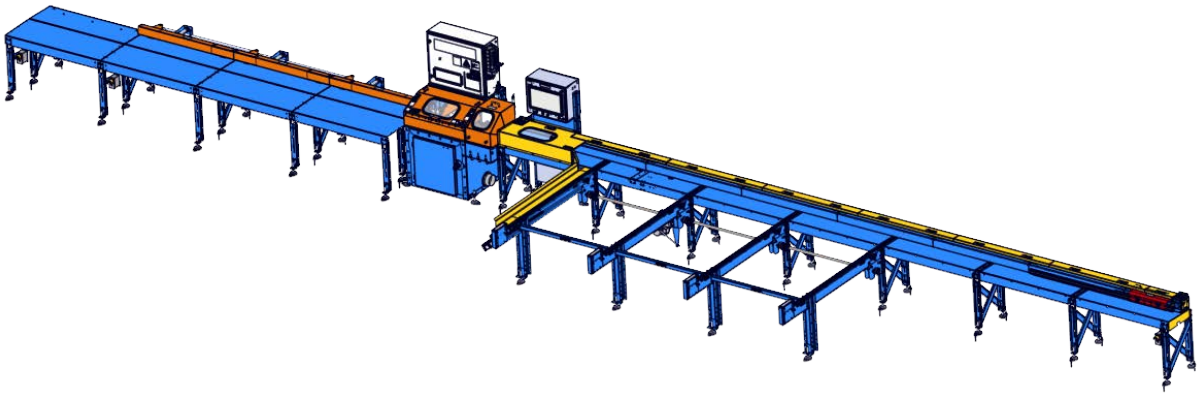
MiTek

OPERATION AND MAINTENANCE MANUAL

001079 REV. B

Hornet II™ Saw



CAUTION:
MiTek recommends printing this manual in high resolution using color ink. Many of the graphics may be unclear and may create an unsafe condition if this recommendation is not followed.

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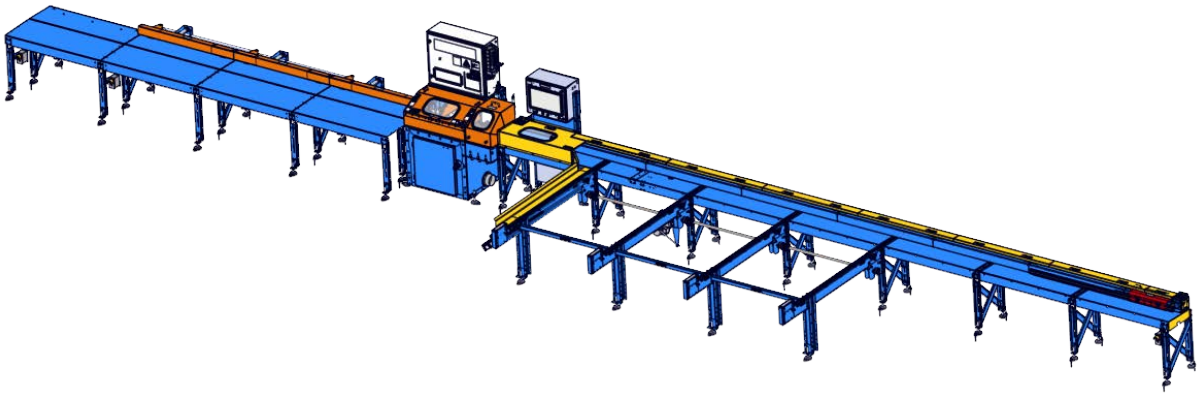

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TABLE OF CONTENTS

Legal Notice

Patents

Made and sold under one or more of the following patents:

U.S. 4,986,052	U.S. 5,837,014	U.S. 6,219,975
U.S. 5,385,339	U.S. 5,854,747	U.S. 6,260,263
U.S. 5,493,834	U.S. 5,873,567	U.S. 6,317,980
U.S. 5,568,862	U.S. 5,884,448	U.S. 6,389,762
U.S. 5,630,697	U.S. 5,885,731	U.S. 6,401,422
U.S. 5,636,494	U.S. 5,906,264	U.S. 6,412,246
U.S. 5,638,658	U.S. 5,934,866	U.S. 6,418,601
U.S. 5,640,832	U.S. 5,947,460	U.S. 6,539,615
U.S. 5,655,399	U.S. 5,987,828	U.S. 6,666,367
U.S. 5,678,395	U.S. 5,996,303	U.S. 6,702,269
U.S. 5,702,095	U.S. 6,048,165	U.S. 6,758,022
U.S. 5,707,204	U.S. 6,112,968	U.S. 6,817,392
U.S. 5,735,087	U.S. 6,134,775	U.S. 6,834,470
U.S. 5,810,341	U.S. 6,170,688	U.S. 6,907,820
U.S. 5,819,412	U.S. 6,205,637	Other patents may apply
U.S. 5,833,222	U.S. 6,212,849	

These patents may apply to saws and infeed or outfeed equipment for saws:

U.S. 6,539,830	U.S. 6,702,096

These patents may apply to presses:

U.S. RE37,797	U.S. 6,079,325	U.S. 6,651,306
U.S. 5,454,687	U.S. 6,145,684	U.S. 6,807,903
U.S. 5,553,375	U.S. 6,330,963	
U.S. 5,468,118	U.S. 6,405,916	

These patents may apply to stackers: U.S. 6,969,054

Other patents pending. Other patents may apply.

Legal Notice

Return Goods Policy

Return goods cannot be accepted without prior authorization and are subject to a restocking charge. The Seller certifies the articles specified herein were produced in compliance with all provisions of the Fair Labor Standards Act of 1938, as amended, including Section 12.—Rev. 6/98.

Corrections and Improvements

To report errors or recommend improvements to this manual, please send an email to autodoc@mii.com.

Use this page to record service bulletins and notices that you receive to keep your manual updated.

Number	Date	Title

CHAPTER 1

Safety (English)

Safety Indicator Signal Words

Refiérase a la página 26 para español.

For safety information in Spanish, refer to page 26.

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 starting on page 16, 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.**

Signal words are used in conjunction with safety symbols to give hazard messages throughout this manual. Common safety symbols are defined starting on page xx.

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.

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

Personal Safety

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

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.

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:

  a) 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.**

  b) Vacuum dust prior to blowing with air

  c) Powered cleaning equipment such as vacuums must be consistent with local governmental codes for use in dusty conditions.

Operating and Maintaining the Equipment

- Ensure that all people, tools, and foreign objects are clear of the restricted zones before operating this equipment. **The restricted zones are shown on** page 15**.**
- 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. If an equipment manual specifies a machine is designed for automated use, ensure safety devices prevent unauthorized entry before moving away from the machine.
- 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.

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.

E-Stop Locations

See Controlled Stop Methods on page 55 for E-stop locations.

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.

Lockout/Tagout

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. See Electrical Lockout/Tagout Procedures on page 7 and Pneumatic System Lockout/Tagout Procedure on page 10 for more information about each type of lockout/tagout procedure.

- Energy sources include electrical, mechanical, 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 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.

Whenever you see this symbol in the margin, lockout/tagout!

Electrical Lockout/Tagout Procedures

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

If you are working on the electrical transmission line to the machine, follow the procedure on page 9.

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: Example of a Disconnect Switch in Off Position

3. Attach a lock and tag that meet OSHA requirements for lockout/tagout.

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

4. Restrain or de-energize all pneumatic components, and other parts that could have live or stored power. See Pneumatic System Lockout/Tagout Procedure on page 10.

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

Pneumatic System Lockout/Tagout Procedure

Before working on or near pneumatic components, bleed the lines of pressure.

When Lockout/Tagout Is Not Required

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

When Lockout/Tagout Is Required

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

Figure 1-4: How to Lockout/Tagout the Pneumatic System Example

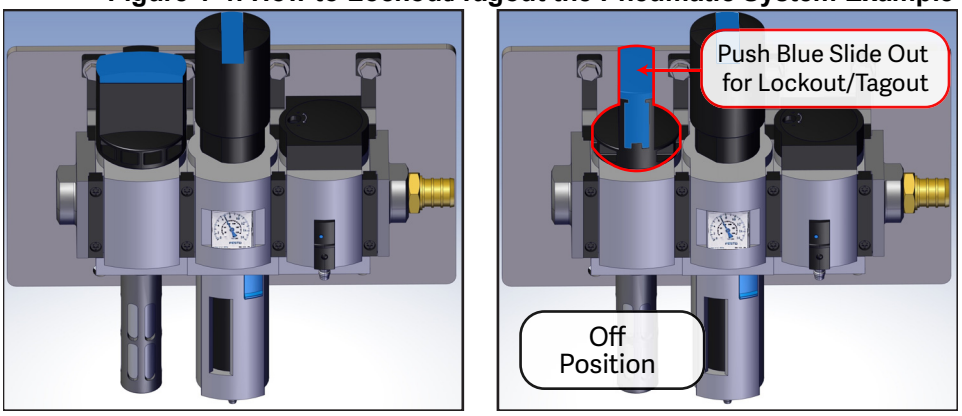
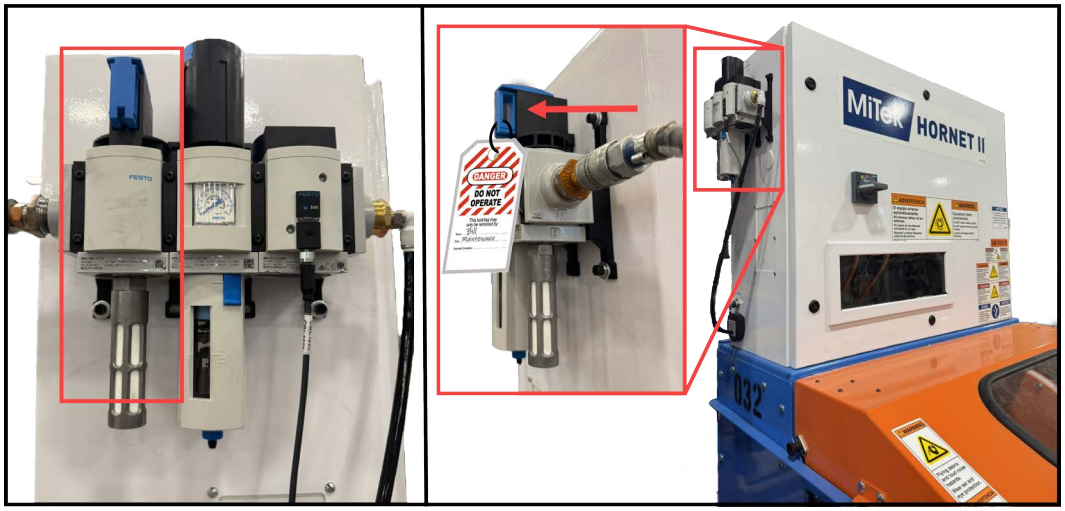


Figure 1-5: How to Lockout/Tagout the Pneumatic System - Hornet II



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.

Treatment for Hazardous Substances

	⚠ WARNING
	**PRINTER INK AND CLEANER IS HIGHLY FLAMMABLE!** **Keep away from extreme heat, sparks, or open flame.** **No smoking near these substances.**

Table 1-1: Hazardous Substances Used in Normal Maintenance

	Printer Ink	Printer Cleaner
Primary Hazards	Flammable	Flammable
Method of extinguishing fire	Alcohol-resistant foam, carbon dioxide, dry powder, water fog--NOT water	Alcohol-resistant foam, carbon dioxide, dry powder, water fog--NOT water
Protective Equipment	Gloves Goggles Eyewash station	Gloves Goggles Eyewash station

Table 1-2: How to Treat Contact With a Hazardous Substance

If Substance Gets On...	Then Do This...	
	Printer Ink	Printer Cleaner
Skin/Clothing	Rinse, remove clothing, then wash skin w/soap	Rinse, remove clothing, then wash skin w/soap
Hair	Wash with soap and water	Wash with soap and water

If Substance Gets On...	Then Do This...	
	Printer Ink	Printer Cleaner
Eyes	Flush with water	Flush with water, remove contact lenses if possible, continue flushing
Ingested	Do NOT induce vomiting; consult physician immediately	Do NOT induce vomiting; consult physician immediately.
Inhalation	Move to fresh air	Move to fresh air

Safety Tests

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

	⚠ CAUTION
	**CRUSH AND CUT HAZARD.** **Before turning on the equipment, make sure that all personnel and equipment are clear.**

General Inspection

1. Lockout/tagout the machine.
2. Make sure sharp objects are clear of all pneumatic and electrical system cables.
3. Check the Hornet II saw for debris or tools that would block the path of moving parts. Remove any that you may find. The following locations are especially important:
   - Auto Loading Live Deck (if equipped)
   - Infeed rail
   - Infeed pusher
   - Outfeed table
   - Outfeed sweeper

- Saw chamber

4. Check saw blade condition (See Replacing a Saw Blade on page 112).
5. Remove lockout/tagout and return electrical power and pneumatic pressure to the machine. See Daily Startup on page 62.
6. Press the illuminated blue Reset button. The Reset button light should turn off to indicate the machine is ready for normal operation.
7. The main filter / regulator and other sub-regulators should match the pressure ratings detailed in Pneumatic System on page 140.
8. Pull on the door handle of the front and rear saw chamber doors (2 total) to verify both doors are closed and locked.

Inspecting Labels/Guards

1. Verify that all safety labels are present and legible.
2. Verify that all guards are present and secure.

E-Stop Test

	⚠ CAUTION
 	**CRUSH AND CUT HAZARD.** **Before turning on the equipment, make sure that all personnel and equipment are clear.**

1. Start running the saw and all integrated components.
   a) Power up the saw using the instructions in Powering Up or Down on page 62.
2. Initiate a cut cycle using the Load Set function. The infeed pusher (or auto loading live deck, if equipped) will begin to move, as will the saw blade.
3. Activate any one of the E-stops listed here:
   - Operator interface E-stop
   - Auto Loading Live Deck E-stop (if equipped)
   - Infeed E-stop
   - Outfeed E-stop
4. Ensure that the following happens in a timely manner:

- The infeed pusher and auto loading mechanism stop
- All illuminated E-stops are solid red
- The bolt that stops the saw blade from raising is engaged
- If the saw blade and integrated components stop as expected, repeat the procedure to test all E-stops listed in step 3.

Testing Movement While E-Stop is Active

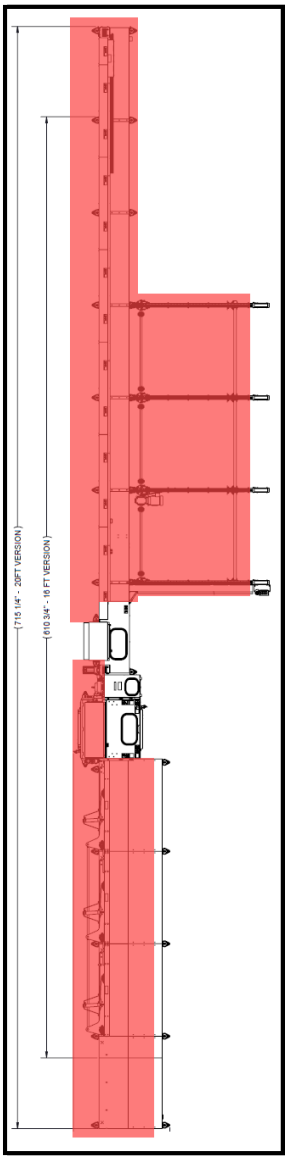
	⚠ CAUTION
	**CRUSH AND CUT HAZARD.** **Before turning on the equipment, make sure that all personnel and equipment are clear.**

1. With an E-stop activated, use the Manual Mode menu in CutBuilder to attempt to manually move the infeed pusher or the outfeed sweeper.
2. Watch the mechanism that was chosen to see if it moves. Because an E-stop is activated, no movement should occur.
3. If movement does occur, Lockout/Tagout immediately and contact Automation Support.

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.**

Figure 1-6: Know the Restricted Zone



Marking the Restricted Zone

The restricted zone must be marked so everyone near the equipment can clearly see the area where danger may exist.

Safety Symbol Definition

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.

Hot surface. Surface temperature can exceed 158°F (70°C) during normal operation. Do not touch.

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 hands away from moving parts.

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

High pressure hydraulic hose. Use safe operating procedures at all times.

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







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.

Open switch before adjusting equipment.

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

Use of a safety harness is mandatory when working above ground floor.

Use of lift equipment is mandatory.

Consult material safety data sheet.

Unplug equipment before servicing.

No open flames in this area.

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 step or stand upon this equipment. Stepping or standing on this equipment may result in serious injury.
Not a step. Do not step or stand at this location.

Do not use a fork lift when moving this equipment. Use of a fork lift may result in equipment damage. Refer to installation procedures.

Do not use unapproved lubricants in this equipment.

Unauthorized personnel are not allowed beyond this point.

Do not operate without guards in place.

Do not weld.

Do not discard into the municipal waste stream.

Indicates notes regarding lubrication.

Declaration of Safety Conformity

Conforms electrically to the following:

- NFPA 79
- NEC Electrical Code
- Relevant electrical enclosures carry UL 508A and the CUL for Canada
- Safety circuit conforms to Category 4 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 - 90 dB
- Machine operation - 100 dB

Seguridad (Español)

Indicadores de seguridad: Palabras de aviso

Las siguientes palabras y colores de aviso se utilizan a lo largo de este documento para indicar riesgos de seguridad. Preste suma atención cuando los vea. El nivel de gravedad es diferente por cada palabra o color de aviso.

Las palabras de aviso van acompañadas por gráficos que muestran al personal lo que deben y no deben hacer. Los gráficos se llaman símbolos de seguridad y se definen en la page 41, pero se proporciona un texto más específico cada vez que se utiliza un gráfico por todo el manual. Todas las personas que estén cerca de una máquina tienen que ser capacitadas en cómo leer estos indicadores de seguridad.

No cumplir las instrucciones que acompañan cada palabra de aviso puede producir daños a la propiedad, lesiones personales e incluso la muerte. El personal debe seguir todos los procedimientos y prácticas de seguridad establecidos para asegurar el uso más seguro posible de este equipo. No obstante, en ningún caso este documento reemplaza el sentido común. El personal debe asegurarse de que el entorno de trabajo sea seguro y esté libre de distracciones.

Peligro	**Indica una situación de peligro inminente que, si no se evita, ocasionará la muerte o graves lesiones.**
Advertencia	**Indica una situación potencialmente peligrosa que, si no se evita, podría producir la muerte o lesiones graves.**
Precaución	**Indica una situación potencialmente peligrosa que, si no se evita, puede producir lesiones menores o moderadas.**
Aviso	**Llama la atención a información importante para entender la operación que se desea realizar o daños a la propiedad probables.**
Ambiental	**Se aplica a condiciones que pueden afectar el entorno pero que no tienen un efecto inmediato o directo sobre el personal o el equipo.**

Reglas de seguridad para el equipo de general

Debido a la imposibilidad de anticipar todas las circunstancias que podrían constituir un riesgo, la información de seguridad suministrada en este manual del equipo y sobre la máquina no es exhaustiva. Si se utiliza o realiza el mantenimiento de esta máquina utilizando un procedimiento no recomendado específicamente por el fabricante, el procedimiento deberá ser aprobado por un ingeniero profesional para asegurarse de que no afecte la seguridad del equipo. ¡Manéjese siempre con suma precaución y sentido común!

Conozca su equipo

- Lea este manual en su totalidad antes de utilizar o mantener el equipo. No utilice esta máquina a menos que esté perfectamente familiarizado con los controles, los dispositivos de seguridad, los paros de emergencia y los procedimientos operativos que se describen en este manual.
- Lea y siga todas las notas de seguridad. El no cumplimiento de estas instrucciones podría producir pérdidas económicas, daños a la propiedad y/o lesiones personales, incluida la muerte.
- Refiérase a las pautas de bloqueo/etiquetado proporcionadas en las siguientes páginas para realizar el mantenimiento y solucionar problemas de este equipo en forma segura.
- Observe y cumpla con todas las etiquetas de seguridad. Cambie las etiquetas gastadas inmediatamente.
- Utilice este equipo únicamente para el propósito que se describe en este manual.
- Sólo personal calificado debe intentar utilizar o realizar el mantenimiento de este equipo. Por "personal calificado" se entiende:

  ...una persona o personas que, por el hecho de poseer un título o certificado de capacitación profesional reconocido o que, por sus amplios conocimientos o experiencia, han demostrado con éxito estar capacitados para resolver problemas relacionados con el tema y el trabajo en cuestión—ANSI B30.2-1983

  ...una persona que posee habilidades y conocimientos relacionados con la construcción y uso de equipos e instalaciones eléctricas y que ha recibido capacitación en seguridad sobre los riesgos posibles—NEC 2002 Handbook

Seguridad personal

- Use siempre lentes de seguridad y protección auditiva en un entorno industrial.
- Utilice una máscara protectora cuando trabaje cerca de aserrín.
- Utilice ropa adecuada y equipo de protección personal apropiado (por ejemplo, lentes de seguridad y protección auditiva.) No use ropa suelta ni joyas. Si tiene el cabello largo, áteselo para atrás.
- Proceda con precaución cuando levante piezas o materiales pesados.

Instalació del equipo

- Siga las instrucciones de instalación al pie de la letra.
- Use el equipo de elevación adecuado para el peso adecuado.
- No utilizar este equipo en zonas residenciales.

Cómo manterner un entorno seguro

- Preste atención a su entorno.
- Mantenga alejados a los niños. Todos los visitantes deben mantenerse a una distancia segura del área de trabajo. Los riesgos pueden no ser evidentes a las personas no familiarizadas con la máquina.
- Mantenga las áreas de trabajo bien iluminadas.
- Mantenga el área de trabajo limpia y libre de cualquier riesgo de tropiezo o resbalamiento.
- No utilice el equipo en lugares húmedos o mojados y no lo exponga a la lluvia o a la nieve.
- Minimice las nubes de polvo y proteja su equipo quitando el polvo de la siguiente manera:
  a) Apague la alimentación eléctrica y todas las fuentes de ignición

	NOTICE
	**¡No utilice nunca aire comprimido dentro de una caja eléctrica! Puede forzar sustancias contaminantes hacia el interior de las conexiones eléctricas.** **Utilice un aspirador para eliminar polvo de las cajas eléctricas. Es aceptable utilizar aire comprimido después de aspirar.**

  b) Aspire el polvo antes de soplarlo con aire
  c) El equipo eléctrico de limpieza como las aspiradoras debe cumplir con los códigos del gobierno local para uso en condiciones polvorientas.

Uso y mantenimiento del equipo

- Asegúrese de que no haya personas, herramientas y objetos extraños en las zonas restringidas antes de utilizar este equipo. Las zonas restringidas se indican en la página 41.
- Realice pruebas de seguridad para verificar que todos los paro de emergencia funcionen adecuadamente antes de utilizar el equipo al principio de la puesta en marcha y después de realizar cualquier tarea de mantenimiento.
- Presione siempre el pulsador de un paro de emergencia antes de acercarse a una máquina por cualquier motivo. Un paro de emergencia puede causar que los componentes se muevan sin previo aviso.
- Use solamente los procedimientos descritos en este manual. Cualquier otro procedimiento debe analizarse con MiTek para verificar que sea seguro.

Para los temas que no se traten en este manual o en línea, póngase en contacto con MiTek para recibir asesoramiento.

- En caso de que la máquina no funcione correctamente, deténgala inmediatamente utilizando un freno de emergencia e informe el problema a un supervisor.
- No deje nunca la máquina encendida si no está junto a ella. ¡Apáguela! No la abandone hasta que todas las piezas se detengan completamente y hasta que se haya apagado la alimentación eléctrica.
- Verifique periódicamente que no haya piezas gastadas o dañadas. Repárelas o cámbielas inmediatamente.
- Use solamente las piezas de repuesto exactas que se especifican. El uso de piezas no aprobadas puede anular la garantía y plantear un riesgo de seguridad.
- Mantenga los sistemas neumáticos y eléctricos en buen funcionamiento en todo momento. Repare las fugas y las conexiones sueltas inmediatamente. No exceda nunca la presión ni potencia eléctrica recomendadas.
- Verifique que todos los dispositivos de seguridad estén en buen funcionamiento antes de comenzar cada turno. Todos los dispositivos protectores y de seguridad deben estar en su lugar antes y durante el uso de la máquina. No desconecte ni evite nunca ningún dispositivo de seguridad ni interbloqueo eléctrico.
- Apriete los pernos y tornillos al par de apriete especificado por MiTek. Si no se especifica el par de apriete, use los estándares de la industria.
- Solo el personal de mantenimiento calificado puede quitar o instalar los dispositivos de seguridad. Solo electricistas calificados deben realizar trabajos eléctricos.
- Inspeccione periódicamente la calidad del producto terminado.
- Documente todas las tareas de mantenimiento preventivo y de reparación durante la vida útil de la máquina para mejorar su eficiencia y reducir el riesgo de accidentes.

Seguridad eléctrica

- No utilice líquidos en el interior de los gabinetes eléctricos.
- Cuando utilice disolventes sobre o alrededor de la máquina, desconecte la alimentación para eliminar las probabilidades de chispas, que pueden producir una explosión o incendio. Use un respirador aprobado para el uso con disolventes. Use ropa protectora, guantes y lentes de seguridad.

Ubicación de un paro de emergencia

Refiérase a la página 55 para ubicación de un paro de emergencia.

Advertencias generales

	⚠ WARNING
	**¡ELECTRICIDAD DE ALTO VOLTAJE!** **Puede causar lesiones personales graves o la muerte. Asegúrese de que solo electricistas calificados realicen trabajos de servicio eléctrico.**

	⚠ WARNING
	**Lea el manual del equipo, las etiquetas de seguridad y toda la información de seguridad suministrada antes de operar o hacerle mantenimiento a este equipo.**

	⚠ WARNING
	**RIESGO DE APLASTAMIENTO O CORTE** **Los protectores siempre deben estar colocados durante la operación para evitar lesiones graves y posiblemente la muerte.** **Reemplace siempre los protectores después de terminar las tareas de mantenimiento y antes de quitar el dispositivo de bloqueo/etiquetado.**

	⚠ WARNING
	**Muchos componentes se fabrican en acero duro tratado térmicamente. No intente enderezar, doblar ni soldar estos componentes, ya que pueden fallar al someterse a cargas y causar lesiones personales o la muerte.**

Bloqueo/Etiquetado

Pautas de bloqueo/etiquetado

Deben cumplir con todas las pautas de bloqueo/etiquetado conforme a la norma OSHA 29 CFR 1910.147. El programa de control de energía de la compañía debe incluir un procedimiento específico. El objetivo de este manual no es reemplazar el procedimiento de desenergización o bloqueo/etiquetado requerido por la OSHA, sino proporcionar pautas orientativas generales.

El término "bloqueo", según se utiliza en este manual, se refiere a la colocación de un dispositivo de bloqueo en las fuentes de energía para asegurar que el dispositivo aislador de energía y el equipo controlado por éste no puedan reenergizarse o utilizarse hasta que se retire dicho dispositivo. Consulte los Procedimientos de bloqueo/etiquetado eléctricos on page 32 y el Procedimiento de bloqueo/etiquetado del sistema hidráulico o neumático on page 35 para obtener más información sobre cada tipo de procedimiento de

bloqueo/etiquetado

- Las fuentes de energía incluyen energía eléctrica, mecánica, hidráulica, neumática, química, térmica y otras.
- En el caso de fuentes de energía eléctrica, la alimentación principal y la alimentación de control a la maquinaria deben apagarse y bloquearse físicamente en la posición "off" (apagado).
- Por lo general, como dispositivo de bloqueo se utiliza un candado con llave.

Si hay más de una persona trabajando en una zona restringida, utilice un dispositivo de bloqueo grupal que permita a cada persona utilizar un candado que sólo pueda ser retirado por la persona que realiza el mantenimiento.

Siempre que vea este símbolo, ¡Bloquee/Etiquete!

Procedimientos de bloqueo/etiquetado eléctricos

Cuando trabaja en una máquina fuera del gabinete eléctrico principal de la máquina

Si trabaja en la línea de transmisión eléctrica a la máquina, siga el procedimiento de la 34.

Antes de realizar el mantenimiento de cualquier máquina con alimentación eléctrica, bloquee y etiquete la máquina de forma adecuada. Cuando trabaje en una máquina fuera del gabinete eléctrico principal de la máquina, salvo en el caso de trabajos en la línea de transmisión eléctrica a la máquina, siga los procedimientos de bloqueo/etiquetado aprobados por la compañía, los cuales deberían incluir, entre otros, los pasos aquí indicados.

1. Coloque un paro de emergencia sobre la máquina.
2. Coloque el mango del interruptor con fusibles en la posición "apagado". Vea la Figura 2-1.

	⚠ WARNING
	RIESGO DE ELECTROCUCIÓN. **Cuando el interruptor con fusibles está apagado, sigue habiendo energía dentro del gabinete del interruptor. ¡Apague siempre la alimentación en la fuente de alimentación del edificio antes de abrir este gabinete eléctrico!**

Figura 2-1: El gabinete eléctrico principal

3. Coloque un candado y una etiqueta que cumplan con los requisitos de bloqueo/etiquetado de la OSHA.

Figura 2-2: Mecanismo de bloqueo/etiquetado en un gabinete eléctrico principal

4. Trabe o desenergice todos los componentes neumáticos y otras piezas que tengan alimentación directa o almacenada.

Cuando trabaje en una máquina dentro del gabinete eléctrico principal de la máquina o en la línea de transmisión eléctrica a la máquina

Antes de abrir el gabinete eléctrico principal o intentar reparar o reemplazar una línea de transmisión eléctrica a la máquina, bloquee y etiquete la máquina en forma adecuada. Siga los procedimientos de bloqueo/etiquetado aprobados por la compañía, los cuales deberían incluir, entre otros, los pasos aquí indicados.

1. Coloque un paro de emergencia sobre la máquina.
2. Apague la alimentación a la máquina en la fuente de alimentación, que, por lo general, es un panel de entrada de suministro eléctrico que se encuentra en una pared de las instalaciones. En la Figura 2-3 se muestra un ejemplo de panel de fuente de alimentación bloqueado.
3. Coloque un candado y una etiqueta que cumplan con los requisitos de bloqueo/etiquetado de la OSHA.
4. Abra la puerta del gabinete al que necesita acceder y usando un multímetro verifique que la alimentación esté apagada.

Figura 2-3: Ejemplo de un mecanismo de Bloqueo/Etiquetado en un panel de entrada de suministro eléctrico

Procedimiento de bloqueo/etiquetado del sistema hidráulico o neumático

Antes de realizar el mantenimiento de los sistemas neumáticos, purgue las líneas para eliminar la presión.

Cuando no se requiere bloqueo/etiquetado

Si trabaja con componentes que no son del sistema neumático pero que requieren su presencia en la proximidad de componentes neumáticos móviles, debe, como mínimo, trabar físicamente estos componentes para que no se muevan. Si no es posible, bloquee/etiquete todo el sistema neumático.

Cuando se requiere bloqueo/etiquetado

Antes de intentar reparar o realizar el mantenimiento de una línea o componente neumático, bloquee/etiquete la máquina en forma apropiada. Siga los procedimientos de bloqueo/etiquetado aprobados por la compañía.

Figura 2-4: Cómo bloquear y etiquetar el sistema neumátic

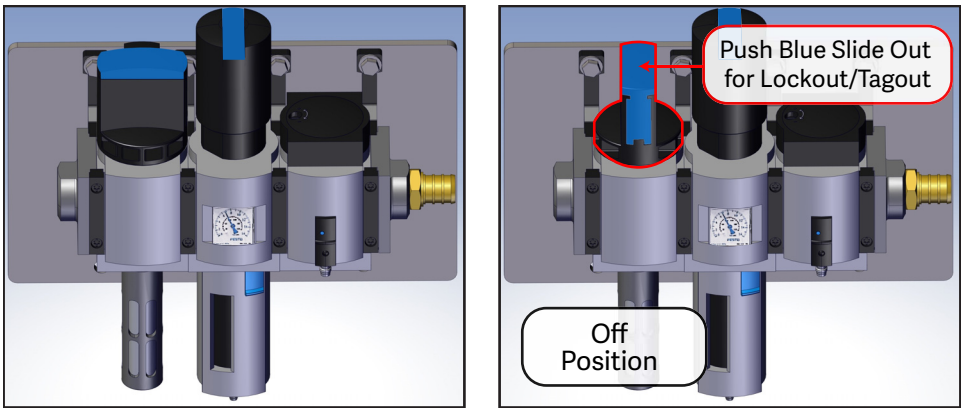
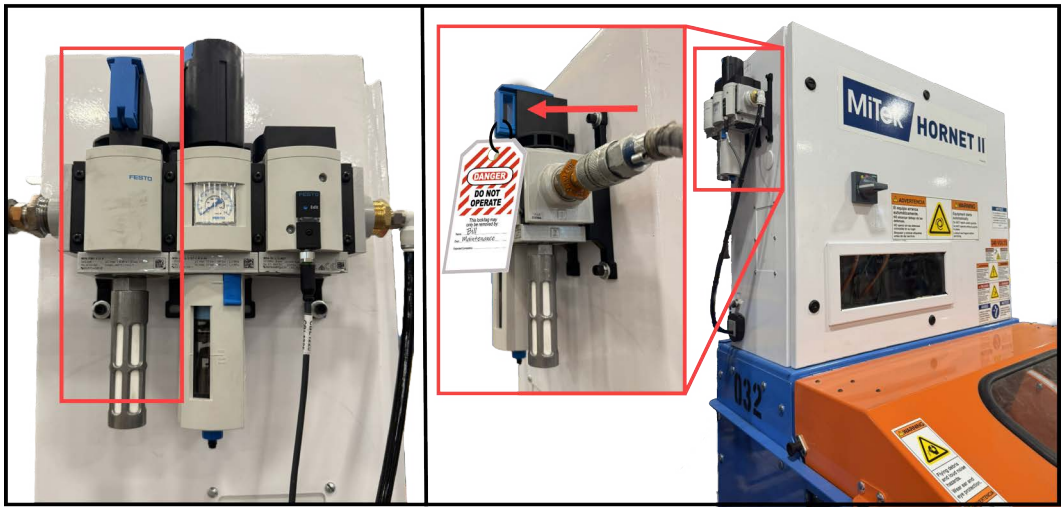


Figura 2-5: Cómo bloqueo/etiquetado el sistema neumático



Solución de problemas con una máquina energizada

Sólo un electricista calificado que utilice el equipo de protección personal y siga los procedimientos recomendados en la norma NFPA 70E debe intentar realizar tareas de reparación o mantenimiento en un área o componente energizados de la máquina o en su proximidad.

Cada vez que se realizan tareas de mantenimiento mientras el equipo está eléctricamente energizado, existe un riesgo potencial de formación de un arco eléctrico. Consulte en la norma NFPA 70E el equipo de protección personal requerido para trabajar con componentes eléctricamente energizados. Los componentes neumáticos e hidráulicos pueden moverse de manera imprevista si no se desenergizan. Trabe físicamente cualquier componente que pueda moverse cuando deba trabajar en ellos o en su proximidad.

Tratamiento en caso de contacto con sustancias peligrosas

	⚠ WARNING
	**LA TINTA Y EL LIMPIADOR DE LA IMPRESORA SON ALTAMENTE INFLAMABLES.** **Manténgalos alejados del calor extremo, las chispas o las llamas expuestas.** **No se debe fumar cerca de estas sustancias.**

Table 2-1: Sustancias peligrosas que se utilizan en el mantenimiento normal

	Tinta de impresora	Limpiador de impresora
Peligros principales	Inflamable	Inflamable
Método de extinción	Espuma resistente al alcohol, dióxido de carbono, polvo seco, agua nebulizada; NO agua	Espuma resistente al alcohol, dióxido de carbono, polvo seco, agua nebulizada; NO agua
Equipo de protección	Guantes Gafas protectoras Estación de lavado de ojos	Guantes Gafas protectoras Estación de lavado de ojos

Table 2-2: Cómo tratar el contacto con una sustancia peligrosa

Si una sustancia entra en contacto con...	Haga esto...	
	Tinta de impresora	**Limpiador de impresora**
La piel/ropa	Enjuague, quítese la ropa y lave la piel con jabón	Enjuague, quítese la ropa y lave la piel con jabón
El cabello	Lave con agua y jabón	Lave con agua y jabón
Los ojos	Enjuague con agua	Enjuague con agua, quítese los lentes de contacto si es posible y continúe enjuagando
Ingestión	NO provoque el vómito; consulte inmediatamente a un médico	NO provoque el vómito; consulte inmediatamente a un médico
Inhalación	Salga al aire libre	Salga al aire libre

Pruebas de seguridad

Este procedimiento de prueba DEBE ser realizado por personal calificado durante la puesta en marcha y después de CUALQUIER tarea de mantenimiento, ajuste o modificación. La prueba permite comprobar si el sistema de seguridad y el sistema de control de la máquina funcionan juntos y detienen la máquina de manera adecuada.

	⚠ CAUTION
	**PELIGRO DE APLASTAMIENTO Y CORTE.** **Antes de encender el equipo, asegúrese de que todo el personal y los equipos estén alejados.**

Inspección General

1. Realice el procedimiento de bloqueo/etiquetado de la máquina.
2. Asegúrese de que los objetos afilados estén alejados de todos los cables del sistema neumático y eléctrico.
3. Verifique que la sierra Hornet II no tenga desechos ni herramientas que pudieran obstruir sus piezas. Retire todo lo que encuentre. Los siguientes lugares son especialmente importantes:
   - Plataforma de carga automática activa (Auto Deck) (si tiene)
   - Riel de alimentación
   - Empujador de alimentación
   - Mesa de salida
   - Barredora de salida
   - Cámara de la sierra
4. Verifique el estado de la cuchilla de la sierra (consulte Remplazo de la cuchilla de la sierra en la página 112).
5. Quite el bloqueo y etiquetado y restablezca la energía eléctrica y la presión neumática a la máquina. Consulte Procedimiento diario de puesta en marcha en la página 62.
6. Presione el botón azul iluminado “Reset” (restablecer). La luz del botón “Reset” debe apagarse para indicar que la máquina está lista para el funcionamiento normal.

7. El filtro/regulador principal y otros subreguladores deben coincidir con las presiones nominales detalladas en Sistema neumático en la página 140.
8. Jale de la manija de las puertas delantera y posterior de la cámara de la sierra (2 en total) para verificar que ambas puertas estén cerradas y bloqueadas.

Inspección de Etiquetas/Protectores

1. Verifique que todas las etiquetas de seguridad estén presentes y sean legibles.
2. Verifique que todos los protectores estén presentes y bien fijados.

Prueba de Los Paros de Emergencia

	⚠ CAUTION
	**PELIGRO DE APLASTAMIENTO Y CORTE.** **Antes de encender el equipo, asegúrese de que todo el personal y los equipos estén alejados.**

1. Comience haciendo funcionar la sierra y todos los componentes integrados.
   a) Encienda la sierra según las instrucciones de Encendido o apagado en la página 62.
2. Inicie un ciclo de corte usando el modo de Ajuste de corte/Ajuste de carga. El empujador de alimentación empezará a moverse al igual que la cuchilla de la sierra.
3. Active cualquiera de los paros de emergencia indicados a continuación:
   - Paro de emergencia de la interfaz del operador
   - Paro de emergencia de la plataforma de carga automática activa (Auto Deck) (si tiene)
   - Paro de emergencia de alimentación
   - Paro de emergencia de salida
4. Asegúrese de que lo siguiente ocurra sin demoras:
   - El empujador de alimentación y el mecanismo de carga automática se detienen

- Todos los paros de emergencia iluminados están de color rojo fijo
- El perno que detiene la cuchilla de la sierra está acoplado
- Si la cuchilla de la sierra y los componentes integrados se detienen según lo esperado, repita el procedimiento para probar todos los paros de emergencia indicados en paso 3.

Prueba de Movimiento Mientras el Paro de Emergencia Está Activo

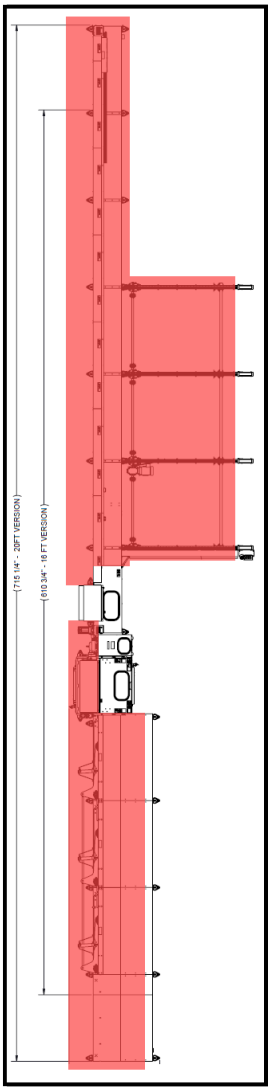
	⚠ CAUTION
	**PELIGRO DE APLASTAMIENTO Y CORTE.** **Antes de encender el equipo, asegúrese de que todo el personal y los equipos estén alejados.**

1. Con el paro de emergencia activado, use la pantalla táctil para intentar mover manualmente el empujador de alimentación o la barredora de salida.
2. Observe si el mecanismo que se eligió se mueve. Como el paro de emergencia está activado, no debería moverse.
3. Si se mueve, realice de inmediato los procedimientos de bloqueo/etiquetado y póngase en contacto con el Soporte técnico de automatización.

Zona Restringida

	⚠ DANGER
	**Manténgase afuera de la zona restringida cuando el equipo esté en uso. Pueden producirse lesiones graves o incluso la muerte si el personal está en la zona restringida.** **Asegúrese que no haya personal en la zona restringida antes de operar el equipo.**

Figura 2-6: Conocer la zona restringida



Marcar la zona restringida

La zona restringida deberá marcarse de tal manera que todas las personas que se encuentren cerca del equipo puedan ver claramente el área donde pueda haber peligro.

Información adicional

CHAPTER 3

Introduction

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 as described on page 46.

Understanding the Manual

Hyperlinks

References to page numbers throughout the manual can be selected to immediately take you to the relevant section.

The Drawing Set

A list of drawings can be found in the back of this equipment manual or in a separate 11x17 binder.

Navigational Aids

The graphics used in Table 3-1 are used throughout the manual to communicate a specific type of information quickly.

Table 3-1: Navigational Aids

Graphic	Definition
	This icon is an important safety note. It indicates that you must lockout/tagout at the disconnect switch located on the equipment using approved methods described in OSHA CFR 1910.147 before continuing with the procedure.
	This icon specifies that certain tools are needed before a procedure begins.
	This icon provides additional information to supplement the main text.
	This icon indicates how to locate additional relevant information or resources.

Operator Training Outline

This training outline is intended to help MiTek Installation Technicians guide the training of machine operators during initial installation of a machine. Click on text in (parentheses) to jump to a specific section.

Subject	Training and Related Links
Using the Manual	• Show the operator how to access the manual on the MiTek website.
Safety	• Review the lockout/tagout procedures for all machine systems: Lockout/Tagout Guidelines on page 6. • Walk the operator through all procedures in the Safety Tests section: Safety Tests on page 12. • Instruct the operator to read the entire Safety chapter before operating the machine for the first time: Safety (English) on page 1.
Operation	• Walk the operator through all procedures in the Safety-Related Operating Procedures section and make note of the location of all E-stops: Safety-Related Operating Procedures on page 55. • Walk the operator through the Operating Procedure section: Operating Procedure on page 87.
Maintenance	• Walk the operator through the process of replacing a saw blade: Saw Blade on page 111. • Instruct the operator to review the Maintenance chapter to learn more about the necessary maintenance to keep their machine running optimally: Maintenance on page 100. • Walk through the Maintenance Checklist with the operator. Make note of the daily, weekly, and monthly/annual task structure and demonstrate how selecting the page numbers will take you to the related section: Maintenance Checklist on page 157.

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
- Service bulletins pertaining to your equipment
- Support, safety, and training information
- Part numbers for ordering parts

Contact Us

MiTek Automation 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
Fax: 636-328-9218
machinerysupport@mii.com

Website
mitek-us.com

Videos
Search for “MiTek Inc” to find us on YouTube

CHAPTER 4

General Information

Introduction to the Equipment

Purpose of the Equipment

The *Hornet II* saw is used for cutting and marking in wall panel applications. The system can cut and mark common wall panel framing parts such as sills, headers, and top and bottom plates.

Description of the Equipment

The *Hornet II* saw includes the following components:

The **Infeed** component is comprised of the infeed rail and pusher which delivers lumber to the saw chamber. It also includes the control interface and board printers.

The infeed can be further customized by adding an optional Auto Loading Live Deck that takes the lumber to the infeed rail of the saw for further processing.

The **Control Unit (HMI)** utilizes a touch-screen interface for controlling and operating the saw.

The **Printers** are used to mark the edge and top of material.

The **Saw Unit** component contains the saw blade itself and the main electrical panel.

The **Outfeed** table receives and manages cut parts. It features an automated sweeper that clears the outfeed area as lumber is processed.

See the following pages for a more detailed overview of the entire system and the options available.

The *Hornet II* saw is available in two configurations:

- **Right-to-Left (RTL)** - the infeed is to the **right** of the saw unit
- **Left-to-Right (LTR)** - the infeed is to the **left** of the saw unit

Both configurations are available in either a **16 foot or 20 foot board length capacity**.

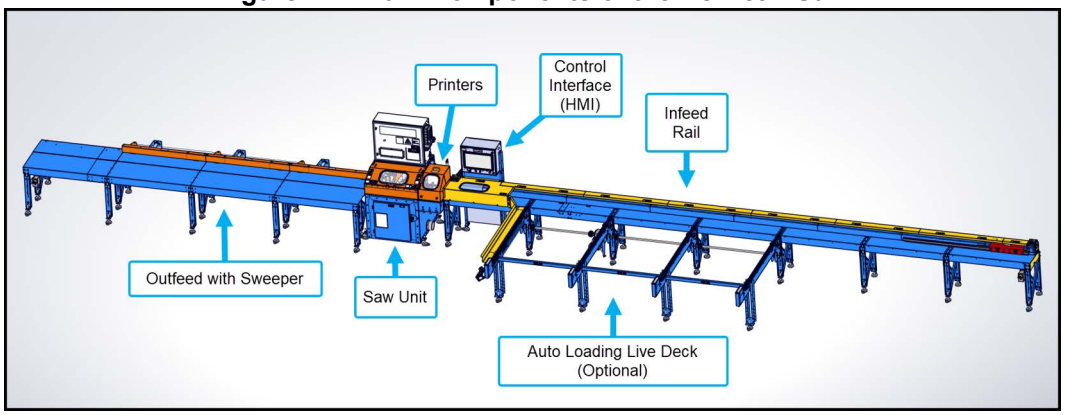
Safety Compliance of the Equipment

Equipment shipped to a U.S. destination is compliant NFPA 79, NEC 2009, and applicable OSHA regulations.

Main Components

Graphical Overview

Figure 4-1: Main Components of the *Hornet II* Saw



See Optional Components on page 49 for graphics of other components not shown here.

Descriptions

Table 4-1 lists some of the main components that are included with all versions of this equipment.

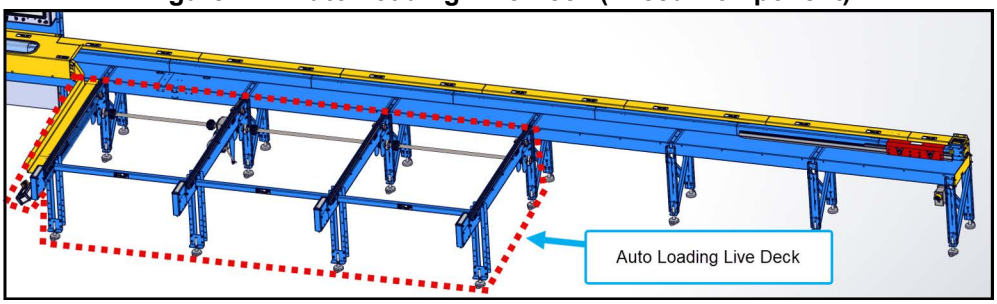
Table 4-1: Main Components

Component	Description
Infeed Rail	Receives the material and feeds it into the saw chamber.
Printers	The edge printer marks the *EDGE* of the material and the face printer marks the *FACE* of the material.
Saw Unit	Saw component where the cutting occurs.
Outfeed	The machine includes a sweeper arm that moves material onto a table to keep it from obstructing material that is exiting the saw unit.

Optional Components

Graphical Overview

Figure 4-2: Auto Loading Live Deck (Infeed Component)



Descriptions

Table 4-2 lists some of the optional components that may be added at the point of sale. Contact MiTek for more information.

Table 4-2: Optional Components

Component	Description
Auto Loading Live Deck	Transports the lumber (placed there by an operator) for automatic loading onto the Infeed Rail.

Dust Extraction Methods

Two ports are provided for dust extraction from the saw unit. It is highly recommended that a dust extraction method that meets the following criteria is used during operation:

Airflow rate: 800 cfm

Port size: 6"

Technical Specifications

Table 4-3: General Specifications

Specification	Data
Saw blade	508 mm diameter (20”)
Pusher accuracy	+/- 1/16”
Angle accuracy	+/- 0.1 degree
Printers (Edge and Face)	4 print heads

Table 4-4: Lumber and Cut Capacity

Specification	Data
Maximum edge of board(s) height	5 3/4”
Maximum face of board(s) width	11 7/8”
Maximum length of board	16’ or 20’ depending on configuration
Maximum number of angle cuts	+/- 70° from square
Min. or max. length of cut	0’ to 16’ or 20’ depending on configuration
Shortest length to enter saw via Auto Loading Live Deck	6’
Maximum stack height for plate and edge printing	3”

Table 4-5: Motor Specifications

Specification	Data
Saw blade	5 HP, 1750 RPM
Auto Loading Live Deck	1HP, 1745 RPM

Table 4-6: Pneumatic Specifications

Specification	Data
Air source tank (if needed)	60 gallons minimum
Volume	100 psi at 11 scfm

Table 4-7: Electrical Specifications

Specification	Data
Voltage (VAC)	230 VAC
FLA plus controls (amps)	35
Disconnect switch fuses (amps)	40
Cycles (Hz)	60
Phases	3

Table 4-8: Dimensional Specifications

Saw Unit	3’ 2-1/4” L x 3’ 6-1/2” W x 6 8-3/16” (+/- 2”) H
System: Saw, 16’ infeed rail, 16’ Outfeed table	50’-9 1/2” L x 5’-3” W x 6’-8 1/8”(+/-2 3/8”) H
System: Saw, 16’ Infeed Rail, 16’ Outfeed table, Auto Loading Live Deck	50’-9 1/2” L x 10’-7” W x 6’-8 1/8”(+/-2 3/8”) H
System: Saw, 20’ infeed rail, 20’ Outfeed table	59’-7 1/2” L x 5’-3” W x 6’-8 1/8”(+/-2 3/8”) H

System: Saw, 20’ Infeed Rail, 20’ Outfeed table, Auto Loading Live Deck	59’-7 1/2” L x 10’-7” W x 6’-8 1/8”(+/-2 3/8”) H

Table 4-9: Approximate Weight Specifications

Specification	Data
Saw Unit	900 lb
Infeed rail - 20’	1500 lb
Auto Loading Live Deck	700 lb
Outfeed table - 20’	500 lb

Table 4-10: Environmental Requirements

Operating temperature	50 to 95 degrees Fahrenheit (10 to 35 degrees Celsius)
Relative humidity	5-95%
Transportation and storage	-13 to 158 degrees Fahrenheit (-25 to 70 degrees Celsius). It has been packaged to prevent damage from the effects of normal humidity, vibration, and shock
Environment for sensors must be:	Free of rain, fog, mist, sand, and bright sunlight

CHAPTER 5

Installation & Startup

Requirements to Meet for Installation

Refer to your original Pre-Installation document for all requirements that must be met before or during installation.

Refer to the General chapter for machine specifications and requirements.

Moving the Equipment Into Place

Follow these guidelines to safely move this equipment with a forklift or crane.

Transportation Equipment Requirements

The forklift, crane, chains, clevises, and all moving equipment must be rated for 150% of the weights listed on Figure 4-9 on page 51 to abide by general safety rules.

Your Responsibilities

During Installation

MiTek supervises the installation to ensure that the system is installed properly and operates correctly. MiTek will also provide operating and maintenance training at the time the equipment is installed. The customer is responsible for providing all labor and equipment needed to complete the installation.

Before Selling or Re-Installing

If you determine that you want to move your equipment to another location or you want to sell your system to another company, refer to the Pre-Installation document received when you first purchased this equipment. If you need another copy of that document, request it from MiTek.

	⚠ WARNING
	**Moving the system without proper planning may result in equipment damage or serious injury.**

Startup Procedures

Before operating your new equipment for the first time, perform these procedures.

	**⚠ WARNING** **Do NOT attempt to start the system for the first time without a MiTek representative present.** **Starting the system without a MiTek representative present may result in equipment damage, serious injury, and/or death.**

Marking Restricted Zone

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.

See Restricted Zone on page 15 for more information.

Safety Tests

Perform all safety tests listed in Safety Tests on page 12.

OPERATION

Safety Operating Notes

	⚠ 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 machine.** **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 warnings. 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 machine.**

	⚠ WARNING
	**CRUSH AND CUT HAZARD.** **Before turning on the machine, make sure that all personnel and other machines are out of the restricted zone (Marking the Restricted Zone on page 15).**

	⚠ WARNING
	**Do not operate this machine unless all guards and safety devices are in place.** **Only qualified maintenance personnel shall repair, remove, or replace guards and safety devices.**

Safety-Related Operating Procedures

Stopping Methods

The *Hornet II* Saw stops movement using a controlled stop or an emergency stop (E-stop).

A controlled stop may be slower than an emergency stop, but a controlled stop is the preferred stopping method unless there is a safety emergency. Using an E-stop to stop the machine regularly may cause excessive wear on components.

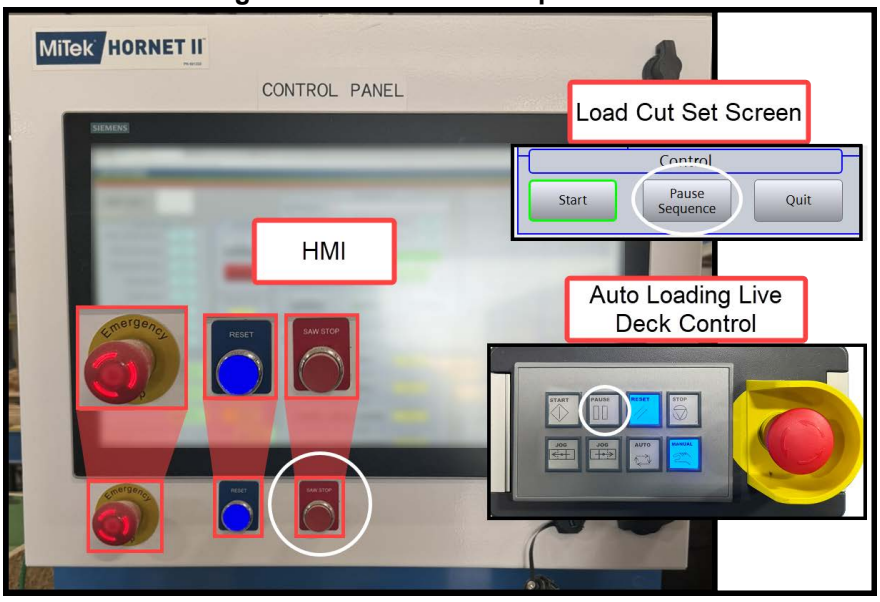
Controlled Stop

To initiate a controlled stop on the *Hornet II*, press the “Saw Stop” button on the control interface (see Figure 6-1). This will stop the auto cutting sequence and turn off the saw blade motor after the last cut on the active board is complete, putting the machine in an idle state.

The machine can also be paused using a pause button. Pressing a pause button pauses the current cutting sequence. While the machine is paused, the pause button will flash. Pressing the pause button again resumes operation. Pause buttons are located:

- On the outfeed sweeper E-stop assembly
- On the Auto Loading Live Deck control panel (if equipped)
- On the Load Cut Set screen in the CutBuilder software

Figure 6-1: Controlled Stop Methods



Emergency Stop

There are 3 E-stops (with 1 optional) located on the main components of the *Hornet II* Saw.

Figure 6-2: E-stops Locations

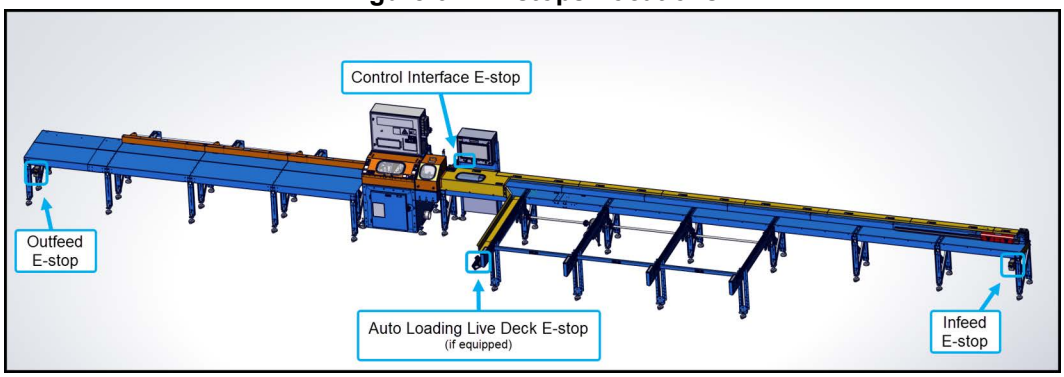


Figure 6-3: How to Operate an E-Stop Pushbutton

To activate a pushbutton, push the button in. The machine no longer operates.

To release a pushbutton, twist the push button (left), or pull the pushbutton to release (right).

Restart After E-Stop Procedure

1. Release all activated E-stops.
   - A list of which E-stops are activated is available in the **Alarm** menu on the home screen.
   - The E-stop indicator will also display on the Home screen when an E-stop is active. See Load Cut Sets on page 73 for more information.
2. Press the blue RESET button on the control interface (see Figure 6-6).
3. Resume normal operation. See Operating Procedure Overview on page 87.

Electrical Disconnect Switches

There is one disconnect switch located on the *Hornet II.* It is located on the main electrical enclosure.

Figure 6-4: Everything You Need to Know About Disconnect Switches

Electrical Enclosure Disconnect Switch

Turning the disconnect handle to the *On* position supplies electrical power to the entire machine. To remove power to the machine, turn the disconnect handle to the Off position. The disconnect handle should be turned off when the machine is not in use.

NOTE: The control panel is equipped with a battery backup. The computer will continue to have power until the backup drains; approximately 5 minutes.

	⚠ WARNING
	**Always turn off power at the main power source before opening the electrical enclosure.** **Even when the disconnect switch is turned to the Off position, there is still live power to the enclosure where the disconnect switch is mounted. This live power may cause severe electric shock.**

Interlocked Doors or Guards

Overview

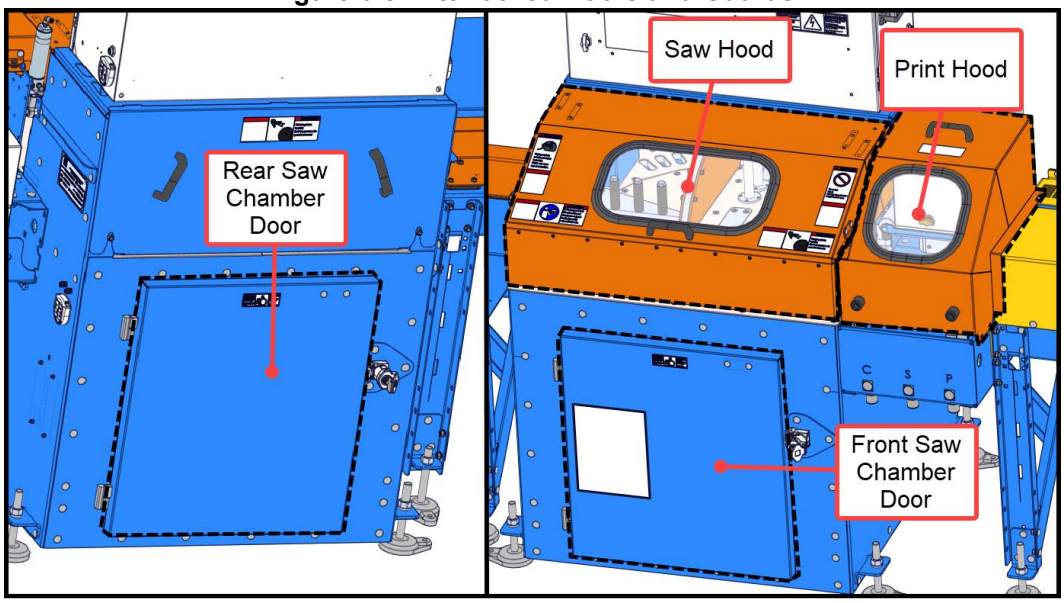
The following doors and guards located on the saw chamber are interlocked with the safety system to prevent entry while components are moving:

- Front saw chamber door
- Rear saw chamber door
- Print hood
- Saw hood

Saw Chamber Doors

The doors shown in Figure 6-5 are secured with door locks that can be opened with a maintenance key that was included with the saw. These doors should not be opened unless a lockout/tagout is in place.

Figure 6-5: Interlocked Doors and Guards



Saw Hood

The saw hood is unable to be opened during operation. However, during certain cuts, the saw hood will unlock and can be opened. This condition will be noted on the control interface in the *CutBuilder* software when applicable.

The saw will otherwise not operate while the hood is open.

Print Hood

If the print hood is opened during operation, the machine will enter an E-stop state. The saw will not operate if the print hood is open.

Maintenance Doors

There are a variety of maintenance doors, such as the saw chamber doors, located on this equipment. These doors may be secured by magnets or mechanical latches. Do not open a maintenance door unless a lockout/tagout is in place.

Safety-Related Indicators on the Machine

This section covers the visual indicators that communicate important information about the status of the machine.

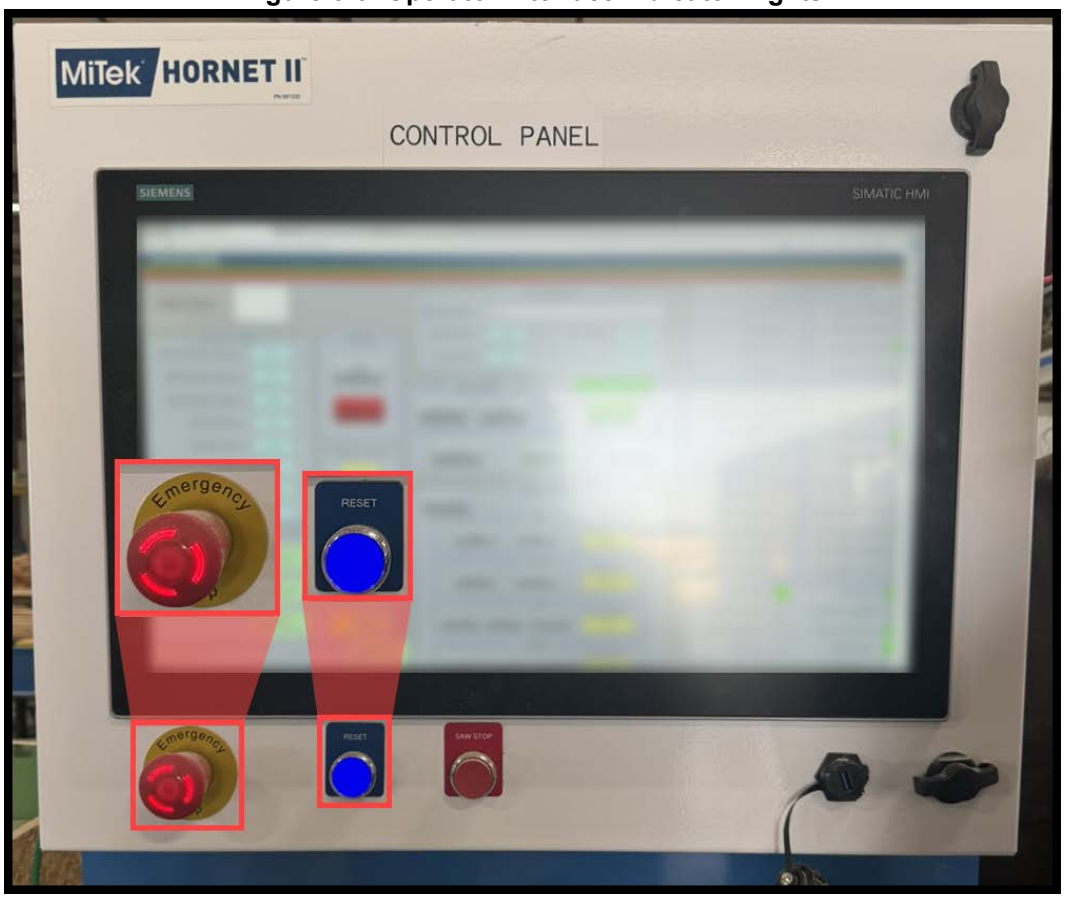
Control Interface Indicator Lights

The lights located on the operator interface indicate the following:

E-STOP: Red light turns on when an E-stop is activated. This light must be off before the machine can operate.

RESET: Blue light turns on after the machine is first powered on, an E-stop is active, the machine is in a faulted state, or a door is open.

Figure 6-6: Operator Interface Indicator Lights



Hardware Overview

Operator Hardware Controls

This section describes the hardware controls available to an operator in a complete system.

Figure 6-7: Operator Interface Controls

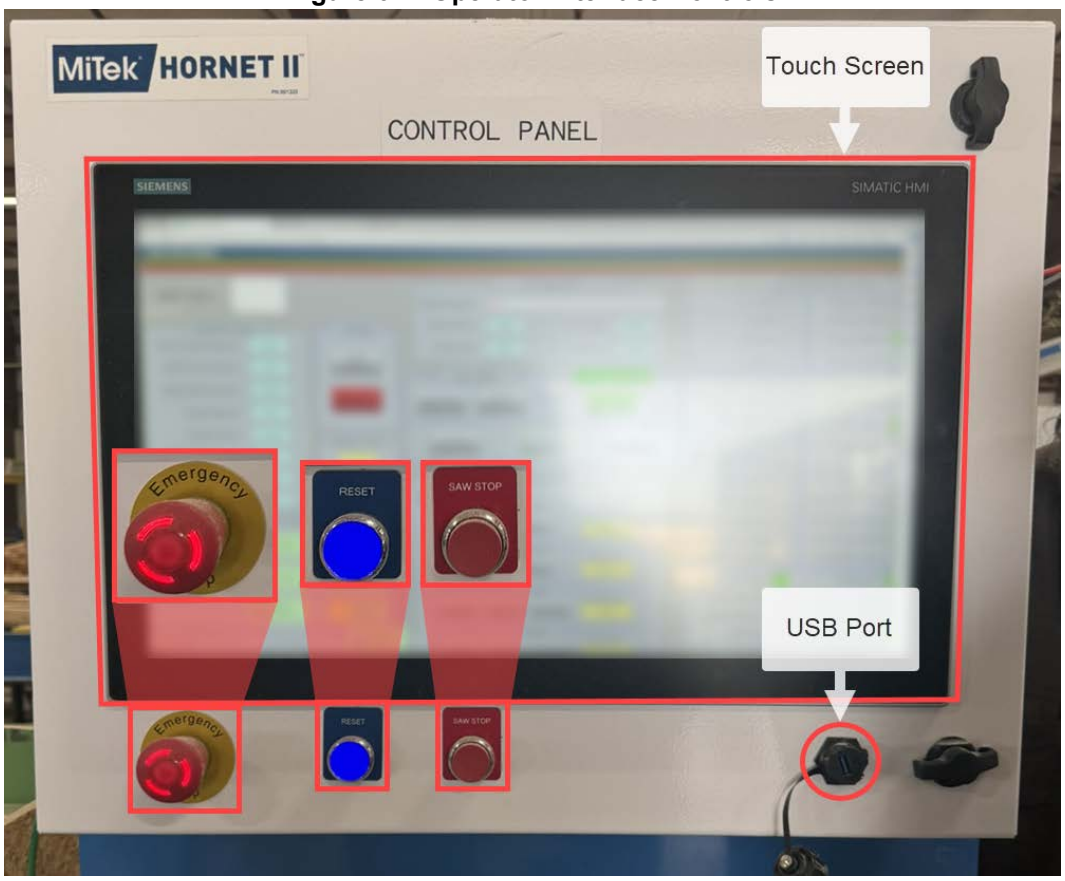


Table 6-1: Description of Operator Interface Controls

Name	Function
E-stop	Stops all movement of the entire *Hornet II*.
Reset	Restores the safety controller and re-enables main power to the system.
Saw Stop	Stops all motion and puts the machine in an idle state.
Touch Screen	Allows for interacting with the machine computer.
USB Port	Used for maintenance activities or to import jobs.

Auto Loading Live Deck (If Equipped)

The Auto Loading Live Deck operation is controlled within the machine software in when in **Auto** mode, but manual operation occurs at the control station shown in Figure 6-8. The control station is located on the rear operator side of the auto loading live deck.

NOTE: If the manual controls are unresponsive, ensure the drives are enabled. See Manual Mode on page 80 for more information.

Figure 6-8: Auto Loading Live Deck Controls

Table 6-2: Description of Auto Loading Live Deck Controls

Name	Function
E-stop	Stops all movement of the entire *Hornet II*.
Start	In **MANUAL** mode, causes conveyor to move a short distance, typically enough to load a new set of material. In **AUTO** mode, Start resumes operations from a Stop.
Pause	Pauses the current cut sequence after the current step is completed. Pressing Pause again resumes operation.
Reset	Resets the machine; serves the same function as the reset button on the control interface.
Stop	Halts the conveyor chains.
Jog (Deck Direction)	Controls which direction the conveyor chains run. Pressing one will begin to move the conveyor in that direction.
Auto	Switches the conveyor to **AUTO** mode.
Manual	Switches the conveyor to **MANUAL** mode.

Powering Up or Down

Daily Startup

1. Complete the Safety Tests on page 12.
2. Review the maintenance tasks in Daily Checklist on page 158 and determine if any tasks should be completed before operation of the machine.
3. Rotate the saw's main disconnect switch to the **ON** position.
4. Move the pneumatic regulator valve for the saw to the **ON** position.
5. Inspect the main filter/regulator and other sub-regulators to ensure the pressure ratings are within the guidelines. See Overview of Pneumatic Components on page 140.
6. Double-click the *CutBuilder* software icon and wait for it to launch.
7. Press the blue RESET button on the operator interface if it is illuminated. The button will be illuminated if there is a fault that has not been cleared.
   - The blue light goes out if all E-stops are cleared. If the RESET button light stays lit, determine which E-stop is activated and reset it (see Controlled Stop Methods on page 55).
   - If the RESET button is still illuminated, there is a fault. Current faults can be seen on the Alarm screen (see Alarm on page 79).

Daily Shutdown

1. Review and complete any unfinished maintenance tasks in the Daily Checklist on page 158.
2. Rotate the saw's disconnect switch to the **OFF** position.
   - The control panel features a battery backup. The computer will automatically shut down and lose power in approximately 5 minutes.
3. Move the pneumatic regulator valve for the saw to the **OFF** position.

Software Overview

This section covers the *CutBuilder* softer that is accessible through the *Hornet II* control interface. This software controls all of the main components that comprise the *Hornet II* saw.

The *Hornet II* control interface is designed as a touch-first device, but it can also be used with a mouse and keyboard (not recommended). See below for a list of terms that will be used throughout the manual and their mouse equivalents:

Select:

- 1 tap on the screen
- 1 left mouse click

Double-tap:

- 2 quick taps on the screen
- 2 quick left mouse clicks

Long-press:

- 1 long press on the screen
- 1 right mouse click

Basic Software Operating Procedure

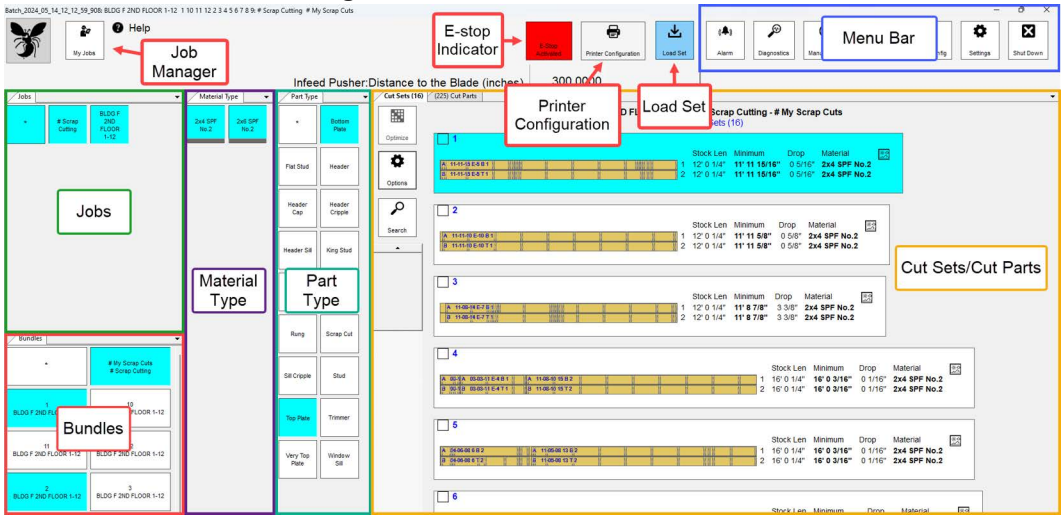
A basic overview of preparing jobs for processing using the CutBuilder application is as follows:

1. Load a job using the Job Manager. Jobs can be loaded via the network or locally via USB.
2. Select the job to be processed, then the desired bundles in the Jobs and Bundles sections.
3. Select the desired parts for processing in the Part Type section.
4. As part types are selected, the Material Type section will populate. Select the desired material types for the selected part types in the Material Type section.
   - Once a material is selected, a screen for selecting available lengths of that specific material appears.
5. After the desired Job, Bundles, Materials, and Parts have been selected, the software is ready to optimize and load cut sets. Select the Optimize button to begin optimizing and loading the cut sets.
   - The generated cut sets are based on all options selected before. Further settings available in the Cut Set Options menu (such as scrap cuts and least waste optimizing) can also affect how cut sets are generated.
   - Pick lists (a list of lumber necessary to process the cut sets) organized by either Cut Sets or Footage are also available in the Cut Set Options menu. See for more information.
6. Select Load Sets to prep the software for processing the job.
   - The saw will automatically load all cut sets unless a specific cut set is selected. See Cut Sets and Cut Parts for more information.
7. Select the desired feed mode in the load cut sets window, then select Start.

Overview of the Home Screen

The home screen shows data for each part to be cut and provides access to all of the functionality required during normal production use. Figure 6-9 shows each section of the home screen.

Figure 6-9: Home Screen Sections



Menu Bar and Ribbon

The menu bar refers to the selections at the top of the home screen. As shown in Figure 6-9, there are multiple functions that appear on the menu bar. See Printer Configuration Window on page 76 for a detailed description of each menu and ribbon.

Help Link

This link will direct you to multiple options for machine information and support. Table 6-3 gives a brief overview of each option.

Table 6-3: Help Options

Name	Function
About	Displays software information, including the version.
Contact Us	Contact information for machine support.
Remote Support	Opens a browser window to a service that allows for remote support with a MiTek representative.

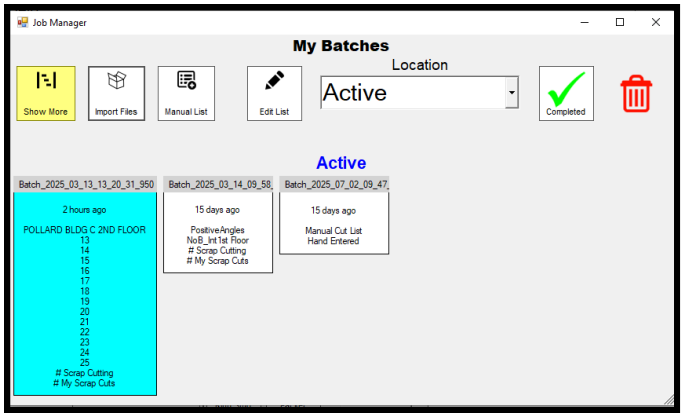
Job Manager

For best performance, the recommended maximum size for job files is 31 megabytes.

The job manager is used to generate jobs for processing. Jobs can be imported from a file or manually created.

Jobs that are currently loaded are highlighted in blue. Select a job to load it.

Figure 6-10: Job Manager

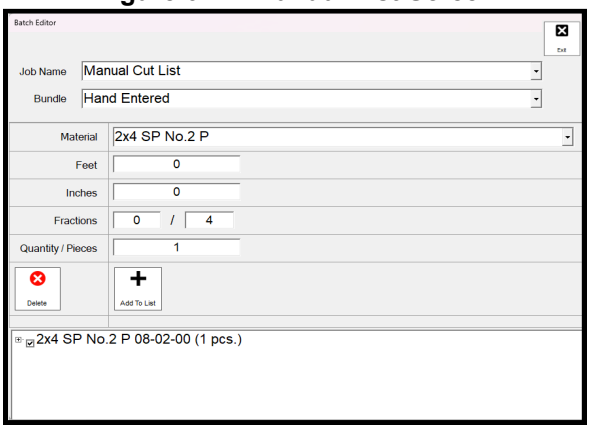


- Import Files — Displays a file explorer for importing jobs. The following file types are supported:
  - Shopnet
  - Virtek (limited support)
  - WBX

  Jobs can be imported via a USB drive or over the network.

- Manual List — Allows for building a custom cutting list. Build a cutting list by selecting the desired material and entering the length and quantity before adding it to the list.

Figure 6-11: Manual List Screen



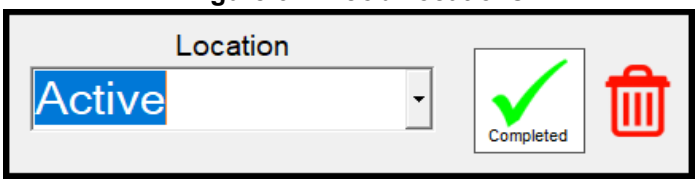
- Edit List — Allows for editing of the currently selected list. The interface is identical to Figure 6-11.

- Location

Jobs can be categorized using the following locations:

- **Active** includes currently loaded jobs available for processing.
- **Trash** includes jobs that have been discarded. Jobs can be placed in the trash by selecting and dragging them to the trash can icon. See Figure 6-12.
- **Completed** includes jobs that have been processed. Use the Completed button to display completed jobs. See Figure 6-12.

Figure 6-12: Job Locations



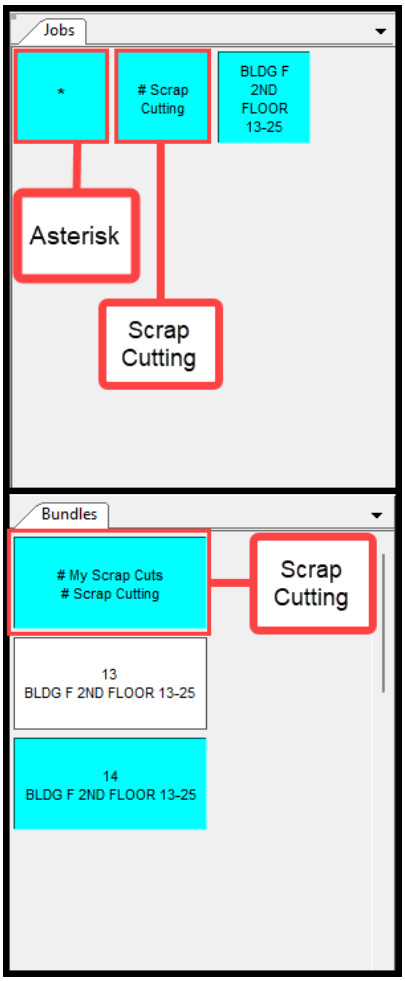
The currently displayed location (active, trash, or completed) will be indicated on the Job Manager screen. See Figure 6-10.

Jobs and Bundles

The jobs section displays the jobs that have been loaded utilizing the Job Manager. For more information, see Job Manager on page 64.

Once a job(s) has been selected, the bundles section will populate with the available bundles. Selected jobs and bundles will be highlighted in blue.

Figure 6-13: Jobs and Bundles Sections



The jobs, bundles, and part type sections may have two extra items available depending on the configuration - the Asterisk and Scrap Cutting

- * (Asterisk) Selects every job available.
- Scrap Cutting Selects items designated for scrap cutting. See Cut Set Options (Optimization, Scrap Cutting, and Pick Lists) on page 93 for more information on utilizing scrap cutting.

Once jobs and bundles are selected, the Part Type section will populate.

Part Type

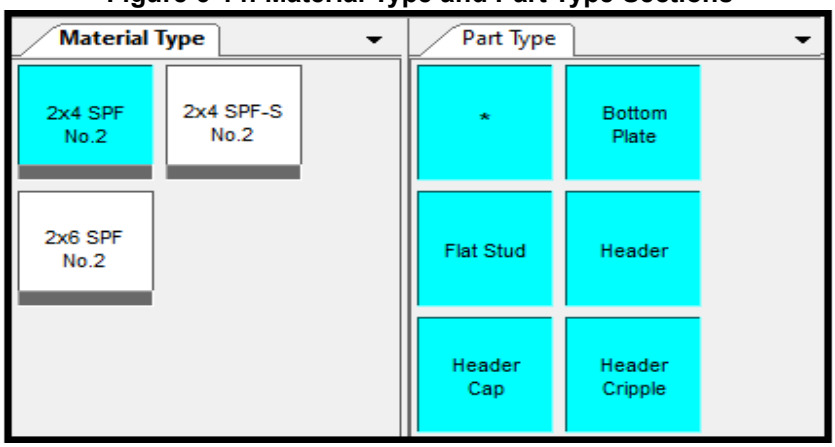
The part type section displays different part types available for processing. The part types are populated based on the selected job and bundles (see Jobs and Bundles on page 66 for more information).

Selected part types are highlighted in blue.

- * (Asterisk) Selects every job available.

Selecting different part types will also change what appears on the Cut Parts tab. See Cut Sets and Cut Parts on page 69 for more information.

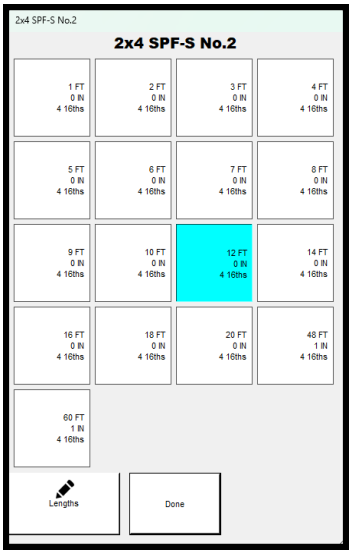
Figure 6-14: Material Type and Part Type Sections



Material Type

The material type section will populate as part types are selected. Once the desired material types for the job are selected, they will be highlighted blue. Selecting a material type will open a dialog box that allows for specifying which material lengths are available for processing the job as shown in Figure 6-15.

Figure 6-15: Available Length Selector



- Lengths Used to add additional custom lengths if the desired length is unavailable for selection.

Cut Sets and Cut Parts

After loading a job and selecting the desired material types and part types, the Optimize button in the cut sets section will blink (see Figure 6-16) and must be selected to proceed.

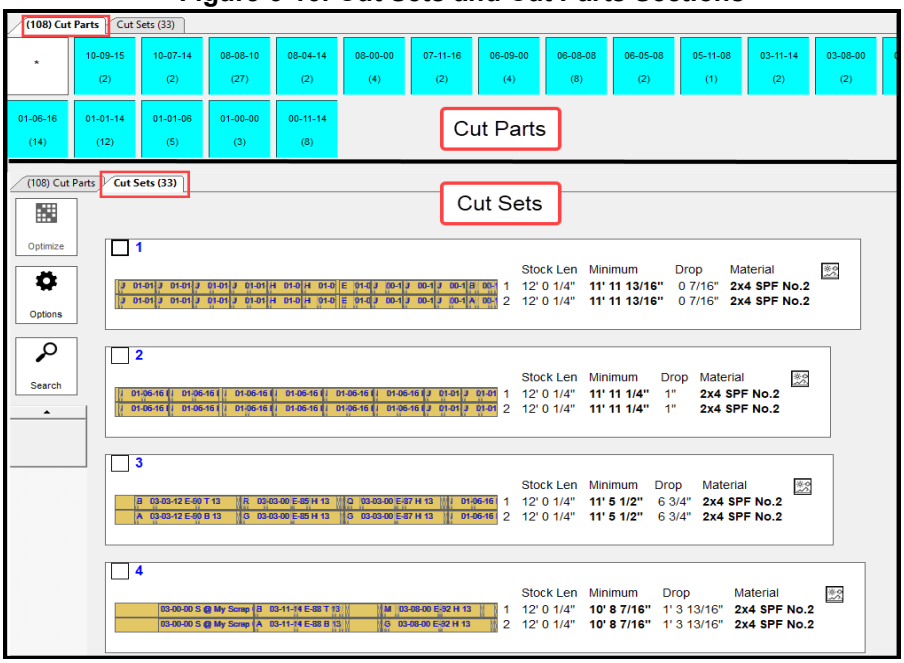
- Note that by default, Optimize will not optimize the job for the least amount of waste. Least Waste Optimization must be selected in Cut Set Options.
- Pick lists (a list of lumber necessary to process the cut sets) organized by either Cut Sets or Footage are also available in the Cut Set Options menu.

For more information regarding job optimization and cut set options, see Cut Set Options (Optimization, Scrap Cutting, and Pick Lists) on page 93.

After optimizing, the cut sets section will populate.

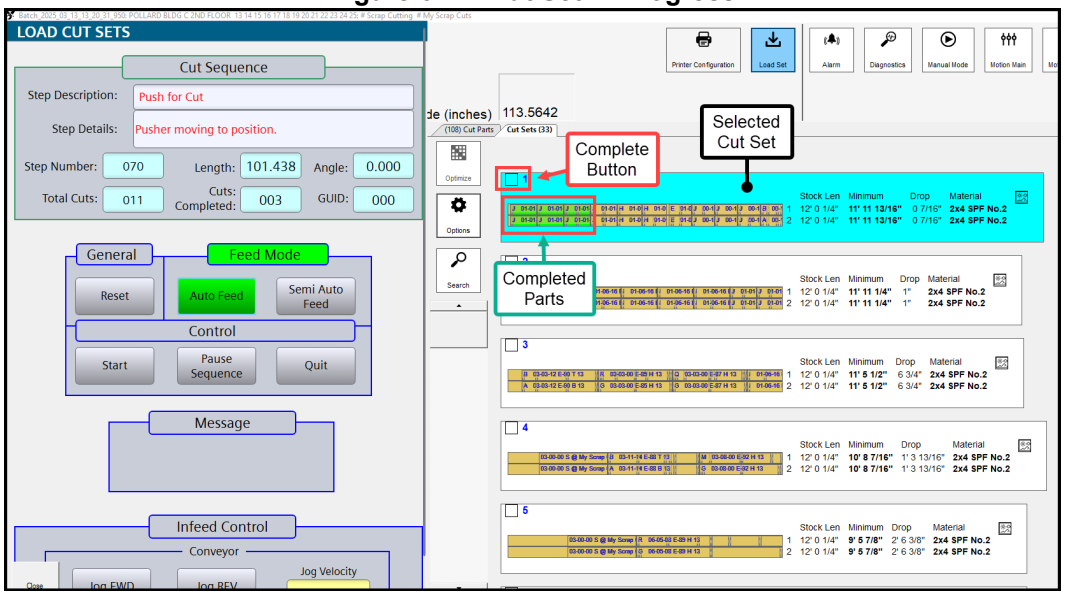
Switch between which screen is active (Cut Sets or Cut Parts) by selecting the appropriate tab at the top of the section; see Figure 6-16.

Figure 6-16: Cut Sets and Cut Parts Sections



Cut Sets

Figure 6-17: Cut Set In Progress



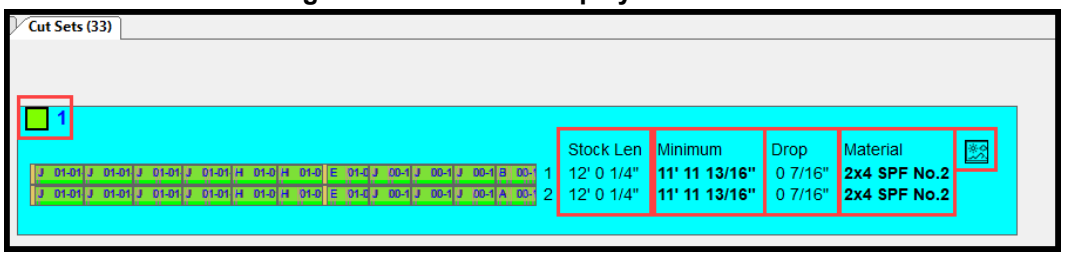
The cut sets section displays the cut sets in the order they will be processed by the saw.

By default, all cut sets will be loaded for processing when using the Load Set function. Alternatively, individual cut sets can be selected for loading. A currently selected cut set is highlighted in blue.

As the saw processes the cut sets, the software will communicate where the saw is in the process. Completed parts are highlighted in green. Once a cut set is completed entirely, the complete button becomes green.

Cut Sets can be changed to a complete status manually before loading sets by selecting the complete button. See Figure 6-18 for a completed cut set example.

Figure 6-18: Cut Set Display Information



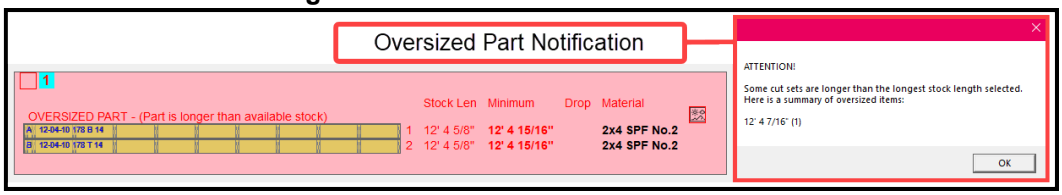
- Complete Button — Toggle to complete a cut set manually. The complete button is green when a cut set is in a completed status.The cut set number is displayed next to the complete button.
- Stock Len — The intended length of the material for that cut set, based on the selected material lengths.

- Minimum — The minimum length of material required for that cut set.
- Drop — The length of waste (does not include intended scrap cuts).
- Material — The intended material type for that cut set.

Double-tap the picture icon to display a pop-up with an image of what will be marked on the part. See Operating the Printer (Printer Settings) on page 90 for more information regarding marking.

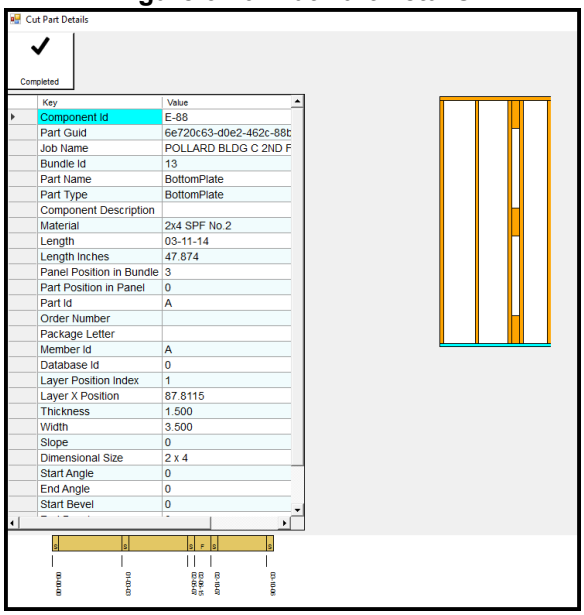
Cut sets may also display in red if it includes an oversized part. An oversized part is a part that is longer than the longest available length selected under Material Type.

Figure 6-19: Oversized Part Notification



Each cut set also has a graphical representation of what will be processed. Selecting an individual part in the cut set will open a Cut Part Details window that includes a graphic of where the part is in the assembly and indicates if it has been completed or not.

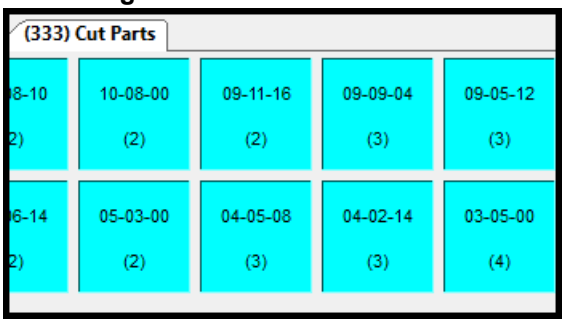
Figure 6-20: Cut Part Details



Cut Parts

The cut parts section allows for selecting or deselecting particular parts from being processed. Selected parts for processing are highlighted in blue. The selections available in the Cut Parts tab changes based on what Part Types are selected.

Figure 6-21: Cut Parts Section



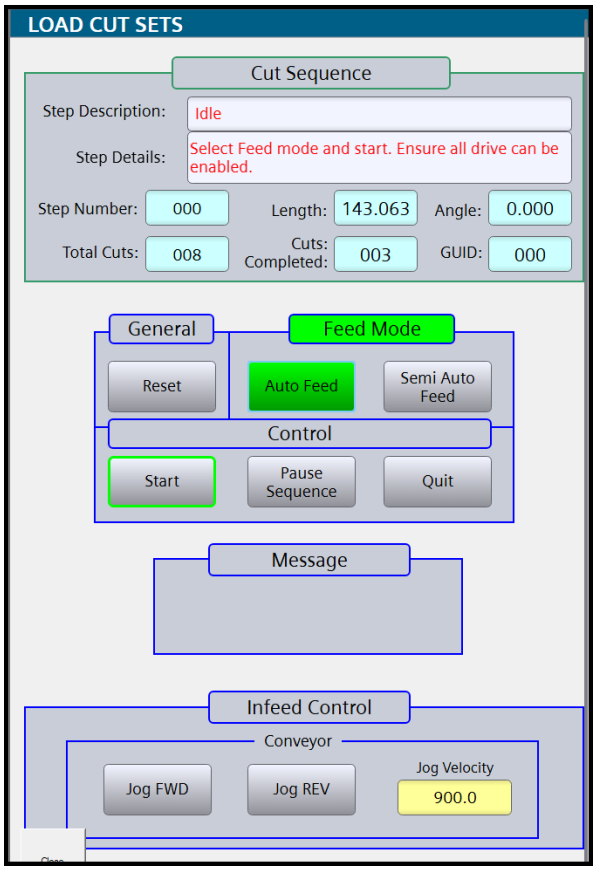
Load Sets

The load set function is used to start the job for processing after selecting from the available items from jobs, bundles, material type, and part type. See Figure 6-9 for the location of the load set button.

Selecting the load set button opens the *Load Cut Sets* dialog box.

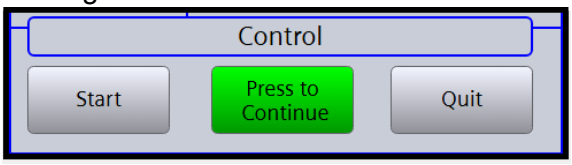
To begin processing cut sets, select the desired feed mode, then Start.

Figure 6-22: Load Cut Sets

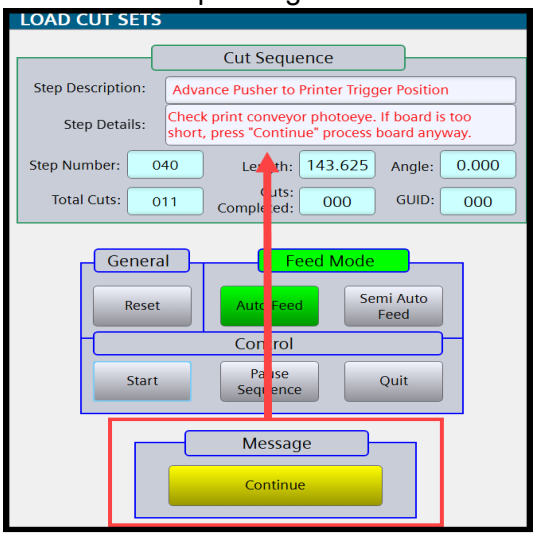


- Cut Sequence — Displays information regarding what the saw is currently processing. It will also display error messages if the saw is unable to start or continue processing material.
- General — Features a reset button that will be highlighted red when there is a fault. The reset button has the same functionality as the physical reset button on the control interface.
- Feed Mode — Select between *Auto* and *Semi Auto* feed modes. The options shown may vary depending on machine configuration.
  - **Auto**: The saw will continue automatically move to the next cut set when complete the current one is complete.
  - **Semi-Auto**: The saw will pause when a cut set is complete. Select “Start” to process the next cut set.

- Control
  - **Start:** Starts processing the cut sets. The machine will check that material is in place for processing and start motion of the pusher and auto loading live deck (if equipped).
  - **Pause Sequence:** Pauses all motion of the saw and puts it in an idle state.
    - When paused, the Pause Sequence button will change to a “Press to Continue” button.



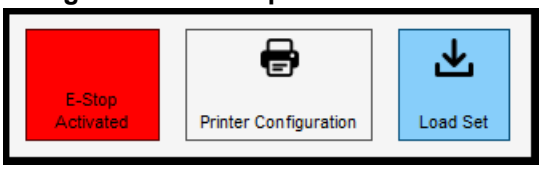
  - **Quit:** Stops job processing.
- Message — Displays an interactive status button when appropriate. The Cut Sequence section will display further information depending on the situation.



- Close — Closes the load set dialog box.
- Infeed Control (optional) — Allows for manual control of the auto loading live deck (if equipped).

E-stop Indicator

Figure 6-23: E-Stop Indicator Active

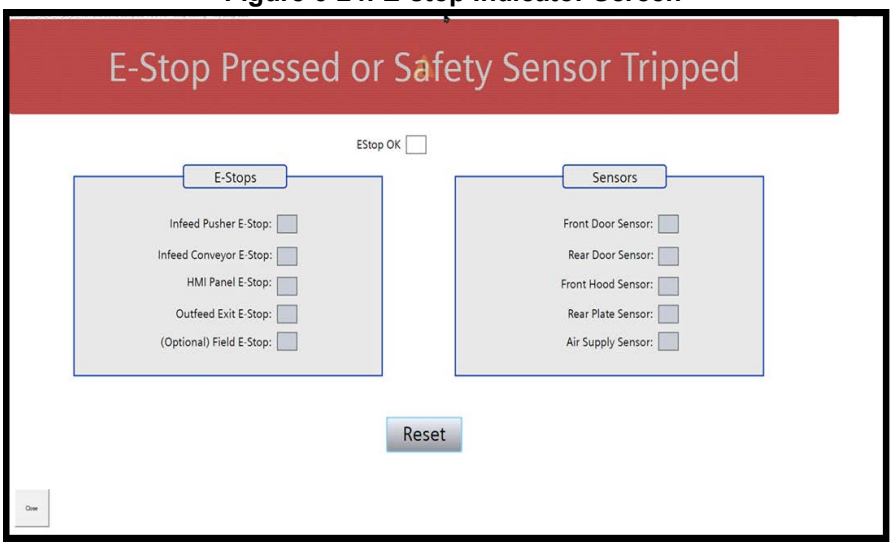


The E-stop indicator will display when there is currently an E-stop active. Clicking the E-stop indicator will display a screen with current E-stop and safety sensor status. If an E-stop of safety sensor is active, the box next to it will be green.

Note that the E-stop indicators screen may vary depending on the saw configuration and options.

The Reset button on the E-stop indicator screen has the same functionality as the physical reset button on the Operator Interface. See Operator Hardware Controls on page 60 for more information.

Figure 6-24: E-stop Indicator Screen

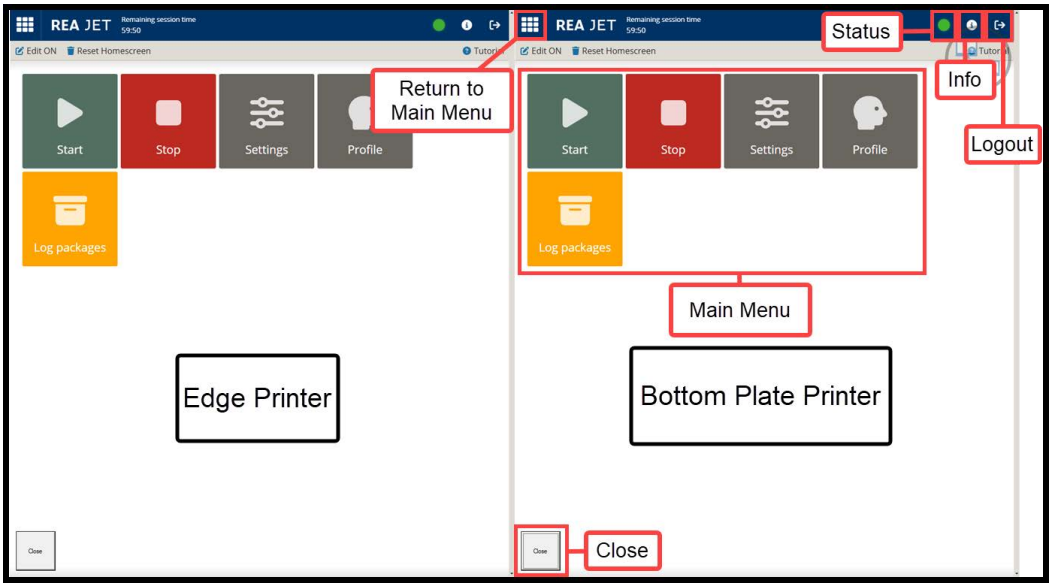


Printer Configuration

Selecting the printer configuration button (see Figure 6-23) will display configuration windows for both the edge printer and bottom plate printer.

- The **Edge Printer** configuration window display is on the *left*.
- The **Bottom Plate Printer** configuration window display is on the *right*.

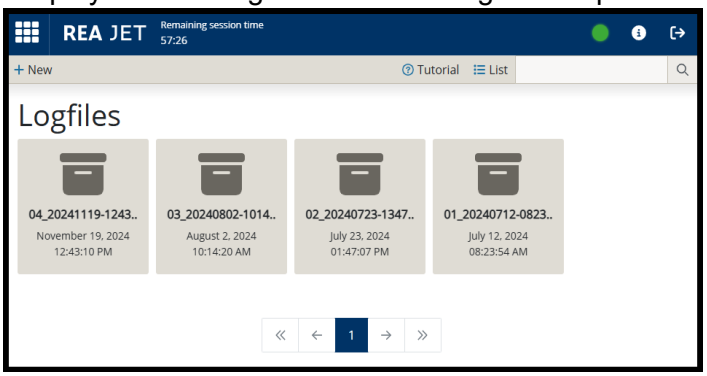
Figure 6-25: Printer Configuration Window



- Return to Main Menu — Returns to the main menu, as displayed in Figure 6-25.
- Status Indicator
  - Displays the current printer status
    - Green indicates the printer is started
    - Red indicates the printer has been stopped
- Logout
  - Log the current user out. This should not be used unless directed by MiTek Automation Support. **Use the CLOSE button to close the configuration windows.**
- Close
  - Closes the configuration window.

Main Menu

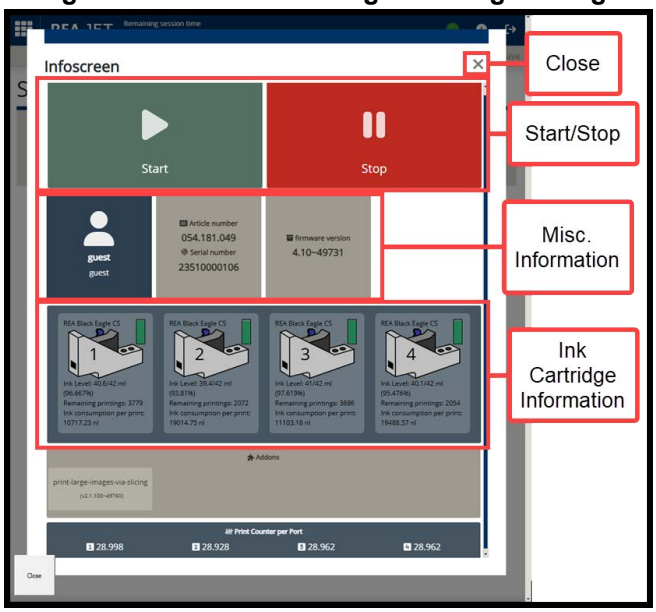
- Start — Starts the printer. The Status Indicator is green wen the printer is started.
- Stop — Stops the printer. The Status Indicator is red when the printer is stopped.
- Profile — Do not use unless directed by MiTek Automation Support.
- Log Packages — Displays current log files. Select a log file to open it.



- Settings — Do not use unless directed by MiTek Automation Support.

Info

Figure 6-26: Printer Settings and Log Packages

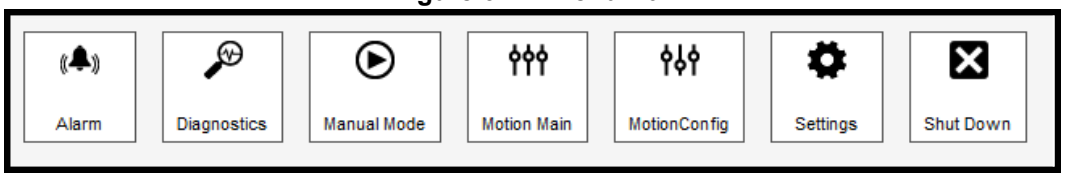


- Start — Has the same functionality as the Start button on the main menu.

• Stop	Has the same functionality as the Stop button on the main menu.
• More Information	Displays miscellaneous troubleshooting information, including: • Logged in User • Article Number/Serial Number • Firmware Version
• Ink Cartridge Information	Displays information about each individual print cartridge, including: • Ink level • Estimated prints remaining • Estimated ink used per print

Menu Bar in Detail

Figure 6-27: Menu Bar



This section addresses the following menus available from the menu bar:

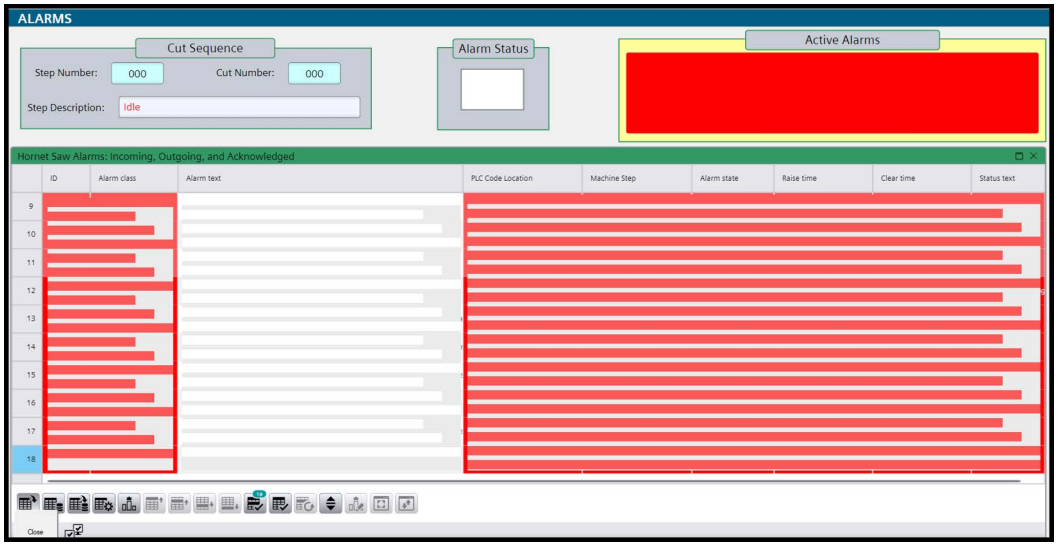
- Alarm
- Manual Mode
- Motion Main
- Motion Config
- Settings
- Shut Down

See the following dedicated section regarding diagnostics:

- System Diagnostics on page 84

Alarm

Figure 6-28: Alarms Window

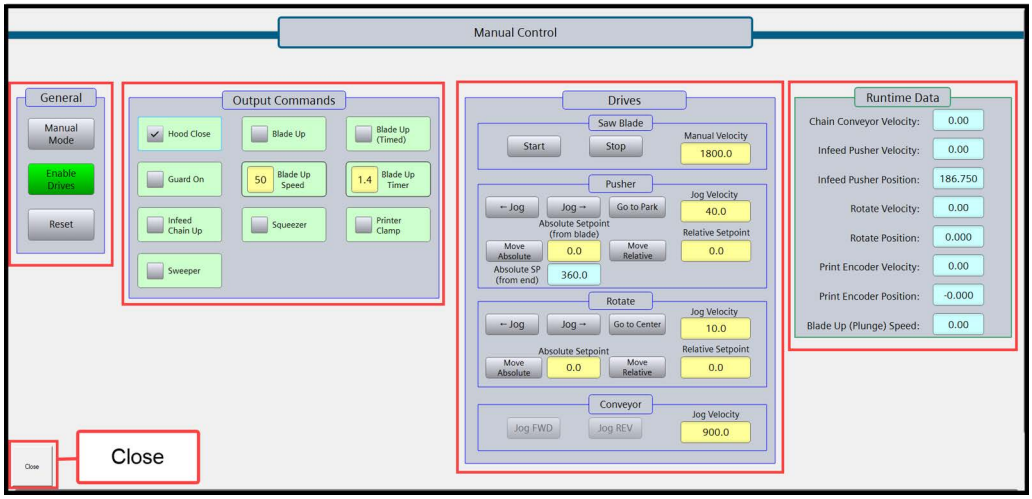


- Cut Sequence — Displays information regarding what the saw is currently processing. It will also display error messages if the saw is unable to start or continue processing material.
- Alarm Status — Displays an image of a red light if there is currently an active alarm.
- Active Alarms — A scrolling list of currently active alarms.
- Hornet Saw Alarms — A compressive list of all alarms with diagnostic information.
- Toolbar — Tools for managing and organizing the alarm list.

Manual Mode

The manual mode button opens the manual control window when selected, which allows for manual control of the different saw functions.

Figure 6-29: Manual Control Window



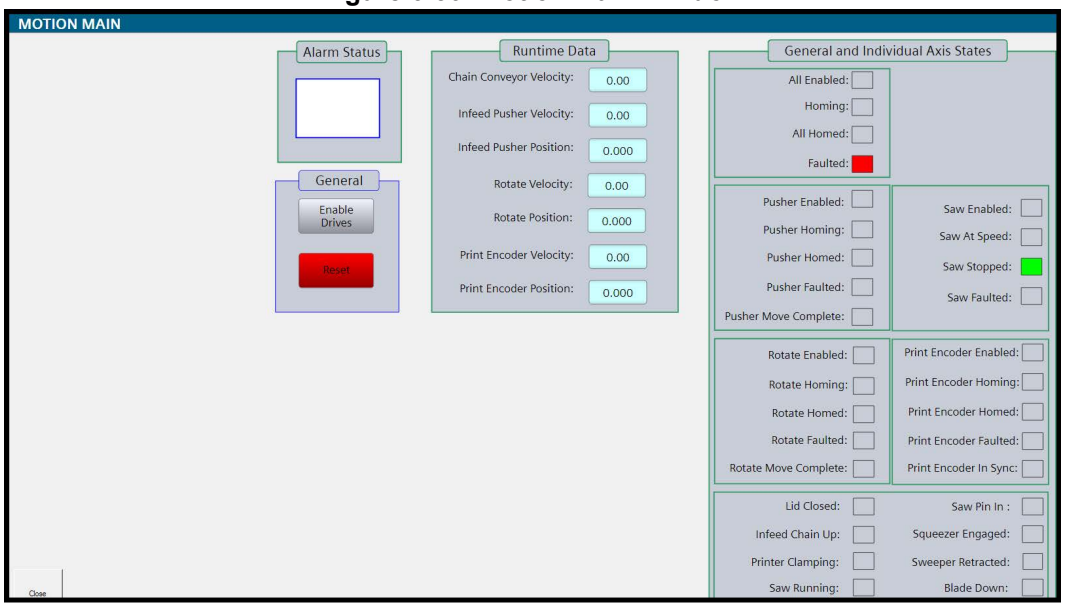
- General — Features the manual mode, enable drives, and reset functions. Manual mode must be selected before output commands can be used.
- Output Commands — Allows for manual manipulation of different saw components. Selecting a component enables that function. Select that function again to disengage it. Enabled functions have a checkmark.

  The Blade Up Speed and Blade Up Timer functions can be modified by selecting them and inputting the desired value.
- Drives — Allows for manual manipulation of various saw drives.
- Runtime Data — Displays various real-time metrics for different saw functions.
- Close — Closes the manual control window.

Motion Main

The motion main menu displays general and individual access states using the color red to indicate a fault. It also has a function for resetting the saw and enabling drives.

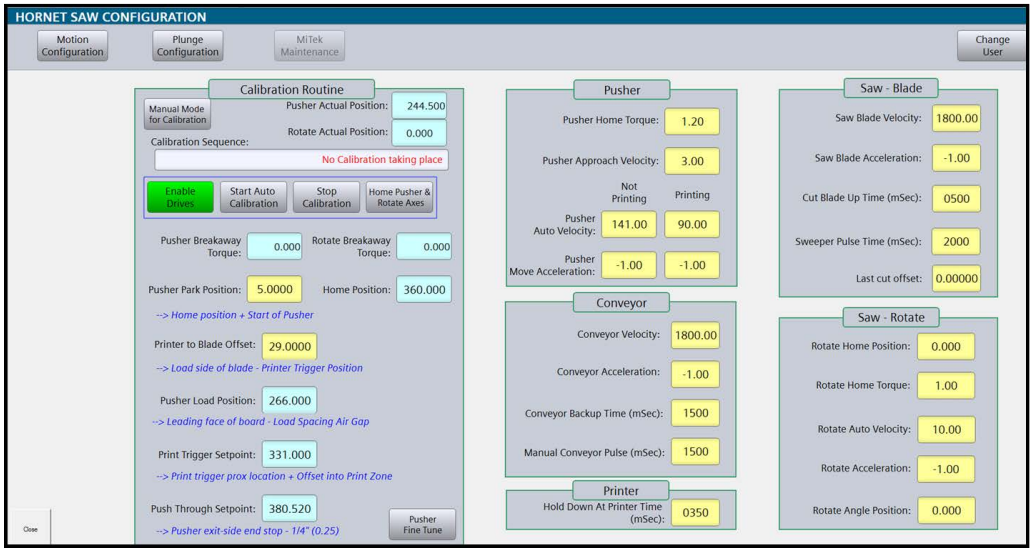
Figure 6-30: Motion Main Window



Motion Config

The motion config window will change depending on which menu is selected. The Motion Configuration menu appears by default. The options include in the motion config menu are used for generally used for troubleshooting purposes.

Figure 6-31: Hornet Saw Configuration Window

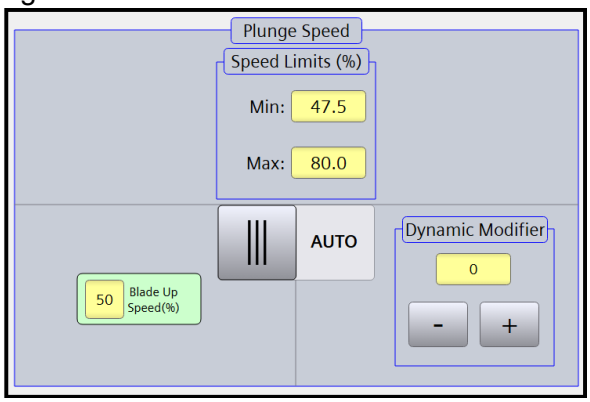


- Motion Configuration
  - Calibration Routine has multiple options for calibration (including automatic calibration). See Calibrating on page 105 for additional information regarding calibration.
  - Various current motion values for the pusher, saw blade, saw rotate, conveyor, and printer motion.

- Plunge Configuration

  The plunge speed values automatically adjust based on material type and other factors.

  The plunge speed values can be manually modified by selecting the “AUTO” switch in the middle to change it to manual.



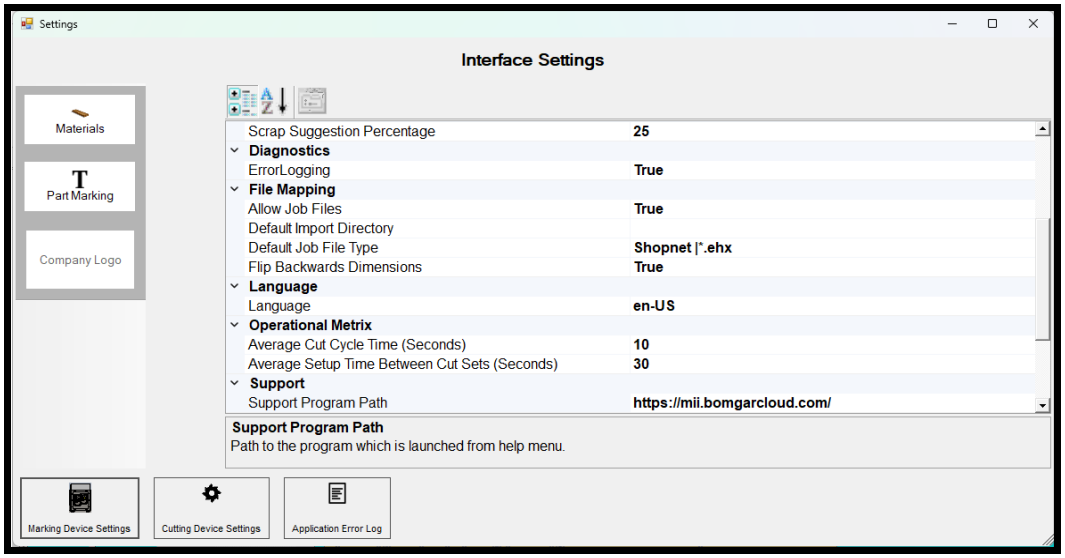
- MiTek Maintenance

  For troubleshooting purposes. Only to be accessed by MiTek support.

- Change User

Settings

Figure 6-32: Settings Window



- Materials

  Change the properties of the available material types, including thickness, width, and grade.

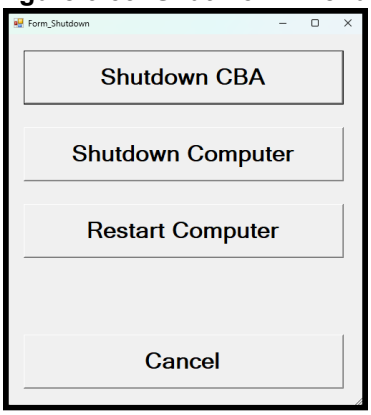
- Print Marking

  Change what information is printed on the processed material. See Operating the Printer (Printer Settings) on page 90 for additional information regarding the print marking menu.

- Company Logo — Upload a logo used in print marking.
- Marking Device Settings — Has an option to disable marking and also includes technical settings for the printer(s).
- Cutting Device Settings — Settings regarding the saw table and blade.
- Application Error Log — A log of application errors for troubleshooting purposes.

Shut Down

Figure 6-33: Shut Down Menu



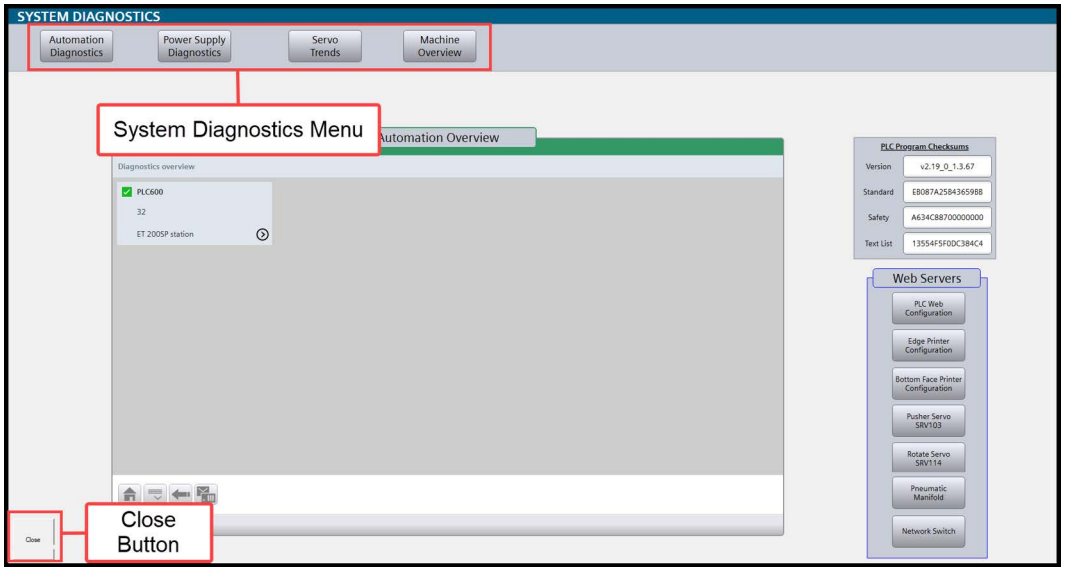
- Shutdown CBA — Closes the *CutBuilder* software.
- Shutdown Computer — Powers off the computer.
- Restart Computer — Restarts the computer.

System Diagnostics

Selecting Diagnostics on the menu bar will open the system diagnostics window.

The system diagnostics window always displays system diagnostics menu and the close button.

Figure 6-34: System Diagnostics Window



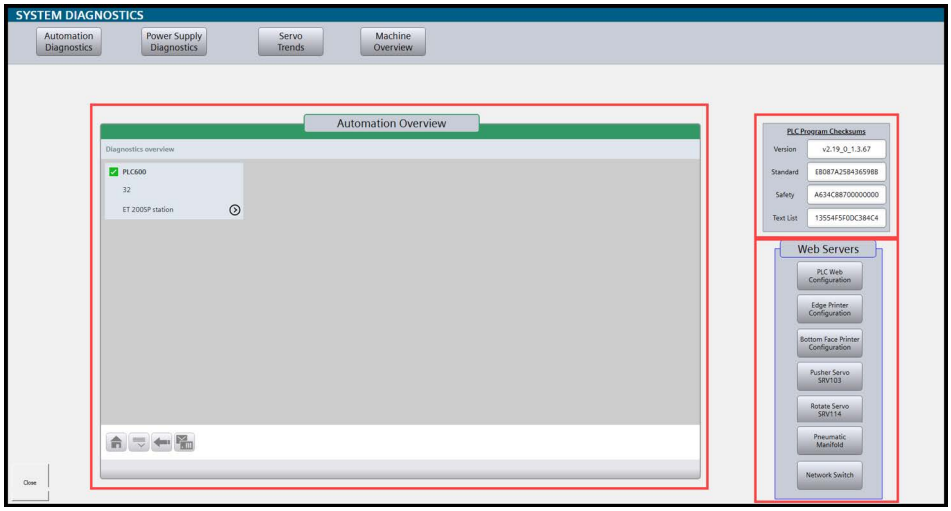
- System Diagnostics Menu — Used to move between the different system diagnostic information displays by selecting the appropriate button.
- Close — Closes the system diagnostics window.

The information displayed changes based on which display is selected:

- Automation Diagnostics
- Automation Diagnostics Display
- Servo Trends
- Machine Overview

Automation Diagnostics

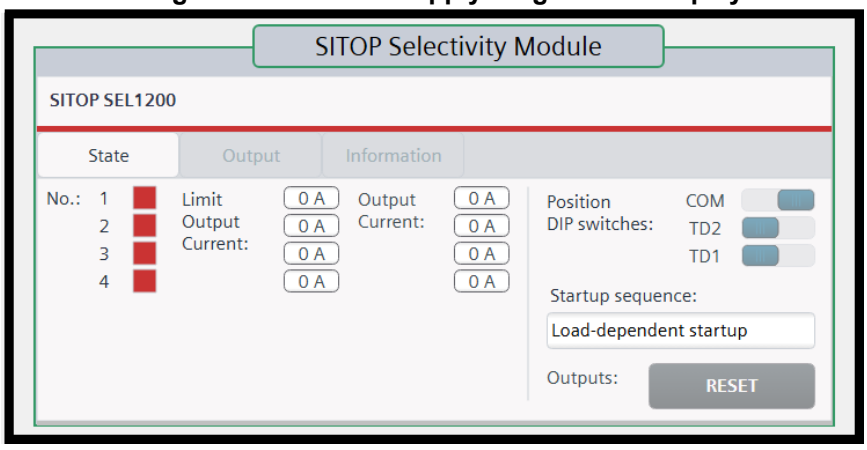
Figure 6-35: Automation Diagnostics Display



- Automation Overview — Displays PLC status information. Clicking on a PLC provides more detailed information.
- PLC Program Checksum — Used for troubleshooting purposes.
- Web Servers — Selecting a web server opens a GUI for that particular component that offers further configuration or troubleshooting options.

Power Supply Diagnostics

Figure 6-36: Power Supply Diagnostics Display

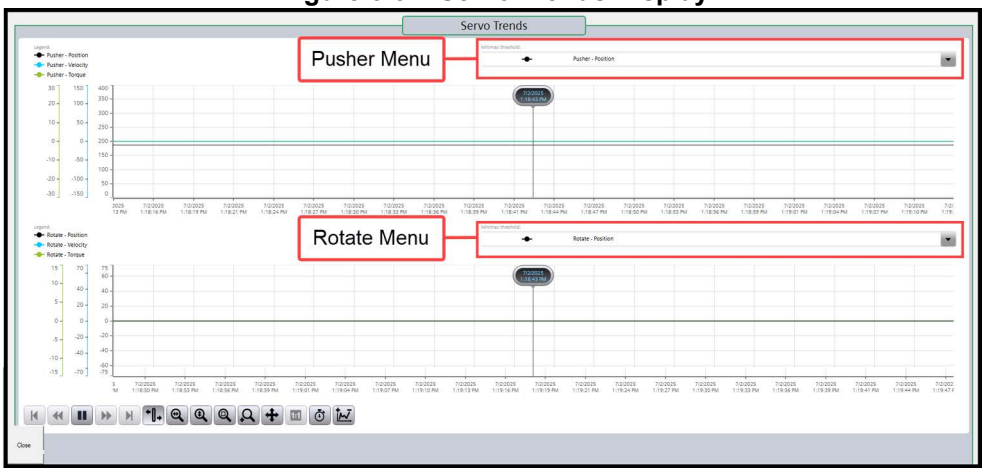


The power supply diagnostics display shows the current status of different SITOP selectivity modules.

- SITOP selectivity modules distribute the current load across several DC load circuits and monitors them for overload and short-circuit conditions.

Servo Trends

Figure 6-37: Servo Trends Display



The servo trends diagnostic menu displays different trends in a graph format for the pusher and rotation servo menus. Different graphs can be displayed by selecting in from the appropriate drop down. See Figure 6-37.

Machine Overview

Figure 6-38: Machine Overview Display

The machine overview menu displays the status of various sensors located throughout the saw with a graphical representation of their location.

If the sensor indicator is:

- Green — Functioning normally
- Red — Has detected an obstruction and/or is not aligned
- Transparent — Not initialized

Operating Procedure

This section instructs operators how to effectively use the *Hornet II* saw. Note that this manual only addresses the use of the *Hornet II*. It does not address methods of designing or building a truss.

Operating Procedure Overview

Table 6-4: Operating Procedure Summary

Step #	Summary Steps	See Section
1	Power up the system.	Daily Startup on page 62
2	Press the blue Reset button on the operator interface.	Operator Hardware Controls on page 60
3	Prepare the printer(s).	Maintaining the Printer on page 119
4	Prepare the lumber feed system with the correct lumber.	Universal Material Loading Guidelines on page 88
5	Import the correct job files or create a manual one.	Job Manager on page 64
6	Use the Jobs, Bundles, Material Types, and Part Types to generate Cut Sets and Cut Parts.	Basic Software Operating Procedure on page 63
7	Use the Load Set function to begin processing a job.	Load Sets on page 72
8	Ensure the outfeed area is clear by removing parts as they are finished.	

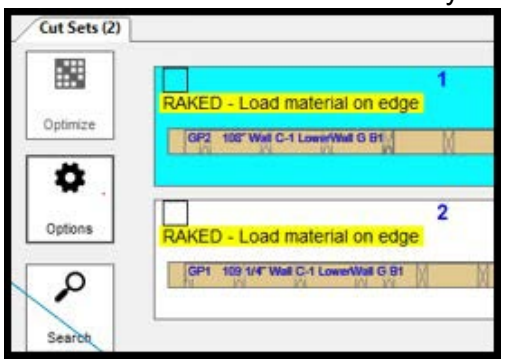
Step #	Summary Steps	See Section
9	Depending on the scenario, use one of the following methods to stop the saw: • Press the Saw Stop button on the operator panel. • Press “Pause Sequence” or Quit on the Load Sets screen. • Press the Stop button on the Auto Loading Live Deck control panel (if equipped). • For emergency situations, activate any E-stop that is integrated with the system.	Stopping Methods on page 55

Specialized Operating Procedures

Universal Material Loading Guidelines

The *Hornet II* saw is designed to cut boards stacked 2-high. Keep in mind the following guidelines when loading material.

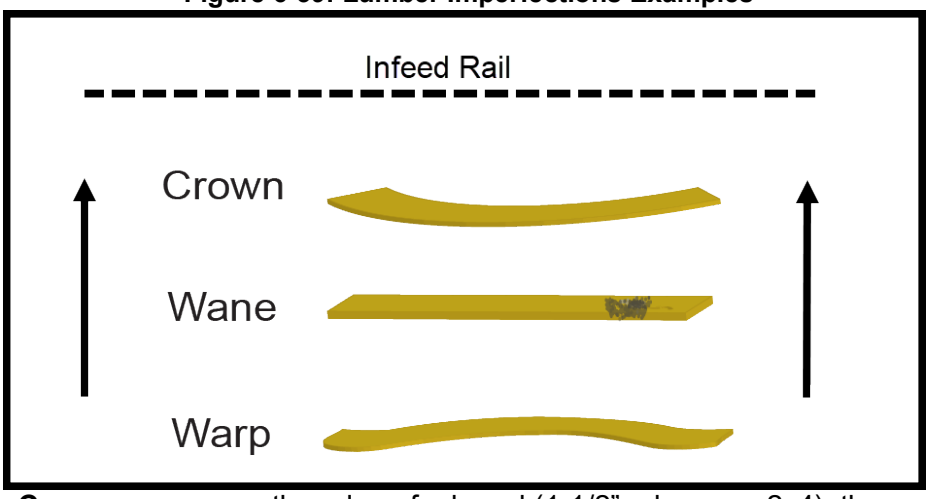
- The saw can process dimensional lumber up to 4x and 12” wide.
  - Note that when using dimensional lumber larger than 2x, it cannot be stacked.
- Load material on its wider surface (2x**4**, 2x**6**, etc.).
  - Material may need to be loaded onto its edge for a special cut. The cut set will indicate when this is necessary.



- Material for raked cuts needs to be loaded directly onto the infeed rail and not the auto loading live deck (if equipped).
- Ensure all material used has no staples or pooled water. Staples can damage the print heads.
- When loading material directly onto the infeed rail, ensure it is not stacked flush against the infeed pusher, and is tight up against the fence line.

Addressing Lumber Imperfections

Figure 6-39: Lumber Imperfections Examples



- **Crown:** a curve on the edge of a board (1-1/2” edge on a 2x4); the crown points up on floor studs or out for wall studs in constructed homes. Place the board so crown points away from the infeed rail as it enters the saw.
- **Wane:** a defect in the board where a portion of the wood is missing from the board edge or face; place opposite of the saw-end of the infeed**.**
- **Warp/Twist:** a curve where the face of the board (3x1/2” side on a 2x4) is higher or lower in one spot than on the rest of the board; place board so warp points up.

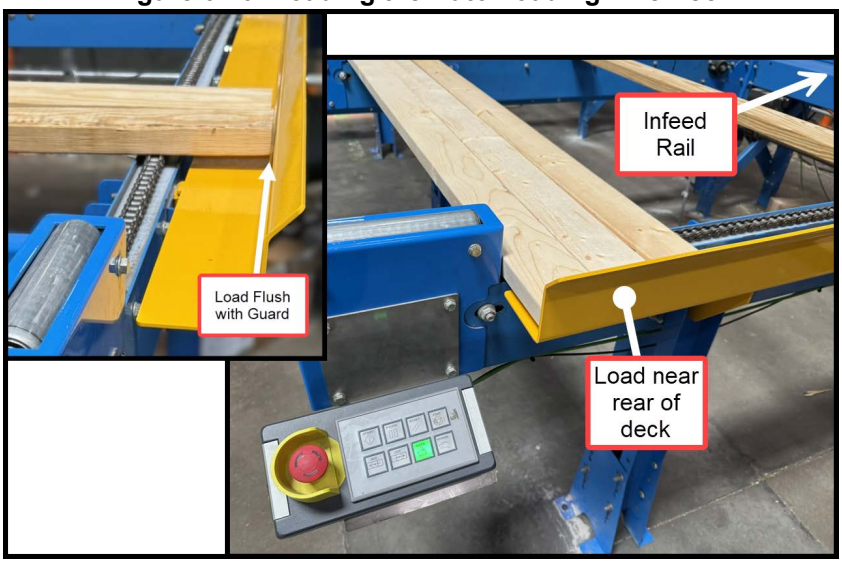
Replace Poor Quality Boards: if a board displays excessive defects in the above areas, it should be discarded and replaced with a different board.

Load the material in the recommended orientation as seen in Figure 6-39, depending on defect - regardless if loading directly onto the infeed rail or the auto loading live deck.

Preparing the Auto Loading Live Deck (if equipped)

1. Ensure all E-stops have been released and that the RESET button on the saw operator panel is not illuminated. If it is, press the button or resolve any active alarms.
2. Place the material onto the auto loading live deck in the order it will be processed according to the loaded cut sets. See Figure 6-40.
    - Load lumber towards the back of the auto loading live deck, near the manual controls.
    - Position the material so it is flush with the auto loading live deck guard.
3. As material is loaded, use the auto loading live deck controls (see Auto Loading Live Deck (If Equipped) on page 61) to move the material towards the infeed rail to make room for more material until all necessary material is loaded, or the auto loading live deck is full.

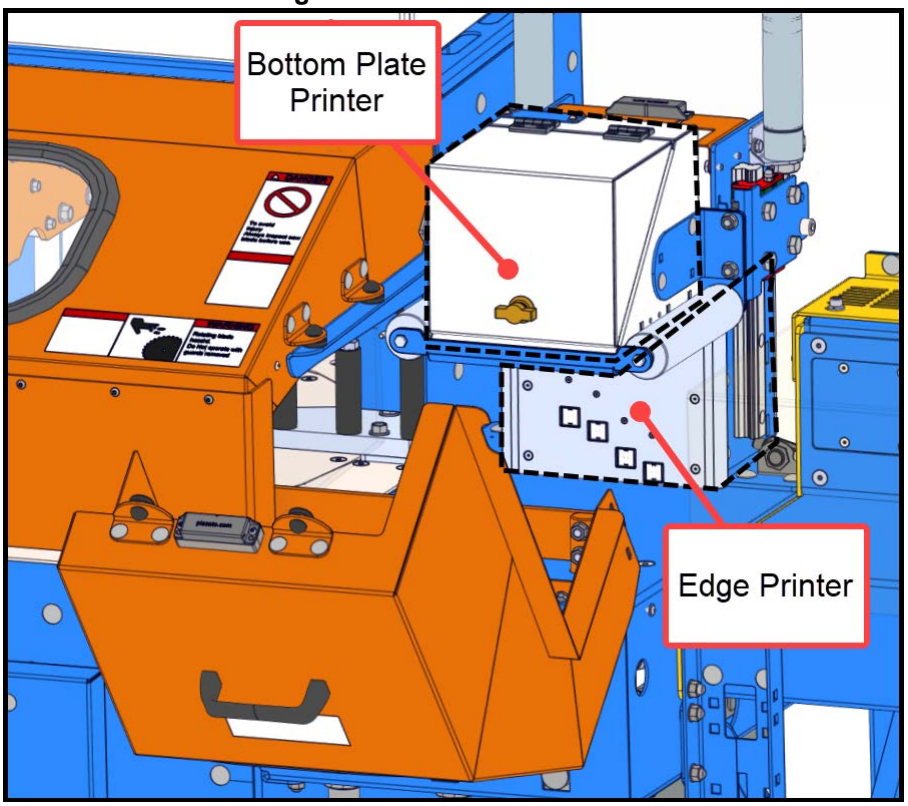
Figure 6-40: Loading the Auto Loading Live Deck



4. Observe all guidelines as described in both Universal Material Loading Guidelines and Addressing Lumber Imperfections on page 89.
5. The chains will automatically progress the material onto the infeed rail as the job is processed.

Operating the Printer (Printer Settings)

Figure 6-41: Printer Locations



- **Printer Specifications**:
  - 4 print heads, 600 DPI
  - 2” print window height
  - Prints in 2x4 lumber stacked up to 2-high

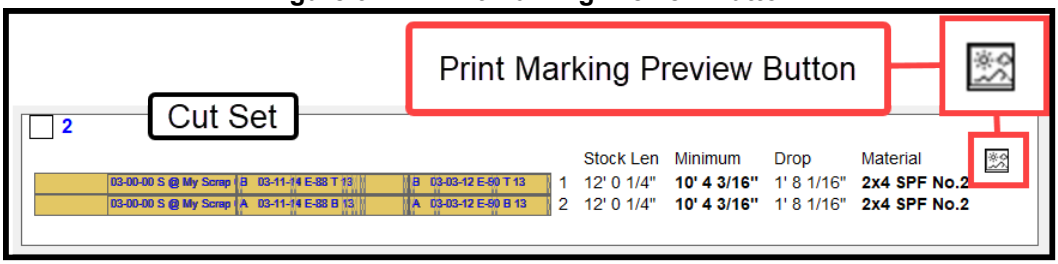
The printers mark the selected fields on each board as it enters the saw unit. Each saw is equipped with an edge printer and a bottom plate printer.

Note that the printers cannot be accessed during normal operation. Opening the print hood will cause the saw to enter an E-stop state.

While minimal interaction with the printers is necessary while processing jobs, maintaining and cleaning the printer according to the preventive maintenance schedule is essential to ensure marking quality. See Maintaining the Printer on page 119 for more information.

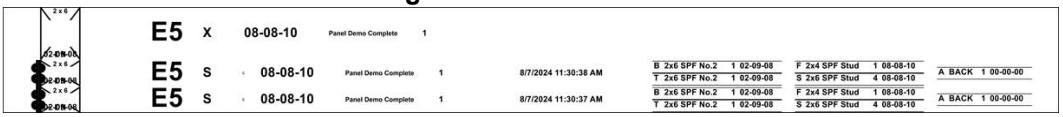
To see what should be marked on each part, select the print marking preview button on the corresponding cutset to open a picture preview.

Figure 6-42: Print Marking Preview Button



Printer Configuration Options

Figure 6-43: Print Areas

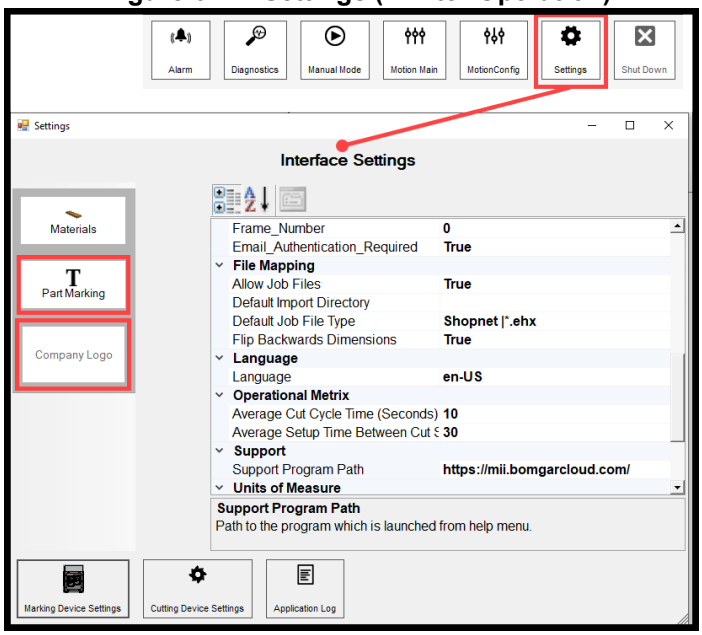


The following fields are available for marking (see Figure 6-44 on page 92 for an example graphic of these fields):

- Attachment size
- Attachment Alias
- Attachment Length
- Component ID
- My Alias
- My Length
- Company Logo
- Job Name
- Bundle ID
- Report Length Summary

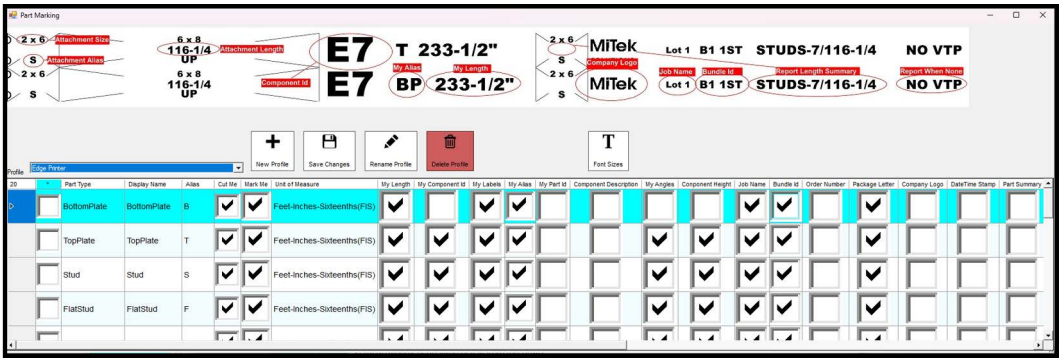
- Report When None

Figure 6-44: Settings (Printer Operation)



The different fields can be configured using the Part Marking screen, available in Settings>**Part Marking**.

Figure 6-45: .Print Marking Fields



- Profile — Changes the displayed profile for editing. Each installed printer has a default profile so fields can be configured per printer.
- New Profile — Creates a new marking profile.
- Save Changes — Saves changes to the current marking profile.
- Rename Profile
- Delete Profile

- Font Sizes — Allows for changing the font size for different fields. Changing the font size is not recommended unless directed to by MiTek support as it may cause issues with print clarity.

- Check or uncheck the box next to desired field to enable or disable it for marking. Marking can also be enabled and disabled based on part type.

Company Logo

A custom company logo may be uploaded for marking on parts.The maximum height for the image is 150 pixels tall. It is recommended that the width is adjusted accordingly to maintain the proper aspect ratio, but there is no limit.

To upload a company logo image or change the existing one, select the company logo in the Settings menu as seen in Figure 6-44.

The company logo preview in the Settings menu is limited to 150x150px, so it may appear cropped.

For more information regarding printer status and software operation, see Printer Configuration on page 76.

Cut Set Options (Optimization, Scrap Cutting, and Pick Lists)

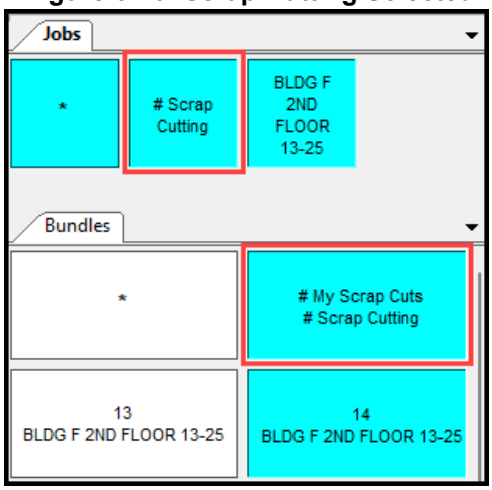
The cut set options can affect efficiency rates and have profound effects on the overall operation of the saw. Proceed with caution when changing the settings in this section.

Optimization

Optimization attempts to generate cut sets with the least amount of waste. Waste is defined on the cut sets as ‘drop’ and does not include designated scrap cuts. Because scrap cuts are not considered waste, the scrap cut settings effect optimization and waste percentage.

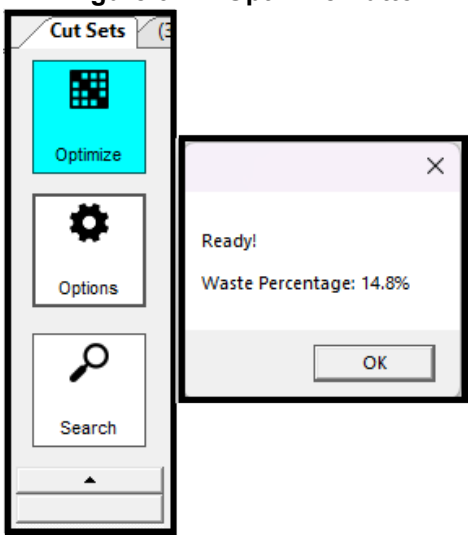
For the *CutBuilder* software to generate cut sets with scrap parts, the scrap part job and bundle must be selected.

Figure 6-46: Scrap Cutting Selected



After loading and selecting a job, then selecting the desired bundles, material types and part types, the *CutBuilder* software will prompt for optimization to occur before loading the cut sets. Clicking the Optimize button (see Figure 6-47) will cause optimization to occur and load the cut sets.

Figure 6-47: Optimize Button



After optimization is complete, a prompt with the waste percentage will display.

Cut Set Options (Cutting)

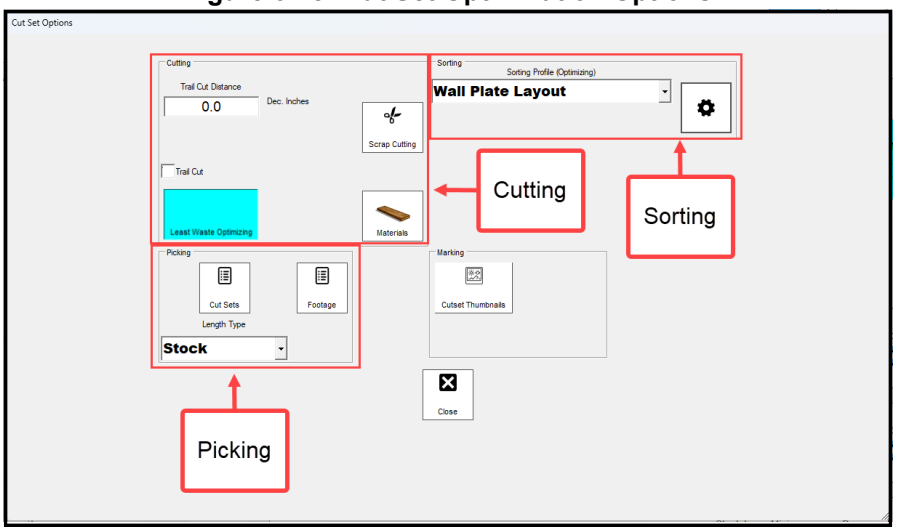
The optimization options menu can be viewed by selecting the **Options** button in the Cut Set window, as seen in Figure 6-47.

Least Waste Optimizing

Ensure “Less Waste Optimizing” is selected in the Cutting section for best results.

- “Least Waste Optimizing” is enabled when the button is highlighted in teal (Figure 6-48).

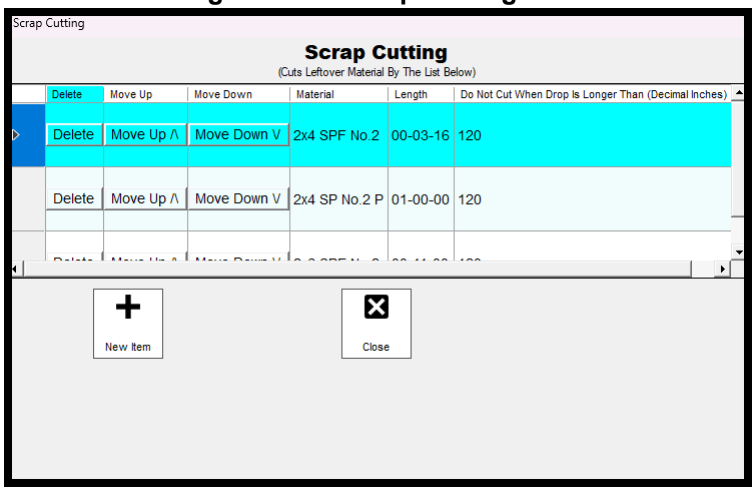
Figure 6-48: Cut Set Optimization Options



Scrap Cutting

The scrap cutting menu (Figure 6-49) in the Cutting section can be used to configure scrap cuts based on material and length. If a cut set qualifies for a scrap cut, the scrap cut will display like any other part.

Figure 6-49: Scrap Cutting Menu



Scrap cuts can be created by selecting **New Item**. Scrap cuts may also populate if they are included in any current or previously loaded job files.

Selecting the **Do Not Cut When Drop Is Longer Than (Decimal Inches)** box will allow for inputting a value. The configured scrap cut will not be included in the cut set if the drop (or scrap) from a cut is longer than the configured value.

Trail Cut

Checking the Trail Cut box by selecting it enables trail cuts and allows a value to be input in the Trail Cut Distance box. All parts will have a trail cut of the selected length when Trail Cut is enabled.

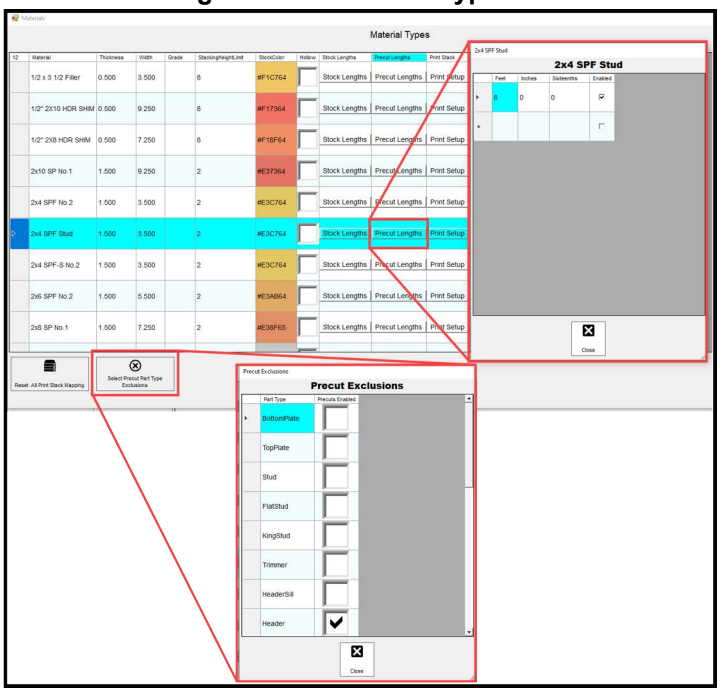
Materials

Selecting **Materials** will open a Material Type menu that allows for modifications for the various default values per material type, and for excluding precut parts.

For example, in Figure 6-50, the saw is configured so if a job includes an 8’ 2x4 SPF Stud that is identified in the job file as a Header, it will not be included in the cut sets as it does not need to be processed by the saw.

NOTE: Only make changes to the material types menu when there is not a job currently loaded. Move the currently loaded job to the Trash to unload it (if necessary), then open the job again when all material type changes are complete.

Figure 6-50: Material Type Menu



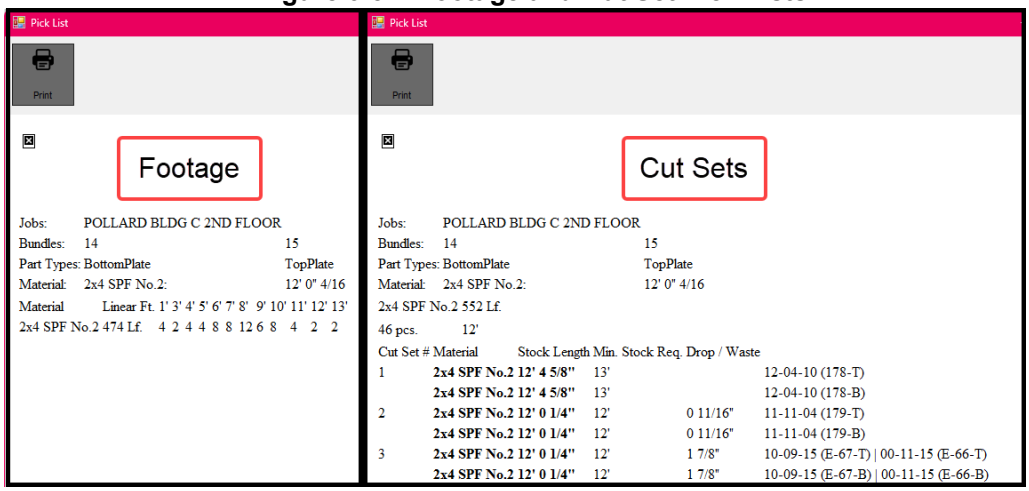
- Stock Lengths — Allows for modification of the available stock lengths.
- Precut Lengths — Allows for the configuration of precut lengths per material type. Used in conjunction with the Select Precut Part Type Exclusions menu.
- Print Setup — Displays what the part will be marked as.
- Select Precut Part Type Exclusions — Allows for excluding precut parts by type if there is a precut part in the job file. Precut parts lengths are identified by using the precut lengths menu.

Pick Lists (Picking)

Pick lists can be generated by selecting either the Cut Sets or Footage button in the Cut Set Options dialog box, under the Picking heading (see Figure 6-48).

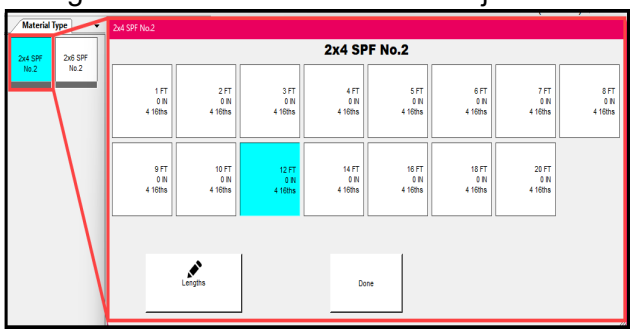
- Cut Sets — Organizes the needed material by cut set, while providing a total of each necessary length at the top. This can be useful for loading material onto the auto loading live deck in the correct order.
- Footage — Displays the total material in linear feet to be processed.
- Save Changes — Saves changes to the current marking profile.
- Rename Profile

Figure 6-51: Footage and Cut Set Pick Lists



The length type can also be changed between “stock” and “minimum” before opening either pick list.

- Stock — Generates a pick list based on the material stock lengths that were selected under material type when loading the cut sets from the selected job.



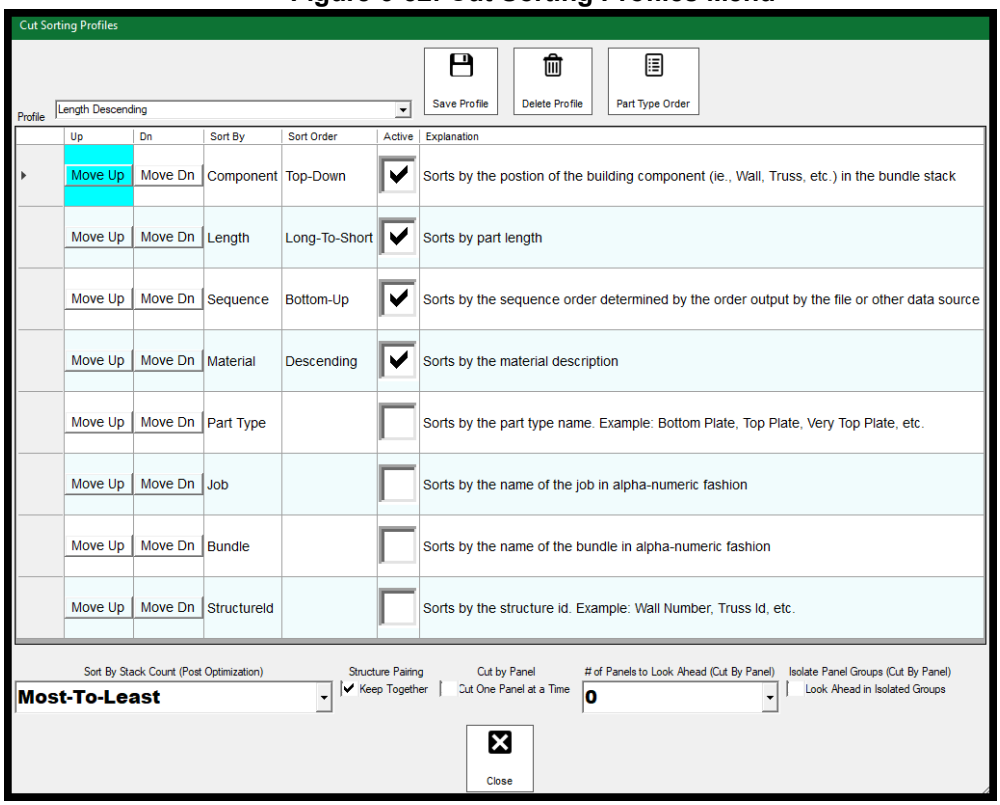
• Minimum	Generates a pick list with minimum lengths that material type is conventionally available in, regardless of what was selected under stock lengths when the material was selected.

Sorting

Under Sorting, a sorting profile that determines how the cut sets are sorted can be selected. The Cut Sorting Profiles menu can be used to create new sorting profiles. See Figure 6-52.

NOTE: Only make changes to the sorting profile when there is not a job currently loaded. Move the currently loaded job to the Trash to unload it (if necessary), then open the job again when all sorting changes are complete.

Figure 6-52: Cut Sorting Profiles Menu



Sort By	Sort Order Options
• Component	• Top-Down • Bottom-Up
• Length	• Long-To-Short • Short-To-Long

• Sequence	• Top-Down • Bottom-Up
• Material	• Ascending • Descending
• Part Type	• Top-Down • Bottom-Up
• Job	• Ascending • Descending
• Bundle	• Ascending • Descending
• StructureID	• Ascending • Descending
• Part Type	Sorts by part type name

CHAPTER 7

Maintenance

Introduction to Maintaining Your Machine

This manual contains information for common repair maintenance and all preventive maintenance. The recommended intervals for the maintenance items addressed in this section are listed in the *Hornet II: Maintenance Checklist* chapter. 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.**

	⚠ CAUTION
	**This icon is an important safety note.** **It indicates that you must lockout/tagout at the appropriate disconnect switch using approved methods described in OSHA CFR 1910.147 before continuing with the procedure.**

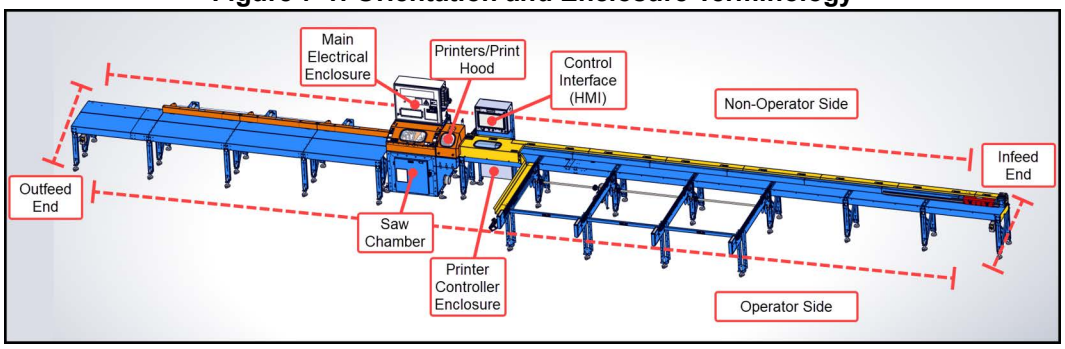
Overview Graphics

See Graphical Overview on page 48 for an overview on the main and optional components of the *Hornet II* saw.

Maintenance Terminology

The orientation and enclosure terminology in Figure 7-1 will be utilized throughout the maintenance section when referring to the different sides and enclosures of the *Hornet II* saw.

Figure 7-1: Orientation and Enclosure Terminology



Major Components

The following graphics call out major components that will be referenced throughout the maintenance chapter.

- **NOTE**: Some figures are depicted without guarding for clarity.

Figure 7-2: Major Components Visible from Infeed Side of Saw

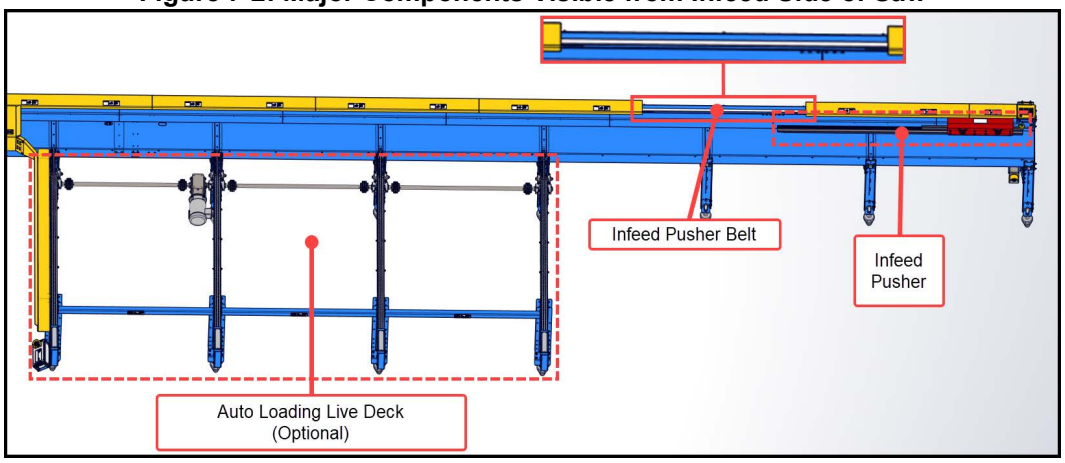


Figure 7-3: Major Components Visible from the Outfeed Side of Saw

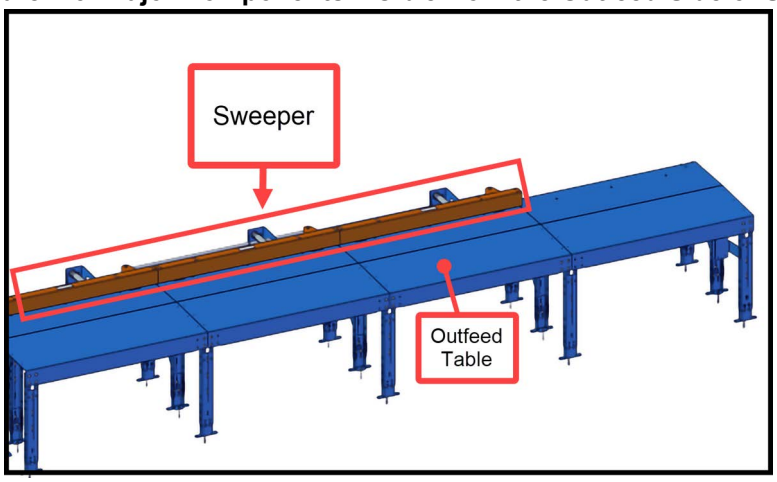
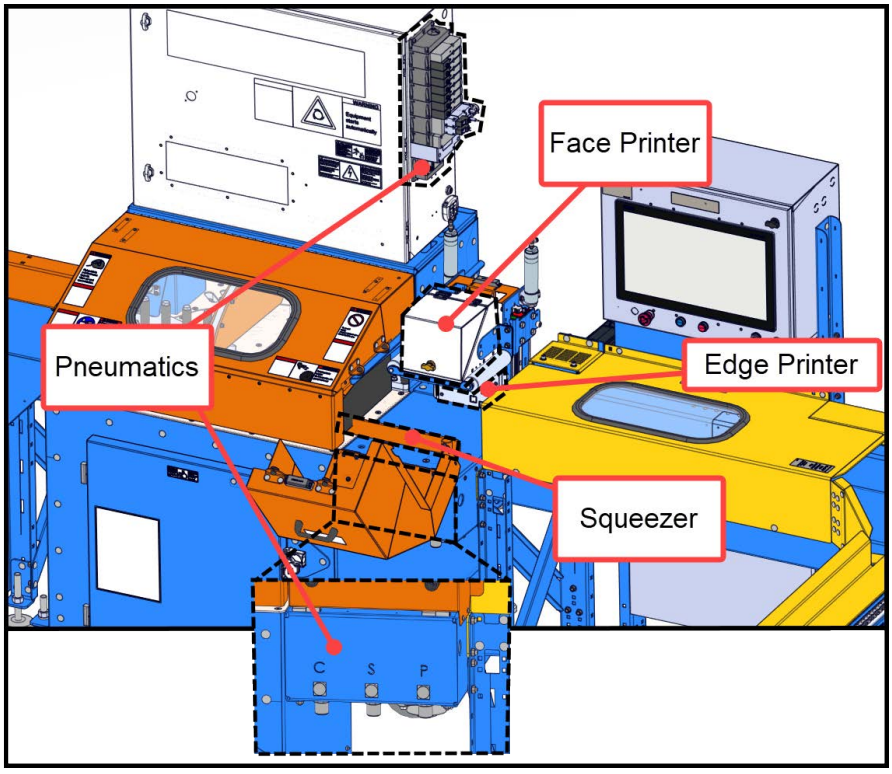


Figure 7-4: Major Components Visible from the Main Area of Saw



Some figures are depicted without guarding for clarity. All depictions are of the 20‘ version of the saw.

Cleaning and Inspecting

Cleaning Saw Dust and Debris

It is important to blow off and vacuum the equipment daily. Saw dust acts as an insulator and will prevent electrical components from working properly, and debris causes mechanical jams.

	⚠ 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.**

BLOW OFF...

- Top and sides of saw frame
- Auto Loading Live Deck chains
- Infeed rail where board travels
- Infeed pusher
- Squeezer assembly
- The sensor on the infeed rail near the HMI enclosure
- Under the saw hood, including:
    - Saw table top
    - Saw blade guard
- Remove lumber scraps and anything that doesn't belong on equipment surfaces & belts, and blow off surfaces

VACCUM...

- Inside electrical enclosures: NEVER USE COMPRESSED AIR!
- Floor of saw chamber
- Saw chamber, especially around the blade and blade belt assembly
- Inside the printers
- Floor under and around the saw

Cleaning Surfaces

If it should become necessary to clean the surfaces of 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.

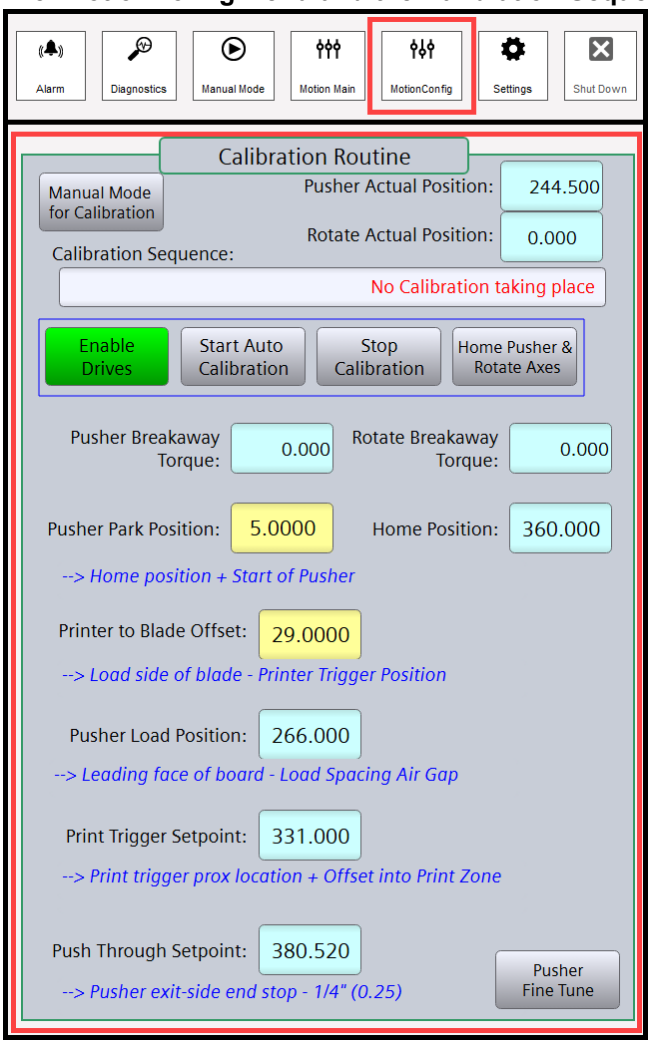
Calibrating

Calibration may be necessary in the following scenarios:

- After significant maintenance, such as replacing a mechanical part
- A saw blade replacement or if the saw blade has been removed from the machine
- If the saw is consistently making inaccurate cuts

The calibration options are available in the *Motion Config* menu in the *CutBuilder* software.

Figure 7-5: MotionConfig Menu and the Calibration Sequence Area



An automatic calibration will calibrate all of the major systems of the saw. To perform an automatic calibration, use the following procedure:

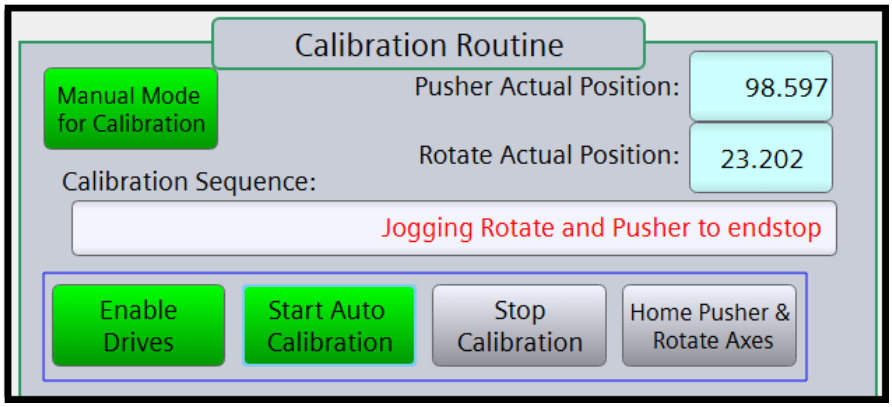
1. Open the MotionConfig menu by selecting the button on the menu bar. See Figure 7-5.
2. Enable drives if necessary.

- The Enable Drives button is green when the drives are enabled, and grey when they are not. If the button is grey, select it to enable drives

3. Select **Manual Mode** for Calibration. The button will turn green to indicate that the saw is now in manual mode.
   - See Figure 7-6 for an example of an automatic calibration in progress with drives and manual mode enabled.
4. Select **Start Auto Calibration** to start the automatic calibration process.

	**⚠ WARNING** **Ensure all personnel are clear of the Restricted Zone before starting calibration.** **Motion will start automatically when Start Auto Calibration is selected.**

Figure 7-6: Calibration In Progress

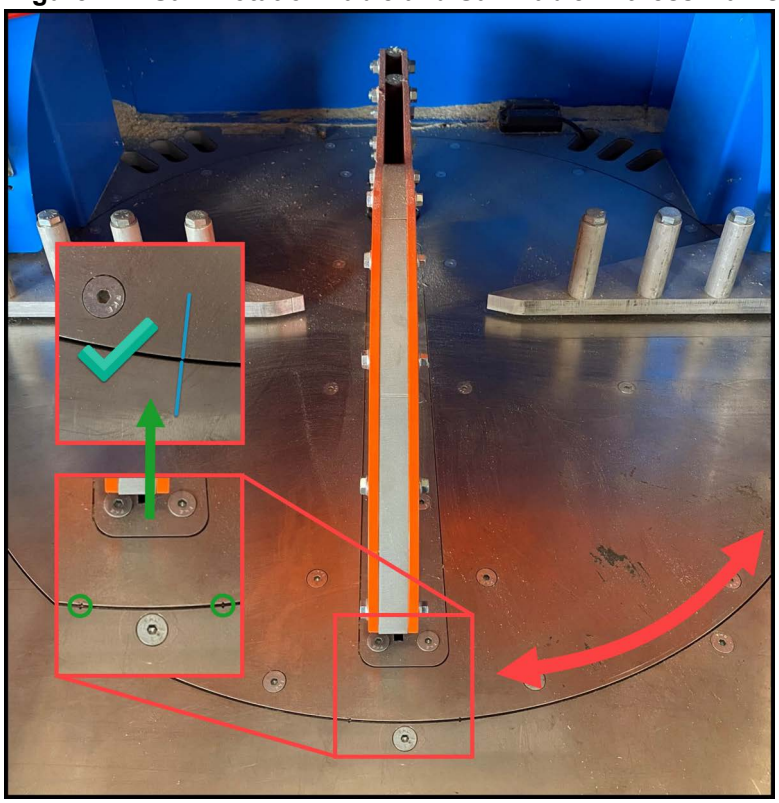


As the calibration progresses, the Calibration Sequence area on the Calibration Routine screen will indicate which part of calibration the machine is currently performing. Watch for the following message, then proceed to the next step:

- Jogging Rotate and Pusher to endstop

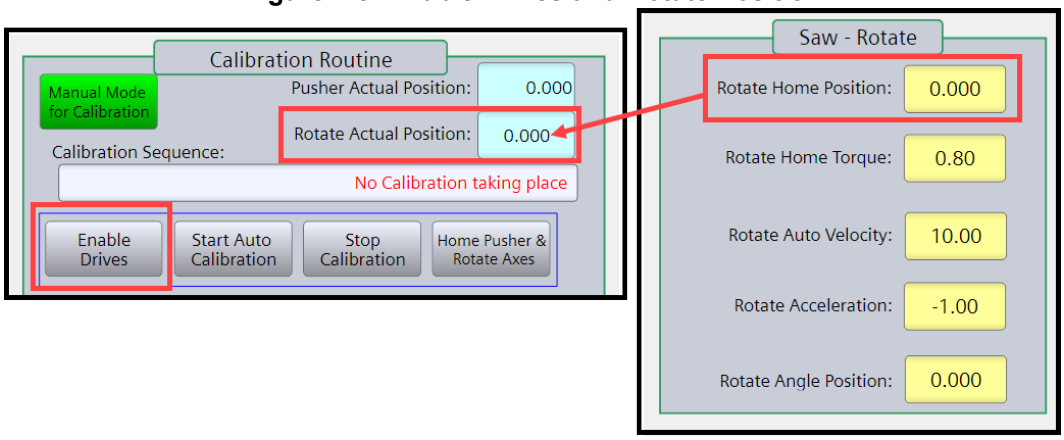
5. While the saw rotation table is moving, observe its motion through the saw hood window to see if it lines up with the witness marks on the saw table as seen in Figure 7-7.
   - If the witness marks on the saw rotation table and saw table are not aligned, select the **Enable Drives** button in the MotionConfig menu (see Figure 7-8) to disable the drives.

Figure 7-7: Saw Rotation Table and Saw Table Witness Marks



6. With the drives disabled, open the saw hood and move the saw rotation table by hand until the witness marks are aligned as seen in Figure 7-7.
7. Note the value in the “Rotate Actual Position” field and input this value into the “Rotate Home Position” field as seen in Figure 7-8.

Figure 7-8: Enable Drives and Rotate Position



8. Enable the drives by selecting the **Enable Drives** button (see Figure 7-8) and re-start the calibration using the **Start Auto Calibration** button.
9. “No calibration taking place” will display in the Calibration Sequence area and the Start Auto Calibration button will no longer be green when calibration is complete.

Lubricating

Lubrication of various items is required to keep the machine operating properly and to prevent costly replacements. See the respective mechanical sections for further instructions on lubrication.

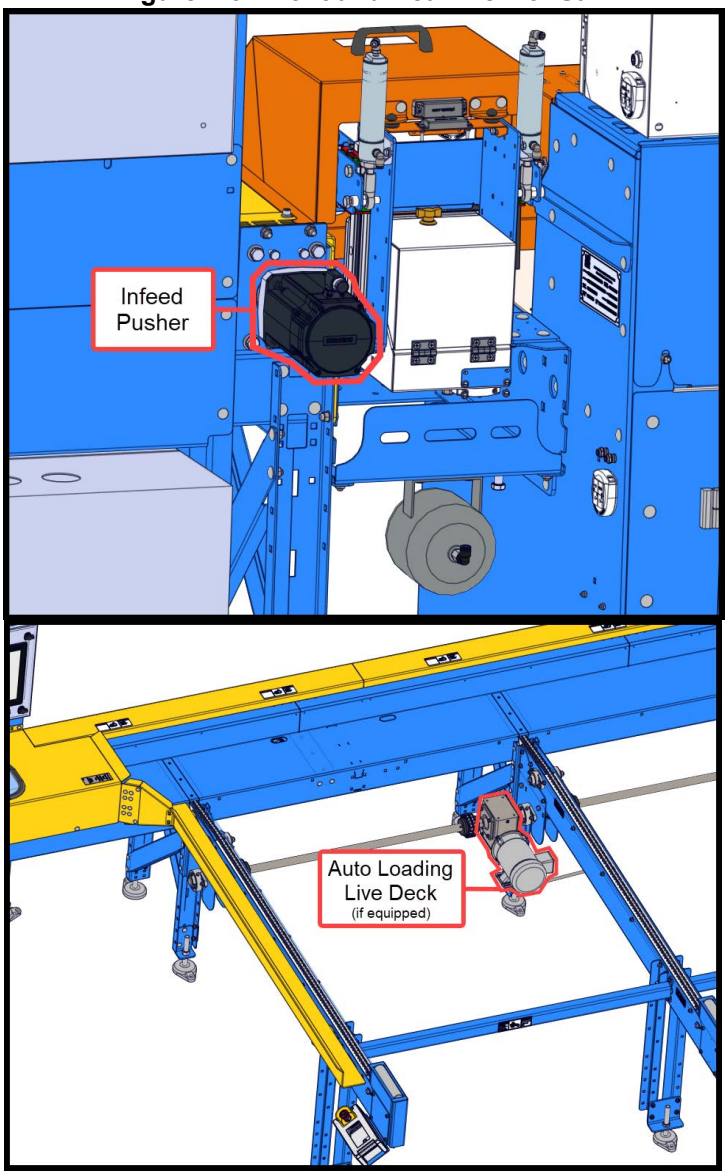
Using a manual grease gun

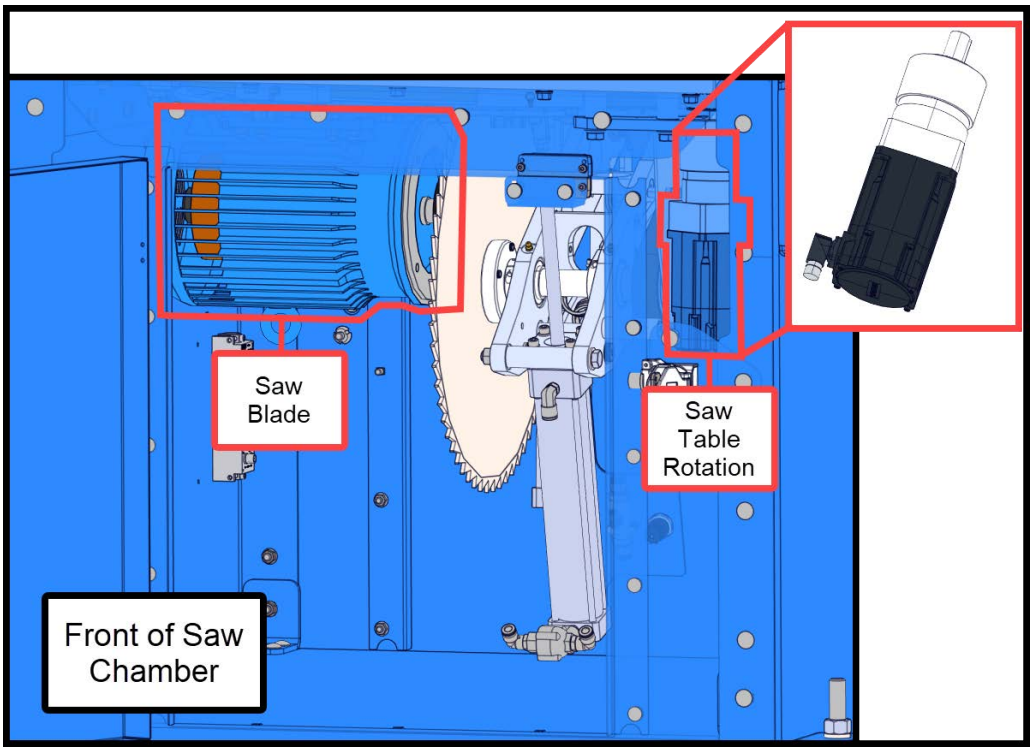
This manual frequently makes reference to various items (such as bearings) that require the use of a manual grease gun for proper lubrication. The amount of lubrication that should be applied is typically measured in cm^3. The amount of lubricant output by a manual grease gun per stroke can vary among models. We highly recommend customers familiarize themselves with the amount of grease output per stroke with any grease gun in order to avoid applying too much lubricant and potentially causing damage to the machine.

Motors and Gearboxes

Motor Locations

Figure 7-9: Front and Rear View of Saw





Motor Maintenance

Table 7-1: Overview of Motor Maintenance

Motor	Gearbox (if present)	Requires Grease	Requires Oil
Infeed Pusher	N/A	N/A	N/A
Saw Blade	N/A	N/A	N/A
Auto Loading Live Deck (if equipped)	Yes	N/A	Yes
Saw Table Rotation	N/A	N/A	N/A

Checking and Changing Gearbox Oil

Check the oil in the gearboxes once every 12 months (one shift) or every 6 months (two shifts). When additional oil is needed, use the oil recommended for each motor type listed in or a comparable type that meets app specifications.

Table 7-2: Recommended Oil Specifications for Motor Gearboxes

Motor	ISO Viscosity Grade	Oil Type	Oil Supplied by Manufacturer
Auto Loading Live Deck	680	Synthetic Polyglycol Oil	Klübersynth UH1 6-680

Drain and refill the oil every 20,000 hours or 4 years. Each gear motor includes a level plug and drain plug. Note that the exact location of each plug will vary between motors.

The approximate amount of oil is listed in Table 7-3.

Table 7-3: Approximate Oil Fill Level

Motor	Quarts	Liters
Auto Loading Live Deck	1.11	1.05

Saw Blade

When to Replace the Saw Blade

Every shift the operator should perform the following tasks to check the saw blade for signs of wear and replace or repair accordingly:

- Check blade diameter. If it is less than 19-1/2” (495.3 mm), or over 20”, the saw blade must be removed and discarded.
- Check for cracks, warping, missing or dull teeth, etc.
- Observe the blade during operation for wobble or vibration.

Check that the bolts holding the blade to the hub are secure.

	⚠ 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.**

The frequency of blade changes and repairs depend on the species and grade of lumber, as well as the number of hours the saw is being run. Your plant may need to change the blade often for optimal saw operation.

Specs for New or Used Saw Blade

Saw blades can be sharpened to significantly extend their life. They must be sharpened by a reputable blade sharpener that is familiar with carbide tips. It is important to meet the specifications etched into each saw blade. If any specification is not met, it can cause the saw blade to cut inefficiently, inaccurately, and/or rotate out of balance. The specifications are further defined in Table 7-4.

Table 7-4: Saw Blade Specifications

Spec Description	Dimension	
Tip-to-tip diameter	495.3 mm min. 508 mm max.	(19-1/2" min.) (20" max.)
Kerf (blade thickness)	4.57 mm	(.180”)

* ATB = Alternating Top Bevel

Spec Description	Dimension
Z= qty of teeth	80
Ø = diameter of center hole	31.75 mm
SK = keyways	0
Hook	10º
Face angle	0º
Top angle	15º
Angle left-to-right (or right-to-left) of ATB*	10º
RPM max	3500 rpm
Model # of saw blade	as shown on saw blade
ATB	indicates an alternating top bevel
Serial # of saw blade	as shown on saw blade

* ATB = Alternating Top Bevel

Replacing a Saw Blade

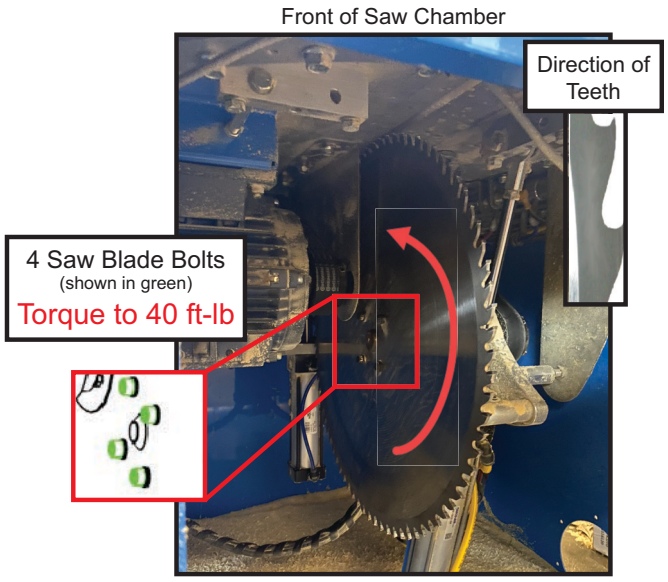
	⚠ WARNING
	**MOVING PARTS CAN CRUSH AND CUT.** **Always verify that power to the machine has been turned off and follow approved lockout/tagout procedures.**

Supplies Needed

- Torque wrench with capacity up to 40ft-lbs
- 3/8” 12-point socket
- Front saw chamber door key
- SB276KIT

1. After ensuring power is locked out, open the front saw chamber door using the key.
2. Loosen and remove the 4 bolts holding the saw blade. See Figure 7-10.
   a) Each new saw blade kit comes with a box of 25 bolts. Keep the extra bolts to reinstall a used blade after sharpening.

Figure 7-10: Saw Blade Specifications



Torque specifications listed in this service bulletin may differ from those provided in other documentation. Please use the specifications listed in this document.

3. Remove the saw blade and follow the below instructions to determine whether it should be discarded or kept for resharpening:

	⚠ CAUTION
	**CUT HAZARD.** **Saw blades are sharp. Wear gloves and eye protection when handling blade.**

   a) Measure the diameter of the blade from outside edge of tooth to outside edge of tooth. If the diameter is less than 19-1/2”, discard it.

   b) If the diameter is greater than 19-1/2”, place the saw blade in a safe location for sharpening.

4. Prepare the surfaces:

	⚠ WARNING
	**Mounting surfaces and hardware must be clean and dry when installing saw blade.** **Dust, dirt, and lubrication may cause the blade to come loose, causing injury or death.**

   a) Blow off dust from the hub and the bolt threads. Remove all pitch and debris from threads.

   b) Wipe down the mounting surface on the new saw blade and the hub. Use a 320-grit emery cloth, if necessary, to remove pitch.

c) Ensure all parts are clean, dry, and free of lubricants.

d) If using a used saw blade, measure its diameter from outside edge of tooth to outside edge of tooth. If the diameter is less than 19-1/2”, or over 20”, discard it.

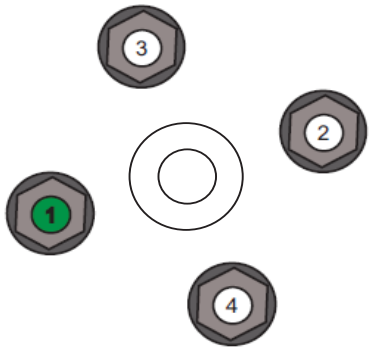
5. Place the new or sharpened saw blade so the holes align with the holes in the hub and the teeth hook points upward. See Figure 7-11 for the correct orientation.

	⚠ WARNING
	**Use ONLY the bolts described in included with the kit.** **Use NEW bolts every time the blade is replaced.** **Do NOT use thread adhesive.** **TORQUE to specifications given in Figure 7-11!** **Ensure the bolts are fully embedded and flush against the saw blade surface.**

A torque wrench should be calibrated on a yearly basis to ensure accuracy.

6. Using new bolts supplied in this kit, install all 4 bolts.
   - Use the torque wrench and 3/8” 12-point socket and bolts listed in *Supplies Needed*.
   - Do NOT use thread adhesive.
   - Hand tighten all 4 bolts before using the torque wrench.
   - Using a torque wrench, tighten the bolts in the order shown in Figure 7-12 until they all reach the recommended torque of 40 ft-lb.
   - Torque specifications listed in this service bulletin may differ from those provided in other documentation. Please use the specifications listed in this document.
   - Once properly torqued, all bolts should sit flush with the surface of the blade. If the bolts are protruding or skewed, repeat step 6 with new bolts.

Figure 7-11: Tighten Saw Blade Bolts in This Pattern



7. By hand, carefully rotate the blade to observe its motion. It should not have any wobble or vibration when rotating.

8. Close the saw chamber door.

9. Power on machine:

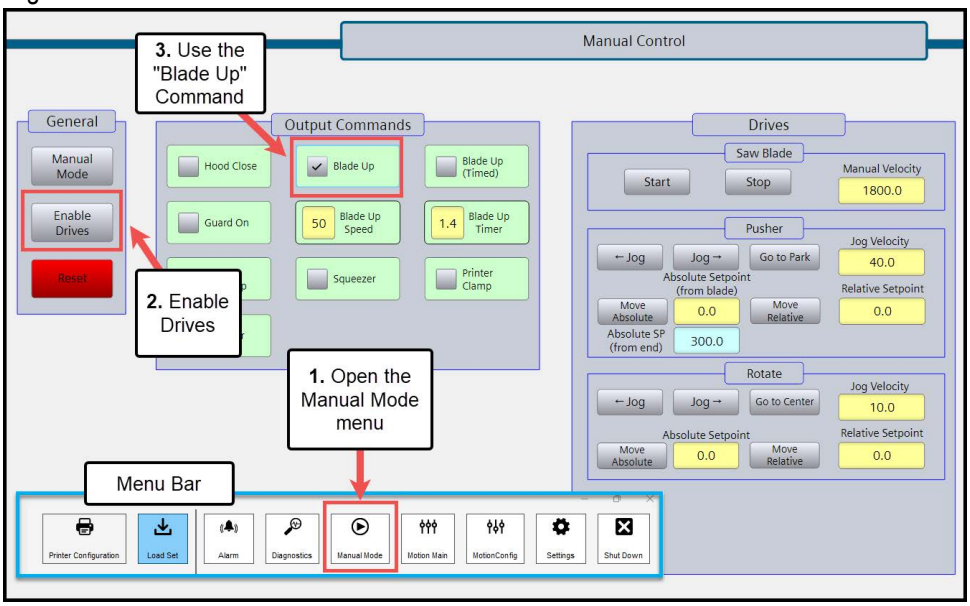
   a) Remove lockout/tagout and switch the disconnect switch to the ON position. .

   b) Release the E-stop and clear any alarms.

c) Use the “Reset” button to resume operation.

10. Open the manual mode menu using the button on the menu bar.
    a) Select “Enable Drives” to start all drives.
    b) Use the “Blade Up” command to bring the saw blade up through the table. Observe the saw blade motion. The saw blade should not have any wobble or vibration when rotating.

Figure 8: Manual Mode Menu



Check the saw blade every shift for the following and replace or repair when needed:

- Cracks, warping, missing or dull teeth, etc.
- Observe any wobble or vibration during rotation.
- Check that the bolts holding the blade to the hub are secure.

11. Perform a calibration. See Calibrating on page 105.

Printer

Ordering Supplies

To order supplies for the *Hornet II* printer, contact REA JET directly. MiTek does not sell the ink.

Once an account is set up, future orders can be placed by providing a PO either of the ways listed here.

- E-mail to **customerservice@reajetus.com,** or
- Call **440-232-0555**

Table 7-5: Printer Supplies

Description	REA JET Part #	MiTek Part #
Black Ink: Black Eagle CS, Chip	61112000	N/A

Only use the specified ink in this printer!
Ink specified for other MiTek inkers and printers will damage this unit.

The ink must be stored between 59ºF and 95ºF and has a 10-12 month shelf life. Refer to the “best before” date printed on the cartridge.

To place your very first order with REA JET, see Placing Your First Supplies Order Through REA JET on page 116.

How Much Ink Will I Use?

The amount of ink you will use depends greatly on the type of parts you cut and the quantity of parts each day. Basic guidelines are listed below to help you determine how much ink to purchase at one time. These guidelines are based on a **5-day work week, 2x shift/day**. Adjust these numbers to reflect your work week.

- On average, the 4 ink cartridges in each printer (8 cartridges total) need to be replaced weekly.

1. Placing Your First Supplies Order Through REA JET

Consumable supplies (ink) must be purchased from either REA JET or a local distributor prior to the saw’s installation, and it MUST be present at the installation of the saw. MiTek does not sell the ink. The most efficient way to place your first order is as follows.

1. Create an account with REA JET using the New Customer Form on the REA JET website:

   New Customer Form: https://reajetus.com/new-customer-form/

2. After creating an account with REA JET, see Ordering Supplies on page 115 for the ordering procedure.
3. Orders should be placed at least 3 weeks prior to the saw installation date to ensure the supplies will be there during installation.

Printer Components Overview

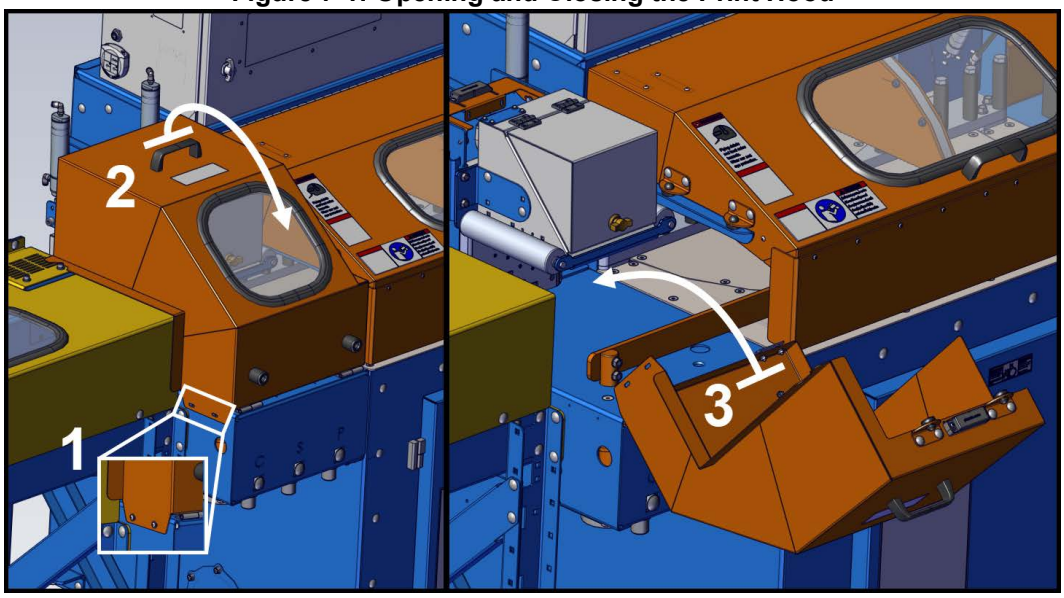
Printer Controller Units

The machine software communicates with the control units in the printer electrical enclosure to determine what to print and when. The control unit then sends a message to the print head(s). The printer controller units are located in the Printer Electrical Enclosure. See Operator Panel Electrical Enclosure on page 149.

Print Hood

A print hood covers the printer area and must be opened to access the printer enclosures. The print hood is equipped with a sensor that will put the machine in an emergency stop state when the hood is opened.

Figure 7-1: Opening and Closing the Print Hood

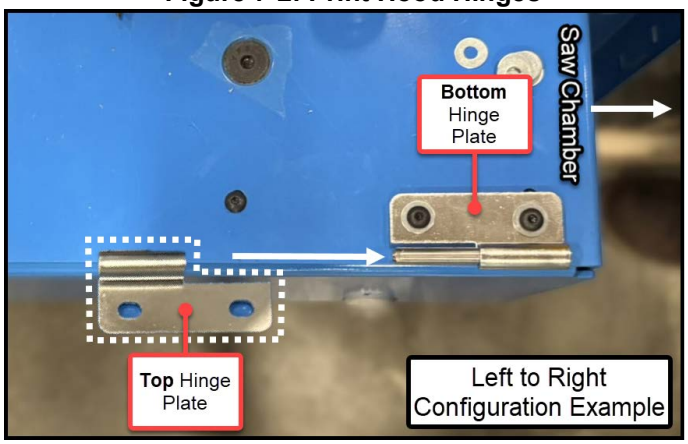


To open and close the print hood:

1. Remove the screws securing the print hood as seen in Figure 7-1 with a 1/2” wrench and a 5/32” hex key.
2. Once the screws have been removed, pivot the print hood open by pulling the handle on the top of the print hood.
3. The print hood will come to a natural resting position against the gatekeep assembly.
4. To close the print hood, gently pivot it up, towards the printers, until it comes to the original position.
5. Always secure the print hood with the screws when closed.

The print hood can also be completely removed for maintenance by sliding the top hinge from the bottom hinge when the print hood is open. The top hinge slides away from the saw chamber for removal.

Figure 7-2: Print Hood Hinges

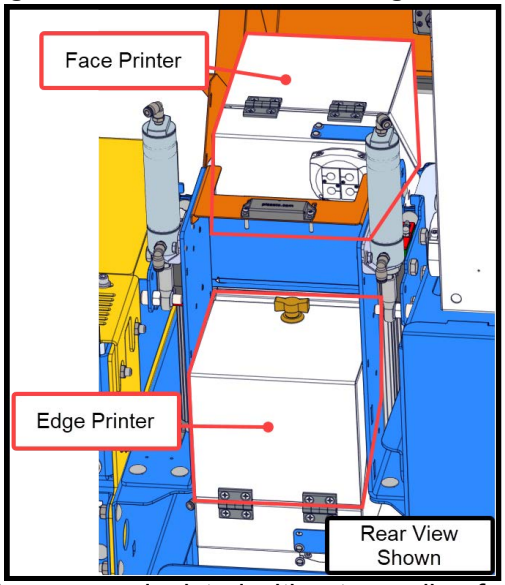


Printer Enclosures

The *Hornet II* saw is equipped with 2 printer enclosures:

- Face Printer — Marks the FACE of the material.
- Edge Printer — Marks the EDGE of the material.

Figure 7-3: Bottom Plate and Edge Printers

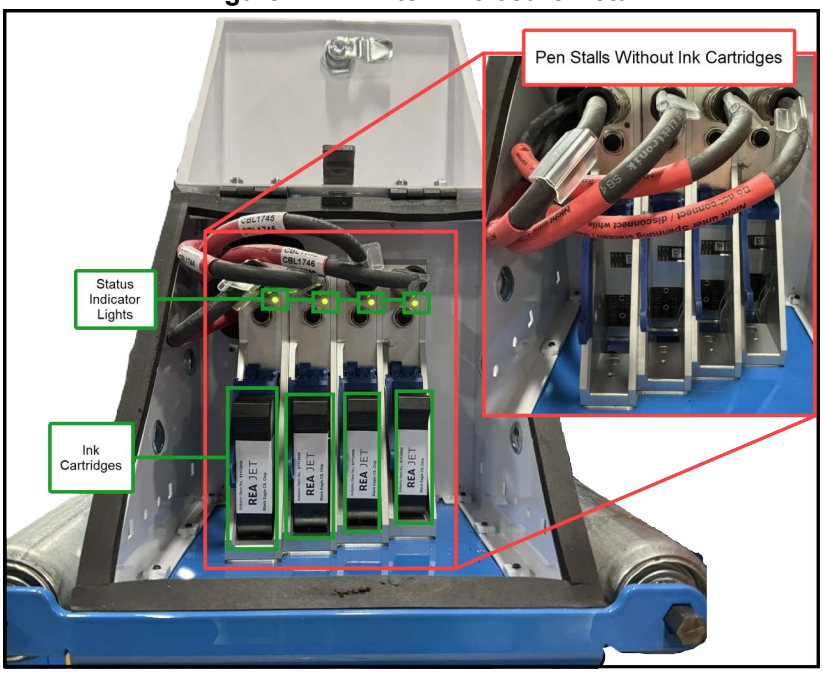


- **NOTE**: Some figures are depicted without guarding for clarity.

The printer enclosures contain pen stalls that the ink cartridges are inserted into. The ink cartridges directly mark a print target according to the signals received from the control unit(s). Each printer has 4 pen stalls and 4 ink cartridges.

The part of the ink cartridge that is exposed and marks the material is commonly referred to as a print head.

Figure 7-4: Printer Enclosure Detail

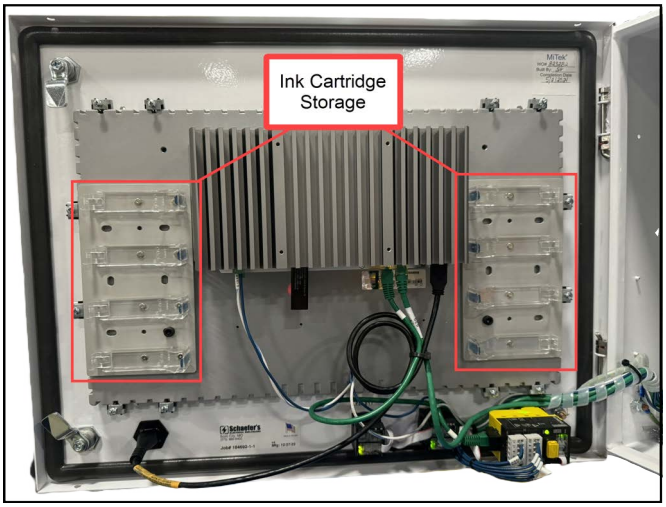


Maintaining the Printer

General Maintenance Reminders

- Always wear safety glasses and rubber gloves when handling ink.
- If ink makes contact with a person's skin, hair, eyes, or clothes, refer to Treatment for Hazardous Substances on page 11.
- Never clean the print heads with pressurized air.
- Always store extra ink cartridges in a temperature-controlled area. The temperature must stay above 32 degrees Fahrenheit to prevent ice crystals from forming and clogging the printer. The interior of the control operator interface enclosure has an area for storing ink cartridges. See Figure 7-3.

Figure 7-5: Ink Cartridge Storage



Cleaning the Print Heads

	⚠ CAUTION
	**Wear goggles and gloves when handling ink.**

Lint-free cloth

Purified water

Washing station

If ink or makes contact with a person's skin, hair, eyes, or clothes, refer to Treatment for Hazardous Substances on page 11.

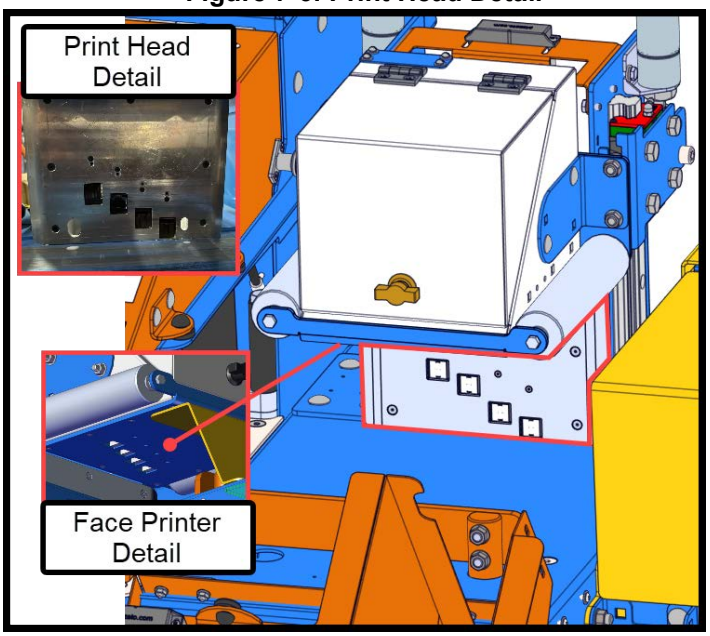
Follow this procedure carefully to clean the print heads correctly. Failing to follow these instructions will push debris into the print head and shorten its life. When a print head is damaged by dust and debris, it may require replacing the ink cartridge.

Clean the print heads before every shift with this procedure:

1. Ensure the printer is completely powered off before cleaning the print heads.
2. Using distilled or deionized water, dampen a non-abrasive, lint-free cloth. Ensure it is not a dry cloth may cause scratches. You may wish to fold the cloth in quarters to prevent ink penetrating through.
3. Dab lightly on each print head using the damp cloth. Do not apply too much pressure as the cartridge could become unseated from the pen stall and cause damage to the printer.
4. Use the damp cloth to dissolve any dried ink by holding it gently against each print head.

5. Once the nozzles appear to be clean and only fresh ink is observed on the cleaning cloth, move to the next cartridge and repeat until all cartridges are clean.

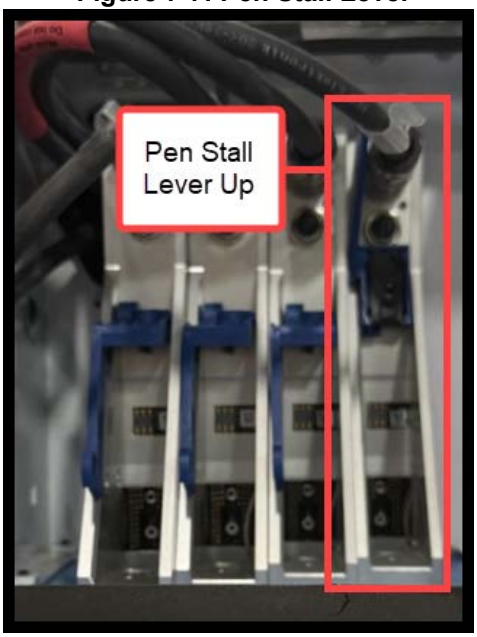
Figure 7-6: Print Head Detail



Replacing an Ink Cartridge

1. Ensure the printer is powered off. Never remove a cartridge from a pen stall while the printer is powered on.
2. Lift the lever on the pen stall you wish to place an ink cartridge in, or that is housing an ink cartridge intended for replacement.

Figure 7-7: Pen Stall Lever



3. Gently pull up (at a 45 degree angle) on the top of the ink cartridge to remove it if necessary.
4. To place an ink cartridge into the pen stall, gently insert it at the same angle as removal (where the far end drops into the carriage first) and push down.
5. Once the ink cartridge is seated, return the lever (see Figure 7-7) to a closed position to secure.

Re-Using a Cartridge After an Operational Pause

1. Once a cartridge has been used, follow these guidelines to improve its shelf life:
   - Remove the cartridges at the end of every day from the printers and store them in the specialized brackets in the operator panel. See Figure 7-5 on page 120.
2. Upon removing the ink cartridge from storage for re-use, clean and install them as described in *Cleaning the Print Heads* and *Replacing an Ink Cartridge*.

Bearings (Lubrication)

Lubricating the Linear Bearings

Check the quality of the lubrication on the guide rails every week to determine when more grease is needed. The frequency of greasing depends on many factors including amount of use and dust. After enough time has passed to determine a pattern, document how often the bearings should be greased, but continue to inspect the rails every week.

NOTICE

Overgreasing will cause premature failure of bearing seals and excessive saw dust and dirt to stick to the guide rails, negating the benefits of the grease. Undergreasing may cause damage to components and affect the accuracy of the saw. A thin film of grease should be visible on the guide rails at all times

Because the linear bearings require frequent lubrication and can be damaged by overgreasing, MiTek recommends the following grease and grease gun be used.

Grease Recommended

***Mobilux*™ EP 2**

This is a general purpose, lithium-based Grade 2 grease that provides excellent protection against rust and corrosion and resists water wash-out, corrosion protection, low temperature pumpability, and high temperature service life.

Grease Gun Recommended

It is recommended to use the following grease gun to ensure the proper amount of grease is applied. If you do not have this grease gun available, it is recommended that you purchase one for future use. Understanding the number of pumps to use (the output of grease) will extend the life of the bearings and the accuracy of the saw.

Hiwin GN-80M

Output: 0.5-0.6 cm^3 per stroke

If you choose to use a different grease gun, document which gun is to be used for this procedure and ensure employees know the output per stroke. The output per stroke should be equal to or less than 0.5 cm^3 per stroke.

Lubrication Amount

Use a grease gun to apply the volume of grease listed in Table 7-6 to the matching bearing size.

Manual grease gun

No.2 lithium-based grease

Table 7-6: Grease Volume Per Bearing Size

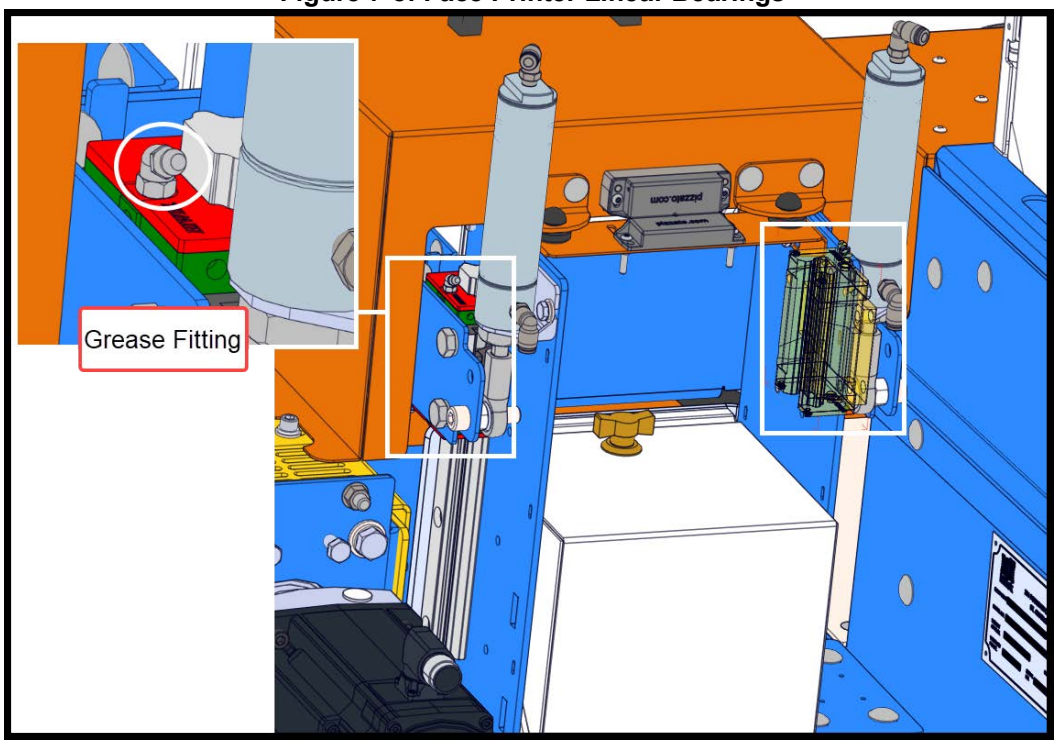
Linear Bearing Size	Amount
Face Printer (size 20)	0.5 cm^3

Location and Number

Table 7-7: Assemblies Lubricated by Linear Guide Bearings

Lubricated Assembly	Qty.	Graphic
Face Printer	2	Figure 7-8

Figure 7-8: Face Printer Linear Bearings



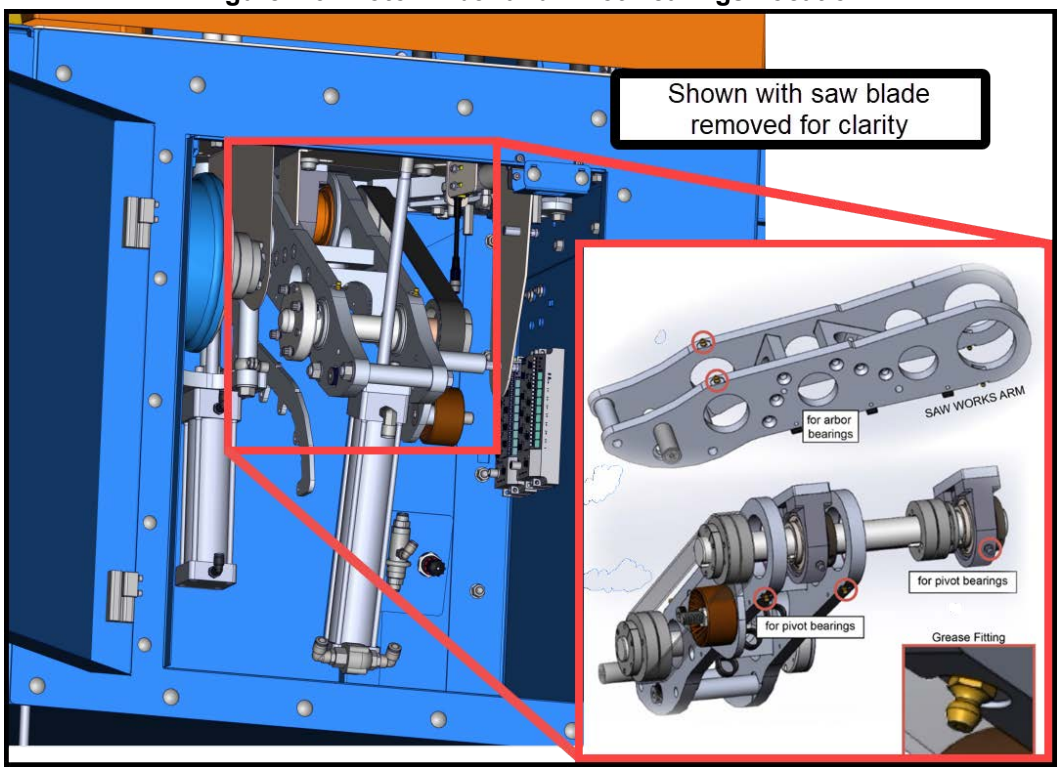
Motor Arbor and Pivot Bearings

The motor arbor and pivot bearings should be lubricated every month (one shift). Use a grease gun to apply 1.5 cm^3 of grease to the fittings shown in Figure 7-9.

Table 7-8: Grease Volume Per Bearing

Bearings	Amount
Motor Arbor and Pivot	1.5 cm^3

Figure 7-9: Motor Arbor and Pivot Bearings Location



Auto Loading Live Deck (if equipped)

Manual grease gun

No.2 lithium-based grease

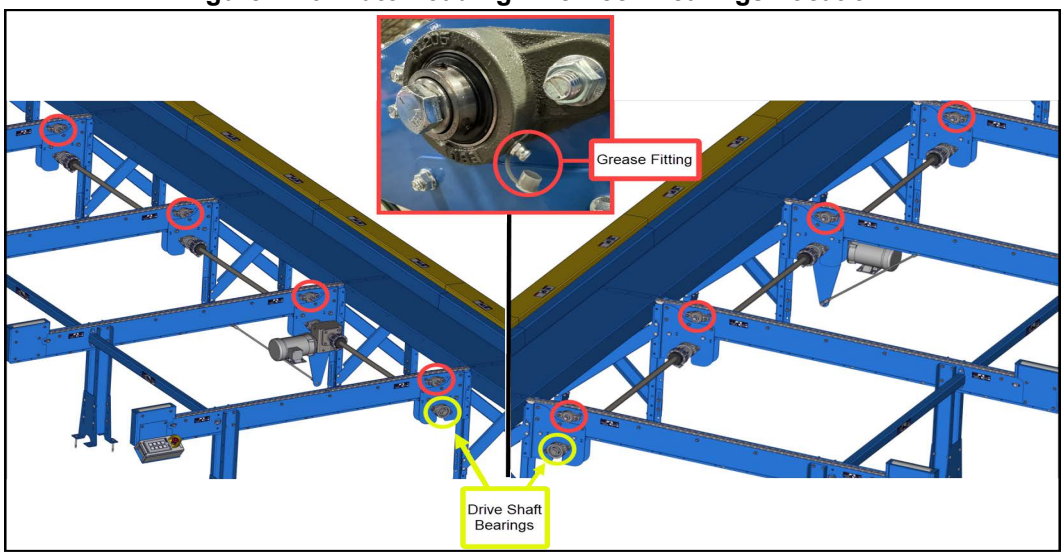
The auto loading live deck bearings should be lubricated every month (one shift). Use a grease gun to apply grease to the fittings shown in Figure 7-10.

Table 7-9: Grease Volume Per Bearing (Auto Loading Live Deck)

Bearings	Amount
Auto Loading Live Deck Bearings	0.5 cm^3

See Auto Loading Live Deck Drive Shaft (if equipped) on page 126 for information regarding the drive shaft bearings.

Figure 7-10: Auto Loading Live Deck Bearings Location



Auto Loading Live Deck Drive Shaft (if equipped)

Manual grease gun

No.2 lithium-based grease

Lubricate the auto loading live deck drive shaft bearings with #2 Lithium-based grease once a year. There is 1 grease fitting on each end of the drive shaft. See Figure 7-10 for the drive shaft bearing location.

Table 7-10: Grease Volume Per Bearing (Auto Loading Live Deck Drive Shaft)

Bearings	Amount
Auto Loading Live Deck Drive Shaft	0.5 cm^3

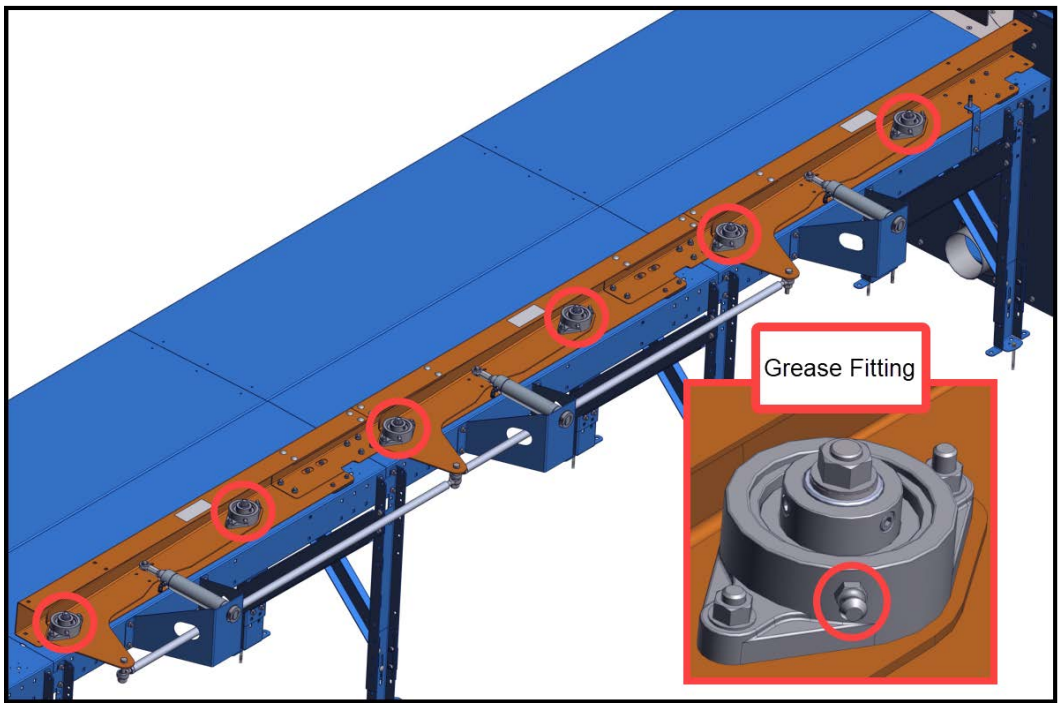
Outfeed Sweeper

The outfeed sweeper bearings should be lubricated every month (one shift). Use a grease gun to apply grease to the fittings shown in Figure 7-11.

Table 7-11: Grease Volume Per Bearing (Outfeed Sweeper)

Bearings	Amount
Outfeed Sweeper	0.5 cm^3

Figure 7-11: Outfeed Sweeper Bearings Location



Squeezer Arm

Manual grease gun

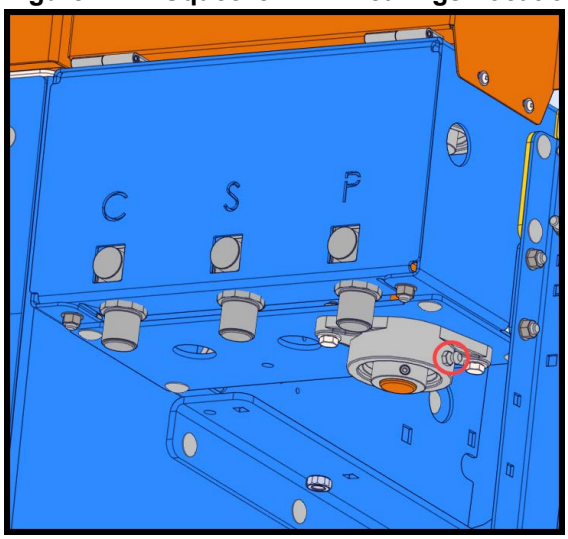
No.2 lithium-based grease

The squeezer arm bearing should be lubricated every month (one shift). The bearing is located under the gatekeep assembly. Use a grease gun to apply grease to the fitting shown in Figure 7-12.

Table 7-12: Grease Volume Per Bearing (Squeezer Arm)

Bearings	Amount
Squeezer Arm	0.5 cm^3

Figure 7-12: Squeezer Arm Bearings Location



Wheels

Lubricating Wheels

Support and Tracking Rollers

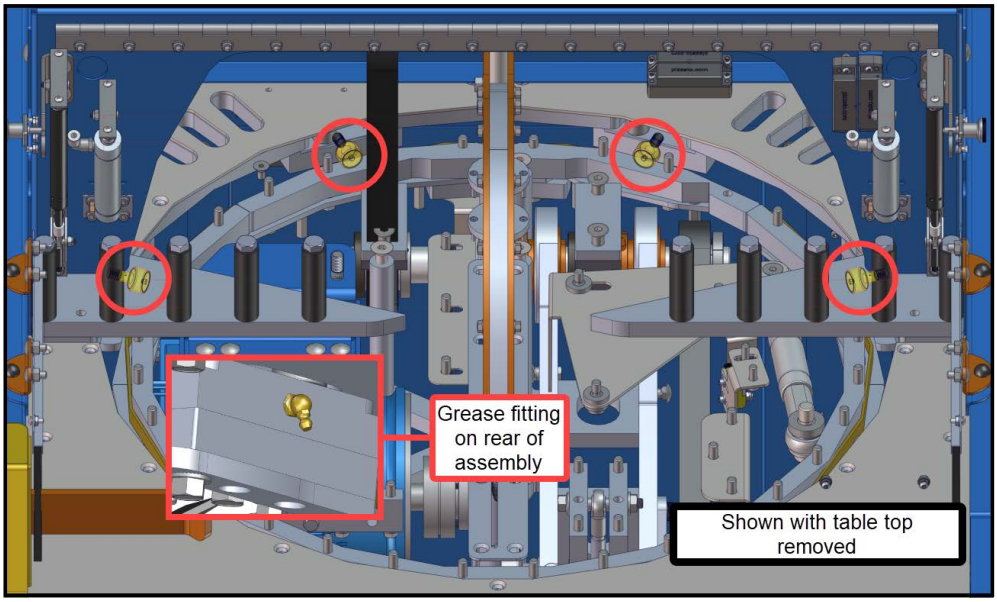
There are 4 support and tracking rollers that support the rotating saw table. The rollers should be lubricated every month (one shift). Use a grease gun to apply of grease to the fittings shown in Figure 7-13.

Table 7-13: Grease Volume Per Wheel

Wheels	Amount
Support and Tracking Rollers	0.5 cm^3

The stainless table top must be removed to access the support and tracking rollers.

Figure 7-13: Support and Tracking Rollers Location

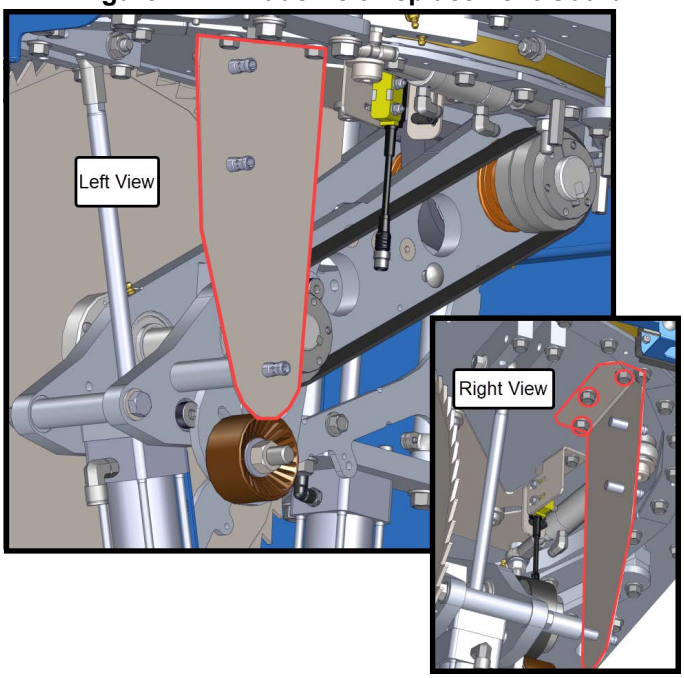


Belts/Infeed Pusher

Blade Belt Replacement

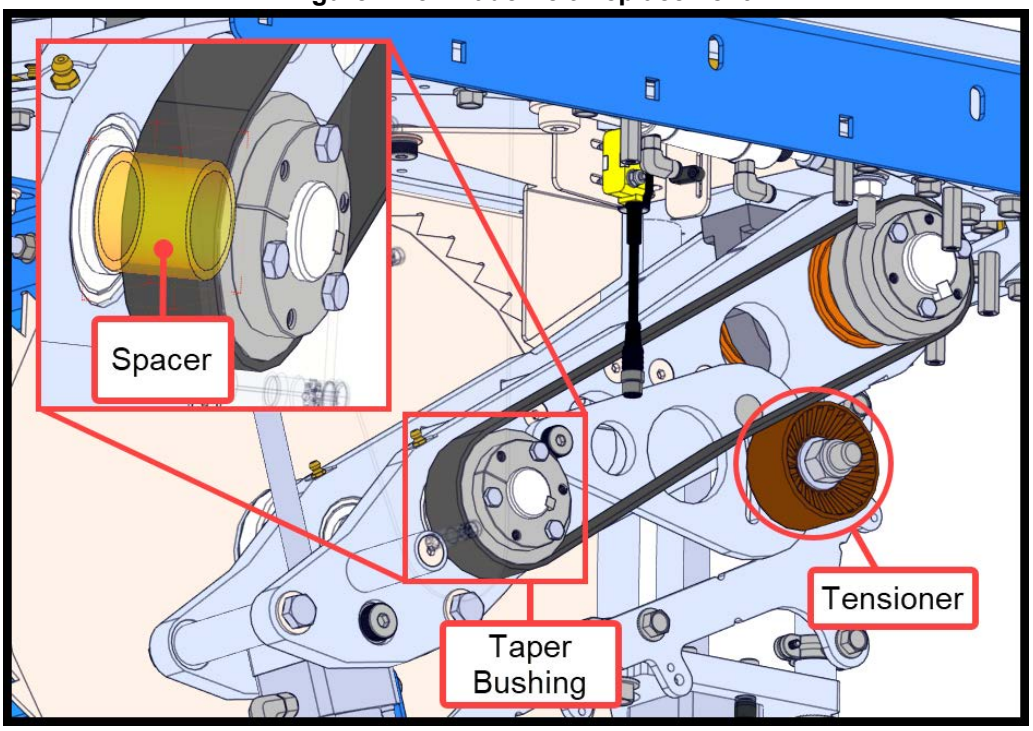
1. Lockout/tagout.
2. Remove the guard between the motor and saw blade by removing the bolts indicated in Figure 7-14. Note that the guard has sensors that need to be removed before the guard can be removed. See Figure 7-35 on page 148.

Figure 7-14: Blade Belt Replacement Guard



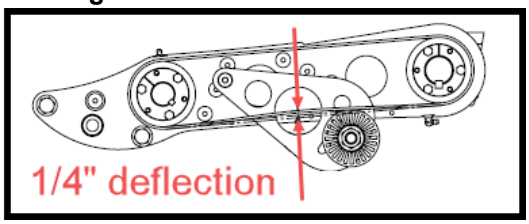
3. Remove the taper bushing. See Figure 7-15.
4. Remove the blade belt and shaft pulley at the same time. The belt is too short to be removed from the pulley while the pulley is still mounted.
5. Install the new belt in the appropriate position.
6. Reinstall the shaft pulley. Ensure that the spacer bushing is between the taper bushing and bearing. Placing the taper bushing against the spacer ensures proper belt alignment. See Figure 7-15.

Figure 7-15: Blade Belt Replacement



7. Pry the tensioner in Figure 7-15 to adjust the belt tension.
   - The belt should deflect 1/4” with 12 pounds of force applied at the location indicated in Figure 7-16 or measured frequency 93.5 Hz.

Figure 7-16: Blade Belt Tension



8. Re-install the guard and sensors.

Motor Belt Replacement

	⚠ WARNING
	**MOVING PARTS CAN CRUSH AND CUT.** **Always verify that power to the machine has been turned off and follow approved lockout/tagout procedures.**

Use the following procedure to replace the motor belt if necessary.

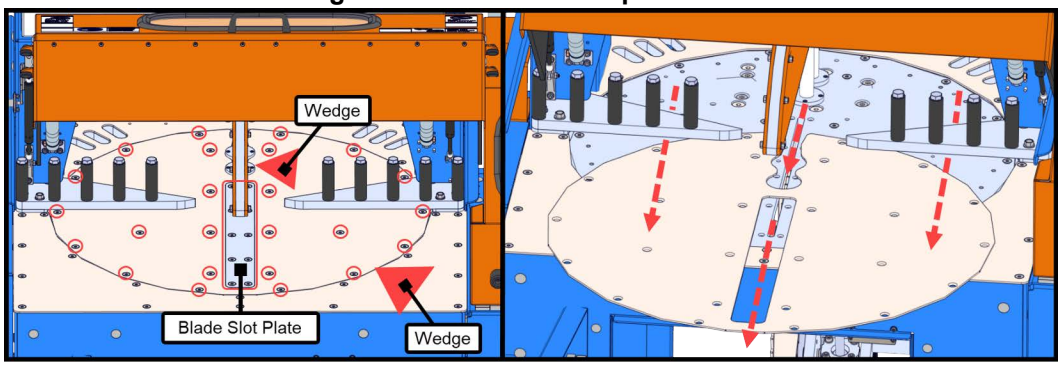
Preparing the Saw

1. Lockout/tagout.
2. Prepare the saw for the motor belt replacement.
   a) Open the front and rear saw chamber doors and the saw hood.
   b) While not necessary, it is recommended to remove the saw blade for easier access. The figures in this procedure are depicted with the saw blade removed. See Replacing a Saw Blade on page 112 for more information.

Removing the Turntable Top and Adjusting the Blade Guard

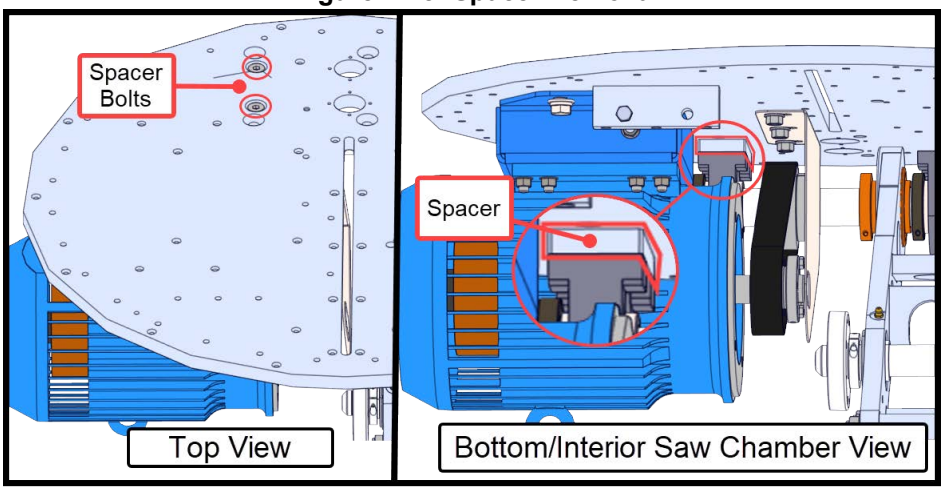
1. Loosen and remove the 10 bolts securing the blade slot plate. Remove the blade slot plate. See Figure 7-17.
2. Loosen and remove the 24 bolts securing the turntable top as seen in Figure 7-17. Remove the turntable top.
   a) To remove the turntable top, use a wedge to lift the top, then place an appropriate tool where the blade slot plate was and pull it in the appropriate direction.
   b) Removing the turntable top using this method allows it to be slid from underneath the lumber guides without removing them.

Figure 7-17: Turntable Top Removal



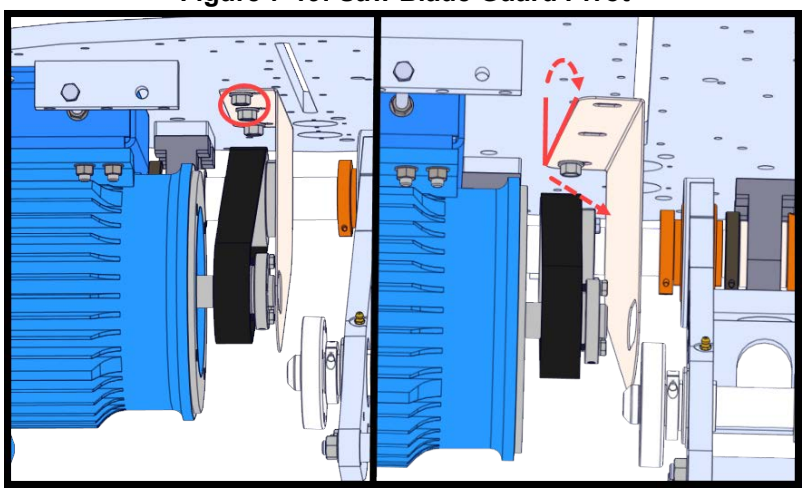
3. Loosen and remove the bolts securing the spacer from the top of the turntable. After removing the bolts, remove the spacer. See Figure 7-18.

Figure 7-18: Spacer Removal



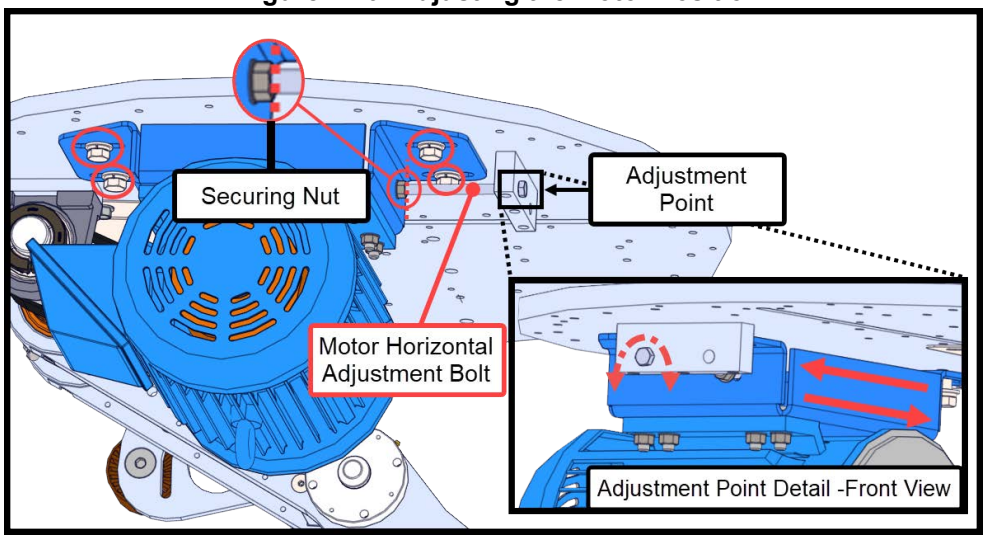
4. Remove the front two bolts from the saw blade guard, then pivot the guard towards the saw blade hub and away from the motor belt. This is done to allow space for removing the belt later. The guard can also be completely removed if desired.

Figure 7-19: Saw Blade Guard Pivot



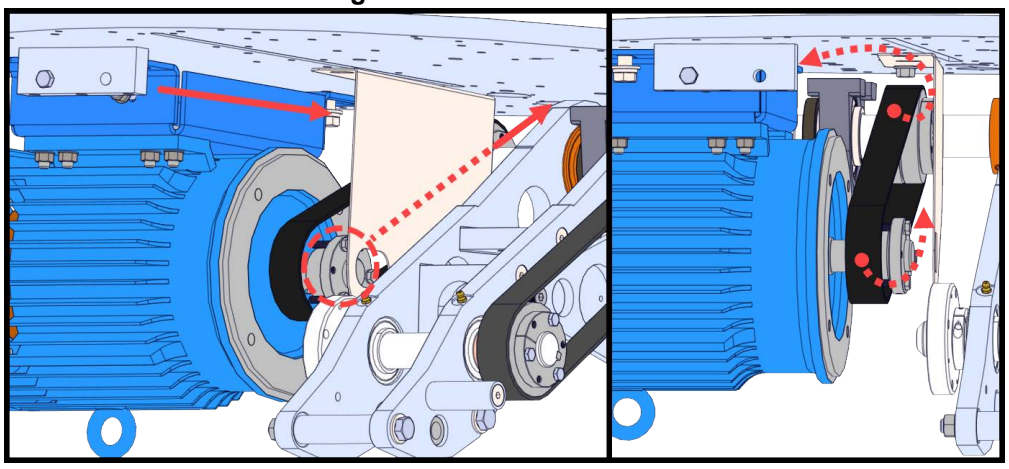
Adjusting the Motor Position

Figure 7-20: Adjusting the Motor Position



1. Mark the position of the securing nut on the motor horizontal adjustment bolt (Figure 7-20). This will aid in returning the motor to the proper position after belt removal or replacement.
2. Loosen the securing nut and move it towards the adjustment point, approximately 3/4”.
3. Loosen the 4 bolts securing the motor housing to the turntable (highlighted in Figure 7-20) so that the motor can be moved towards the front or back of the saw chamber, but do not remove the bolts.
4. At the adjustment point, turn the motor horizontal adjustment bolt counterclockwise to move the motor towards the back of the saw chamber, until the lower part of the motor belt can be easily removed from the hub as seen in Figure 7-21.
   a) Turning the motor horizontal adjustment bolt clockwise moves the motor towards the front of the saw chamber.

Figure 7-21: Motor Belt Removal



5. Once the belt has been removed from the motor hub, remove the belt from the pulley on the shaft. Completely remove the belt via the gap made from removing the spacer in Step 3 in procedure *Removing the Turntable Top and Adjusting the Blade Guard*.

Installing the Belt Replacement and Re-Assembly

1. Feed the belt into the chamber and position it around the shaft pulley via the gap created from removing the spacer.
2. Position the opposite end of the belt around the motor hub.
   a) The motor may need to be adjusted before the belt will secure to the hub. Monitor the belt tension and adjust as necessary when performing the next step.
3. Move the motor back into the original position using the motor horizontal adjustment bolt.
   a) The mark created to indicate the original position of the securing nut (Step 1 in procedure *Adjusting the Motor Position*) can be used as reference for the original motor position.
4. Once the motor is back in the original position and the belt has the proper tension, secure the motor.
   a) Tighten the 4 bolts securing the motor to the turntable.
   b) Tighten the securing nut on the motor horizontal adjustment belt until the motor is secure.
5. Return the belt guard to the original position and secure using the two bolts removed in Step 4 in procedure *Removing the Turntable Top and Adjusting the Blade Guard*.
6. Reinstall the spacer, pillow block bolts, turntable top, and belt slot plate. See *Preparing the Saw* and *Removing the Turntable Top and Adjusting the Blade Guard* for more information.
7. Reinstall the saw blade if it was removed. See Replacing a Saw Blade on page 112 for more information.
8. Close and secure the saw chamber doors and hood.
9. Remove any lockout/tagout devices and power on the machine, including the pneumatics. See Powering Up or Down on page 62 for more information.
10. Perform a calibration. See Calibrating on page 105 for more information.

Infeed Pusher

Removing the Infeed Pusher Belt Guards

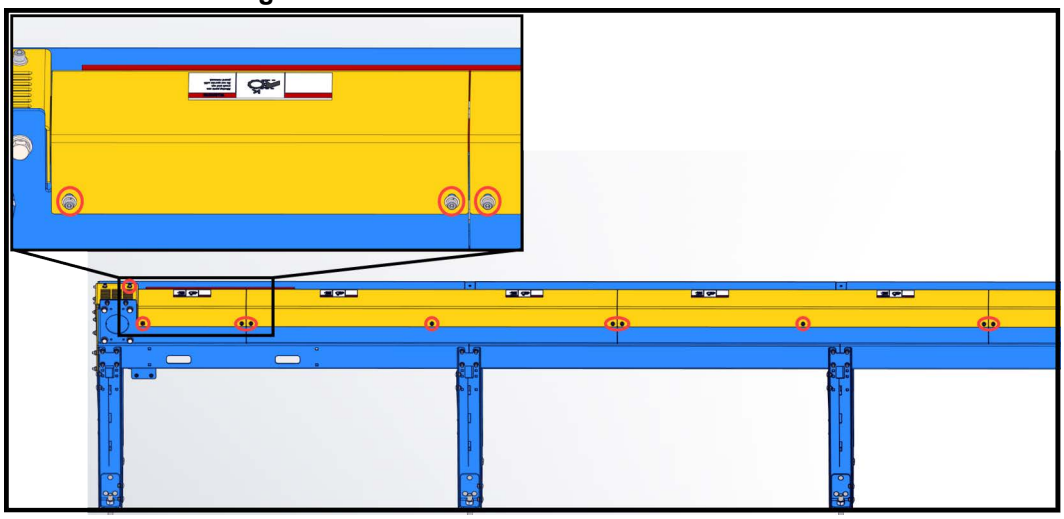
Removing the infeed pusher belt guards may be necessary for certain maintenance tasks.

	⚠ 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.**

Use the following procedure to remove the guards as needed from the infeed pusher belt:

1. Lockout/tagout. Do not operate the saw with any guards removed.
2. To remove an infeed pusher guard, use a 1/2" socket to remove the bolts securing the guard. The securing bolts for the belt guards are on the non-operator side of the saw. See Figure 7-22.

Figure 7-22: Infeed Pusher Belt Guard Removal

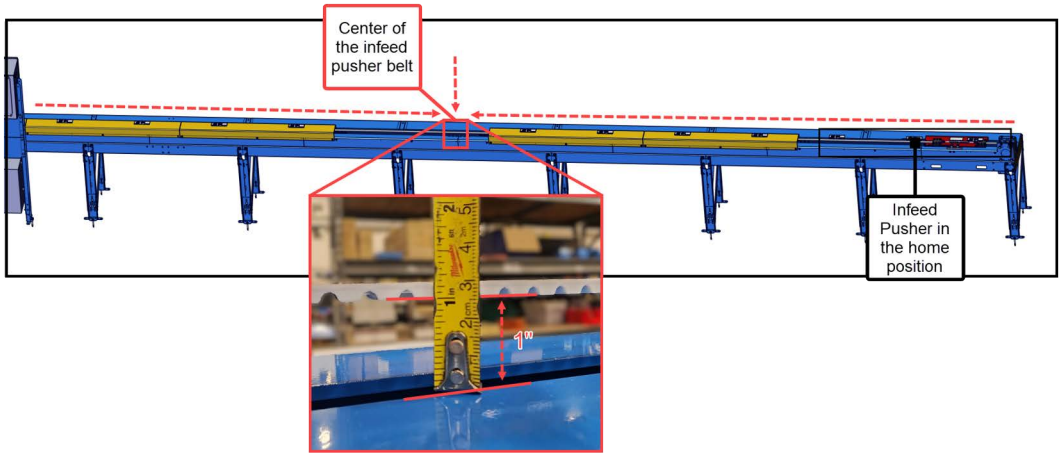


3. Retain the removed bolts/washers and use them to secure the infeed pusher belt guards when reinstalling them.

Belt Tension

The infeed pusher belt is at the appropriate tension when there is a 1" space between the top of the infeed channel and the bottom of the belt when the infeed pusher is in the home position (Figure 7-23).

Figure 7-23: Infeed Pusher Belt Tension

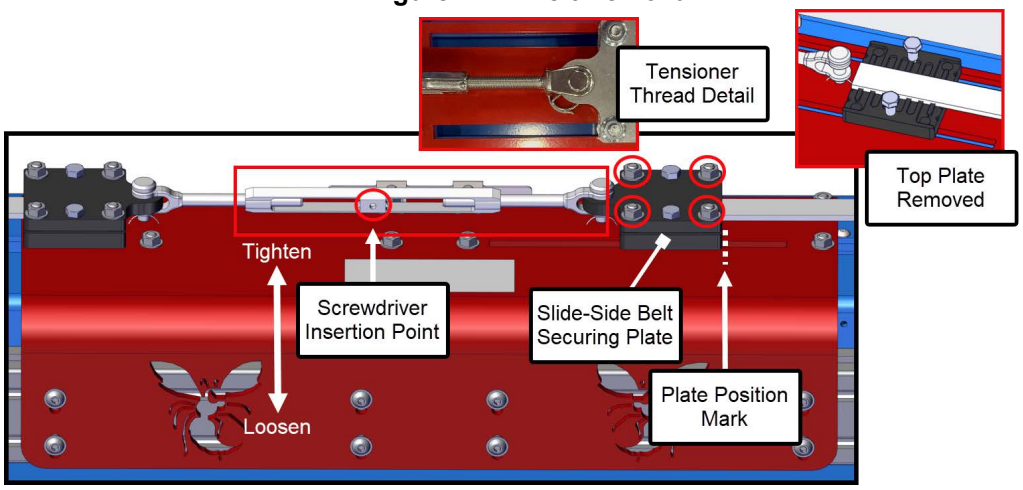


To adjust the tension of the infeed pusher belt, use the following procedure.

	⚠ WARNING
	**MOVING PARTS CAN CRUSH AND CUT.** **Always verify that power to the machine has been turned off and follow approved lockout/tagout procedures.**

1. If not already there, move the infeed pusher the home position using the *Manual Mode* menu in the CutBuilder software.
2. Lockout/tagout.
3. Remove the guard(s) over the infeed pusher. See Figure 7-23.
   - For more information regarding guard removal, see Removing the Infeed Pusher Belt Guards on page 136.
4. Using a marker, mark the current position of the slide-side belt securing plate (Figure 7-24) so it can be used as a reference when re-installing the plate.
5. Loosen and remove the 4 bolts from the slide-side belt securing plate on the slide side of the infeed pusher. Remove the top cover, exposing the belt.
6. Loosen the belt by inserting a screwdriver (or another leverage device) into the tensioner on the pusher. Leverage the tool up or down to rotate the tensioner. See Figure 7-24.

Figure 7-24: Belt Removal



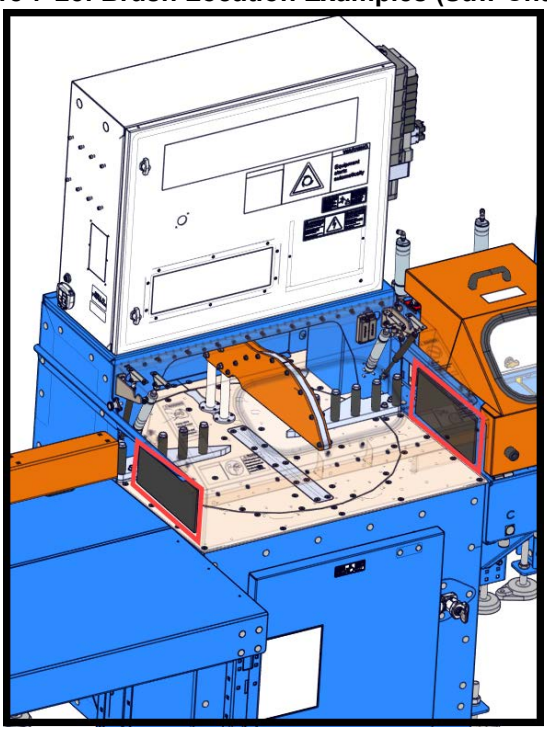
7. Once the infeed belt is at the desired tension, replace the slide-side securing plate.
8. Replace all guards removed in Step 3.
9. Remove the lockout/tagout, power on the saw, and perform a calibration. See Calibrating on page 105 for more information.

Wear Items

Brushes

Brushes exist at some openings and rails to keep scrap and other debris from accidentally entering the saw chamber or causing an obstruction. The brushes should be inspected periodically and replaced when necessary.

Figure 7-25: Brush Location Examples (Saw Chamber)



Replacing Brushes

To replace the saw chamber brushes, use the following procedure:

1. Lockout/tagout.
2. Remove the bolts securing the existing brush. Retain for re-installation.
3. Remove and discard existing brush.
4. Use bolts removed in Step 2 to install the new brush.

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.**

The pneumatic system controls all of the components listed in Figure 7-14.

There are multiple pneumatic regulators on this system. The main filter/regulator manages incoming air from the air source, keeping it at the pressure needed for the most demanding pneumatic components in the system. It is the only regulator that needs to be connected to an air source. Some components have their own regulator to further reduce the pressure. See Figure 7-14 for the optimum pressure settings for each.

Table 7-14: Overview of Pneumatic Components

Component	Description	PSI
Main Regulator		90
Face Printer	Changes the vertical position of the printer based on board height.	40*
Squeezer	Holds the board flush against the fenceline as it enters the saw chamber.	40*
Counter Balance	Assists with saw blade stabilization.	40*

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

PSI Recommendations for Face Printer, Squeezer, and Counter Balance

40 PSI is the recommended starting point for the face printer, squeezer, and counter balance regulators. Adjust in small increments if needed.

- Adjust the Counter Balance (C) pressure until the holdback arm is retracted and the face printer is lifted.
- Adjust the Squeezer Arm (S) pressure until the holdback arm fully clamps.
- Adjust the Printer (P) pressure until the face printer assembly lowers completely and smoothly.

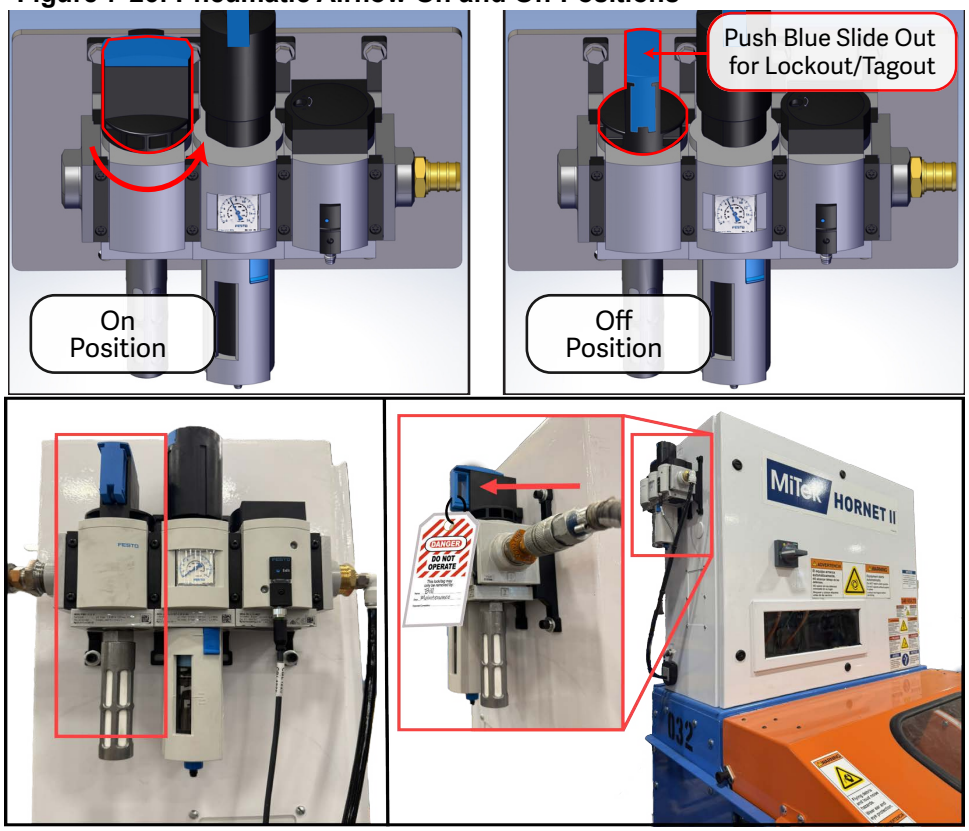
See Adjusting the Pressure on Additional Regulators on page 144 for more information.

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 main shut-off valve to the OFF position and push the blue slide outward so the lockout/tagout hole is visible.

Figure 7-26: Pneumatic Airflow On and Off Positions



2. Lockout/tagout through the hole on the slide. See Figure 1-5 on page 10 for an example.

Maintaining the Filter / Regulator

Purchasing a Filter / Regulator

The filter/regulator can be purchased directly from MiTek. Refer to the Ordering Parts on page 194 for instructions on ordering parts.

Adjusting the Pressure on the Filter / Regulator

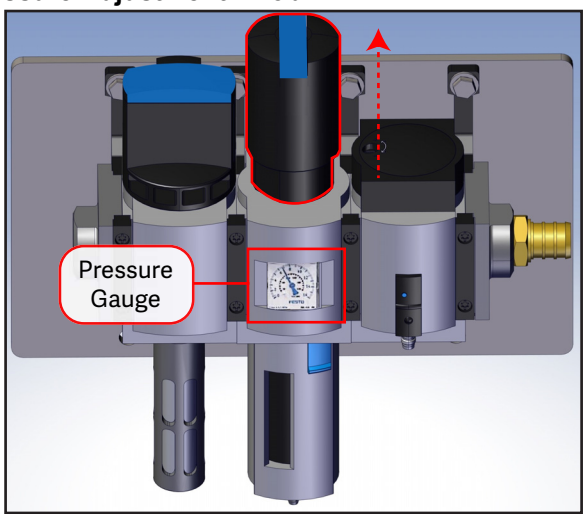
The pressure adjustment knob on the filter / regulator controls the operating pressure for the entire pneumatic system. The operating pressure for the

pneumatic system should be set at 90 psi. Use the following procedure to adjust operating pressure.

The system pressure should be set to 90 psi. If the system pressure drops below a certain psi, the machine software will display an error and the machine will cease operation.

1. If the blue slide on the pressure adjustment knob is pulled out, push it back until it is flush with the knob.
2. Pull upward on the knob to release it. (see Figure 7-27).

Figure 7-27: Pressure Adjustment Knob



3. Turn the knob to adjust the pressure.
   - Turning the knob clockwise increases pressure.
   - Turning the knob counterclockwise decreases pressure.
4. Once the gauge reads 90, push the knob downward to lock it into place.

Replacing Filter Element on the Filter / Regulator

The regulator uses a filter that must be replaced every 6 months. This filter can be purchased through MiTek. Refer to the Ordering Parts on page 161 for instructions on ordering parts. Use the following procedure to replace a filter element.

1. Remove pressure from the lines by using the procedure in Removing Pressure from the Pneumatic System on page 141.
2. Pull downward on the blue tab on the bowl and twist to remove the bowl from the regulator.
   - The blue tab may be located on the back of the regulator bowl.

3. Unscrew the black plastic baffle holding the filter element and remove it from the regulator.

Figure 7-28: Filter Element with Bowl Removed

4. Replace the filter element. Screw the black plastic baffle back into place.
5. Place the bowl back onto the regulator body by pushing up and turning. Make sure bowl is secure and the blue tab is in the locked position before returning pressure to the lines.

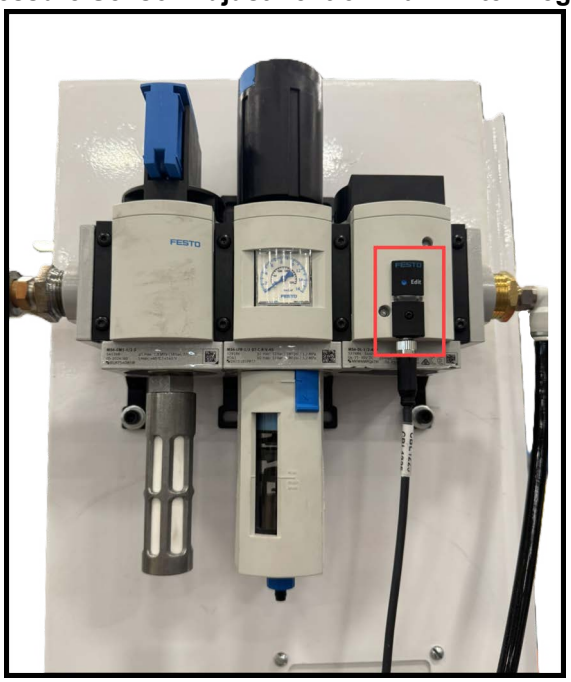
Adjusting the Main Pressure Sensor

The pressure sensor prevents the system from operating with inadequate air pressure. It sets the pressure at which the saw will no longer operate because it will not have enough pressure to perform its tasks. If the pressure drops below the minimum requirement, determine and fix the issue before attempting to cut boards.

The pressure sensor should not need to be adjusted under normal circumstances. However, knowing how to adjust this setting may assist in troubleshooting. Use the follow procedure to modify the pressure switch setting.

1. Set the main filter/regulator to the minimum operating pressure of 75 psi.
2. Hold the blue **Edit** button (see Figure 7-29) until it flashes.
3. Return the main filter/regulator to the standard system pressure of 80 psi.

Figure 7-29: Pressure Sensor Adjustment on Main Filter/Regulator Assembly



4. Replace the filter element. Screw the white plastic baffle back into place.
5. Place the bowl back onto the regulator body by pushing up and turning counterclockwise. Make sure it is secure before returning pressure to the lines.

Adjusting the Pressure on Additional Regulators

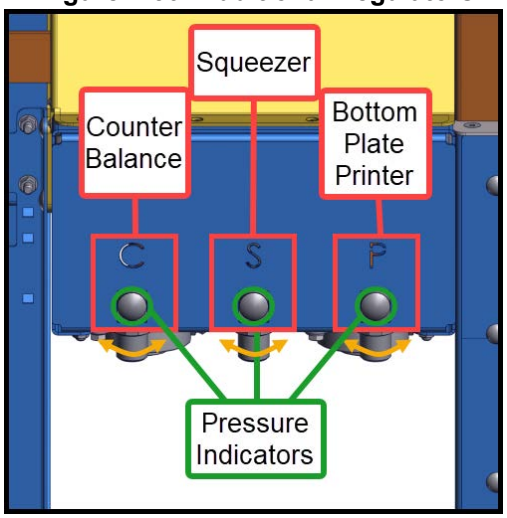
There are 3 additional regulators, located on the front of the gatekeep assembly as seen in Figure 7-30. They are labeled “C”, “S”, and “P.

- C - Counter Balance
- S - Squeezer
- P - Face Printer

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

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

Figure 7-30: Additional Regulators

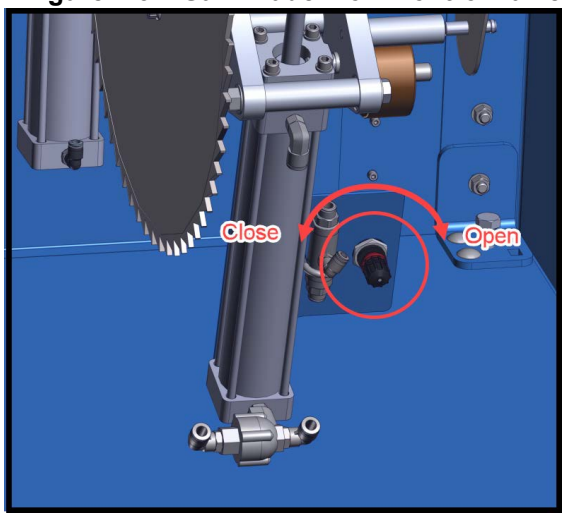


1. To adjust the regulator pressure, pull down on the black knob of the desired regulator and turn it either **CLOCKWISE** or **COUNTERCLOCKWISE**:
   - Turn the knob in a *clockwise* direction to **decrease** pressure
   - Turn the knob in a *counterclockwise* direction to **increase** pressure
2. Once the desired pressure has been reached, stop turning the knob, then push up to secure it in place and lock the pressure.

Saw Blade Flow Control Valve

There is a pneumatic flow control valve that controls the speed that the saw blade lowers into the saw chamber after making a cut. See Figure 7-31.

Figure 7-31: Saw Blade Flow Control Valve



Electrical System

A complete list of sensors is found in Figure 7-15. They are arranged in approximate order from the infeed to the oufeed side of the machine (facing the machine). Photos are shown on subsequent pages.

Sensor Overview

Table 7-15: Sensors List

Sensor Name	Description	See...
Fenceline/Infeed	Detects the presence of material on the infeed rail.	Figure 7-34
Overtravel	Detects the position of pusher on the infeed rail.	Figure 7-32
Print Squeezer	Verifies the presence of material in front of the squeezer before it engages.	Figure 7-32
Print Hood	Detects if the print hood is secured.	Figure 7-32
Blade Up	Detects saw blade position.	Figure 7-35
Blade Middle	Detects saw blade position.	Figure 7-35
Blade Down	Detects saw blade position.	Figure 7-35
Sweeper Retracted	Detects if the outfeed sweeper is retracted.	Figure 7-33
Saw Pin	Detects if the saw pin is engaged.	Figure 7-35
Front Door	Detects if the door is secured.	Figure 7-32
Back Door	Detects if the door is secured.	Figure 7-33
Hood	Detects the position of the hood.	Figure 7-32
Rear Plate	Detects the presence of the plate guard on the rear of the saw chamber.	Figure 7-32

Figure 7-32: Front of Saw Sensors

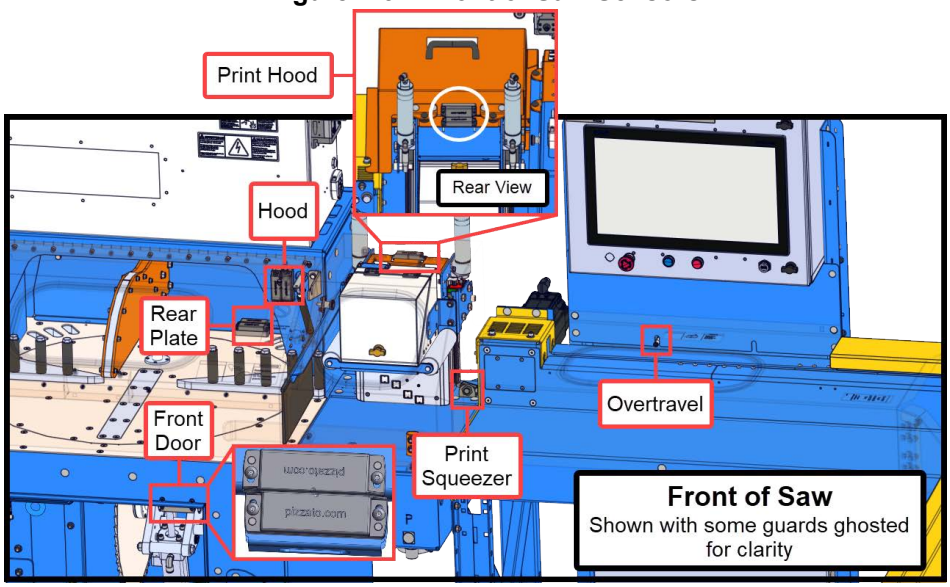


Figure 7-33: Rear of Saw Sensors

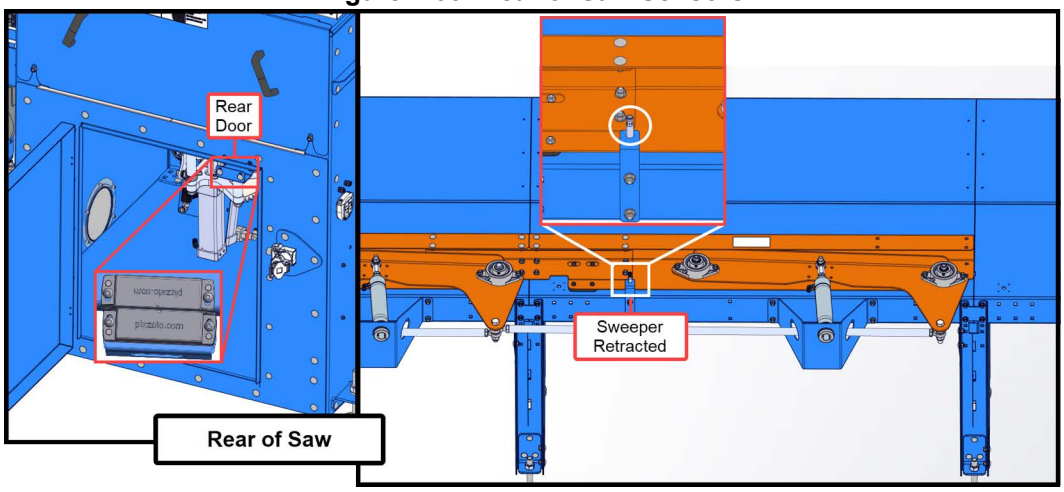
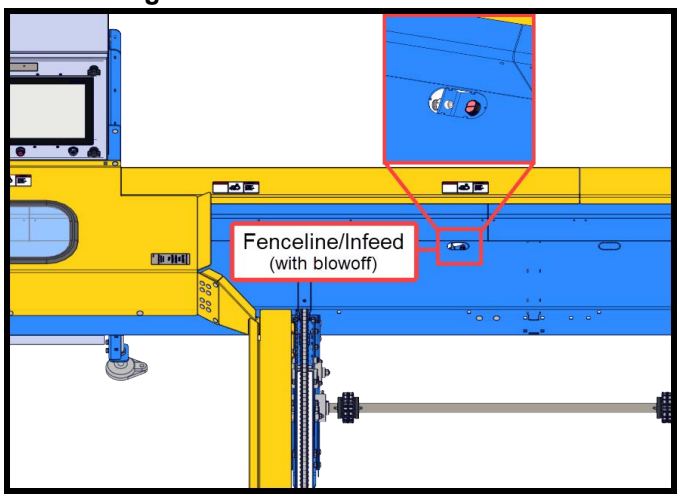
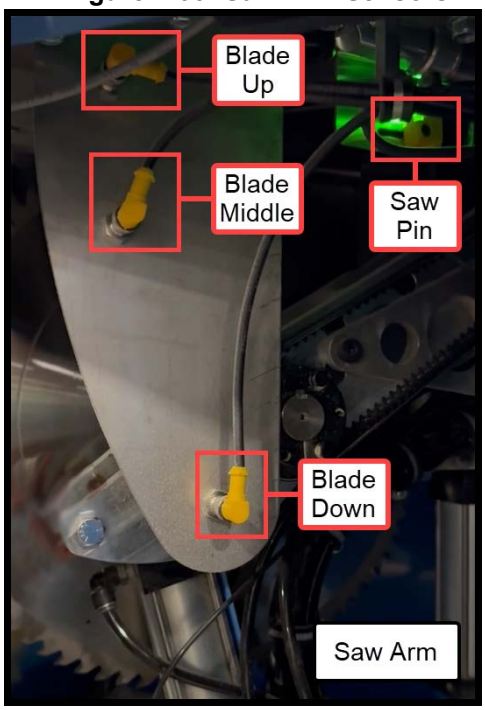


Figure 7-34: Fenceline/Infeed Sensor



The infeed sensor features a blow-off to prevent sediment forming that generates false positives.

Figure 7-35: Saw Arm Sensors



Electrical Enclosures

VFD (Variable Frequency Drive)

NOTICE
Do not modify any parameters on any VFDs unless instructed by Automation Support!

A VFD is an important part of several electrical circuits in the *Hornet II*. Verifying the voltage in and out of the VFD is always a good first step in the electrical troubleshooting process. See Figure 7-36 for the location of each VFD located inside the main electrical enclosure.

If the VFD experiences a fault, the error code will display on the VFD display and on the Operator Interface.

Automation Support is available at 800-523-3380

PLC (Programmable Logic Controller)

PLCs are located inside of the operator panel enclosure. See Figure 7-37. Please contact Automation Support for assistance with clearing unknown faults.

Figure 7-36: Main Electrical Enclosure

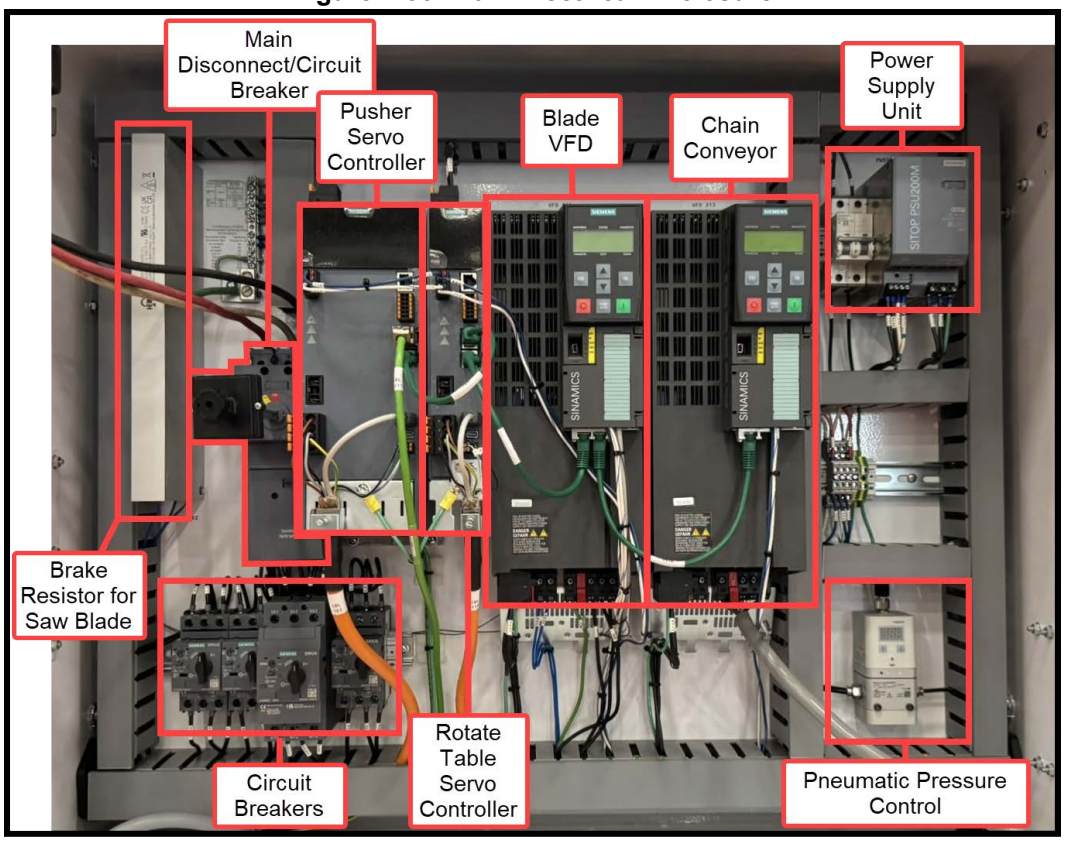


Figure 7-37: Operator Panel Electrical Enclosure

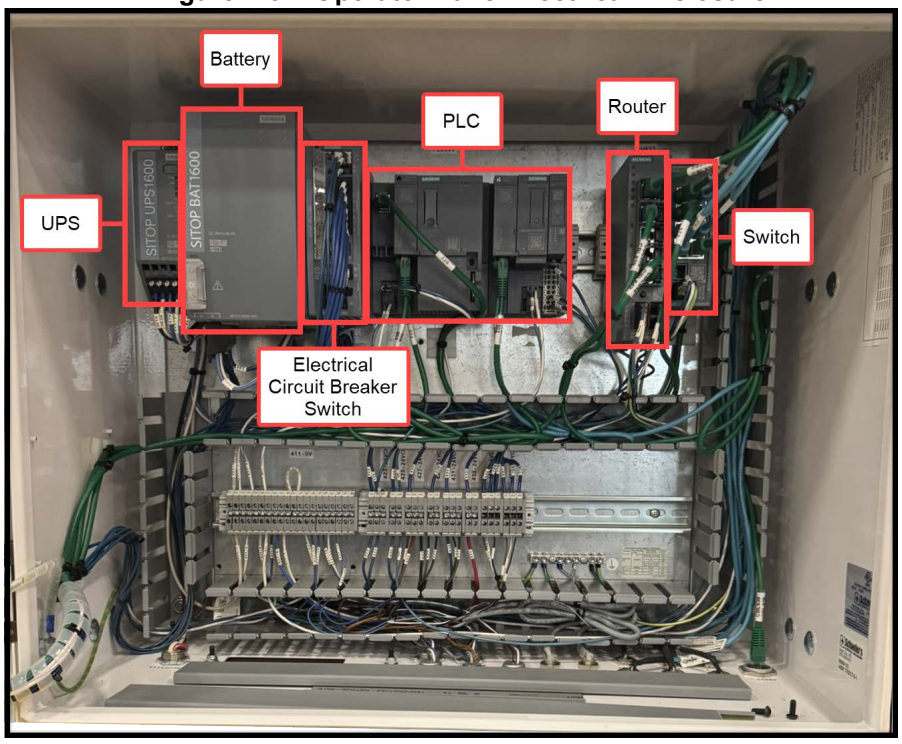
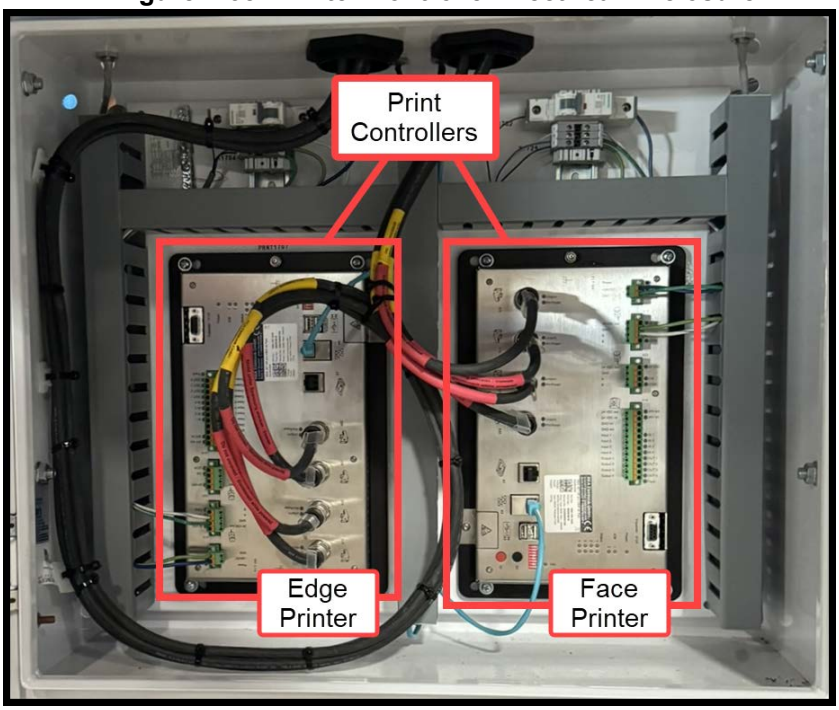


Figure 7-38: Printer Controller Electrical Enclosure



Software

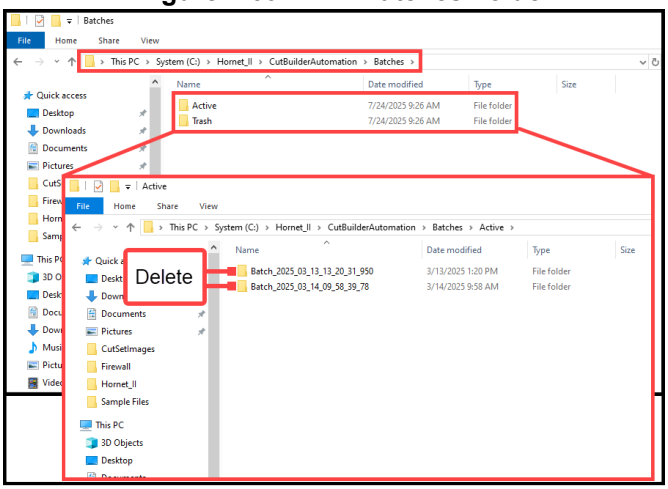
CBA Application Performance Preservation

Clearing Batches

The CBA application can experience significant delays when loading or importing new jobs if too many jobs accumulate in the Active and Trash folders. It is recommended to delete jobs from these folders using the following procedure on a regular basis.

1. Close CutBuilder by selecting Shut Down > **Shutdown CBA**.
2. Open the File Explorer and navigate to C:> Hornet II > CutBuilderAutomation > **Batches**.

Figure 7-39: CBA Batches Folder



3. In both the Active and Trash folders, delete all of the batch folders by selecting them, then using a long-press to open the menu and select **Delete**.

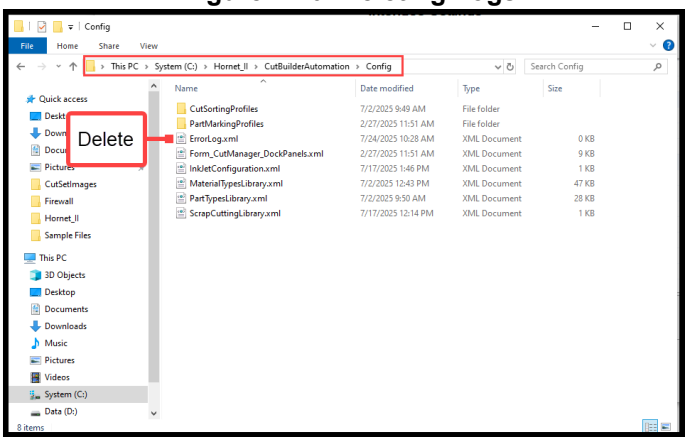
Relaunch the CBA application and resume normal operation.

Disable Logging

If there are significant delays when navigating CBA or with print images, disabling logging may help. To disable logging, use the following procedure.

1. Open the **Settings** menu on the Menu Bar.
2. Ensure the value for Diagnostics > Application Log is set to False. Use the drop down menu as seen in Figure 7-40 if it is not set to False.

Figure 7-40: Deleting Logs



3. Close CutBuilder by selecting Shut Down > **Shutdown CBA**.
4. Open the File Explorer and navigate to C:> Hornet II > CutBuilderAutomation > Config
5. Delete the ErrorLog.xml file by selecting it, then using a long-press to open the menu and select **Delete**.

CHAPTER 8

Troubleshooting

Getting Started with Troubleshooting

If you have reviewed the information in the *Maintenance* chapter and this chapter but have not solved your problem, please call MiTek Machinery Division Customer Service for assistance.

Safety Notes for Troubleshooting

Read the safety section starting on page 2. 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.**

	⚠ CAUTION
	**Always lockout/tagout unless it is absolutely necessary to have an energized machine for troubleshooting.** **This icon indicates that you must lockout/tagout at the appropriate disconnect switch using approved methods described in OSHA CFR 1910.147 before continuing with the procedure. In the absence of this icon, it is still your responsibility to lockout/tagout when possible.** **If it is absolutely necessary to troubleshoot an energized machine, follow NFPA 70E for proper procedures and personal protective equipment.**

Figure 8-1: Tools Required

When the toolbox shown in the margin appears, you should gather the tools listed below it before beginning the procedure next to which it appears.

Before beginning the troubleshooting process or calling MiTek Machinery Division Customer Service, gather the following tools:

- Insulated slotted screwdriver
- Insulated Phillips screwdriver
- Equipment manual and drawings, including any electrical schematics
- Pen and notepad
- Multimeter

  A multimeter is an electronic measuring instrument. The analog versions were referred to as a volt-ohm-meter (VOM). Digital models are referred to as digital multimeters (DMM). Your multimeter should have the following features:

  - Voltage (volts) measurement
  - Resistance (ohms) measurement
  - Current (amps) measurement
  - Ability to measure both AC and DC power
  - Autoranging feature
- PPE as required by NFPA 70e

First Steps

Mechanical Troubleshooting

Always clean and lubricate the equipment as a first step in most troubleshooting processes. Most mechanical malfunctions are caused by inadequate preventative maintenance.

Electrical Troubleshooting

1. Lockout/tagout at the disconnect switch located on the equipment.

	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.**

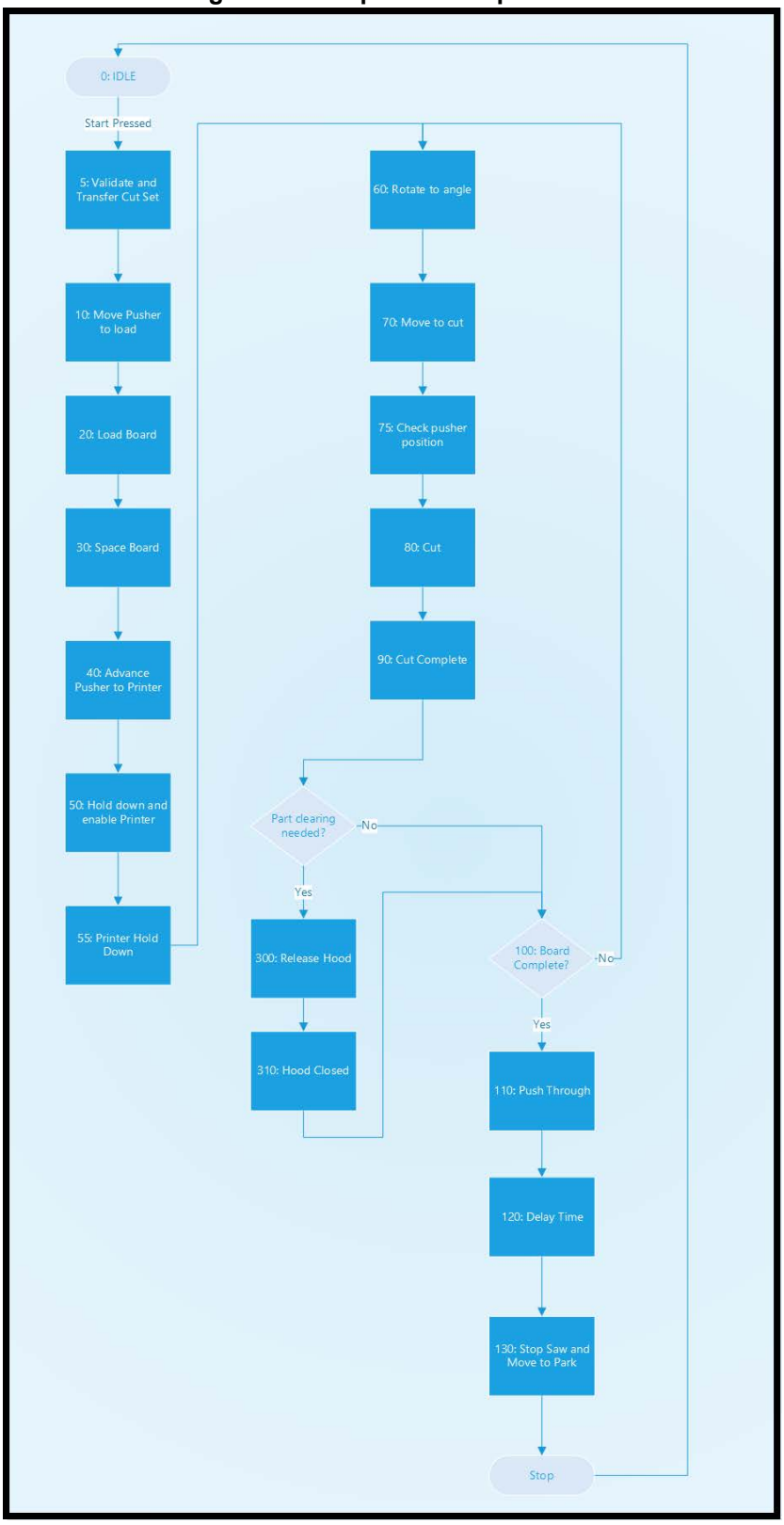
2. Vacuum and dust the electrical enclosure.
3. Remove the lockout/tagout equipment and attempt to run the Hornet II again. If that did not solve the problem, proceed with the next step.
4. Adhere to all regulations and guidelines given in NFPA 70e and in your company's energy control program.

	⚠ WARNING
	**ELECTRICUTION HAZARD.** **All electrical work must be performed by a licensed electrician.** **If it is absolutely necessary to troubleshoot an energized machine, follow appropriate guidelines.**

5. Determine where the electrical problem begins. To do this, you need a multimeter.
   - Determine if you are working with AC (alternating current) or DC (direct current) before checking voltage.
   - Measure incoming and outgoing voltage to and from components. Proceed in a logical order determined by your machine's specific problem, and write down the order that you check each component and the amount of voltage that the multimeter registers.

Sequence of Operations

Figure 8-2: Sequence of Operations



CHAPTER 9

Maintenance Checklist

Using the Maintenance Checklists

Copy these checklists and place the copies with the Hornet II. Leave the original checklists in this manual for future use.

Checklist
Daily Checklist on page 158
Weekly Checklist on page 159
Monthly Checklist on page 160

Safety Notes for the Maintenance Checklists

	⚠ WARNING
	**CUT AND CRASH HAZARD.** **Perform the safety tests described starting on page 12 before operating the machine after performing maintenance or repairs.**

	⚠ WARNING
 	**ELECTROCUTION AND HIGH PRESSURE HAZARDS.** **Always turn the power off by activating an E-stop when the machine is not operating.** **Always verify that all power to the machine is off and followed approved lockout/tagout procedures (OSHA 29 CFR 1910.147) before performing any maintenance.** **Turn off the air switch or shutoff valve if appropriate. Bleed pneumatic lines if appropriate.**

Should you lockout/tagout to perform this action safely?

Daily Checklist

Month and year _____

Week of _____

	⚠ WARNING
	**Lockout/tagout before performing maintenance.** **If power is required, make sure all personnel are clear of the restricted zone.**

Action	Shift	Page	Initials / Date					
Perform safety tests	1	12						
	2							
	3							
Blow off system, including Auto Loading Live Deck, Infeed Pusher, Saw Unit, and outfeed table	1	103						
	2							
	3							
Vacuum saw unit	1	103						
	2							
	3							
Clean printer nozzles	1	119						
	2							
	3							
	1							
	2							
	3							
	1							
	2							
	3							
	1							
	2							
	3							

Should you lockout/tagout to perform this action safely?

Weekly Checklist

Year _____

	⚠ WARNING
	**Lockout/tagout before performing maintenance.** **If power is required, make sure all personnel are clear of the restricted zone.**

Action	Page	Initials / Date					
Inspect linear bearing rails for lubricant (face printer)	123						
Replace saw blade	111						
Clear batches and delete logs to improve CBA performance	151						
Inspect sensors for debris and/or excessive buildup and clean as needed	146						

Date	Notes

Should you lockout/tagout to perform this action safely?

Monthly Checklist

Year _____

	⚠ WARNING
	**Lockout/tagout before performing maintenance.** **If power is required, make sure all personnel are clear of the restricted zone.**

Action	Months (one shift)	Months (two shifts)	Page	Initials / Date			
Check Auto Loading Live Deck alignment	1	0.5	100				
Inspect and lubricate the saw table support rollers	1	0.5	129				
Lubricate motor arbor and motor pivot bearings	1	0.5	124				
Inspect and lubricate the squeezer bearings	3	0.5	127				
Check oil level in all gearboxes	3	3	109				
Inspect and lubricate the auto loading live deck drive shaft bearings	6	3	126				
Inspect proximity sensors for stability and tighten locking nuts	6	6	146				

Date	Notes

Parts List

Ordering Parts

Use the MiTek web site to locate parts and part numbers, then order them using one of these methods:

By E-Mail	By Phone
Send an e-mail to mitekparts@mii.com with all relevant information, including the part number.	Call 1-800-523-3380.

Safety Notes for Replacing Parts

	NOTICE
	**Use only replacement parts purchased from MiTek.** **Parts from other sources may cause damage to your machine .**

	⚠ WARNING
 	**ELECTROCUTION AND HIGH PRESSURE HAZARDS.** **Always turn the power off by activating an E-stop when the machine is not operating. Follow approved lockout/tagout procedures (OSHA 29 CFR 1910.147).** **All electrical work must be performed by a licensed electrician.** **Always verify that all power to the machine is off and followed approved lockout/tagout procedures (OSHA 29 CFR 1910.147) before performing any maintenance.** **Turn off the air switch or shutoff valve if appropriate. Bleed pneumatic lines if appropriate.**

Drawing Set

Drawings are inserted in the back of the manual or included in a separate binder, depending on the machine.

Description	Drawing Number
Mechanical - RTL* Drawings are 501 and LTR Drawings are 502**	
Hornet II Saw Assembly	76720-501/502
Sweeper Table	76687-501/502
Sweeper Assembly	76685-501/502
Gatekeeper Assembly	76673-501/502
Bottom Plate Printer	76672-501
Saw Chamber	76686-501/502
Infeed Pusher	76883-501/502
Auto Loading Live Deck	76692-501/502
Electrical	
Saw Schematic	90668
Saw Electrical Assembly	90668-501
Main Electrical Enclosure Assembly	90668-502
Operator Interface (PC) Enclosure	90668-503
Printer Panel Electrical Enclosure	90668-504
Chain Conveyor Electrical Enclosure	90668-505
Outfeed Push Button Electrical Enclosure	90668-506
Infeed Push Button Electrical Enclosure	90668-507
Print Head Assembly	90668-610
Pneumatic	
Pneumatic Assembly	76711
Saw Chamber Valve Assembly	77150-501
Air Prep Assembly	77151-501
Stroke Cylinder Assembly	76502-501

**RTL = Right to Left*

***LTR = Left to Right*

Glossary

affected employee	an employee whose job requires him or her to operate or use a machine or equipment on which servicing or maintenance is being performed under lockout or tagout, or whose job requires him or her to work in an area in which such servicing or maintenance is being performed
amperage	the strength of an electric current, expressed in amperes
anchor plate	a steel plate that holds the tables in place; it is anchored to the concrete floor and the tables are welded to it
authorized employee	a person who locks out or tags out a machine or equipment in order to perform servicing or maintenance on that machine or equipment; an affected employee becomes an authorized employee when that employee's duties include performing servicing or maintenance covered under this section
Auto Loading Live Deck	a staging conveyor that feeds lumber to the Infeed Rail
energized	connected to an energy source or containing residual or stored energy
energy isolating device	a mechanical device that physically prevents the transmission or release of energy, including but not limited to the following: manually operated electrical circuit breaker; a disconnect switch; a manually operated switch by which the conductors of a circuit can be disconnected from all ungrounded supply conductors, and in addition, no circuit can be operated independently; a line valve; a block; and any similar device used to block or isolate energy—push buttons, selector switches, and other control circuit type devices are not energy isolating devices
energy source	any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy
layout	a scaled diagram of the location of components and the space that they occupy
lockout device	a device that utilizes a positive means such as a lock, either key or combination type, to hold an energy isolating device in the safe position and prevent the energizing of a machine or equipment, including blank flanges and bolted slip blinds; should be standardized within the facility in at least one of the following criteria: color; shape; or size; and additionally, in the case of tagout devices, print and format shall be standardized

lockout/tagout	a means of isolating a piece of equipment from its energy source so maintenance can safely occur; guidelines provided in OSHA 29 CFR 1910.147
operator control interface	the method in which the operator controls the machine; it may be a touch screen, a control panel, etc.
PLC	(programmable logic controller) a solid-state control device that can be programmed to control process or machine operations. It consists of five basic components: processor, memory, input/output module, the power supply, and the programming device.
port	a connection point for a peripheral device
qualified person	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—NEC2002 Handbook
regulator	a component of the pneumatic system that connects to the main air source and regulates the air pressure allowed into the system
tagout device	a prominent warning device, such as a tag and a means of attachment, which can be securely fastened to an energy isolating device in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed; should be standardized within the facility in at least one of the following criteria: color; shape; or size; and additionally, in the case of tagout devices, print and format shall be standardized
torque	a turning or twisting force
VFD	(variable frequency drive) controls the speed of the machine
voltage	Equal to the difference of electric potential between two point on a conducting wire carrying a constant current of one ampere when the power between the points is one watt
wane	a defect in a board where a portion of the wood is missing from the board edge or face
warp	a curve where the face of a board (3-1/2" side on a 2x4) is higher or lower in one spot than the rest of the board

A

B

C

E

F

L

M

O

P

R

S

V