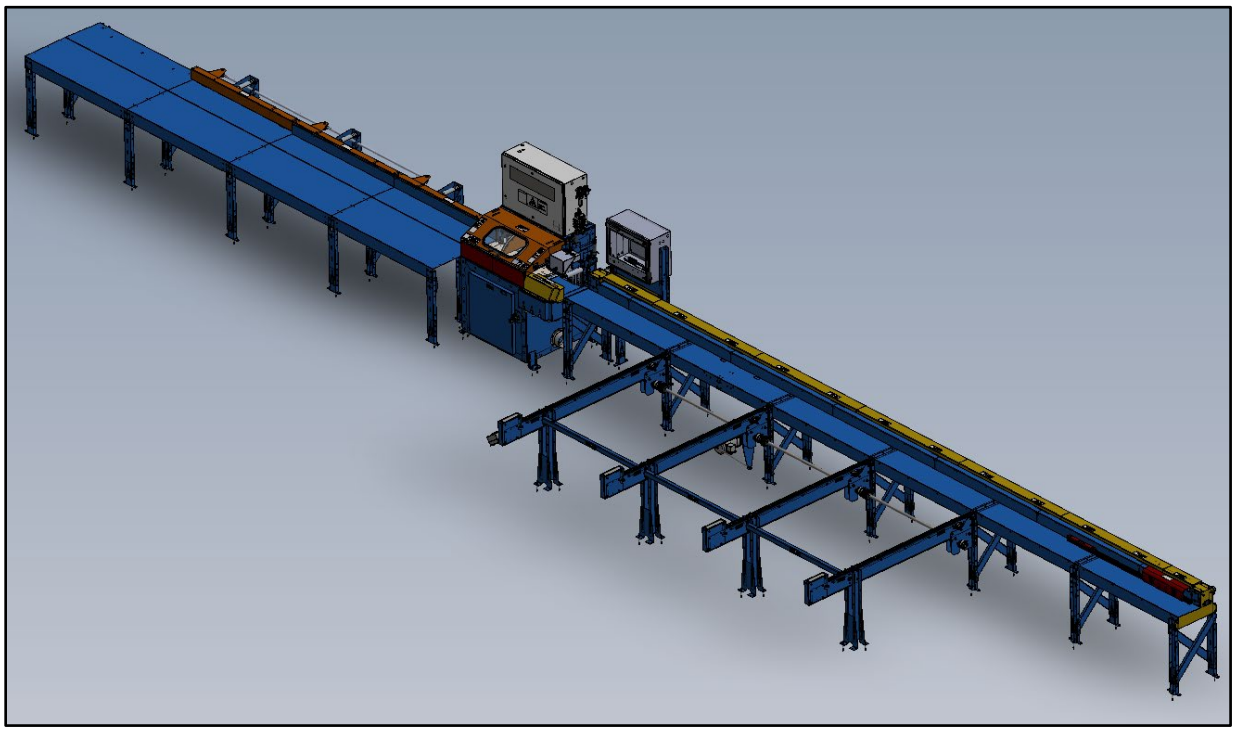
MiTek® Safety, Operation & Maintenance Manual

Hornet II™ saw

Linear Cut Processing Systems



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Applies to: Gen. 2

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1 Safety

1.1.1 Safety Indicator Signal Word

The following signal words and colors are used throughout this document to indicate safety hazards. Pay careful attention when you see them. The level of severity differs for each signal word and color.

Signal words are accompanied by graphics showing what personnel should or should not do. The graphics are called safety symbols and are defined in the General Warnings section, but more specific text is provided every time a graphic is used throughout the manual. Everyone near the machine must be trained on how to read these safety indicators.

Failure to comply with the instructions accompanying each signal word may result in property damage, personal injury, or even death. Personnel must follow all safety procedures and practices to ensure the safest possible operation of this equipment. However, at no time is this document a substitute for common sense. Personnel must ensure that the work environment is safe and free of distractions.

Danger	**Indicates an imminently hazardous situation which, if not avoided, is likely to result in death or serious injury.**
Warning	**Indicates a potentially hazardous situation, which, if not avoided, may result in death or serious injury.**
Caution	**Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.**
Notice	**Calls attention to information that is significant to understanding the operation at hand or the potential for property damage.**
Environmental	**Applies to conditions that may affect the environment but do not have an immediate, direct effect on personnel or equipment**

1.1.2 General Safety & Equipment Rules

Because it is impossible to anticipate every circumstance that might involve a hazard, the safety information provided in this equipment manual and on the machine is not all-inclusive. If this machine is operated or serviced using a procedure not specifically recommended by the manufacturer, the procedure shall be approved by a professional engineer to ensure it will not render the equipment unsafe. Use extreme caution and common sense at all times.

1.2 Safety Rules

1.2.1 Know Your Equipment

- Read this manual completely before using or maintaining the equipment. Do not operate this machine unless you have a thorough knowledge of the controls, safety devices, emergency stops, and operating procedures outlined in this manual.
- Read and follow all safety notes. Failure to comply with these instructions may result in economic loss, property damage, and/or personal injury including death.
- Refer to the lockout/tagout guidelines on the following pages to safely perform maintenance and troubleshooting of this equipment.
- Observe and obey all safety labels. Replace worn labels immediately.
- Use this equipment solely for the purpose described in this manual.
- Only qualified personnel should attempt to operate or perform maintenance on this equipment. “Qualified personnel” is defined as:

  ...a person or persons who, by possession of a recognized degree or certificate of professional training, or who, by extensive knowledge, training, or experience, has successfully demonstrated the ability to solve problems relating to the subject matter and work—ANSI B30.2-1983

  ...one who has skills and knowledge related to the construction and operation of the electrical equipment and installations and has received safety training on the hazards involved—NEC 2002 Handbook

1.2.2 Personal Safety

- Always wear safety glasses and hearing protection in an industrial environment.
- Utilize a filtering face piece (dust mask) when working near sawdust.
- Wear proper clothing and appropriate personal protective equipment (e.g., safety glasses and hearing protection.) Do not wear loose clothing or jewelry. Confine long hair by tying it back.
- Use caution when lifting heavy parts or material.

1.2.3 Installing the Equipment

- Follow installation instructions completely.
- Use proper lifting equipment rated for the proper weight.
- This equipment is not for use in a residential area.

1.2.4 Keeping a Safe Environment

- Pay attention to your surroundings.
- Keep children away. All visitors should be kept a safe distance from the work area. Hazards may not be apparent to individuals unfamiliar with the machine.
- Keep work areas well lit.
- Keep the work area clean and free of any trip or slip hazards.
- Do not use the equipment in damp or wet locations or expose it to rain or snow.
- Minimize dust clouds and protect your equipment by cleaning dust in this manner:
    - Shut down electrical power and sources of ignition

	NOTICE
	**Never use compressed air inside an electrical enclosure. It may force contaminants into electrical connections.** **Use a vacuum to remove dust from electrical enclosures. Canned air is acceptable after vacuuming.**

    - Vacuum dust prior to blowing with air
    - Powered cleaning equipment such as vacuums must be consistent with local governmental codes for use in dusty conditions.

1.2.5 Operating and Maintaining the Equipment

- Ensure that all people, tools, and foreign objects are clear of the restricted zones before operating this equipment.
- Perform safety tests to ensure all E-stops are working properly before operating the equipment at the initial startup, after performing any maintenance, and in accordance with the maintenance schedule.
- Always push an E-stop button before approaching a machine for any reason. An E-stop may cause components to move without warning.
- Only use procedures described in this manual. Any other procedures should be discussed with MiTek to verify it is done safely. For topics not covered in this manual or online, contact MiTek for advice.
- In case of machine malfunction, stop the machine immediately using an E-stop, lockout/tagout, and report the malfunction to a supervisor.
- Never leave the machine running unattended. Turn the power off! Do not leave the machine until all parts have come to a complete stop and all electrical power has been shut off.
- Check for worn or damaged parts regularly. Repair or replace them immediately.
- Only use exact replacement parts specified. Using unapproved parts may void the warranty and can be a safety risk.
- Keep the hydraulic, pneumatic, and electrical systems in good working order at all times. Repair leaks and loose connections immediately. Never exceed the recommended pressure or electrical power.
- Check that all guards and safety devices are in place and in working order before each shift starts. All protective guards and safety devices must be in place before and during use of the machine. Never disconnect or bypass any safety device or electrical interlock.
- Torque bolts and fasteners to the specifications given by MiTek. If no torque specification is given, use industry standards.
- Only qualified maintenance personnel shall make adjustments or remove, repair, or install safety devices. Only qualified electricians should perform electrical work.
- Periodically inspect the quality of the finished product.
- Document all preventive and repair maintenance over the life of the machine to improve machine efficiency and reduce the risk of accidents.

1.2.6 Electrical Safety Notes

- Do not use any liquids in the interior of electrical cabinets.
- When using solvents on and around the machine, remove power to the machine to eliminate the chance of sparking, resulting in explosion or fire. Wear a respirator approved for use with solvents.

1.2.7 General Warnings

	⚠ WARNING
	**HIGH VOLTAGE ELECTRICITY!** **May cause serious personal injury or death. Ensure only qualified electricians perform electrical service work.**

	⚠ WARNING
	**Read the equipment manual, safety labels, and all safety information provided before operating or maintaining this equipment.**

	⚠ WARNING
	**CRUSH OR CUT HAZARD** **Guards must always be in place during operation to avoid serious injury and possibly death.** **Always replace guards after completing maintenance and before removing the lockout/tagout device.**

	⚠ WARNING
	**Many components are manufactured from high carbon, heat-treated steel. Do not attempt to straighten, bend, or weld these components, as they may fail under load causing serious personal injury or death.**

1.2.8 E-Stop Locations

Refer to *Emergency Stop Buttons/Mechanisms* for location of E-stops.

1.3 Lockout/Tagout

1.3.1 Lockout/Tagout Guidelines

Lockout/tagout all energized systems before performing maintenance on them.

All lockout/tagout guidelines must be met according to OSHA 29 CFR 1910.147. A specific procedure should be included in your company's energy control program. This manual is not intended to replace your company's de-energizing or lockout/tagout procedure required by OSHA, but merely to provide general guidance.

The term "lockout," as used in this manual, means placing a lockout device, such as a keyed padlock, on any and all energy sources to ensure that the energy isolating device and the equipment being controlled cannot be re-energized or operated until the lockout device is removed.

- Energy sources include electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy.
- In the case of electrical energy sources, the main power and control power to the machinery must be turned off and physically locked in the Off position.
- Before performing maintenance on the pneumatic or hydraulic systems, bleed the lines prior to lockout/tagout to eliminate pressure.

If more than one person is working in a restricted zone, use a group lockout device that will allow each person to use a lock that can be removed only by the person performing the maintenance.

"Tagout" means that a prominent warning is securely fastened to an energy-isolating device to indicate that the equipment shall not be operated.

1.3.2 Electrical Lockout/Tagout Procedures

1.3.2.1 Working on a Machine Outside the Machine's Main Electrical Enclosure

Before performing maintenance on any machine with electrical power, lockout/ tagout the machine properly. When working on a machine outside of the machine's main electrical enclosure, not including work on the electrical transmission line to the machine, follow your company's approved lockout/ tagout procedures which should include, but are not limited to the steps here.

1. Engage an E-stop on the machine.
2. Turn the disconnect switch handle to the Off position. See Figure 1-1.

	**⚠ WARNING** **ELECTROCUTION HAZARD.** **When the disconnect switch is off, there is still live power within the disconnect switch's enclosure. Always turn off the power at the building's power source to the equipment before opening this electrical enclosure.**

Figure 1-1: Disconnect Switch in Off Position

3. Attach a lock and tag that meet OSHA requirements for lockout/tagout. See Figure 1-2.
4. Restrain or de-energize all pneumatic components, hydraulic components, and other parts that could have live or stored power.

Figure 1-2: Sample of a Lockout/Tagout Mechanism on an Electrical Enclosure

1.3.2.2 Working on a Machine Inside the Machine's Main Electrical Enclosure or in the Electrical Transmission Line to the Machine

Before opening the main electrical enclosure, or attempting to repair or replace an electrical transmission line to the machine, lockout/tagout the machine properly. Follow your company's approved lockout/tagout procedures which should include, but are not limited to the steps here.

1. Engage an E-stop on the machine.
2. Shut the power to the machine off at the machine's power source which is usually an electrical service entry panel on the facility wall. One example of a locked-out power source panel is shown in Figure 1- 3.
3. Attach a lock and tag that meets OSHA requirements for lockout/tagout.
4. Open the door to the enclosure in which you need access, and using a multimeter, verify that the power is off.

Figure 1-3: Sample of a Lockout/ Tagout Mechanism on a Power Source Panel

1.3.2.3 Hydraulic or Pneumatic System Lockout/Tagout Procedure

Before working on or near hydraulic or pneumatic components, bleed the lines of pressure. See *the* *Pneumatic System* section for further instruction.

When Lockout/Tagout Is Not Required
If working on components other than the hydraulic or pneumatic system, but that requires you to be near the vicinity of movable hydraulic or pneumatic components, you must, at a minimum, physically restrain those components from moving. If this is not possible, lockout/tagout the entire hydraulic or pneumatic system.

When Lockout/Tagout Is Required

Before attempting repair or performing maintenance on a hydraulic or pneumatic line or component, lockout/tagout the machine properly. Follow your company's approved lockout/tagout procedures.

Sample of a Lockout/Tagout on a Pneumatic System

1.3.3 Troubleshooting with an Energized Machine

Only a qualified electrician, using the personal protective equipment and following the procedures recommended in NFPA 70E should ever attempt service or repair of or near an energized area or component of the machine.

Whenever maintenance is performed while the equipment is electrically energized, there is a potential electric arc flash hazard. Refer to NFPA 70E for the personal protective equipment required when working with electrically energized components. Pneumatic and hydraulic components may move unexpectedly if not de-energized. Physically restrain any components capable of movement when working on or near those components.

1.4 Emergency Stop Buttons/Mechanisms

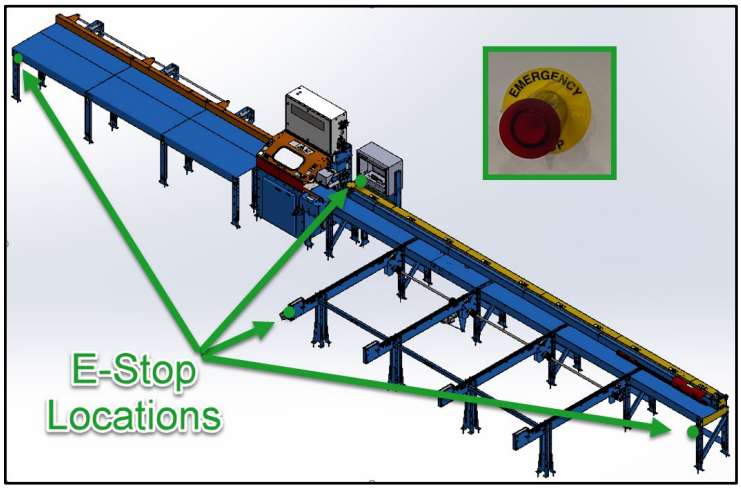
1.4.1 Overview and Locations

Ensure all operators and other personnel around the equipment know the location of ALL safety stop ("Emergency Stop"/E-stop) buttons/mechanisms and the purpose and proper procedures for using them.

An E-stop stops any movement and function of the machine (including toggling a locking bolt to stop saw blade motion) but does not completely cut power. The machine will need to be reset to resume functionality.

Note that raising the saw hood will also stop all motion, but the saw does not need to be reset to resume operation and it will not engage the locking bolt in the saw unit.

A diagram of all E-stop locations (shown with optional equipment):

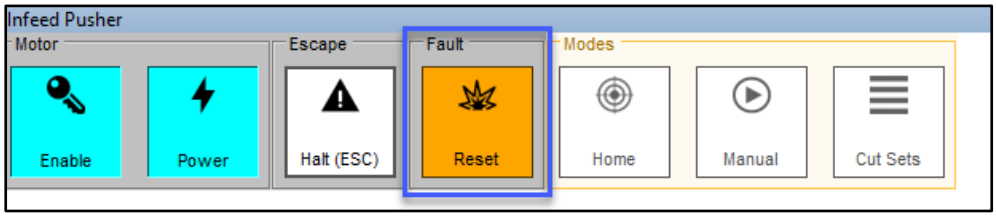


1.4.2 Engaging and Disengaging an E-Stop

1. To activate an E-Stop, push on it. An E-stop will illuminate red in color when engaged.

2. To deactivate an E-stop, pull on the button so it is in the up position and is no longer illuminated.

3. To resume operation, press the Reset button in the CutBuilder software. The reset button can be found on the Infeed Pusher panel.



1.4.3 Safety Guards

- NEVER operate equipment if any of the safety guards are not properly installed.
- NEVER bypass, modify, or otherwise disable any of the safety guards.

1.4.4 Audible Alerts

- Whenever audible alerting features are in use, be sure to obey all warnings, cautions, or other instructions heard from the audible system.

1.5 Safety Tests

This test procedure MUST be performed by qualified personnel at startup and after ANY maintenance, adjustment, or modification. Testing ensures that the safety system and machine control system work together to stop the machine properly.

1.5.1 Inspecting the *Hornet II* Saw

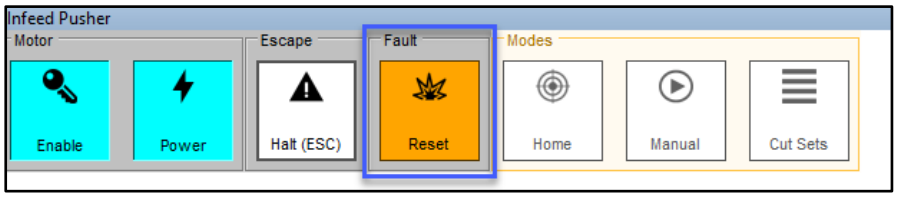
1. Lockout/tagout the machine.
2. Check the *Hornet II* Saw for debris or tools that would block the path of parts. Remove any that you may find. The following locations are especially important:
    - Infeed pusher and squeezer
    - Outfeed table
    - Saw chamber
3. Check the physical condition of the *Hornet II* Saw.
4. Remove lockout/tagout and return electrical power and pneumatic pressure to the machine.
5. Verify the machine has power by checking if the HMI is has power.
6. Verify all doors are closed and locked.

1.5.2 E-Stop Test

1. Verify there is no material on the infeed end of the saw or inside the saw chamber.
2. Initiate a cut cycle using the Cut Set/Load Set mode. The infeed pusher will begin to move as will the saw blade.
3. Activate an E-stop. Verify that the following happens when the pushbutton is depressed:
    - The infeed pusher and auto loading mechanism stop
    - All illuminated E-stops should turn solid red
    - The bolt that stops the saw blade should engage
4. If the E-stop does not engage properly, immediately lockout/tagout and service the machine.

5. Pull the E-stop to release it. The solid red light should no longer be illuminated on any E-stops.

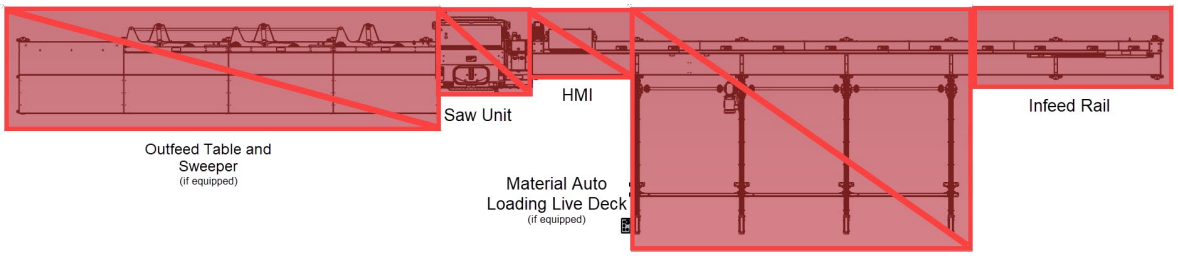
6. To resume operation, press the Reset button on the Infeed Pusher panel in the CutBuilder software.



1.6 Restricted Zone

	**⚠ DANGER** **Stay out of the restricted zone when equipment is in use. Serious injury or death may result if personnel are in the restricted zone.** **Always look for personnel in the restricted zone before operating equipment.**

Know the Restricted Zone



1.6.1 Marking the Restricted Zone

The restricted zone must be marked so everyone near the equipment can clearly see the area where danger may exist. The restricted zone must be marked and maintained so everyone near the equipment can clearly see the area where danger may exist. The customer is responsible for marking the restricted zone prior to startup and maintaining the markings so it is clearly visible throughout the life of the machine.

2 Safety Symbol Definitions

The safety symbols shown in this section are found throughout the manual to indicate hazards related to this machine. All personnel expected to operate or maintain this machine should be familiar with these safety symbols and their meanings.

User caution. It indicates a condition where equipment damage resulting in injury could occur if operational procedures are not followed. To reduce risk of damage or injury, refer to accompanying documents, and follow all steps or procedures as instructed.

Electrical hazard. It indicates dangerous high voltages inside of an enclosure and/or the presence of a power source. To reduce the risk of fire or electric shock, do not attempt to open the enclosure or gain access to areas where you are not instructed to do so. Refer servicing to qualified service personnel only.
This equipment should be operated only from the type of source indicated on the manufacturer's identification label. Installation should be in compliance with applicable sections of the national electric code. Consult your local building code before installing.

Crush hazard. Keep hands and other body parts clear.

Noise hazard. Equipment produces loud noise in excess of 100 DBA during operation. Use appropriate PPE to protect hearing when in the vicinity of this equipment.

Slip hazard. Use of appropriate footwear is required.

Trip hazard. Pay attention when walking in this area.

Kickback hazard.

Keep hands clear of cutting parts.

Keep hands and body clear.

Crush hazard from above.

Ventilate. Slots and openings in the cabinet are provided for ventilation to ensure reliable operating of the equipment. To protect the equipment from overheating, those openings must not be blocked or covered. This equipment should not be placed in a built- in installation, such as a wall cutout, unless proper ventilation is provided because hot temperatures result.

Operation of this equipment may result in flying debris and excessive noise. To reduce the risk of eye injury, wear only approved PPE.

Keep feet away from moving parts.

Keep hands away from moving parts.

High pressure hose. Use appropriate PPE when working on equipment. Maintain safe pressure level at all times.

Equipment has automatic restarting capability. Lockout/tagout on the upstream disconnect before servicing.

Warning. Three-man lift required to move this equipment safely. Refer to the installation manual.

The operation of this equipment requires the use of PPE. Do not operate without wearing the required protective clothing.

Refer to manual. After installation, read the user's guide carefully before operating. Follow all operating and other instructions carefully.

Circuits are live. Lockout/tagout on the upstream disconnect prior to servicing.

Lockout in a de-energized state.

Lift point. In order to decrease the likelihood of damage to the equipment, use only the lift points indicated in the manual.

To reduce the risk of equipment damage or injury to personnel, maintain pressure at safe levels.

Use of lift equipment is mandatory.

Consult material safety data sheet.

Unplug equipment before servicing.

No smoking in this area.

Hazardous moving parts are located behind this access panel. Do not operate this equipment without all guards and covers in place.

Do not place containers with liquids such as coffee, water, soda, etc. on this equipment. Do not operate this equipment in a wet environment. Do not expose to water.

No lift point. Do not lift this device with a hook/crane assembly. Equipment damage occurs. Refer to the installation instructions.

Do not use unapproved lubricants in this equipment.

Do not operate without guards in place.

Do not discard into the municipal waste stream.

Indicates notes regarding lubrication.

2.1 Declaration of Safety Conformity

Conforms electrically to the following:

- NFPA 79
- NEC Electrical Code
- Electrical enclosures carry UL 508A and the CUL for Canada
- Safety circuit conforms to Category 3 redundant monitoring

Conforms mechanically to the following:

- 10CFR 1910
- ANSI B 11.19

Declaration of Noise Emissions

Decibel level of ambient and machine operation sound levels:

- Ambient - 76 dB
- Machine operation - 86 dB

3 Introduction

3.1 Introduction to the Manual

	**⚠ WARNING** **Read this manual completely before using this equipment.** **Do not operate this equipment until you have a thorough understanding of all controls, safety devices, emergency stops, and operating procedures outlined in this manual.** **All hazard instructions must be read and observed. Failure to do so may result in economic loss, property damage, and/or personal injury.** **This manual must always be available to personnel.**

In order for this manual to be useful, the appropriate sections must be easily accessible by operators and maintenance personnel.

This manual addresses the most recent version of the equipment as of the date listed on the title page. For earlier revisions, contact MiTek.

3.2 Additional Resources

Website

Visit the MiTek website for up-to-date information on all MiTek equipment. You may also find the following information there:

- The latest revisions of this manual
- Services bulletins pertaining to your equipment
- Support, safety, and training information
- Part numbers for ordering parts

Contact Us

MiTek Automation Customer Support
301 Fountain Lakes Industrial Drive
St. Charles, MO 63301

Parts Orders (with part number)
Email: mitekparts@mii.com

Technical Assistance
Phone: 800-523-3380
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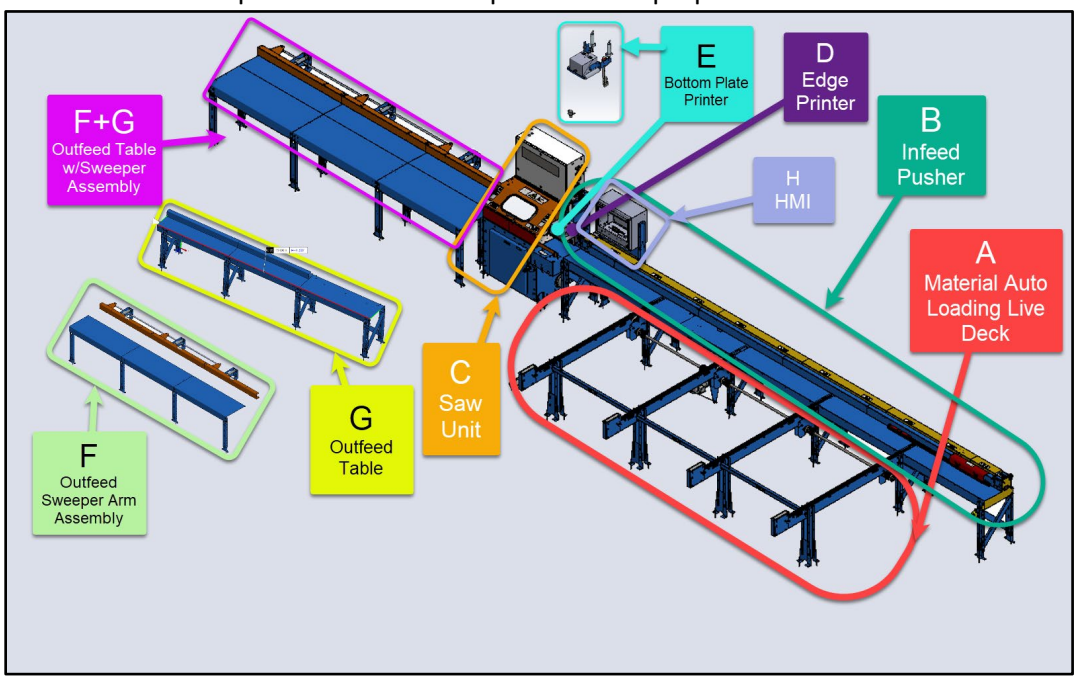
Videos
Search for “MiTek Inc” to find us on YouTube

4 Main Components and Optional Equipment



The right-to-left configuration is shown in the above figure. The option for a left-to-right configuration is also available.

4.1 Main Components

- **Infeed pusher (B)** – A pushing mechanism comprised of an infeed rail and pusher used to push materials through the cutting and labeling device.
- **Saw unit (C)** – The part of the machine that houses the saw blade.
- **Edge printer (D)** – A device used to perform labeling or place other information onto the part being processed.
- **Outfeed table (G)** – Area where processed items feed onto after being processed.
- **Operator Interface or HMI (H)** – A touch-screen computer with CBA installed that is used for the operator to acquire and deliver information to and from the overall process.
- **CutBuilder Automation software**- CutBuilder Automation (CBA) is a package of software applications which make up the main user interface of the Hornet II.

4.2 Optional Features

- **Bottom plate printer (E)** – An optional device used to perform labeling or place other information onto the media being processed. The bottom plate printer marks the part face that is resting on the infeed conveyor. If the incoming boards are stacked 2- high, only the bottom plate receives face printing.
- **Material Auto Loading Live Deck (A)** – A staging conveyor that transports the lumber (placed there by the operator) and advances 1 piece (or stack) at a time for automatic loading onto the Infeed Rail.
- **Outfeed sweep arm assembly (F)** – A combination of a steel-top table and sweep arm on the outfeed that automatically moves processed boards onto the table to be removed by the operator.

4.3 Dust Extraction Methods

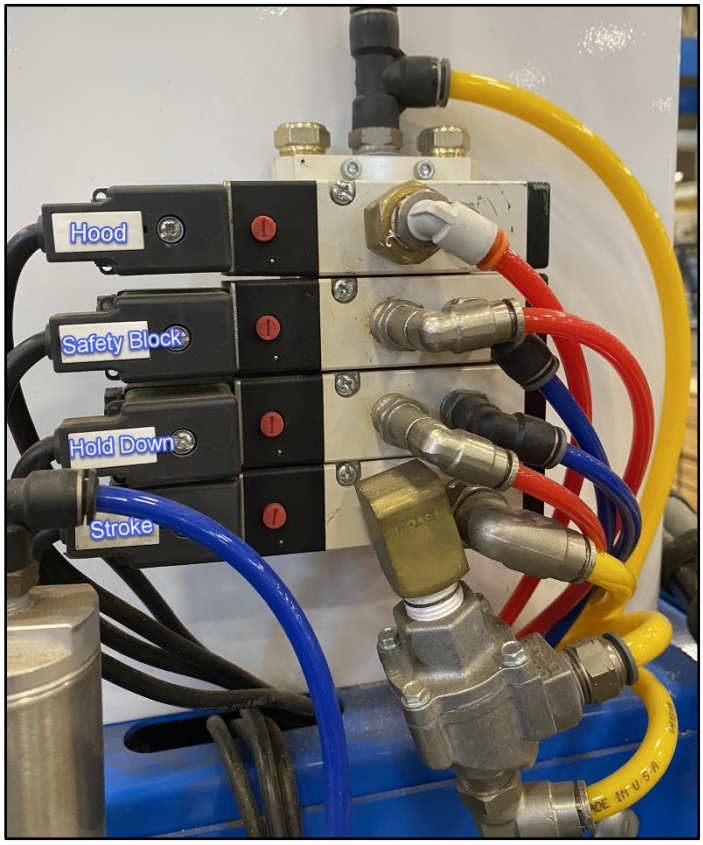
One port is available for dust extraction from the saw chamber. It is highly recommended that a dust extraction method is used during operation. A dust extractor for Hornet should have a suction capacity of 800 CFM.

4.4 Air Valve Assemblies

There are two air valve assembles located on the Hornet. One is on the saw unit, mounted to the electrical panel, between the panel and the HMI enclosure, as shown here:

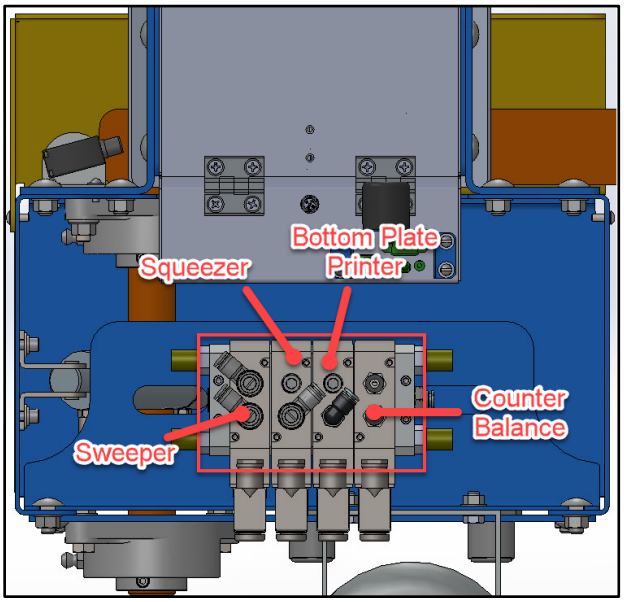
The four valves from top to bottom are:

- Hood
- Safety Block
- Hold Down
- Stroke



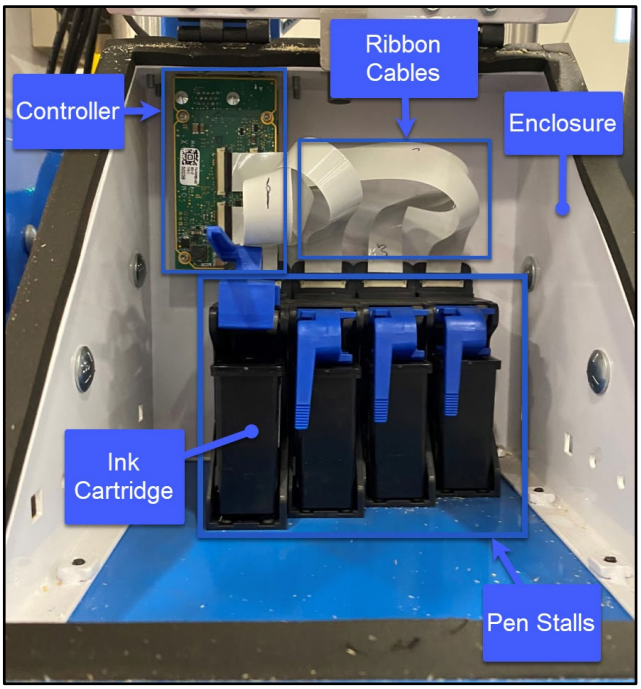
There is an additional air valve assembly on the back of the gatekeeper assembly. The valves include:

- Sweeper (if equipped)
- Squeezer
- Bottom plate printer (if equipped)
- Counter balance



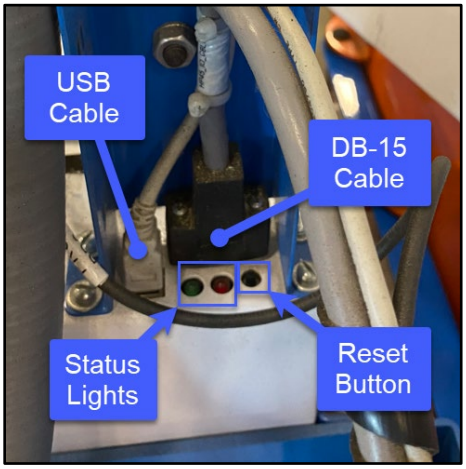
See the Pneumatic System section for more information on pressures and how to adjust them.

5 Printer Components



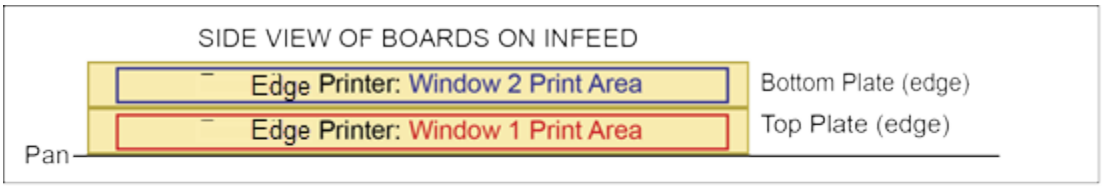
The Hornet printer is comprised of the following components:

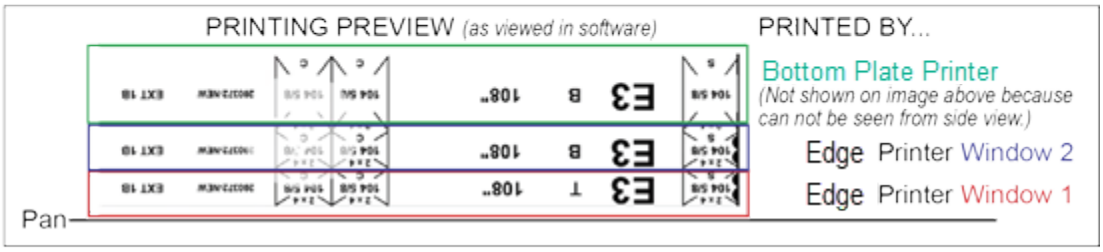
- **Enclosure** – The metal housing for the printer. There is a DB-15 cable and a USB cable that connects to the enclosure. There are also two status lights (one red, one green) and a reset button.



- **Controller** – The controller is comprised of two boards and connects to the pen stalls via the ribbon cables.
- **Ribbon Cables** – Cables that connect the pen stalls to the controller.
- **Pen Stalls** – Stalls that house the ink cartridges. They are spring loaded and feature a clip for securing the ink cartridges.
- **Ink Cartridges** – Replaceable cartridges that house the ink and have the nozzles that transfer the ink onto the material.

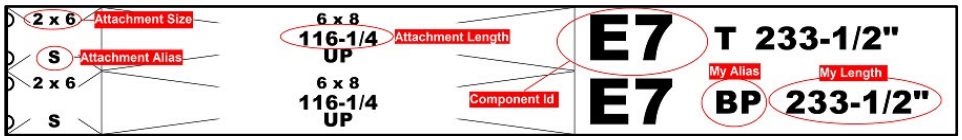
5.1 Print Areas

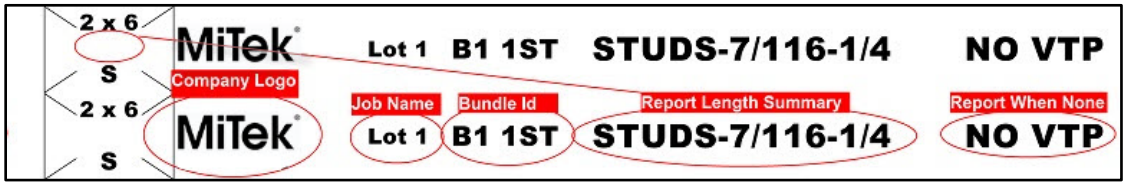




5.1.1 Reading the Printed Data

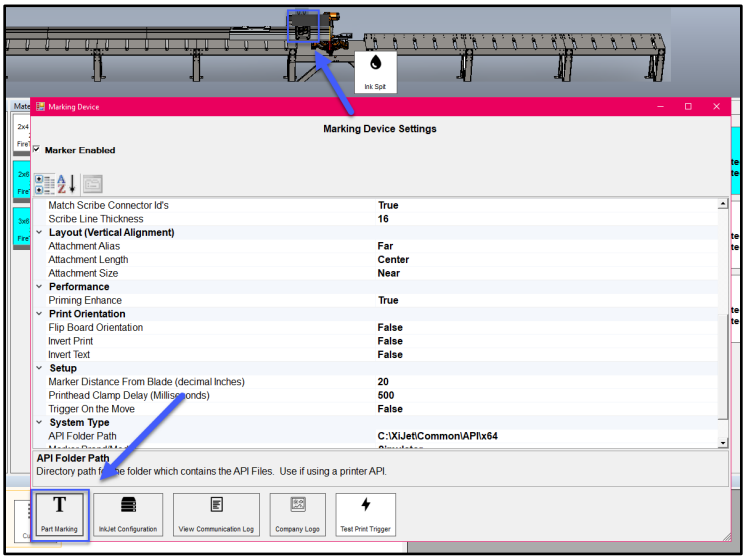
The following figures identify the different informational items that can be printed by the edge or bottom plate printer (if equipped).





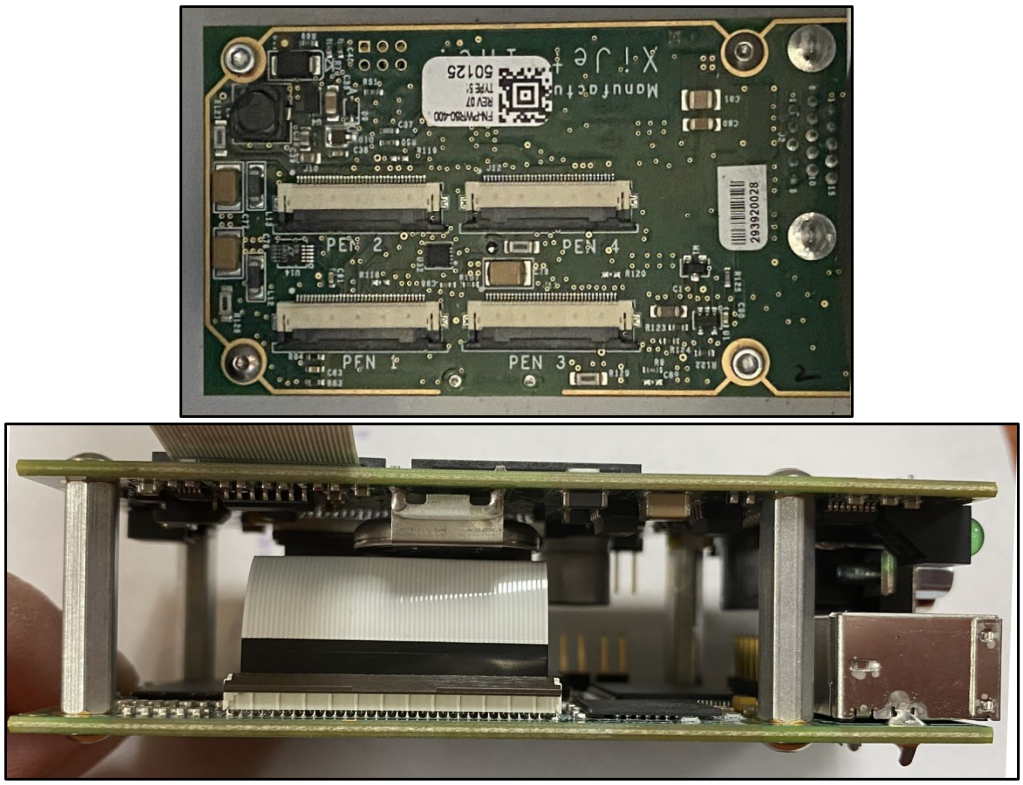
5.1.2 Modifying the Printed Data

To modify the printed data settings, click on the printer on the saw picture on the top panel of the CutBuilder software, then click on Print Marking to open the Print Marking menu.

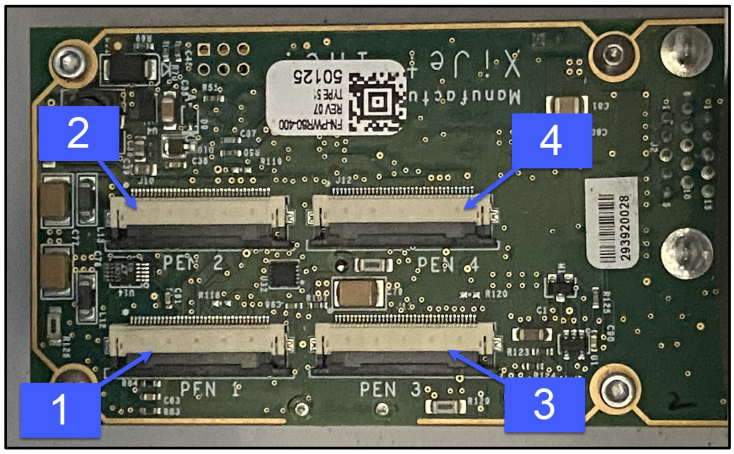


5.2 Controller

The controller is comprised of two boards with a bushing between them.

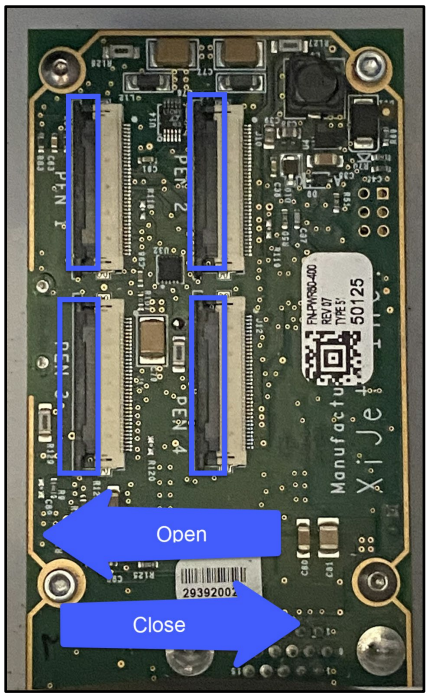


The top board of the controller features four slots for ribbon cables. Each slot is labeled one through four and corresponds with a pen stall.



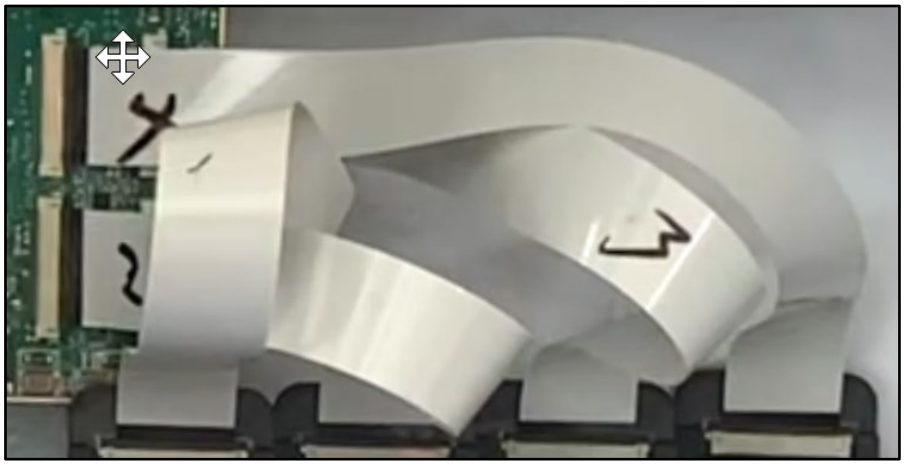
Opening and Securing a Ribbon Cable Slot

To open a ribbon cable slot, pull the black clip away from the slot. To secure it, push the black clip back into place.



5.3 Ribbon Cables

Each printer housing has four ribbon cables. The ribbon cables connect the pen stalls to the controller and must be unseated on both the controller and pen stall end to be removed.



5.4 Pen Stalls

Each printer enclosure has four pen stalls that house the ink cartridges. Each pen stall is connected to a corresponding slot on the controller with a ribbon cable. When facing the pen stalls from the front of the enclosure, the pen stall closest to the back of the enclosure is number four, and the pen stall positioned closest to the front is number 1.

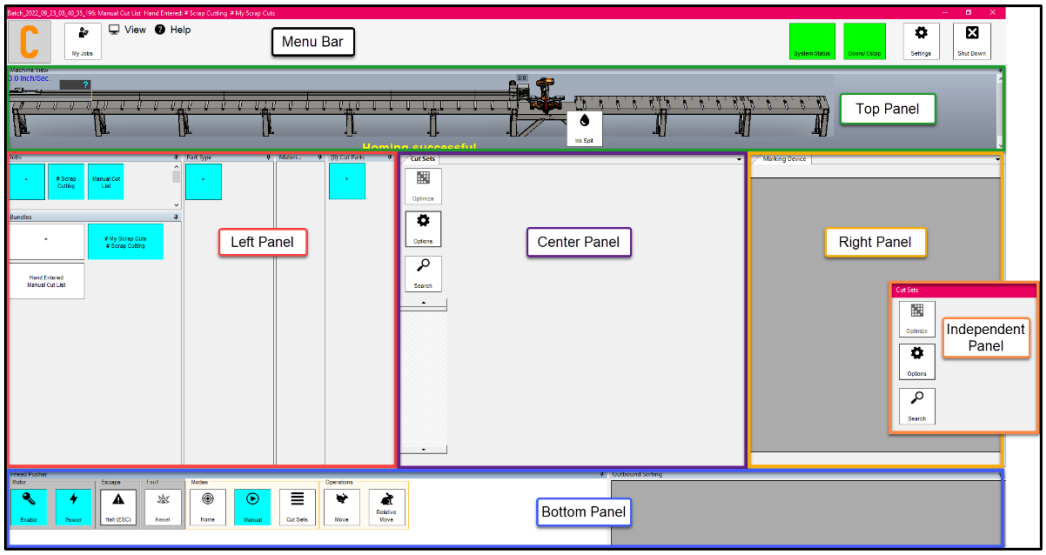
6 CutBuilder Software

6.1 Software Overview

The CutBuilder software is the main interface for the Hornet saw. It is highly customizable and provides different operating modes for processing jobs.

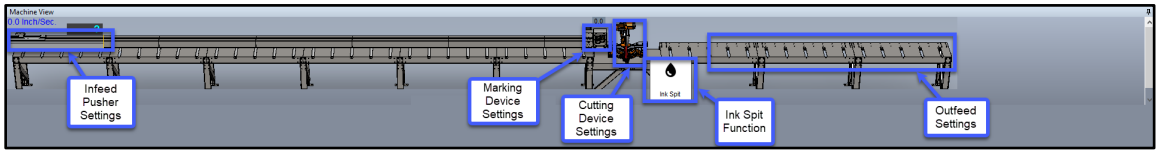
6.2 Home Screen Panels

The home screen is comprised of seven different panels, with five of them customizable.



Home Screen Panels:

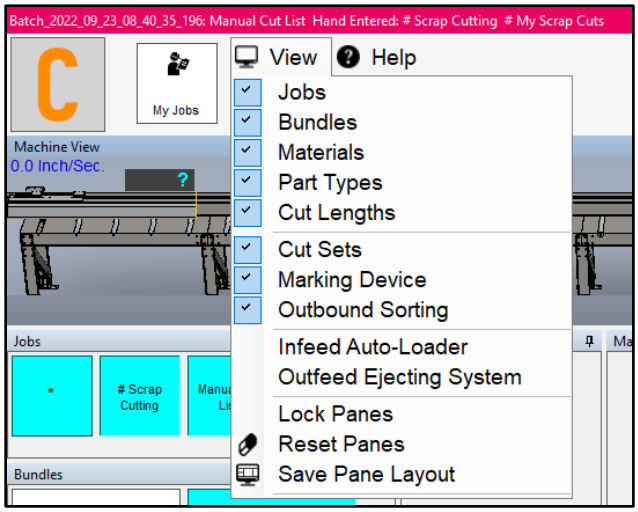
- **Menu Bar** – Features the My Jobs, View, Help, Settings, and Shut Down functions. It also features a System Status and Doors/E-Stop indicator.
- **Top Panel** – Features an image of the saw that is interactive. Clicking on certain parts of the image will bring up the corresponding settings menu.



- **Left Panel, Center Panel, and Right Panel** – Three different horizontal panels that can be customized with different panes.
- **Bottom Panel** – Another customizable panel that typically features the Infeed Pusher pane.

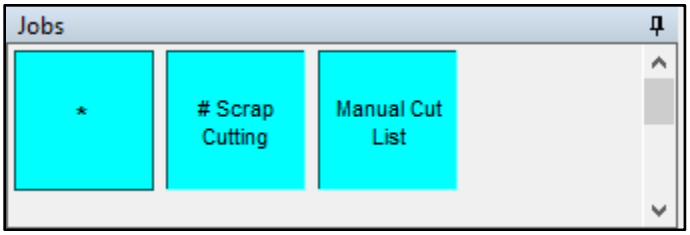
6.3 Home Screen Panes

The different home screen panes can be accessed by using the View menu on the Menu Bar.

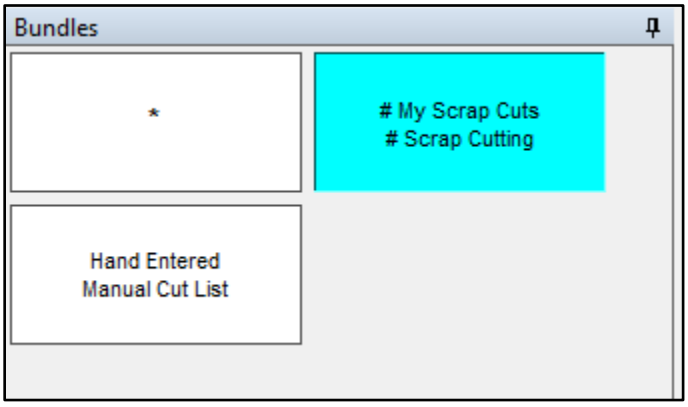


The available home screen panes are:

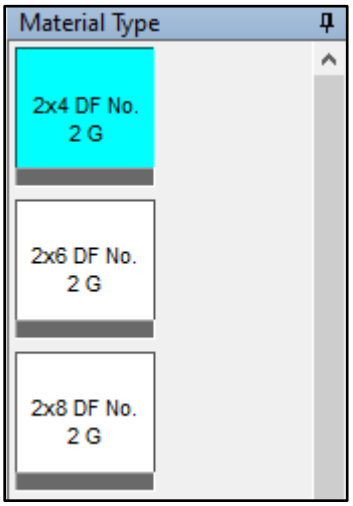
- **Jobs** – Displays the currently loaded jobs.



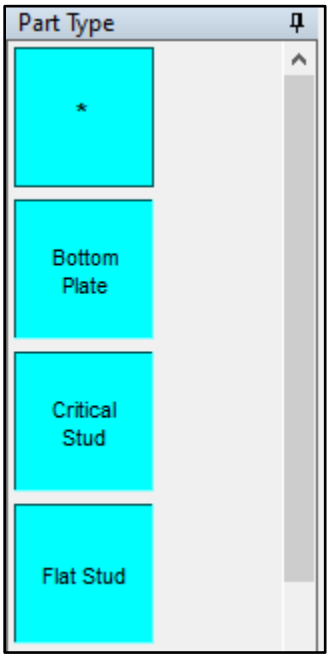
- **Bundles** – Displays the available bundles for the currently selected jobs.



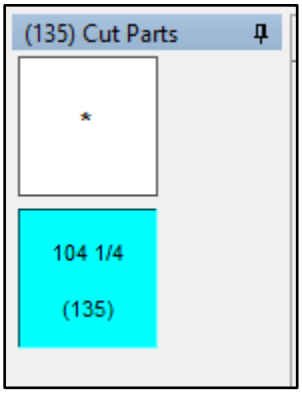
- **Materials (Material Type)** – Displays materials that can be selected to use for the cut sets.



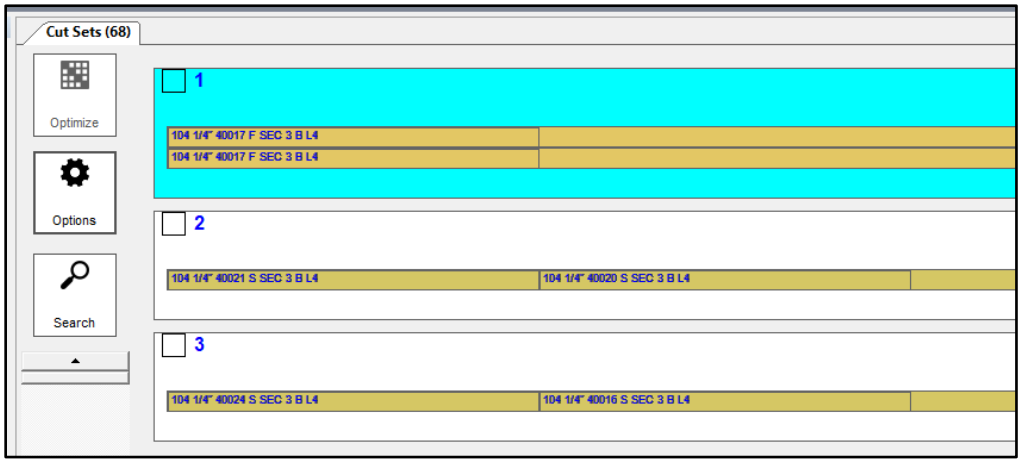
- **Part Types** – Displays the different part types that are included in the selected job and bundle.



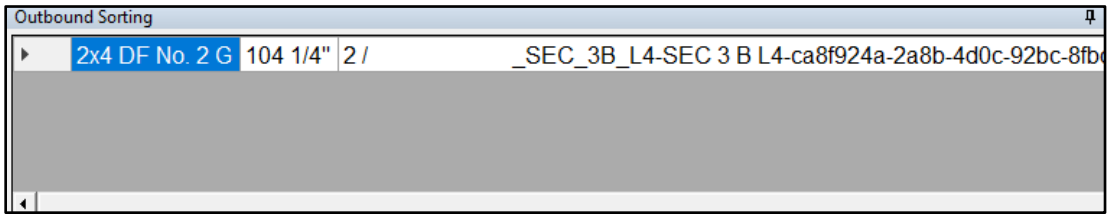
- **Cut Lengths (Cut Parts)** -



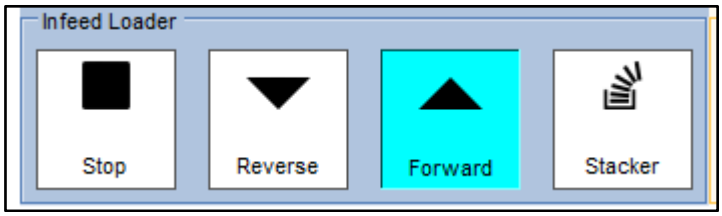
- **Cut Sets** -



- **Outbound Sorting** – Displays information identifying the top piece of material in a cut set as they are processed.



- **Infeed Auto-Loader** – Displays additional controls for the Auto Loading Live Deck (if equipped)



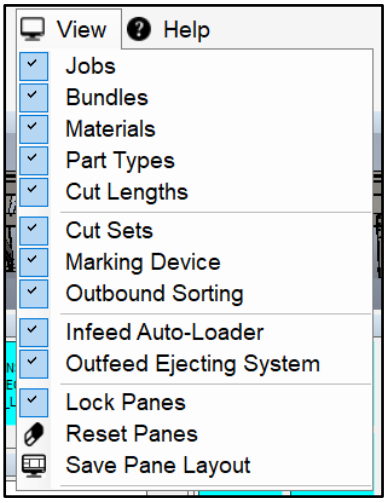
- **Outfeed Ejecting System** – Displays additional controls for the outfeed sweeper arm (if equipped)

6.4 Customizing the Home Screen Panels with Panes

The home screen panels (excluding the Menu Bar and Top Panel) can be configured freely using the different panes.

6.4.1 View Menu

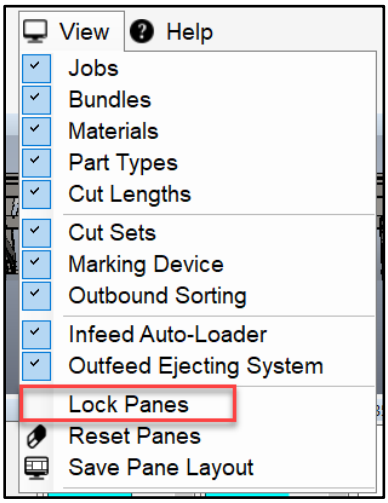
The View menu on the Menu bar can be used to display different panes. If the pane has a check mark by it, then it is currently displayed somewhere on the home screen.



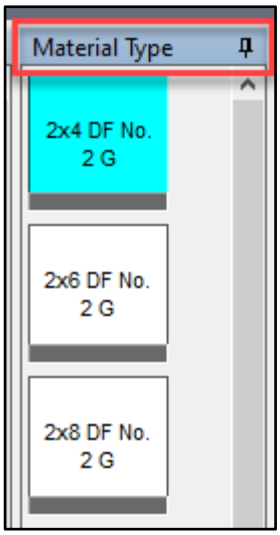
- **Lock Panes** can be used to lock the current layout. The presence of the checkmark indicates that the panes are locked. Click on the Lock Panes option to remove the checkmark and allow the panes to be moved freely.
- **Save Pane Layout** is used to save the current pane layout as the default. Note that only one pane layout can be saved at a time.
- **Reset Panes** can be used to go back to the last saved pane layout.

6.4.2 Arranging Panes

To arrange panes, start by ensuring the panes are not locked by checking the Lock Panes status in the View menu on the Menu Bar. The following figure displays the Lock Panes status as unlocked.

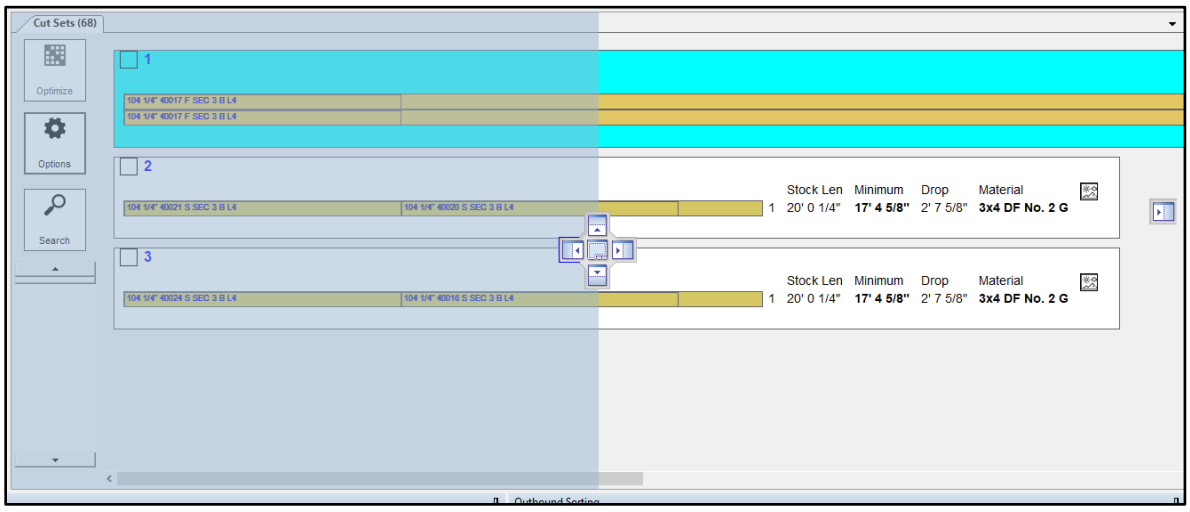


To move a pane, left click on the title bar of the pane you wish to move and begin to drag it to the panel you would like to move it to.

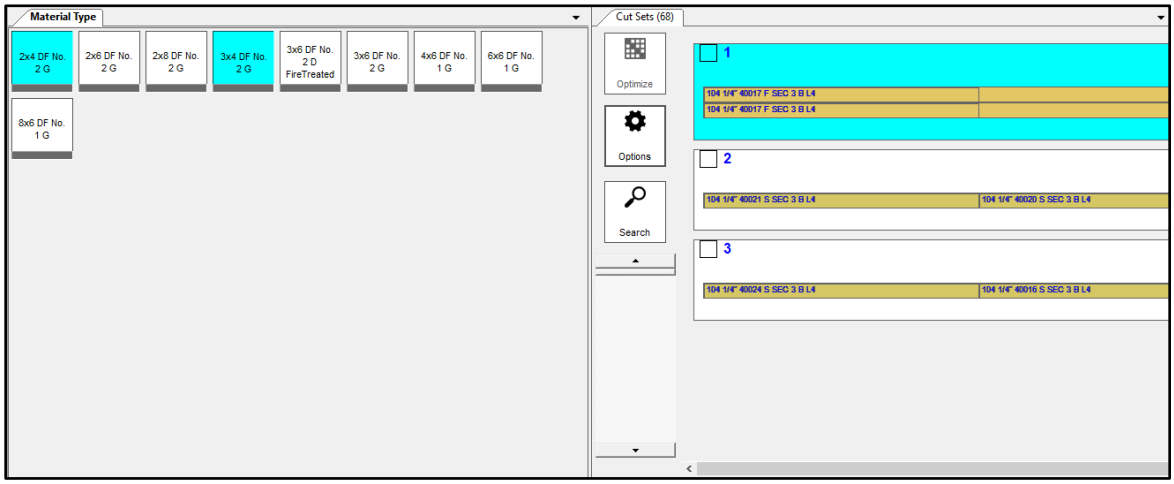


The following pane-pinning icons will appear:

When hovering over a pane-pinning icon, a transparent box will appear showing a preview of where that pane will display when dropped. Below is an example of the preview when hovering over the left arrow pane-pinning icon:



When the pane is in the desired position as indicated by the preview, release the left-click to ‘drop’ the pane in that position.



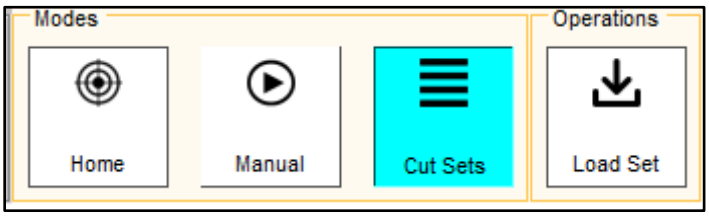
6.5 Software Control Buttons Overview

6.5.1 Standard Software Buttons

Infeed Pusher

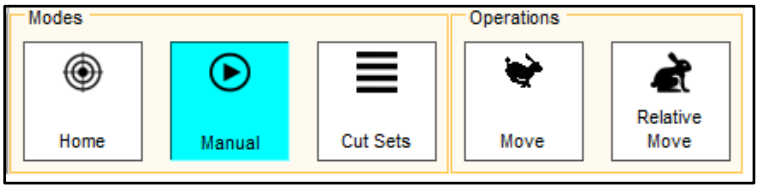
- **Motor > Enable** – Enables power to the motor system.
- **Motor > Power** – Activates power to the motor system.
- **Escape > Halt** – Stops the current command/process.
- **Fault > Reset** – Clears the halt command to allow processes to run.

Modes



- **Modes > Home** – Executes homing of the push arm.
- **Modes > Manual** – Changes the operational mode to **Manual** for using manual operations such as: moving pusher to a given location, jogging the pusher forward or backward, and other manual type of operations.
- **Modes > Cut Sets** – Changes the operational mode to "Cut Set" mode which is used for optimized cutting of full stock lengths into shorter cut lengths.
- **Operations > Load Set** – Available when in "Cut Set" mode. Pressing "Load Set" does the following:

    1. Sends the push arm to a location adequate for loading the machine with the stock length of the active cut set.
    2. Loads the marking device with the information required for the active cut set.
    3. Opens the "Cut Set Operations" window exclusively for performing cut set operations.



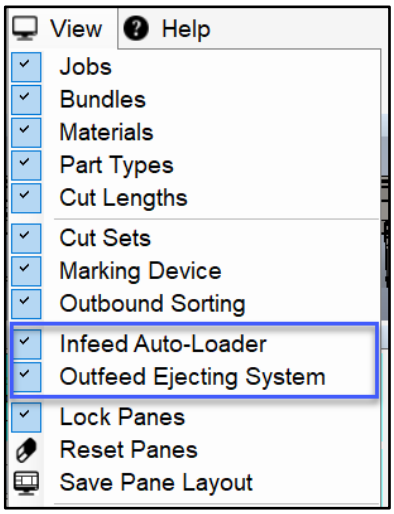
- **Operations > Move** – Available when in the "Manual" mode. Allows the operator to input a distance and make the push arm move to the distance entered.
- **Operations > Relative Move** – Allows the operator to move the push arm forward or backward by a distance entered by the operator.

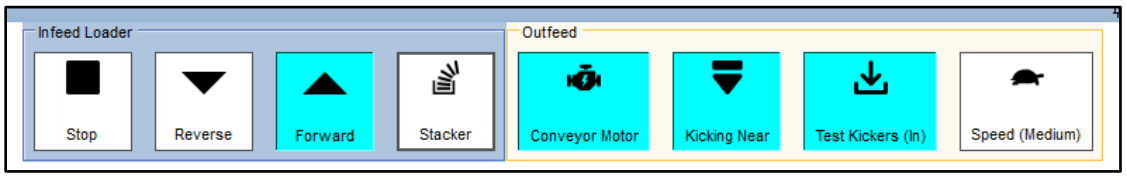
6.5.2 Optional Software Buttons (for Optional Equipment)

The optional software control buttons that appear in the CutBuilder are affected by which panels are currently displayed. See the "Home Screen Panes" section for more information.

6.5.2.1 Infeed and Outfeed

The Infeed Loader and Outfeed control buttons are only available if equipped and if the Infeed Auto-Loader and Outfeed Ejecting System panels are enabled in the View menu.





- **Infeed Loader > Stop** – Stops the infeed conveyor.
- **Infeed Loader > Reverse** – Runs the infeed conveyor in reverse away from the infeed pusher assembly.
- **Infeed Loader > Forward** – Runs the infeed conveyor in a forward direction toward the infeed pusher assembly.
- **Outfeed > Conveyor Motor** – Turns the outfeed conveyor motor on.
- **Outfeed > Kicking Far/Near** – This button toggles the outfeed kicking system to either use the "Near" kickers closest to the central operator of the system or the "Far" kickers furthest from the main operator location (if equipped).
- **Outfeed > Test Kickers (Out/In)** – Used to for testing purposes only to check functionality of all pneumatic kicking mechanisms. Pressing "Test Kickers (Out)" will execute all kickers to extend out. Pressing "Test Kickers (In)" will retract the kickers back to their normal position.

  Note: The system does not allow running the outfeed with the kickers extended out nor should the operator attempt to run the system with the kickers extended out.

- **Outfeed > Speed (Medium/Fast)** – An option available to certain models is the existence of multiple speeds. Used to switch the conveyor speed to one of two speeds: "Medium" or "Fast".

  Note: Speed controls of this button are not relevant when in Cut Set Operations Mode. When in Cut Set Operations Mode, speeds are determined by each material type in the Materials Library settings of the software.

7 Pre-Operation

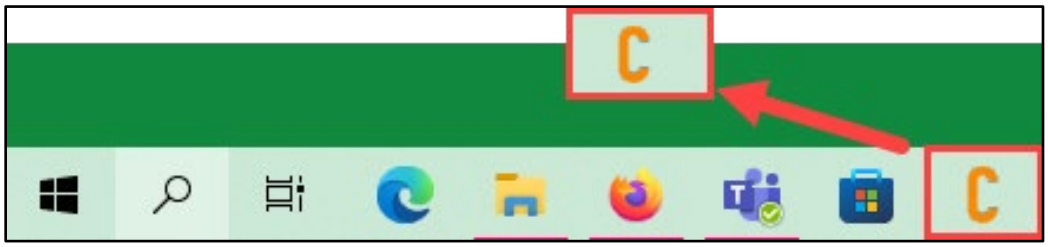
7.1.1 Passwords

The following passwords are necessary to start and fully use the CutBuilder software:

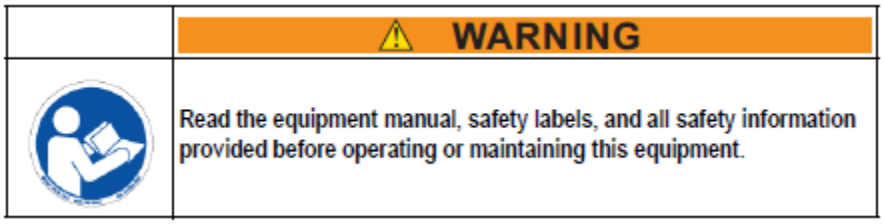
- Windows
- Interface password: Required to view or change the global settings screen
- Machine password: Required to view or change individual device settings

7.1.2 Pre-Operation Software Checks

1. If the computer is not already on, start the computer by pressing its power button.
2. Confirm that the PC is on and at the Windows login prompt by visually inspecting the screen on the computer monitor in the HMI.
3. Login to Windows with your company-assigned Windows username and password.
4. Wait until all obvious startup activity has completed and the cursor is ready for use before starting the *CutBuilder* software.
5. Start *CutBuilder Automation* by clicking the icon shown below. Note that the icon may vary or be in a different location.



7.2 Pre-Operation Physical Checks



Perform all safety checks before using the saw. See Safety Tests for more information.

Preparing the Printer

Perform the following checks on the edge printer and the bottom plate printer (if equipped) before operating the saw for best results. See the *Printers* section for more information regarding replacing cartridges and testing the printers.

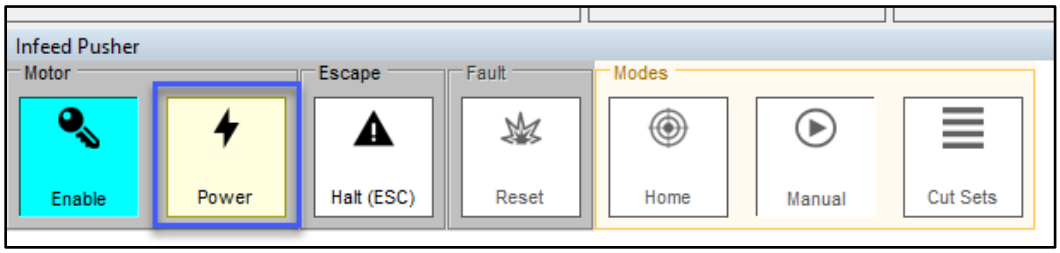
1. Visually inspect the nozzles on the front of the inkjet cartridges.
2. If any noticeable damage to any cartridges is found, replace the cartridge.
3. Clean, purge, and test the printer.

8 Operation

8.1 Start Conditions

Powering Up the Motor Controls

The motor controls for the pusher must be powered on before operation may begin. The button for powering on the motor controls can be found on the bottom panel of the CutBuilder software.

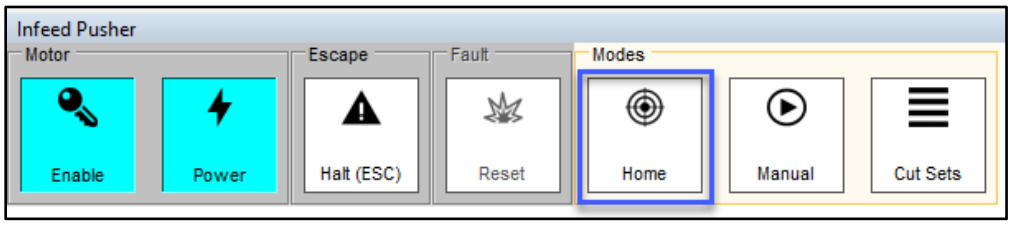


Homing the Pusher

After powering on the motor controls, the pusher must be homed.

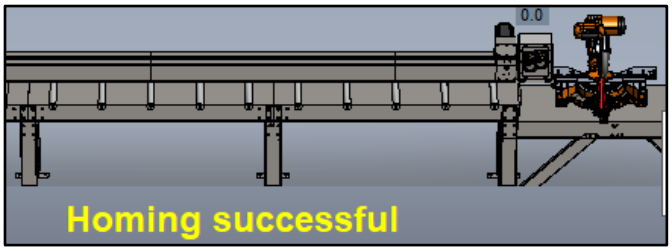
To begin homing, press the **Home** button which is located in the bottom panel of the CutBuilder software.

NOTE: If the home button is flashing in color, this indicates homing is required and is the only option.

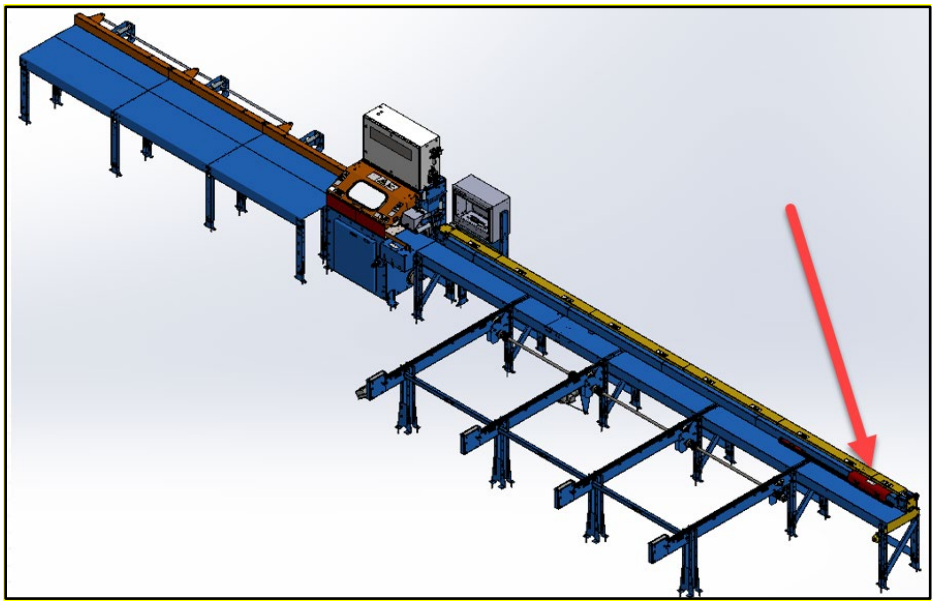


1. The pusher will begin moving toward the homing sensor. Once the pusher reaches the homing sensor, it will move the opposite direction, away from the sensor. Then, the pusher resets its internal reference and the pusher's homing is completed.

2. A "Homing successful" message will appear when homing the pusher is complete.



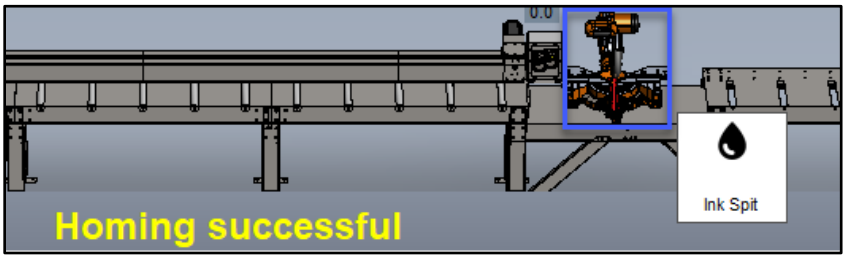
NOTE: For efficiency, always home the pusher before homing the saw.



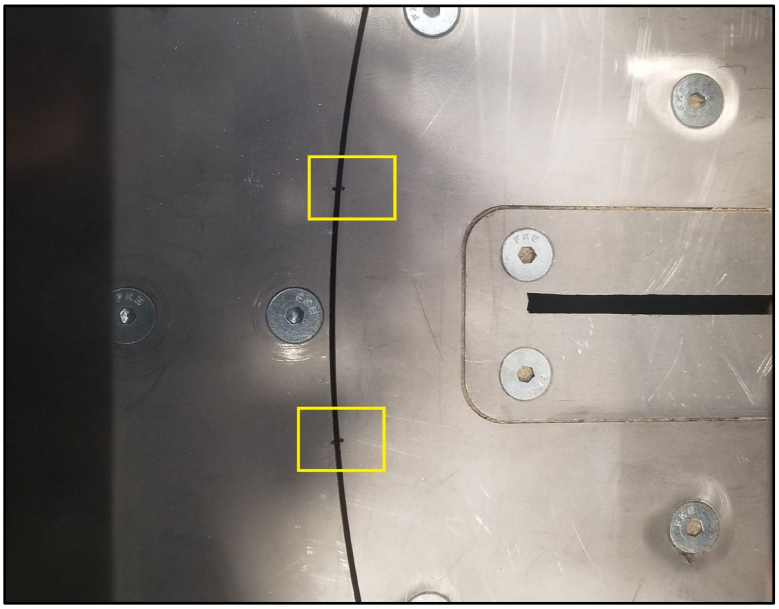
8.1.1 Homing the Saw Angle

The saw angle must be homed before operation of the saw can begin. Use the following procedure to accomplish homing the saw angle.

1. To begin homing the saw angle, open the Saw Menu by clicking on the saw in the top panel in the CutBuilder software.



2. Enter the machine password if prompted.
3. Click the Home button.
4. The grooves on the saw angle table should align with those on the saw table. If they do not, perform a calibration of the angle. See the Maintenance section for more information on calibration.



8.2 Physical Control Buttons

8.2.1 Auto Loading Live Deck (Optional)

- **Emergency stop** – Puts the machine in an emergency stop state. It functions identically to the other E-Stops.
- **Pause** – Prevents the saw from proceeding to the next cut sequence. If there is an active cut sequence, the saw completes the cut sequence, then moves to the optimized position, ready for the next cut. Pressing the Pause button again resumes operation.
- **FWD** – Pressing and holding the button causes the chains to progress towards the infeed pusher.
- **REV** – Pressing and holding the button causes the chains to progress away from the infeed pusher.
- **Start** – Starts the current sequence of operations and pushes material on the chains until it is loaded onto the infeed pusher.

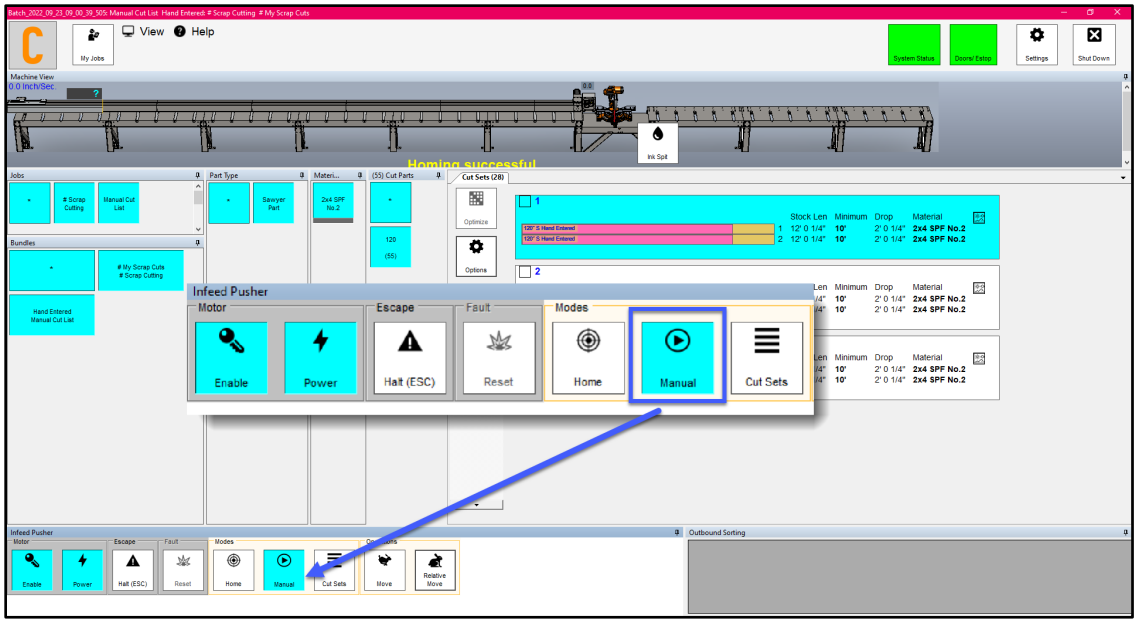
8.2.2 HMI Enclosure

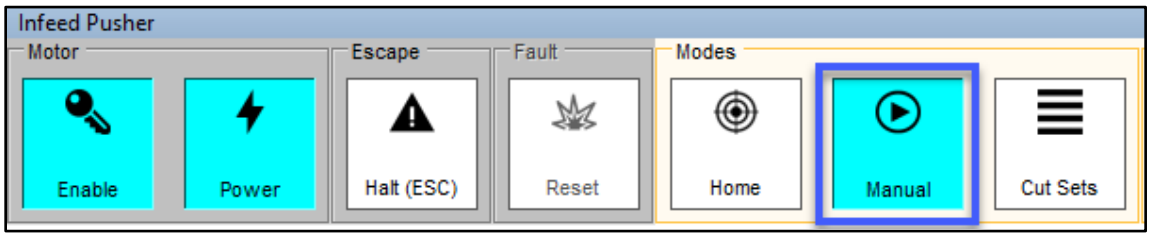
- **Emergency stop** – Puts the machine in an emergency stop state. It functions identically to the other E-Stops.
- **Reset** – Resets the saw after a fault. Has the same function as the Reset button in the CutBuilder software.

- **Saw Stop** – Halts all movement on the saw. Using Saw Start will not resume activity. The saw must be reset to proceed.
- **Saw Start** – Starts the saw from a stopped state.
- **Pause** – Halts all movement of the saw. Saw Start will resume activity.
- **Pusher Go** – Resumes movement of the pusher from a Saw Stop or Pause state.

8.3 *Manual Mode*

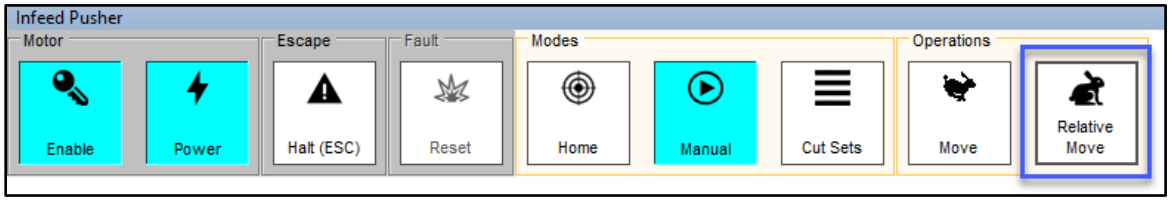
Manual mode can be used for simple tasks such as making the pusher arm move to a given location or moving forward or reverse for a given distance. The button for manual mode can be found on the bottom panel of the CutBuilder software.



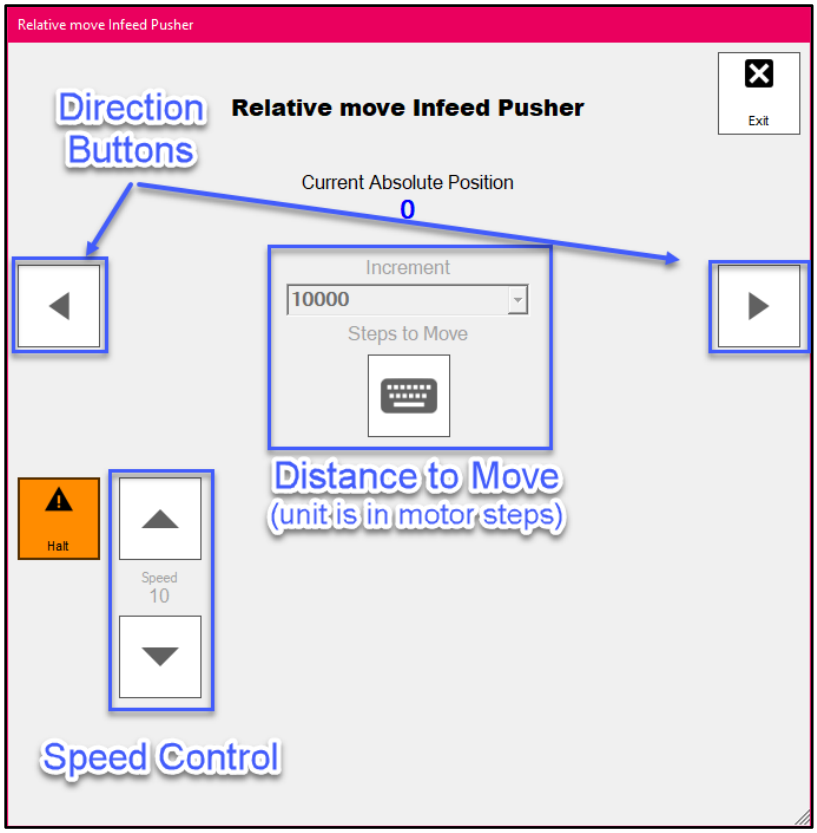


8.3.1 Relative Move Pusher (Distance)

The **Relative Move** function is used to move the pusher either forward or backward a specified distance. To begin moving the pusher, press the **Relative Move** button, available on the Infeed Pusher menu.

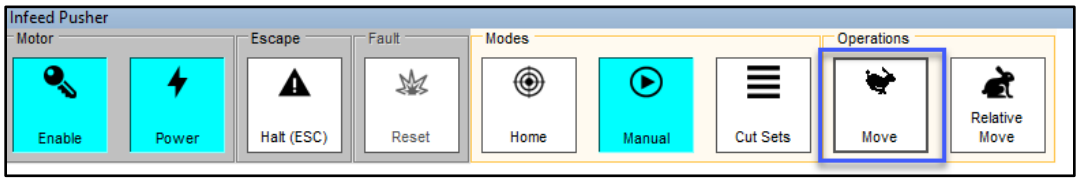


The Relative Move Infeed Pusher window will appear. Speed and distance can be set in increments. All increments are in motor steps. Toggling the right or left direction buttons will move the push arm accordingly.



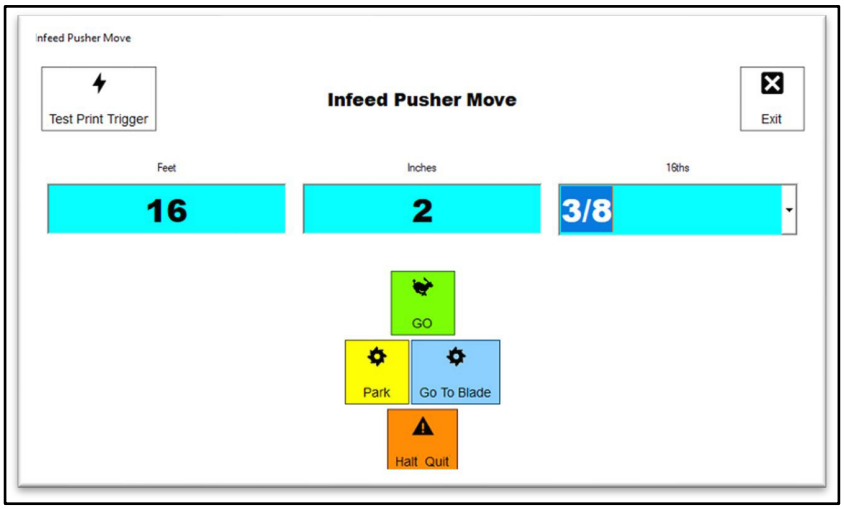
8.3.2 Move Infeed Pusher (Position)

The **Move** function of Manual Mode can be used to move the infeed pusher to a specified position.

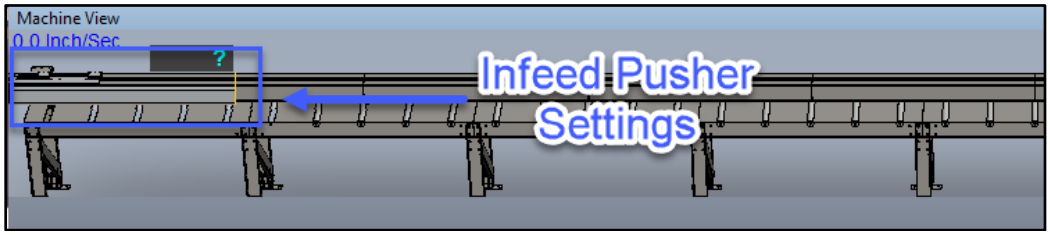


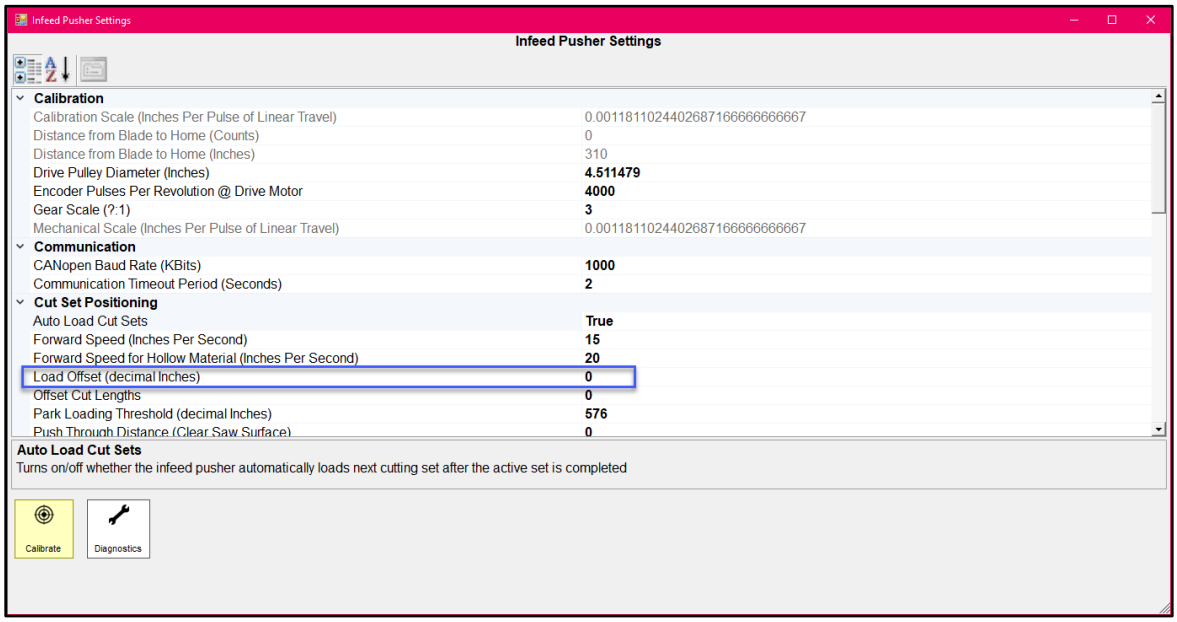
The **Move** window will appear.

- Enter a distance, then select **Go** to execute and the pusher will move to the position entered. The distance is measured from the saw blade.
- Select **Park** to quickly move the infeed pusher to its park position, which is at the end of the infeed conveyor, farthest away from the saw blade.



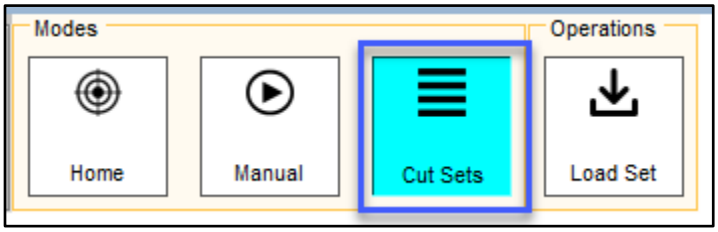
The exact location can be adjusted using the **Load Offset** setting in the Infeed Pusher Settings screen. The Infeed Pusher Settings can be displayed by clicking on the Infeed Pusher on the Top Panel.





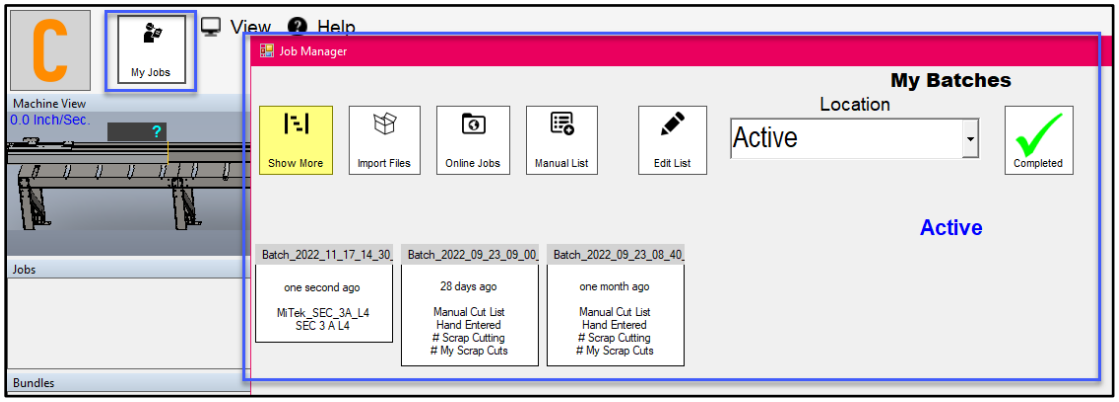
8.4 Cut-Set Mode/Job Manager

Cut Set mode is used for cutting entire lists of cut items from long stock lengths for optimal usage of material.



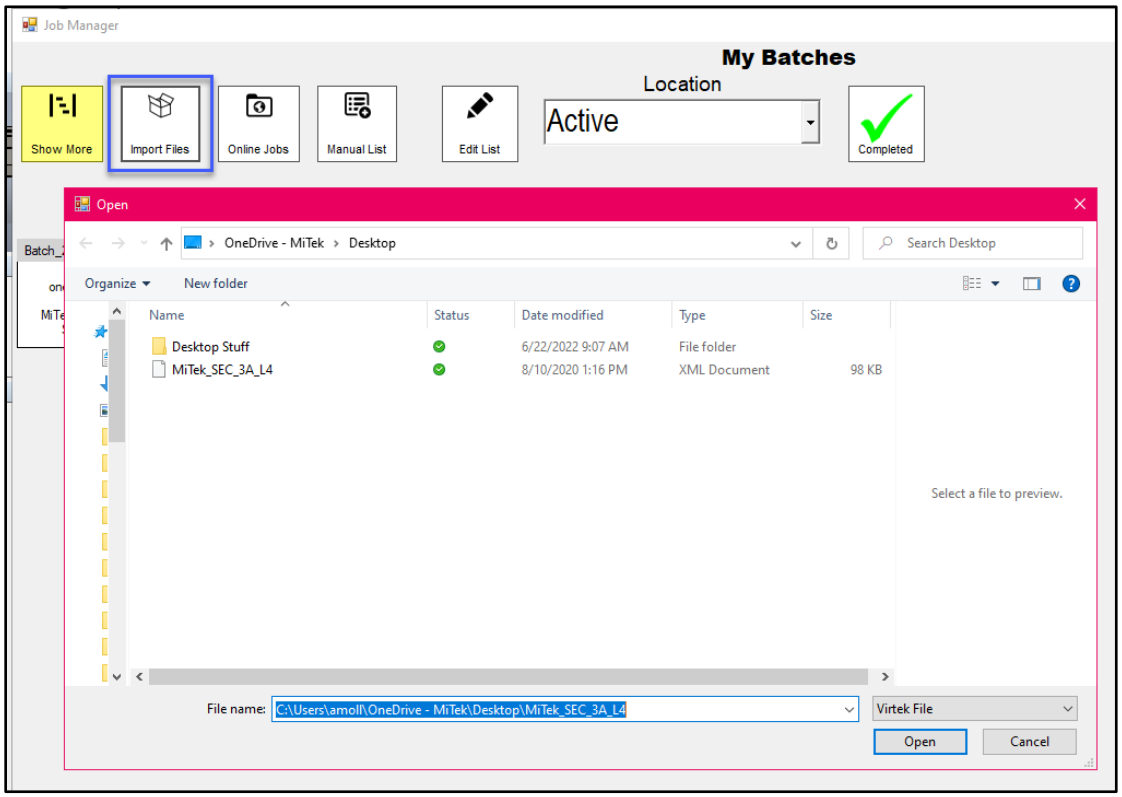
8.4.1 Job Manager

Jobs are managed by using the Job Manager menu. To access the Job Manager menu, press the My Jobs button located on the Menu Bar. The Job Manager will open.



Importing Files and Accepted File Types

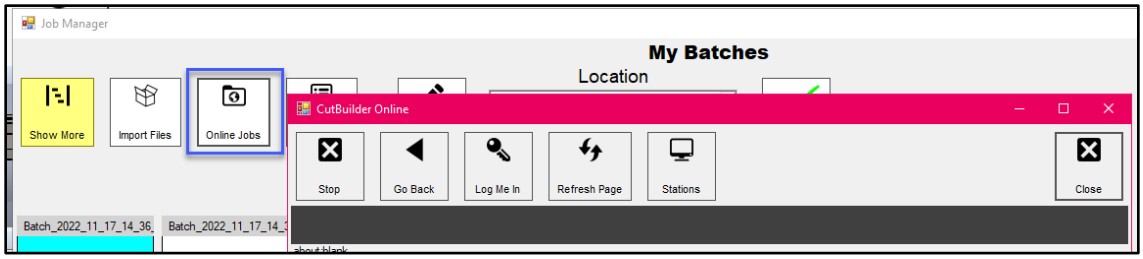
Files can be imported by clicking the Import Files button in the Job Manager window.



Navigate to the desired file and click “Open” to load it.

Online Jobs

Online Jobs can be used to load files from an online location (if configured).



File Types

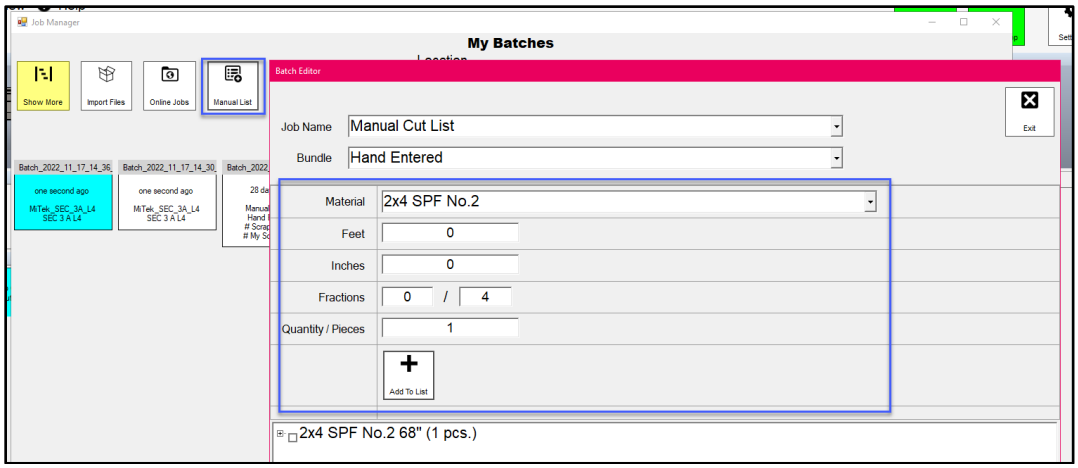
Cut Sets can be imported as one of these types:

- .xml files is generated from MiTek production software. Can also be called a Virtek® LaserMC® file.
- .ehx is generated by MiTek Production software, including ShopNet™ software.
- .wbx

Manual Entry

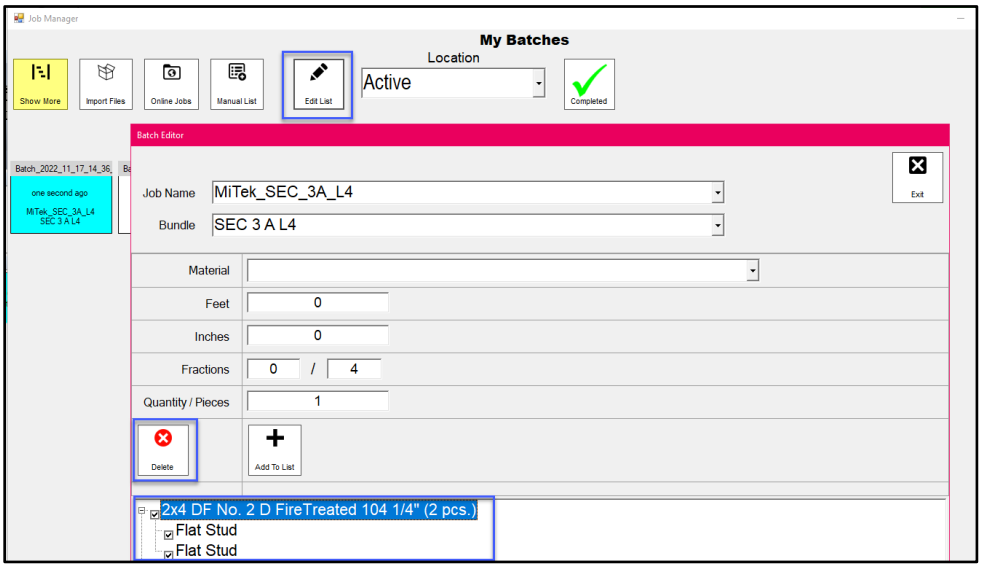
A manual cut list can be created as opposed to importing a job. Manual entry jobs allow the operator to build a custom cutting list. A manual cut list has the same options as an imported one (can be optimized, has print labels, etc.)

To create a manual cut list, click on Manual List in the Job Manager menu. Build a cutting list by selecting desired material and entering length, quantity, then click Add to List. Click Exit. when finished.

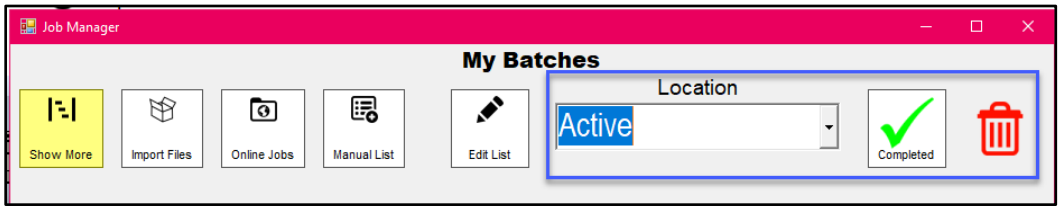


Edit List

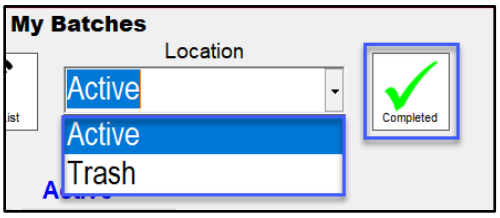
The Edit List function can be used to edit any current loaded job. Batches may be added manually by using the same technique as Manual Entry. Batches can also be deleted by clicking the check box next to the desired batch and using the **Delete** button.



Locations, Completed, and Trash

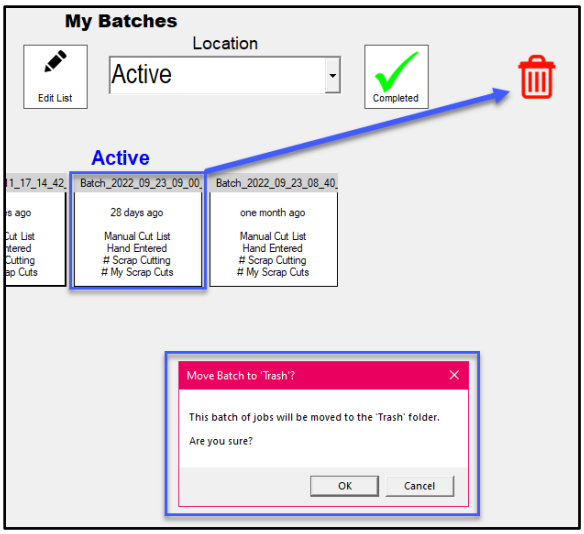


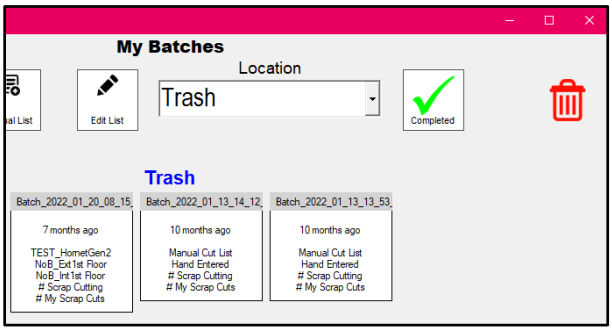
Jobs can be in 3 separate locations – **Active**, **Trash**, and **Completed**.



By default, the Job Manager displays jobs that are Active. Click the drop-down menu, then **Trash**, to see jobs that have been deleted. Click the **Completed** button to see jobs that have already been processed.

To delete a job (or move it to the trash), left click the job and drag it to the trash can icon. A dialog box will display, asking for a confirmation. The job will be moved to the Trash location.





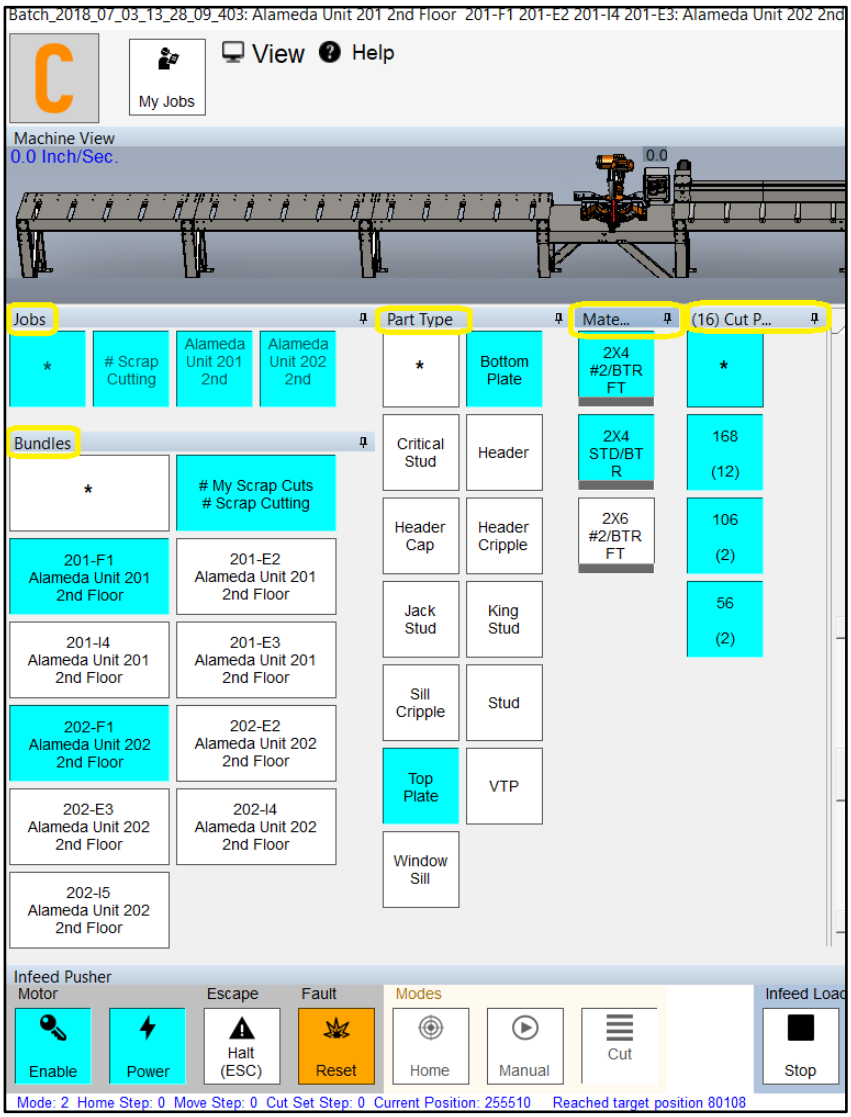
8.4.2 Populating Cut Sets from a Specified Job

The Jobs, Bundles, Part Type, Materials, and Cut Part panes can be used to populate the Cut Set panel which determines what is cut next. See the Home Screen Panes section for more information on the specific panes.

For example:

> A job contains all the parts of a house and has many different dimensional lumbers in use. You want to cut only the part types that are 2x4s used for Bottom Plates and Top Plates. Place toggles on those items, as shown below, and the cutting solution will only include those items in the cutting mix. When you want to cut the rest of the items, simply follow the same principal and toggle on the other items.

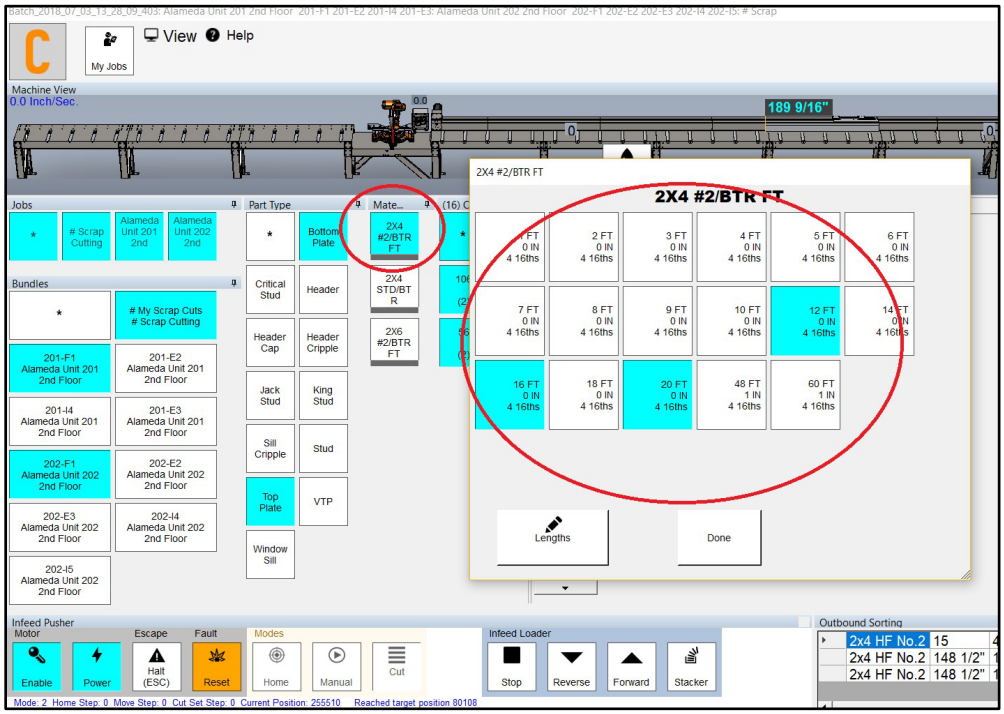
The following graphic highlights the 5 panes required to achieve this example:



8.4.3 Selecting Stock Lengths

Upon toggling any material type, a window will appear for selecting the stock length(s) to optimize cutting. Toggle on/off which stock lengths to use. The optimizer can utilize one or many different stock lengths. When multiple stock lengths are chosen, the optimizer will use all selected lengths and produce cut sets based upon whichever stock length would produce the least waste for each cut set created.

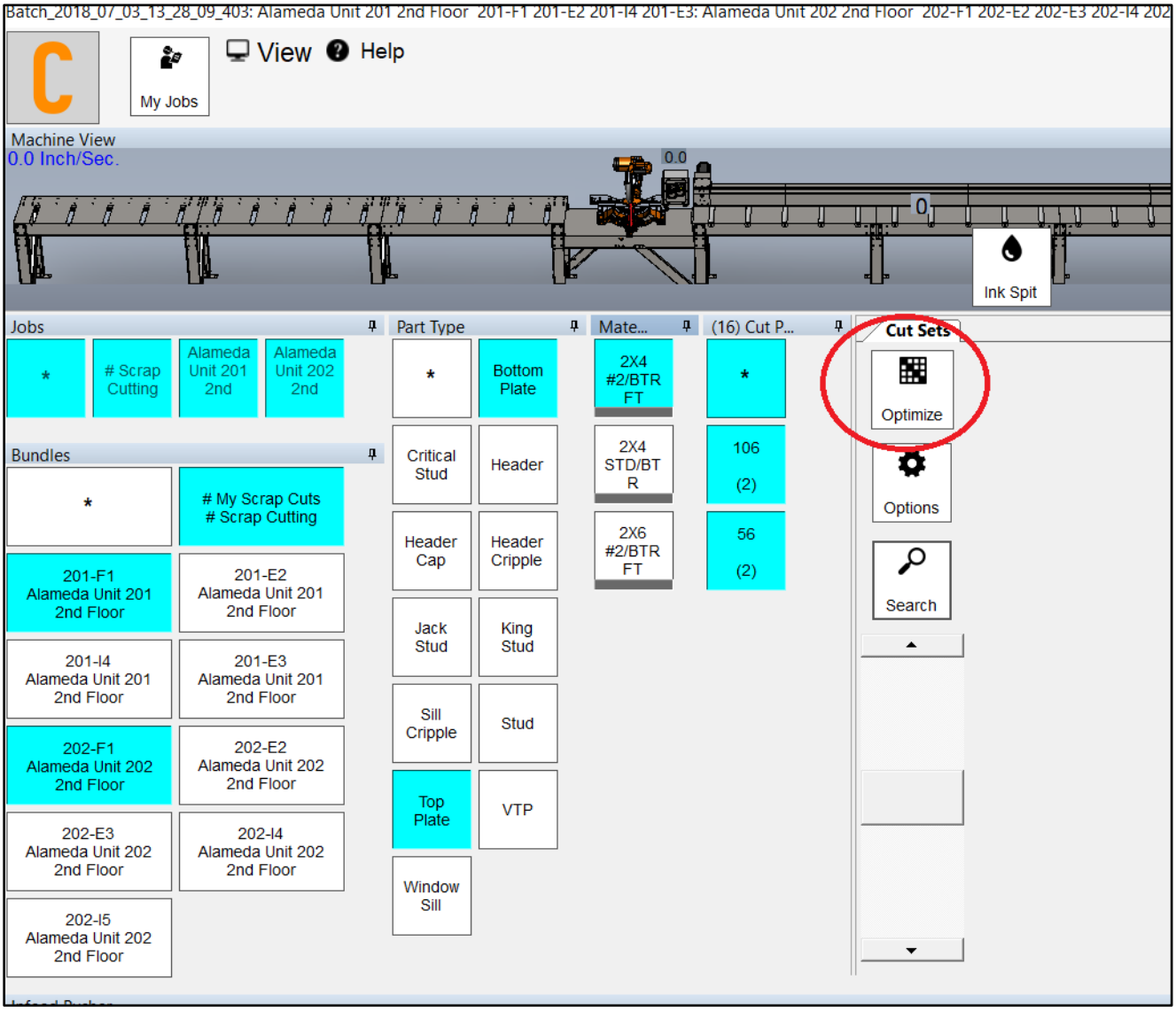
If the desired stock length is not listed, add to or edit the stock length library by clicking the **Lengths** button in the lower left of the window to access the editor. Once the selections are made, close the window by pressing the **Done** button.



8.4.4 Optimizing Material

After all of the appropriate selections have been made, press the **Optimize** button, and the cutting solution will appear in the “Cut Sets” panel.

Optimizing processes all selections and generates the cut sets to have the least amount of waste.



8.4.5 Cut Sets

After optimizing, the “Cut Sets” panel will display a cutting solution set up in a list of “Cut Sets”. Each row in this list is a Cut Set. Each Cut Set represents a board or stack of boards as they will be run through the machine, how they will be cut, and other details about the parts.

The Cut Sets window is interactive and can be used to:

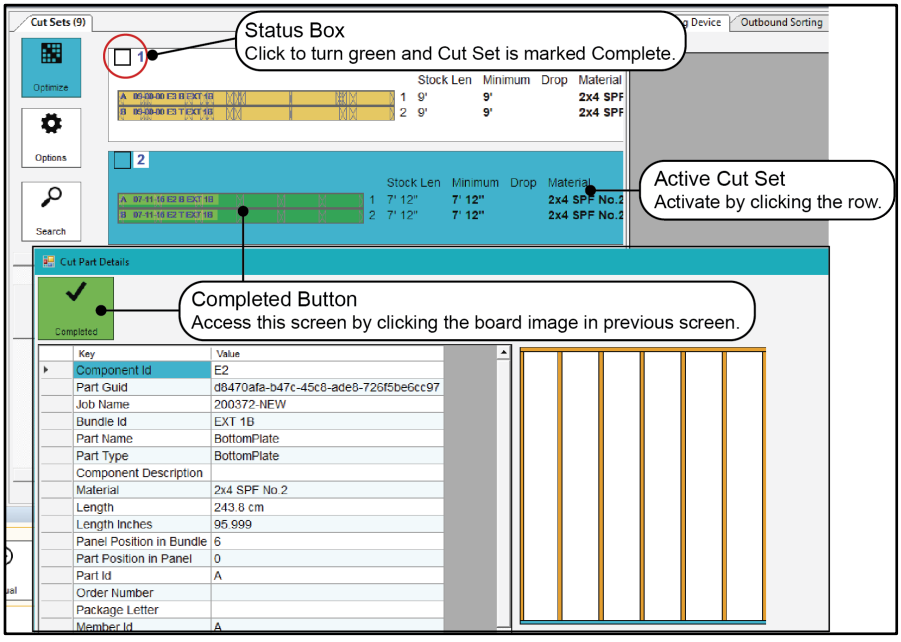
1. **Activate Cut Set** – The active cut set is always indicated by its turquoise color. In the example, Cut Set number 1 is the active cut set. The active cut set is important as it is the start point for beginning cutting and represents the currently active setup to be run or running through the machine. To manually indicate an active cut set, select it by clicking anywhere there is text in the Cut Set row.

2. **View Cut Part Details and Printed Image** – Click the board image, and the Cut Part Details screen displays details about the Cut Set and shows an image of the printing that part will receive.

3. **Complete/Incomplete**— During normal operation the Hornet will automatically "complete" each cut set as it runs. On rare occasions, when a job fails to complete, use one of these methods to manually mark a set of cuts complete:

    a. Click the board image, and the Cut Part Details screen appears. Select the **Completed** button to toggle between completed/not complete. The color green indicates a Completed status.

    b. To complete all of the parts in a cut set at the same time, select the Status box located on the left-hand side of the cut set number. When the status box and the board images turn green, every board in that cut set is marked complete.



8.5 Cutting Procedure

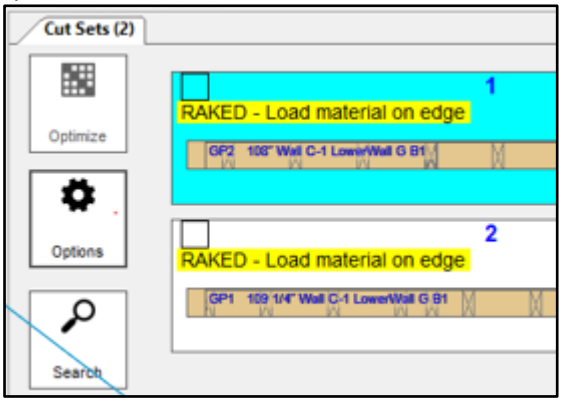
8.5.1 Loading Lumber and Lumber Considerations

The saw is designed to cut boards stacked 2-high. This may be the top plate and bottom plate of the same wall panel, or it may be from different wall panels, depending on the optimization choices.

Manually loading boards onto the infeed conveyor:

- Handles boards dimensional lumber from 2x up to 12”, 3x up to 12”, and 4x up to 12” wide.
- Load material onto the infeed conveyor on its wider surface (2x**4**, 2x**6**, etc.).

NOTE: Material may need to be loaded onto its edge for a special cut. The cutset will indicate when this is necessary.



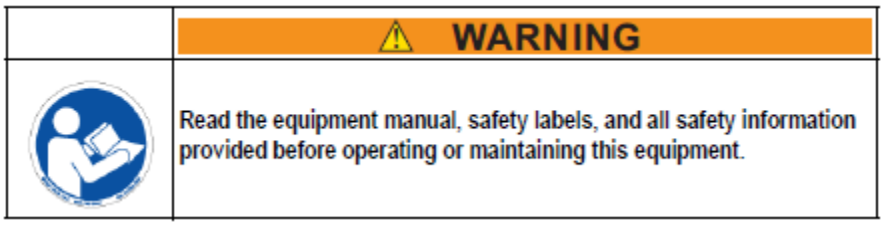
- Load 2x lumber stacked 2-high on infeed conveyor. Can also cut 2x lumber as a single board.
- Lumber thicker than 2x dimensional lumber can only be cut 1 board high. Ensure the boards used:
    - Have no staples and no standing water on them. Staples can damage the print heads.
    - Are not tight up against the pusher when placed on the infeed rail.
    - Are tight up against the fenceline when not using an Auto Loading Live Deck.

Aligning the stacked boards:

- When loading directly onto the infeed rail, ensure they are not stacked tight against the pusher.
- If loading boards onto an Auto Loading Live Deck, load the first set of lumber to be processed at the first chain tube (on the side closest to the infeed rail).
- Load the lumber so that the 2 boards are flush, and 4-5 inches over the end of the rail, towards the operator.

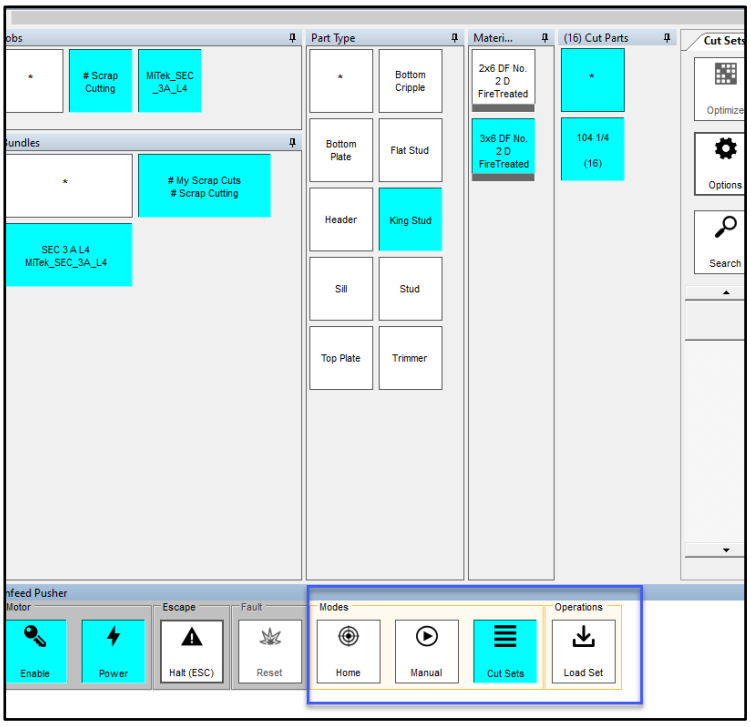
- Normal use of the saw requires the two boards be the same length, although it is possible to cut using boards of different lengths.
- As the boards progress, ensure they remain flush with each other and pushed up against the pusher as they may slip. Be aware of the squeezer when attempting to ensure the boards remain flush with each other.

8.5.2 Cutting Procedure Overview



1. Select the **Cut Sets** button on the bottom panel.
2. Select the **Load Set** button. The Cut Set Operations window appears, and the next batch of Cut Sets are imported.

   NOTE: If the Load Set button does not appear, ensure there are cut sets populated. See the Populating Cut Sets from a Specified Job section for more information.



3. Verify the correct lumber is loaded. See the Loading Lumber and Lumber Considerations section for more information.

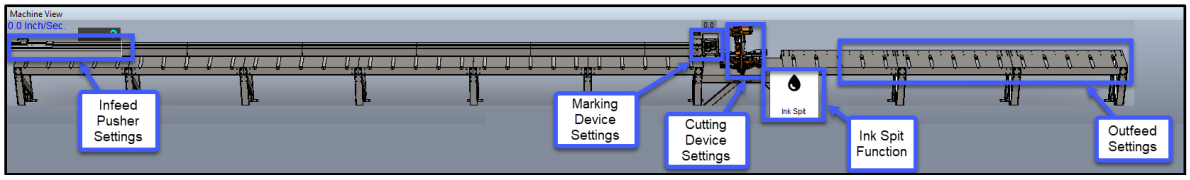
WARNING: Before beginning cutting operations, check that the machine is safe and clear of all personnel and objects as the infeed pusher will be activated with motion.

4. Select the **GO** button.
5. All boards for the current Cut Set are cut, then the Cut Complete button appears.

6. Click **Cut Complete**, and the next Cut Set is loaded.
7. Once all Cut Sets are cut, press **Quit**.
8. Press the **Reset** button.
9. Press the **Load Set** button again to import another batch of Cut Sets.

8.6 System Settings

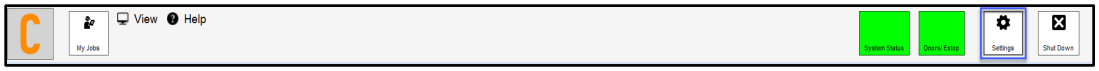
Accessing the Device Settings Windows

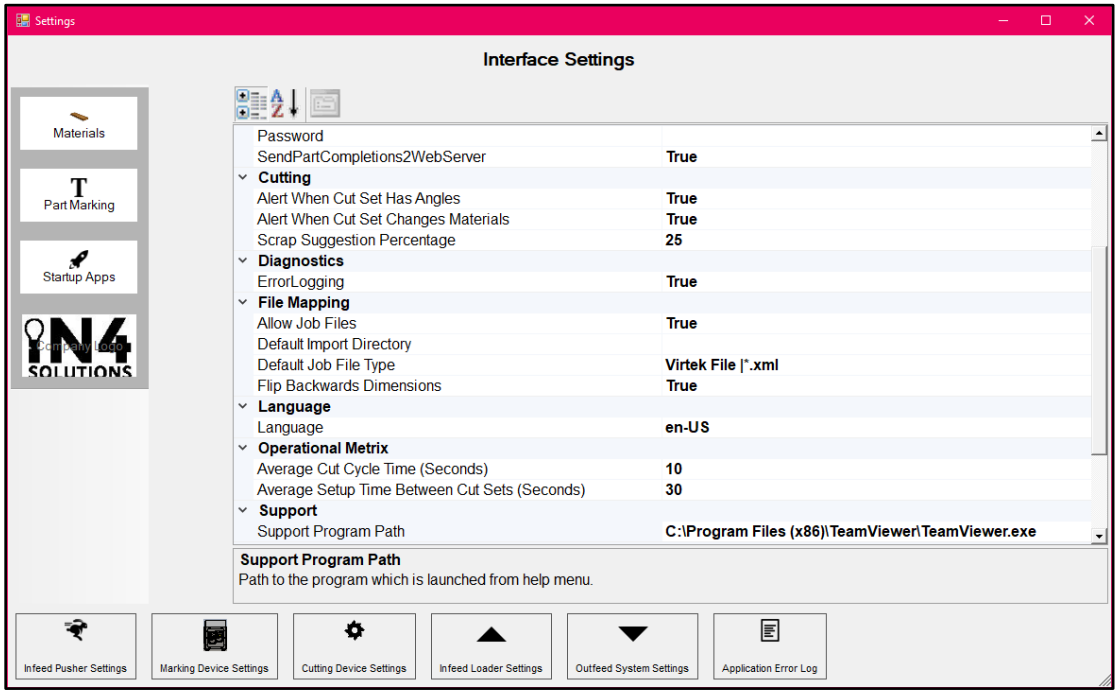


Most settings can be accessed by clicking the appropriate component in the Top Panel.

Note that there is no undo or save function; the new settings are automatically saved once you close the window. It is advised to always document the settings used if they deviate from the recommendation.

Most settings can also be accessed via the **Settings** menu on the Menu bar.





9 Maintenance

9.1 Introduction to Maintaining Your Machine

This manual contains information for common repair maintenance and preventive maintenance. Additional maintenance instruction and videos can be found on our web site or video storage site.

Read the safety section starting on page 1. The safety test procedures in the safety section MUST be performed by qualified personnel after ANY maintenance, adjustment, or modification. Note these safety reminders:

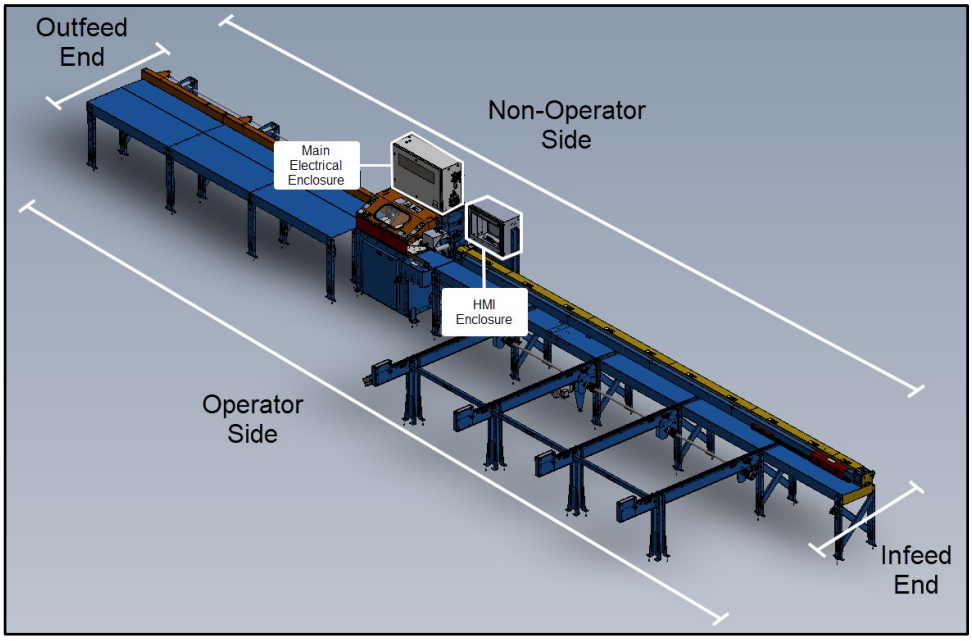
	⚠ WARNING
	**ELECTROCUTION, HIGH PRESSURE, CRUSH, CUT, AND CHEMICAL HAZARDS** **Read this section AND the safety section in the preliminary pages before operating or maintaining this equipment.** **Do not operate this machine until you have a thorough understanding of all controls, safety devices, E-stops, and operating procedures outlined in this manual.** **Read and observe all hazard instructions. Failure to do so may result in economic loss, property damage, and/or personal injury.** **This manual must always be available to personnel operating and maintaining this equipment.**

- Note the proper way to clean inside an enclosure:

	NOTICE
	**Never use compressed air inside an electrical enclosure. It may force contaminants into electrical connections.** **Use a vacuum to remove dust from electrical enclosures. Canned air is acceptable after vacuuming.**

9.2 Overview Graphics

The orientation terminology in the following graphic will be utilized throughout the maintenance section. For a graphical depiction of the major components of the Hornet II saw, see the Main Components and Optional Equipment section.



9.3 Cleaning and Inspecting

9.3.1 Cleaning

If it should become necessary to clean this machine, disconnect it from its power source first. Do not use liquid cleaners, aerosols, abrasive pads, scouring powders or solvents, such as benzene or alcohol. Use a soft cloth lightly moistened with a mild detergent solution. Make sure the surface cleaned is fully dry before reconnecting power.

	⚠ **CAUTION**
	**CRUSH AND CUT HAZARD** **Always replace guards after completing maintenance and before removing the lockout/tagout device.** **Operating a machine with guards removed may result in serious injury or death.**

	NOTICE
	**Never use compressed air inside of electrical enclosures. It may force contaminants into electrical connections.** **Use a vacuum to remove dust from electrical enclosures. Canned air is acceptable after vacuuming.**

9.3.2 Inspecting

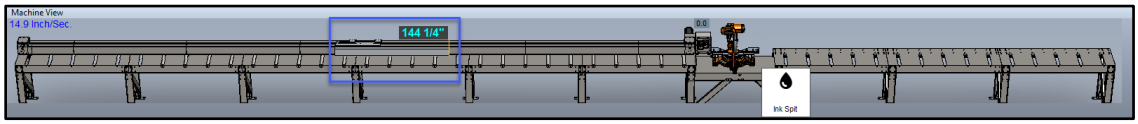
Work Area

Make sure any sharp objects are clear of all pneumatic and electrical systems.

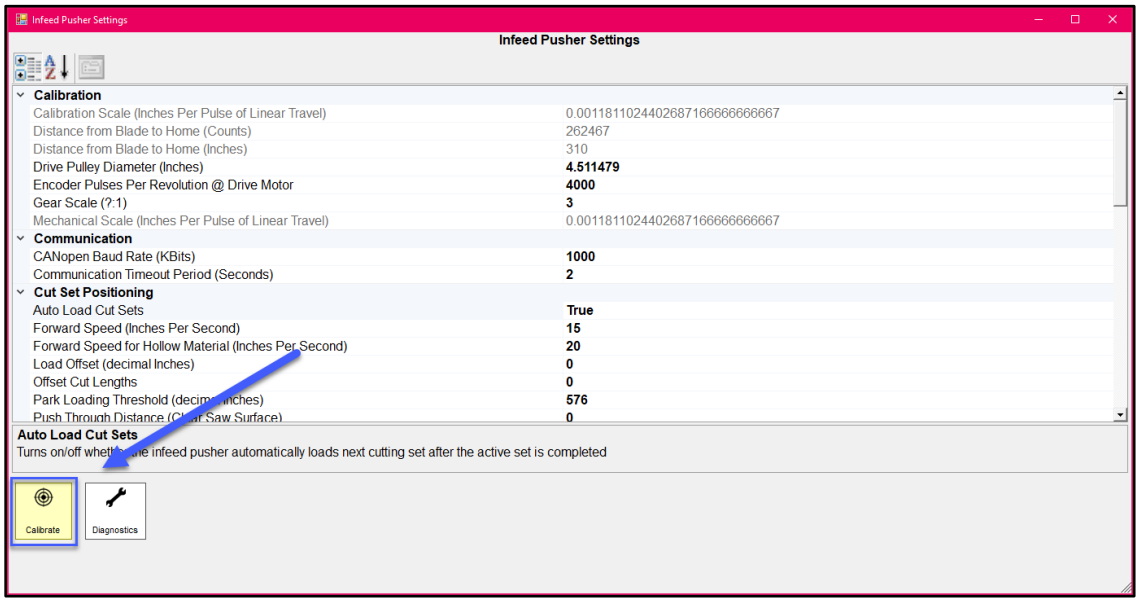
9.4 Calibration

9.4.1 Calibration of the Pusher

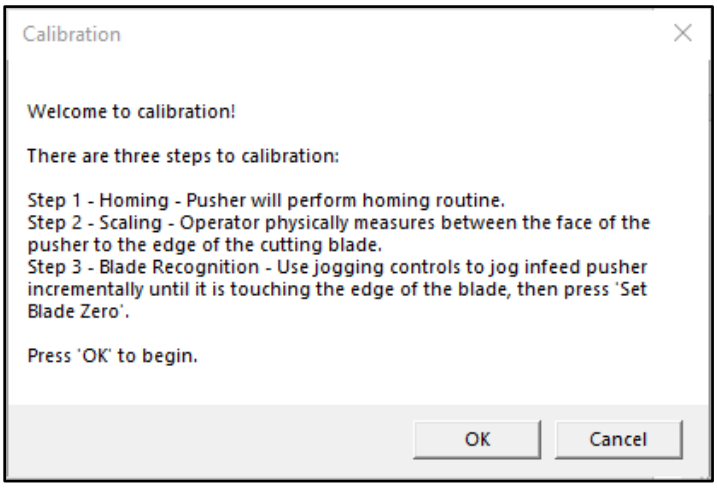
1. Click on the pusher on the machine view in the top panel of the CutBuilder software and enter the machine password if prompted.



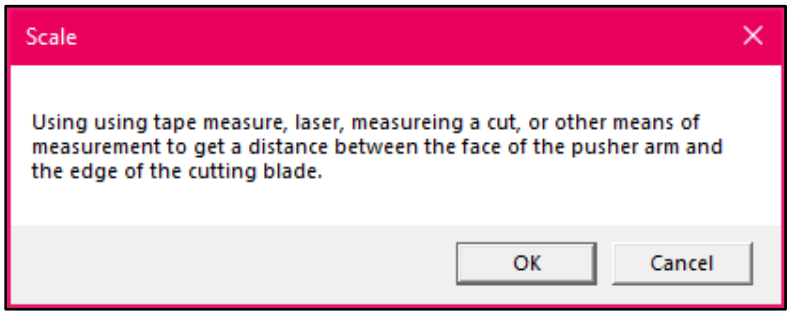
2. The infeed pusher settings will open. Select “Calibrate”.



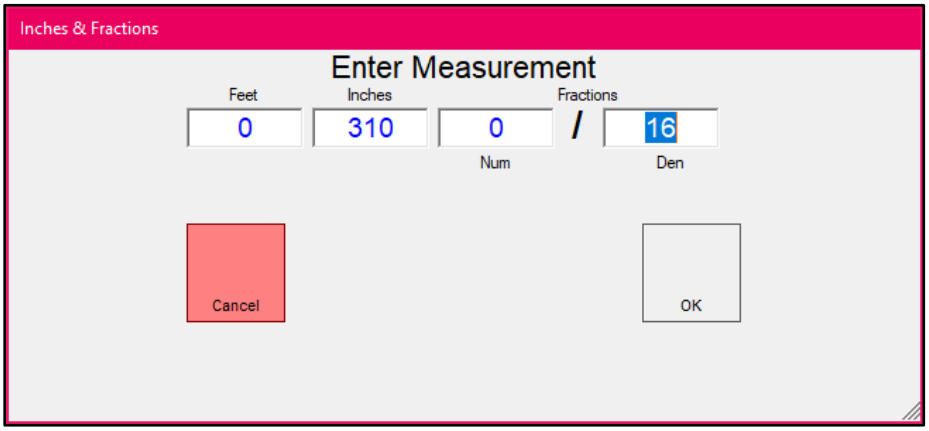
3. A dialog box will open with a brief explanation of the calibration process. Click “OK” to start the homing process.



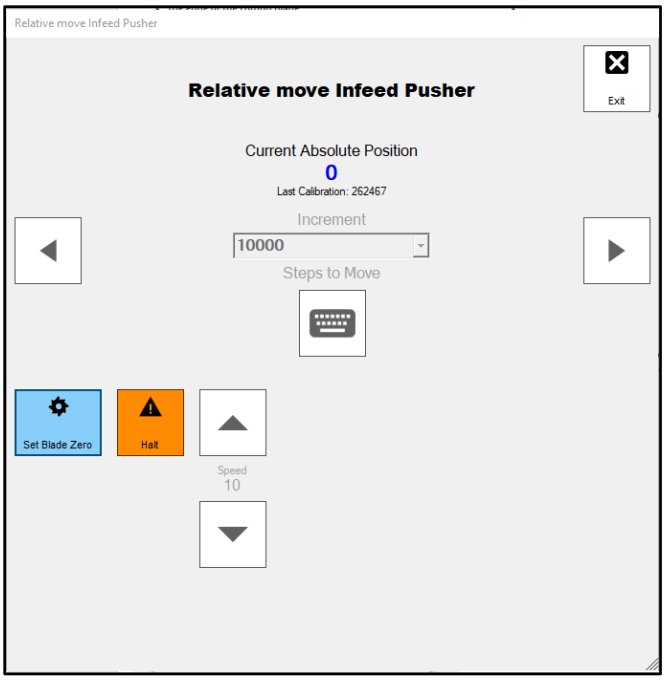
4. Another dialog box will appear that explains the scaling process. Once homing is complete, measure from the edge of the pusher to the edge of the physical saw blade, then click “OK”. The Enter Measurement dialog box appears.



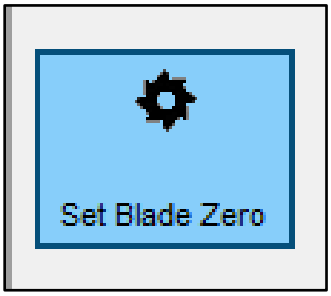
5. Enter the measurement from the edge of the pusher to the edge of the physical saw blade in the Enter Measurement dialog box, then click “OK”. The Jog Infeed pusher dialog box appears.



6. Using the Relative Move infeed pusher menu, adjust the pusher manually by choosing the increment to move, then the left or right button accordingly.

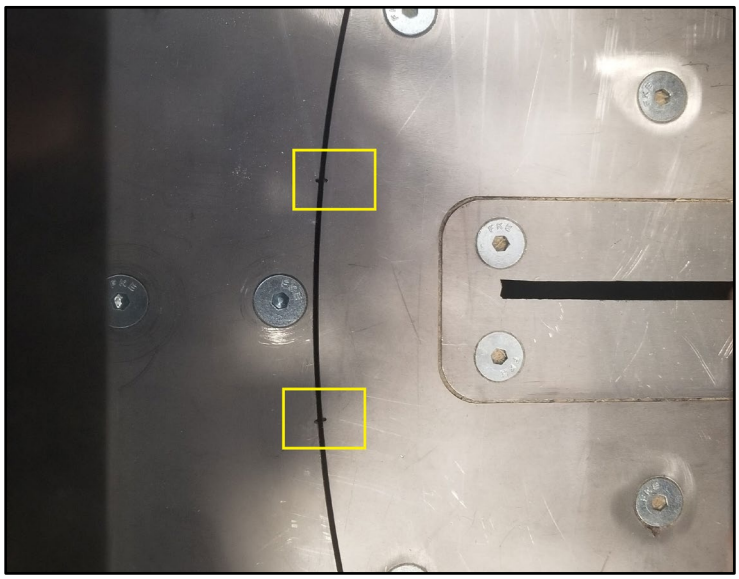


7. Move the pusher until the end of the pusher is as close as possible to the physical saw blade without touching it. Once the pusher is in the appropriate position, click the “Set Blade Zero” button to complete the calibration process.

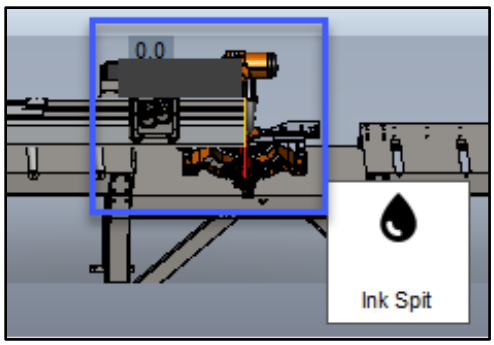


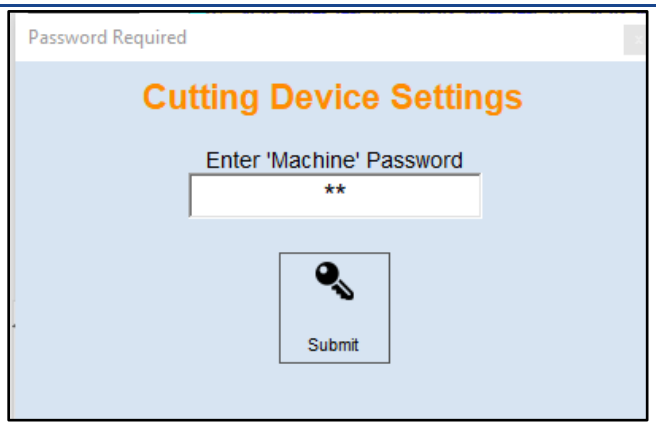
9.4.2 Calibration of the Angle

1. A calibration is needed if the groves on the angle table are not matched up with the rest of the table after homing the saw angle. Below is an example of the groves matching up accordingly. Note that they may not align exactly due to wear and different saw configurations.



2. To begin the calibration process, open the saw menu by clicking the saw graphic on the top panel of the CutBuilder software. Enter the password if prompted. The Cutting Device Settings window will open.

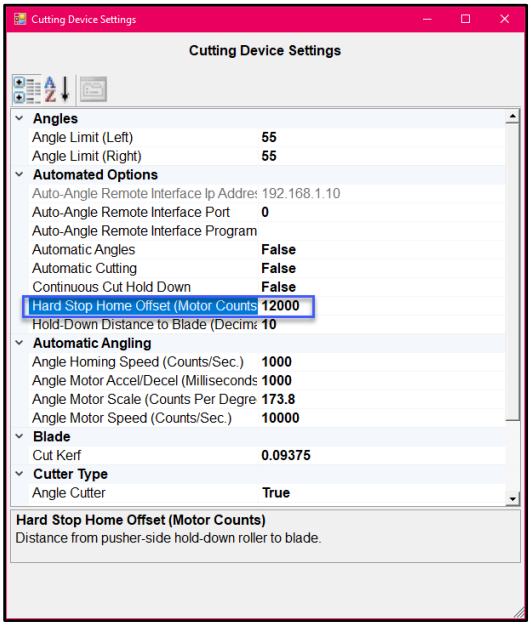


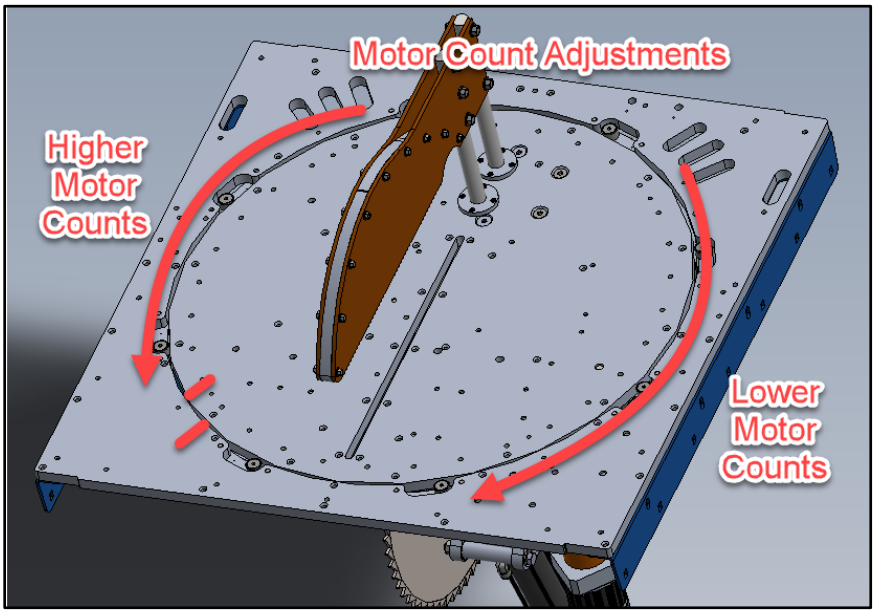


3. Adjust the “Hard Stop Home Offset (Motor Counts)” figure to calibrate the angle. Adjusting the number to be lower causes the table to turn more in a clockwise direction when homed, and increasing the number causes the table to turn more in a counterclockwise direction. After adjusting the number, home the saw again and check if the grooves are aligned. If they are not, continue to repeat steps 1 through 3 until they are aligned.

   NOTE: The Hard Stop Home Offset number should not be configured below 11,700 or above 12,300. If adjustment beyond this range is necessary, there is likely a problem beyond calibration, such as a loose belt.

   In the following example figure, increasing the motor counts would cause the table to stop in a more counterclockwise direction, moving the grooves further into alignment when homing.





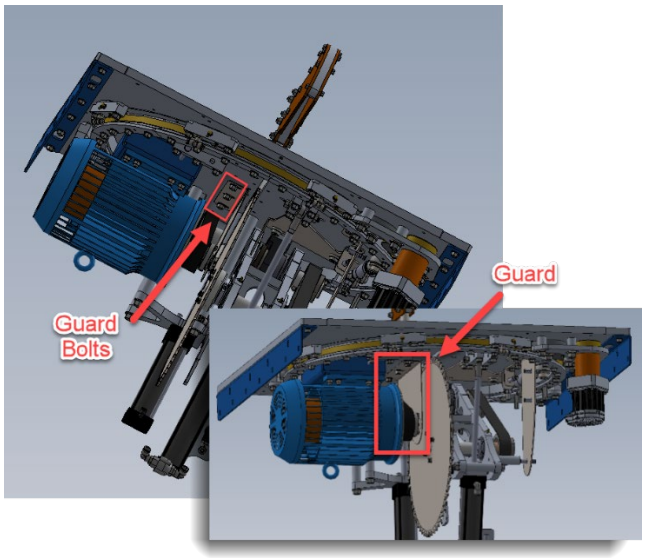
4. Once the grooves are aligned after homing the saw angle the angle calibration process is complete.

9.5 Belts

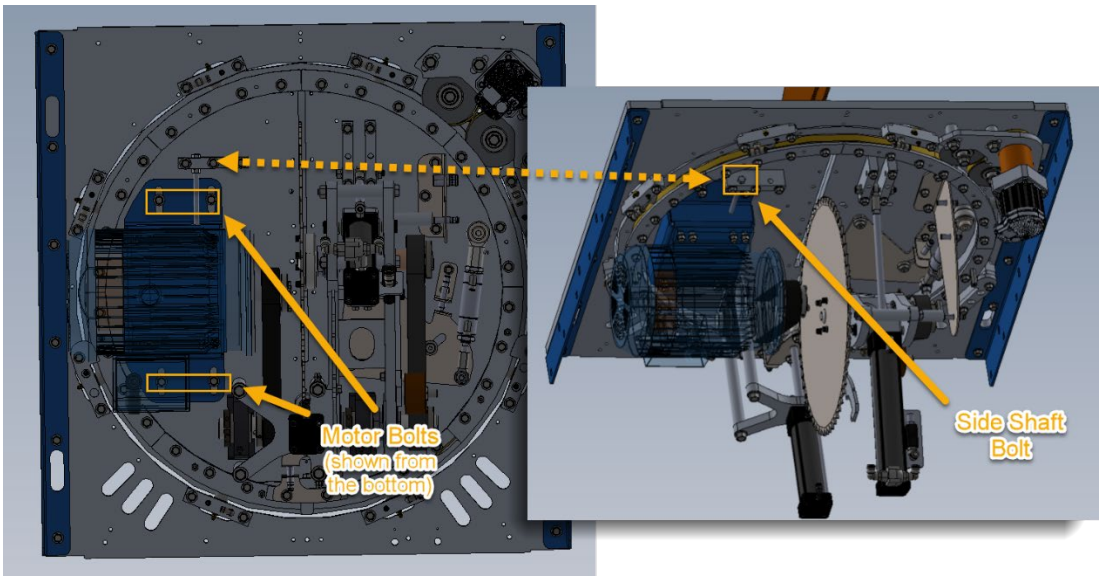
9.5.1 Motor Belt Replacement

The motor belt may need to be replaced if it becomes worn or as directed by MiTek Automation Support. To replace the motor belt, use the following procedure.

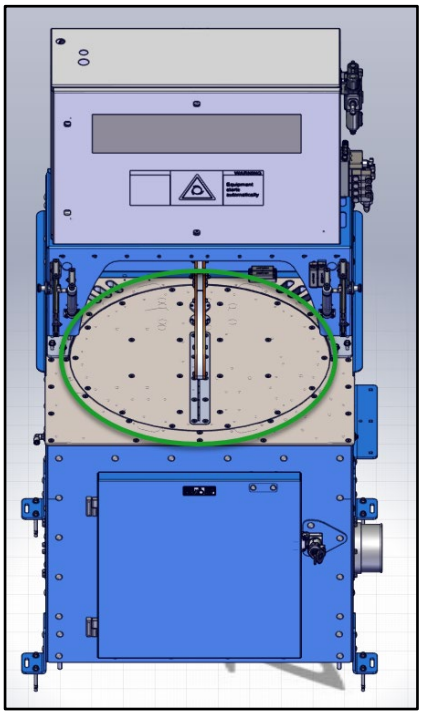
1. Lockout/tagout.
2. Remove the guard between the motor and saw blade by removing the bolts indicated in the next figure.



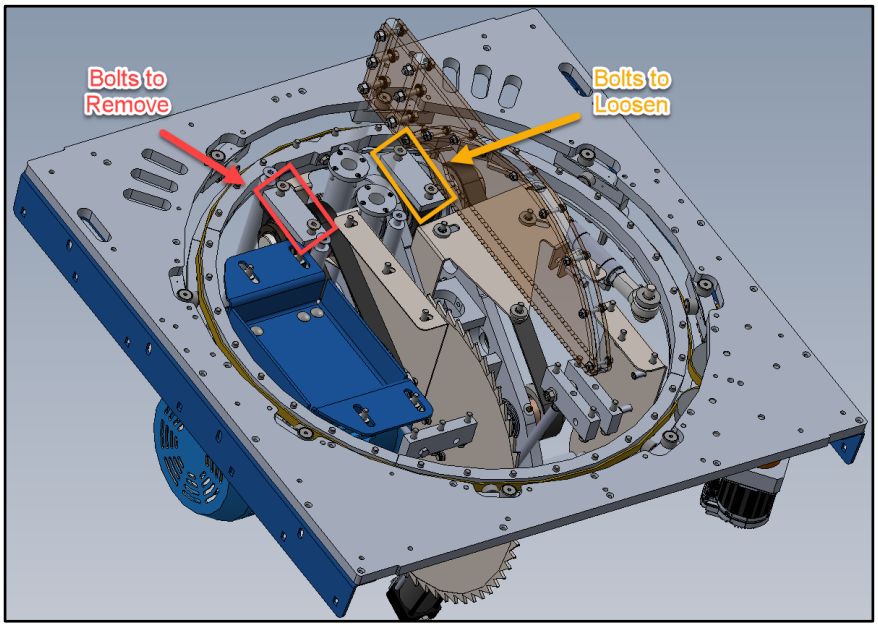
3. Loosen the motor bolts and the side shaft belt until the belt is loosened enough for removal. Ensure not to loosen the bolts so much that the motor becomes unattached.



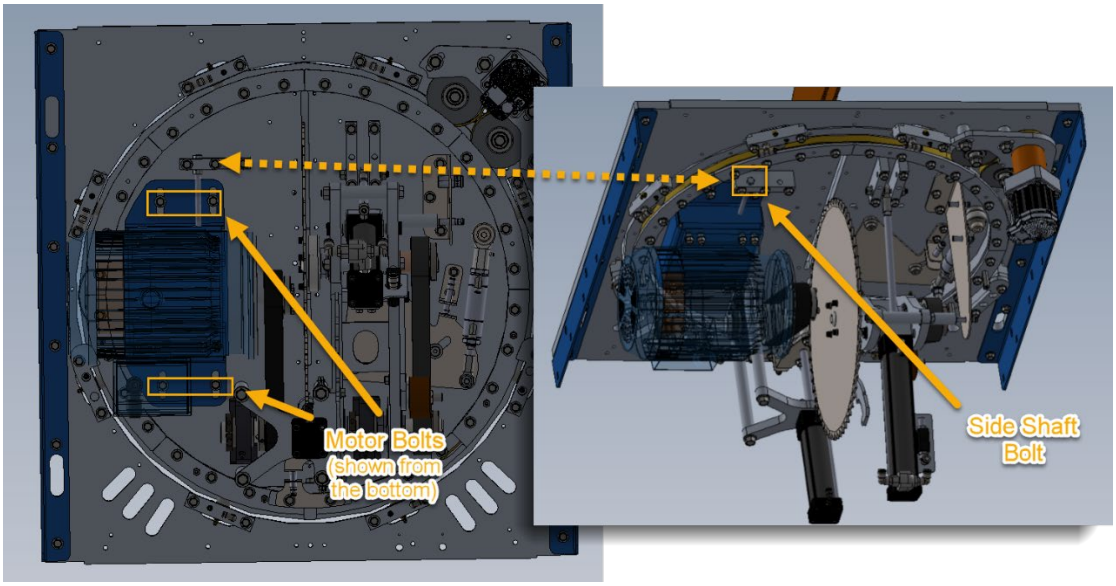
4. Remove the stainless-steel topper from the round table in the saw unit to expose the 1/2” FHCS that attaches to the bearing.



5. Remove the motor side bearing bolts from the top side and then remove the 1/2" aluminum spacer that is between the bearing and the tabletop. Also loosen the bolts indicated below which will cause the pivot shaft assembly to droop – this is to assist in belt replacement. There is no need to remove any bearings from the shaft.



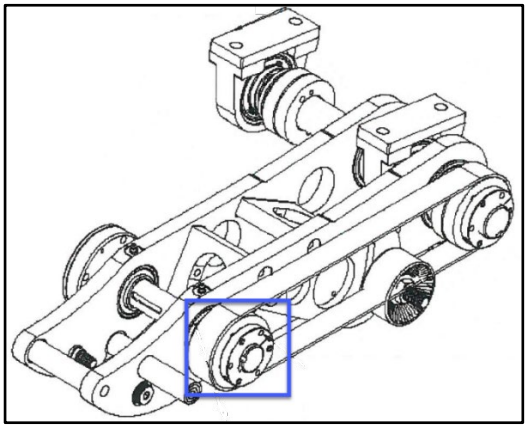
6. The belt can be freely accessed and replaced. Ensure the belt is replaced in the correct direction.
7. Re-tighten the motor bolts and side shaft bolt as needed to tension the belt.



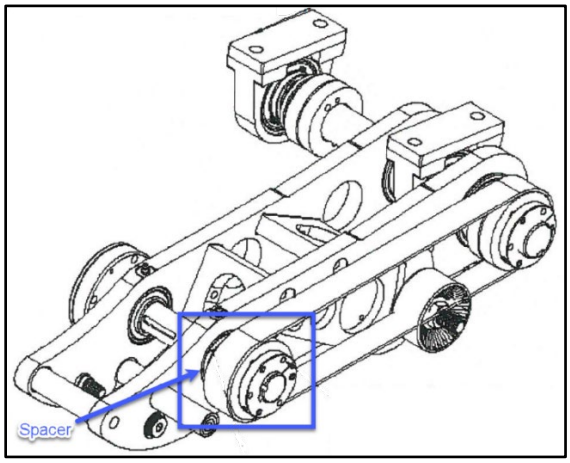
8. Spin the hub by hand to ensure nothing is binding or needs to be adjusted before re-assembly.
9. Re-install the guard between the motor and blade, tighten and install any bolts as needed from the pivot assembly, and replace the stainless-steel topper on the round table.

9.5.2 Blade Belt Replacement

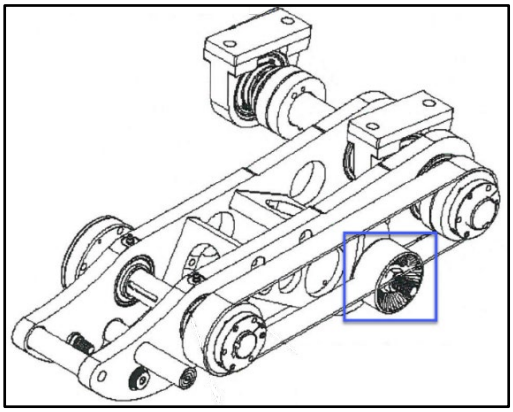
1. Remove the taper bushing that is highlighted in the below figure.



2. Remove the blade belt and shaft pulley at the same time. The belt is too short to be removed from the pulley while the pulley is still mounted.
3. Install the new belt in the appropriate position.
4. Re-install the shaft pulley. Ensure that the spacer bushing is between the taper bushing and bearing. Placing the taper bushing against the spacer ensures proper belt alignment.



5. Pry the tensioner indicated in the figure below to adjust the belt tension. The play for the blade belt should be approximately 1/4 in.



9.6 Bearings and Lubrication

The location of all bearings that require lubrication are listed in this section.
See the Maintenance Checklists section for a recommended schedule.

9.6.1 Applying Bearing Lubricant

	**⚠ WARNING** **Lockout/tagout before performing any maintenance!** **If power is required, ensure all personnel are clear.**

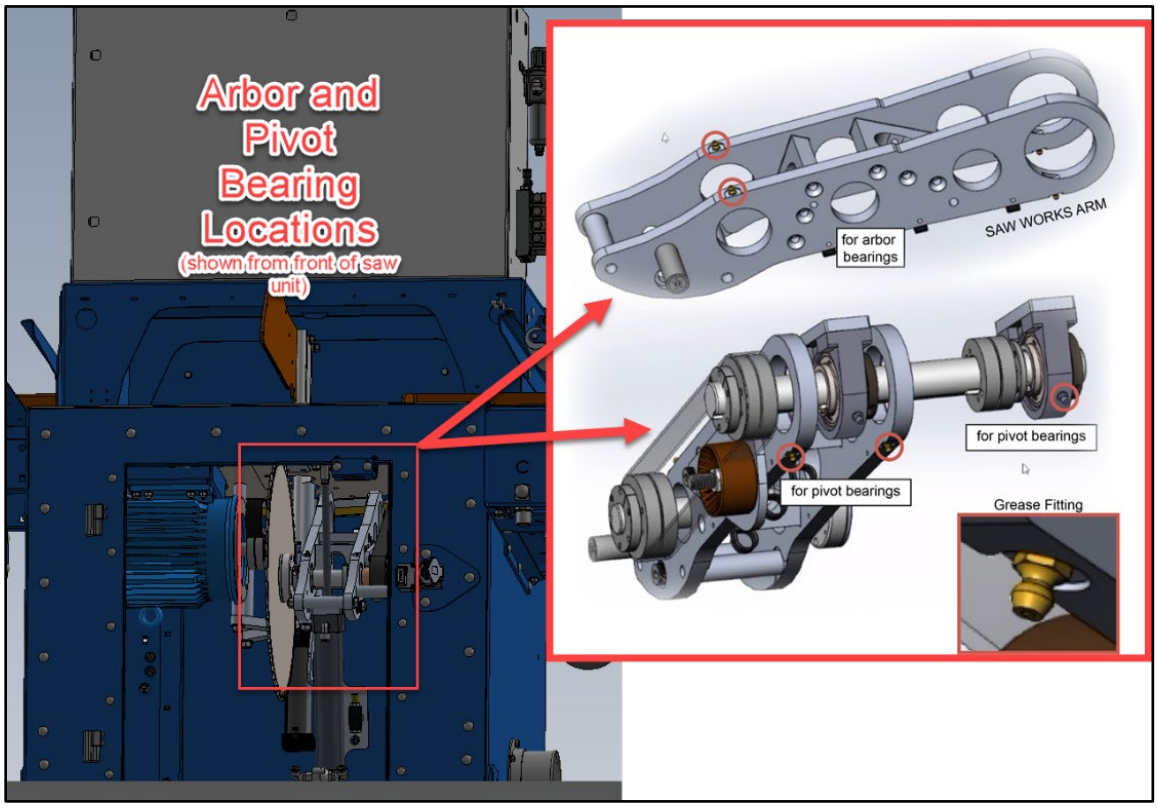
To lubricate bearings, use the following steps.

1. Gather the following materials:
    a. Manual grease gun
    b. No. 2 lithium-based grease
2. Lockout/tagout
3. Locate the grease fitting on the bearing. The following sections provide guidance on the grease fitting locations depending on the part.
4. Clean the fitting thoroughly to remove any dirt or old grease.
5. Place the manual grease gun over the fitting.
6. Add grease to the bearing until you feel resistance. Adding more grease after you encounter resistance may damage the bearing.

    Repeat steps 1 through 5 until all bearings are greased.

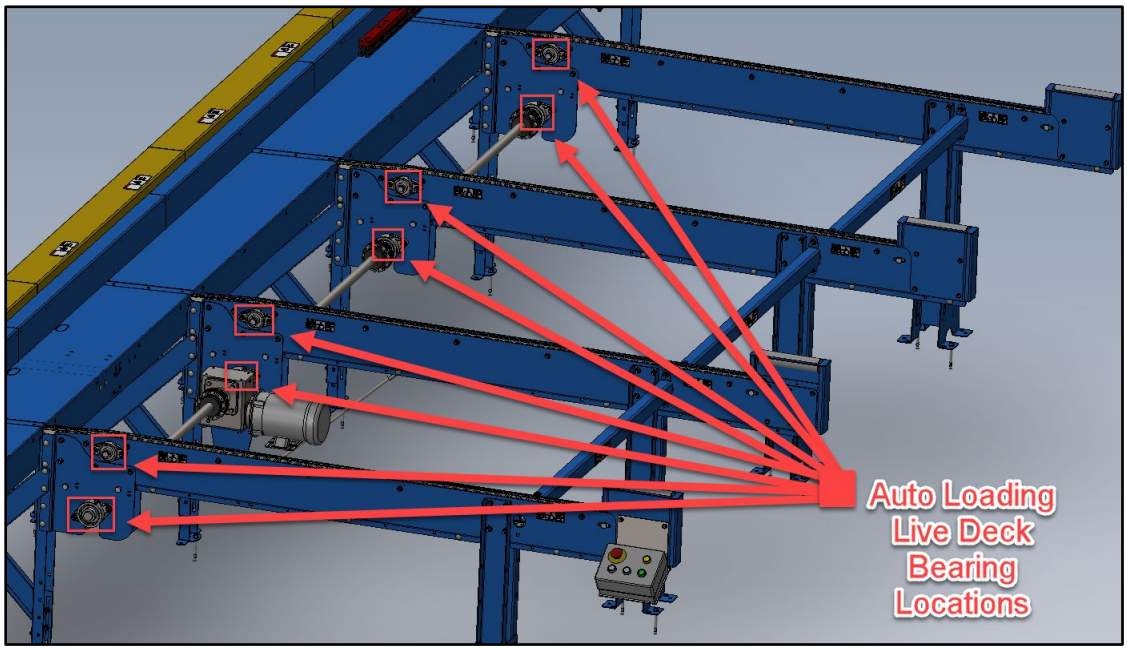
Motor Arbor and Pivot Bearings

Motor arbor and pivot bearing locations:

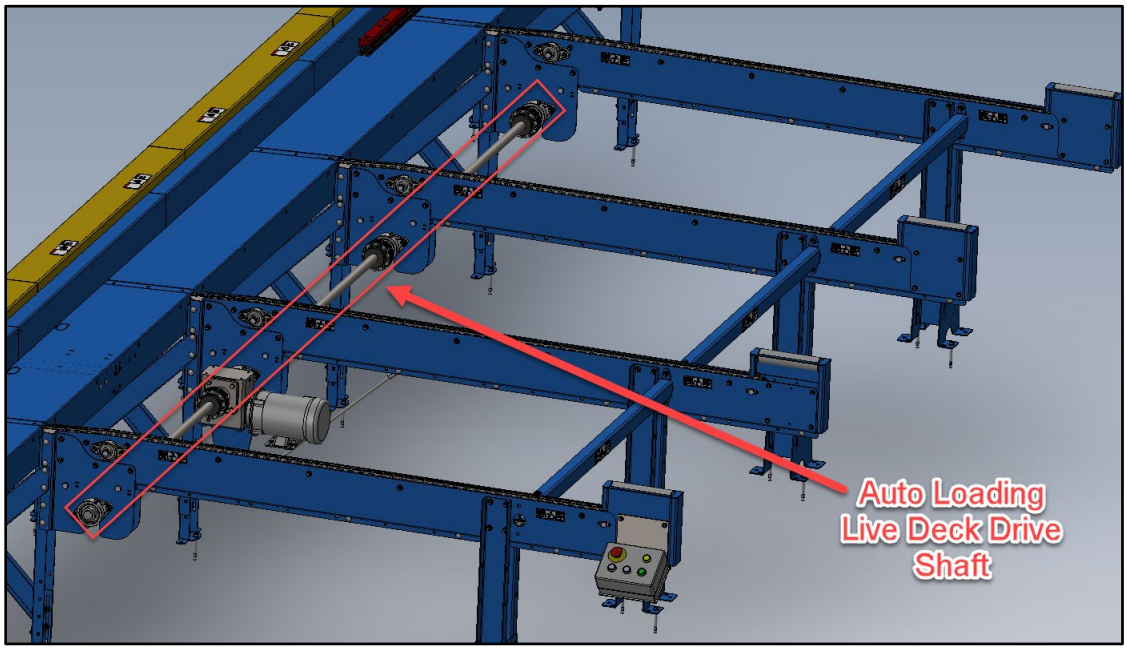


Auto Loading Live Deck

Auto Loading Live Deck bearing locations:

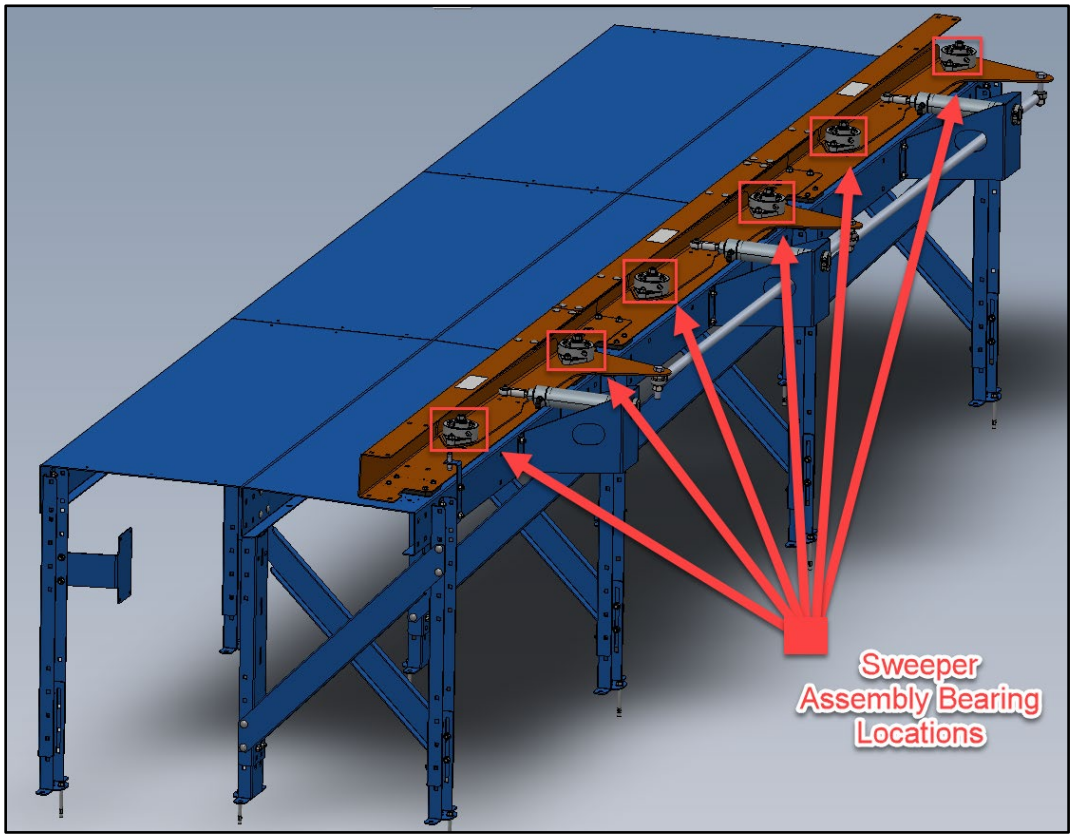


Auto Loading Live Deck drive shaft location:



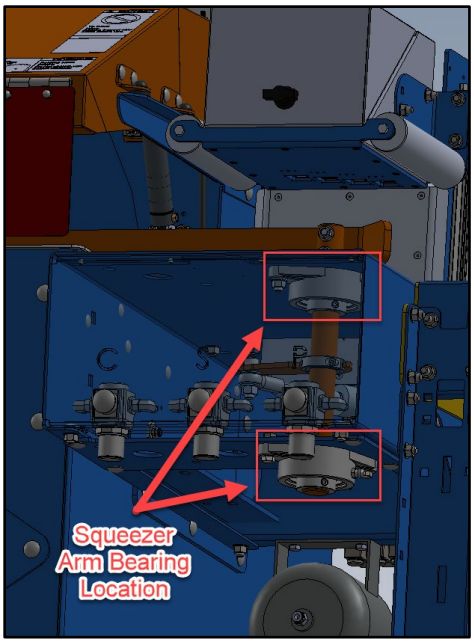
Outfeed Table w/ Sweeper Assembly

Sweeper assembly (if equipped) bearing locations:



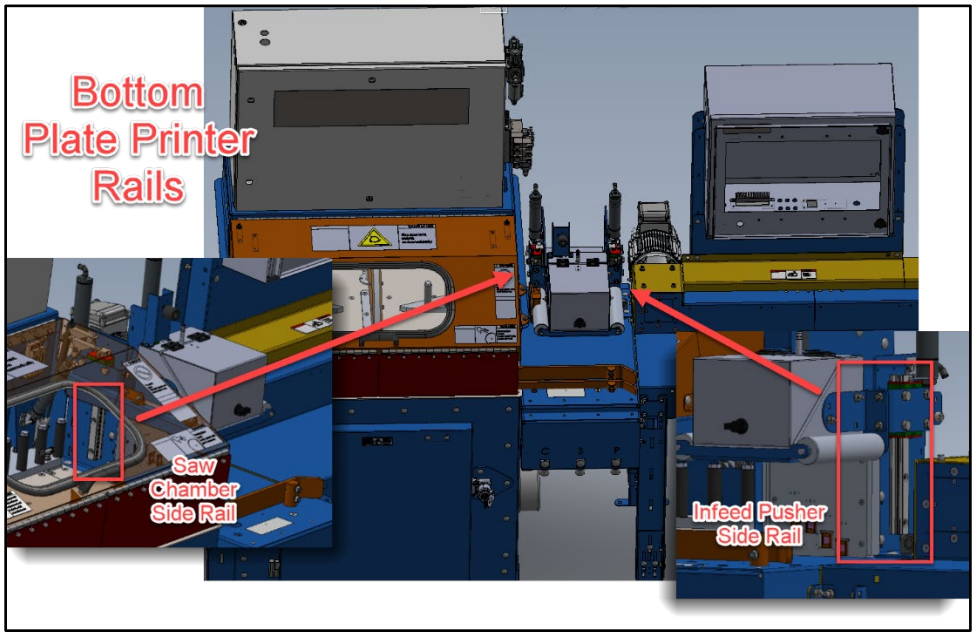
Squeezer Arm

The squeezer arm bearings are located behind and under the front plate embossed with "CSP". The front plate is transparent to make the bearing locations easier to see in the following figure:



9.6.2 Bottom Plate Printer Rails

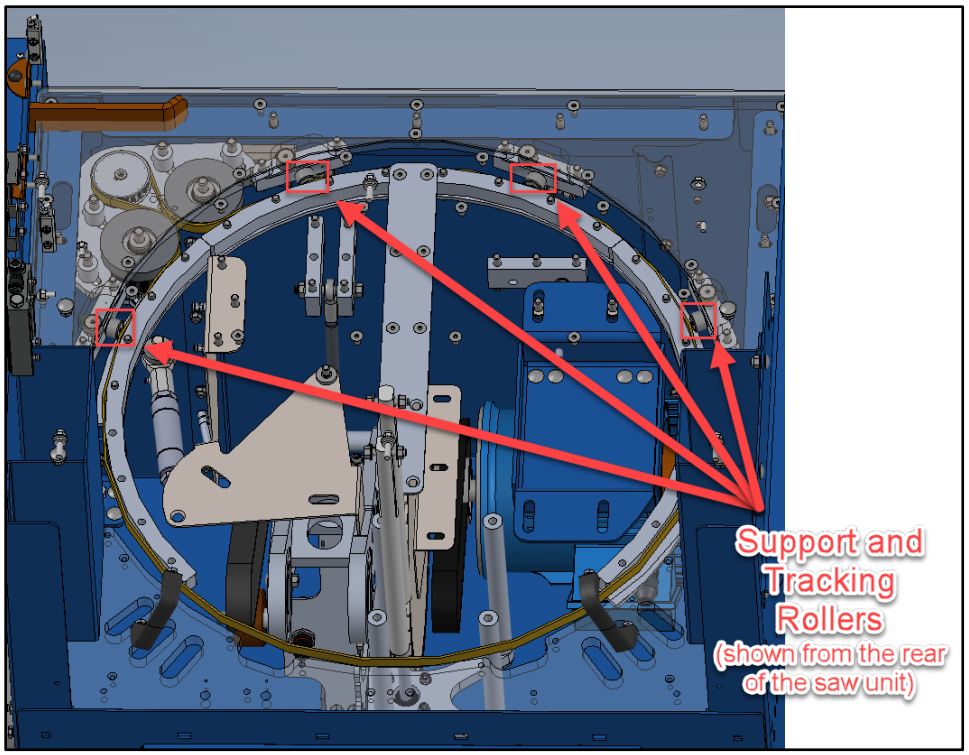
The bottom plate printer (if equipped) has rails on either side that should be lubricated:



9.6.3 Support and Tracking Rollers

The stainless toppers must be removed to access the support and tracking rollers. The rollers should be lubricated as needed to ensure smooth operation.

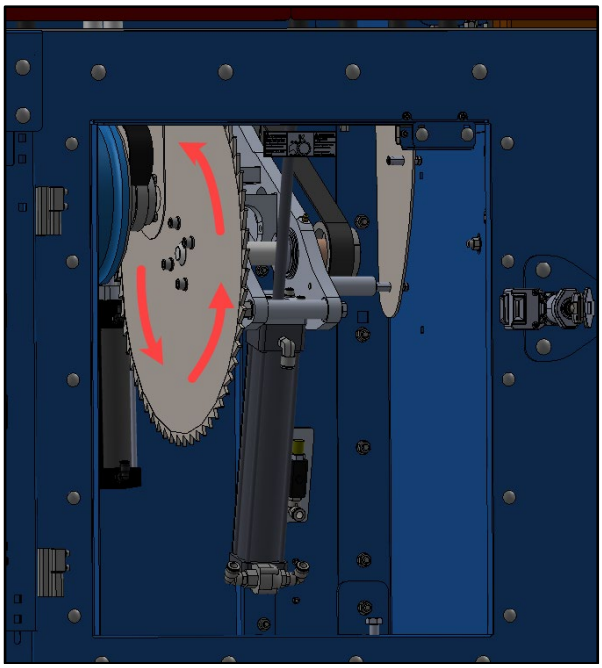
Support and tracking rollers location (shown with the toppers and saw guard removed):



9.7 Saw Blade

Direction of Blade Teeth

The blade teeth of a replacement blade must match the following orientation.



The blade rotates upward towards the saw table.

Specs for Replacement Blades

A replacement blade must meet the following criteria:

- 20” = Blade Diameter
- .180” = Kerf
- 80= # of teeth
- 10° = Hook Angle
- 0° = Face Angle

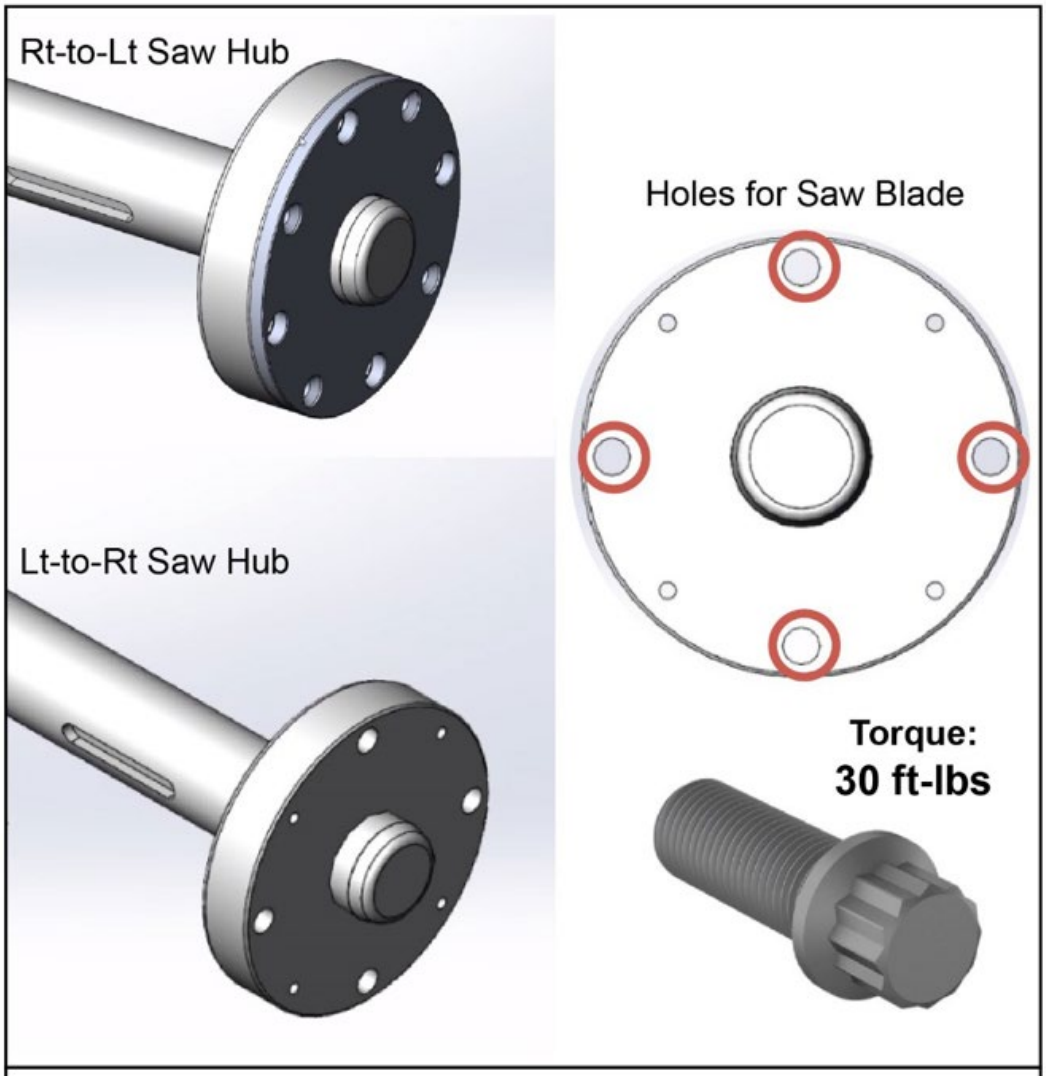
When to Replace the Saw Blade

The frequency of blade changes and of repairs also depends on the number of hours the saw is running each week. Check the saw blade weekly for signs of wear and replace accordingly.

	⚠ WARNING
	Keep saw blades sharp and in good condition. Have the saw blade re-tipped if carbide tips become chipped or come off. Dull blades cause high kickback forces which can cause injury.

Replacing the Saw Blade

1. Gather the following supplies:
   - New saw blade
   - 3/8” 12-point socket
   - Torque wrench driver
2. Activate an E-stop and lockout/tagout.
3. Open the front saw chamber door to access the blade.
4. Remove 4 bolts holding saw blade.
5. Remove saw blade and set aside for safe disposal.
6. Place the new saw blade on the hub.
7. Tighten the bolts to the torque specification of 30 ft-lbs.



9.8 *Pneumatic System*

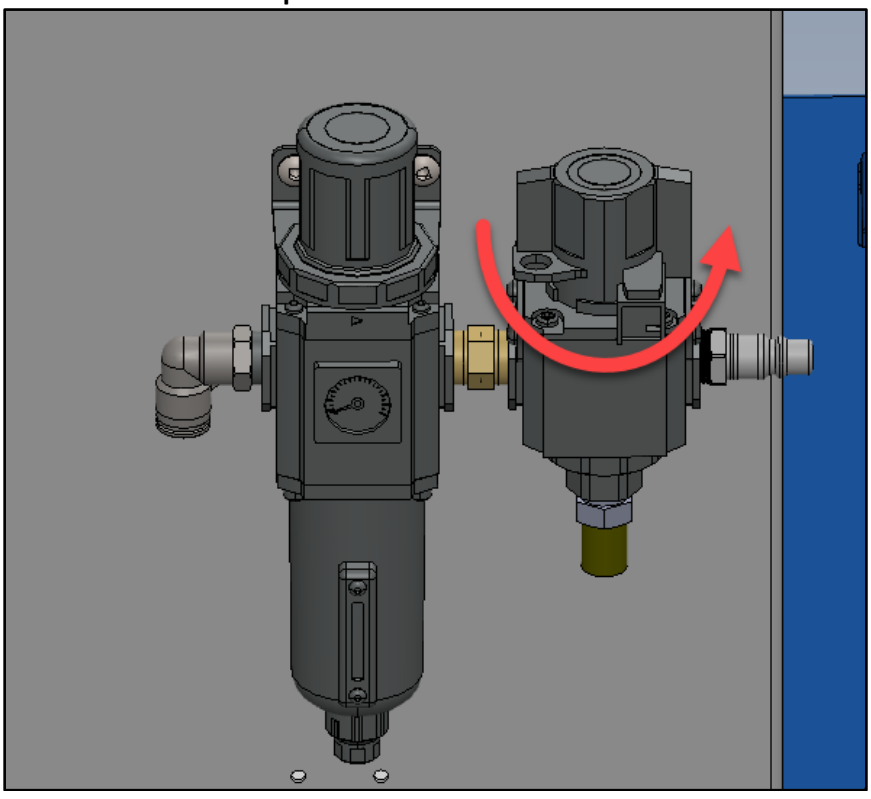
	**⚠ CAUTION** **HIGH PRESSURE HAZARD.** **Bleed all pressure from pneumatic lines before performing maintenance on pneumatic components.** **Pressurized components may move suddenly or vent air to atmosphere, causing injury.**

9.8.1 Removing Pressure from the Pneumatic System

Most procedures involving the pneumatic system require the removal of pressure. Use the following procedure to remove pressure from the system.

1. Turn the switch to the off position by turning it counterclockwise while applying downward pressure. The lockout/tagout hold will move into a position where a lockout/tagout can be used.

Red Pneumatic Switch in the Open Position



2. Lockout/tagout through the hole on the slide.

Red Pneumatic Switch in the Lockout Position

Red Pneumatic Switch with a lockout/tagout

9.8.2 Filter/Main Regulator

The filter/regulator can be purchased directly from MiTek.

9.8.3 Maintaining the Filter / Regulator(s)

Adjusting the Pressure on the Filter / Regulators

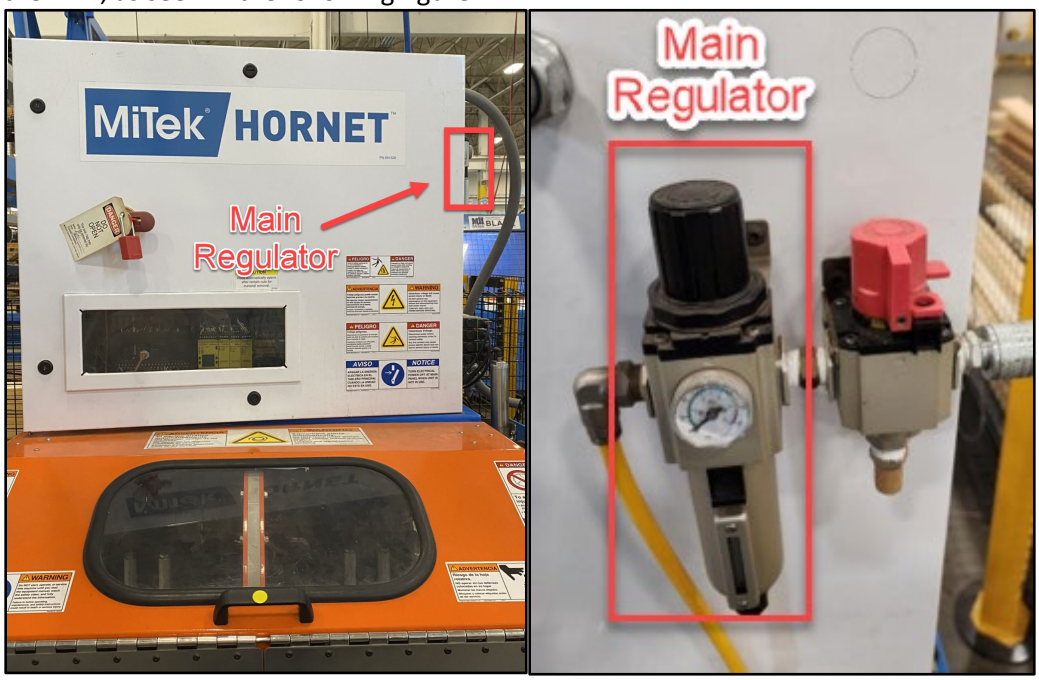
The pressure adjustment knob on a regulator controls the operating pressure for a pneumatic system. The following table lists the necessary operating pressure for the different regulators.

Regulator/Action	PSI
Main	80
Bottom Plate Printer*	40
Squeezer*	40
Counter Balance*	40

*Note that these pressures may need to be slightly adjusted for proper operation. 40 PSI is the recommended starting point.

Adjusting the Pressure on the Main Regulator

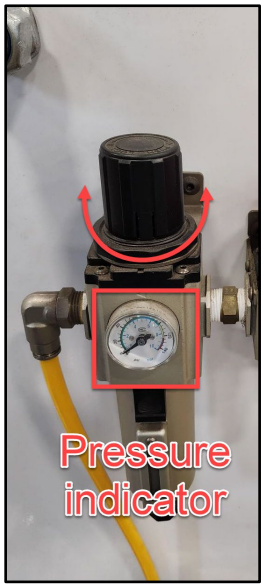
The main regulator is located on the electrical enclosure, between the enclosure and the HMI, as seen in the following figure:



Use the following procedure to adjust operating pressure for the main regulator.

1. Pull up and then turn the black knob at the top of the main regulator to adjust the pressure. The gauge on the front of the regulator indicates the current pressure.

    - Turn the knob in a **clockwise** direction to **increase** pressure
    - Turn the knob in a **counterclockwise** direction to **decrease** pressure

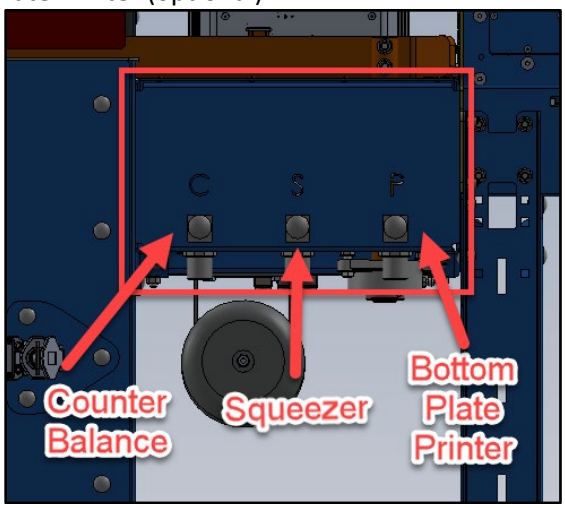


2. Once the desired pressure has been reached, stop turning the knob, then push down to secure it in place and lock the pressure.

Adjusting the Pressure on Additional Regulators

There are two additional regulators, located on the front of the gatekeep assembly. There may be a third if the saw has optional equipment. They are marked by a “C”, “S”, and “P”.

- C – Counter Balance
- S – Squeezer
- P – Bottom Plate Printer (optional)



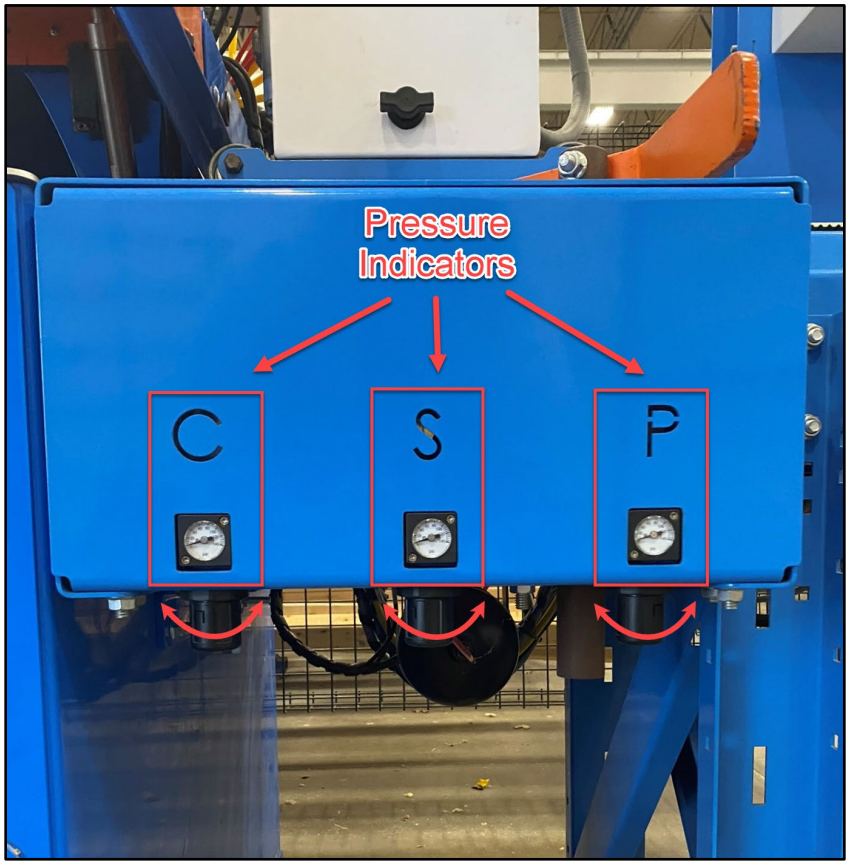
Use the following procedure to adjust operating pressure on any of the additional regulators.

Note that the additional regulators are installed inverted, so the directions for increasing and decreasing pressure are opposite from the main regulator. The pressure indicator also reads inverted.

1. Pull down and then turn the black knob of the desired regulator to adjust the pressure. The gauge on the front of the regulator indicates the current pressure.

    - Turn the knob in a **clockwise** direction to **decrease** pressure
    - Turn the knob in a **counterclockwise** direction to **increase** pressure

2. Once the desired pressure has been reached, stop turning the knob, then push up to secure it in place and lock the pressure.

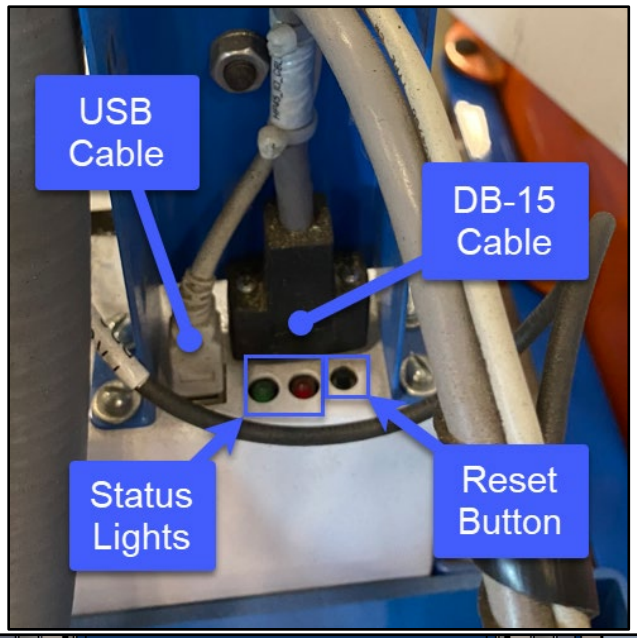


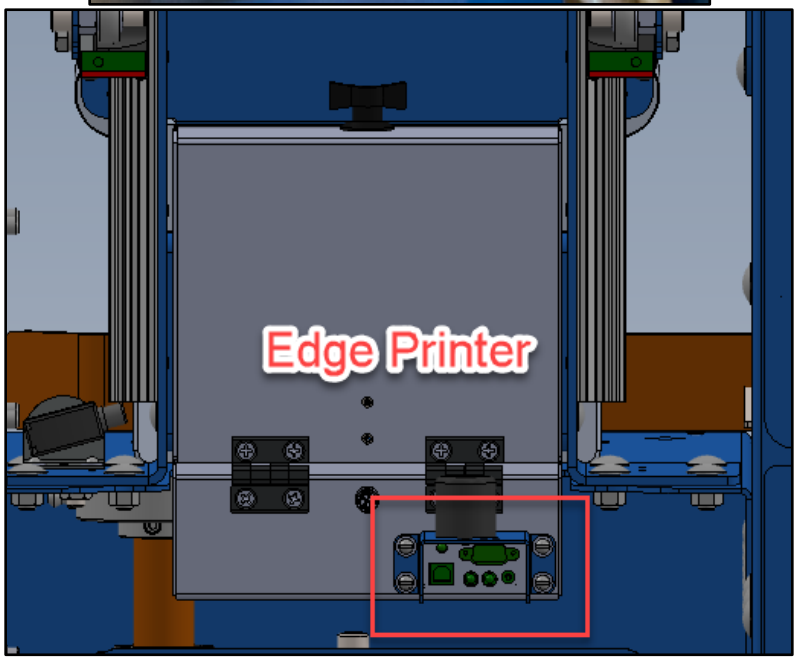
9.9 Printers

9.9.1 Removing the Controller

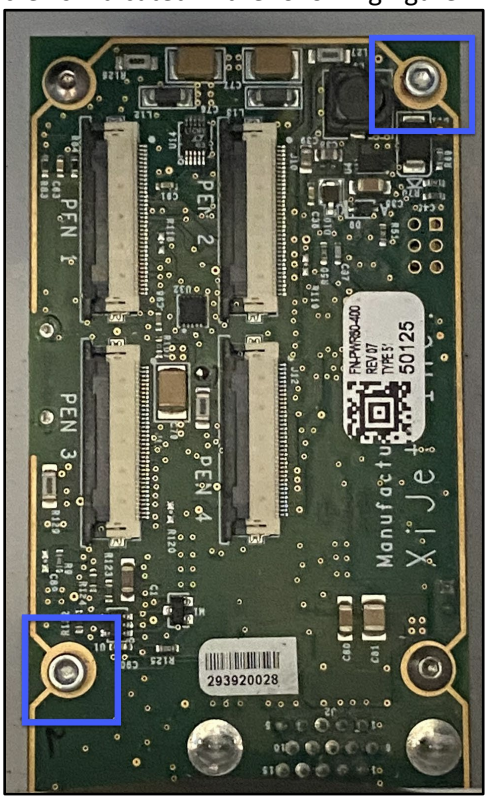
The printer controller may need to be removed if it malfunctions or if directed by MiTek Automation Support.

1. Lockout/tagout.
2. Ensure the printer is completely powered off before opening the printer enclosure.
3. Remove the USB and DB-15 cables from the top of the enclosure if working with the bottom plate printer. If working with the edge printer, remove the cables from the back of the enclosure.





4. Remove the two screws indicated in the following figure.



5. Both boards will be unseated once the screws are removed and can be removed from the enclosure. Take care not to lose the bushings that go between the controllers if they become separated.

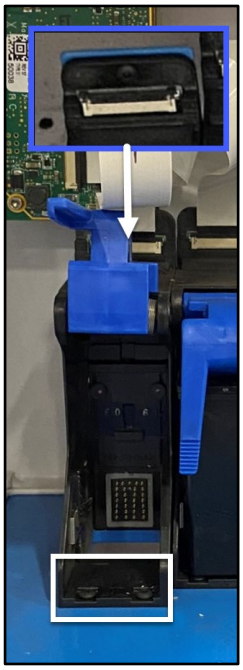
9.9.2 Removing the Pen Stalls

One or multiple pen stalls may need to be removed if they malfunction or if directed by MiTek Automation Support.

Use the following procedure to remove and/or replace a printer pen stall.

1. Lockout/tagout.
2. Start by completely removing the ribbon cable connected to the pen stall to be removed.
3. Ensure the printer is completely powered off before opening the printer enclosure.

Remove the screw at the top of the stall (if present) and the two screws securing the bottom of the stall



4. The pen stall may be removed once all screws are removed.

9.9.3 Cleaning the Printer(s)

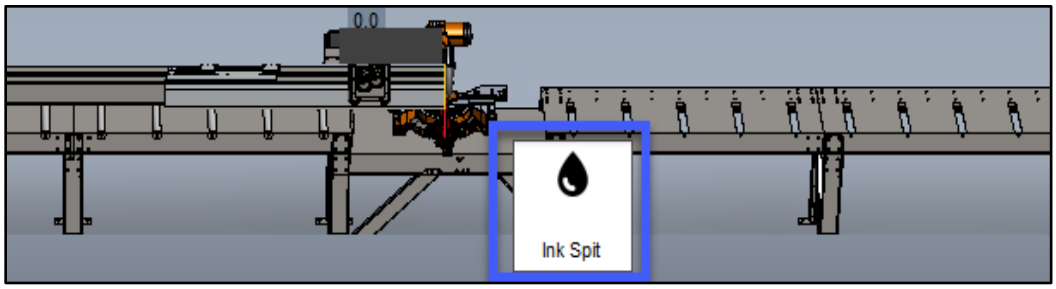
Perform these steps anytime the printer has had a break from printing for more than 30 minutes for best printing results.

1. Lockout/tagout.
2. Ensure the printer is completely powered off before opening the printer enclosure.
3. Start by slightly wetting a non-abrasive, lint-free cloth with distilled or deionized water, or use a wet wipe. Ensure it is not dry as a dry cloth may cause scratches. You may wish to fold the cloth in quarters to prevent ink penetrating through to your fingers.
4. Dab lightly, one-at-a-time, on the face of the nozzles of each of the cartridges. Be careful not to push too hard as the cartridge could become unseated from inside its stall and cause damage to the printer.
5. Let the wet cloth dissolve any dried ink by holding it gently on each nozzle. When dried ink is dissolved, a small amount of fresh ink should flow through the nozzles and into the wet rag via capillary action.
6. Once the nozzles appear to be clean and only fresh ink is observed on the cleaning cloth, move to the next cartridge, and repeat for each cartridge.

7. Place a piece of scrap wood or paper in front of the printer to test for ink spray.

8. Press the **Ink Spit** button to make all the ink cartridges emit a burst of ink spray onto the scrap wood/paper. NOTE: the saw must be powered on to use the **Ink Spit** function.

    - The Ink Spit button is located in the CutBuilder software on the top panel.

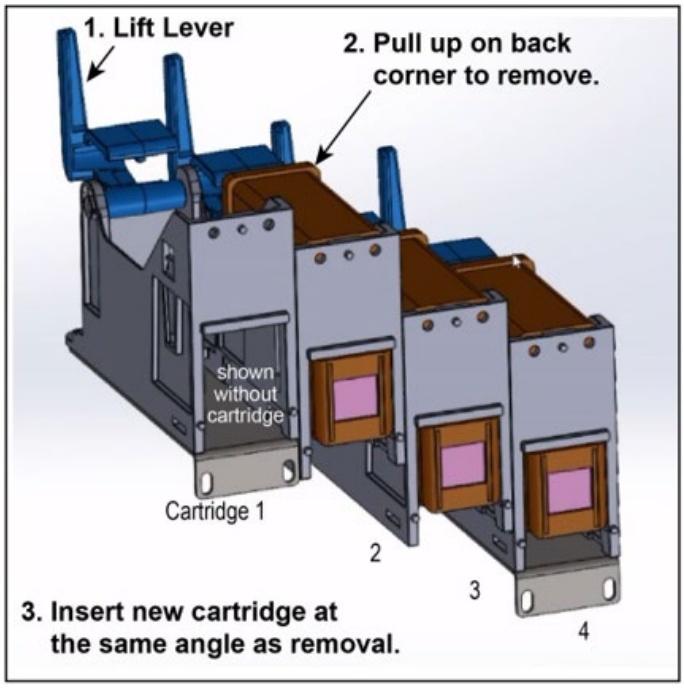


9. Successful preparation of the inkjet printer is completed when a full, vertical line of ink is present for all cartridges. Repeat steps 2 through 5 until successful preparation of all cartridges is achieved.

9.9.4 Ink Cartridges

9.9.4.1 Removing and Replacing Ink Cartridges

1. Lockout/tagout or power down the printer. Never remove a cartridge from a pen stall assembly while the printer enclosure is powered on.
2. Lift the lever on the pen stall housing the ink cartridge intended for replacement.
3. Gently pull up on the corner closest to the pins to remove the cartridge.
4. To replace a cartridge, gently insert it at an angle where the far end drops into the carriage first.
5. Once the cartridge is seated, return the lever to a closed position to secure the cartridge.



9.9.4.2 Re-Using a Cartridge After an Operational Pause

1. Once a cartridge has been used, follow these guidelines to improve its shelf life:
    - Unused for less than 1 day: Leave cartridges in machine and clean and purge before next use
    - Unused for more than 1 day: Remove cartridges from machine, clean as described in the cleaning section, and place in airtight container. Clean and purge before next use
    - Cartridges should always be stored with the nozzles facing down.
2. Upon removing the print cartridge from its container for re-use, clean as described in the Removing and Replacing Ink Cartridges section.
3. Install the cartridge according to the instructions in the Removing and Replacing Ink Cartridges section.
4. Use the Ink Spit function to make all the ink cartridges emit a burst of ink spray onto scrap material. Ensure all cartridges emit a clear, dark line. See Removing and Replacing Ink Cartridges for more information.

9.9.4.3 Storage and Environment

- Operating temperature of ink: 13°-35°C (55°–95°F)
- Storage & transportation temperature (anytime a cartridge is not propelling ink): 10°-35°C (50°–95°F)
- Shelf Life: 6 months (less if cartridge has been used)
- Do NOT shake the cartridge. Handle with care.

Take care never to let ink cartridges freeze. Freezing will cause the water in the ink to separate and will ruin the cartridge. Cartridges ordered during the winter months must be shipped via air freight to ensure they are always kept above freezing temps.

9.9.4.4 Ordering Replacement Ink Cartridges

To order replacement ink cartridges, contact MiTek Automation Support at 1-800-523-3380.

9.10 Electrical Systems

9.10.1 Electrical Enclosure

Cleaning Inside Electrical Enclosures

	NOTICE
	Never use compressed air inside of electrical enclosures. Compressed air may force contaminants into electrical connections. Use a vacuum to remove dust from electrical enclosures. Canned air is acceptable after vacuuming.

Over time, sawdust may accumulate inside of the electrical enclosures. Once every week, use a vacuum to remove sawdust from each electrical enclosure. Removing sawdust helps prevent problems with electrical components.

9.10.2 Sensors

This section contains a list of sensors and recommended maintenance.

9.10.2.1 Photoeye Sensors

Infeed Sensor

The infeed sensor detects the presence of material on the infeed rail. It should be positioned to secure sensor visibility.

The Infeed Sensor should be cleaned on a weekly basis or as needed based on visibility. It is recommended that the window be cleaned using a common glass/plastic cleaner. The window should be sprayed and wiped down with a soft cloth to prevent damage to the surface. Do NOT use benzene, acetone, or a thinner as it will damage the surface.

Squeezer Sensor

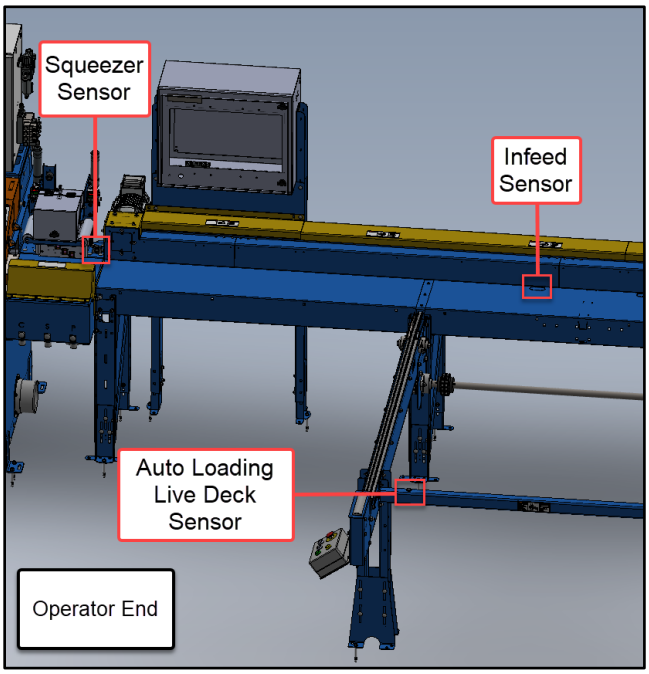
The Squeezer Sensor verifies presence of material in front of the squeezer before it engages.

The Squeezer Sensor should be cleaned on a weekly basis or as needed based on visibility. It is recommended that the window be cleaned using a common glass/plastic cleaner. The window should be sprayed and wiped down with a soft cloth to prevent damage to the surface. Do NOT use benzene, acetone, or a thinner as it will damage the surface.

Auto Loading Live Deck Sensor (if equipped)

The Auto Loading Live Deck Sensor detects the presence of material on the auto loading live deck.

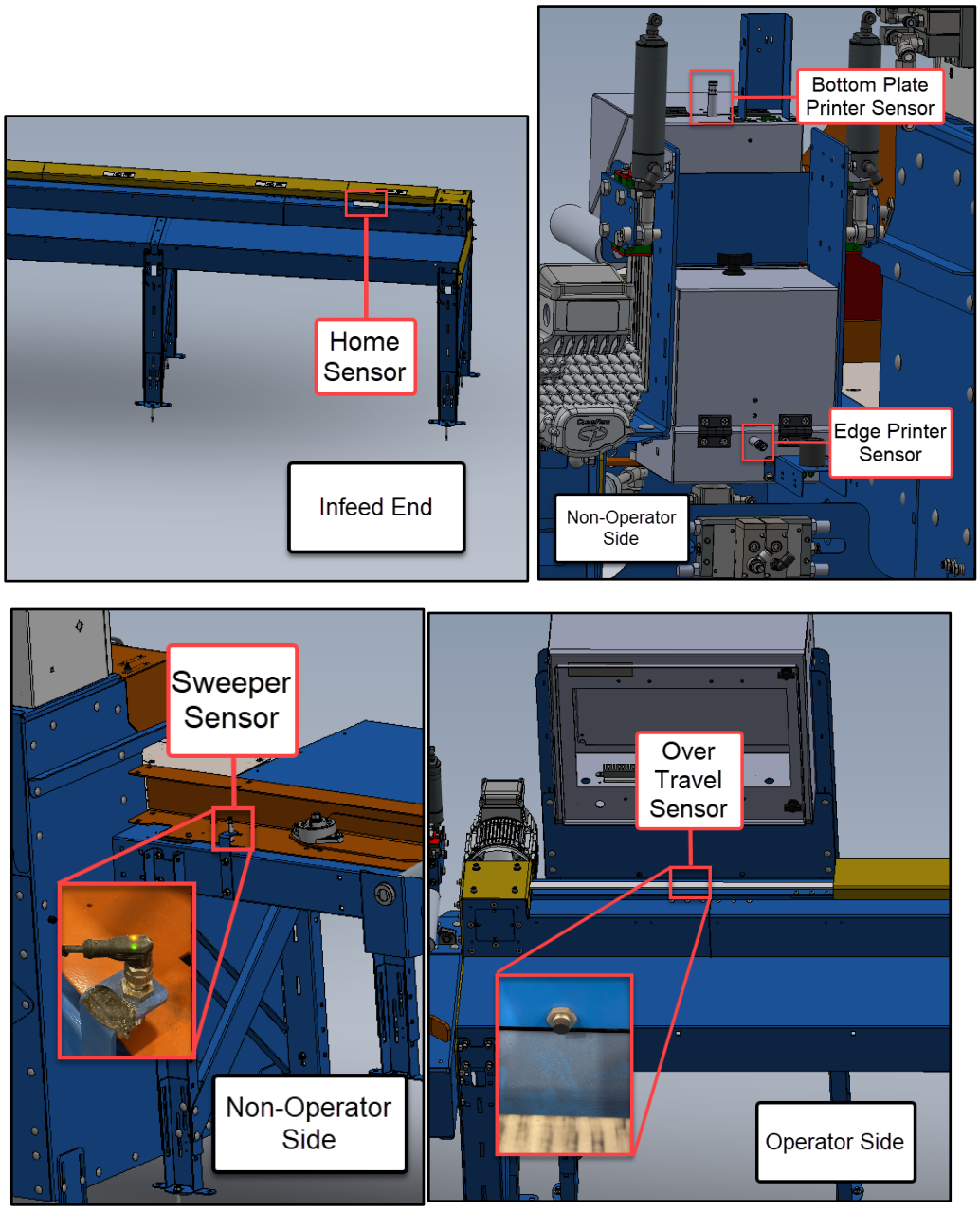
The Auto Loading Live Deck Sensor should be cleaned on a weekly basis or as needed based on visibility. It is recommended that the window be cleaned using a common glass/plastic cleaner. The window should be sprayed and wiped down with a soft cloth to prevent damage to the surface. Do NOT use benzene, acetone, or a thinner as it will damage the surface.



9.10.2.2 Proximity Sensors

Proximity sensors (5) that detect material (or that an enclosure is closed) are located along the length of the machine. Check the locking nuts and sensor tightness every 6 months.

- Home Sensor
- Over Travel Sensor
- Edge Printer Sensor
- Bottom Plate Printer (if equipped)
- Sweeper Sensor

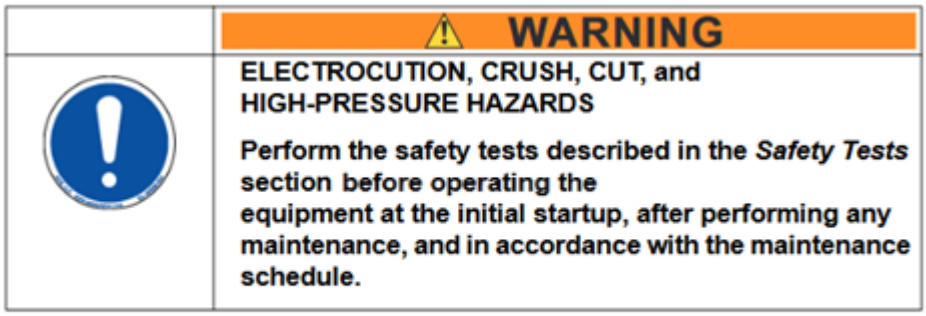

Home Sensor
Infeed End
Bottom Plate Printer Sensor
Edge Printer Sensor
Non-Operator Side
Sweeper Sensor
Non-Operator Side
Over Travel Sensor
Operator Side

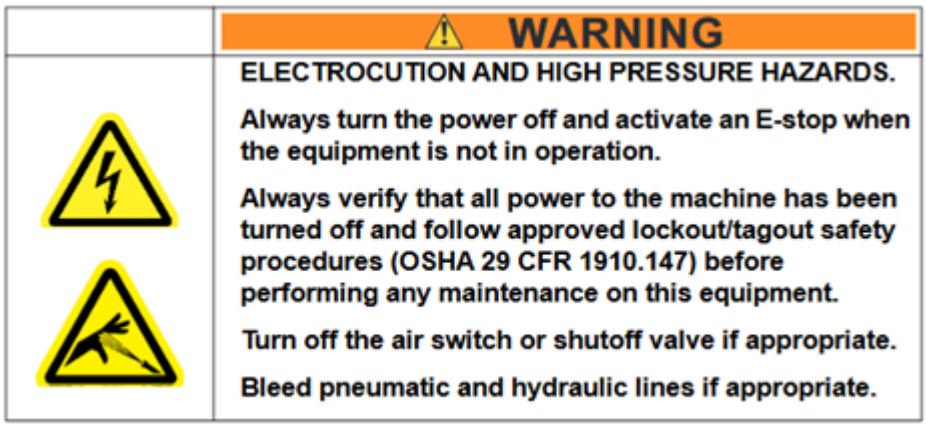
10 Maintenance Checklists

These checklists guide you through all preventive maintenance tasks required to keep this equipment in top working condition.

These pages are supplied with the intent that you will photocopy them and leave the original in the manual for future use. Space is provided in each chart to place the date that the work is done and the initials of the person performing the work.

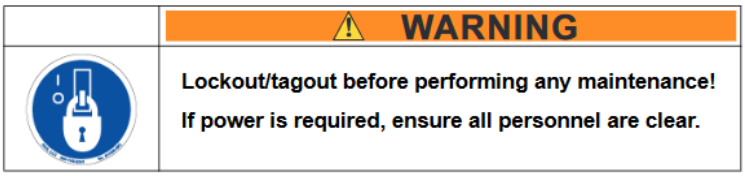
10.1 Safety Notes For Maintenance Checklists





10.2 Daily and Weekly Checklist

Hornet II



Month and Year:

_____

Week:

_____

Action	Interval	Dates						
Perform all safety tests	Daily							
Blow off system, including Auto Loading Live Deck, Infeed Pusher, Saw Unit, and outfeed table	Daily							
Vacuum Saw Unit	Daily							
Clean printer nozzles and test printers	2x/Day							
Inspect linear guide bearing rails for grease (bottom plate printer only)	Weekly							
Replace saw blade	Weekly							
Insect the squeezer photo eye and clean as needed	Weekly							
Inspect sensors for debris and/or excessive buildup	Weekly							
Grease motor arbor bearings and motor pivot bearings	Weekly							

Notes **Date**

_____

_____

_____

_____

10.3 Monthly Checklist

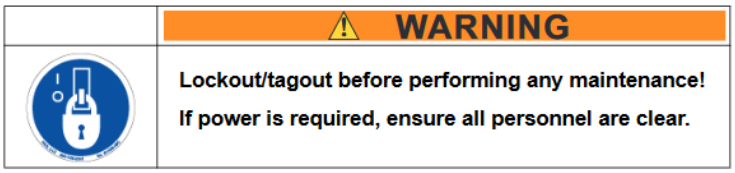
Hornet II™

Month:

_____

Year:

_____



Action	Interval	JAN	FEB	MAR	APRIL	MAY	JUNE
Check Auto Loading Live Deck alignment	1 month						
Inspect and apply grease as needed to the saw table support and tracking rollers	1 month						
Grease 2 bearings for the squeezer arm	3 months						
Check oil level in all gearboxes	3 months						
Auto Loading Live Deck drive shaft bearings: grease	6 months						
Proximity Sensors - check locking nuts and sensor tightness	6 months						

Action	Interval	JULY	AUG	SEP	OCT	NOV	DEC
Check Auto Loading Live Deck alignment	1 month						
Inspect and apply grease as needed to the saw table support and tracking rollers	1 month						
Grease 2 fittings on elevation jack screw	3 months						
Check oil level in all gearboxes	3 months						
Auto Loading Live Deck drive shaft bearings: grease	6 months						
Proximity Sensors - check locking nuts and sensor tightness	6 months						

10.4 Annual Checklist

Hornet II™

⚠ WARNING

Lockout/tagout before performing any maintenance!

If power is required, ensure all personnel are clear.

Year: _____

Action	Interval	Sign and Date When Action is Performed		
Auto Loading Live Deck motor/gearbox: grease	1x/year			
Auto Loading Live Deck drive shaft: grease 1 fitting per strand	1x/year			
Lubricate squeezer arm bearings	1x/year			
Inspection	1x/year			

Notes **Date**