	39921	PLC-POWER SLICE I/O
6	PLC-854	DIGITAL OUTPUT MODULE 80/24VDC/1 WIRE	40035	PLC SLICE I/O
7	PLC-934	DIGITAL INPUT MODULE 4I/24VDC/3 WIRE	39885	PLC SLICE I/O
8	PLC-918	ENCODER EMULATION CHANNEL (A/B)-4MHZ	40053	PLC/PRINT ENCODER
9	PLC-949	DIGITAL OUTPUT MODULE 80/24VDC/1 WIRE	39885	PLC SLICE I/O
11	DV-817	THERMOSTAT	40076	VORTEC COOLER
13	RECTP-820A	RECEPTACLE 3 PRONG	40079	POWER 120V-PRINTER PUMP
14	RECTP-820	RECEPTACLE 3 PRONG	40079	POWER 120V-MPERIA HMI
15	M842R	CONTACTOR 3 POLE/9AMP/600VAC/24VDC COIL	40069	INFEEED CHAIN REVERSE
16	M841F	CONTACTOR 3 POLE/9AMP/600VAC/24VDC COIL	40069	INFEEED CHAIN FORWARD
18	CR-801	CONTACTOR 3 POLE/9AMP/600VAC/24VDC COIL	37971	PRINTER PANEL SAFETY
19	CB-804	CIRCUIT BREAKER, 3P, 4A, C-CURVE	40080	INFEEED MTR

4.2.8 Small Parts Electrical Cabinet

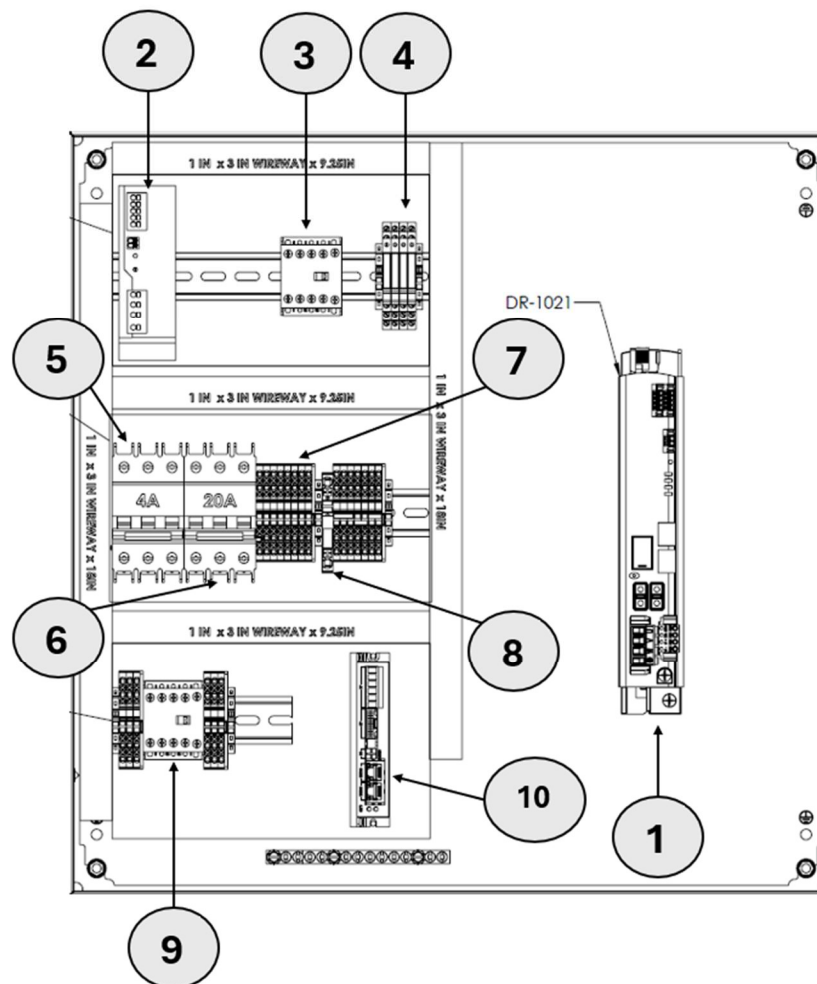


FIGURE 135 SMALL PARTS ELECTRICAL CABINET

No	Tag No.	Description	APN	Circuit
1	DR-1021	SERVO DRIVE 12AMP PEAK	37288	SMALL PARTS (SP AXIS)
2	PW-1010	Power Supply TRIO-PS-2G/3AC/24VDC/10A, 3-phase	38546	POWER SUPPLY
3	M-1000	Contactor 600 VAC 6 Amp IEC + Options	37971	SMALL PARTS MOTOR
4	CR-1041-1050	PLC-RPT- 24DC/21, Relay, 1PDT, 6 Amp, 250 Vac/dc	26121	SMALL PARTS
5	CB-1009	Miniature Circuit Breaker, 3 Pole, 240VAC 4 Amps	40068	POWER SUPPLY
6	CB-1007	Miniature Circuit Breaker, 3 Pole, 240VAC 20 Amps	42501	SMALL PARTS DRIVE
7	TB-SP	Push-In Terminal Block, Single Level, PIT 2.5-Quattro	40039	SMALL PARTS (SP AXIS)

8	FU-1009	TCP 10A Thermal miniature circuit breaker	42084	POWER SUPPLY
9	M-1043	Contactor 600 VAC 6 Amp IEC + Options	37971	SP1 AC
10	DR-1102	Microstep Drive w/ Multi Fieldbus options, EtherNet/IP	40061	SPH ROLLER DRIVE

4.3 CLEANING

4.3.1 Saw Cabinet

Following this instruction will ensure the lumber feeding system continues to operate smoothly.

- ◆ Clean sawdust out of the machine at the end of each shift of operation.
- ◆ A vacuum should be used to avoid creating an intense dust hazard from using compressed air in the confined space of the machine.
- ◆ Special attention should be given to sensors, both the emitters and receivers. Buildup and blockages can give false signals.
- ◆ Cylinder shafts for pusher assemblies should be wiped clean. Pitch buildup can create binding.
- ◆ The roller beds under the belts of L1 & L2 need to have debris removed to keep the rollers from binding. Failure to do so can lead to broken seals on bearings and eventual belt slippage causing length issues.
- ◆ Linear bearings and rails (T1 and Z1) should be cleaned to allow smooth travel.
- ◆ Z1-Actuator should be cleaned, especially the underside of it. If not, there is potential for debris buildup to cause the Z1-axis to home incorrectly and lose calibration.
- ◆ Beneath the saw cabinet should be cleaned of sawdust and debris as well. Buildup will eventually cause resistance and binding against the belts, leading to tracking deviation and damage.
- ◆ A dryer sheet can be used on the plexiglass window to help it resist dust from sticking to it.

4.3.2 Printers

The ALS 5.0 is equipped with two printer heads. The first is a top face printer for printing job ID and connector plate details (with upgraded print system) for placement of connector plates during truss

building operations. The other is a side face printer (Thermal Ink Cartridge style printer) for printing wall panel details and stud marking on the Side face of the lumber, both printers are located on the infeed and all lumber stocks will be pre-printed before entering the saw for pieces to be cut.

4.3.2.1 Face Printer

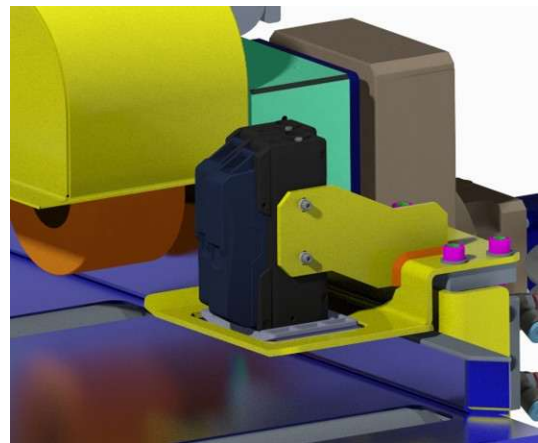


FIGURE 136 FACE PRINTER

4.3.2.2 Edge Printer



FIGURE 137 EDGE PRINTER

See Figure 138 below to identify components on the Side Face Printer. The printer is located on the infeed to the right of the Top Face Printer. This is the Printer that is installed closest to the saw. This printer utilizes Thermal Ink Cartridges for Printing, there are no ink to refill when the ink runs out simply replace the ink cartridges with a new one and resume printer operations. The steps for replacing the Ink cartridges are described below in Figure 139.

◆ Main Components

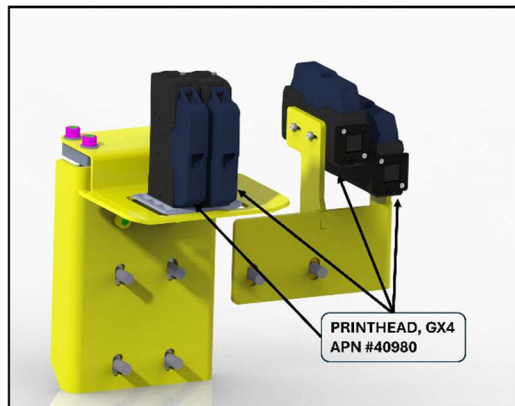


FIGURE 138 MAIN COMPONENTS

HOW TO REPLACE INK CARTRIDGES

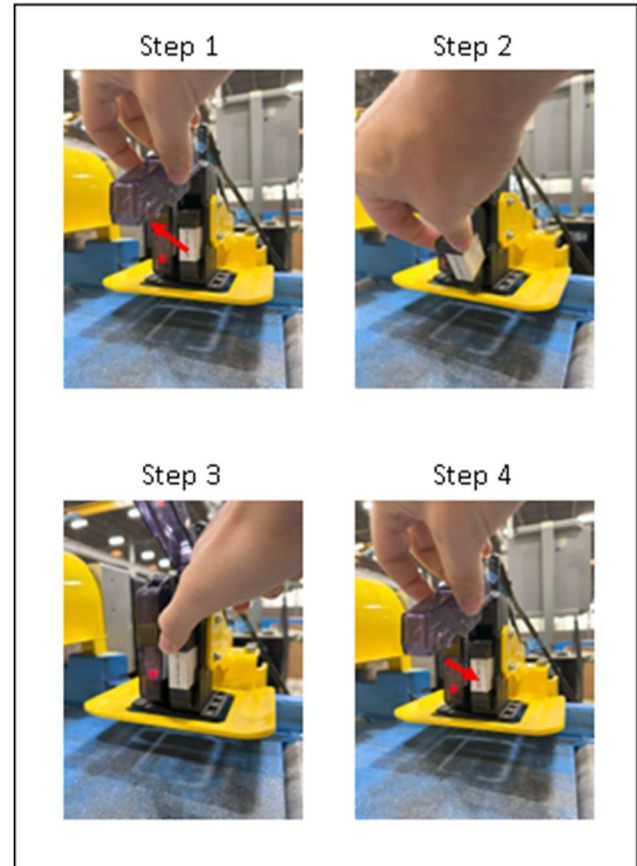


FIGURE 139 REPLACING INK CARTRIDGES

STEP 1: Open printhead dust cover

STEP 2: Pull up on the back of the cartridge to remove it from the printhead

STEP 3: Insert the new cartridge by placing the head in first and the press on the back of the cartridge

STEP 4: Close the printhead dust cover

HOW TO CLEAN & MAINTAIN INK CARTRIDGES

This section provides the best practices for cartridge maintenance and handling. These techniques allow you to optimize ink availability and maintain image quality.

Cartridge maintenance may be necessary when you are no longer getting the expected quality output. Print cartridge servicing must be performed on a regular basis to prevent (or recover from) clogged nozzles and to remove puddled ink or debris from near the nozzles. Optimum maintenance is a trade-off between highest image quality and the expense of wasted ink, reduced throughput, and mechanism wear. Keeping in mind that the print nozzle plate can

have ink on it and still produce an acceptable image quality, the amount of servicing needed is a matter of experimentation and determining an acceptable level of print nozzle plate cleanliness for your application.

The Blue Protective tape should remain on the nozzles of the print cartridge until the cartridge is installed in a printing device.

For the best performance, use the cartridge within 2 weeks after removing it from the pouch.

Never shake the cartridge back and forth in an attempt to mix the ink or recover the pen.

Once the protective tape is removed, the nozzles must be protected to keep the ink from drying out. To prevent drying, the print cartridge nozzles should be sealed (capped) with a cartridge clip when not in use.

Capping the print cartridge nozzles also protects the print cartridge from dust and shock.

Before inserting the cartridge into the printer, gently wipe the printhead to remove any ink on the print nozzle that accumulated during the shocks and vibration that can occur during shipping. Follow the instructions on wiping techniques during normal use.

Wiping is a method of cleaning the print nozzle, and is the most common form of print cartridge servicing in a printing system that does not have a built in service station. Wiping removes fibers and debris from the media and surroundings, dried ink (in the form of plugs or crust), and excess ink (in the form of ink puddles on the print nozzle). When these materials accumulate on the print nozzle, this can cause ink droplets to deflect from the desired trajectory, resulting in degraded image quality.

The recommended technique for wiping is a "wicking wipe" shown in Figure 140 and Figure 141. A wicking wipe is characterized by a combination of absorbent material, slow speed, and properly applied pressure. This combination provides enough capillary draw along the nozzles to wick ink from them. The wiping material should be absorbent, lint-free, and nonreactive with the ink. The material can be used dry or wetted with water. Avoid tap or bottled water containing added minerals because they will react with inks and clog nozzles.

Hold the cartridge with the nozzles down and pull from either side of the pen. As the ink is slowly wiped across the print nozzle, it will soften hardened deposits of ink and debris. Wiping the print nozzle too slowly causes ink to wick out of the nozzles and streak across the print nozzle. Wiping too fast bounces the print nozzle over the surface and won't remove the debris. It is better to repeat the process several times with constant speed and force than to wipe too fast or press too hard.

NOTE:

WIPING TOO FAST MAY INCORPORATE AIR BUBBLES AND LEAD TO INADEQUATE WICKING.

PRESSING TOO HARD WILL SCRATCH THE ORIFICE AND MAY BREAK THE FRAGILE DROP EJECTORS.

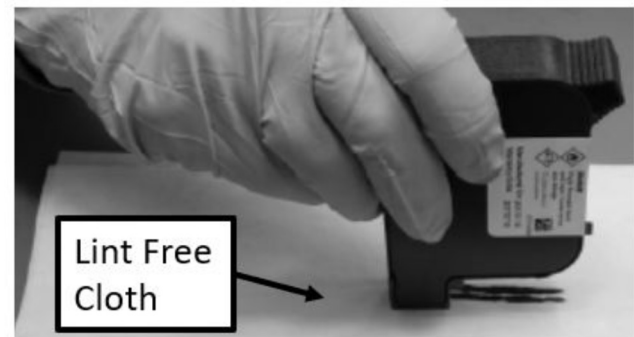


FIGURE 140 "WICKING WIPE" TECHNIQUE FOR REMOVING HARDENED DEPOSITS OF INK AND DEBRIS (INITIAL WIPE)



FIGURE 141 "WICKING WIPE" TECHNIQUE FOR REMOVING HARDENED DEPOSITS OF INK AND DEBRIS (LATER WIPE)

Always Wipe and Remove Dried Ink when the cartridges are sitting idle for more than 4 Hrs. For extended idle time > 4 Hrs, Remove Cartridge and Cap it and Store in Cool dry place.

4.4 LUBRICATION

See the included maintenance log for lubrication intervals (**Appendix B**). This section includes the locations where grease will be added per the maintenance intervals.

- ◆ Use a MANUAL grease applicator. Electric applicators tend to overfill the ports and blow seals on bearings. Manual grease guns allow the user to feel resistance and give greater control.
- ◆ Use NLGI 2 LITHIUM based grease.
- ◆ NEVER use greases containing graphite, carbon particles, or any fibers of any type.

4.4.1 Infeed Assembly

There are 4 grease fittings on the bearing block for the L1P wheel. The fittings can be accessed from the rear of the machine (4 total).

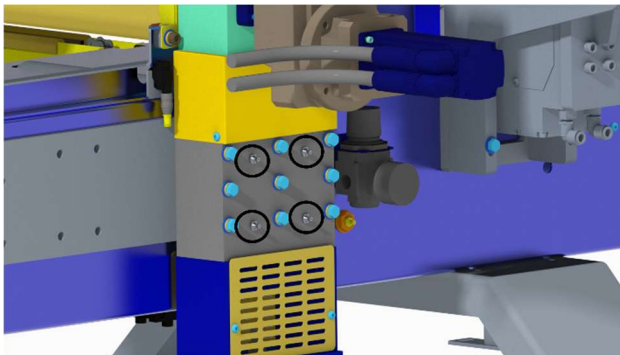


FIGURE 142 L1P GREASE FITTINGS

Below the roll case for the infeed conveyor there is a driveshaft that powers each of the lumber strands on the live deck. On this driveshaft there are a total of 8 bearings that each contain one grease fitting (8 total).

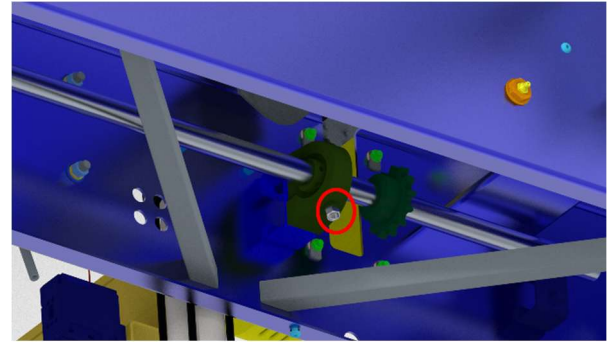


FIGURE 143 ROLL CASE DRIVESHAFT BEARINGS

There is one grease fitting on each gripper assembly. To access them, make sure each gripper assembly is fully retracted. The fitting will be visible through the access hole at the rear of the machine (4 total).

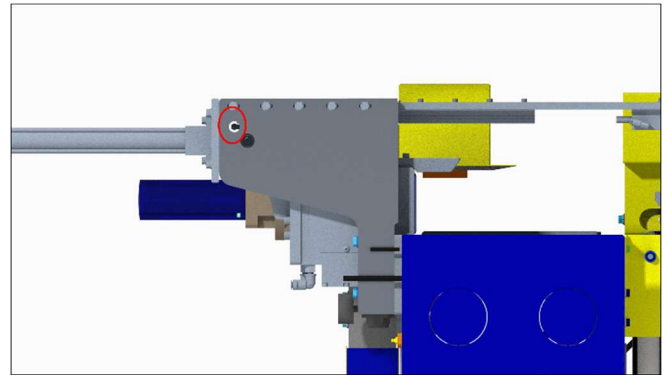


FIGURE 144 GRIPPER ARM GREASE PORT

4.4.2 Saw Cabinet

4.4.2.1 L1 & L2 Pushers

There are 4 grease fittings on top of each bearing block on the L1 & L2 Pushers. (8 total)

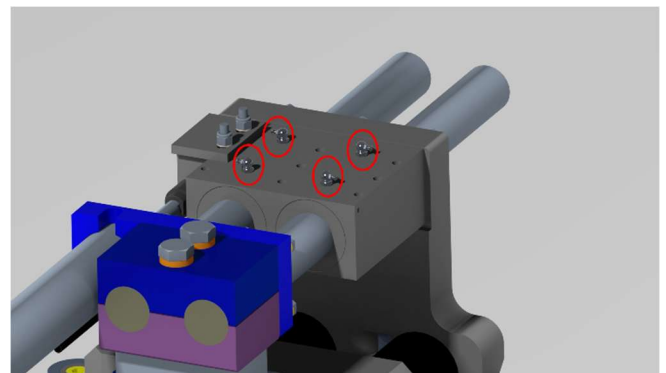


FIGURE 145 PUSHER GREASE FITTINGS

4.4.2.2 L1 & L2 Clamps

On the back of the saw cabinet, there are 2 sets of grease blocks, one for the L1 clamp bearings, and one for the L2 clamp bearings. Each set has 4 fittings. (8 total)

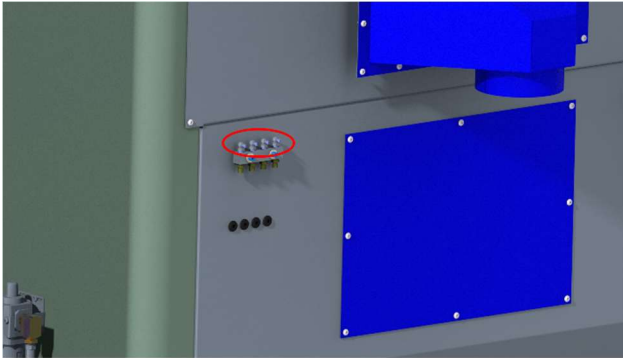


FIGURE 146 CABINET GREASE BLOCKS

4.4.2.3 T1 Bearings

There are grease fittings on each of the linear bearings that ride on the T1-rail. Two can be accessed from the front and two from the back of the saw head assembly. (4 total)

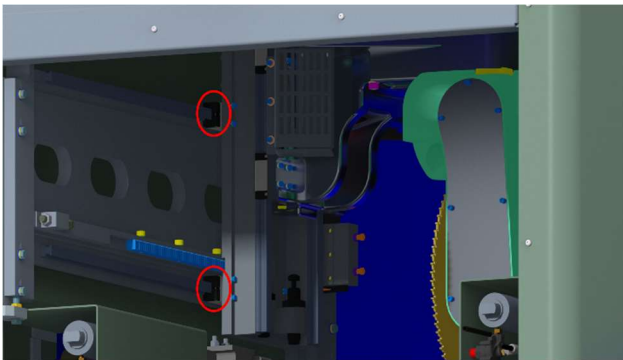


FIGURE 147 T1-AXIS BEARINGS

4.4.2.4 Z1 Bearings

There are grease fittings on each of the linear bearings that ride on the Z1-rail. Two can be accessed from the top and two from the bottom of the saw head assembly. (4 total)

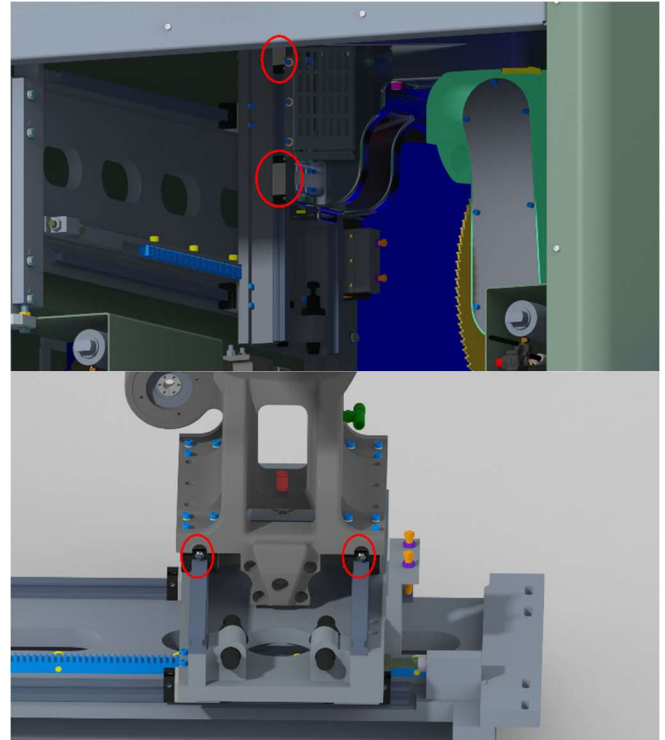


FIGURE 148 Z1-AXIS BEARINGS

4.4.2.5 Sorting Conveyor

Just like the trash incline, there are four bearings on the sorting conveyor—2 on the drive roller on the left side of the saw cabinet, and 2 more on the idler end on the right side. (4 total)

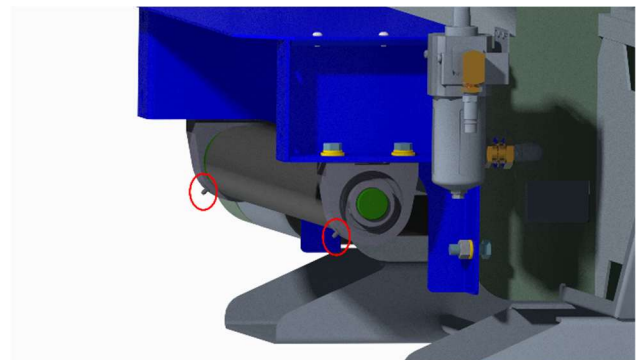


FIGURE 149 SORTING CONVEYOR SHAFT BEARINGS

Outfeed Assembly

There are three shafts under the outfeed roller case. Remove the guards around the two farthest from the saw cabinet and grease the bearings on each side of the shaft. Do not remove the guard plate the motor

is mounted to. These fittings can be accessed without removing the motor (6 total).

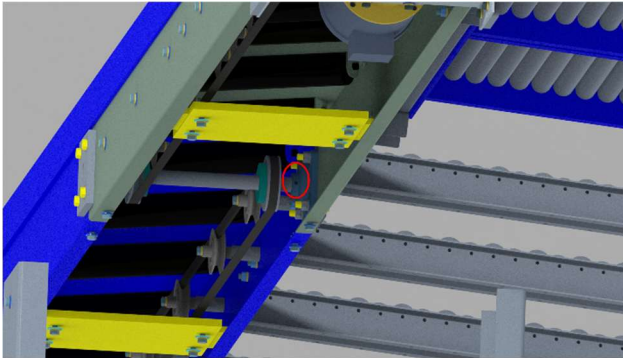


FIGURE 150 OUTFEED SHAFT BEARINGS

4.4.3 Waste Conveyor

There are four bearings on the trash incline—two on the drive roller at the top of the incline and two more on the idler end at the bottom of the incline, under the sorting conveyor (4 total)

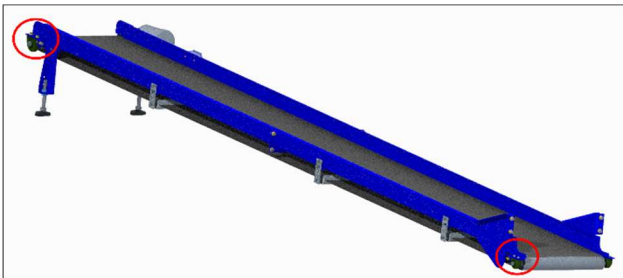
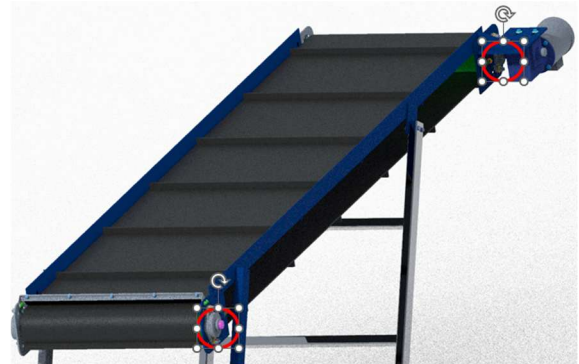


FIGURE 151 WASTE CONVEYOR SHAFT BEARINGS

4.4.4 Incline Waste Conveyor

(OPTIONAL)

For customers with the optional Incline Waste Conveyor, there are four bearings with grease ports to service. Just like the waste conveyor, there are two on the drive roller at the top of the incline and two more on the idler end at the bottom of the incline, under the waste conveyor. (4 total)



4.5 TOLOMATIC® ACTUATOR MAINTENANCE

Alpine recommends wearing disposable Nitrile gloves when completing the actuator maintenance.

The TOLOMATIC Actuator will need to be lubricated according to the maintenance schedule ([Appendix A](#)).

To perform maintenance the actuator will need to be removed and moved to a clean location. To grease the components correctly the procedure from the TOLOMATIC Manual ([RSA 32- HT Motor Mount Roller Screw Actuators Installation & Service Manual](#)) will need to be followed. Then, the actuator can be reinstalled.

4.5.1 Removing Z1 Actuator

Step 1 – Open the Manual screen and select the Z1 to open the “Axis Control” screen.

Step 2 – Disable the software limit in the upper left part of the “Axis Control” screen.

Step 3 – Jog the Z1 axis down until it is sitting on the shock absorbers.

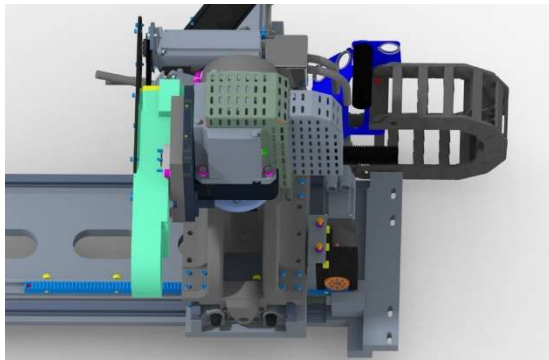


FIGURE 152 Z1 SITTING ON CUSHIONS

Step 4 – Disable the axis and power down the computer and saw with the cabinet door open. Lockout-tagout ([OSHA 29 CFR 1910.147](#)) before entering saw.

Step 5 – Remove the top right cover of the saw cabinet by removing the 12 ,1/4-20 UNC screws and nuts on top where the cover is attached to the left-hand cover at the middle and to the saw frame. This will give access to the Tolomatic Z-Axis Actuator and allow for removal through the roof of the cabinet.

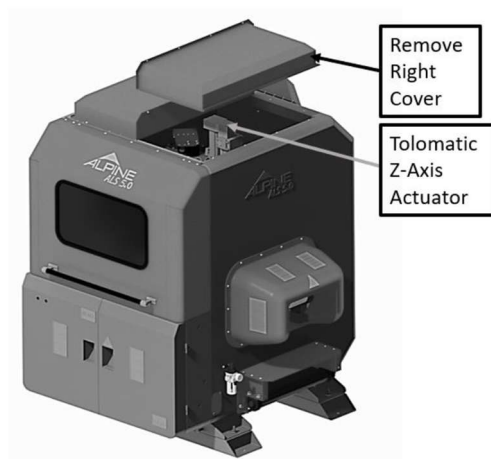


FIGURE 153 CABINET COVER REMOVAL

Step 6 – Start removing the actuator by releasing the rod end that is attached to the Z-axis slide. Remove the four socket head cap screws from the bottom of the casting using an 8mm Allen wrench.

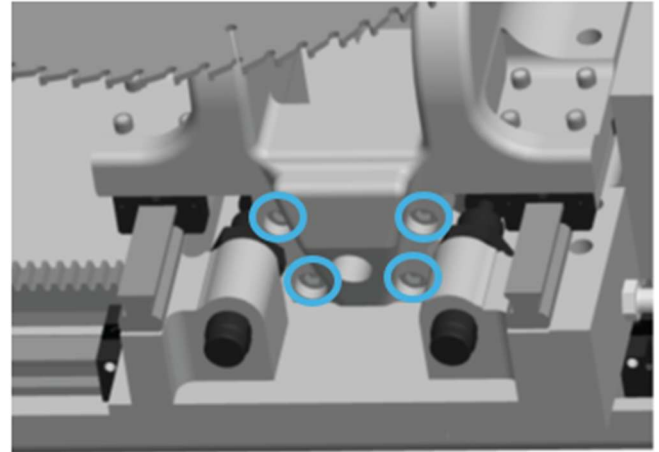


FIGURE 154 BOTTOM OF CASTING

Step 7 – Use an 8mm Allen wrench to remove the cap screws from the trunnion mount at the top of the actuator. Carefully lift the actuator up and remove it through the top of the machine.

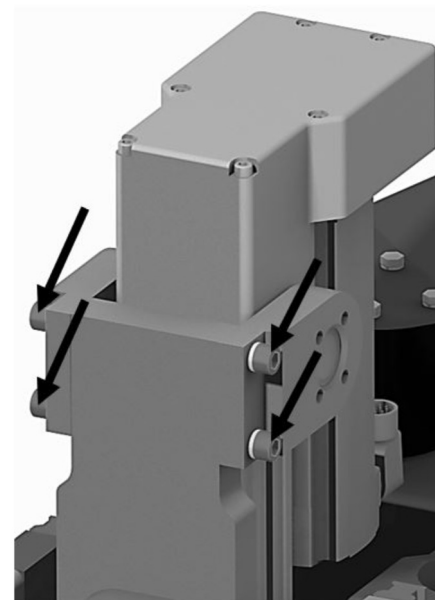


FIGURE 155 TRUNION BOLTS

4.5.2 TOLOMATIC Actuator Belt Change

Step 1-Open the Manual screen and select the Z1 to open the "Axis Control" screen.

Step 2- Disable the software limit in the upper left part of the "Axis Control" screen.

Step 3- Jog the Z1 axis down until it is sitting on the shock absorbers.

Step 4- Disable the axis and power down the computer and the saw with the cabinet door open. Lockout-tagout (**OSHA 29 CFR 1910.147**) before entering saw.

Step 5- Remove the top right cover of the saw cabinet by removing the 12 ,1/4-20 UNC screws and nuts on top where the cover is attached to the left-hand cover at the middle and to the saw frame. This will give access to the Tolomatic Z-Axis Actuator.

Step 6- Remove the top cover of the actuator by removing the 6X socket head cap screws.

Step 7- Remove the belt from the motor pulley. Loosen the motor mount bolts and allow the square nut to slide in the slots towards the actuator to create slack to remove the belt.

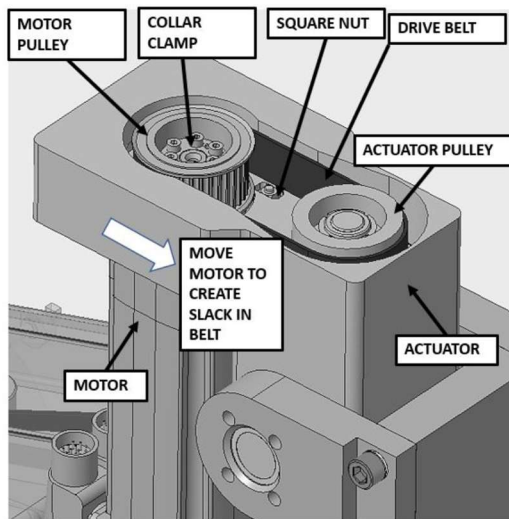


FIGURE 156 ACTUATOR BELT

Step 8- Install the new belt. Tension the belt by placing the spreader tool between the pulleys and use the adjustment nut to spread the pulley apart. Measure the deflection until it reaches 12in or 3mm. Then tighten the motor mount bolts before removing the spreader tool.

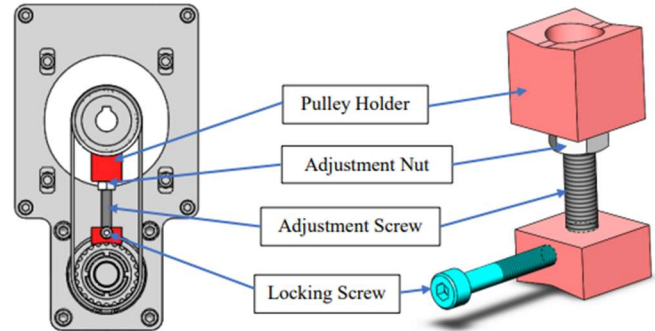


FIGURE 157 BELT PULLEY SPREADER TOOL

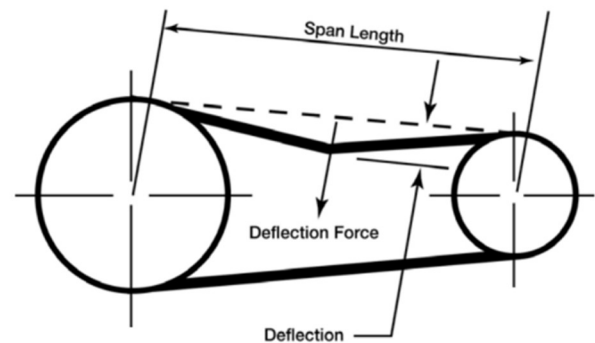


FIGURE 158 BELT DEFLECTION DIAGRAM

Actuator size and torque callout	Smallest Shaft Diameter		Tension Force/weight		Sonic Tension Method				Force Deflection Method			
					Span Tension Force		Mass		Width		Deflection	
	in	mm	lbf	N	lbf	N	lb/in	g/m	in	mm	in	mm
RSA332 HT1	Up to .470	Up to 12.00	40	178	20	178	0.3	3.5	0.984	25	0.12	3
	Over .470	Over 12.00	60	267	30	267	0.3	3.5	0.984	25	0.12	3

FIGURE 159 BELT DEFLECTION VALUES

Step 9 – Replace the motor cover and right-side cover of the saw cabinet.

Step 10- Remove all tools, close door, & remove lockout-tagout devices.

Step 11- Restart machine and home all axes.

4.6 CONVEYOR BELT REPLACEMENT AND TENSIONING

(BE SURE THAT ALL BELT ROLLERS ARE CLEANED AND SQUARED BEFORE STARTING ADJUSTMENTS.)

4.6.1 Conveyor Belt Removal & Installation

Step 1 – Loosen tail pulleys and put slack in the belt

Step 2 – Unbend lacing rod and remove it from the belt.

Step 3 – Remove the belt.

Step 4 – Thread the belt the same as the previous belt was threaded.

Step 5 – Pull the ends of the belt together, aligning the lacing.

Step 6 – Install the rod that connects the lacing.



FIGURE 160 CONVEYOR BELT LACING

Step 7 – Bend the lacing rod end to keep it from sliding out.

Step 8 – Tension and square tail pulleys to pull up slack on the bottom.

Step 9 – Ensure belt does not slip with a light load of 10–15lbs.

4.6.2 Waste Conveyor Belt Tensioning

Step 1 – Before adjusting check pulleys to ensure they are clear of debris

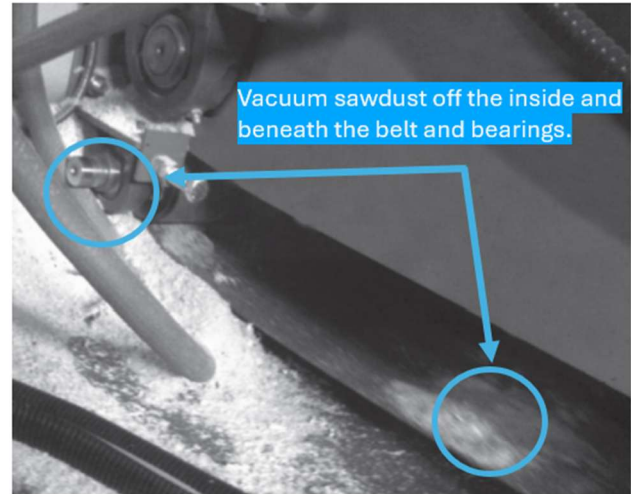


FIGURE 161 SAW DUST BUILDUP ON BELT

Step 2 – Run conveyor to determine which way the belt is tracking.

Step 3 – Adjust bottom guide roller closest to machine.

THINK OF TRACKING A BELT LIKE RIDING A BICYCLE, THE FORWARD ROLLER IS THE HANDLEBAR. THE BELT WILL ADJUST ACCORDING TO THE DIRECTION IN WHICH YOU MOVE THE FORWARD ROLLER.

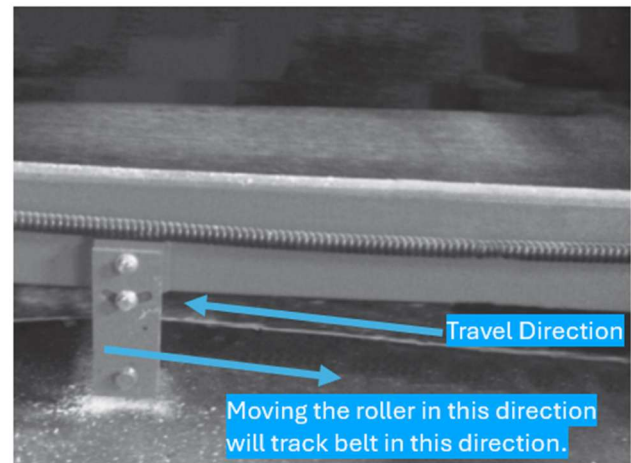


FIGURE 162 TRAVEL DIRECTION AND TACKING

DUE TO SLIPPAGE AND ROLLER DYNAMICS THERE IS A LIMITED AMOUNT OF ADJUSTMENT THAT CAN BE MADE. IT IS IMPORTANT THAT ALL THE ROLLERS ARE SPINNING. IF THE ROLLER STOPS SPINNING ADJUST IT BACK TO THE POINT IT SPINS. THEN MOVE TO THE NEXT ROLLER AND CONTINUE THE ADJUSTMENT PROCESS.

Step 4 – Adjust middle guide roller the same as above if needed.

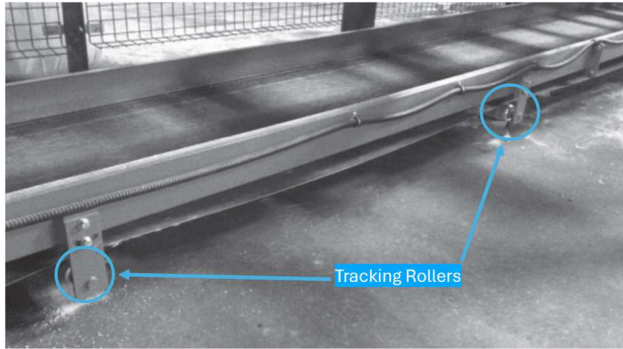


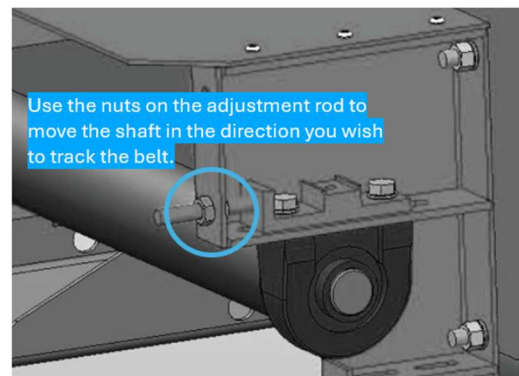
FIGURE 163 GUIDE ROLLERS

4.6.3 Sort Conveyor

The belt used on the sort conveyor features a self-tracking belt and does not track off guide rollers. This offers a simplified process for belt replacement and tracking as detailed in the following steps.

Step 1 – Ensure tail pulleys are free of debris.

Step 2 – Square tail pulleys by making slight adjustments to the tension blocks.



Step 3 – Run for 15 minutes to ensure belt is tracking correctly.

5 TROUBLESHOOTING

CONDITION	CAUSE	CHECK	CORRECTION
5.1 INCORRECT HOMING/ CANNOT HOME THE MACHINE	No power	The green LED which indicates that the power is on should be illuminated	Press the button labeled "power reset" (Section 1.1.2)
	Axis with fault	Call Alpine Equipment Customer Service.	Fault codes must be found using Alpine Equipment Customer Service troubleshooting tools to properly resolve this issue.
	Axis is blocked	Visually inspect A1, T1, Z1, B1 (if equipped) for blockage.	Remove blockage and restart the homing process.
5.2 CENTERLINE IS OFF	Warped lumber	Visually inspect lumber.	Re-cut with lumber that is straight.
	T1 axis homing	Measure the centerline using a framing square, the measurement should be 1 ¾ in. from the back fence.	Try to home T1. Then, re-calibrate the axis following the instructions in Section 4.1.9
5.3 LENGTH IS NOT CORRECT (THE LENGTH TOLERANCE OF THE ALS 5.0 IS ±1/16 IN.)	Length calibration	Check the cut length of the board using a tape measure.	Re-calibrate L1 & L2, following the instructions in Section 4.1.3
	L1 & L2 clamps not operating properly	The clamp should come down within 1 ¼ in. of the L1 & L2 belts.	Tighten screws on the cylinder if they appear to have backed out of their holes.
		Confirm that the rod end of the cylinder remains intact.	Replace the cylinder if damaged or inoperable.
	Check L1/L2 belt tensions	Section 4.1.3 covers the belt tensioning procedure.	Follow the tensioning procedure, cut a board, and check the length for correctness.
	Mechanical blockage	Visually inspect for mechanical blockage, especially near the LPS sensors.	Remove blockage and re-check length.
	Clean sensors	Locate emitters and receivers on L1 & L2 drives.	Wipe clean with a cloth, then use glass cleaner on the face of both the emitter and receiver.
	Wet or icy lumber	Visually inspect lumber for dampness or ice.	Remove wet or ice-covered board from the infeed queue allowing it to dry completely before feeding it into the saw.
	Low Air pressure (Air pressure should read between 80-90 psi.)	Locate the regulator on outfeed of saw near the bottom of the outside of the saw cabinet and check the pressure.	Adjust the regulator.
		Listen for air leaks.	If an air leak is found it should be repaired immediately, call Alpine Equipment Customer Service if assistance is required.

CONDITION	CAUSE	CHECK	CORRECTION
	Worn belts	Visually inspect belts for wear or cracking.	Rotate belts to even wear, or order new belts from Alpine Equipment Customer Service.
5.4 CONVEYOR WILL NOT START	Machine is in E-Stop condition	Check all E-Stop locations to determine if one is pressed.	Reset the E-Stop switches by pulling them to the out position and press the "Power Reset" button.
	Breaker trip	Using the included electrical schematic, locate the breaker.	Check the conveyor system for mechanical blockage, then reset the breaker.
	Breaker overload	Using the included electrical schematic, locate the breaker overload.	Press the reset button on the overload. If the overload continues to trip, call a qualified electrician to identify the source of the problem.
	No power to relay	Using the included electrical schematic, locate the relay. When on, a red LED will illuminate on the relay.	If the relay does not turn on, call a qualified electrician to identify the source of the problem.
	No power to contactor coil		Call a qualified electrician to identify the source of the problem.
5.5 PRINTER WILL NOT PRINT	Incorrect print controller program settings	Locate print controller in the infeed electrical panel. Or use printer remote access software.	Reset print controller and print head settings. Match the settings to the default values.
	Empty ink cartridge	Check ink level on controller	Replace ink cartridge
	Dirty print sensor	Check for an amber light on the print sensor when a board is present.	If the light on the sensor is not changing properly, use glass cleaner on the sensor, cleaning any dried ink off it.
		Verify that during other operational situations, the light illuminates green	If the light does not illuminate green, it may be necessary to replace the sensor, call Alpine Equipment Customer Service for further assistance.
5.6 PRINTS SAME INFORMATION	Print controller disconnected	Ensure print controller network cable is plugged in Check if print cable is damaged.	Plug in the print controller network cable. Replace the printer network cable. Contact Alpine Customer Support
	Print disabled	See if the printer is enabled	Enable printer from the saw application
	Printer improperly configured	Ensure the correct IP address and settings are configured in the saw application	Type in the IP address for the print controller

CONDITION	CAUSE	CHECK	CORRECTION
5.7 CANNOT READ THE PRINT INFORMATION	Clogged print head	Visually inspect the print head.	Try cleaning the print head with a lint free cloth
	Dried ink on print head	Visually inspect the print head.	Try cleaning the print head with a lint free cloth
	Printhead too far from lumber	Close L1 Pusher and Clamp, check the distance between the printheads and the board.	Adjust the gap so that it is no more than 1/8"
5.8 INCONSISTENT PRINT PLACEMENT	Loose encoder cable	Check that the encoder cable is tightened to the controller.	Tighten the connector
5.9 INFEED BAD LUMBER LOAD	Warped or crooked lumber	Visually inspect lumber before putting it on the live deck.	Pause or cancel the job, remove the warped or crooked lumber, then resume the job.
	Controller program error	Check the computer desktop for a bad load error.	Reset the controller program.
		Visually inspect lumber queue for a bad lumber load.	Pause or cancel current job and straighten lumber.
	Incorrect L1P height	Remove the guard on L1P and check the dimension from the L1P roller down to the automated infeed. The height measurement should be 1 3/8 in.	With the guard off, adjust the roller to 1 3/8 in.
		Check the screws on the air cylinder to determine if they have begun to back out.	Tighten screws
	Low air pressure (gauge should read 80-90 psi.)	Locate the regulator on outfeed of saw near the bottom of the outside of the saw cabinet and check the pressure.	Adjust the regulator.
5.10 INFEED WILL NOT START	Breaker trip	Check breaker CB 804 (inside printer cabinet) to determine if it has tripped.	Reset the breaker.
	Breaker overload	Using the included electrical schematic, locate the breaker overload location.	Press the reset button on the overload. If the overload continues to trip, call a qualified electrician to identify the source of the problem.
	Blocked/dirty sensor	Visually check sensor for blockage/debris.	Remove blockage/clean debris using a cloth and glass cleaner.

CONDITION	CAUSE	CHECK	CORRECTION
5.11 L1 BELT RUNS IN REVERSE	Dirty EDS sensor	Open the manual control screen in the ALS software. Check the colors of the circles in the top left corner. They should both be red, if not see the correction to the right.	Clean the EDS sensors (emitter and receiver) with a cloth and glass cleaner.
	EDS sensors display green on ALS software manual screen	Open the manual control screen in the ALS software. If both lights remain green after they are cleaned, then check the sensors and cables for visible damage.	Call Alpine Equipment Customer Service.
5.12 PNEUMATIC CYLINDER DOES NOT ACTUATE OR ACTUATES SLOWLY	Low Air pressure (Air pressure should read between 80-90 psi.)	Locate the regulator on outfeed of saw near the bottom of the outside of the saw cabinet and check the pressure.	Adjust the regulator.
	Defective air cylinder	Listen for air escaping from the cylinder. Check for free motion by disconnecting the air and manually move the system connected to that air cylinder.	Replace the air cylinder. Trouble moving the system indicated mechanical blockage. Remove the mechanical blockage and repeat the check.
	Air leak	Listen for air leaks inside and outside the saw cabinet.	Repair any air leaks immediately as they will cause the saw to drop below the required operating pressures.
	Defective solenoid valve	Listen for leaks as the solenoid valve actuates. A leaking valve could indicate damage to the seals.	Replace solenoid valve.
	Mechanical binding	Disconnect the air and manually move the axis in question.	If difficult movement is experienced a bearing may be near the end of its life, call Alpine Equipment Customer Service for further assistance.
5.13 BLADE MOTOR WILL NOT START	Breaker tripped	Check CB 122 breaker in the main electrical cabinet.	Reset breaker if tripped.
	Servo drive error	Check codes on the blade motor servo drive in the electrical cabinet. It should display "bb" or "run."	Locate the blade reset button on the inside of the main electrical cabinet. Hold this reset button for 10-15 seconds. This will reset the blade motor servo drive and clear the fault code. After resetting, if the drive does not display "bb" or "run" call Alpine Equipment Customer Service.
	Damaged power or feedback cables	Visually inspect power and feedback cables.	Replace damaged cables. Call Alpine Equipment Customer Service if further assistance is required.

CONDITION	CAUSE	CHECK	CORRECTION
5.14 MACHINE STOPS DURING CUTTING OPERATION	Axis is blocked	Visually inspect A1, T1, Z1, B1 (if equipped) for blockage.	Remove blockage and restart the homing process.
	Low Air pressure (Air pressure should read between 80-90 psi.)	Locate the regulator on outfeed of saw near the bottom of the outside of the saw cabinet and check the pressure.	Adjust the regulator.
	Cut out of range	Set up the piece in semi-auto mode and run the cut.	If the cut cannot be completed in semi-auto call Alpine Equipment Customer Service for assistance.
	Corrupted TRS file	Cut a job from a different TRS file to determine if this is the root cause.	Call Alpine Equipment Customer Service so they can analyze the TRS file being used.
	MPI state error	This error will cause the controller program to close. Check computer desktop for an error.	To resolve this error, call Alpine Equipment Customer Service.
5.15 BEVEL	Encroaching adjacent pieces	Check the Bevel Spacing setting	Increase the value to add more space between bevels. The maximum value that can be entered is 0.166 which is equal to 2 in.
	Floor web length accuracy	Measure the floor web cut, if it is: Too long Too short	Make the number in "Check the Floor Web Length Adj." more positive Make the number in "Check the Floor Web Length Adj." more positive
	Bevel centerline	Perform a full machine calibration. Then, cut multiple test boards of the piece causing centerline inaccuracy. Change "Adjustments with LEADING and TRAILING Data." Values as follows: Centerline is too low Centerline too high	Cutting multiple test boards will eliminate the variability of lumber as a cause for this issue. Adjust number in positive direction Adjust number in negative direction
	Single bevel length	Perform a full machine calibration. Then, cut multiple test boards of the piece causing centerline inaccuracy. Change "Singl Bev Back Face Len Adj." Values as follows:	Cutting multiple test boards will eliminate the variability of lumber as a cause for this issue.

CONDITION	CAUSE	CHECK	CORRECTION
	Rip valley cut length	Measure the length of the rip cut, if it is: A-Too long B-Too short	A-Make the number in the "Rip Valley Length Adj" more negative B-Make the number in the "Rip Valley Length Adj" more positive
	Rip valley offset	Visually check the rip valley cut, if it is: A-Too shallow B-Too deep	A - Adjust number in positive direction B - Adjust number in negative direction
5.16 E-STOP	Cannot recover from E-Stop condition	Check all E-Stop buttons on the ALS (Figure 1) to determine if any are pressed. Check that three LED lights are illuminated on the safety relay module.	Return all E-Stop switches to operating condition, pulling them out and then press the blade reset button. If the relays are not illuminated contact Alpine Equipment Customer Service for further assistance.
	Thermistor overheating		Call Alpine Equipment Customer Service for further assistance with this issue.

6 APPENDIX

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6.2 APPENDIX B MAINTENANCE INTERVALS

ALS 5.0 Machine Inspection Guide and Maintenance Log

Week Start Date ____/____/____

EVERY SHIFT OR 8 HOURS OF RUN TIME	Mon	Tue	Wed	Thu	Fri	Sat	Sun					
Clean saw dust off the machine with a vacuum cleaner. (Compressed air may cause a safety hazard)												
Clean printer heads												
Check all light bulbs in the operator control panel.												
Check that water has drained from coalescer.												
Check the saw blade for chipped, broken, or dull teeth.												
EVERY 10 SHIFTS OR 80 HOURS OF RUN TIME							Date					
Verify the calibration of all axes.												
Verify all belt tensioning.												
Hand tighten all servo motor cables.												
Inspect all cables, connections, and routing components for damage or interference.												
Clean all sensors.												
EVERY 20 SHIFTS OR 160 HOURS OF RUN TIME							Date					
Inspect the belts for cracks, wear, tracking, and tension.												
Apply one pump of grease (NLGI Grade No. 2) to fittings.												
Assembly	Total	Location					Date					
Saw Cabinet	24											
L1 & L2 Clamps	8	Four on each bearing block										
L1 & L2 Pushers	8	On the back of saw cabinet										
T1 Bearings	4	On the horizontal rail behind saw head assembly										
Z1 Bearings	4	On the vertical rail behind saw head assembly										
Infeed	16											
L1P	4	Four on the back of the bearing block										
Drive Shaft Bearings	8	Under the infeed roll case										
Gripper	4	One on each of the gripper assemblies										
Outfeed	6											
Drive Shaft Bearings	6	Two bearings on each shaft under the roll case										
Conveyors	12											
Sorting	4	Two on drive roller and two on idler roller										
Waste	4	Two on drive roller and two on idler roller										
Incline (Optional)	4	Two on drive roller and two on idler roller										
EVERY 100 SHIFTS OR 800 HOURS OF RUN TIME							Date					
Check L1 & L2 belts for wear and tension												
EVERY 260 SHIFTS OR 2080 HOURS OF RUN TIME							Date					
Lubricate the Z1 Tolomatic® actuator.												
Tighten electrical connections in the main panel (Lockout-Tagout)												

6.3 Appendix C-Tolomatic Actuator

[RSA Actuator Manual](#)