MiTek

OPERATION AND MAINTENANCE MANUAL

001132

BLADE 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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MiTek

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BLADE II™ SAW

Part # and Rev.	001132 rev. B
Print Date	April 29, 2024
Effectivity	Frame 488
Revision Date	29 April 2024
Revised By	A. McIntire
Orig. Release Date	15 December 2023
Created By	A. McIntire

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

TABLE OF CONTENTS

SAFETY (ENGLISH)

Safety Indicator Signal Words

Refiérase a la página 25 para español.

For safety information in Spanish,refer to page 25.

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 17, but more specific text is provided every time a graphic is used throughout the manual.

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 17.

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 16**.
- 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 Emergency Stop on page 59 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 Hydraulic or Pneumatic System Lockout/Tagout Procedure on page 10 for more information about each type of lockout/tagout procedure.

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

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

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

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 8.

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.

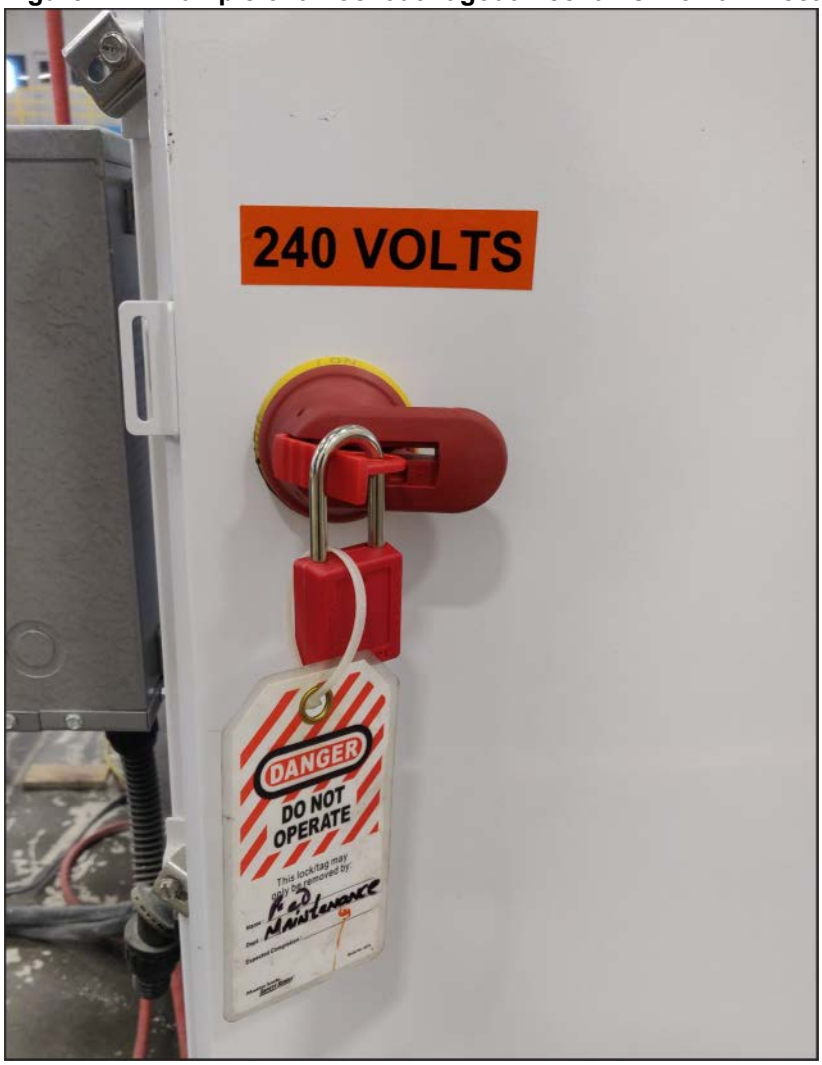
1. Engage an E-stop on the machine.
2. Turn the disconnect switch handle to the Off position. See Figure 1-1.

	⚠ 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, hydraulic components, and other parts that could have live or stored power.

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

Hydraulic or Pneumatic System Lockout/Tagout Procedure

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

When Lockout/Tagout Is Not Required

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

When Lockout/Tagout Is Required

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

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

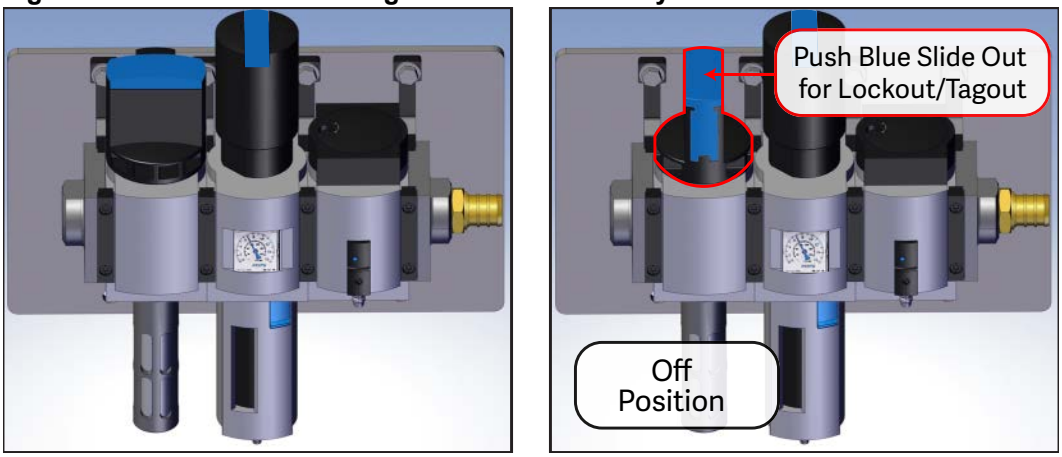


Figure 1-5: Sample of a Lockout/Tagout on a Pneumatic System

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
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

These test procedures MUST be performed by qualified personnel at startup and after ANY maintenance, adjustment, or modification. Testing ensures that the safety system and machine control system work together to 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 *BLADE II* saw for debris or tools that would block the path of parts. Remove any that you may find. The following locations are especially important:
   - Infeed component (Auto Deck or *Ranger*)

- Infeed Rail
- LASM clamp
- Infeed and Outfeed clamps
- Outfeed component (Skewed Conveyor or CDS)

4. Check saw blade condition (see When to Replace the Saw Blade on page 109)
5. Remove lockout/tagout and return electrical power and pneumatic pressure to the machine.
   - Power up the saw using the instructions on Powering Up or Down on page 68.
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 Overview of Pneumatic Components on page 148.
8. Without pressing the open-door pushbutton, pull on the door handle for each door (3 total) to verify all doors are closed and locked.

Inspecting Indicators

1. While performing any of the following safety tests, check to ensure the red **Blade In Motion** light located on the operator interface panel lights up when the blade is running.
2. While performing any of the following safety tests, check to ensure the beacon on top of the main electrical enclosure lights up when cutting is taking place.
3. Verify that all safety labels are present and legible.

Interlock Door Test

This test is intended to verify the interlock doors DO NOT open when the saw blade is in motion.

	⚠ 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 on Powering Up or Down on page 68.
   b) Place the machine in MANUAL mode using the switch on the operator interface.
   c) Start the saw motor by pressing the Saw Motor **START** button on the operator interface.
2. Attempt to open the following interlock doors by simultaneously pressing the open-door pushbutton and pulling on the door handle:
   - saw chamber
   - stroke / elevation (infeed)
   - stroke / elevation (outfeed)
3. If any doors open, immediately lockout/tagout the machine and contact Automation Support.

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 on Powering Up or Down on page 68.
   b) Place the machine in MANUAL mode using the switch on the operator interface.
   c) Start the saw motor by pressing the Saw Motor **START** button on the operator interface.
   d) Wait approximately 5 seconds until the blade is up to full speed.
2. Prepare a stopwatch to time how long it takes for the saw blade to stop.
3. Activate any one of the E-stops listed here and measure the time between pressing the E-stop and when the blade comes to a complete stop.
   - Operator interface E-stop
   - Electrical enclosure E-stop
   - Infeed Rail E-stop

- Other Infeed or Outfeed Component E-stops (will vary depending on setup)

4. Ensure that the blade and integrated components stop motion in a timely manner:
   - If the saw blade does not stop within 5-10 seconds, contact Automation Support immediately for resolution.
   - If all integrated components do not stop in a timely manner, lockout/tagout the entire wood processing system and arrange for a qualified service technician to troubleshoot and repair the equipment.
   - 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

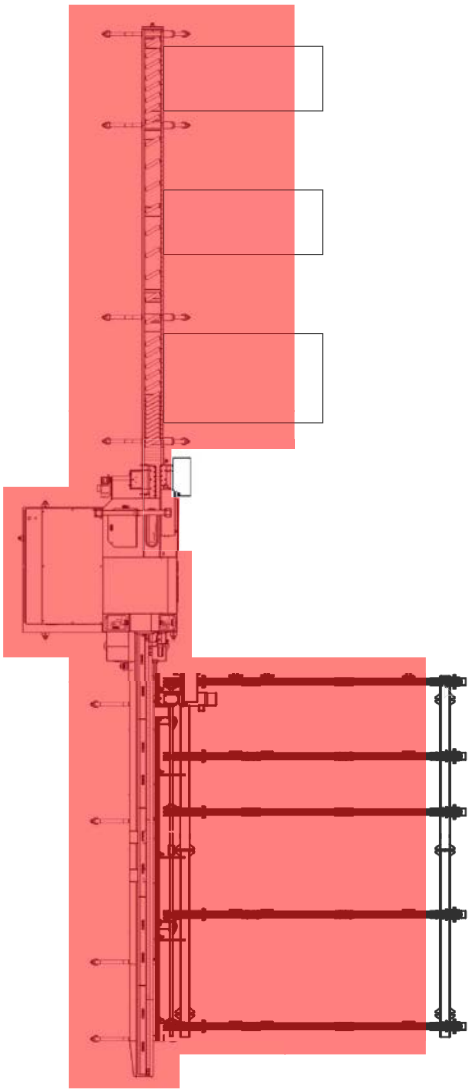
	⚠ CAUTION
	**CRUSH AND CUT HAZARD.** **Before turning on the equipment, make sure that all personnel and equipment are clear.**

1. With an E-stop activated, use the touch screen to attempt to manually move an axis.
2. Watch the axis 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. See page 57 for more details.

Safety Symbol Definitions

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

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

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

Crush hazard. Keep hands and other body parts clear.

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

Slip hazard. Use of appropriate footwear is required.

Trip hazard. Pay attention when walking in this area.

Kickback hazard.

Keep hands clear of cutting parts.

Keep hands and body clear.

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.

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.

Consult material safety data sheet.

Unplug equipment before servicing.

No smoking in this area.

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

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

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

Do not 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 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
- Electrical enclosures conform to UL 508A and are labeled for UL/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 un equipo de protección personal (por ejemplo, lentes de seguridad y protección auditiva) en un entorno industrial.
- Utilice una máscara protectora cuando trabaje cerca de aserrín.
- Use ropa adecuada. 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 16.**
- 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 59 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 en la página 31 y el Procedimiento de bloqueo/etiquetado del sistema hidráulico o neumático en la página 34 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 page 33.

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.

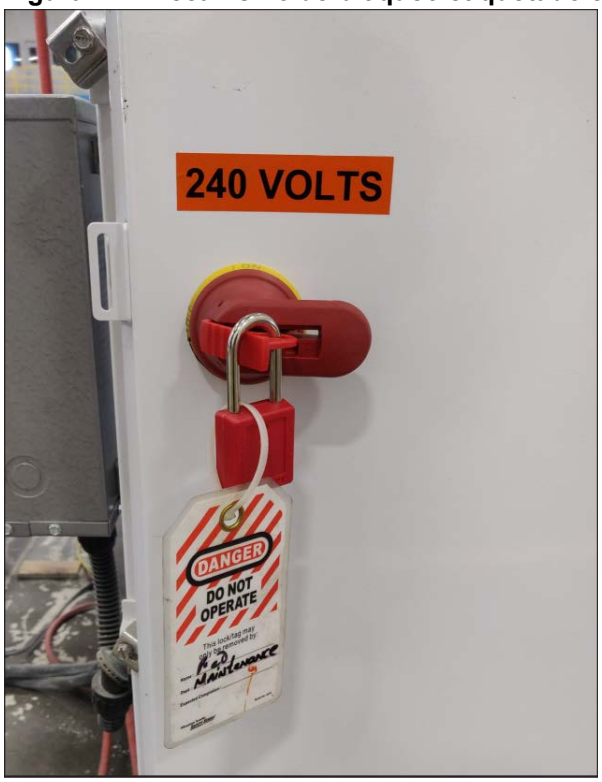
1. Coloque un paro de emergencia sobre la máquina.
2. Coloque el mango del interruptor con fusibles en la posición "apagado". Vea la Figura 2-1.

	⚠ 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

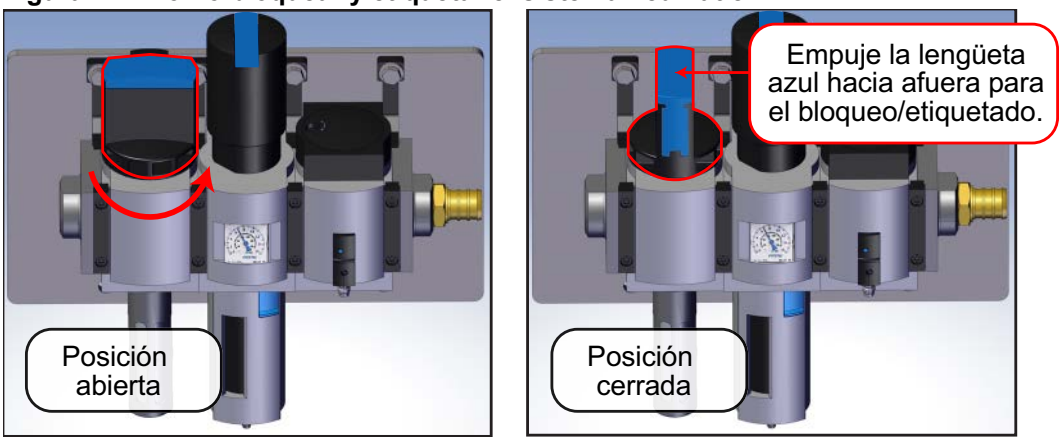


Figura 2-5: Cómo bloqueo/etiquetado el sistema neumático

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 BLADE II* no tenga desechos ni herramientas que pudieran obstruir sus piezas. Retire todo lo que encuentre. Los siguientes lugares son especialmente importantes:
   - Componente de alimentación (Auto Deck o *Ranger*)
   - Riel de alimentación
   - Prensa del LASM
   - Prensas de alimentación y de salida
   - Componente de salida (banda transportadora inclinada o CDS)
4. Verifique el estado de la cuchilla de la sierra (consulte Cuándo reemplazar la cuchilla de la sierra en la página 109)
5. Quite el bloqueo y etiquetado y restablezca la energía eléctrica y la presión neumática a la máquina.
6. Encienda la sierra según las instrucciones de Encendido o apagado en la página 68.
7. 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.
8. El filtro/regulador principal y otros subreguladores deben coincidir con los valores nominales de presión detallados en Descripción general de los componentes neumáticos en la página 148.
9. Sin presionar el pulsador de apertura de la puerta, jale de la manija de cada puerta (3 en total) para verificar que todas las puertas están cerradas y bloqueadas.

Indicadores de inspección

1. Mientras realiza cualquiera de las siguientes pruebas de seguridad, compruebe que la luz roja “*Blade In Motion*” (cuchilla en movimiento) en el panel de la interfaz del operador se encienda cuando la cuchilla esté funcionando.
2. Mientras realiza cualquiera de las siguientes pruebas de seguridad, compruebe que la luz en la parte superior de la caja eléctrica principal se encienda cuando se realicen los cortes.
3. Verifique que todas las etiquetas de seguridad estén presentes y sean legibles.

Prueba del interbloqueo de las puertas

Esta prueba tiene por objeto verificar que las puertas interbloqueadas NO se abran cuando la cuchilla de la sierra esté en movimiento.

	⚠ 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 68.
   b) Coloque la máquina en modo MANUAL con el interruptor en la interfaz del operador.
   c) Arranque el motor de la sierra presionando el botón **START** (arrancar) en la interfaz del operador.
2. Intente abrir las siguientes puertas interbloqueadas pulsando simultáneamente el botón de apertura de la puerta y jalando de la manija de la puerta:
   - cámara de la sierra
   - carrera / elevación (alimentación)
   - carrera / elevación (salida)
3. Si alguna puerta se abre, bloquee/etiquete la máquina de inmediato y póngase en contacto con el Soporte técnico de automatización.

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 68.
   b) Coloque la máquina en modo MANUAL con el interruptor en la interfaz del operador.
   c) Arranque el motor de la sierra presionando el botón **START** (arrancar) en la interfaz del operador.
   d) Espere aproximadamente 5 segundos hasta que la cuchilla avance a toda velocidad.
2. Prepare un cronómetro para medir el tiempo que tarda en detenerse la cuchilla de la sierra.
3. Active cualquiera de los paros de emergencia indicados aquí y mida el tiempo transcurrido entre que presiona el paro de emergencia y el momento en que la cuchilla se detiene completamente.
   - Paro de emergencia de la interfaz del operador
   - Paro de emergencia de la caja eléctrica
   - Paro de emergencia del riel de alimentación
   - Otros paros de emergencia de los componentes de alimentación o salida (variará en función de la configuración)
4. Asegúrese de que la cuchilla y los componentes integrados detengan el movimiento sin demoras:
   - Si la cuchilla de la sierra no se detiene en un intervalo de 5 a 10 segundos, póngase en contacto de inmediato con el Soporte técnico de automatización para que lo solucionen.
   - Si todos los componentes integrados no se detienen a tiempo, realice procedimientos de bloqueo/etiquetado en todo el sistema de procesamiento de madera y pida a un técnico de servicio calificado que diagnostique y repare el equipo.

- 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 step 3.

Prueba de movimiento mientras el paro de emergencia está activo

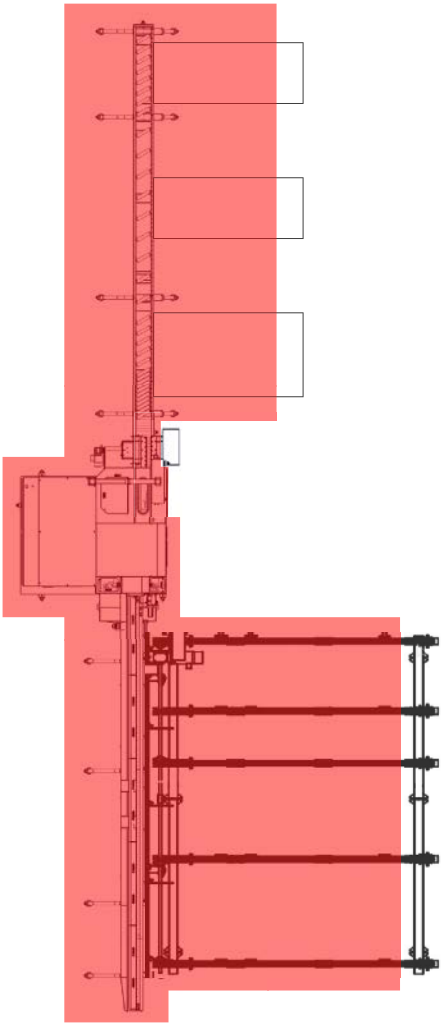
	⚠ CAUTION
	**PELIGRO DE APLASTAMIENTO Y CORTE.** **Antes de encender el equipo, asegúrese de que todo el personal y los equipos estén alejados.**

1. Con el paro de emergencia activado, use la pantalla táctil para intentar mover manualmente un eje.
2. Observe si el eje que 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. Refiérase a la página 57.

Información adicional

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

All text references colored blue (in form of page numbers, headings, etc.) 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

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 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 59. • Walk the operator through the Operating Procedure section: Operating Procedure on page 81.
Maintenance	• Walk the operator through the process of replacing a saw blade: Saw Blade on page 109. • Instruct the operator to review the Maintenance chapter to learn more about the necessary maintenance to keep their machine running optimally: Maintenance on page 91. • 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 189.

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

GENERAL INFORMATION

Introduction to the Equipment

Purpose of the Equipment

The *BLADE II* saw helps Roof Truss and Floor Truss Component Manufacturers cut more high-mix chords and web parts by avoiding machine downtime and increasing throughput with more green-light time.

Description of the Equipment

The *BLADE II* saw includes the following components:

- The **Infeed** component takes the lumber, in the correct order, to the infeed rail of the saw for cutting.
- The **Saw** component contains the board printer, the saw blade itself, and the waste conveyor.
- The **Outfeed** component receives and manages cut parts.

Aspects of these components can be further customized according to customer need. See the following pages for a more detailed overview of the entire system and the options available.

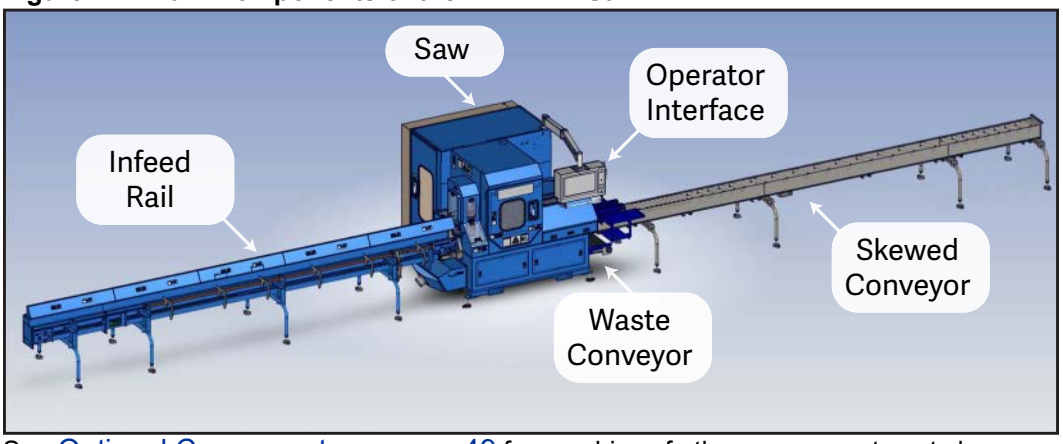
Safety Compliance of the Equipment

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 *BLADE II* Saw



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

Descriptions

Table 4-1 lists the components that are included with the different configurations of this equipment

Table 4-1: Machine Components

Name	Description
Infeed Component	Your machine will include one of two options determined during the ordering process: • An Auto Deck that transports the lumber (placed there by operator) and advances 1 piece at a time for automatic loading onto the Infeed Rail (16' and 20' options available). • An automated *Ranger* lumber retrieval system that picks the correct lumber (without an operator) and delivers it, in order, to the Infeed Rail.
Infeed Rail	Receives 1 piece of lumber and feeds it into the saw chamber. (16' and 20' options available)
Saw	Saw component where the printing and cutting occurs.
Outfeed Component	Your machine will include one of two options determined during the ordering process: • A powered skewed conveyor that arranges boards for operator removal (16' and 20' options available). • A Component Delivery System (CDS) that moves members from the saw to the tables without the need for manual sorting. The CDS is only offered as part of the DirectDrive system. See the Mitek website for more information.

Name	Description
Waste Conveyor	Moves waste from the saw to the point of removal. A standard and extended size are available.

Optional Components

Graphical Overview

Figure 4-2: Auto Deck (Infeed Component)

Figure 4-3: Ranger (Infeed Component)

Figure 4-4: Component Delivery System (Outfeed Component)

Descriptions

Table 4-2 lists the optional components that may be added at the point of sale or added later as a paid upgrade. Contact MiTek for more information (see Contact Us on page 46).

Table 4-2: Optional Saw Components

Name	Description
Additional print heads (up to 3 total)	The standard saw comes with one front face printer. You may also purchase or upgrade to an additional rear face printer and edge printer. See for more information on printing options.
AGS+	Assembly Guide System; prints joint and component locations and plates. Requires printer option E or F.
Incline waste conveyor	Works with the saw waste conveyor to move waste up an incline to reach the top of a dumpster.
Second monitor	Allows a second monitor for displaying truss/part data and production metrics. See Second Display Support on page 51.
Transformer for voltages other than 230 volt.	If the site voltage is anything other than 230 volts, a transformer is necessary.

Additional Printer Options

The ***BLADE II*** saw can be customized to use a number of different printer configurations

Table 4-3: *BLADE II* saw Print Head Configurations

Option	Description	Valve Configuruation
A	Standard with every saw. 1 print head prints standard print fields (text) on front face.	16 Front
B	Uses 2 print heads to print standard print fields, joint and plate information, and joint alignment marks all on the face-up side of boards.	16 Front / 7 Rear
C	Same as A, plus a 2nd print head to print on the top edge of boards.	16 Front / 7 Edge
D	Same as B, plus a 3rd print head to print on the top edge of boards.	16 Front / 7 Rear / 7 Edge
E	*AGS*+: Uses 2 print heads to print everything in B, plus plate outlines in correct location, and basic graphics all on the face-up side of boards.	32 Front / 32 Rear
F	*AGS*+: Same as E, plus a 3rd print head to print on the edge of boards.	32 Front / 32 Rear / 7 Edge

Second Display Support

The *BLADE II* saw supports outputting truss/part data and production metrics to a second display. When purchasing a monitor for this use, it is highly recommended to obtain the specifications listed here:

- Recommended screen size: 65"
- Supported screen resolution: 1920x1080
- Ports required: HDMI

Dust Extraction Methods

One port is provided for dust extraction from the saw chamber. We recommend working with a location dust extraction method to find a solution that meets the following criteria:

Airflow rate: 2100 scfm

Technical Specifications

Table 4-4: General Specifications

Specification	Data
Saw Blade	432 mm diameter (17")
Accuracy of each axis	1/32" and 0.1 degree
Printer	16 valves, front face (see Additional Printer Options on page 50)

Table 4-5: Lumber and Cut Capacity

Specification	Data
Edge of board	1-3/8" to 1-5/8"
Face of board	2-1/2" to 11-7/8"
Maximum length of board	16' (20' option available)
Shortest length to exit saw chamber	2"
Shortest length to enter saw via Auto Deck	6' (option available for shorter)
Min. or max. length of cut	infinite
Number of angle cuts	infinite

Table 4-6: Motor Specifications

Specification	Data
Saw blade	5 hp, 4200 rpm
Waste conveyor and lumber exit chain	.5 hp
Skewed Conveyor	1 hp
Auto Deck	1 hp

Table 4-7: Pneumatic Specifications

Specification	Data
Air source tank (if needed)	60 gallons minimum
Volume	110 psi at 73 scfm

Table 4-8: Electrical Specifications

Specification	Data
Voltage (VAC)	230 VAC (other voltages require transformer)
FLA plus controls (amps)	67
Disconnect switch fuses (amps)	100
Cycles (Hz)	60
Phases	3

Table 4-9: Dimensional Specifications

Specification	Data
Saw	10' L x 8' W x 6' 6"
System: Saw, 16' Infeed Rail, 10' deep Auto Deck, 20' Skewed Conveyor	46' L x 18' 5" W x 6' 6"
System: Saw, 20' Infeed Rail, 10' deep Auto Deck, 20' Skewed Conveyor	55' L x 18' 5" W x 6' 6"

Table 4-10: Weight Specifications

Specification	Data
Saw	8,900 lbs
Infeed rail - 16'	1360 lbs
Infeed rail - 20'	1600 lbs
Skewed Conveyor - 16'	900 lbs
Skewed Conveyor - 20'	1100 lbs

Table 4-11: Environmental Requirements

Operating temperature	40 to 122 degrees Fahrenheit (4 to 50 degrees Celsius).
Relative humidity	45 to 85 percent humidity
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 scanners must be:	Free of rain, fog, mist, sand, and bright sunlight

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.

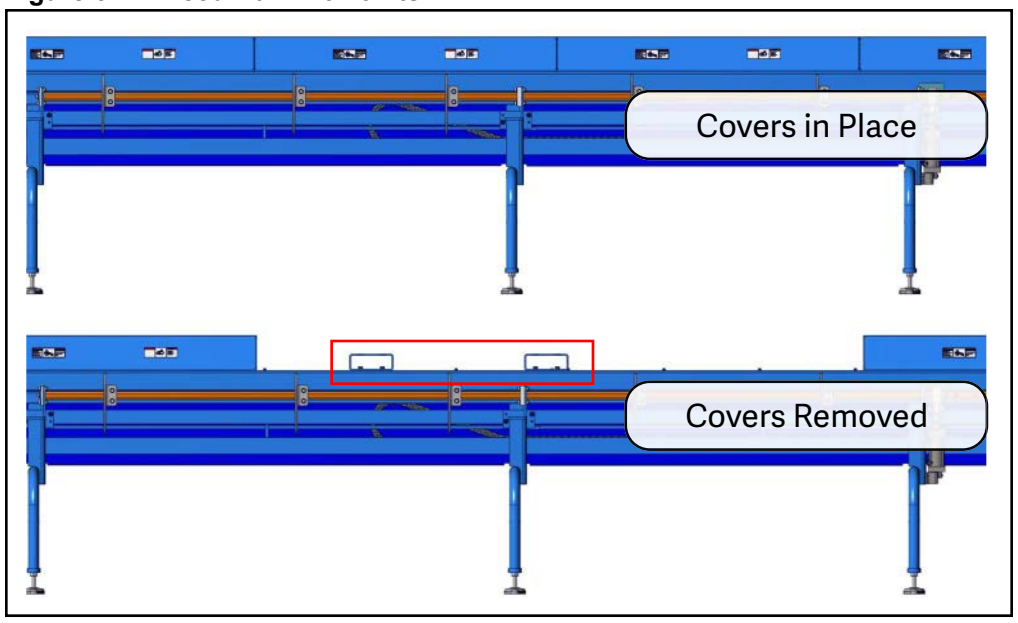
Transportation Equipment Requirements

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

Lift Points for Forklift

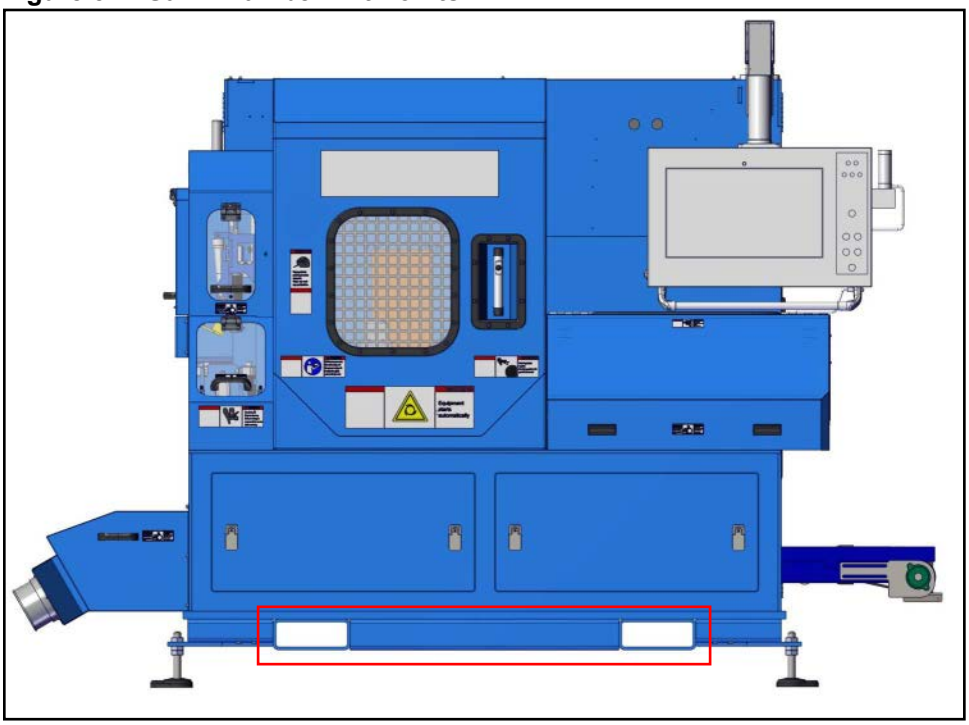
Infeed Rail

Figure 5-1: Infeed Rail Lift Points



Saw Chamber

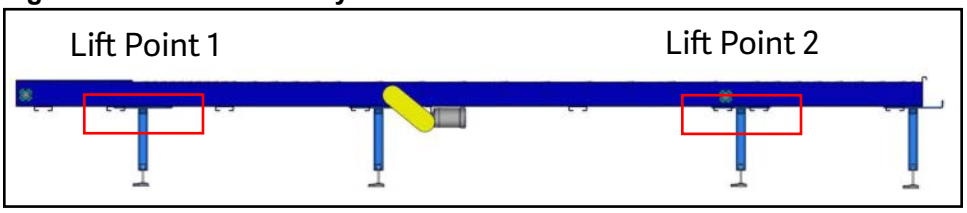
Figure 5-2: Saw Chamber Lift Points



Skewed Conveyor

The skewed conveyor does not include dedicated lift points. MiTek recommends using two forklifts to lift the skewed conveyor at the points shown in Figure 5-3. Lifting the skewed conveyor with a single fork lift may result in damage to the conveyor.

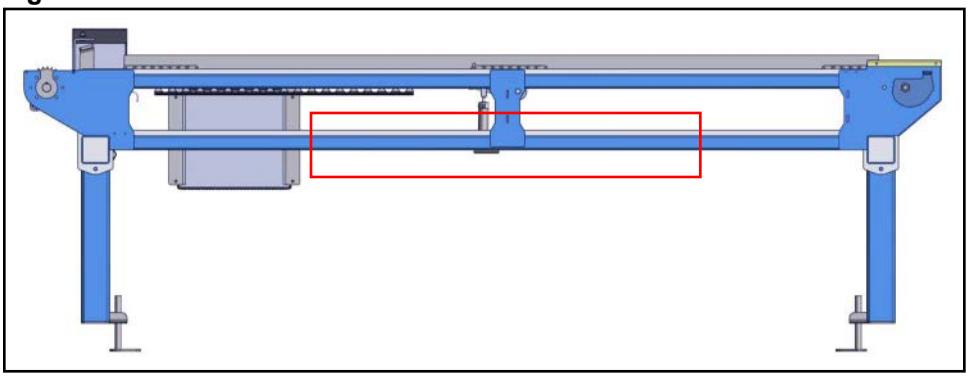
Figure 5-3: Skewed Conveyor Lift Points



Auto Deck

Depending on length, an Auto Deck is shipped in 2 to 3 sections. To lift a section, place forklift forks under the bottom, flat surface. Ensure the forks cover as much of a section as possible.

Figure 5-4: Auto Deck Lift Points



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.

Your equipment arrived with Service Bulletin SB181, which includes restricted zone tape and instructions for installing it. Additional restricted zone kits can be ordered as needed using the contact information found on Ordering Parts on page 194.

Safety Tests

Perform all 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 (see Marking the Restricted Zone on page 16).**

	⚠ 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

This *BLADE II* saw may be stopped by using a cycle stop or an emergency stop (E-stop). Engaging an E-stop will stop all movement on the Auto Deck, infeed rail, saw component, and skewed conveyor. It does NOT include other material handling systems, even those supplied by MiTek.

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

Cycle Stop

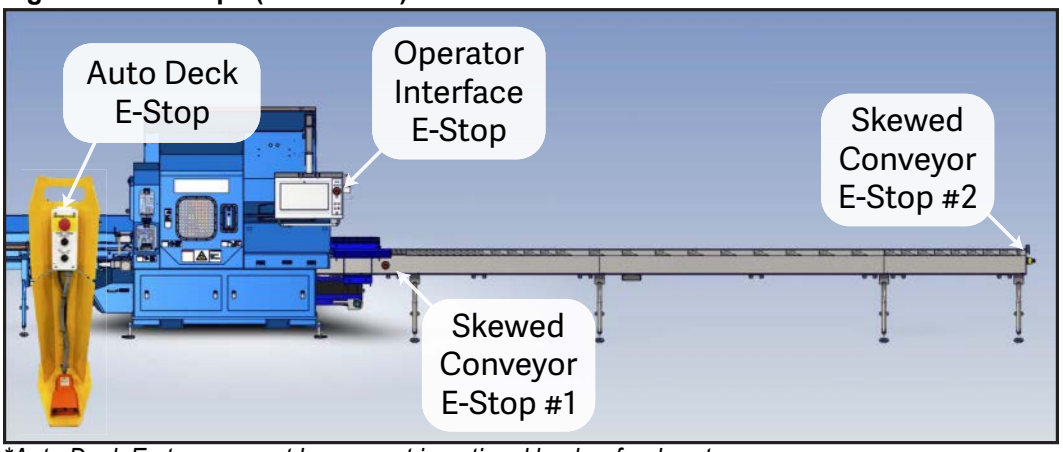
To initiate a cycle stop on this machine, select STOP CUTTING from the software tool bar (see Figure 6-11). This will stop the auto cutting sequence and turn off the saw blade motor after the last cut on the active board is complete.

Emergency Stop

There are 6 E-stops located on the main components of the *BLADE II* saw.

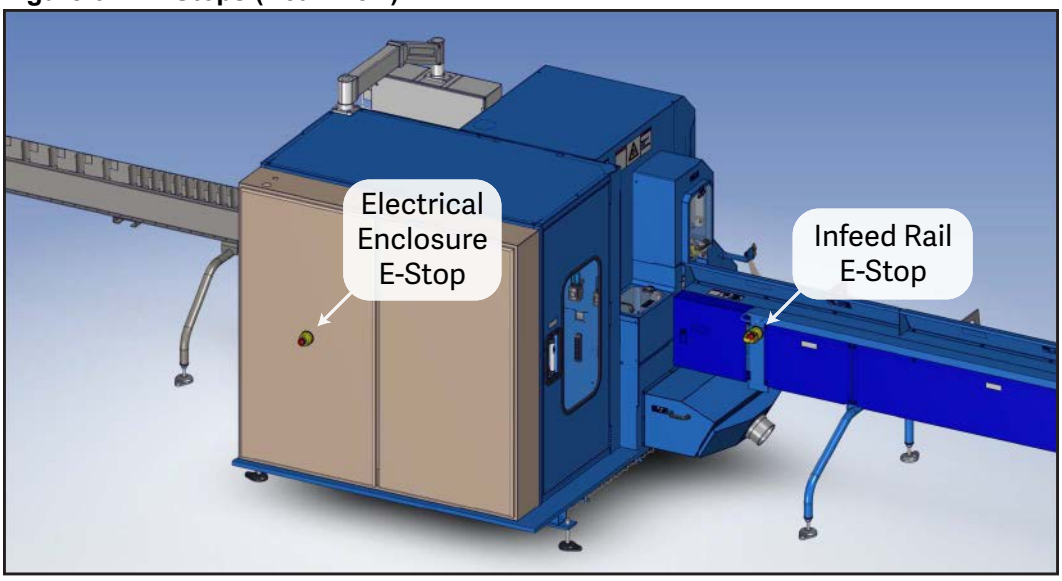
	⚠ CAUTION
	**CRUSH HAZARD.** **When an E-stop is released, the load arms on the Infeed Rail may automatically raise with high force.**

Figure 6-1: E-Stops (Front View)



**Auto Deck E-stop may not be present in optional lumber feed system*

Figure 6-2: E-Stops (Rear View)



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 pushbutton (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 need to be released is shown by selecting the **Doors/E-Stops** indicator on the home screen.
2. Press the blue **RESET** button on the operator interface panel (see Figure 6-8).
3. Resume normal operation. See Operating Procedure Overview (Auto Mode) on page 81.

Disconnect Switch

There are 3 disconnect switches located on the main components of the *BLADE II* saw.

Figure 6-3: 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

Auto Deck
Disconnect Switch

Skewed Conveyor
Disconnect Switch

	⚠ 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

There are three doors located on the saw chamber that are interlocked with the safety system to prevent entry while components are moving. These doors may be opened via two methods.

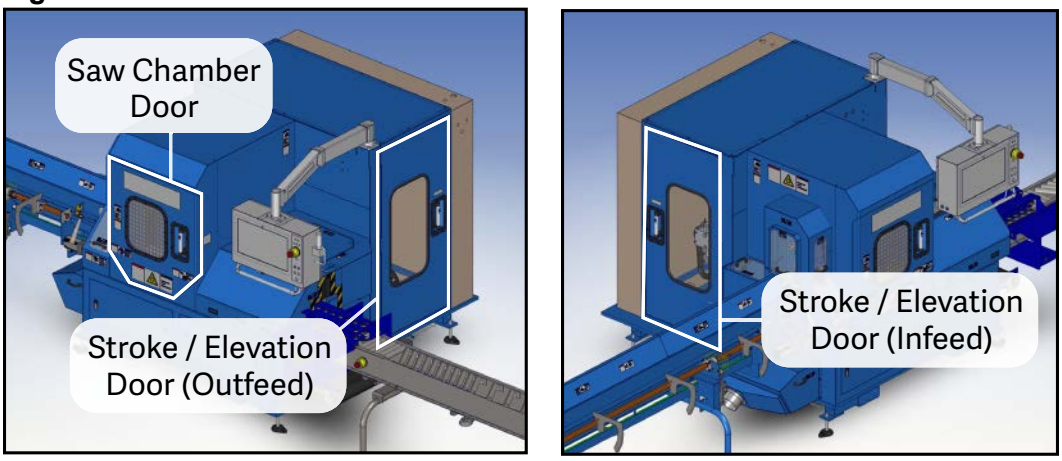
Door Handles with Open-Door Pushbuttons

The doors shown in Figure 6-4 include handles with open-door pushbuttons that, when held while pulling on the handle, will unlock the door if the following requirement is met:

- The green **Blade Stopped** indicator light on the operator interface is illuminated.

If the listed requirements are not met, the open-door pushbuttons will not work.

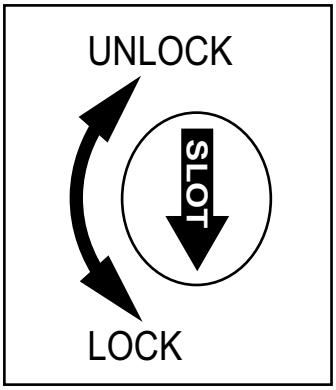
Figure 6-4: Pushbutton Door Locations



Door Interlock Switches

The doors shown in Figure 6-4 also include interlock switches that allow the doors to be manually opened by qualified maintenance personnel with the use of a flathead screwdriver. See Figure 6-5 for instructions on how to use and reset the interlock switches. The saw will not operate if an interlock switch is not returned to the lock position after use.

Figure 6-5: Interlock Switch Instructions



To open door without power:

1. **Turn the interlock switch one half turn to the unlock position to unlock.**
2. **Turn the interlock switch one half turn to the lock position to lock.**
3. **After returning power, open and close the door using the push button.**
4. **Press RESET on the HMI.**

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Maintenance Doors

There are a variety of maintenance 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 visual and audio indicators that communicate important information about the status of the machine.

Light and Horn Beacon

The beacon is located on top of the machine's main electrical enclosure. It indicates the following:

Red: A fault exists. The machine software will communicate what the fault is and what the next step should be. Some faults allow the system to continue cutting, other shut down all movement.

Yellow (flashing): The system is waiting for one of the following actions to occur:

- The Auto Deck to place a board on the Infeed Rail.
- The printer trigger to be turned on.
- The CLS to complete its reading

Green: System is operable and is in Auto Mode with no active faults.

Horn: The horn notifies the operator of errors and faults when in Auto Mode. The sound continues until the operator does one of the following:

- Acknowledge the error/fault on the HMI screen
- Turns the saw to Manual Mode
- Activates an E-stop

Figure 6-6: Light and Horn Beacon on Main Enclosure

Operator Interface Indicator Lights

The lights located on the operator interface indicate the following:

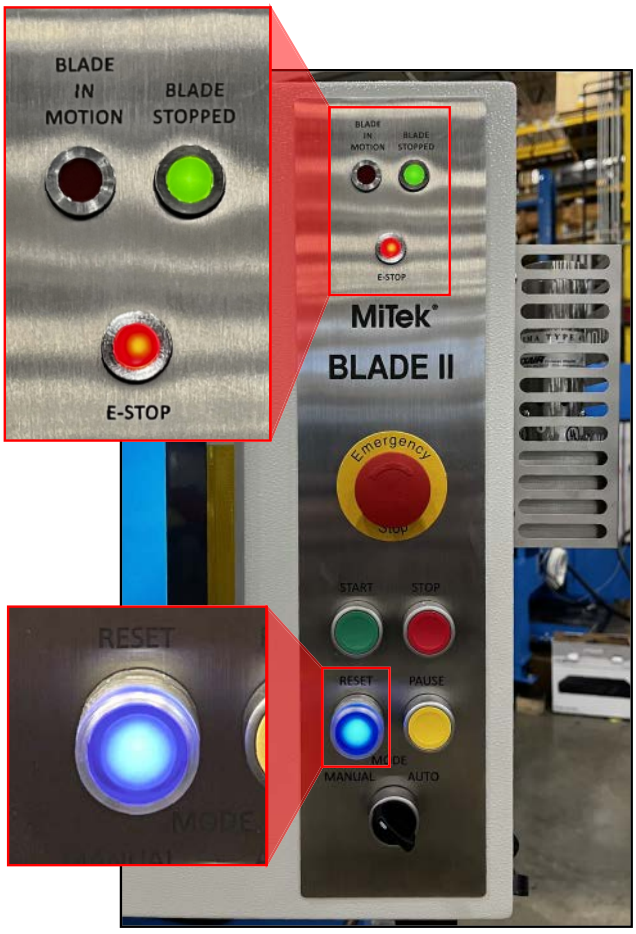
BLADE IN MOTION: Red light turns on when the blade is spinning. Certain doors can not be opened while this light is on.

BLADE STOPPED: Green light turns on when the blade is not spinning. This light must be on for certain doors to be opened

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, or a door is open.

Figure 6-7: Operator Interface Indicator Lights



Hardware Overview

Operator Hardware Controls

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

Operator Interface

Figure 6-8: Operator Interface Controls

Table 6-1: Description of Operator Interface Controls

Name	Function
E-stop	Stops all movement on the entire *BLADE II*.
Start	Starts the blade motor
Stop	Stops the blade motor (Manual Mode)
Reset	Restores the safety controller and re-enables main power to the system.
Pause	Pause the cutting process after completing the current cut.
Mode	Switches between Auto and Manual Modes using a 2-position switch

Name	Function
USB Ports	Can be used to connect a mouse or keyboard or other USB devices

Skewed Conveyor

The Skewed Conveyor will automatically start running when a cutting job has been initiated. To turn the Skewed Conveyor off (or back on), turn the selector switch to either the STOP or START position and release the switch. It is a spring-return switch, so it will always return to center when released.

Figure 6-9: Skewed Conveyor Controls

Auto Deck

The Auto Deck operation is integrated within the machine software in Auto Mode, but manual operation occurs at the control station pedestal shown in Figure 6-10.

Figure 6-10: Auto Deck Controls

Table 6-2: Description of Auto Deck Controls

Name	Function
E-stop	Stops all movement on the entire *BLADE II*.
Forward/Reverse (Deck Direction)	Controls which direction the Auto Deck staging conveyor chains run.
Raise/Lower (Lumber Stops)	Controls the lumber stops.The lumber stops serve two purposes: • To separate two different jobs that may be on the Auto Deck staging conveyor at the same time. • To create space within a job to reduce the amount of pressure or clutter near the load arms, especially when using a mixture of lumber lengths.
Foot Pedal	Press down and hold down to cause chain to travel. Load arms must be up for forward travel. See Preparing the Auto Deck.

Powering Up or Down

Daily Startup

1. Rotate the saw's disconnect switch to the ON position.
2. Rotate the disconnect switch for the Auto Deck or other lumber feed system to the ON position.

3. Double-click the *BLADE* software icon and wait for it to launch.
4. Press the blue RESET button on the operator interface.
   - 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 Emergency Stop on page 59).

Daily Shutdown

1. Select the machine software **Exit** icon on the ribbon menu and select **Yes** to verify.
2. Shut down the computer using the **Power** > **Shut down** method in Windows.
3. After the computer powers down, rotate the saw's disconnect switch to the OFF position.
4. Rotate the disconnect switch for the Auto Deck or other lumber feed or outfeed system (if equipped) to the OFF position.

Software Overview

This section covers the *BLADE II* saw software that is accessible through the operator interface. This software controls all of the main components that form the complete wood processing system. Other software (such as *Board Stretcher)* that also impacts the production process may be operated remotely.

The *BLADE II* saw operator interface is designed as a touch first device but it can also be used with a mouse and keyboard. 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

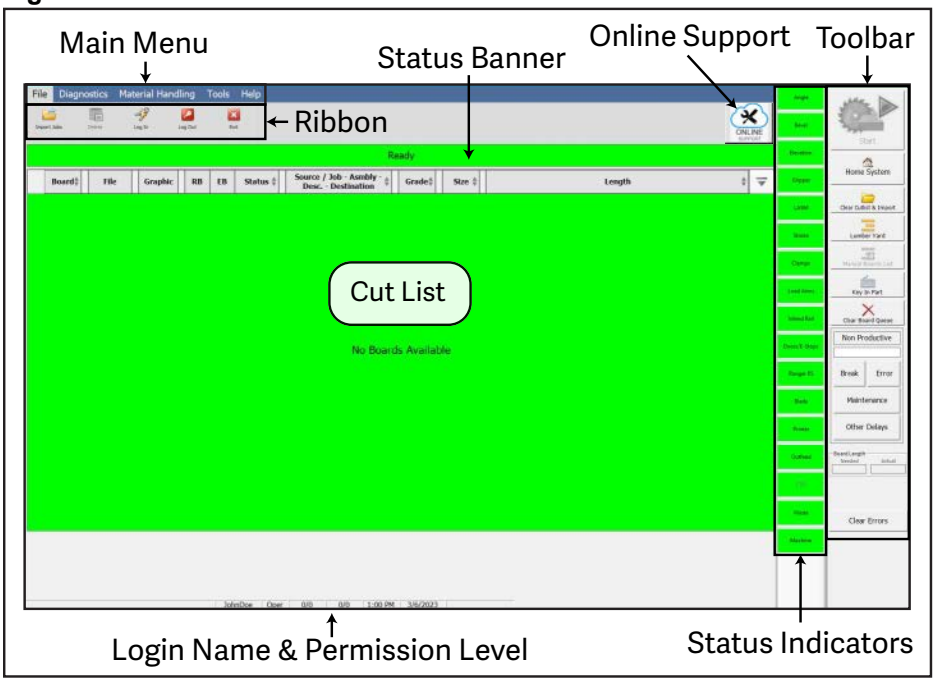
Long-press:

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

Overview of 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 6-11 shows each section of the home screen.

Figure 6-11: Home Screen Sections



Main Menu and Ribbon

The main menu refers to the selections at the top of the home screen. As shown in Figure 6-11, the functions within each main menu appear in the ribbon. See Main Menus in Detail on page 77 for a detailed description of each main menu and ribbon.

Online Support

This link will take you direct to the machine support page. Visit this site for links to the online version of this manual, video guides, and troubleshooting and trainer resources.

Status Indicators

The status indicators are shown in Figure 6-11. Table 6-3 gives a brief overview of each status indicator's purpose. If any status indicator is red, that component is not ready. To determine why a status indicator is lit or a component is not ready, select the indicator to display a second menu or additional data.

Table 6-3: Status Indicators on Home Screen

Name	Description
Status Banner	Status bar directly above the cut list window that displays one of the following, depending on the overall saw status: Not Ready, Ready, Clearing Saw, Active, Press Reset
Angle	Servo axis; turns the blade for angle cuts
Bevel	Servo axis; turns the blade for bevel cuts
Elevation	Servo axis; raises and lowers the blade assembly
Gripper	Servo axis; moves the gripper on the infeed rail
LASM	Servo axis; moves the LASM assembly that carries the boards through the saw chamber
Stroke	Servo axis; moves the blade forward/backward (in/out)
Clamps	Side clamp and top clamp on infeed side of saw
Load Arms	Load arms, located on Infeed Rail
Infeed Rail	Infeed Rail, including gripper
Doors/E-Stops	Indicates if saw chamber door and stroke/elevation door are closed and locked and all E-stops released
Auto Deck or Ranger RS	The lumber feed system
Blade	Saw blade rotation
Printer	The printer(s), located on infeed end of saw
Outfeed	Outfeed clamp and lumber exit chain
CDS (if present)	Provides diagnostic information about the Component Delivery System (CDS) if present
Waste	The integrated waste conveyor

Name	Description
Machine	Shows errors found in the Machine tab under **Diagnostics** > **Detailed Diagnostics**, including E-stops, and Auto/Manual Mode switch. Additional troubleshooting must be done using Diagnostics which requires administrative permissions.

Toolbar

The Toolbar stays active at all times on the Home Screen. Some buttons may change function or become unavailable (greyed out) due to the status of the saw.

Table 6-4: Toolbar Buttons

Name	Description
Start (Auto Mode)	START begins feeding lumber into the saw chamber and cutting. Saw motor must be turned on manually first. The button turns to STOP while saw is actively cutting. STOP (appears when cutting) stops the auto cutting sequence AND turns off the saw blade motor after the last cut on the active board is complete.
Home System (Manual Mode)	Places all axes in their home positions.
Clear Cutlist & Import	Imports a new job file and clears previous jobs out of the job queue. To import jobs without deleting previous jobs, go to **File** > **Import Jobs**.
Lumber Yard	See Lumber Yard on page 72 for more details.
Manual Boards List	Displays the boards required for this job.
Key In Part	Allows parts to be added to the Cut List or remainders list. See Key In Part on page 73.
Clear Board Queue	Erases the record of what the infeed system already has in queue (usually the next 1-4 boards to be cut).
Non-Productive	Allows the operator to indicate what the saw is doing when it's not running. See Recording Non-Productive Time on page 87.
Board Length	Indicates the length of the board needed to make the planned cuts, and the actual length of the active board. The actual board must be equal to or longer than the board needed.
CLS Status	Indicates the lumber crookedness measured by the CLS.
Clear Errors	Clears all software errors and allows the saw to continue running (if safe).

For additional details on how to use the Lumber Yard, refer to the *Board Stretcher* Training Manual.

Lumber Yard

The Lumber Yard is where the operator can see the lumber required for the active job, and assign specific lumber to specific stations in the lumber feed system. See below for important terminology for understanding the functioning of this aspect of the machine software:

- **lumber**: a group of boards or a non-specific board

- **board**: a specific piece of lumber required by the saw to cut out specific parts; lumber becomes a board when the software decides exactly how to use it
- **infeed component***:* any component that feeds lumber to the Infeed Rail; usually the Auto Deck staging conveyor or the *Ranger*
- **station**: a physical location on a lumber retrieval system

Figure 6-12: Lumber Yard Screen

The bottom half of the screen is the **Lumber Inventory**. It is a list of the previously used lumber used to be delivered by the lumber feed system for the active job.

The top half of the screen is the **Required Lumber**. It shows lumber required for the job by the lumber feed system.

1. To assign a Required Lumber to a specific spot in the Lumber Inventory, just drag it down and drop it on the desired station.
   - For a manually loaded lumber feed system, such as the Auto Deck, the software views all lumber as manual and it doesn't matter what device ID each lumber type has. There is no need to make specific assignments.
   - For automated feed systems, the virtual lumber must be assigned to the station where the actual lumber is located.
2. To change a lumber assignment, select the CLEAR button in the row of the assigned lumber inventory.
3. To choose the number of Lumber Inventory rows displayed, go to **Tools** > **Options** > **Material Handling**.

Key In Part

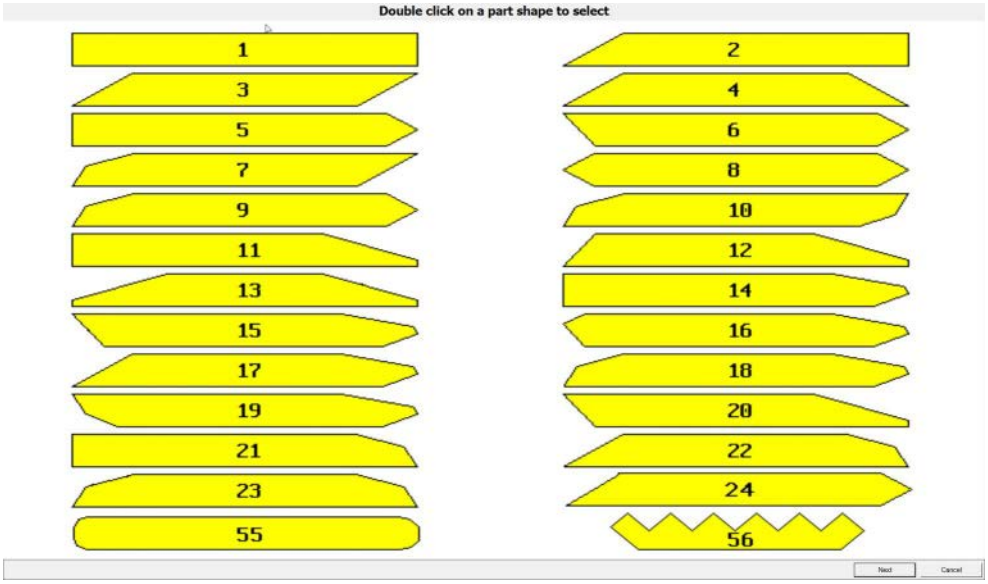
To add remainders from parts in the Cut List, right-click on the part.

Selecting The Key In Parts buttons displays the part Key In dialog and allows parts to be added to the Cut List or remainders list.

The Key In Select screen shown in Figure 6-13 contains specific part types to choose from. Double-click the part type that looks most like the part that needs to be cut.

- The next window displays a list of possible places to get the lumber from. If using an Auto Deck, there will not be a choice of how to load the board.

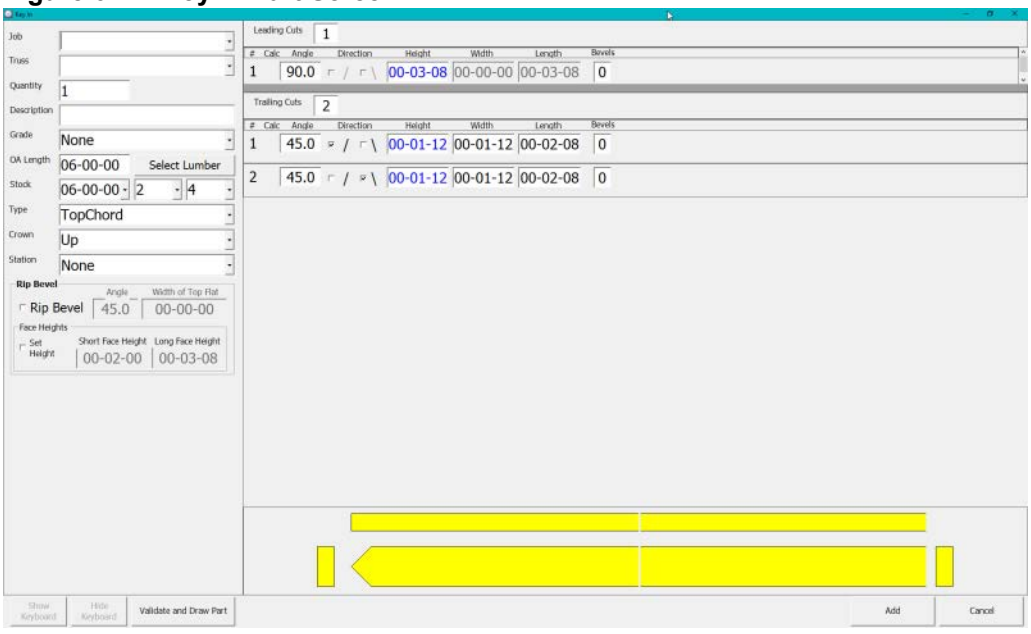
Figure 6-13: Key In Part Select Screen



The Key-In screen, which opens after selecting a part, allows the operator to enter the details of the part (see Figure 6-14).

- If using a lumber feed system that allows stations to be chosen, the Grade, Stock Size, and Stock Length will be populated for boards being loaded from a station.
- If a manual board is selected, the operator populates the following fields: Lumber Grade, Stock Size, Overall Length, Stock Length, Chord, and Crown.

Figure 6-14: Key In Part Screen



Most fields in the Key-In screen are populated according to the part you chose on the Key-In Select screen, but many of the fields can be modified, including adding a bevel.

If entering dimensions, one of the cuts must be calculated to ensure correct cutting of the part.

Other functions include:

- **Validate and Draw Part** updates the part based on the information entered.
- **Add** to add the part to the Remainder or Cut List.
- Rip Bevel allows the operator to set the short side to a specific dimension in order to create specifically-sized blocks or boards that are not in a Job file.

Cut List Screen

Cut List Column Headings

Table 6-5 gives a brief description of each column's purpose. More detail is given in subsequent pages.

Figure 6-15: Cut List Column Headings

Table 6-5: Cut List Column Heading Descriptions

Name	Description
Board	The index of the board (the identity or order of the board in that job).
File	For boards, it is the name of the file that the boards were imported from. For parts, it is the order that the part will be cut in.
Graphic	Displays an image of the cut part.
RB/EB	Signifies that there is a rip bevel (RB) or end bevel (EB) on the board.
Status	• Complete: The board or part has been cut. • In Process: The part is being cut. • Queue: The part is loaded onto the load arms located on the Infeed Rail. • Rejected: The part will not be cut. • Infeed: A board in the job that has not been processed.
Source/ Job-Truss-Desc.	For boards, it is where the board will be loaded from. For parts, it shows the job name, truss description, and part description
Grade	Grade of board
Size	Board dimensions. For example: 2x4 (for Imperial units), or width of the board in millimeters (for metric)
Length	Length of board and overall length of the parts.
Select Board Arrow	Select the arrow to choose Current Board, Top of List, or Bottom of List.

Long-Press Menu From Cut List

When a board is first selected and then long-pressed in the Cut List, most of the choices in Table 6-6 are available. When a part is long-pressed, fewer choices are available.

Table 6-6: Cut List Long-Press Menu Descriptions

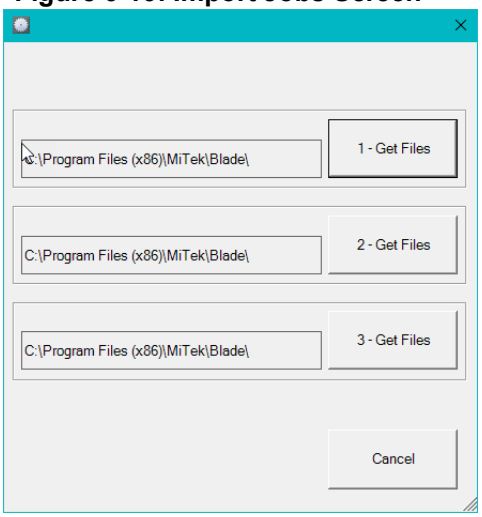
Name	Description
Start Cutting Here	Skips previous boards in the Cut List and begins cutting with the selected board.
Cut (Auto Mode)	Use to cut a single board. Procedure is on Cutting 1 Board on page 83.
Redo	Cuts the selected board or part again. The stock length is chosen in the Redo window but must be adequate length.
Reject	Rejects the current board so it will not be cut. A rejected line is highlighted in red and moved toward the top of the Cut List.
Reject Series	Rejects a series of boards listed consecutively in the Cut List as chosen by the operator. See Rejecting or Resetting Jobs and Boards for selecting a series.
Reset	Resets the current board so it can be re-cut.
Reset Series	Resets a series of boards listed consecutively in the Cut List as chosen by the operator. See Rejecting or Resetting Jobs and Boards for selecting a series.
Add To Queue	Adds the current board to the material handling queue.
Remove From Queue	Removes the current board from the material handling queue.
Add to Remainders	Only available when a part is selected (not a board). Add the selected part to the Remainders list. See Adding Remainders to view the Remainders list.

Main Menus in Detail

File Menu

- Import Jobs: Allows files to be imported to Cut List. The different network options are customizable default folders for common job file directories (see Figure 6-16). Use Get Files to browse to a specific location if needed.

Figure 6-16: Import Jobs Screen



The address to the default folders can be changed in **Tools** >**Options** > **File Import** with Administrator or Technician permission levels.

- Jobs Stats/Delete: Allows parts to be deleted from Cut List.
- Log In: Only required if site management sets it up in **Tools** > **Options** or if needing technical or administrative permissions.
- Log Out: Can alternate between operator, technical, or administrator level permissions by logging out the current user. Log back in using the Log In button.
- Exit: Exits the program.

Diagnostics

Abort Cutting Sequence: Cancels current cutting sequence. After cancellation, the software asks how to handle the board that was just active. Use if the saw becomes unresponsive due to PLC miscommunication.

Visualize:	Displays an image of the saw components and active board at any point in time. The image changes as the position of the components move.
Logs:	Allows detailed information of each part or board to be displayed, including print information.
Detailed Diagnostics:	Brings up a set of tabbed menus for specific components. The data here can be viewed by anyone, but administrator or technician permissions is needed to change some fields.
Air Cut:	For troubleshooting purposes; tells the system to function even though the sensors are not detecting boards to cut. Automated feed systems are not included in the operation during Air Cut. Click on the checkbox to turn on or off. Places a yellow Air Cut band across the START button when the feature is on.

Material Handling

View Remainders:	Shows the remainder list and allows the operator to manage the list and the options for each part. To add a new remainder part, see Managing Remainders.
Reset Unprocessed Boards:	Reset all boards in the active job so the job can be started over or skipped. An operator may reset specific boards (using long-press menu) after resetting or rejecting all boards
Reject Unprocessed Boards	Rejects all boards in the active job so the job can be started over or skipped. An operator may reject specific boards (using long-press menu) after resetting or rejecting all boards.
Pick List	Displays a list of boards necessary to process the current job. It is grouped by grade and size. To view the boards in the order they will be cut, use the Manual Boards List button on the Toolbar.

Tools

Pre-Calibration Boards:	Use specific boards and cuts to aid in calibration.
Calibrate:	Allows the servos, printer, and CLS to be auto-calibrated.
Options:	Contains option sub-menus for various aspects of the machine.
Configuration:	Advanced function to change configuration items. Should not be used under normal circumstances
Plant:	Allows the company information to be entered which auto-fills some fields when contacting technical support through the Help Menu
Current Shift Reports:	Provides production data, board usage, and non-productive time data per shift.

Help

View Help:	Opens the help procedure tool. Start a procedure a follow the on-screen instructions.

Remote Support:	Links to a web site where MiTek can remotely troubleshoot. MiTek must provide login information before using this site.
Contact Us:	Opens the send error tool.
Email Troubleshooting Data:	Opens the Email Troubleshooting Data tool. Fill in all fields to ensure useful troubleshooting reports.
About:	Displays the *BLADE* software version number and backup and renew functionality.

Quick Software Troubleshooting

Additional information can be found in Troubleshooting on page 174 and on the MiTek website, but the most common operator interface problems can be solved by following the instructions here. Specifically, if a button or field is grayed out or not available, try these steps first.

1. Read the software status banner for information about the status of the saw. If the solution is not clear from the status banner text, continue this procedure. The most common status clues that will quickly solve the problem are:
   - Emergency Stop: Locate and disengage the active E-stop.
   - Press E-Stop Reset: Press the blue RESET button on the operator interface.
2. Check that saw is in the correct mode using the selector switch on the operator interface.
3. Press **CLEAR ERRORS** on the Toolbar.
4. Press **HOME SYSTEM** on the Toolbar.
5. Determine if Admin or Tech permissions are required and log in as such.
6. Check for active E-stops and release them. Then press **RESET**.
7. Check that AIR CUT is not active (yellow banner across START CUTTING button).

Board Stretcher Software

For instructions on using our optimization software, see the *Board Stretcher* manual on the MiTek website.

Operating Procedure

This section instructs operators how to effectively use the *BLADE II* saw. This machine offers two operating modes (AUTO and MANUAL) but it is designed be used in AUTO mode for standard production. MANUAL mode may be required for troubleshooting, performing maintenance, or changing software settings.

Operating Procedure Overview (Auto Mode)

Table 6-7: Operating Procedure Summary

Step #	Summary Steps	See Section
1	Power up the system.	Daily Startup on page 68
2	Press the blue Reset button on the operator interface.	Operator Interface on page 66
3	Setup the lumber feed system with the correct lumber.	Preparing the Auto Deck on page 82
4	Select Home System on toolbar to home system.	Toolbar on page 72
5	Import the correct job files.	Importing Job Files on page 83
6	Verify the saw is in Auto Mode and press Start to start the saw blade motor.	Operator Interface on page 66
7	Select Start on the toolbar to begin cutting a job.	Toolbar on page 72
9	Depending on the scenario, use one of the following methods to stop the saw: • Select **Stop** in the software toolbar to stop after the current board is finished (same button used to start cutting). • Select **Diagnostics** > **Abort Cutting Sequence** in the software main menu • Press the hardware **Pause** button on the saw's operator interface panel to pause the saw after the current cut is complete. • In Manual Mode, press the hardware **Stop** button on the saw's operator interface panel. • For emergency situations, activate any E-stop that is integrated with the system.	Stopping Methods on page 59

Specialized Operating Procedures

Preparing the Auto Deck

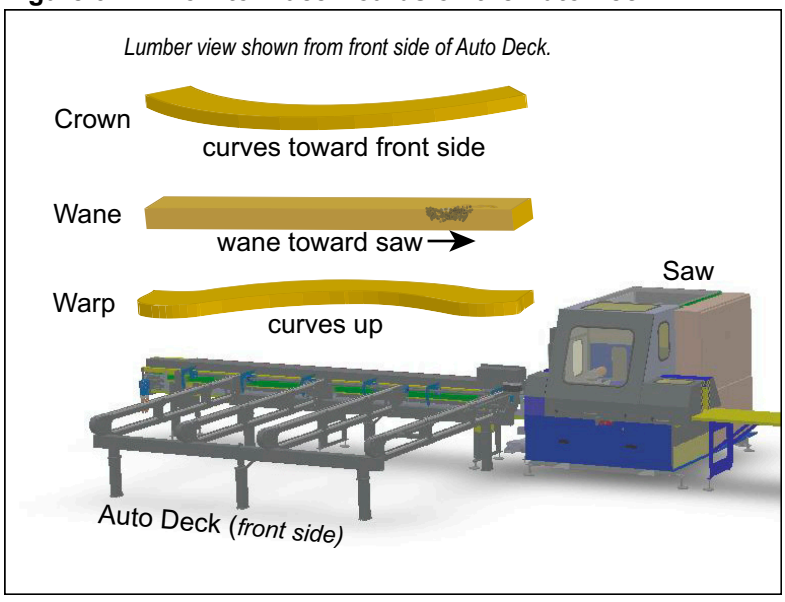
1. Ensure all E-stops have been released and the RESET button on the saw's operator interface panel was pressed.

	⚠ CAUTION
	**CRUSH HAZARD.** **When an E-stop is released, the load arms on the Infeed Rail may automatically raise with high force.**

2. Raise either the load arms or the lumber stops:
   - If the Auto Deck conveyor is empty of lumber and no job is currently running, place the load arms in the Up position by selecting **Load Arms** on the toolbar.
   - If there is still lumber on the Auto Deck conveyor to be used in the previous job, raise the pneumatic lumber stops to keep the two jobs separate from each other. Do so by turning the selector switch on the Auto Deck controls to RAISE.
3. Place the lumber on the Auto Deck in a single layer with the end of each board against the Auto Deck fence (on the infeed side).
4. Boards must be placed on their face (4x dimension of a 2x4) in the order they will be cut. See Figure 6-17 for a diagram of board configuration and proper alignment.
5. The lumber will automatically be forwarded and loaded onto the saw's Infeed Rail after selecting **Start** on the touch screen.

Board Stretcher optimization software is used to manage the order of the cuts.

Figure 6-17: How to Place Boards on the Auto Deck



Dealing with Imperfections

- **Crown**: a curve of 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 board so crown points up as it enters saw
- **Wane**: a defect in a board where a portion of the wood is missing from the board edge or face; place toward saw-end of conveyor
- **Warp/Twist**: a curve where the face of a board (3-1/2” side on a 2x4) is higher or lower in one spot than on the rest of the board; place board so warp points up when sitting on Auto Deck
- **Replace Poor Quality Boards**: if a board diplays excessive defects in the above areas, it should be discarded and replaced with a different board

Importing Job Files

After jobs are processed through *Board Stretcher*, the optimization software, they are stored in the input location (see Board Stretcher Software) until the saw operator is ready for them.

1. Import the job using one of these methods:
   a) To import a job and clear the previous Cut Lists, select the Clear Cutlist & Import button on the toolbar.
   b) To import a job without clearing the Cut List, select File (in tabbed menus at top of Home Screen) and select the Import Jobs button.
2. Review the lumber assignments and make sure boards are assigned to the correct locations:
   a) Select the Lumber Yard button shown in the toolbar (you may also have the opportunity to go to the Lumber Yard directly from the Import Jobs screen).

      The lumber the saw needs is listed in the top section. The lumber existing in inventory (in the machine software) is listed in the bottom section.
   b) Select on the lumber in the top section and drag it to the appropriate inventory in the bottom section.
   c) Select OK.

Cutting 1 Board

1. Place the Mode selector switch in Auto Mode.
2. Start the blade motor.
3. Select the board in the Cut List.
4. Long-press and select Cut.
   - A message appears asking the user to drop the selected board into the Infeed Rail.

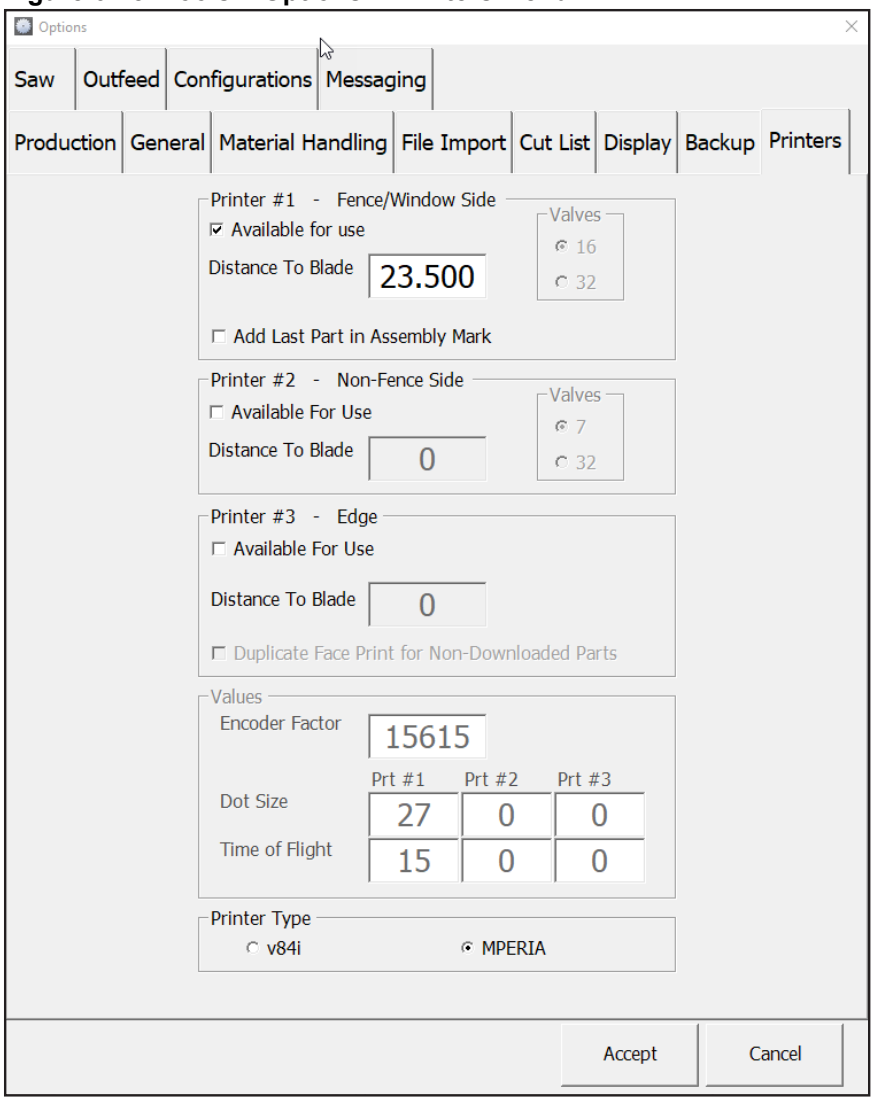
5. Select the **Continue** button and the board feeds into the saw chamber for cutting.

Operating the Printer

The Printer(s) print identification on each board as it enters the saw chamber. Each saw has at least 1 printer.

- To turn the Printer off, or back on, go to **Tools** > **Options** > **Printer** and check or uncheck **Available for use** in the *BLADE* software.
- To choose or change the fields to print, use the *Board Stretcher* software.
- To adjust the location of the image on the board, among other settings, calibrate the printer using **Tools** > **Calibrate** from the machine software.
- Operators should not modify any values in the Values field (ex: Dot Size and Time of Flight) unless instructed by Automation Support.
- To flush the system (required weekly), see Flushing the Printer on page 119.

Figure 6-18: Tools > Options > Printers Menu



Other Printing Options (*Board Stretcher*)

The printing features controlled by the *BLADE II* saw software are minimal. Most printing control is located in the *Board Stretcher* software. The following topics are discussed further in the *Board Stretcher* manual. The manual can be accessed on the MiTek website.

- Print the PartHighSide arrow to show which end points toward the top of the truss.
- Where printing occurs
- What fields print
- How to use the Multi-saw feature
- Much, much more!

Managing Remainders

The saw program can maintain a list of default components or remainders, selected by the user, which may be processed from any waste remaining after the cutting list has been run through the normal optimizing routine. The remainder components are entered and assigned a priority by the saw operator, based on the required demand and existing supply of such items.

Note that adding remainders may impact overall production due to the added cutting time!

Adding Remainders

Pre-programmed remainders can be added to the remainders list or to the Cut List using the Key In Part button on the toolbar (see Key In Part).

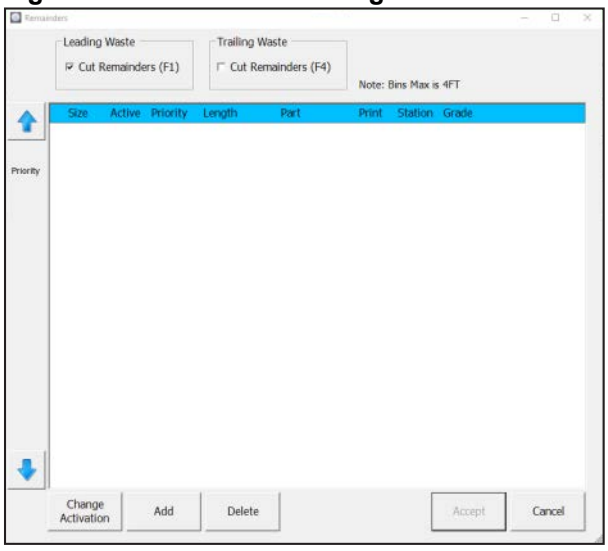
Parts from the Cut List can be added to the remainders list by long-pressing the part in the Cut List and selecting Add To Remainders.

Viewing Remainders

After a part is added to the remainders list, it can be viewed and managed using the following tasks on the View Remainders screen on the Material Handling menu:

- Make each part active or inactive.
- Change the priority of each part in relationship to each other.
- Delete parts from the list (this does not affect the job they came from).
- Indicate if remainders should be cut from leading or trailing end of board.

Figure 6-19: Material Handling > View Remainders Screen



Rejecting or Resetting Jobs and Boards

Individual parts can not be rejected.

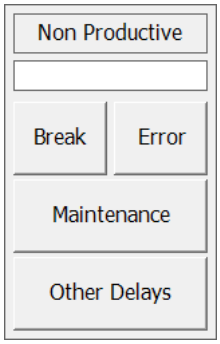
- To reject/reset one board, right-click on the board in the Cut List and select Reject or Reset.
- To reject/reset a series of boards in the Cut List, select one row, then immediately select a lower row. Long-press on the lower row and select Reject Series or Reset Series. Everything between and including the two rows selected is now either:
  - Highlighted and moved to the top of the list if Reject Series was chosen.
  - Not highlighted and moved back to their numerical place in the list if Reset Series was chosen.
- To reject/reset all the boards in a job, use the buttons in the Material Handling ribbon.

Recording Non-Productive Time

The Non-Productive Time section allows the operator to indicate what the saw is doing when it's not running.

- **Break**: Indicates operator break
- **Error**: If an error is received on-screen that requires attention, activate this button while finding the solution. The error automatically populates the window.
- **Maintenance**: Indicate time spent on any maintenance using this button. Select the most accurate category from the drop-down menu.
- **Other Delays**: For any non-productive time that doesn't fit one of the categories above, select this button and type a description of the delay.

Figure 6-20: Non-Productive Widget on Home Screen



Determining Board Recovery Solutions

Understanding Board Recovery

The screen shown in Figure 6-21 will appear when a board has a status of *In Process* and the START CUTTING button is selected. It is the result of the saw having been stopped in the middle of a job. The partially cut board will be cleared out of the saw chamber automatically when the START button is pressed. This screen gives the operator a chance to tell the saw the status of that board. Select one of the options shown in Figure 6-21 and select OK. Each option is defined later in this section.

Figure 6-21: Board Recovery Options

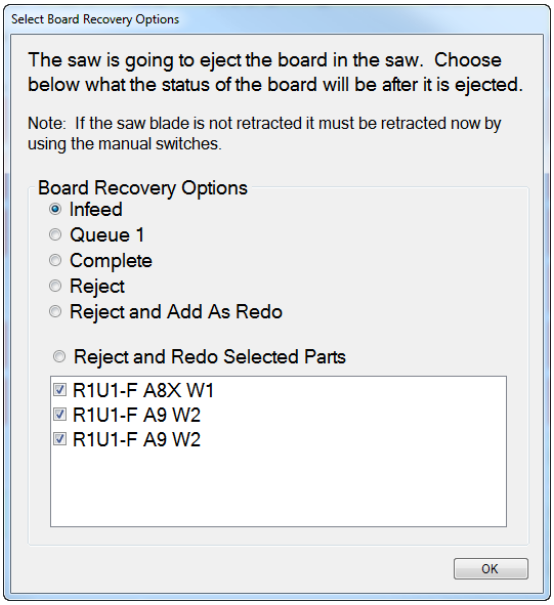
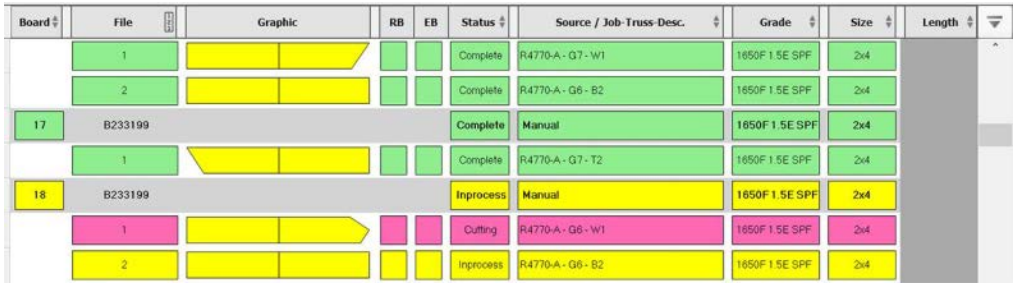


Figure 6-22: Cut List Sample, Shown While Cutting Board 18, Part 1



In Figure 6-22, note the following things while reading the description of each board recovery option discussed on subsequent pages.

- Board 2 is in process (already in the saw cutting chamber). When the cutting was stopped, Board 2 was not complete, and therefore, will have to be cleared out of the saw chamber before the saw can continue cutting.
- Board 3 is Queue #1 (already processed by software and sitting on load arms to be placed onto the Infeed Rail).

Infeed

Place the new board on the Auto Deck, just behind the load arms, so it is the next board to be placed on the Infeed Rail after Queue #1 board (Board 3 in Figure 6-22).

Queue 1

Place the new board on the Auto Deck, above the load arms, so it is the next board to be placed on the Infeed Rail.

Complete

No more parts are needed from the interrupted board (in the software), so don't manually load anything. The software marks it as complete and moves on.

Reject

The board does not need to be cut further, so don't manually load anything. The software marks it as rejected.

Reject and Add as Redo

The board is being marked as rejected, but also added back into the job. With this option, all parts on the board are recut. Where the board falls in the job depends on the default chosen in **Tools** > **Options** > **Cut List** > **Redo Parts**.

If Cut First is selected, a new board must be placed on the Auto Deck just behind the load arms, so it is the next board to be placed on the Infeed Rail after Queue #1 (Board 3 in Figure 6-22). If Cut Last is selected, it will be the last board cut in this job.

Reject and Redo Selected Parts

The board is being marked as rejected, but certain parts can be added back into the job. With this option, only the parts selected in the lower portion of the screen shown in Figure 6-21 are recut. Where the parts fall in the job depends on the default chosen in **Tools** > **Options** > **Cut List** > **Redo Parts**.

If Cut First is selected, a new board must be placed on the Auto Deck just behind the load arms, so it is the next board to be placed on the Infeed Rail after Queue #1 (Board 3 in Figure 6-22). If Cut Last is selected, it will be the last board cut in this job.

Resetting a Stalled Saw

See Abort Sequence under Diagnostics.

Calibration

See the Calibration section on the MiTek website.

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 Maintenance Checklist chapter. Additional maintenance instruction and videos can be found on our web site or video site.

Read the safety section starting on page 12. 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.**

Certain parts should be kept in stock at your facility. These parts are listed in the Ordering Parts appendix.

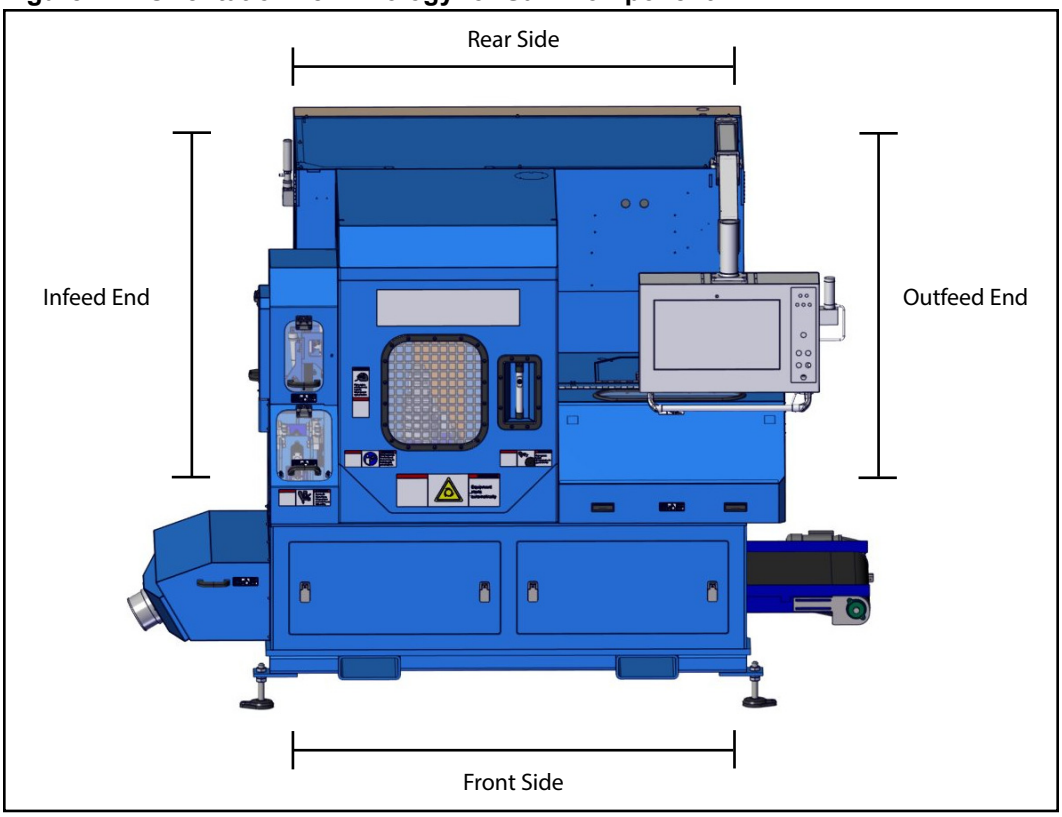
Overview Graphics

See General Information on page 47 for an overview on the main and optional components of the *BLADE II* saw.

Maintenance Terminology

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

Figure 7-1: Orientation Terminology for Saw Component



Major Components

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

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

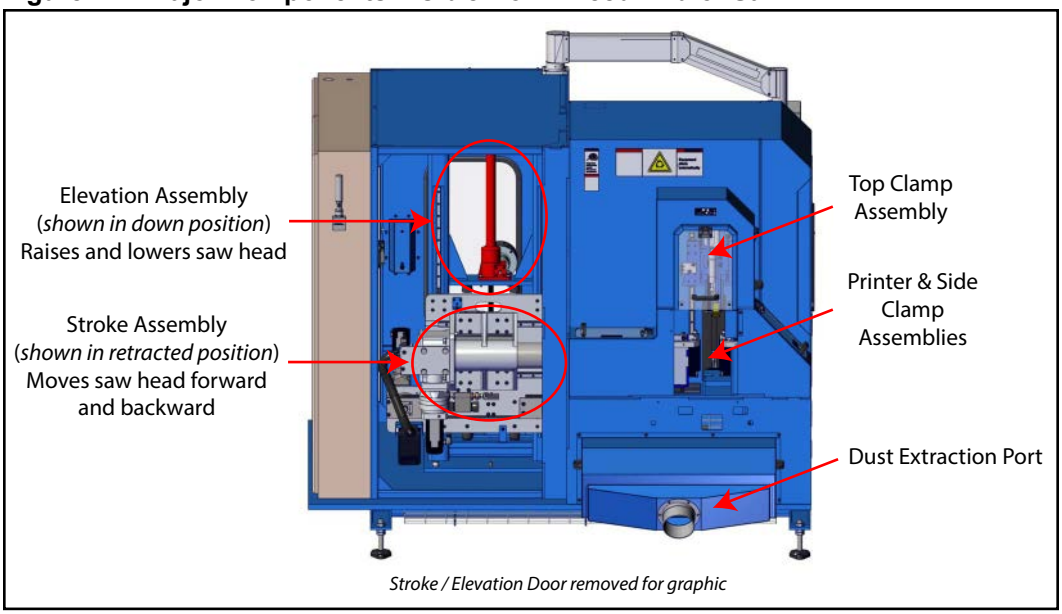


Figure 7-3: Major Components Visible from the Front Side of Saw

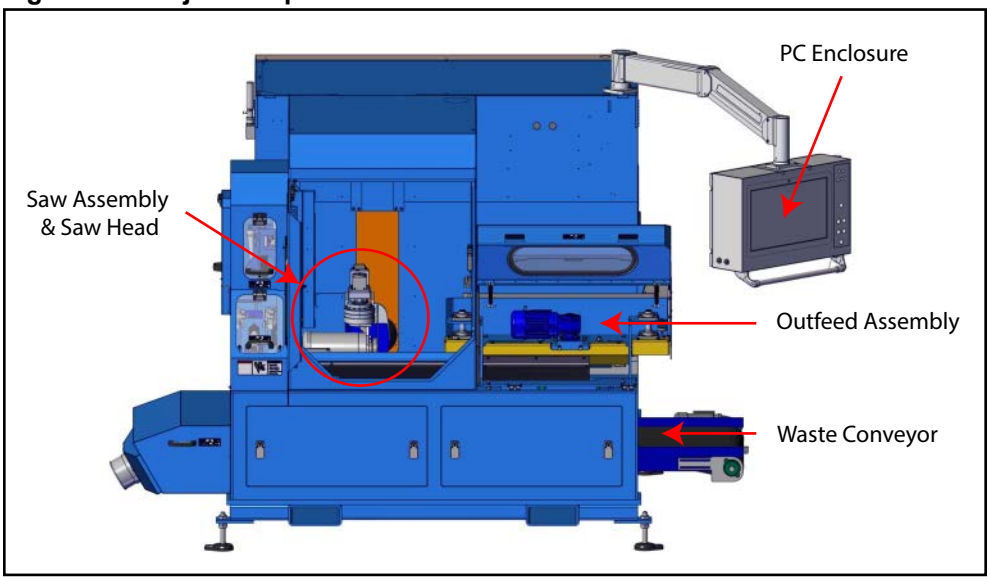
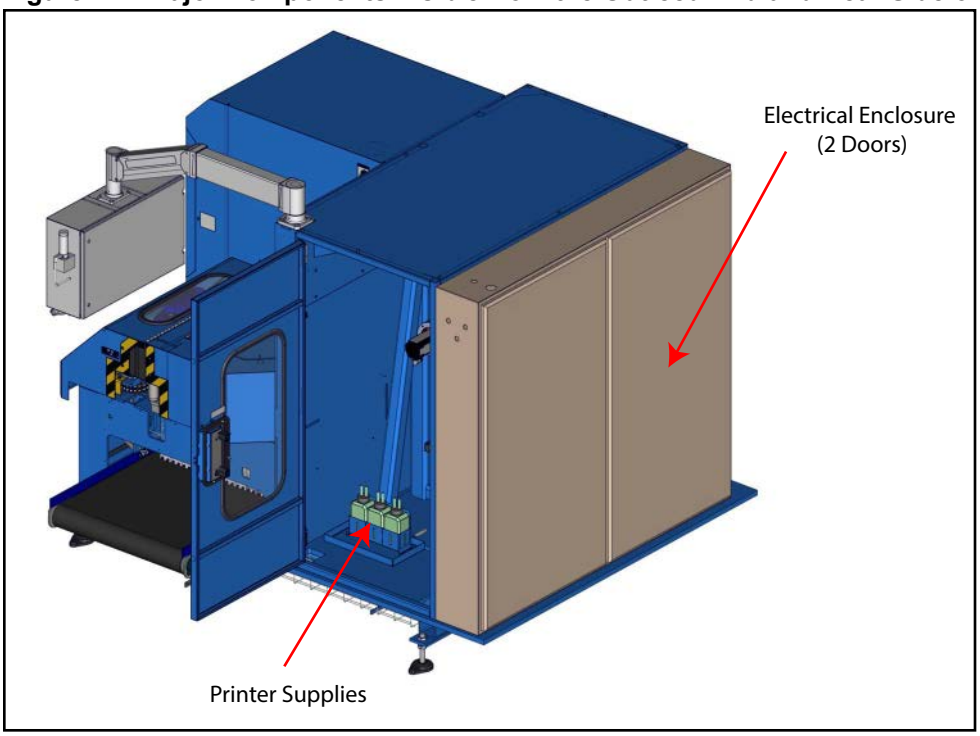


Figure 7-4: Major Components Visible from the Outfeed End and Rear Side of Saw



Axes and Home Positions

There are 6 major axes referred to on this equipment. Their definitions and home positions are shown in the following graphics. The axis number shown in Table 7-1 may be needed when troubleshooting.

Table 7-1: Axes List and Description

Axis #	Axis Name	Description
1	Gripper	Holds and pushes board along Infeed Rail.
2	LASM	Lumber Advance Short Move; holds and moves board while inside saw chamber.
3	Elevation	Raises and lowers saw blade.
4	Stroke	Moves saw blade in and out.
5	Angle	Turns saw blade for angle cuts.
6	Bevel	Turns the saw blade for bevel cuts.

Figure 7-5: Gripper Axis

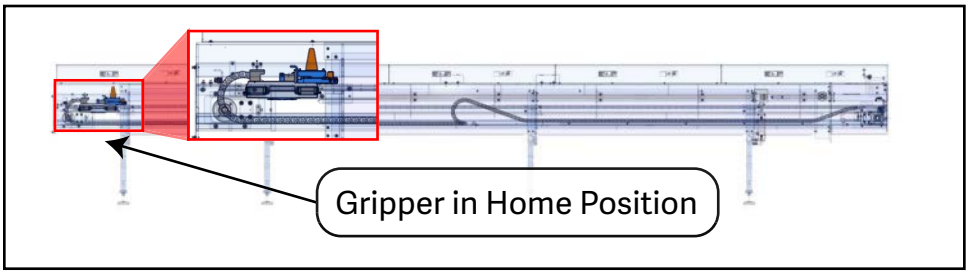


Figure 7-6: ASM Axis Isolated

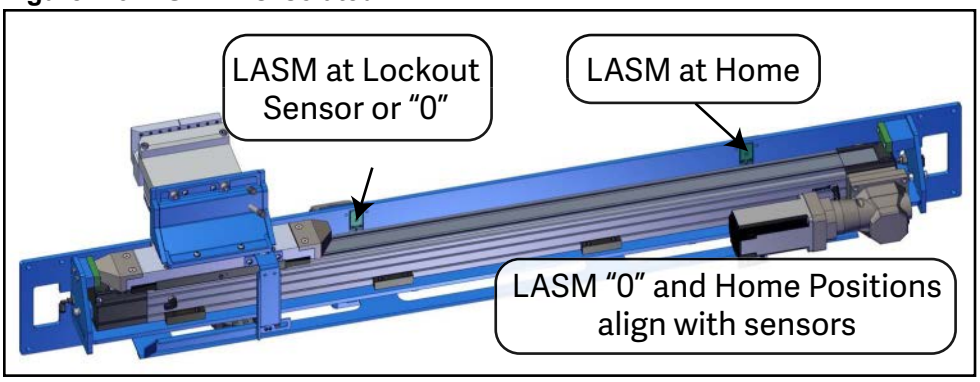


Figure 7-7: LASM Axis "0" Position

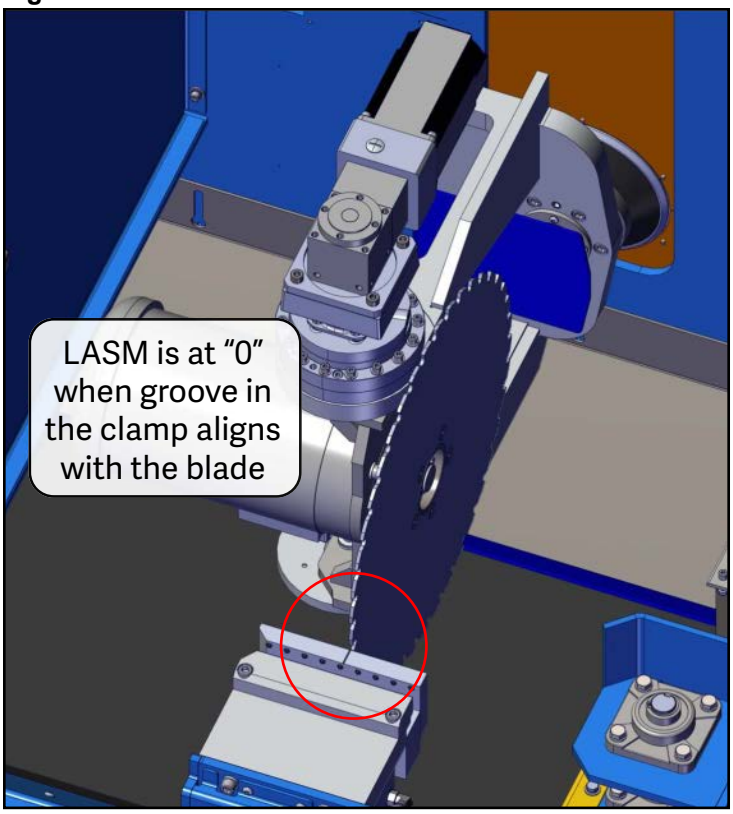


Figure 7-8: Elevation and Stroke Axes (Infeed End View)

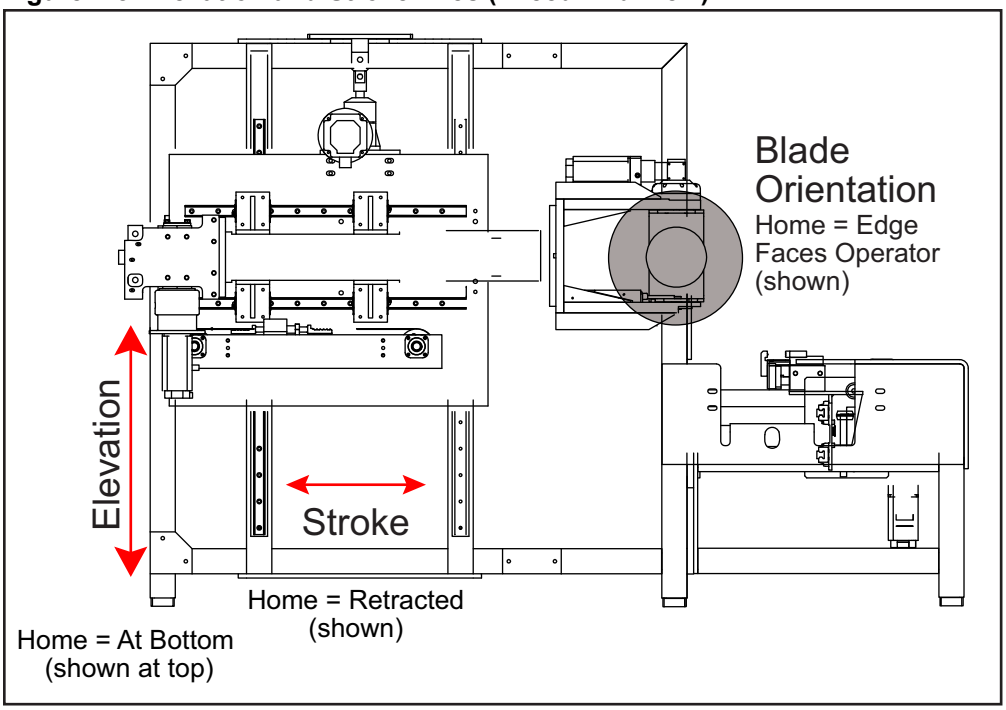
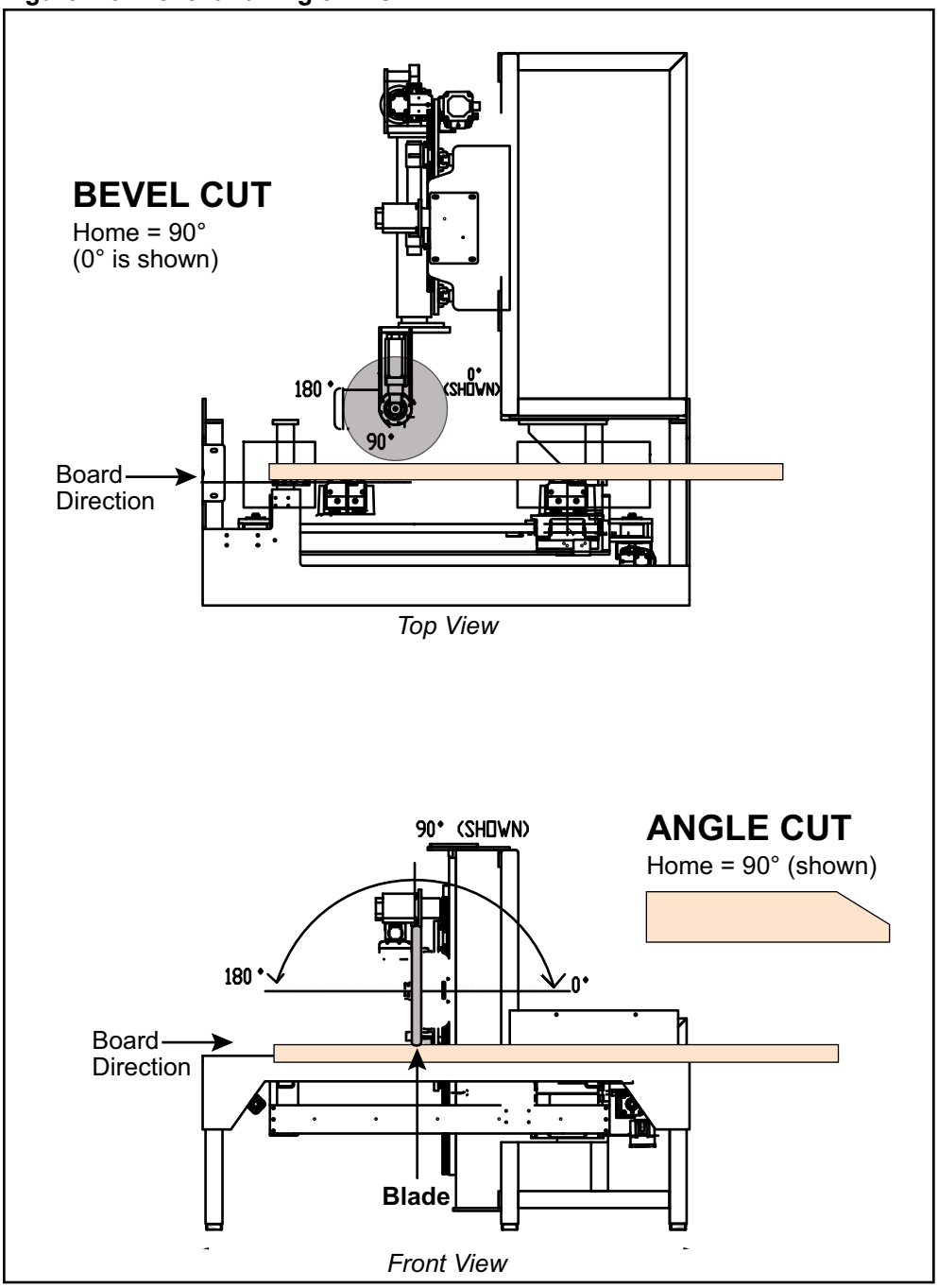


Figure 7-9: Bevel and Angle Axis



Cleaning

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.

	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.**

	⚠ 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.**

BLOW OFF...

- Top and sides of saw frame
- Auto Deck chains
- Infeed rail where board travels
- Gripper assembly, behind gripper assembly, and board slip sensor
- Sensors on Infeed Rail near saw end
- Inside top/side clamp assembly
- Outfeed clamp, lumber channel, behind outfeed clamp at cylinder
- Inside stroke/elev chamber; all axes
- Remove lumber scraps and anything that doesn't belong on equipment surfaces & belts, and blow off surfaces

VACUUM...

- Inside electrical enclosures: NEVER USE COMPRESSED AIR!
- Floor of stroke/elev chamber
- Floor of saw chamber
- Saw chamber, especially around blade and LASM (cover the Crooked Lumber Sensor under LASM to protect from saw dust)
- Inside the printer and side clamp assembly (infeed side)
- Floor under and around system

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

Refer to Calibration on page 90 in the Operation chapter.

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.

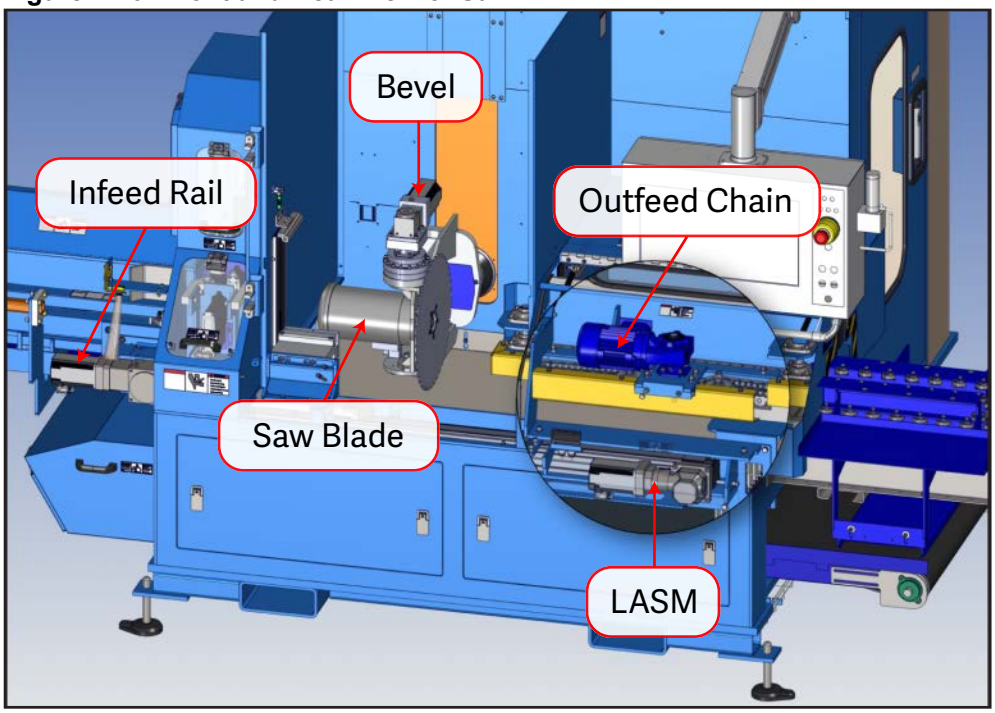
Using a Manual Grease Gun

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 7-10: Front and Rear View of Saw



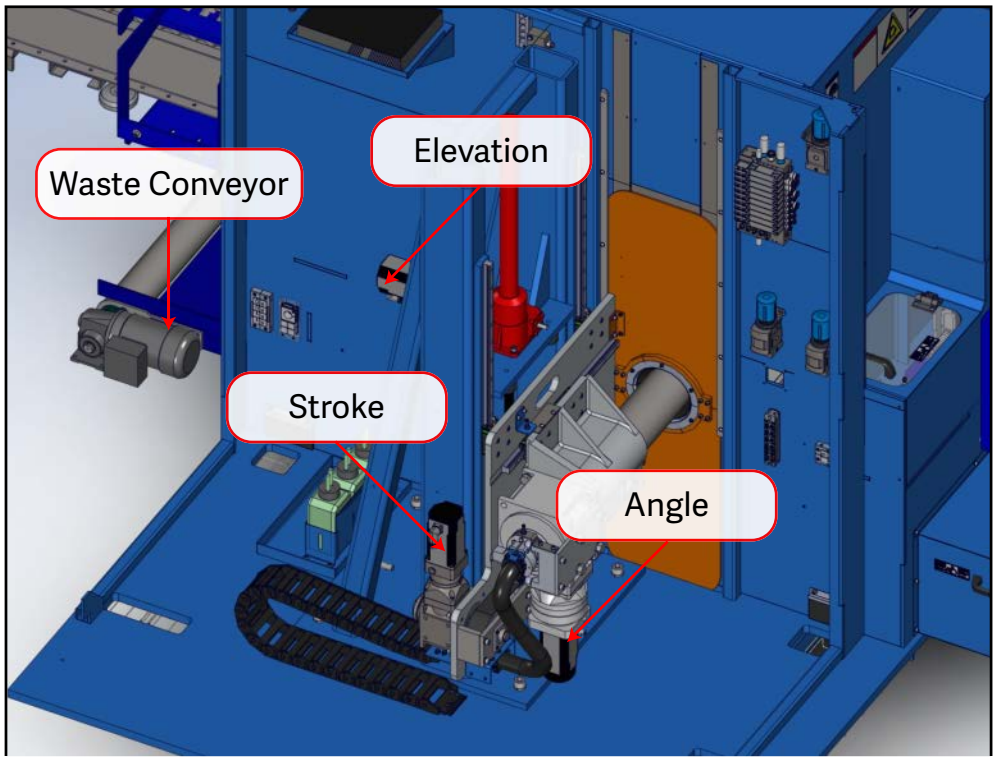
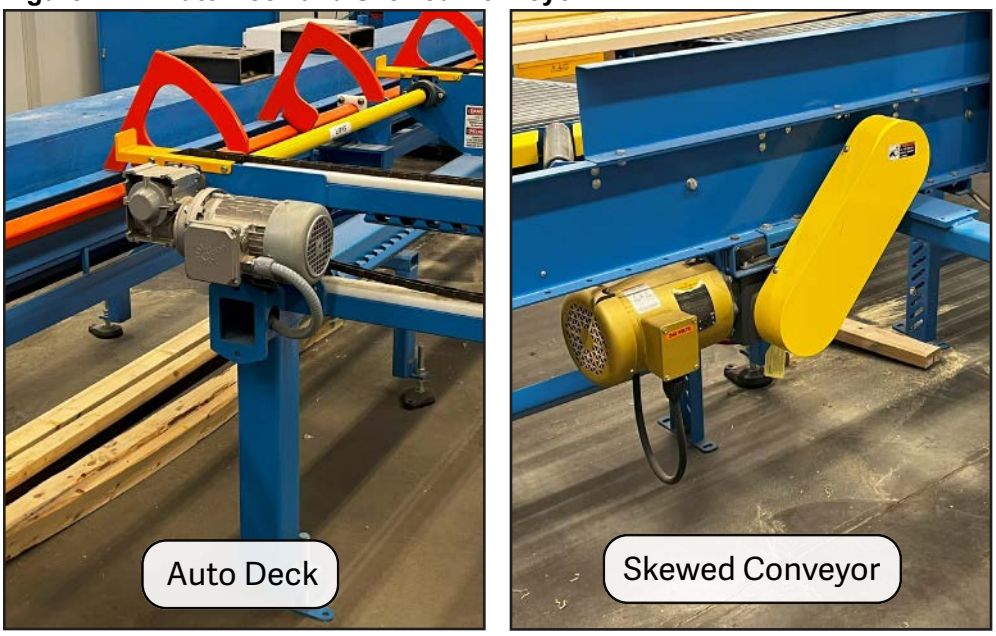


Figure 7-11: Auto Deck and Skewed Conveyor



Motor Maintenance

Table 7-2: Overview of Motor Maintenance

Motor	Gearbox (if present)	Requires Grease	Requires Oil
Angle	No	No	No
Elevation (with brake)	No	No	No
Stroke	No	No	No
Bevel	No	No	No
Saw Blade	No	Yes	No
LASM	No	No	No
Infeed Rail	No	No	No
Outfeed Chain	Yes	No	Yes
Skewed Conveyor	Yes	No	Yes
Waste Conveyor	Yes	No	Yes
Auto Deck	Yes	No	Yes

Checking and Changing Gearbox Oil

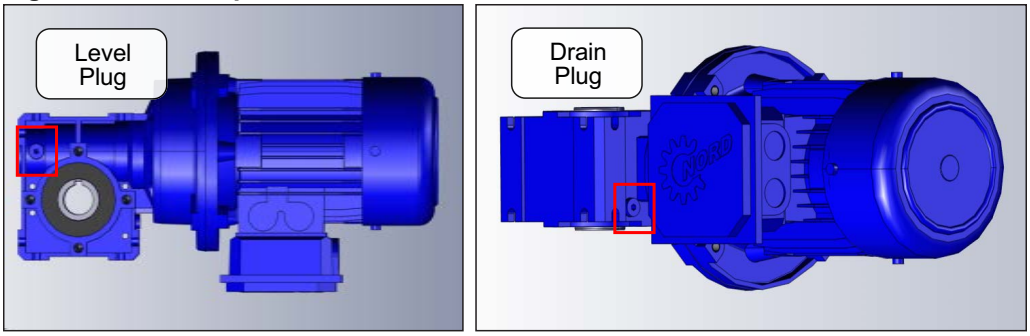
Check the oil in the all gearboxes once every 12 months (one shift) or every 6 months (two shifts). When additional oil is needed, use the oil recommended for each motor type listed in Table 7-3 or a comparable type that meets all specifications.

Table 7-3: Recommended Oil Specifications for Motor Gearboxes

Motor	ISO Viscosity Grade	Oil Type	Oil Supplied by Manufacturer
Outfeed Chain	680	Synthetic Polyglycol Oil	Klübersynth UH1 6-680
Waste Conveyor	680	Synthetic Polyglycol Oil	Klübersynth UH1 6-680
Auto Deck	680	Synthetic Polyglycol Oil	Klübersynth UH1 6-680
Skewed Conveyor	460	Synthetic Polyglycol Oil	Klübersynth UH1 6-460

Drain and refill the oil every 20,000 hours or 4 years. Each gear motor includes a level plug and drain plug (see Figure 7-12 for example). Note that the exact location of each plug will vary between motors.

Figure 7-12: Example of Oil Level Bolt and Oil Drain Bolt Location



The approximate amount of oil is listed in Table 7-4. This amount of oil should be enough to reach the oil level bolt.

Table 7-4: Approximate Oil Fill Level

Motor	Quarts	Liters
Outfeed Chain	.127	.12
Skewed Conveyor	.4	.378
Waste Conveyor	.106	.1
Auto Deck	.1	.094

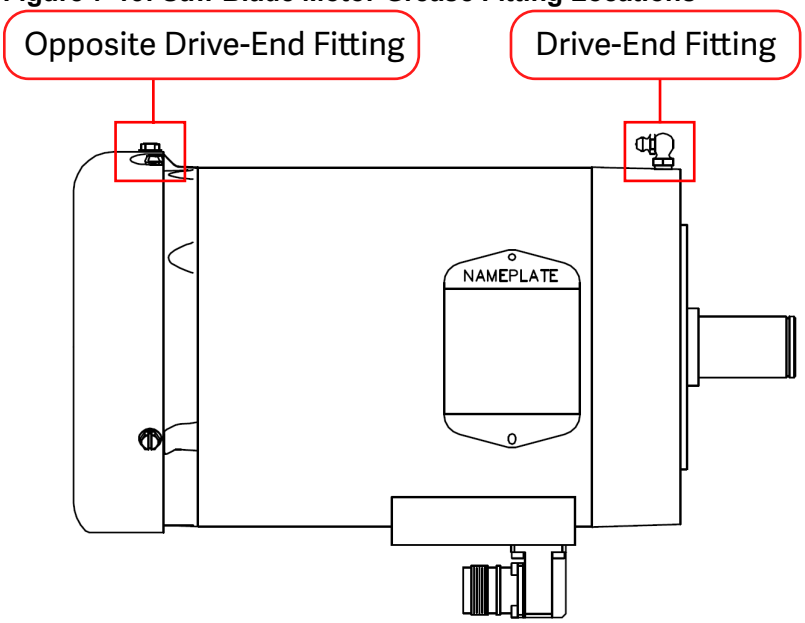
Lubricating Saw Blade Motor Bearings

Manual grease gun

No.2 lithium-based grease

There are two grease fittings on the saw blade motor for the drive end (DE) and opposite drive end (ODE) bearings. Each bearing should be lubricated every 12 months (one shift) or every 6 months (two shifts).

Figure 7-13: Saw Blade Motor Grease Fitting Locations



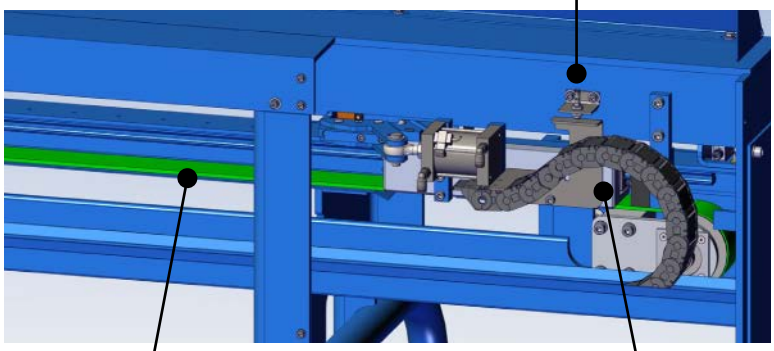
Slippage Errors and Tightening Motor Couplings

Slippage Errors

Figure 7-14: Potential Causes of Gripper Slippage Error

1. Check for mechanical obstructions like wedges, damaged parts, etc. that may be inhibiting the axis from moving freely.

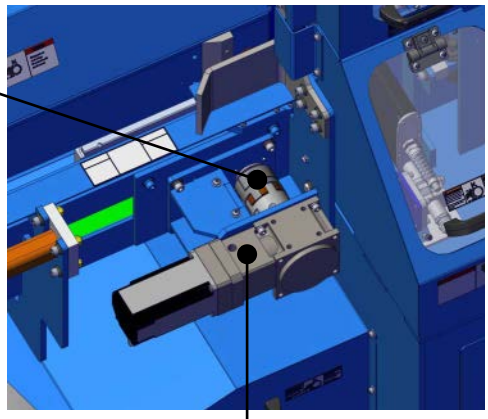
2. Check the home sensor, bracket, and target plate for damage. Should be 1/32" gap (paper folded in half should slide easily under it).

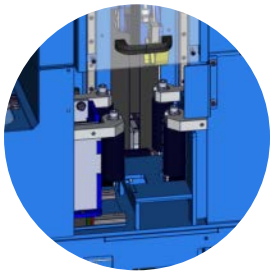


3. Check timing belt tension moves 1/4" up and down at center. Check pulley: teeth should not be worn and shaftshould not have movement.

4. Lubricate linear guide bearings.

5. Input torque Setting: 309 in-lbs
use 4-mm hex key socket
2 places





6. Tighten coupler between motor and gearbox.
Output torque Setting: 89 in-lbs
use 4-mm hex key socket

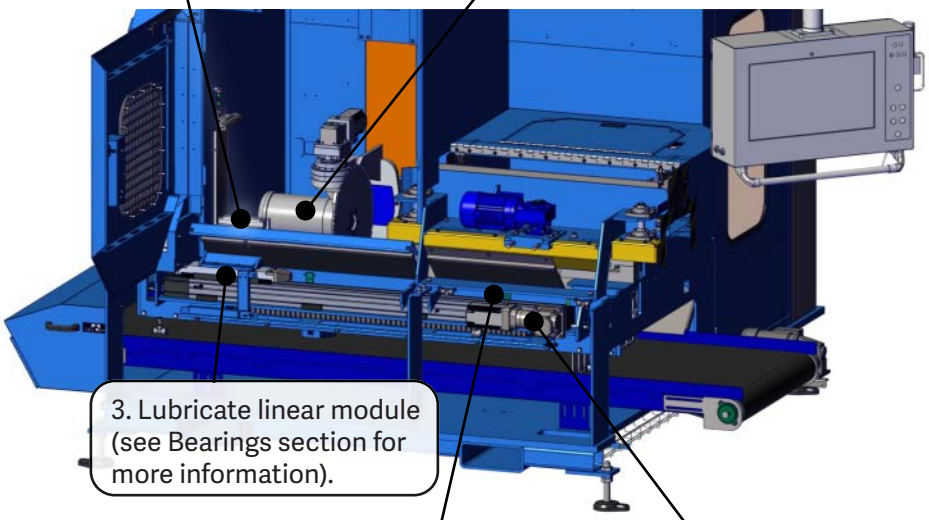
7. Ensure gripper or boards are not hitting the infeed side clamp rollers or printer at the saw frame.

Figure 7-15: Potential Cause of LASM Slippage Error

1. Check for mechanical obstructions like wedges, damaged parts, etc. that may inhibit the axis from moving freely.

2. Ensure LASM travels smoothly, does not hit any part of saw, and does not show signs of recent blade collisions.

6. Check the quality of the saw blade and ensure it spins smoothly. Dull or wobbly blades can put the saw in a bind.



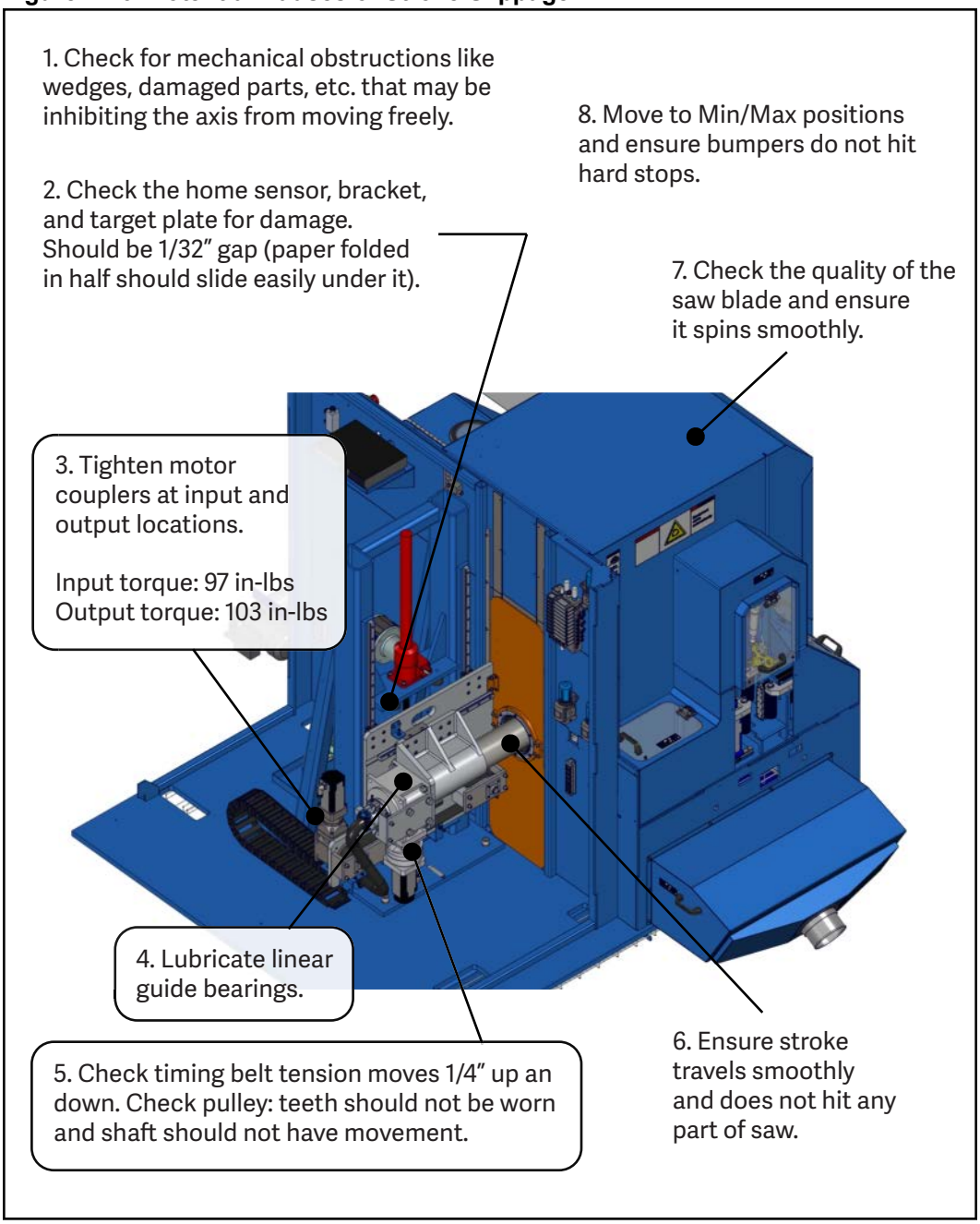
3. Lubricate linear module (see Bearings section for more information).

4. Check the home sensor, bracket, and target plate for damage. Should be 1/32" gap (paper folded in half should slide easily under it).

5. Tighten motor couplers at input and output locations.

Input torque: 90 in-lbs
Output torque: 2 stage process (first set to 133, then to 267 in-lbs)

Figure 7-16: Potential Causes of Stroke Slippage



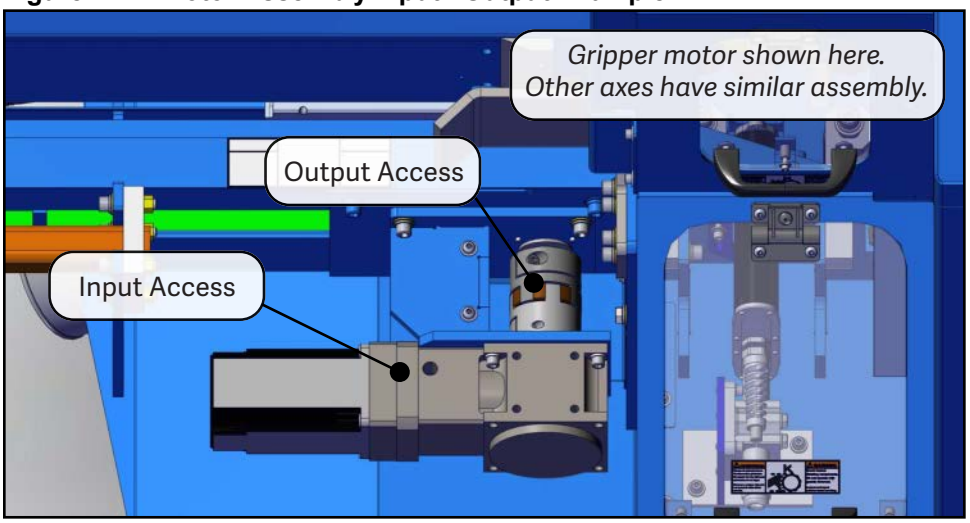
Tightening Motor Coupler on Servo Motors

This section contains instructions for setting the correct torque values for various motor couplers.

Table 7-5: Torque Values for Input and Output Couplers

Motor	Torque (in-lbs)	Hex Size
INPUT		
LASM	90	4 mm
Stroke	97	5 mm
Bevel	50	3 mm
Angle	177	6 mm
Infeed Drive (Gripper)	89	4 mm
OUTPUT		
LASM	133 and then 267 (2 stage process)	5 mm
Stroke	103	10 mm (socket)
Bevel	138	7 mm
Angle	106	10 mm (socket)
Infeed Drive (Gripper)	309 (2 places)	6 mm

Figure 7-17: Motor Assembly Input / Output Example



Instructions for LASM, Stroke, Gripper, and Angle Servo Motors (Input)

1. Remove the plug labeled output in Figure 7-17 to access the hole.
2. Align the screw with the hole using one of the following methods:
   a) **For LASM, Stroke, and Gripper couplers only**: with E-stop activated move axis by hand.

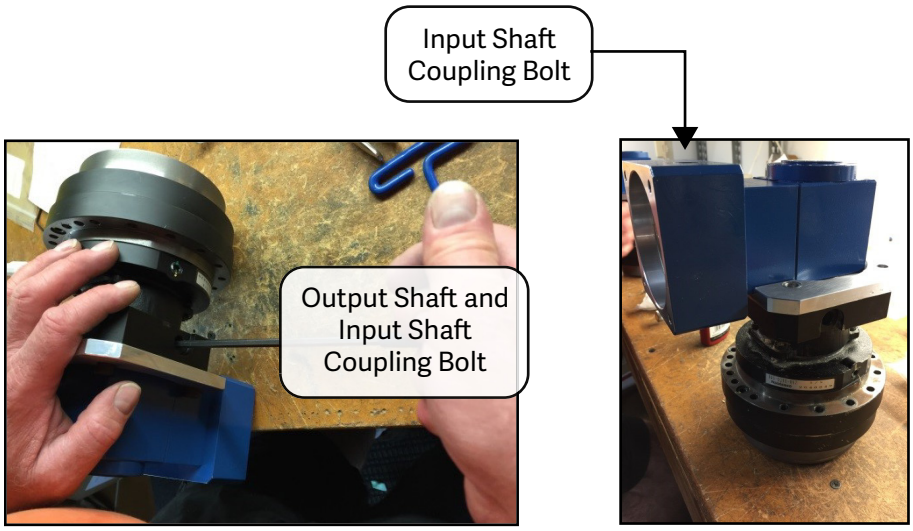
b) **For other couplers**: With power on, enter small position changes in **Diagnostics** > **Detailed Diagnostics** > **Move To Position** fields to move motor coupler in small increments.

3. Torque bolt to the appropriate setting (see Table 7-5) using a torque wrench and hex key.

For Bevel Servo Motors (Input and Output)

Use the same steps in Instructions for LASM, Stroke, Gripper, and Angle Servo Motors (Input) on page 107, but refer to Figure 7-18 below.

Figure 7-18: Bevel Coupling Bolt Locations



Elevation Jack Screw

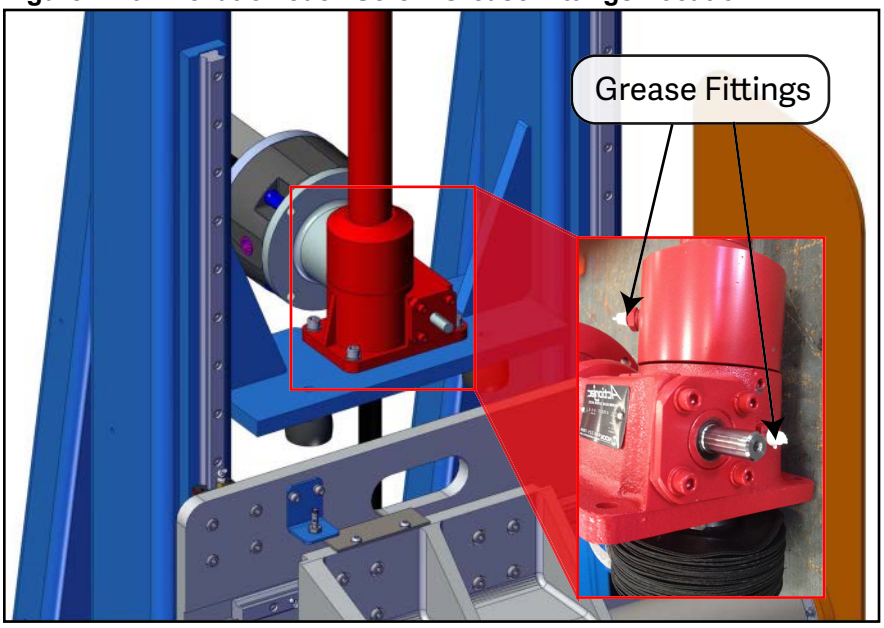
The elevation jack screw raises and lowers the saw head.

Apply grease to the 2 fittings on the jack screw housing every 3 months.

Manual grease gun

No.2 lithium-based grease

Figure 7-19: Elevation Jack Screw Grease Fittings Location



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's less than 16-5/8" (425 mm), 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

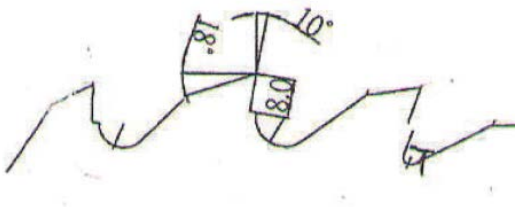
Saw blades can be sharpened to significantly extend their life. They must be sharpened by a reputable blade sharpener that is familiar with carbide tips. It is important to meet the specifications etched into each saw blade. If any specification is not met, it can cause the saw blade to cut inefficiently, inaccurately, and/or rotate out of balance. The specifications are further defined in Table 7-6.

Table 7-6: Saw Blade Specifications

Spec Description	Dimension	
Tip-to-tip diameter	425 mm min. 432 mm max.	(16-5/8" min.) (17" max.)
Kerf (blade thickness)	4.8 mm	(.189”)
Z= qty of teeth	40	
Ø = diameter of center hole	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	4500 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

Saw Blade Tips Diagram

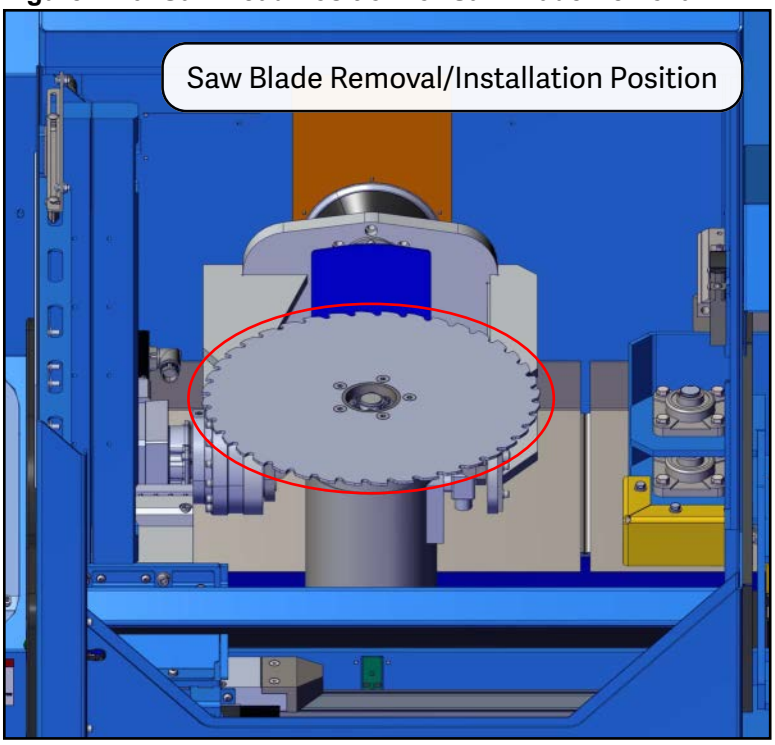


Replacing a Saw Blade

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

1. Gather the following supplies:
   - Socket Wrench
   - Torque wrench with capacity up to 220 in-lbs
   - T40 Torx™ bit compatible with wrench
2. Use the machine software to position the saw head to prepare for saw blade removal:
   a) Rotate the angle of the saw blade so it is in a horizontal position (flat surface on top).
   b) Adjust the elevation and stroke to a comfortable position for removing the blade.

Figure 7-20: Saw Head Position for Saw Blade Removal

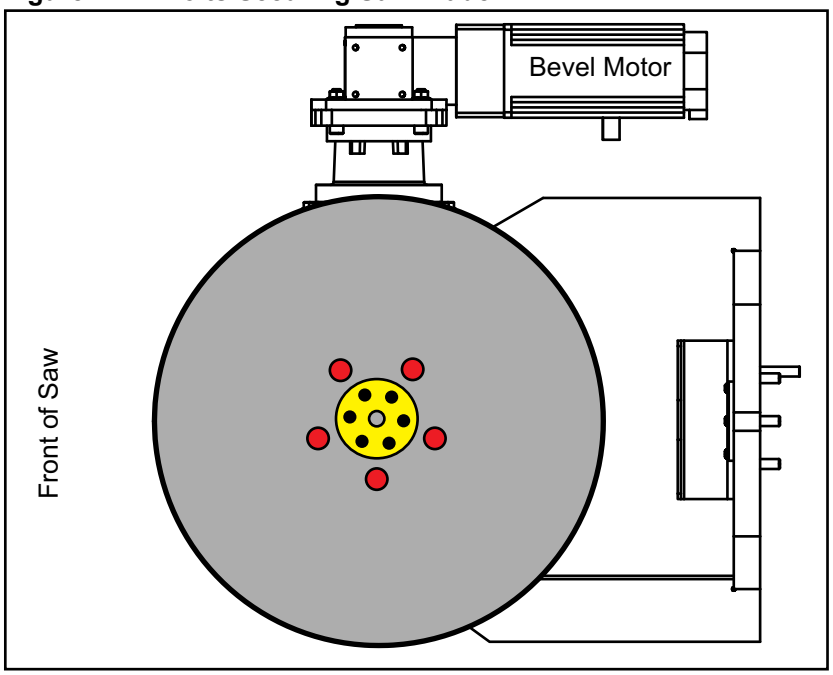


3. Activate an E-stop on the machine.
4. Press the **Request to Unlock** button next to the saw chamber door and open the door.
5. Turn the disconnect switch handle on the main electrical enclosure to the OFF position and lockout/tagout the machine. See Lockout/Tagout on page 6.

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

6. Use a socket wrench and T40 bit to loosen and remove the 5 bolts securing the saw blade (shown in red in Figure 7-21). Discard the bolts.

Figure 7-21: Bolts Securing Saw Blade



7. Remove the saw blade and follow the below instructions to determine whether it should be discard or kept for resharpening:
   a) Measure the diameter of the blade from outside edge of tooth to outside edge of tooth. If the diameter is less than 16-5/8", discard it.
   b) If the diameter is greater than 16-5/8", place the saw blade in a safe location for sharpening.

Hub Bushing Bolts Reminder
It is not necessary to re-torque the hub bushing bolts unless the hub itself feels loose. If you feel it's necessary to check the torque on the hub bolts, only set the torque wrench to 156 in-lbs. If the bolts turn at 156 in-lbs, refer to SB252 to properly re-torque the hub bushing bolts. If the bolts do not turn at 156 in-lbs, no further action is needed.

8. 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 16-5/8", discard it.

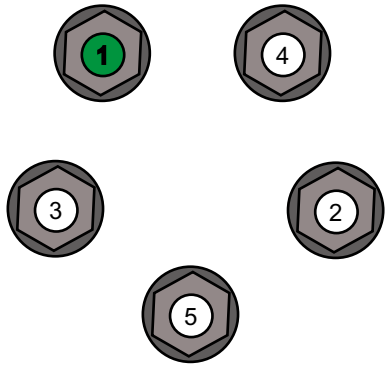
9. Place the supplied new or sharpened saw blade so the holes align with the holes in the hub and the teeth hook points downward when cutting a straight cut. See Figure 7-23 for the correct orientation.

	⚠ WARNING
	**Use ONLY the bolts included in the SBKIT.** **Use NEW bolts every time the blade is replaced.** **Do NOT use thread adhesive.** **TORQUE to specifications given in Figure 7-23!** **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.

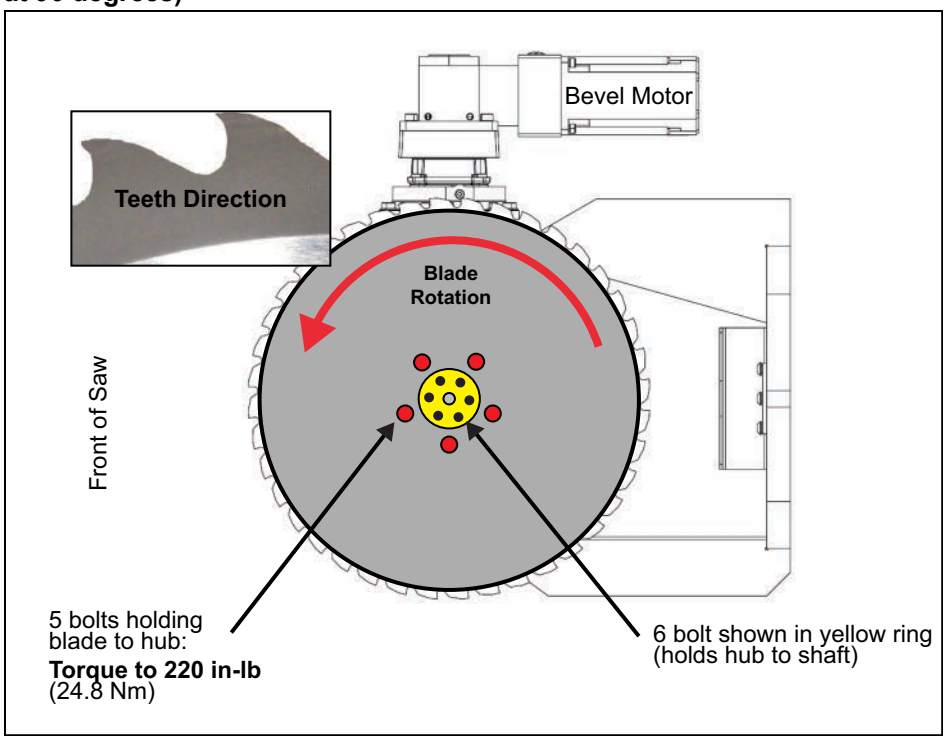
10. Using new bolts supplied in this kit, install all 5 bolts.
    - Use the torque wrench and T40 bit and bolts referenced in Step 1.
    - Do NOT use thread adhesive.
    - Hand tighten all 5 bolts in the order shown in Figure 7-22.
    - Using a torque wrench, tighten the bolts in the order shown in Figure 7-22 until they all reach the recommended torque shown in Figure 7-23.
    - Once properly torqued, all bolts should sit flush with the surface of the blade. If the bolts are protruding or skewed, repeat step 10 with new bolts.

Figure 7-22: Tighten Saw Blade Bolts in This



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

Figure 7-23: Torque Specs for Saw Blade (view from side of saw, with blade at 90 degrees)



12. Close the saw chamber door.
13. Power on machine:
    a) Remove lockout/tagout and switch the disconnect switch to the ON position.
    b) Release E-stop and press Reset switch on the HMI.
14. Use the machine software to start the saw blade rotation and observe its motion. It should not have any wobble or vibration when rotating.
15. Calibrate the stroke and LASM axes per Calibration on page 90

Printer

Ordering Printer Supplies

To order supplies for the *BLADE II* printer, contact Matthews directly. MiTek does not sell the ink or cleaning solution.

Once the account is set up, future orders can be placed by providing a PO any of the three ways listed here. To place your very first order with *Matthews Marking Systems*™, see Placing Your First Supplies Order Through Matthews on page 115.

- E-mail to mms-insidesales@matw.com
- Fax **412-665-2594**
- Call **800-775-7775**

Table 7-7: Printer Supplies

Description	Unit	Quantity per Case	Matthews Part #	MiTek Part #
Cleaner: SCP-900C	Case	6 bottles (1 liter ea.)	71002860	N/A
Black Ink: SCP-901A	Case	6 bottles (1 liter ea.)	71002863	N/A
Cap w/ Filter	1 Unit	N/A	41206373	005-00135
Print Head Brush	1 Brush	N/A	41001415	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 32ºF and 90ºF and has a 2-month shelf life.

How Much Ink Will I Use?

The amount of ink you will use depends greatly on which Printer(s) you have, type of parts you cut, and 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, 1 shift/day**. Adjust these numbers to reflect your work week.

- For Truss Use, with an AGS option:
  On average, the Printer uses approximately 1 liter of ink every 1-2 weeks.
- For Wall Panel use, with an AGS option:
  On average, the Printer uses approximately 2-3 liters per week.

Placing Your First Supplies Order Through *Matthews*

Consumable supplies (ink and cleaner) must be purchased from either Matthews or a local distributor. MiTek does not sell the ink and cleaner solutions. The most efficient way to place your first order is as follows.*

1. Print and fill out the Matthews credit form that is included in the Inker/ Printer Agreement.
2. Send an e-mail to Matthews at mms-insidesales@matw.com with the following information:
   a) Notation that you are a MiTek customer
   b) Ship To address
   c) Bill To address
   d) Attach the following files:
      - Matthews Credit Form
      - PO stating this purchase items, Matthews part numbers, and quantities (listed in Inker/Printer Agreement)
3. A customer service representative will assign the account internally, and your Matthews account is created.
4. Call to place your first order and verify that all credit information has been received. Orders should be placed at least 3 weeks prior to the saw installation date to ensure the supplies will be there during installation.

* *Failure to supply a purchase order will delay the shipment of supplies. If you do not have the credit form, contact Matthews to obtain a credit application. These supplies may also be purchased from an approved local distributor. Contact Matthews to obtain your local distributor's contact information.*

Printer Components Overview

Print Controller and V-Links

The machine software communicates with the print controller in the electrical enclosure to determine what to print and when. The print controller sends messages to a V-Link that is connected to a specific print head. Depending on the configuration of your machine, it may contain 1-3 V-Links.

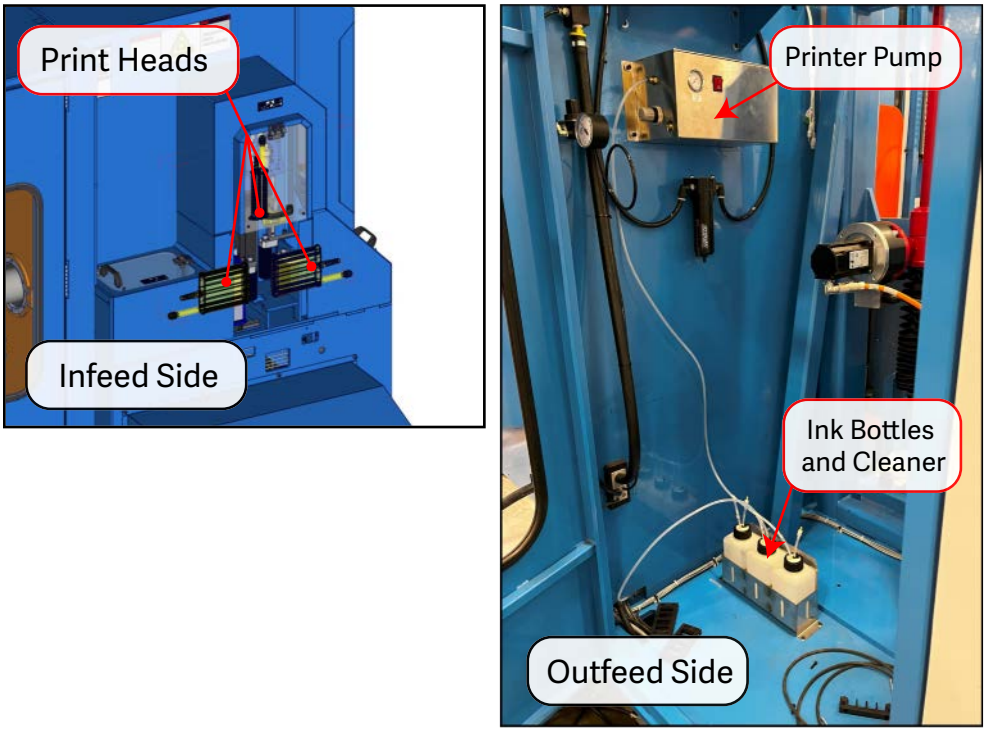
Print Head(s)

The print heads use ink from the ink bottles to mark a print target according to the signals received from the control unit. Depending on the configuration of your machine, it may contain 1-3 print heads.

Printer Pump

The printer pump supplies ink and cleaner fluid to the print heads. The pump should be set at 12 psi or lower. Exceeding this recommended setting will damage the print heads.

Figure 7-24: Printer Components



Maintaining the Printer

General Maintenance Reminders

- Always wear safety glasses and rubber gloves when handling ink.
- If ink or cleaner makes contact with a person's skin, hair, eyes, or clothes, refer to Treatment for Hazardous Substances on page 11.
- Check regularly for kinks or other stoppages in the lines.
- Never clean the print heads with pressurized air.
- Do not allow the ink or cleaner level to fall below the bottom of the pick-up tube. The air will negatively effect print quality and cause damage to the print head.
- Always store extra bottles of ink and cleaner in a temperature-controlled area. The temperature must stay above 32 degrees Fahrenheit to prevent ice crystals from forming and clogging the printer.
- Never pressurize a bottle while it is positioned outside the bottle holder.
- Never exceed the recommended pressure setting of 12 psi.

Cleaning the Print Heads

Small brush

Cleaner fluid

Washing station

Clean the printer head face (nozzles) at least twice a day using this procedure. See Using the Brush to Clean and Practices That May Damage the Print Heads following these instructions for important information related to this procedure.

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

1. Lockout/tagout the pneumatic system's main regulator.
   - Note that the top clamp (infeed side) will lower when air pressure is removed.
2. To ease access to the print heads, follow the instructions in Raising the Top Clamp on page 153 to secure the top clamp in place.
3. Pour some of the cleaning solution from a Matthews bottle (for flushing print heads) into a small cup or bottle.
4. Place a rag underneath the print heads to catch drips and protect the paint and fluid lines from damage.
5. Dip the provided brush into the cleaning solution.
6. Lightly move the brush back and forth across each nozzle, ensuring that all visible traces of ink are gone each time.
7. Immediately rinse the brush in the cleaning solution to remove any ink before it dries.
8. Place the brush in a sealable plastic bottle or container.

Using the Brush to Clean

- Only use the cleaning solution supplied by Matthews. Do not use water or any other chemical for cleaning. Failure to do so will damage the unit and void the warranty.
- Never dip the brush into a cleaner bottle that will be used with the saw.
- After cleaning, place the brush in a sealable plastic bottle or container (a wide mouth bottle works well). Dirt must be kept out.
- Do not use a plastic bag because the cleaner may eat through it.
- It is acceptable to leave cleaner in the brush bottle to keep the brush flexible.
- Do not rinse the brush with water. Replace the brush when it is damaged or too dirty to clean properly.

Practices That May Damage the Print Heads

- Do not use a spray bottle to apply the cleaner directly to the nozzles. The spray may push debris into the nozzles and damage the hoses or other components it contacts.
- Do not use rags or paper towels on a print head. Using anything other than the brush to clean a print head can push debris into the print head nozzles and create a clog or damage the nozzle.

Flushing the Printer

The printer should be flushed to clean ink out of all print heads every month **OR** if the printer will go unused for more than 48 hours.

Identifying Your Printer

The flushing instructions refer to 7, 16, and 32 valve printers. Use Table 7-8 to determine which printer setup your system uses.

Table 7-8: *BLADE II* saw Print Head Configurations

# of Valves		16 or 32	7 or 32	7
System ID and Printing Location		Ink Bottle 1	Ink Bottle 2	
		Front	Rear	Edge
Option	A	16	N/A	N/A
Option	B	16	7	N/A
Option	C	16	N/A	7
Option	D	16	7	7
AGS+ option	E	32	32	N/A
AGS+ option	F	32	32	7

The Flushing Procedure

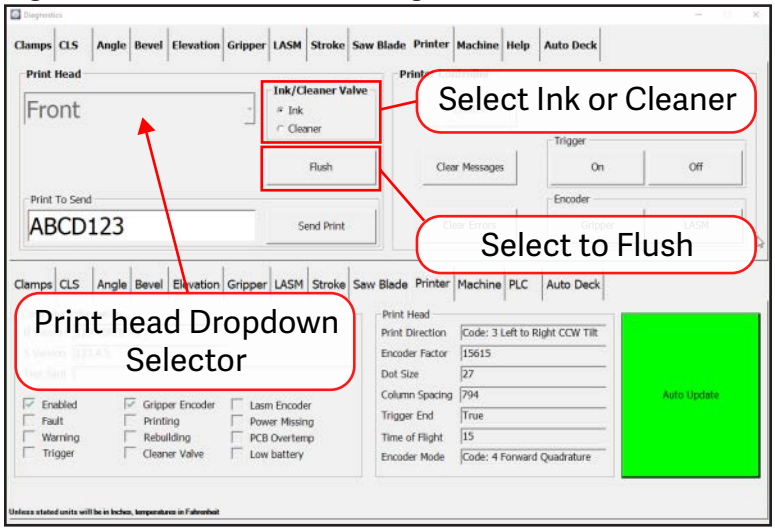
To flush the print system with cleaner fluid, follow these steps for each print head:

	⚠ CAUTION
	**FLUID WILL EXIT NOZZLES DURING FLUSH!** **When a Flush cycle is initiated, be sure to have something in front of the print head nozzle plate(s) to capture the discharged fluid!**

1. Lockout/tagout the pneumatic system's main regulator.
   - Note that the top clamp (infeed side) will lower when air pressure is removed.

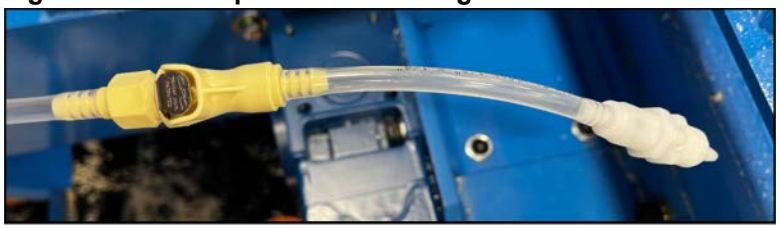
2. To ease access to print heads, follow the instructions in Raising the Top Clamp on page 153 to secure the top clamp in place.
3. Remove the lockout/tagout of the pneumatic system's main regulator.
4. In the machine software, go to **Diagnostics** > **Detailed Diagnostics** > **Printer** and select the desired print head from the dropdown, then select **Cleaner**.

Figure 7-25: Printer Flush Settings in Software



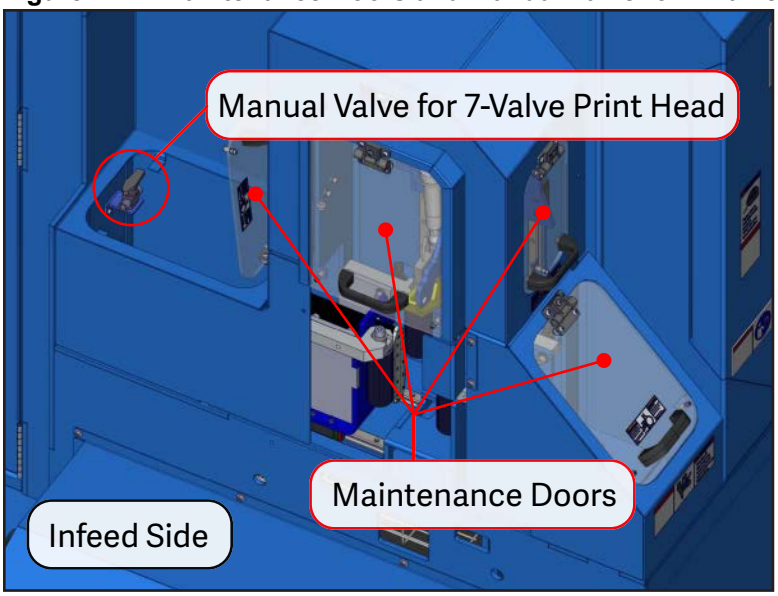
5. Locate the manual purge valve for the print head you are flushing and point it toward a waste container. An example valve is shown in Figure 7-26 and the valves themselves can be accessed through one of the maintenance doors shown in Figure 7-27.
   - If you are flushing a 7-valve print head (rear and/or edge print heads in certain configurations), turn the manual hand valve to switch the fluid from the ink to the cleaner bottle.

Figure 7-26: Example of Manual Purge Valve



6. Pull back on the valve until no ink is coming out, only clear cleaner.

Figure 7-27: Maintenance Doors and Manual Valve for 7-Valve Print Heads



7. Place a rag under the print heads to capture the cleaner liquid.
8. On the printer screen, select the **Flush** button a few times until you see clear cleaner come through the nozzles on the selected print head.
9. Repeat this process for all other print heads. See Identifying Your Printer on page 119 for the number of print heads in your configuration.
10. The print system has now been flushed with cleaner. **MiTek recommends flushing the print system if the printer will go 48 hours or longer without use.**
11. To return the printer to use, see Preparing the Print for Use After Flushing on page 121.

Preparing the Print for Use After Flushing

	⚠ CAUTION
	**FLUID WILL EXIT NOZZLES DURING FLUSH!** **When a Flush cycle is initiated be sure to have something in front of the print head nozzle plate(s) to capture the discharged fluid!**

To return the printer to operation, follow these steps for each print head:

1. In the machine software, go to **Diagnostics** > **Detailed Diagnostics** > **Printer**, select the print head from the dropdown, then select **Ink** (see Figure 7-25**)**.
2. Locate the manual purge valve for the print head you are flushing, and point it toward a waste container. Pull back on the valve until only ink is coming out.

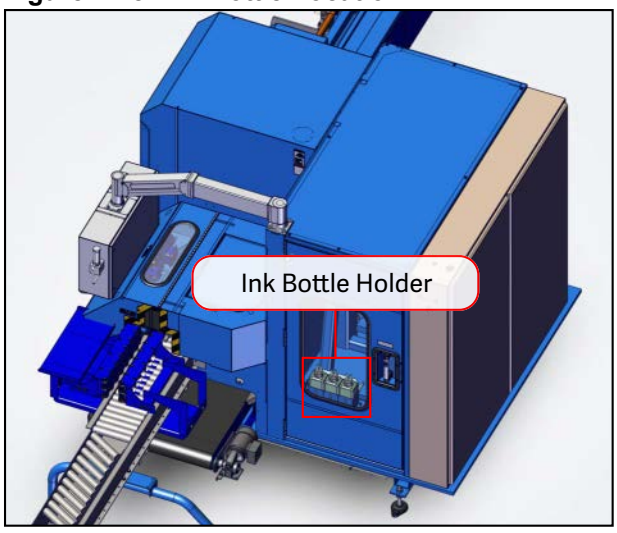
- If you are flushing the 7-valve print head (edge), turn the manual hand valve to switch the fluid from the cleaner to the ink bottle.

3. Place a rag under the print heads to capture the cleaner liquid.
4. On the printer screen, select the **Flush** button a few times until you see ink come through the nozzles on the selected print head.

Replacing an Ink or Cleaner Fluid Bottle

1. Open the Stroke / Elevation (Outfeed) door.
2. Switch the power switch on the printer pump to the OFF position (see Figure 7-30 on page 124).
3. Pull the ring on the pressure release valve to release all air pressure in the print system (see Figure 7-30 on page 124). **There must not be any air pressure in the system when replacing fluid bottles.**
4. Shake the new ink bottle vigorously.
   - Refer to Ordering Printer Supplies on page 115 for help with ordering ink or cleaner fluid.
5. Remove the cap from the new bottle, but not the foil seal.
6. Remove filter assembly from the empty bottle.
   - See Replacing the Bottle Filter and Lid Assembly on page 123 to determine if the filter assembly may need to be replaced.
7. Cut a X shape in the foil seal on the new bottle.
8. Insert the existing filter assembly into the new bottle and screw the cap back on to secure.
9. Place the new bottle back in the ink bottle holder.
10. Switch the power switch on the printer pump to the ON position and close the door.

Figure 7-28: Ink Bottle Location



11. Ensure the manual valve for 7-valve print heads is in the ink position for printing.
12. Purge the line so all air is pushed out. See Preparing the Print for Use After Flushing on page 121.

Replacing the Bottle Filter and Lid Assembly

The filter and lid assembly on each fluid bottle should be replaced when print quality begins to show that ink or cleaner is not getting through the lines.

1. Unscrew the filter and lid assembly (a single part) and remove it from the bottle.

Figure 7-29: Bottle Filter and Lid Assembly

2. Screw the new filter and lid assembly into place.

Extending Filter Life

To lengthen the time between replacements for the filter and lid assembly, follow these instructions:

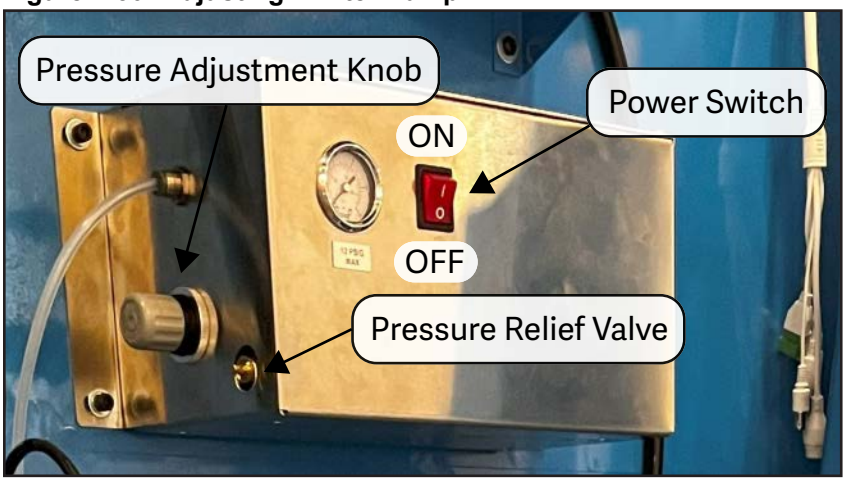
1. Follow the steps for releasing the pressure from the ink and cleaner bottles (see Replacing an Ink or Cleaner Fluid Bottle on page 122).
2. Place the ink filter and lid assembly onto a cleaner bottle and flush the system. This allows cleaner to run through the filter and remove some of the old ink.

Setting the Air Pressure

The pump that affects the printer system's pressure can be access via the stroke / elevation door (outfeed). **It must be set to no higher than 12 psi. Exceeding this recommended setting will damage the print heads.**

The printer's pneumatic system has a non-adjustable relief valve set at 15 psi next to the pump.

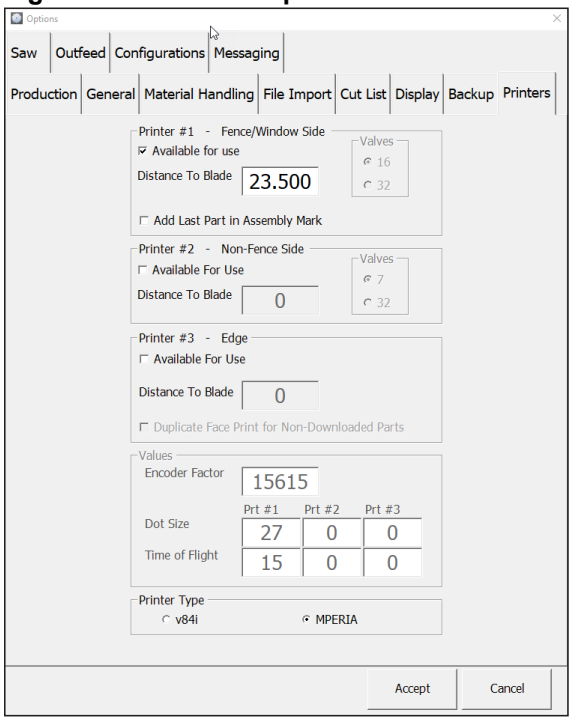
Figure 7-30: Adjusting Printer Pump



Printer Tab in Software Option Menu

- The *Dot Size* must stay between 15-27, but the recommended setting is 27.
- *Time of Flight* is the time it takes for an ink dot to get from the print head to the board. It is calculated during the calibration of the printer. Must stay between 0-200.
- If marks are not in the correct location (most important when marking component location on wall panels), increase the time of flight to print on the board earlier. Decrease the time of flight to print on the board later.

Figure 7-31: Tools > Options > Printers Menu



Printer Sensors States

To see the printer sensor states, go to **Diagnostics** > **Detailed Diagnostics** > **Printer**.

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 7-9 to the matching bearing size.

Manual grease gun

No.2 lithium-based grease

Table 7-9: Grease Volume Per Bearing Size

Linear Bearing Size	Amount
Stroke, & Elevation (size 25)	0.8 cm^3
Gripper, Infeed Top Clamp, Infeed Side Clamp, and Outfeed Clamp (size 20)	0.5 cm^3

Location and Number

Table 7-10: Assemblies Lubricated by Linear Guide Bearings

Lubricated Assembly	Qty.	Graphic
Infeed Rail Gripper	2	Figure 7-32
Top Clamp	4	Figure 7-33
Infeed Side Clamp	4	Figure 7-33
Stroke	4	Figure 7-34
Elevation	4	Figure 7-34
Outfeed Clamp	4	Figure 7-35

Figure 7-32: Infeed Rail Gripper Bearing Location

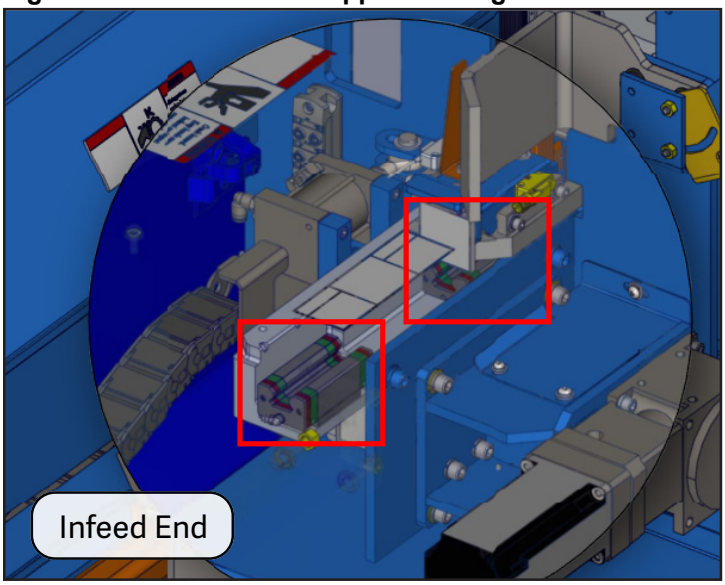


Figure 7-33: Infeed Side and Top Clamp Bearing Location

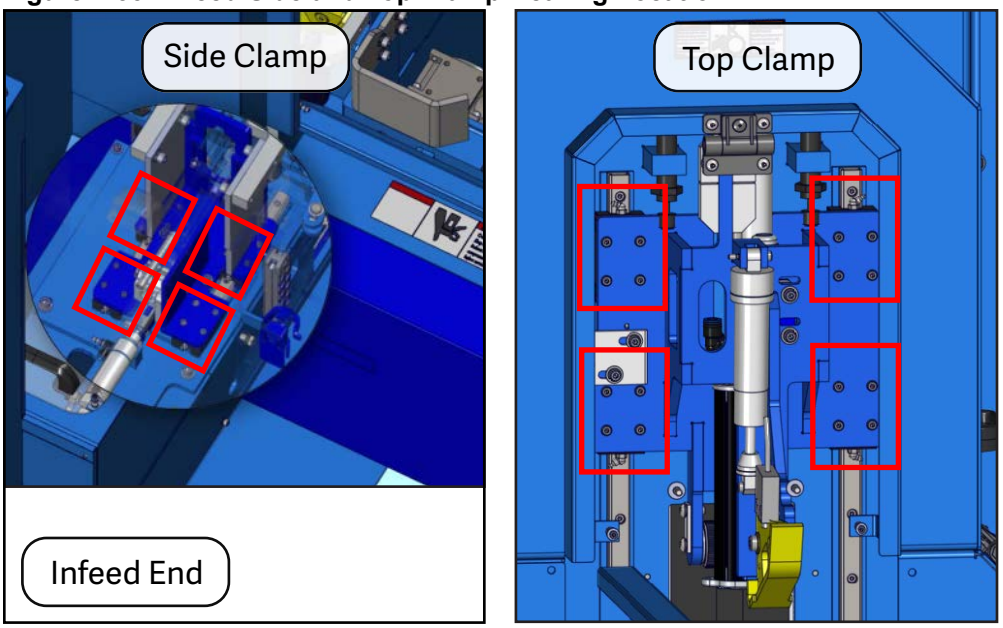


Figure 7-34: Stroke and Elevation Bearing Locations

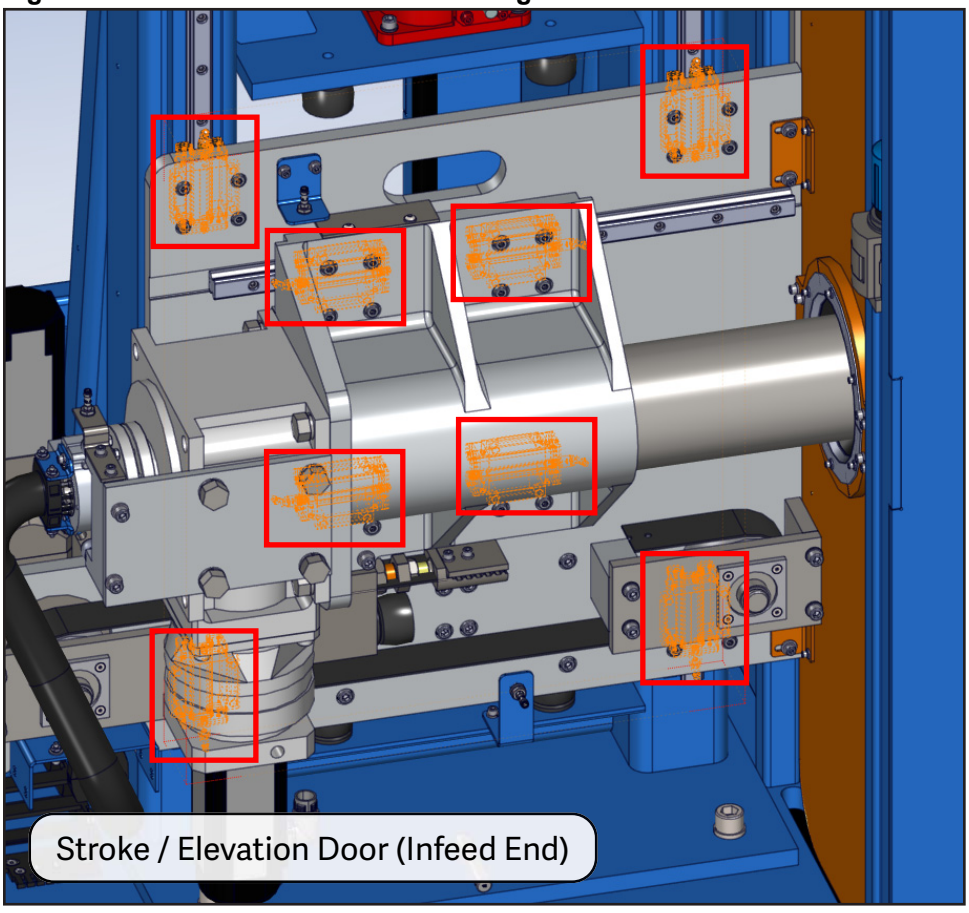
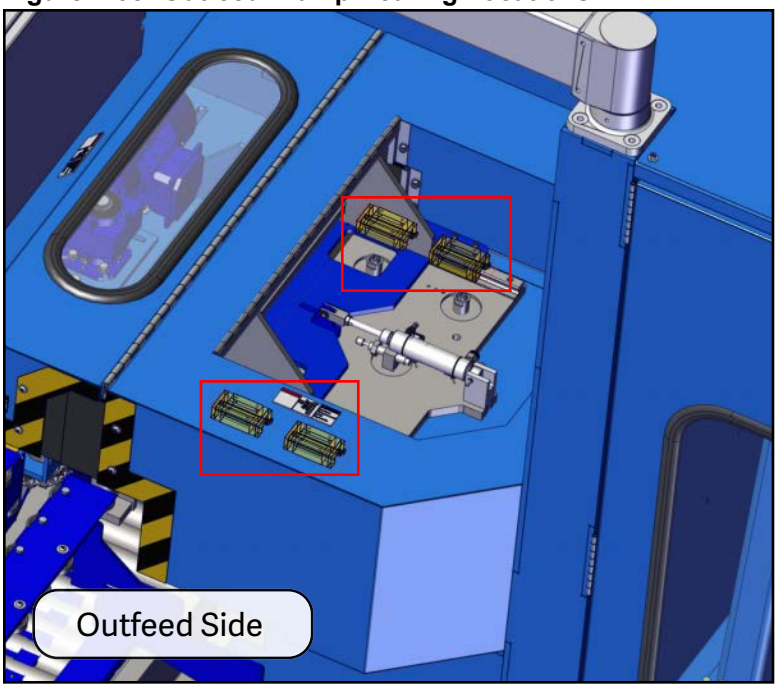


Figure 7-35: Outfeed Clamp Bearing Locations



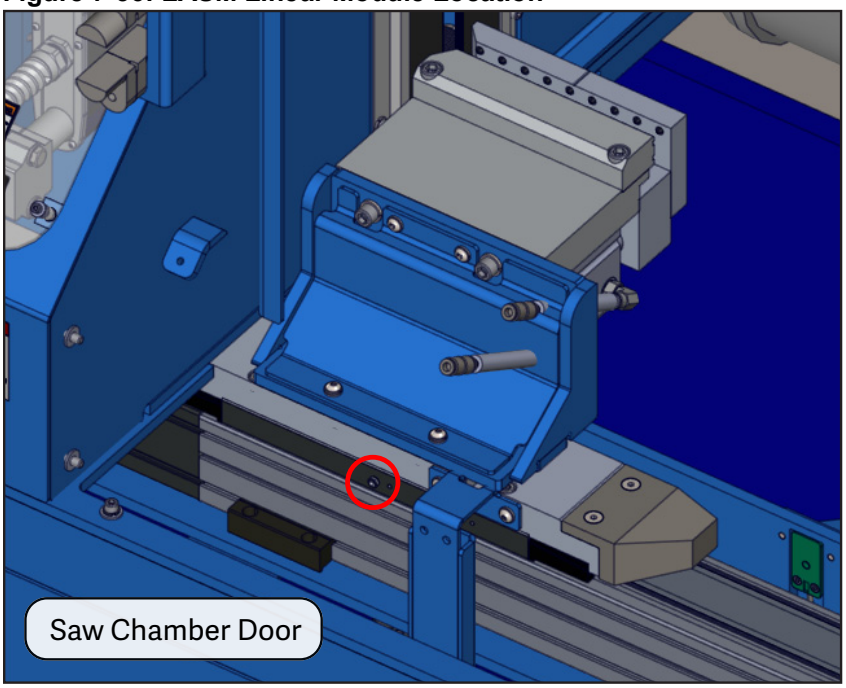
LASM Linear Module

Manual grease gun

No.2 lithium-based grease

The LASM linear module should be lubricated every 24 months (one shift) or every 12 months (two shifts). Use a grease gun to apply 2.8 cm^3 of grease to the fitting shown in Figure 7-36.

Figure 7-36: LASM Linear Module Location



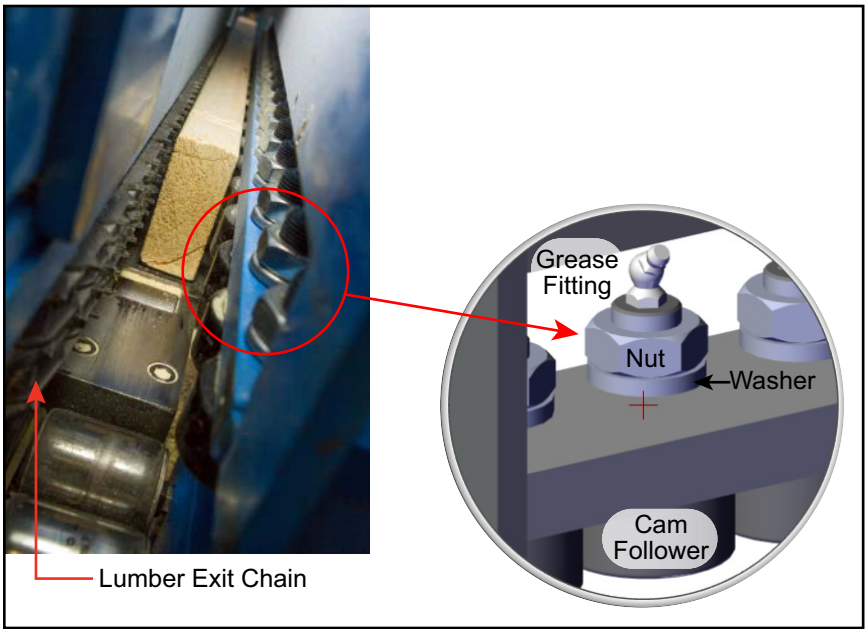
Cam Followers (Outfeed Assembly)

Manual grease gun

No.2 lithium-based grease

As a board exits the saw chamber, a set of cam followers make contact with the board's back surface to guide it and ease its travel to the outfeed. Apply a #2 lithium-based grease to each of these cam followers once every year. Remove the top guard to access the cam followers.

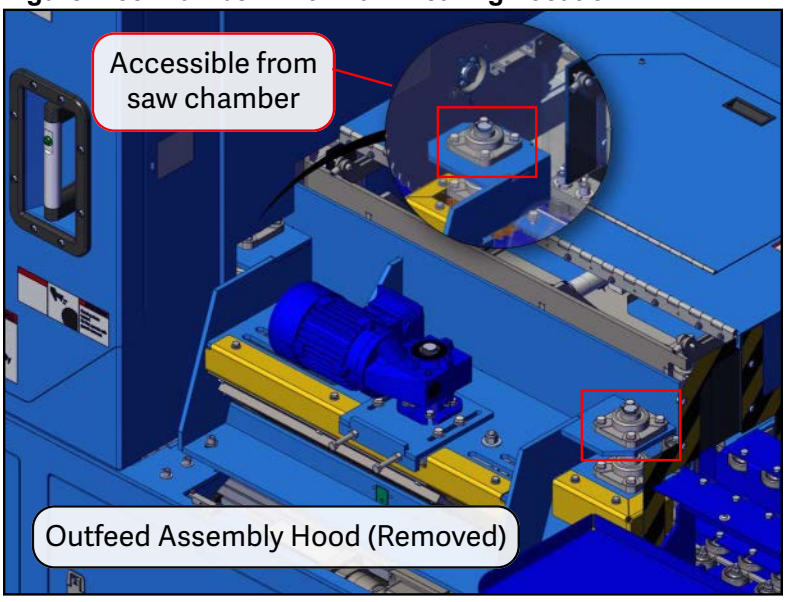
Figure 7-37: Outfeed Cam Followers Location



Lumber Exit Chain Bearings

Apply a #2 lithium-based grease to the idle-end bearings once every 12 months (1 shift) or every 6 months (2 shifts).

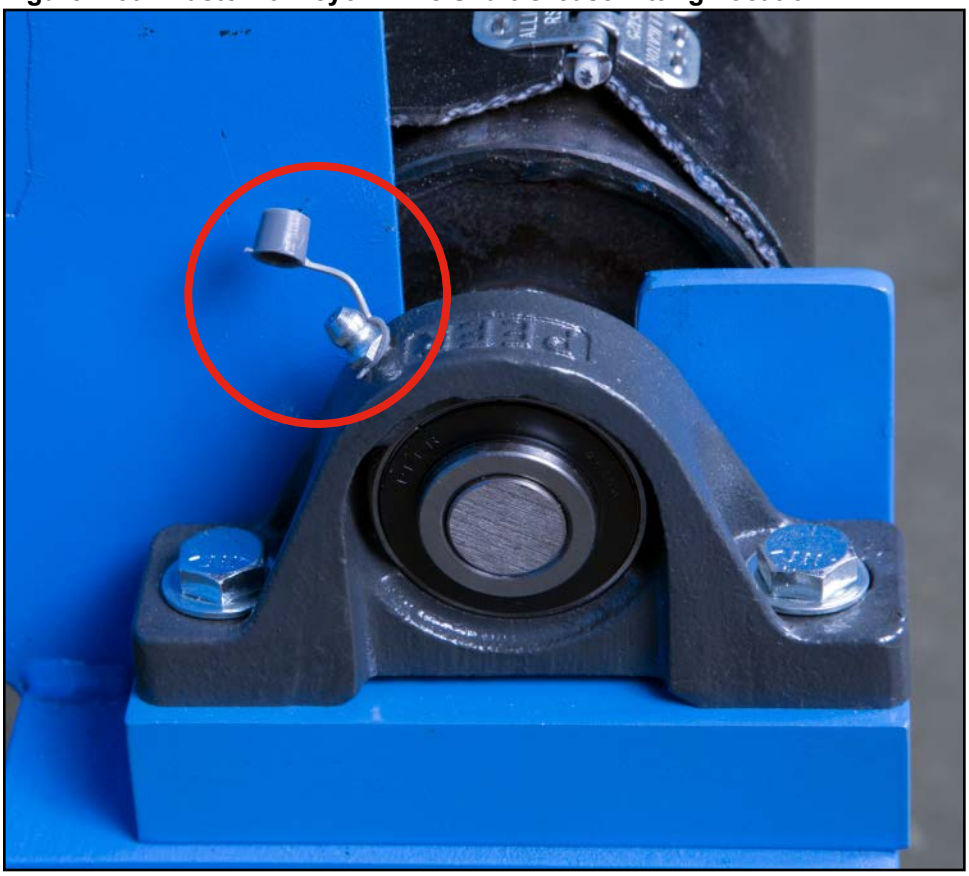
Figure 7-38: Lumber Exit Chain Bearing Location



Waste Conveyor Drive Shaft

Lubricate the waste conveyor bearings with #2 Lithium-based grease once a year. There is 1 grease fitting on each end of the drive shaft.

Figure 7-39: Waste Conveyor Drive Shaft Grease Fitting Location



Auto Deck Drive Shaft (Infeed Component)

Apply #2 lithium-based grease to the grease fittings on the Auto Deck shaft bearings every 12 months (1 shift) or 6 months (2 shifts). There is 1 fitting for each Auto Deck strand and there are 5-6 strands total depending on Auto Deck length.

Figure 7-40: Auto Deck Drive Shaft Grease Fitting Location

Wheels

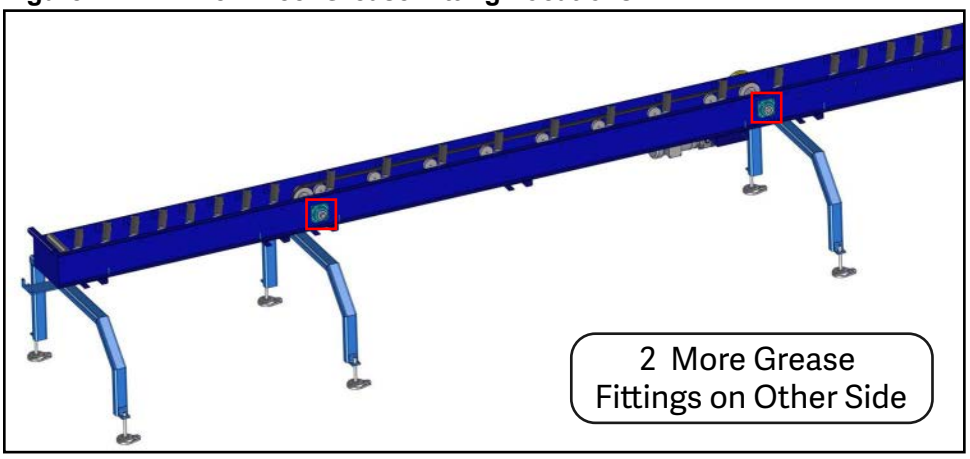
Lubricating Wheels

Skewed Conveyor Wheels

There are 2 drive wheels that drive the belts. Each of the drive wheels have 2 bearings with grease fittings on the front and rear side of the conveyor. Use a #2 lithium-based grease every 6 months (1 shift) or every 3 months (2 shifts). The

non-powered wheels that guide the belt require no lubrication. The conveyor rollers and skatewheels on the Skewed Conveyor require no lubrication.

Figure 7-41: Drive Wheel Grease Fitting Locations



Chains

The chains utilized in this machine may require cleaning, lubrication, or tensioning. This section details which types of maintenance are necessary for specific chains.

Lubricating Chains

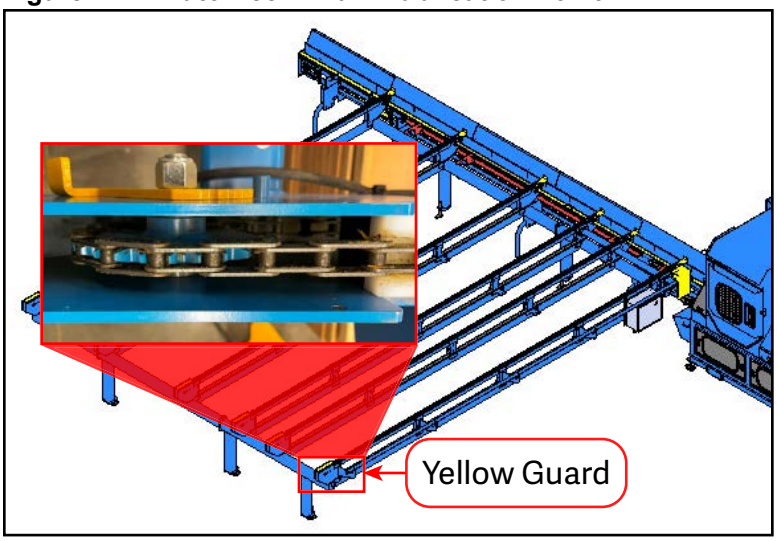
These chains should be lubricated with a high-grade, non-detergent, petroleum-base oil. Anti-foam, anti-rust, and film-strength improving additives are often beneficial. SAE 30 grade is recommended.

Apply oil to the edges of the link plates of the chain near where the chain makes contact with a sprocket and to the inside of the chain generally.

Auto Deck Chain

Remove yellow guard to access chain and sprocket. Lightly lubricate each chain every 12 months.

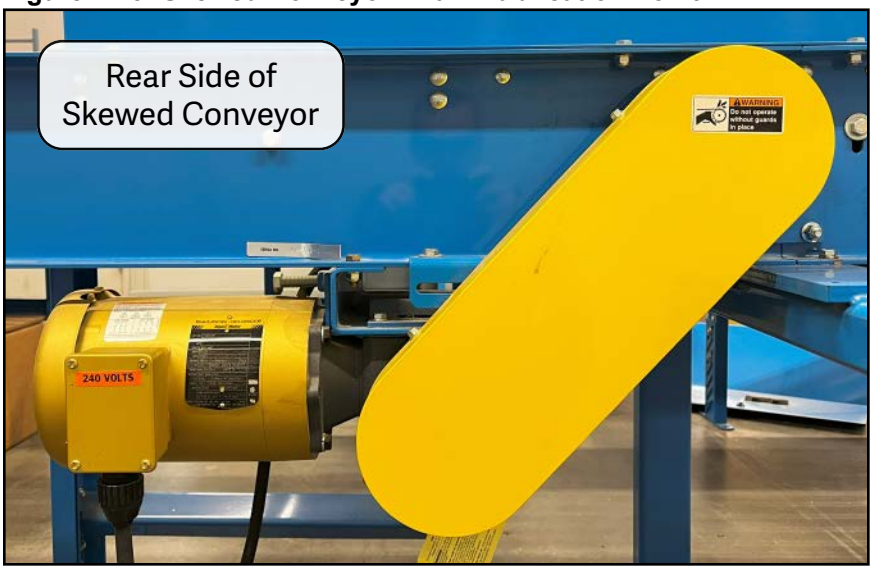
Figure 7-42: Auto Deck Chain Lubrication Point



Skewed Conveyor Chain

Remove yellow guard to access chain and sprocket. Lightly lubricate the chain every 2 months.

Figure 7-43: Skewed Conveyor Chain Lubrication Point



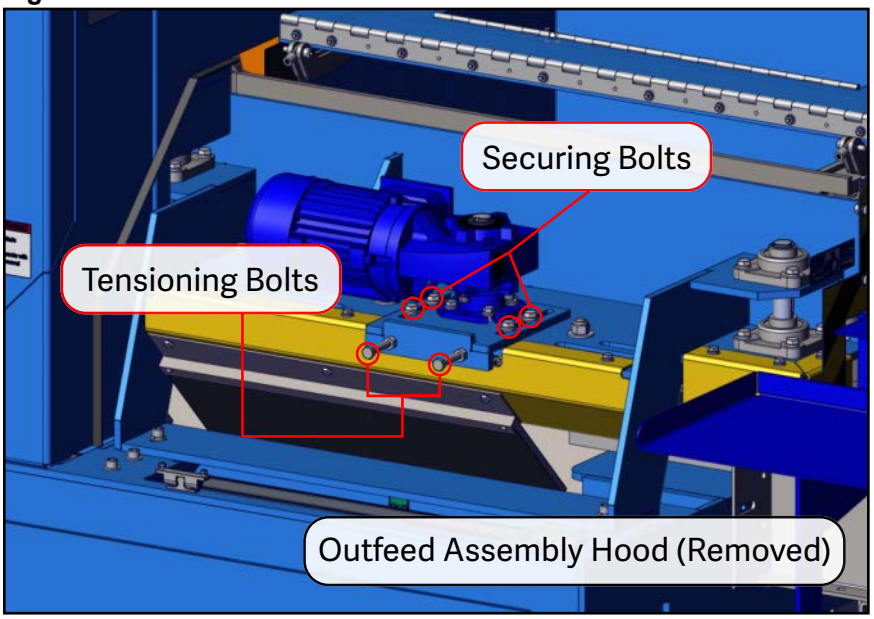
Adjusting Chain Tension / Positioning

For most applications, a chain should be installed with a sag depth between 2%-4% of the distance between sprockets holding the chain. Follow this formula unless measurements are provided for a specific chain.

Lumber Exit Chain Tension

Loosen the 4 securing bolts and then tighten or loosen the tensioning bolts (see Figure 7-44) to adjust the chain tension. Once the chain has been tensioned, tighten the securing bolts.

Figure 7-44: Lumber Exit Chain Tensioner Mechanism



Lumber Exit Chain Positioning

The lumber exit chain must be perfectly parallel with the LASM fixed jaw. All other alignments are measured off of the lumber exit chain (see Table 7-11), so it must be straight and in a location as described here.

Table 7-11: Outfeed Components Alignment Guide

This...	Must Be	This...
Lumber exit chain	parallel to	LASM fixed jaw
Lumber exit chain	in straight line with	sprockets
Outfeed clamp cam followers	parallel to	lumber exit chain

Follow these instructions to adjust the location of the entire lumber exit chain assembly:

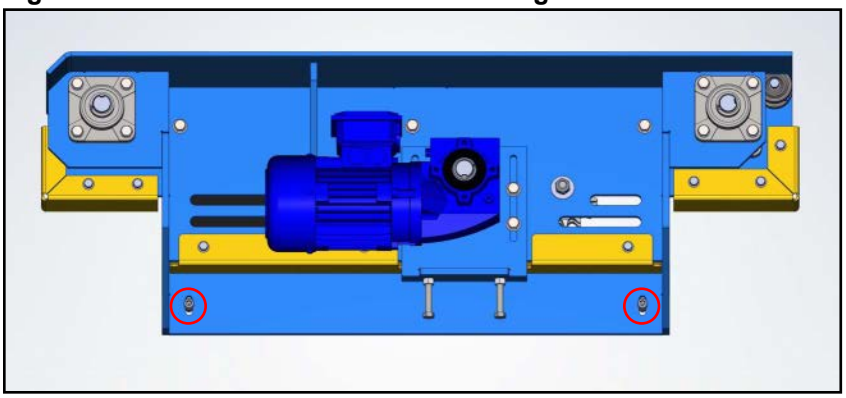
1. Ensure the lumber exit chain is parallel with the travel rail for the LASM and the chain teeth protrude 1/16" in front of the fixed jaw.
2. Check this measurement with LASM at left end of the lumber exit chain, and again with the LASM all the way to the right. Both ends must be identical indicating the lumber exit chain and LASM rail are parallel.
3. Ensure the channel for the lumber is approximately 2-1/2” wide from tip of chain teeth to surface of cam followers when fully unclamped.
4. If it is necessary to adjust the lumber exit chain, follow these steps:

a) Loosen the 2 bolts called out in Figure 7-45.

b) Push or pull on the lumber exit chain assembly to align as described previously.

c) Tighten the 2 bolts called out in Figure 7-45.

Figure 7-45: Lumber Exit Chain Positioning Bolts

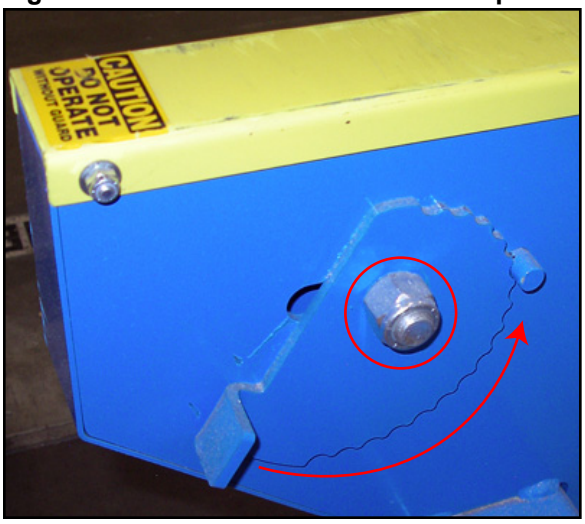


Auto Deck Chain Tension

To tension the chain, loosen the locknut shown in the middle of the take-up in Figure 7-46. Manually pry the take-up, one notch at a time, until the chain is the desired tension, then re-tighten the locknut.

Do not over-tension the Auto Deck chain. An excessive load will cause the VFD to show a fault.

Figure 7-46: Auto Deck Tension Take-Up



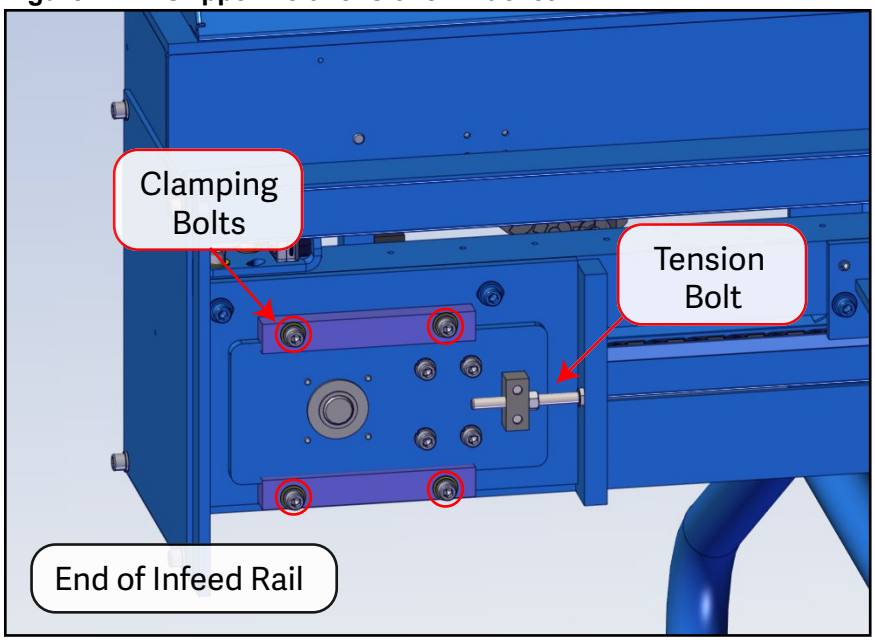
Belts

Gripper

Adjusting Gripper Belt Tension

1. Loosen the 4 bolts clamping the belt tensioner bracket to the frame.

Figure 7-47: Gripper Belt Tensioner Bracket



2. Back off the jam nut and turn the tension bolt to wedge bracket out until the belt is tight.
3. On rear side of the machine, test the tension of the belt at the mid point of the infeed rail. The top section of the belt should lift approximately 3/16 in. with little effort.
4. Re-tighten the bolts clamping the bracket to the frame.
5. Move the gripper assembly back and forth (from the touch screen) to test the belt tracking. Adjust if necessary.

Adjusting the Gripper Belt Tracking

If the gripper belt is not tracking on the shaft evenly, follow this procedure:

1. Loosen the tension (see Gripper Belt Tensioner Bracket) and manually move the belt over to the center of the shaft.
2. Tighten the tension, ensuring that the motor assembly is straight and square.
3. Manually move the gripper to the opposite end of the Infeed Rail to test the tracking.

4. Repeat this process until the belt stays where it was placed on the shaft.

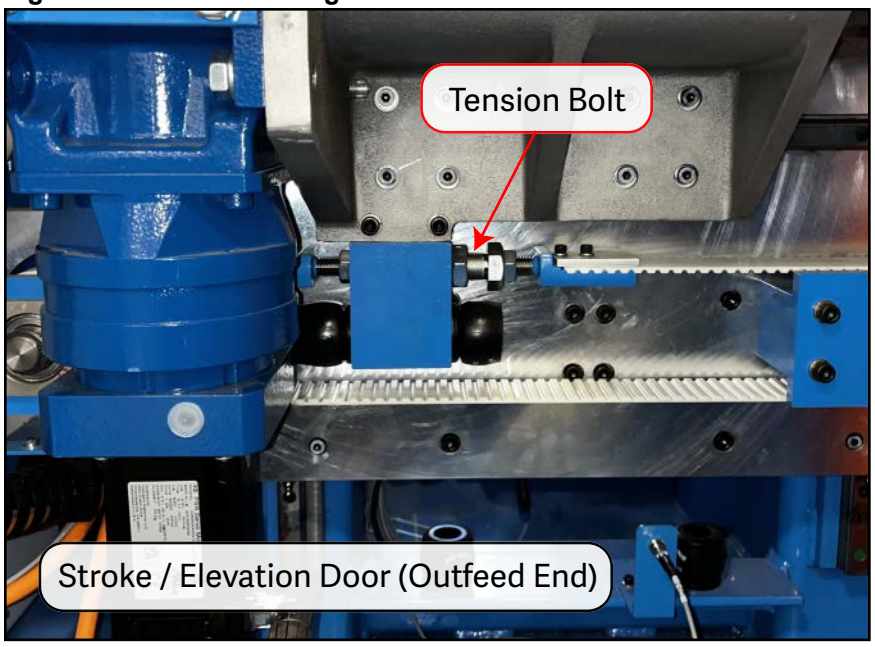
Stroke Axis

Adjusting Stroke Belt Tension

The stroke assembly is attached to a cogged belt called a timing belt. To adjust the tension of stroke timing belt, follow this procedure:

1. Locate the threaded rod used as a tension bolt that puts tension on the timing belt attached to the assembly (see Figure 7-48).

Figure 7-48: Stroke Timing Belt Tension Bolt



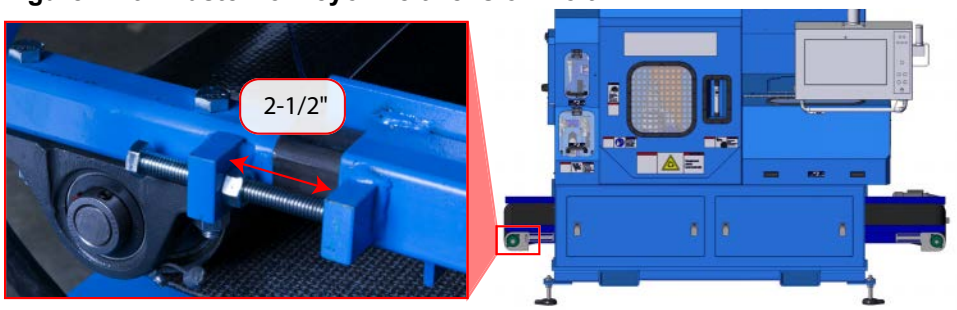
2. Back off the jam nuts and adjust the bolts to tighten or loosen the tension on the cogged, white belt.
3. Tighten the jam nuts.
4. From the machine software Home Screen, select Stroke and choose one of the Jog options to move the assembly back and forth to test the belt tracking.
5. Adjust if necessary.

Waste Conveyor

Adjusting Waste Conveyor Belt Tension

1. Remove the dust extraction cover to access then tension bolt shown in Figure 7-49.

Figure 7-49: Waste Conveyor Belt Tension Bolt



2. Start with the tension bolt at approximately 2-1/2”.
3. Adjust as needed so the belt runs smoothly.

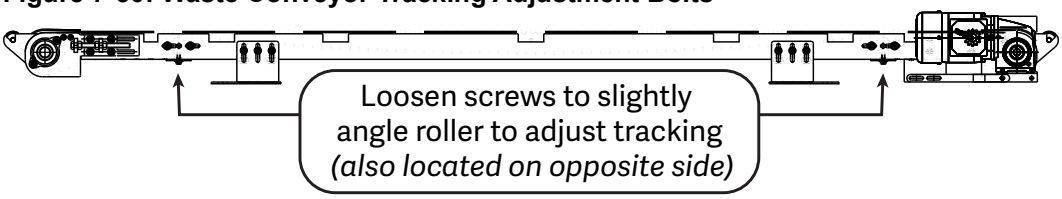
Adjusting Waste Conveyor Belt Tracking

With extended use or belt replacement, the belt tracking may need adjustment. The key to perfect tracking is to make each adjustment very small and to remain patient as it may require more than one roller to be adjusted. Expect several adjustment cycles before the belt tracks perfectly.

	⚠ CAUTION
	**Use your company’s approved lockout/tagout guidelines while adjusting the belt. Ensure that no one can power on the conveyor without notifying all personnel in the restricted zone.**

1. After tensioning the belt, test the tracking:
   a) Remove lockout/tagout devices and power up the saw.
   b) Run the conveyor and watch how the belt tracks.
2. If the belt walks toward one side, adjust it as described here.
   a) Determine which way the belt needs to move toward, and address that end of the belt.
   b) Adjust the angle of the roller (see Figure 7-50 for location of tracking adjustment bolts)

Figure 7-50: Waste Conveyor Tracking Adjustment Bolts



3. Test the belt by returning power the saw. The belt should stay approximately centered on the conveyor bed. Some minor back and forth motion is normal, but it should never rub the side of the conveyor frame.

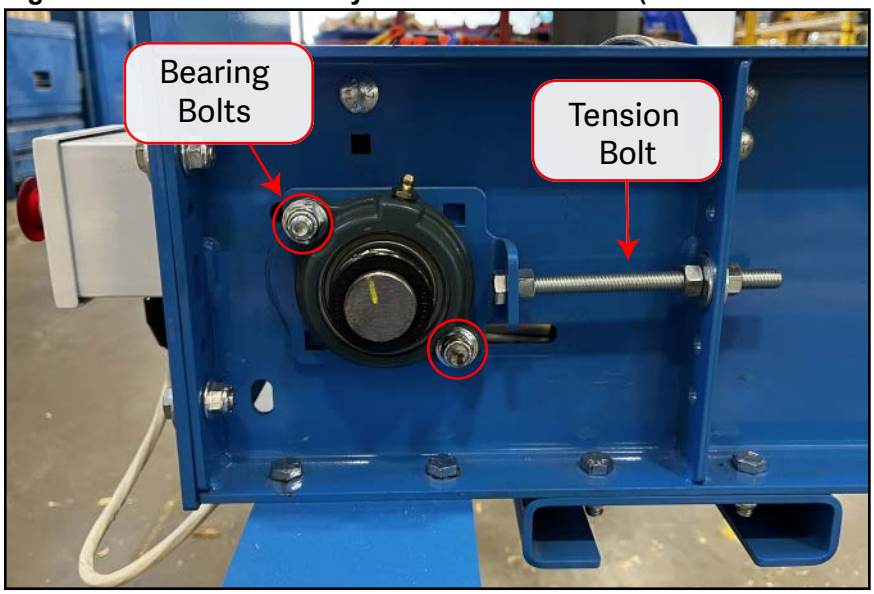
Skewed Conveyor

Adjusting Skewed Conveyor Belt Tension

The Skewed Conveyor belt is driven by 2 drive wheels, both powered by the same motor. The belt should be tensioned so it moves easily and smoothly without much slack. To adjust the tension, follow this procedure:

1. Loosen the 2 bolts securing a bearing on each side of the conveyor (4 bolts total). See Figure 7-51.
2. Adjust the drive wheel in or out using the lag nuts on the tensioning bolt on each side of the conveyor.
3. Re-tighten the 4 bolts.

Figure 7-51: Skewed Conveyor Tensioner Bracket (*mirrored on other side*)



Adjusting Skewed Conveyor Belt Sheaves

If the belt tension seems correct, but the belt is not making consistent and smooth contact with the rollers, adjust the sheaves that support the belt (located under the rollers) using this procedure.

1. Determine which sheaves need to be raised or lowered.
2. Loosen the bolt in the middle of each sheave needing adjustment.
3. Adjust the location of each sheave in its slotted hole, then tighten each bolt.
4. Inspect the belt.It should make just enough contact to drive the rollers, but not be too tight.

Wear Items

Bumpers

Bumpers are used on the following axes to reduce stress on mechanical parts when stopping at the end of their range:

- Stroke / Elevation
- Gripper
- LASM

Bumpers should be replaced if they appear cracked or significantly worn.

Not all bumpers are the same size. Refer to the Ordering Parts appendix for instructions on ordering parts.

To replace a bumper, remove the screw(s) securing the existing bumper and install the replacement. Discard the damaged bumper.

Figure 7-52: Stroke / Elevation Bumpers

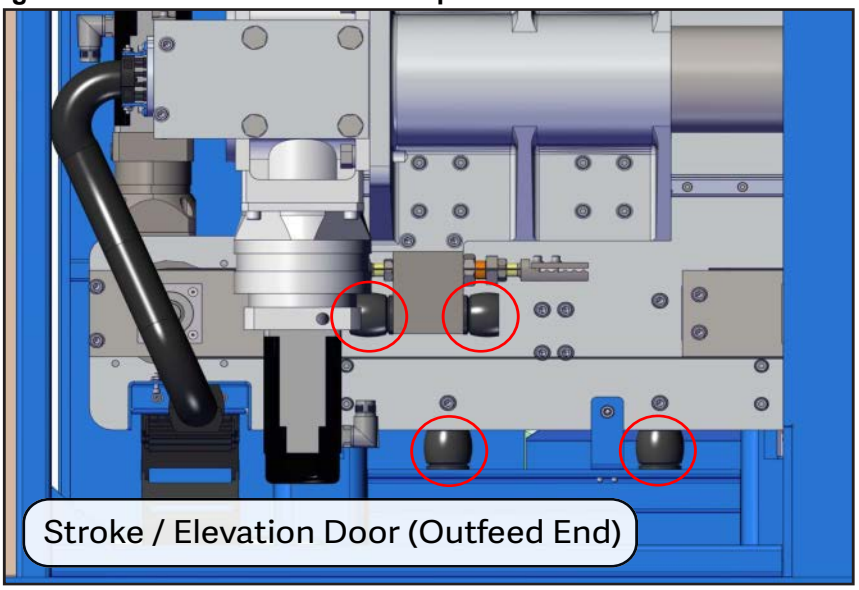


Figure 7-53: Gripper Bumpers

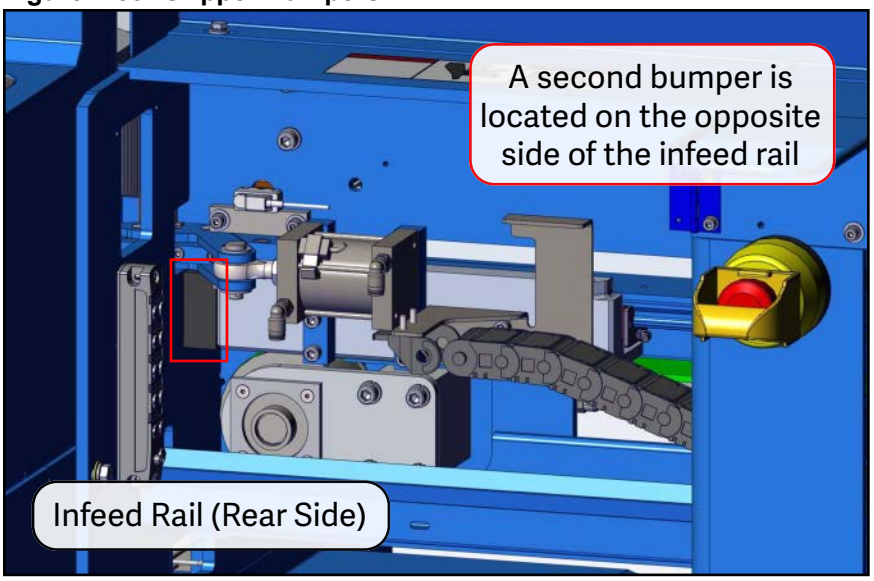
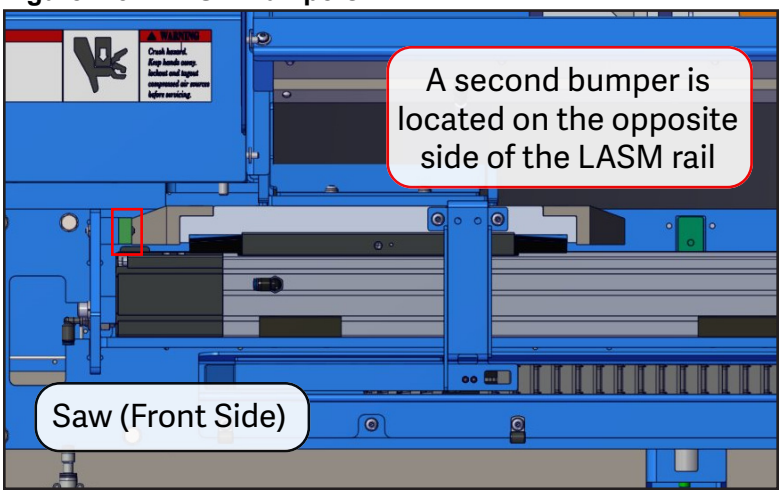


Figure 7-54: LASM Bumpers

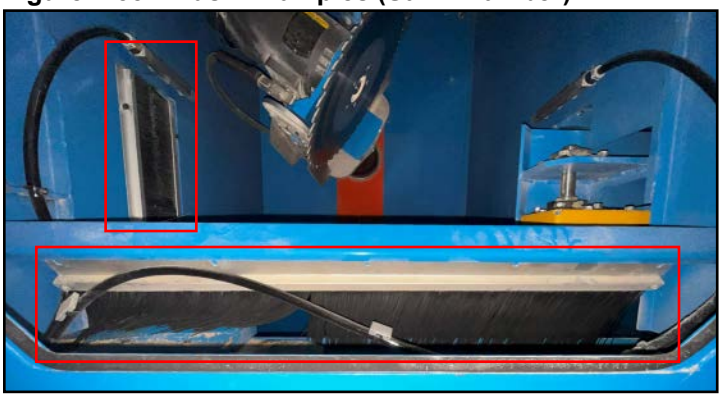


Brushes

Brushes exist at some openings and rails to keep scrap and other debris from accidentally entering the saw chamber or sitting on a rail causing an axis

obstruction. The brushes should be inspected periodically and replaced when necessary.

Figure 7-55: Brush Examples (Saw Chamber)



Replacing Brushes

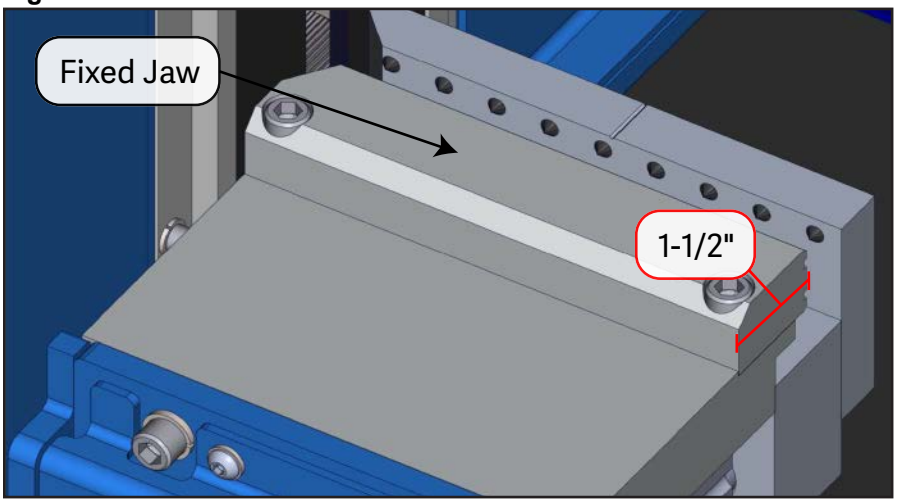
1. Remove bolts securing existing brush. Retain for re-installation.
2. Remove and discard existing brush.
3. Use bolts removed in step 1 to install the new brush.

LASM

Fixed Jaw

Measure the fixed jaw of the LASM periodically to ensure it is not worn. It must be at least 1 1/2" thick. If worn to less than that, replace it as soon as possible.

Figure 7-56: LASM Fixed Jaw Minimum Thickness

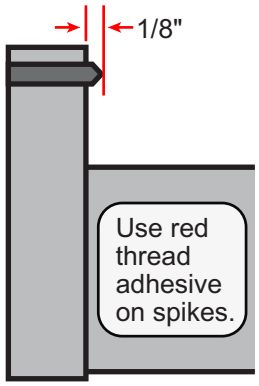


LASM Spikes

Spikes (socket-head cap screws) are assembled into the carriage side of the LASM jaw to hold the board in place.

When spikes become dull or damaged, unscrew each spike and replace each with a new spike, ensuring the spike extends 1/8" past the LASM jaw surface. Use red thread adhesive.

Figure 7-57: LASM Spike Depth



Tape Liner

Tape liner provides friction resistance for the seal plate assembly (the orange plate) that slides up and down with the elevation axis located inside the stroke/elevation chamber.

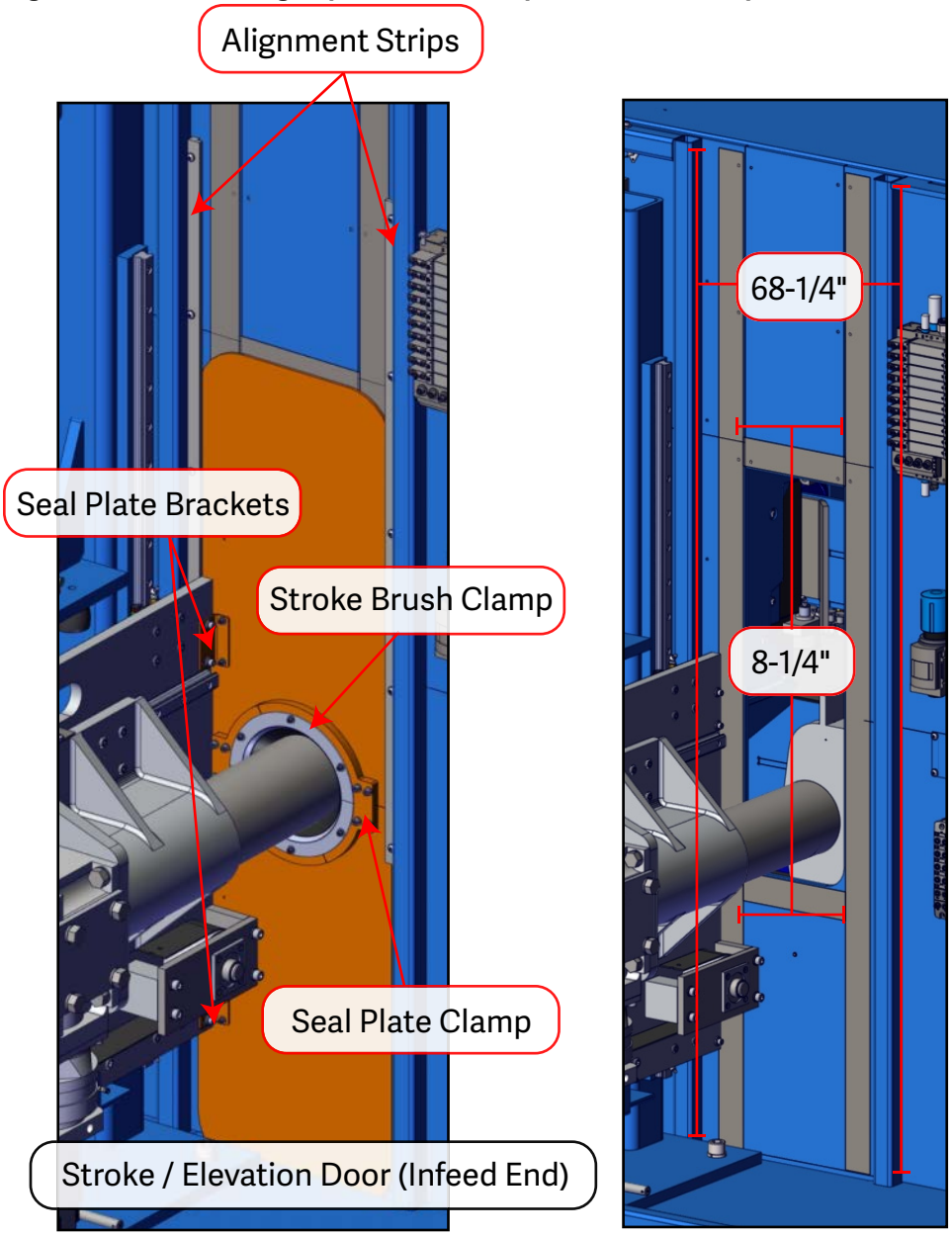
Replace the tape liner if presented with any of the following issues:

- Signs of metal rubbing against metal (orange seal plate rubbing against the blue frame plate)
- Excess saw dust entering the stroke/elevation chamber due to poor seal

Replacing The Tape Liner

It is recommended to replace all 4 tape strips at the same time to keep the plate even.

Figure 7-58: Accessing Taper Liner for Replacement and Tape Placement



1. Remove the alignment strips securing the seal plate on each side.
   - See Figure 7-58 for identification of critical components and correct placement and length of tape strips.
2. Remove all bolts securing the seal plate clamp and remove both sections.
3. Remove all bolts securing the stroke brush clamp and remove the clamp.
4. Remove the seal plate brackets connecting the seal plate to elevation assembly.
5. Remove both sections of the now free top and bottom sections of the seal plate.

6. Remove the existing tape liner (4 pieces total).
7. Thoroughly clean the surface with a damp cloth.
   - Failure to clear the surface may prevent the new tape liner from adhering securely to the frame.
8. Cut 2 pieces of tribo-tape liner from the roll at 68 1/4" and another 2 pieces at 8 1/4".
9. Place the tape liner on the machine frame as shown in Figure 7-58.
10. Reinstall all components in reverse order. When re-installing the alignment strips, be careful not to over-tighten the bolts as this could impede movement of the orange seal plate.

Shock Absorbers

The following shock absorbers keep the clamps from slamming at the end of their cycle.

- Top clamp: located on extend and retract positions.
- Infeed side clamp: located on retract position only.
- Outfeed side clamp: located on retract position only and controls clamp opening.

Replacing a Shock Absorber

1. Preparing the Saw:
   a) Move the component requiring the shock absorber to make accessible:
      - For the infeed side clamp, move the gripper to Home position.
      - No positioning is required when replacing the infeed side clamp or outfeed clamp shock absorber.
   b) Lockout/tagout the machine.

2. Unscrew the locknut and damaged shock absorber and discard all pieces.
3. Install the new shock absorber into the bracket:
   a) Remove the lock nut from the new shock absorber.
   b) Place the collapsible end through the bracket pointing the correct direction, and screw it in as indicated in Table 7-12.
   c) Slide the lock nut over the collapsible end and tighten against the bracket.
4. Check that the sensors on the cylinder that control “fully open” and “fully closed” are set correctly. Their location may need to be slightly adjusted.

Table 7-12: Shock Absorber Overview

Location	Qty	Graphic	Distance	Piston points...
Top Clamp: Top (retract)	2	Figure 7-59	1/2” from bottom surface of bracket to end of shock absorber body.	Down
Top Clamp: Bottom (extend)	2	Figure 7-59	1/2” from top surface of bracket to end of shock absorber body.	Up
Infeed Side Clamp	1	Figure 7-60	See Figure 7-60.	Toward saw front
Outfeed Clamp	1	Figure 7-61	Adjust to 2-1/2” between lumber exit chain teeth and camfollower. See	Toward saw front

Adjusting a Shock Absorber

Figure 7-59: Shock Absorbers for Top Clamp Retract Stroke

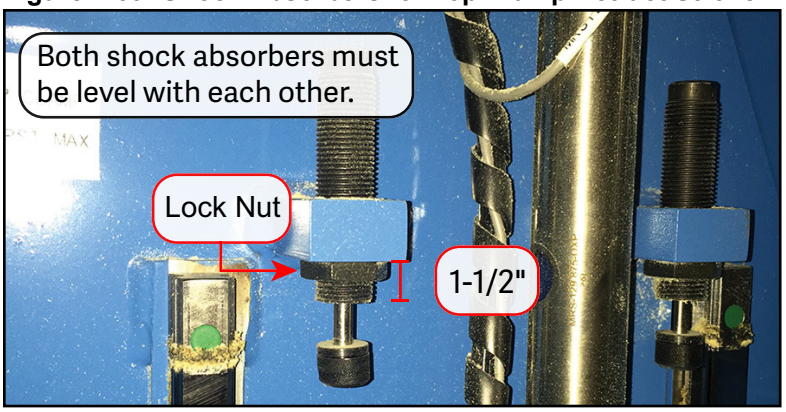


Figure 7-60: Top View of Infeed Side Clamp Rollers

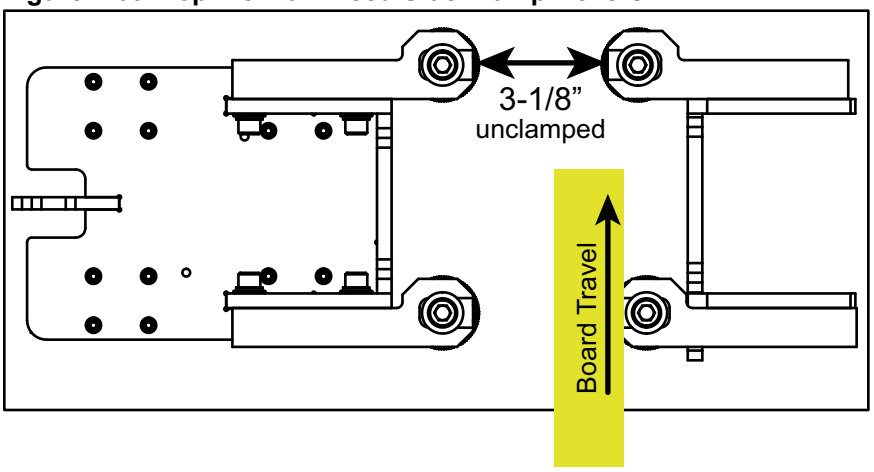
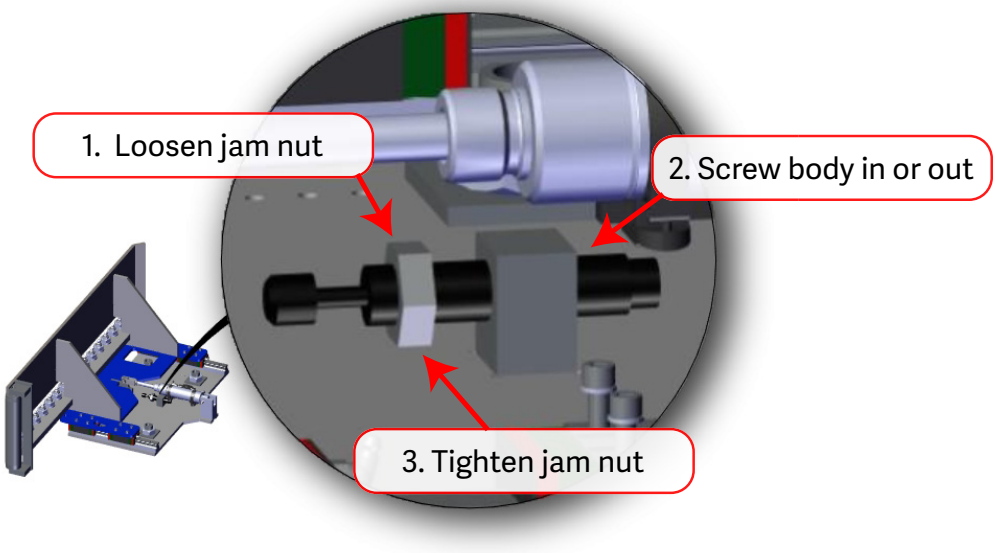


Figure 7-61: Adjusting Outfeed Clamp Shock Absorber



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 Table 7-13.

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 than needs to be connected to an air source. Some components have their own regulator to further reduce the pressure. See Table 7-13 for the optimum pressure settings for each.

Table 7-13: Overview of Pneumatic Components

Component	Description	PSI
Auto Deck Pusher	Pushes each board onto thee load arms to be loaded onto the Infeed Rail.	110
Auto Deck Lumber Stops	Provides separation between two jobs on Auto Deck conveyor.	
Load Arms	Loads the lumber from the lumber feed system onto the Infeed Rail.	
Gripper Clamp	Holds the end of the board as it is traveling along the Infeed Rail.	
LASM Clamp	Holds each board inside the saw chamber and delivers each cut piece to the outfeed clamp.	
Infeed/Outfeed Air Knives	Provides a curtain of air at the infeed and outfeed areas to contain dust.	
LASM Rail Chamber	Pressurizes the LASM rail chamber to keep out dust	6
LASM Carriage Air Knife	Air knife on LASM carriage blows dust off rail as it moves	10
Side Clamp	Holds the lumber from the sides while entering the saw chamber.	30 (clamp) 110 (unclamp)
Top Clamp	Holds the lumber from the top while entering the saw chamber	
Outfeed Clamp	Holds the lumber while exiting the saw chamber.	60 (clamp) 110 (unclamp)

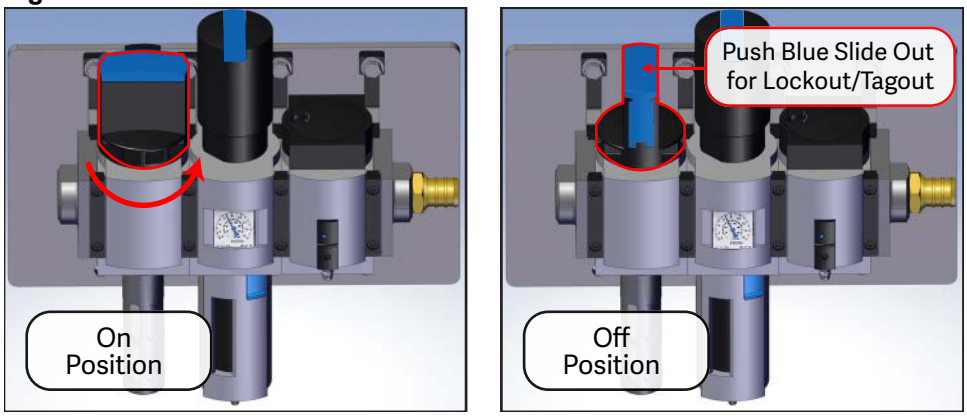
Component	Description	PSI
Printer	Prints identification on board for each cut piece using air powered print heads. SETTING THIS PRESSURE HIGHER THAN RECOMMENDED WILL DAMAGE THE PRINT HEADS!	12

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 7-62: Pneumatic Airflow On and Off Positions



2. Lockout/tagout through the hole on the slide. See Figure 1-4 on page 10 for 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

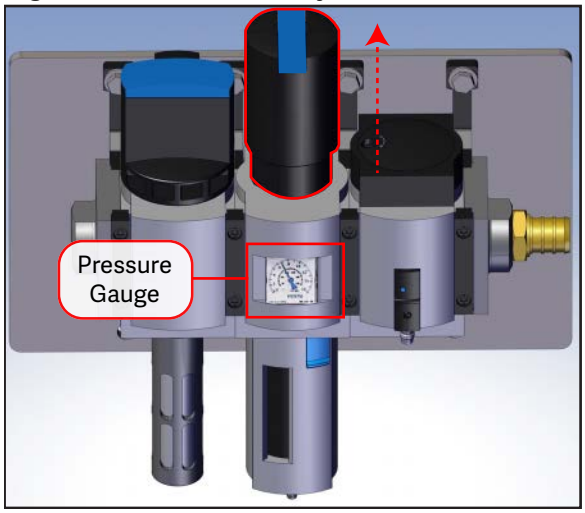
The pressure adjustment knob on the filter / regulator controls the operating pressure for the entire pneumatic system. The operating pressure for the

pneumatic system should be set at 110 psi. Use the following procedure to adjust operating pressure.

The system pressure should be set to 110 psi. If the system pressure drops below 75 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 7-63).

Figure 7-63: 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 110, 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 194 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 149.
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 7-64: 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 7-65) until it flashes.
3. Return the main filter/regulator to the standard system pressure of 110 psi.

Figure 7-65: Pressure Sensor Adjustment on Main Filter/Regulator Assembly

Air Knives

This machine utilizes multiple air-knives to manage sawdust. For optimal performance, the air-knife must supply only dry air. If droplets of water are being ejected from the air-knife. the external pneumatic system that supplies air pressure to the machine may require adjustment or maintenance.

Adjusting Cabinet Coolers

A cabinet cooler maintains an appropriate temperature for all components inside an enclosure. The cooler activates when a thermostat located inside the enclosure indicates that the interior of the enclosure is above a set point. The set point can be adjusted using the dial on the thermostat.

This machine includes two cabinet coolers that should be set to the following temperatures using the paired thermostat:

- Operator interface enclosure: 85-90 degrees Fahrenheit
- Main electrical enclosure: 130 degrees Fahrenheit

Figure 7-66: Example of Cabinet Cooler and Paired Thermostat (left to right)

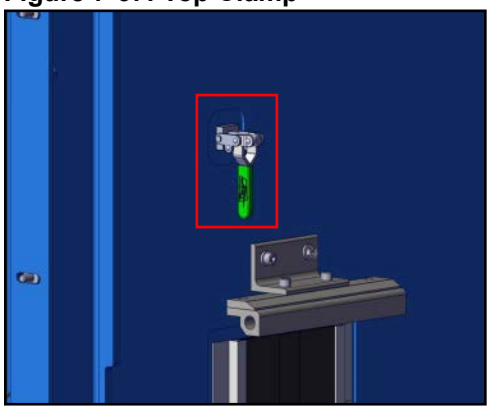
Clamps

Raising the Top Clamp

For ease of maintenance, the containing top clamp (infeed side) can be raised and locked into place when the saw is not operating. To raise and lock the assembly:

1. Open the saw chamber door.
   - Note that opening the door will cause the air pressure to release and the top clamp to fall if it is unclamped position.
2. Ask another person to lift the top clamp to the unclamped (topmost) position.
3. With the other person holding the clamp in place, engage the lever inside the saw chamber on the infeed side (see Figure 7-67).

Figure 7-67: Top Clamp



Adjusting the Outfeed Clamp

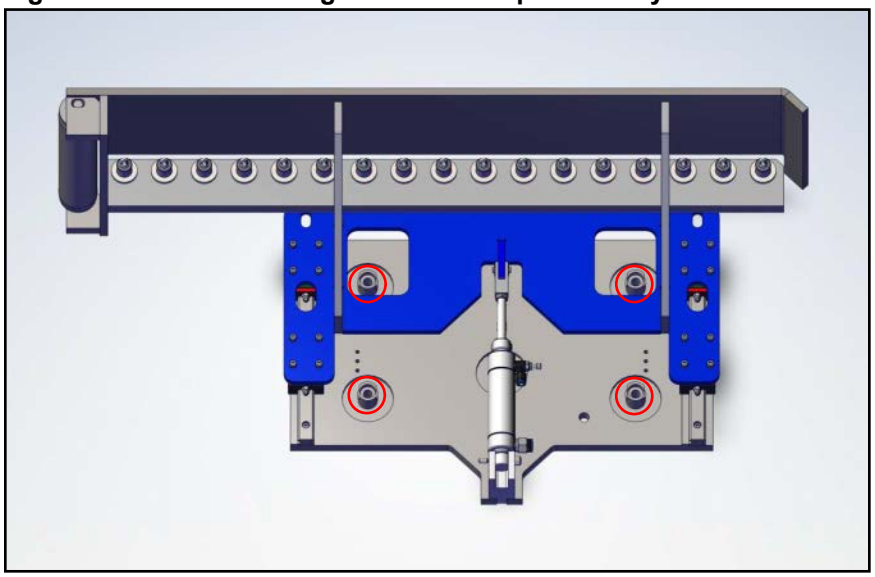
The outfeed clamp camfollowers must be parallel to the lumber exit chain at all times.

1. Mechanically adjust the clamp location using these steps. Steps for adjusting in smaller increments occur in the next step.
   - Set the lumber exit chain location EXACTLY as described in Lumber Exit Chain Positioning.

     The lumber exit chain MUST be parallel and 1/16” forward of the LASM fixed jaw.

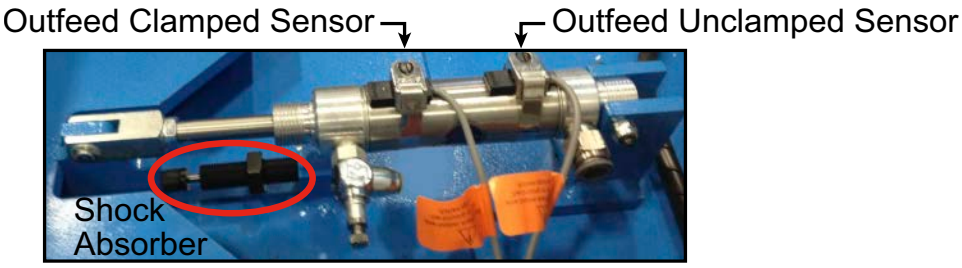
2. Use these steps to align the outfeed clamp assembly and sensors to accomplish these bullet points:
   - Outfeed clamp assembly is parallel to the lumber exit chain.
   - More than 2-1/2” gap between tip of chain teeth and edge of cam followers (with clamp fully retracted). This measurement will be refined with sensor location and shock absorber later.
   - 1-3/8” or less gap when fully extended without board in it.
   - Should have slight offset between front edge of outfeed clamp cam followers and front edge of powered skewed conveyor cam followers. This can be adjusted on the powered skewed conveyor.
3. To make adjustments, loosen the bolts circled in Figure 7-68 and adjust the entire clamp assembly so it is parallel with the lumber exit chain. Tighten the bolts securely when done.

Figure 7-68: Bolts Holding Outfeed Clamp Assembly



4. Adjust the outfeed clamp sensors so the clamp opens and clamps to the proper dimensions given previously.

Figure 7-69: Outfeed Clamp Adjustment



5. To adjust the outfeed clamp in small increments to reach the correct lumber channel, adjust the shock absorber as described in Figure 7-61.

Cylinders

The *BLADE II* saw utilizes pneumatic cylinders for Infeed Rail load arms and various clamps throughout the machine. Observe the operation of pneumatic systems every 3 months and adjust as needed.

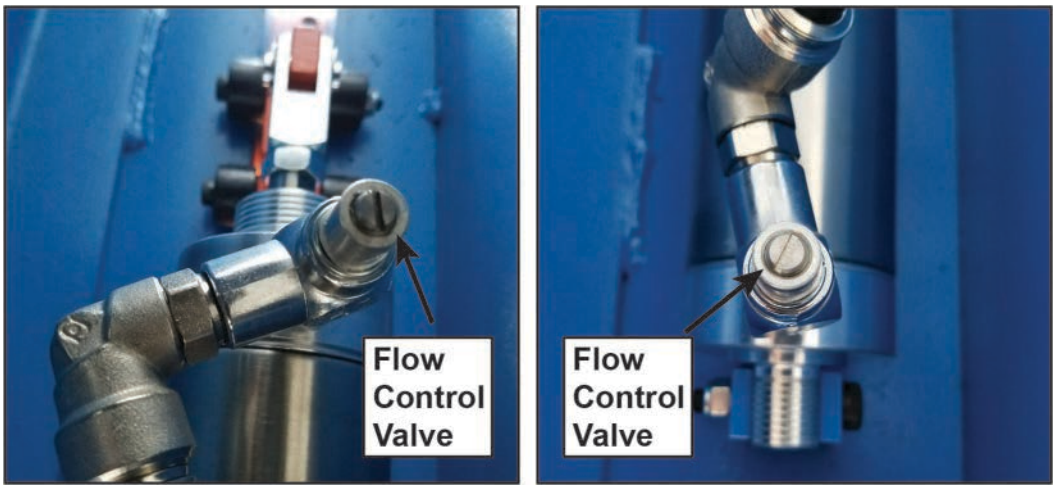
Adjusting Flow Control Valves

Both ends of some cylinders have flow control valves to adjust how fast the cylinders extend and retract. If cylinders with flow control valves move too slowly or quickly, adjust the flow control valves. The location of the flow control valve that needs adjustment depends on whether the cylinder is moving too quickly on the extending or retracting stroke.

Table 7-14: Adjusting the Flow Control Valves

Stroke	Valve Location	Increase Speed	Decrease Speed
Extend	Rod end of cylinder	Turn the adjusting screw counterclockwise	Turn the adjusting screw clockwise
Retract	Cap end of cylinder	Turn the adjusting screw counterclockwise	Turn the adjusting screw clockwise

Figure 7-70: Rod-End (Left) and Cap-End (Right) Flow Control Valves



Electrical System

Sensors Overview

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

Table 7-15: List of Infeed Rail Sensors

Sensor Name	Description	See...
Load Arm Up	Indicates when the load arms are up so lumber feed system will not advance.	Figure 7-71
Load Arm Down	Indicates when the load arms are down so lumber feed system will advance.	Figure 7-71
Board Sensor (Load Arms)	Indicates that lumber is located at a position where the load arms will raise it on the next up movement.	Figure 7-71
Gripper Obstruction	Detects material that has fallen behind the gripper and stops gripper movement to prevent potential collisions	Figure 7-71
Gripper Home	Determines the position of the gripper during the homing process.	Figure 7-71
Gripper Unclamped	Indicates the gripper is not clamped.	Figure 7-71
Board Slip	Indicates if the board is tight against the gripper face.	Figure 7-71
Leading Edge Receiver	Works with the emitter sensor to determine the location of the leading edge of the board which is used in the board length measurement process.	Figure 7-71
Leading Edge Emitter	See Leading Edge Receiver description.	Figure 7-71
Top Clamp Ski Sensor	Indicates the top clamp is clamped on a board.	Figure 7-72
Top Clamp Clamped (EP/TC Bottom)	Indicates when the top clamp is fully clamped meaning there is no board present.	Figure 7-72
Top Clamp Unclamped (EP/TC Top)	Indicates when the top clamp on the infeed side of saw is up.	Figure 7-72
Side Clamp Unclamped	Indicates when the side clamp on the infeed side of saw is open.	Figure 7-72
Elevation home	Determines the position of the elevation during the homing process.	Figure 7-72

Sensor Name	Description	See...
Stroke home	Determines the position of the stroke during the homing process and that the saw is in a retracted position.	Figure 7-72
Angle home	Determines the position of the angle during the homing process.	Figure 7-72
LASM Lockout	Prevents saw blade from moving when LASM is within sensor's vision. Located on the stationary portion of the LASM assembly at the centerline of the saw blade. When LASM block is within the sensor's vision, the saw blade will not move because of a collision risk, unless overridden by software.	Figure 7-73
LASM Home	Determines the position of the LASM during the homing process.	Figure 7-73
Crooked Lumber Sensor (CLS)	Uses ultrasonic wavelengths to determine the location of the bottom of the board.	Figure 7-73
Bevel home	Determines the position of the bevel during the homing process and that the bevel is close to square.	Figure 7-73
Outfeed Clamped	Indicates when the outfeed clamp is clamped meaning there is no board present.	Figure 7-73
Outfeed Unclamped	Indicates the outfeed clamp is open.	Figure 7-73
LASM Clamped	Indicates that the LASM clamp is clamped, meaning there is no board present.	Figure 7-74
LASM Unclamped	Indicates when the LASM clamp is open.	Figure 7-74
Auto Deck Lumber Sensor (Optional Component)	Indicates there is a board present just behind the load arms by sensing the leading edge of the board. When the Auto Deck Lumber Sensor indicates a board is present, the system knows to index the board when the load arms clear of wood and are in the down position.	Figure 7-75
Auto Deck Pusher Extend/Retract (Optional Component)	Indicates the state of the lumber pusher on the Auto Deck (2 sensors). Retracted=Home, Extended=Pushed	Figure 7-75
Air Pressure	Indicates if the system air pressure has dropped below the minimum requirement.	Adjusting the Main Pressure Sensor on page 151

Figure 7-71: Infeed Rail Sensors

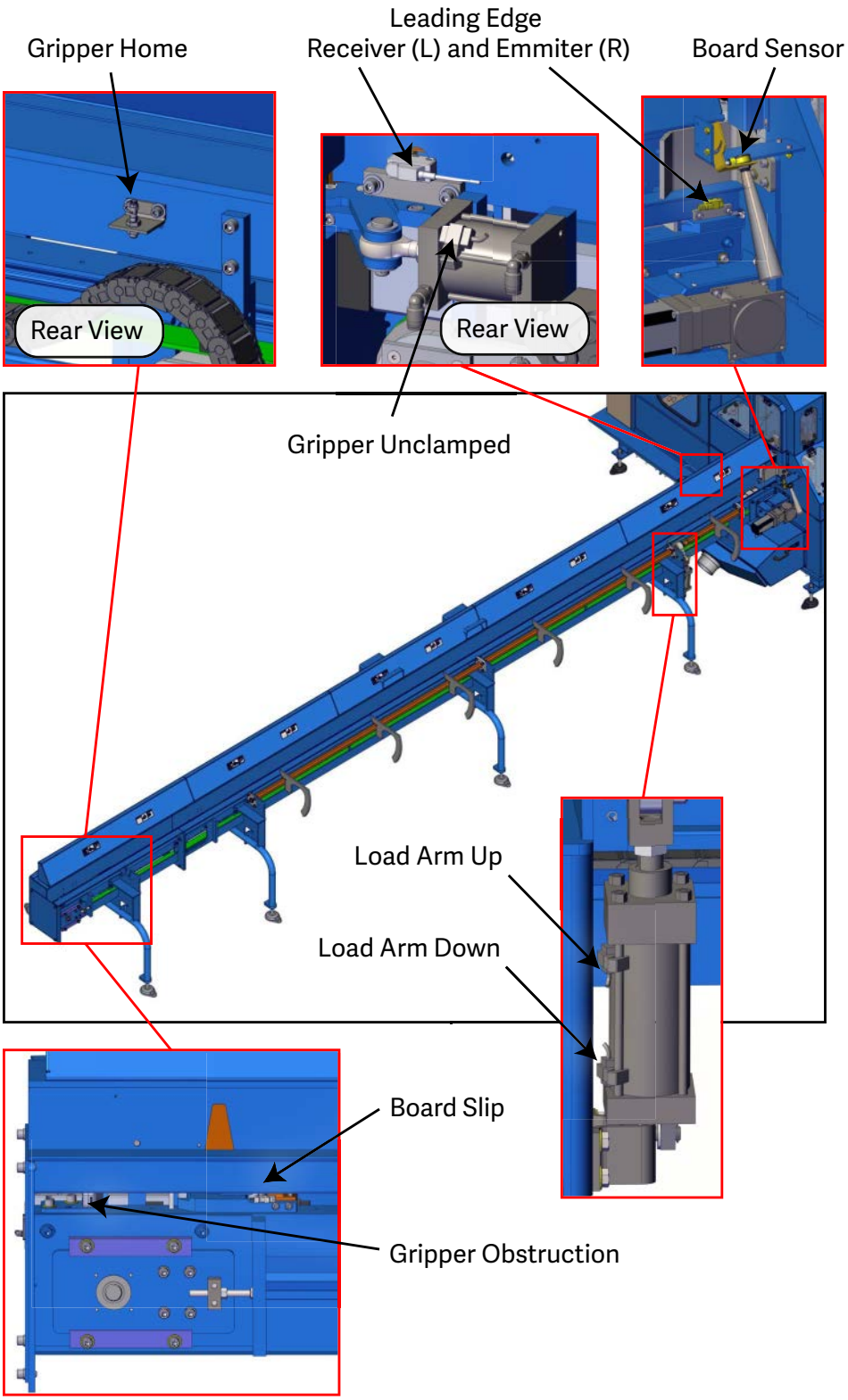


Figure 7-72: Stroke/Elevation Chamber and Infeed Clamp Sensors

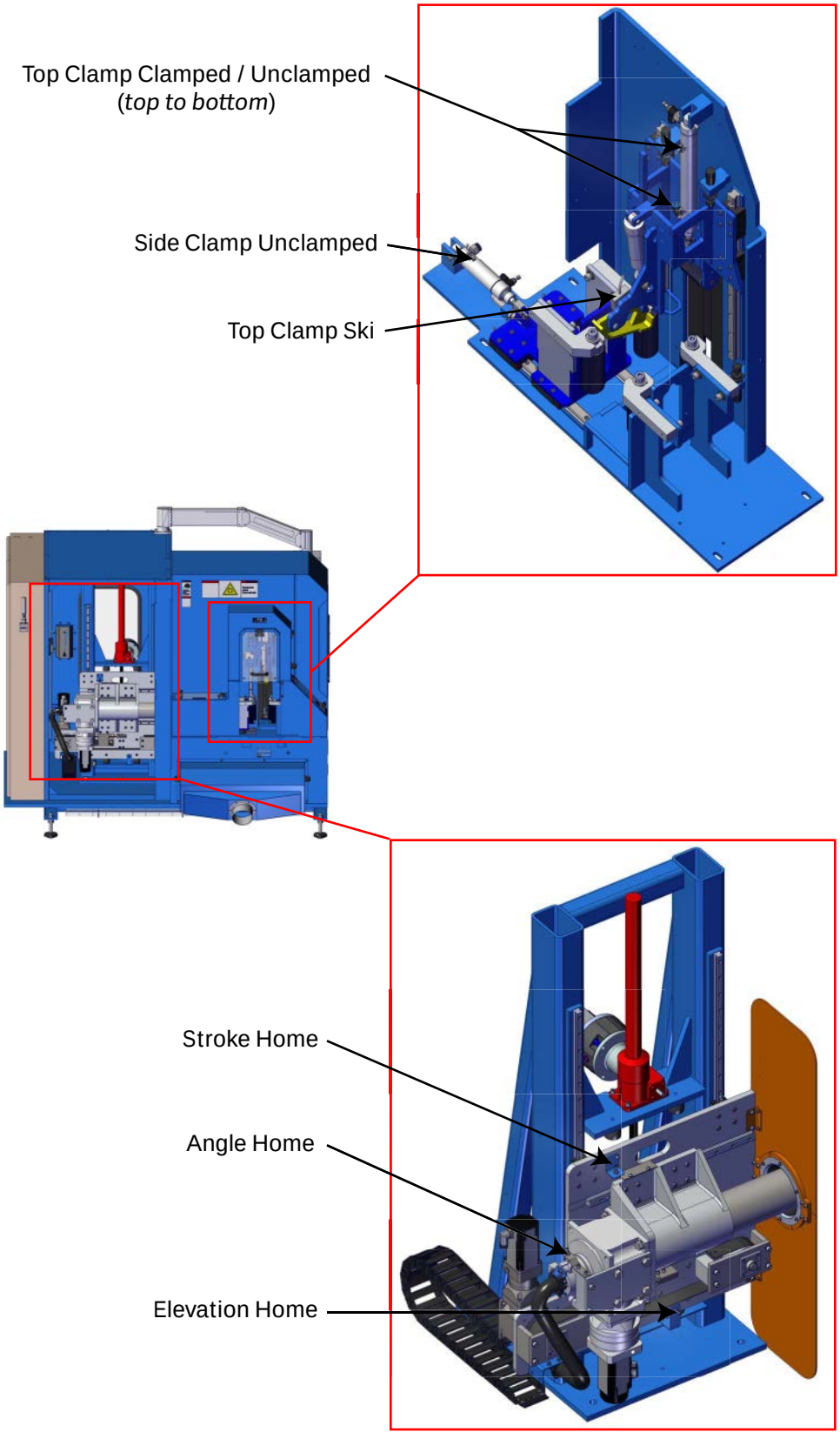


Figure 7-73: Saw Chamber and Outfeed Sensors

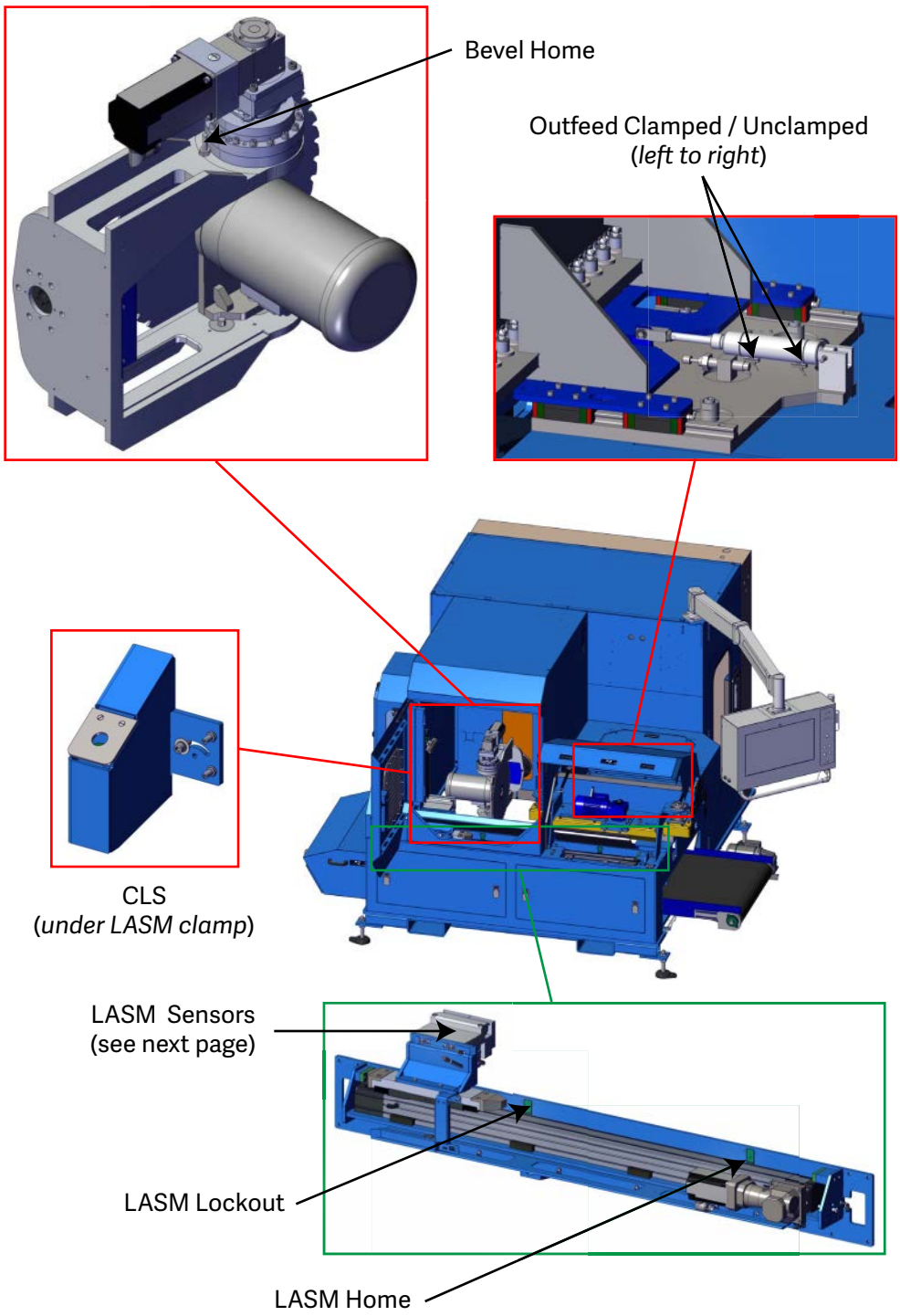


Figure 7-74: LASM Clamp Sensors

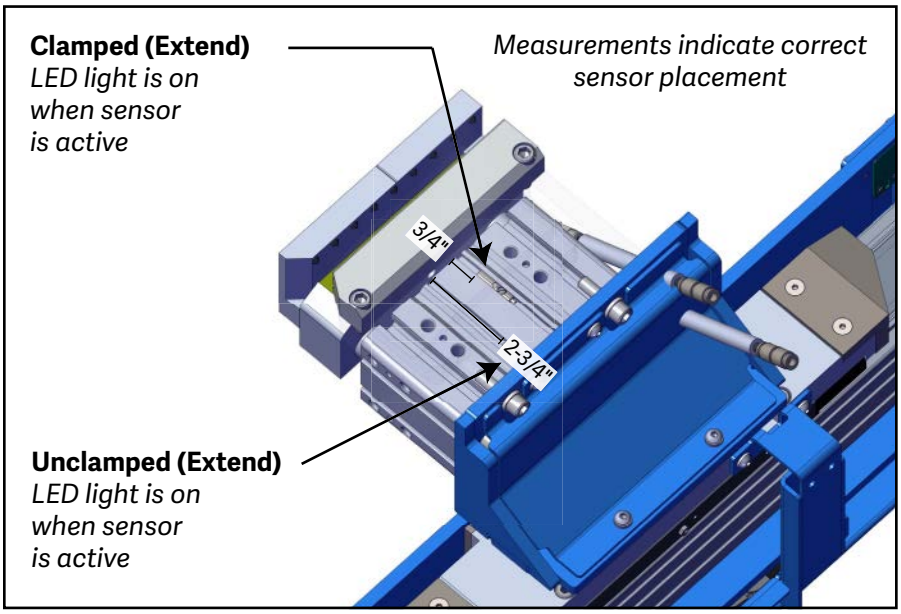
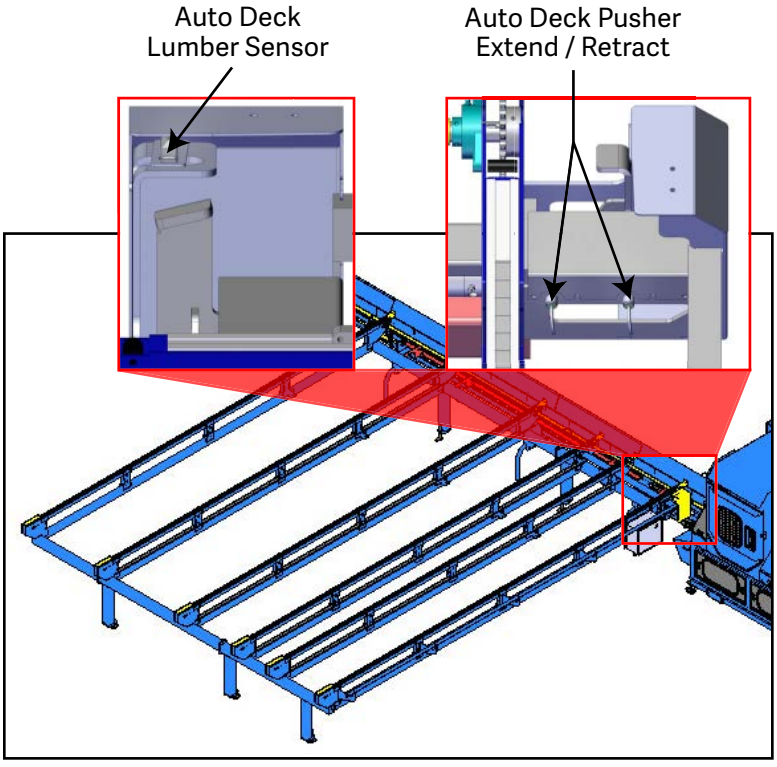


Figure 7-75: Auto Deck Sensors (Optional)



Sensor Maintenance

Sensor Gaps for Prox Switches (Home Sensors)

The home sensors are all inductive proximity switches, also called prox switches. All prox switches should have an air gap between the sensor and the target of

approximately 1/32".

Troubleshooting Home Sensors

See following procedures for instructions on troubleshooting home sensors.

Checking Inspection Points

1. Check for obstructions interfering with the sensor.
2. Ensure all prox switches have 1/32" air gap.
3. Ensure dust and debris is not in the way of the sensor or target.

Checking Communication Between the PLC and Sensor

Check the PLC input module to determine if the sensor is communicating with the PLC. The indicator light on the PLC should illuminate while the PLC is receiving data from the sensor.

Resetting the System

Ensure home position is correct by homing the axis or part in question. If the home position is not correct, the axis will hit a hard stop.

Does the Home Sensor Have Power and Functionality?

1. For inductive proximity switches (Home sensors):
   a) From the touch screen on the operator interface, select **Diagnostics** > **Detailed Diagnostics** > any servo tab.

	⚠ CAUTION
 	CRUSH OR CUT HAZARD! Use extreme caution and effective communication when a second person is in the restricted zone.

   b) With one person watching the screen, have a second person place a screwdriver or anything with a steel or iron surface in front of the sensor.
      1) If the sensor has an LED light, it should illuminate when the metal object is detected. If the light does not illuminate, there is either no power to the sensor or the sensor is broken. Check the wiring and points of power farther up the line to determine where power transmission ends.

2) On the **Detailed Diagnostics** screen, the indicator next to the Home Sensor field should turn blue while the metal object is detected. If it does not, there is a communication issue.

2. For other sensors (not inductive proximity switches):
   a) From the touch screen on the operator interface, select **Diagnostics** > **Detailed Diagnostics** > any servo tab..

	⚠ CAUTION
	CRUSH OR CUT HAZARD! Use extreme caution and effective communication when a second person is in the restricted zone.

   b) With one person watching the screen, have a second person watch the sensor while the operator manipulates the saw so the sensor engages.

      If the sensor has an LED light, it should illuminate when the sensor engages. If the light does not illuminate, there is either no power to the sensor or the sensor is broken. Check the wiring and points of power farther up the line to determine where the power transmission ends.

3. Find the source of the problem and resolve:
   a) Try substituting the cable that plugs into the junction box.
   b) Try substituting the sensor with a sensor from spare parts, or a different sensor on the saw, but only if they are identical sensors.

Adjusting & Troubleshooting the Crooked Lumber Sensor

The following instructions should be followed when:

- Parts are not accurate and the cause may be the elevation of the blade, OR
- The message **Out of Range** consistently displays in the CLS status menu (on the Home Screen Toolbar).

A working CLS makes a constant clicking sound.

Straight 2x4x8 or longer

Plumb bob

Round bubble level

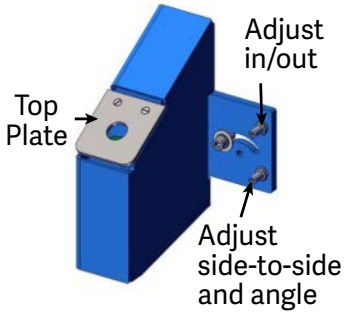
CLS Positioning

1. Move the LASM away from the CLS using the indicator menu on the Home Screen.
2. Remove top plate from CLS by removing the two bolts on top of the CLS housing.

3. Calibrate the CLS.
   a) Go to **Tools** > **Calibrate** from the operator interface.
   b) Follow the on-screen instructions and select **Make Alignment Cut**.

4. Lockout/tagout.
5. Drop a plumb bob over the board and down just above the bubble level. Make sure the string from the plumb bob is in the newly cut slot in the board.
6. The sensor must be positioned so that it is centered on the blade, bubble level, and the board. Use the bubble level and plumb bob as devices to achieve positioning of the CLS. Figure 7-76 shows the adjustment bolts on the CLS.

Figure 7-76: CLS Adjustment Bolts

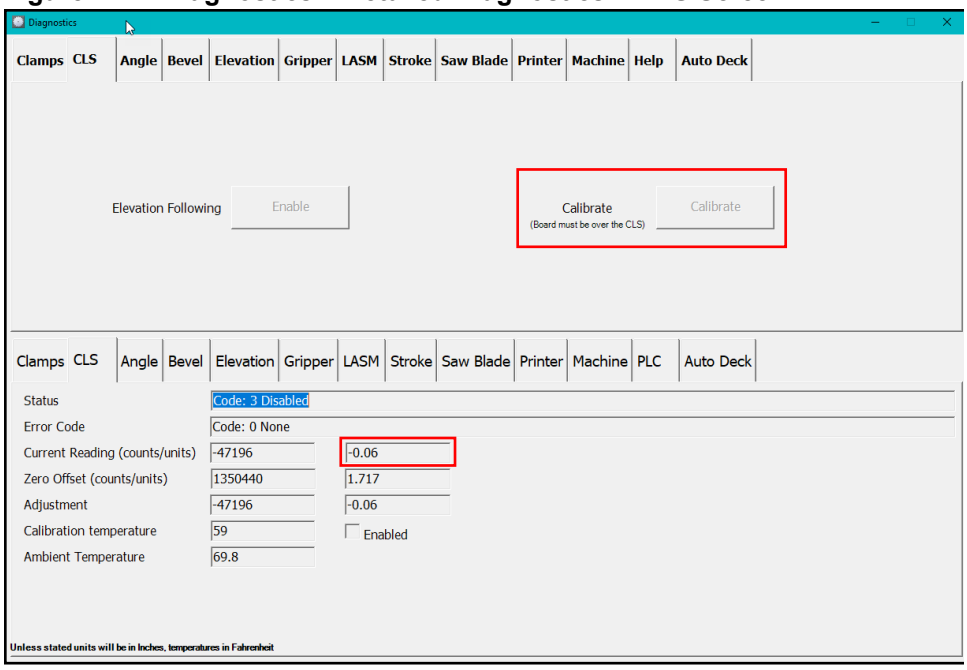


Determine if CLS is Working

Straight 2x4x8 or longer

1. Move the LASM away from the CLS so it doesn't interfere with the test.
2. Place a straight 2x4x8 or longer on the Infeed Rail and slide it into the saw chamber.
3. Unclamp and clamp the infeed and outfeed clamp (using indicator menus on Home Screen) so the board is firmly clamped in both.
4. Go to **Diagnostics** > **Detailed Diagnostics** > **CLS** tab.
5. Note the exact reading in the **Current Reading** field called out in Figure 7-77.
6. Press the **Calibrate** button. If the CLS is operating and adjusted correctly, the following should be true:
   a) The field labeled **Current Reading** in Figure 7-77 should change by .02 or less.
   b) The field labeled **Current Reading** in Figure 7-77 should be near 0.

Figure 7-77: Diagnostics > Detailed Diagnostics > CLS Screen



Testing the Elevation and CLS Communication

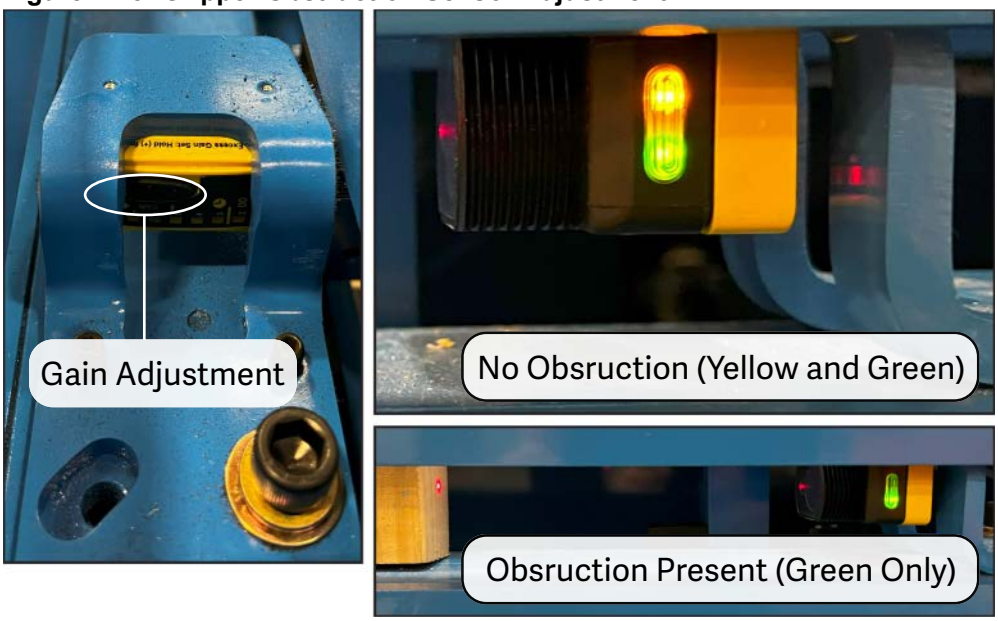
Straight 2x4x8 or longer

1. Place a 2x4x6 or longer on the Infeed Rail and slide it into the saw chamber while still holding onto the end sticking out of the saw chamber. Ensure it is covering the CLS.
2. From the saw's operator interface, go to **Diagnostics** > **Detailed Diagnostics** > **CLS** and click the **Enable** button under Elevation Following.
3. Test the following steps and results:
   a) Lift the infeed end of the lumber. It should result in the blade elevation rising.
   b) Set the lumber down in its original position. It should result in the blade elevation lowering.
   c) The elevation status menu (on the Home Screen indicators) should display **Enabled Homed.**
4. If the blade elevation moved as expected:
   a) Wait for the blade elevation to settle (should not take more that 15 seconds). Once settled, monitor the blade elevation for 10 minutes.
   b) During this period there should be no movement of the blade elevation. If there is movement, then remove the wire connection (unscrew the metal ring on the end of the cable at the sensor) from the bottom of the sensor. Using high-quality, dry compressed air, blow out the connector on the wire and on the sensor. Replace the wire on the sensor and repeat the test. If the test continues to fail contact Automation Support.

Adjusting Gripper Obstruction Sensor

1. See Figure 7-71 on page 158 for the location of the gripper obstruction sensor.
2. Switch the saw to MANUAL mode.
3. From the machine software home screen, select **Gripper** > **Move Min** to move the gripper to infeed end of the saw.
4. Increase the gain on the sensor using the button shown on Figure 7-78 until both the yellow and green lights are lit. The red laser should be visible on the reflective plate on the back of the gripper assembly.
   - Do not increase the gain beyond this point, as it may negatively impact the performance of the sensor.
5. Use a piece of board to test the sensor. If the sensor is blocked, the yellow light should turn off and the green light will remain lit (see Figure 7-78).

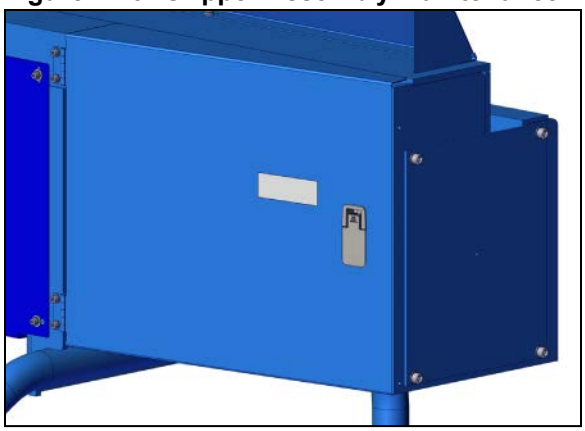
Figure 7-78: Gripper Obstruction Sensor Adjustment



Adjusting Board Slip Sensor

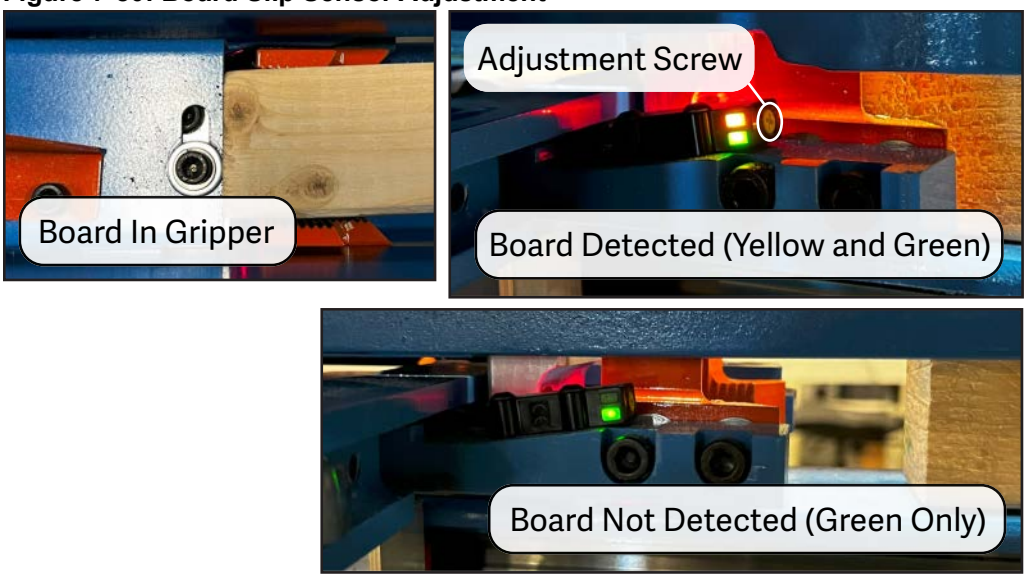
1. See Figure 7-71 on page 158 for location of the board slip sensor.
2. Switch saw to MANUAL mode.
3. From the machine software home screen, select **Gripper** > **Move Max** to move the gripper to the home position (away from the saw).
4. Open the maintenance hatch of the far end of the infeed rail to access the board slip sensor (see Figure 7-79).

Figure 7-79: Gripper Assembly Maintenance Door



5. Place a board inside the gripper teeth as shown in Figure 7-80.
6. Use a Phillips screwdriver to turn the sensor adjustment screw clockwise until the green and yellow lights are both lit.
7. Remove the board and verify the yellow light turns off.
8. If the yellow light does not turn off, turn sensor adjustment screw counter clockwise until the yellow light turns off without the board present.

Figure 7-80: Board Slip Sensor Adjustment



Auto Deck Lumber Sensor Adjustment

See the Auto Deck Lumber Sensor manual for information on how to adjust this sensor.

Electrical Enclosure

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 *BLADE II* saw. Verifying the voltage in and out of the VFD is always a good first step in the electrical troubleshooting process. See Figure 7-83 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 (Figure 7-81). See the **Fault messages** section of the ACS 380 VFD manual or the ACS 880 VFD manual for a list of fault codes, causes, and solutions. For help troubleshooting VFD faults, call MiTek Automation Support.

Automation Support is available at 800-523-3380

Figure 7-81: VFD Fault

Safety Controller

The safety controller is located inside of the control enclosure. See **Finding and Fixing Faults** section of the safety controller manual for a list of fault codes, causes, and potential solutions.

PLC (Programmable Logic Controller)

The PLC is located inside of the control enclosure. See the PLC CPU and PLC Profinet manuals for a list of diagnostic codes, causes, and potential solutions. Please contact Automation Support for assistance with clearing unknown faults.

Servo Drives

See **Fault and Warning Messages** section of the servo drive manual for a list of fault codes, causes, and potential solutions.

Safety Motion Relay

See **Fault Detection** section of the safety motion relay manual for a list of fault codes, causes, and potential solutions.

Figure 7-82: Electrical Enclosure (Left Side)

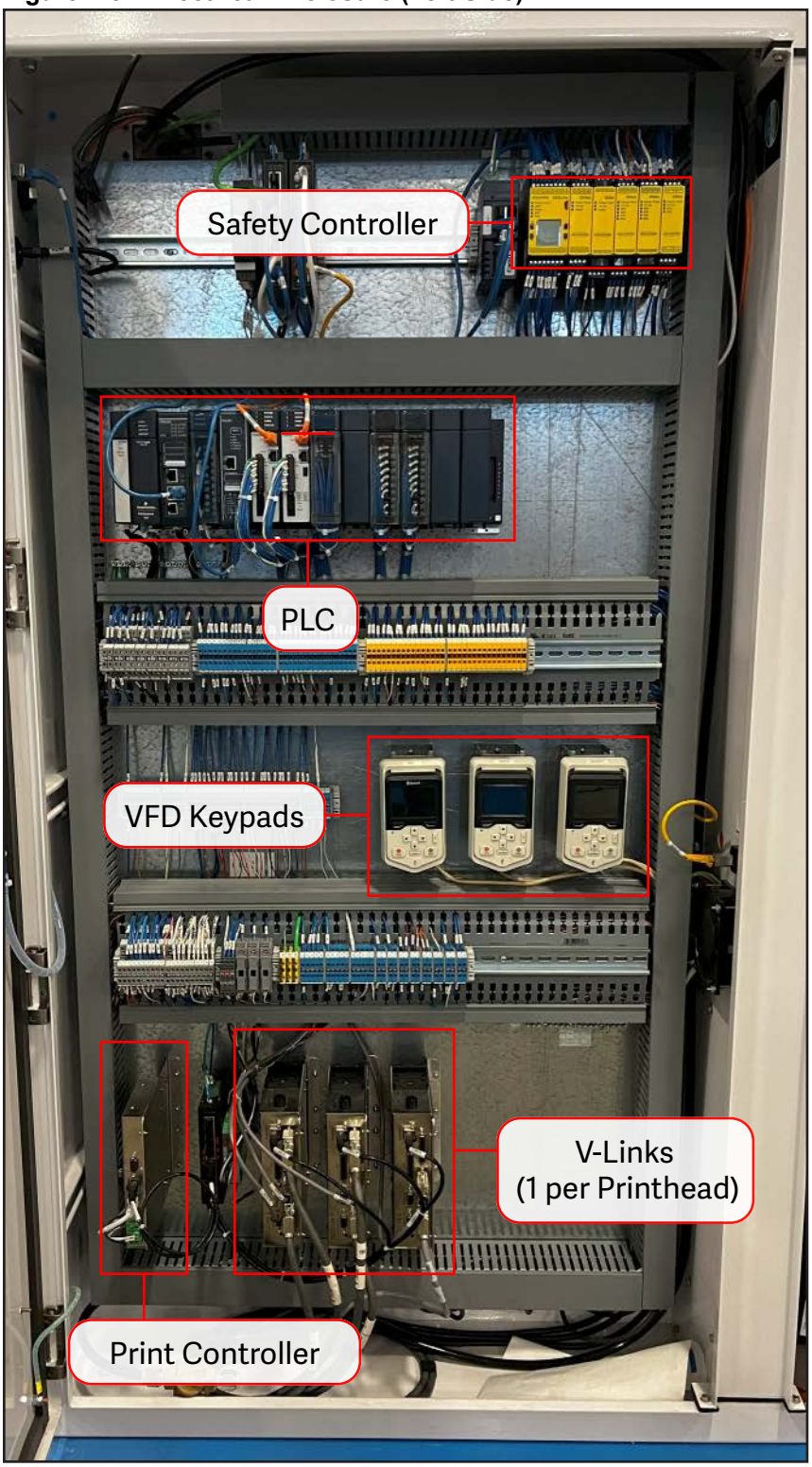
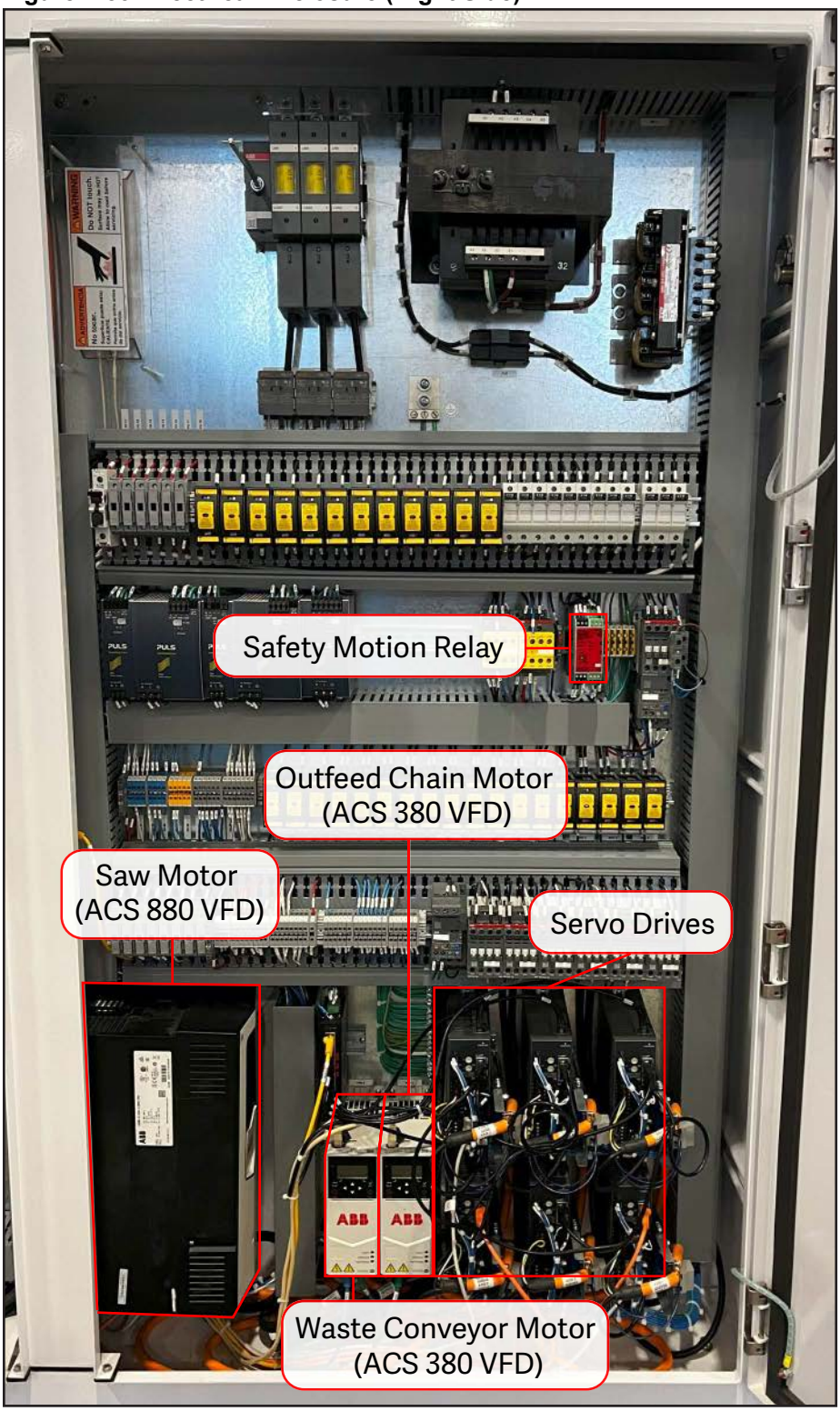


Figure 7-83: Electrical Enclosure (Right Side)

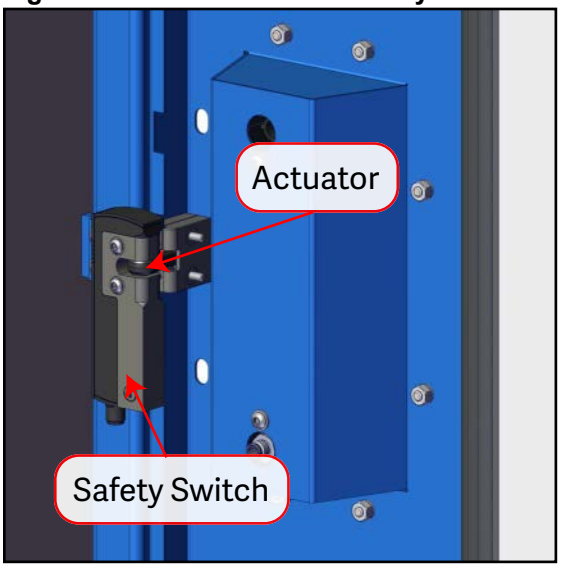


Select Component Overview and Maintenance

Interlock Doors

There are three doors located on the saw chamber that are interlocked with the safety system to prevent entry while components are moving. Each of these doors utilize a safety switch and actuator (see Figure 7-84).

Figure 7-84: Interlock Door Safety Switch and Actuator



Programming a New Actuator

If you install a replacement actuator, it must be programmed to work with a specific safety switch.

1. Disconnect and reconnect the cable connected to the safety switch to cycle power.
2. Place the actuator inside the safety switch. The programming procedure is signaled by the safety switch: **green LED off**, **red LED on**, **yellow LED (slow) flash**.
3. After 10 seconds, the signal pattern should change. A **yellow LED (fast) flash** indicates that safety switch should be power cycled to progress the programming procedure. Remove the actuator and power cycle the switch by disconnecting and reconnecting the power cable.
   - The switch must be power cycled within 5 minutes to proceed to the next step.
4. After power is returned to the switch, place the actuator inside the safety switch.
5. To fully complete programming, the machine **MUST** be powered for at least 10 minutes with the door closed.

6. Verify the door functions properly as described in Interlocked Doors or Guards on page 62.

Synchronous Flashing of all LEDS on Safety Switch

If one of the interlock doors is not functioning correctly and the safety switch displays a synchronous flash of all LEDS (Green, Red, and Yellow), attempt the following procedures. After troubleshooting is complete, test the door functions properly as described in Interlocked Doors or Guards on page 62.

Procedure 1

1. Open the affected interlock door (all LEDS flashing).
2. Close door and keep closed for 20 seconds. If **Red LED** starts to flash quickly, proceed to next step.
3. Open door and keep open for 15 seconds. If **Yellow LED** starts to flash quickly, proceed to next step.
4. Close door and keep closed for 10 seconds. If **Green LED** starts to flash quickly, proceed to next step.
5. Open door. If the **Green LED** is on (not flashing) the door is working properly.
6. If the door is still not working, see **Procedure 2**.

Procedure 2

1. Disconnect and reconnect the cable connected to the safety switch to cycle power.
2. Insert the actuator into the safety switch. If the **Red LED** displays a slow flash and then a fast flash, proceed to next step.
3. As soon as the **Red LED** starts flashing rapidly (all LEDs must NOT have started flashing again), the actuator must be pulled out.
4. The **Yellow LED** will flash slowly and after a while will start flashing faster. As soon as the **Yellow LED** starts flashing faster, insert the actuator into the safety switch.
5. If the **Green LED** displays a slow flash and then a fast flash, proceed to next step.
6. Remove the actuator from the safety switch.
7. Open door. If the **Green LED** is on (not flashing) the door is working properly.

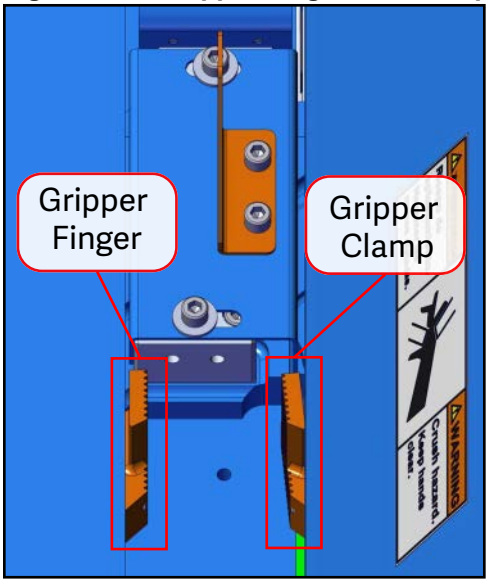
Gripper

The gripper is the assembly that moves the lumber along the Infeed Rail.

Cleaning the Gripper

Use a pick or wire brush to clean the grooves on the gripper finger and gripper clamp every month (1 shift) or every 2 weeks (2 shifts).

Figure 7-85: Gripper Finger and Clamp Grooves



Manually Turning the Gripper Belt to Find Obstructions

If you need to manually move the gripper to remove an obstruction or troubleshoot, the gripper belt can be jogged from the saw's operator interface.

From the Home Screen, select the **Gripper** indicator and choose one of the Jog options. Move the gripper assembly back and forth to test the belt tracking. Adjust if necessary.

If the gripper becomes difficult to move, refer to Troubleshooting appendix on page 174.

Skewed Conveyor

The Skewed Conveyor is one of the outfeed components that can be paired with the *BLADE II* saw. It is a powered conveyor that drives the lumber away from the outfeed side of the machine to be offloaded or directed onto other conveyors.

Aligning the Skewed Conveyor

The side skatewheel fence and lumber guide assembly must be parallel with each other. The gap should allow the exiting lumber to travel freely without rubbing hard on either side.

1. A properly aligned skewed conveyor should meet the following criteria:

TROUBLESHOOTING

Navigating the Troubleshooting Appendix

The troubleshooting appendix is divided into tables according to system of the *BLADE II* saw that is experiencing problems. See Table 8-1 for a list of systems.

Table 8-1: Troubleshooting by System

System	Page
Mechanical	178
Pneumatic	183
Electrical and Software	185

If you have reviewed the information in the Maintenance chapter and this chapter but have not solved your problem, please call MiTek Automation Support for assistance.

Getting Started with Troubleshooting

Safety Notes for Troubleshooting

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
	**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.**

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 preventive 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 *BLADE II* saw 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.

Should you lockout/tagout to perform this action safely?

Mechanical Problems and Solutions

Problem	Possible cause	Possible solution	Page
An axis is not moving	Accumulation of dust and debris, machine not cleaned regularly	Clean equipment at intervals recommended in maintenance checklist	189
	Obstruction	Look for wedges, fallen tools, or other parts impeding movement of the machine	
	Cable / connector issue	Check for secure connection of all related cables	
	Lubrication needed, machine not lubricated regularly	Lubricate equipment at intervals recommended in maintenance checklist	189
Straight cuts come out the correct length, but my angled parts are off.	Calibration needed	Run auto calibration on the angle and elevation.	90
No board was detected during the measuring process.	Gripper issue	Check that the board is properly clamped in the gripper	
	Calibration needed	Calibrate gripper, and let saw measure again, checking that board is in gripper properly	90
	Correct length wasn't entered in software	Enter correct length	
	Leading edge sensor did not activate	Try adjusting the Leading Edge Sensor (emitter or receiver) in **Tools** > **Options** > **Saw** > **Edge Detector Beam Sensor**	
My straight cuts come out the correct length, but my angled parts are off. The actual angle is not what the screen is telling me I should have.	Incorrect elevation value	Cut a type 2 part with a 45 degree angle from the Key In Parts screen. Increase the elevation value by amount that you are short or vice versa.	77
	Calibration needed	Check the angle calibration and recalibrate if necessary.	90

Should you lockout/tagout to perform this action safely?

Problem	Possible cause	Possible solution	Page
The last part of my board is always short but the blade was making a trailing cut.	The main regulator is not set to the correct pressure	Set the main regulator to 110 psi and verify the saw is consistently receiving 110 psi	149
	LASM teeth wear	Replace the LASM teeth if showing wear.	143
	LASM inches per count issue	Check the LASM inches per count through auto-calibration.	90
The length for the last part on my board is wrong.	Insufficient pressure	Check the last part on the board. There should be a mark from where the gripper clamped onto the board if the end of the board was cut square. If there is any indication of the board slipping (ex: a long scrape mark), the gripper clamp pressure may need to be increased.	148
	Calibration needed	The gripper home position is incorrect. Auto-calibrate the gripper.	90
I am getting random lengths off by 1/8" up to 1"	Calibration needed	Verify the gripper and LASM home positions and inches per count by running auto-calibration.	90
	Insufficient pressure	The gripper or LASM may be slipping. Check that the regulators are set correctly.	148
	LASM teeth wear	Replace the LASM teeth if showing wear.	143
Receiving frequent messages that saw blade will contact LASM in Auto Mode.	Incorrect LASM Max Position value	Check that the LASM **Max Position** is set to 12 inches (305 mm) or higher.	
	LASM misalignment	Check that LASM is aligned properly: Notch in center of LASM should align with saw blade when LASM is at 0 position.	97

Should you lockout/tagout to perform this action safely?

Problem	Possible cause	Possible solution	Page
My parts are off roughly 3/8 of an inch consistently.	The belt has jumped a cog on the pulley.	Calibrate the gripper.	90
	The white gripper timing belt may be set too loose.	Re-tension the belt.	136
The gripper is hitting an obstruction when none can be seen.	The gripper is hitting the infeed side clamp rollers.	Adjust the position of the infeed side clamp rollers	146
	Tight spots in the gripper belt.	Manually move the gripper to find tight spots in the belt.	173
When the gripper goes back to accept the maximum length board the gripper jams. (Or the wood lands on top of the gripper assembly.)	Calibration needed	Check the gripper home position, counts per inch, and maximum position by running auto-calibration.	90
Gripper won't move.	Obstruction	Clear obstructions	
	Accumulation of dust and debris on Infeed Rail	Clean Infeed Rail	189
	Linear guide bearing lubrication needed	Linear guide bearings may not be properly working. Check lubrication and physical condition of bearing block and rails. Replace bearing block if uncertain of age.	125
	Error state	Check the status banner for error states and address	70

Should you lockout/tagout to perform this action safely?

Problem	Possible cause	Possible solution	Page
Receiving home Z pulse errors.	Calibration needed	Calibrate the gripper.	90
	Gripper motor coupling is loose	Check torque values for gripper motor	107
	Gripper belt tension	Check the tension of the white gripper timing belt	136
	Miscellaneous	If needed: 1. Remove the white gripper timing belt. 2. Check linear bearings to ensure the entire assembly is not sagging. 3. Remove the screws holding the gripper to the bearings. 4. Add thread adhesive (*Loctite*) and install the screws back in place. 5. Adjust gripper home sensor air gap to 1/32”. 6. Calibrate gripper again.	
Saw blade cut through the LASM jaw.	Miscellaneous	Contact Automation Support immediately	46
Lumber clips the saw entrance ramp	Infeed Rail lumber surface is below the entrance ramp.	Level the Infeed Rail to the saw.	
Lumber not entering saw chamber straight	Gripper and LASM misalignment	Ensure Gripper finger is in the same plane (straight with) the LASM fixed jaw for the Infeed Rail’s entire length.	
Lumber catching on load arms and not feeding onto Infeed Rail correctly	Auto Deck chain is loose	Tighten the Auto Deck chain tension.	135
Outfeed chain binding	Obstruction	Look for broken bolts or plastic obstructing the chain.	
	Lumber exit chain tension	Check lumber exit chain tension.	134
Skewed conveyor rollers slow to reach full speed	Skewed conveyor belt is loose	Tighten skewed conveyor belt	133

Should you lockout/tagout to perform this action safely?

Problem	Possible cause	Possible solution	Page
Auto Deck not advancing the board correctly onto the load arms	Sensor issue	Adjust the location of the Auto Deck Board sensor.	161
Auto Deck load arms are not moving down far enough to accept lumber.	Alignment issue	Adjust the entire square tube that holds the load arms by loosening the hex nut.	
More than 1 board is being loaded onto the Infeed Rail at a time.	Too many boards, not using lumber stops	The Auto Deck may be overcrowded. Remove excess boards. Use the lumber stops to limit the number of boards being indexed.	82
	Sensor issues	Adjust the Auto Deck Board sensor position.	161

Should you lockout/tagout to perform this action safely?

Pneumatic Problems and Solutions

Problem	Possible cause	Possible solution	Page
My saw keeps shutting off saying that I don't have enough air pressure.	The main regulator is not set to the correct pressure	Set the main regulator to 110 psi and verify the saw is consistently receiving 110 psi	149
	The pressure sensor is not set the correct minimum pressure	Set the pressure sensor to 75 psi	151
	Part failure	Replace pressure switch, regulator, or seals in filter/ regulator assembly	
Infeed side or top clamp is not working.	Obstruction	Check for obstructions.	
	Insufficient pressure	Check system pressure (main regulator) and secondary regulator for clamp to ensure correct air pressure.	148
	Shock absorber issue	Check the shock absorber and tighten or replace as needed.	145
	Coil issue	Determine if coils are working by checking LEDs on coils as you clamp and unclamp.	
	Incorrect sensor placement	Fully Clamped Sensor may be activated too early if not positioned correctly. Reposition the sensor.	
	Linear guide bearing lubrication needed	Linear guide bearings may not be properly working. Check lubrication and physical condition of bearing block and rails. Replace bearing block if uncertain of age.	125
LASM unclamp times out and displays error	Incorrect sensor positioning	Check position of the extend and retract sensor. Tighten all bolts.	161
No printout and no clicking sound heard from head during printout.	Power issue	Ensure the print controller is receiving power and that it is enabled in the software.	
	Cable / connector issue	Ensure print head cable is connected.	

Should you lockout/tagout to perform this action safely?

Problem	Possible cause	Possible solution	Page
No printout or poor printout quality but clicking sound is heard from head during printout.	Tubing issue	Ensure hose from ink bottle is connected and ink bottle is full. Check hose for blockage.	
	Software issue	Dot size must be within acceptable range.	118
	Printer hardware	Clean or replace ink filter.	
	Air pressure setting	Verify printer regulator is set to 12 psi	148
Print head won't print	Miscellaneous	Check ink supply, clean nozzle, purge and flush, and check clogs in line.	117
	Cable / connector issue	Check gripper encoder and cable.	
My printing has a blank line through the middle of it. It's not printing properly	Standard maintenance needed	Flush and clean the printers.	117

Should you lockout/tagout to perform this action safely?

Electrical and Software Problems and Solutions

Problem	Possible cause	Possible solution	Page
Sensor faults	Faulty writing, loose connections	Check for faulty wiring and make certain all connections are secure	
	Sensor not properly aligned	Properly adjust sensor	
	Sensor covered by dust, machine not cleaned regularly	Clean equipment at intervals recommended in maintenance checklist	189
	Inadequate dust collection system	Install adequate dust collector	
Software button or field is grayed out	Incorrect mode selected	Check that the Auto/Manual switch is in the correct position.	
	Miscellaneous	Carry out quick software troubleshooting	80
Some status indicators are red	Software issue	Click on red indicator and check if bottom menu item says Enabled Not Homed or Enabled Homed. After homing the system, it should say Enabled Homed. If not, investigate obstructions, lubrication, and other mechanical reasons.	
	Software issue	Select **CLEAR ERRORS** on Toolbar.	
	Software issue	Select **HOME SYSTEM** on Toolbar.	
Visualize screen is not working.	Software issue	Open **Diagnostics** > **Visualize** screen prior to pressing the START CUTTING button.	
Lumber is not feeding after pressing START CUTTING.	Software issue	Check to see if START CUTTING button has yellow banner reading AIR CUT across it. If so, go to **Diagnostics** menu and remove the check mark next to **Air Cut**.	
	Sensor issue	Check for Auto Deck errors, specifically if Autodeck Lumber sensor is detecting board.	161

Should you lockout/tagout to perform this action safely?

Problem	Possible cause	Possible solution	Page
Saw is in **Waiting for Printer Trigger** state.	Software issue	Select **Abort Cutting Sequence** on the **Diagnostics** ribbon. Do NOT adjust trigger status in **Detailed Diagnostics**—it will cause the printing sequence to be out of order.	
Outfeed timeout failure state	Obstruction	Short Wedges may be stuck between the two outfeed rollers. Remove and retry.	
	Miscellaneous	Adjust the outfeed clamping roller sensor. Align and/or tighten the lumber exit chain. If the problem persists, the following tips will help further troubleshooting: 1. When a board is clamped, the lights on both sensors (extend and retract) should be off. 2. When the clamping rollers are at full extend (without wood), the light on the extend sensor should be on. When the clamping rollers are fully retracted only the retract sensor light should be on.	
Cutting sequence is out of order.	Software issue	May happen if the printer trigger state is changed in **Detailed Diagnostics**. For now, abort cutting sequence and start the job over at the right place. To prevent in future: When you receive the saw status **Waiting for Printer Trigger**, use the **Abort Cutting Sequence** button on **Diagnostics** ribbon.	

Should you lockout/tagout to perform this action safely?

Problem	Possible cause	Possible solution	Page
CLS not working	Miscellaneous	Check that the housing and bracket are in good condition to protect the CLS and keep it in place. Check that the CLS cable is securely connected. Check the CLS positioning. Check that CLS is receiving power and sensor is working (check positioning first). Check that the CLS and elevation are communicating.	163
Loss of encoder error state	Encoder and coupler contact	Adjust the in/out adjustment bolts to prevent the encoder from making contact with the coupler.	
Sensor is not working or component controlled by a sensor is not responding properly	Miscellaneous	Refer to the systematic troubleshooting procedure.	161
Component timing out.	Sensor issue	Check location of extend and retract sensors.	156
Stroke axis error state	Calibration needed	Calibrate stroke axis	90
	Stroke travel bottoming out	Set minimum position to 1.25 in **Detailed Diagnostics** screen.	
Auto Deck is not running	VFD Issue	Check the Auto Deck's variable frequency drive (VFD) for errors. The VFD is located in the control panel on the Auto Deck. Check the wires from the motor to the VFD.	
Auto Deck VFD Error	Chain tension may be too tight	Loose auto deck chain tension	135

Should you lockout/tagout to perform this action safely?

Problem	Possible cause	Possible solution	Page
Software indicates that the stock lumber is too short, but I measured the lumber and it is the correct length	Gripper home position issue	1. Before the next board is run during a job, measure and record the length of the next board to be cut. 2. Calibrate the Gripper home position and re-cut the board using a new piece of lumber. If the problem is not resolved, continue to step 3. 3. Make sure that the **Actual Length** field corresponds with measured length. If the numbers don't correspond, change the Edge Detector Photo Eye value in **Tools** > **Options** > **Saw** by the amount the board measures off. 4. If the board measures short, decrease the measurement for the sensor position.	90

MAINTENANCE CHECKLIST

Using the Maintenance Checklists

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

Checklist
Daily Checklist on page 190
Weekly Checklist on page 191
Monthly / Annual Checklist on page 192

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 Infeed component, Infeed Rail, lumber exit chain, motor vents, an Outfeed component	1	98						
	2							
	3							
Vacuum stroke/elev. chamber	1	98						
	2							
	3							
Clean printer nozzles (every shift)	1	118						
	2							
	3							
	1							
	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					
Replace saw blade	109						
Inspect linear guide bearing rails for grease	125						
Blow out all motor vents							
Vacuum the electrical enclosure							

Date	Notes

Should you lockout/tagout to perform this action safely?

Monthly / Annual 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 lumber exit chain tension and alignment	1	.5	133				
Check Auto Deck chain tension	12	12	135				
Lubricate Auto Deck chain	12	12	133				
Lubricate Skewed Conveyor chain	2	2	133				
Check all belts for proper tension and tracking	12	12	136				
Lubricate elevation jack screw (2 grease fittings)	3	1.5	109				
Check oil level in all gearboxes	12	6	101				
Drain and change gearbox oil (every 20,000 hours minimum)	48	24	101				
Lubricate skewed conveyor drive wheel bearings	6	3	131				
Replace main regulator's filter element	24	12	150				
Lubricate saw blade motor bearings (2 grease fittings)	12	6	103				
Lubricate outfeed clamp camfollowers	12	6	129				
Lubricate waste conveyor drive shaft bearings	12	6	130				
Lubricate Auto Deck drive shaft (1 grease 1 fitting per strand)	12	6	131				

BLADE II SAW: MAINTENANCE CHECKLIST

Should you lockout/tagout to perform this action safely?

Action	Months (one shift)	Months (two shifts)	Page	Initials / Date			
Check for leaks in all bearings, gearboxes, and motors	12	12					
Inspect all sprockets, replacing any that do not rotate easily.	12	12					
Measure the LASM fixed jaw. It must be at least 1 1/2" thick.	12	6	142				
Check the entire system for loose hardware	12	12					
Clean all metal surfaces with a soft cloth and mild detergent	12	6	99				
Flush the printer lines	1	1	119				

ORDERING PARTS

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	
Top Level Assembly	76100-501
Saw Assembly	76101-501
Guards and Covers Assembly	76102-501
Stroke and Elevation Chamber Brush Seal	76115-501
LASM Assembly	76160-501
CLS Assembly	76165-501
LASM Carriage	76172-501
Saw Head Assembly	76189-501
Stroke and Elevation Assembly	76200-501
Stroke Angulation Assembly	76201-501
Lumber Exit Assembly	76210-501
Infeed Rail Assembly, Standard Load 20'	76242-501
Infeed Rail Assembly, Reverse Load 20'	76247-501
RH Blade Skewed Conveyor, 20' Lumber	76092-501
LH Blade Skewed Conveyor, 20' Lumber	76092-502
Gripper Assembly Standard Load	76253-501
Gripper Assembly Rear Load	76254-501
Waste Conveyor Assembly	89195-901
Auto Deck 20' Long, 6 Strand, 20' Lumber	89775-501
Electrical	
Saw Schematic	90715
Saw Electrical Assembly	90715-501
Saw Electrical Enclosure	90715-502
Operator Interface (PC) Enclosure	90715-507
Skewed Conveyor Schematic	90475
Skewed Conveyor Electrical Assembly	90475-501
Skewed Conveyor Electrical Enclosure	90475-502

Description	Drawing Number
Auto Deck Schematic (optional)	90626
Auto Deck Electrical Assembly (optional)	90626-501
Auto Deck Electrical Enclosure (optional)	90626-502
Pneumatic	
Assembly	76346-501
Top and Side Clamp Assembly	76350-501
Outfeed Clamp Assembly	76440-501
Printer (multiple options)	76460-501/510/525/530/535
Printer schematic (multiple options)	76468-501/510/525/530/535
Top Clamping Assembly	89360-501

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
angle	the axis that rotates the saw blade
amperage	the strength of an electric current, expressed in amperes
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 Deck	a staging conveyor that feeds lumber to the Infeed Rail
Auto Mode	a staging conveyor that feeds lumber to the Infeed Rail
axis	a main line of direction, motion, growth, or extension; includes angle, bevel, elevation, and stroke; plural is *axes*
bevel	the axis that cuts on the 4" dimension of a 2x4
board	a specific piece of lumber with specific dimensions required by the saw to cut out specific parts
bow	a curve of the face of a board (3-1/2" surface on a 2x4); the bow points to the side on floor and wall studs
bumper	a small, black rubber shock resistor used throughout the interior of the saw
beacon	a light that displays one of several colors to represent the state of the machine
CLS	Crooked Lumber Sensor; senses when a piece of lumber is crooked and adjust the cut to compensate
connector plate	the nail-plate that is embedded into production material to hold it together
crown	a curve of the edge of a board (1-1/2" edge on a 2x4); the crown points up for floor studs or out for wall studs
disconnect	noun, the handle, often on a machine's main electrical enclosure, that shuts off incoming power at that spot in the electrical system
elevation	the axis that moves the saw blade up and down

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
gripper	the component on the Infeed Rail that holds the end of the board and pushes it into the saw chamber
infeed component	any component that feeds lumber to the Infeed Rail; usually the Auto Deck staging conveyor or *Ranger* system
Infeed Rail	the rail that lumber rests on before entering the saw chamber
inventory	in the saw software, inventory is the lumber entered into the software that is available to assign parts to in a job
Job	A group of parts requiring specific boards to be cut
LASM	Lumber Advance Short Move; grabs the board as it enters the saw chamber, and moves it to the outfeed side of the saw chamber, if necessary
layout	a scaled diagram of the location of components and the space that they occupy
leveling screws	used to refer to any structural leg that can be adjusted up or down by a screwing motion
limit switch	an electro-mechanical device that consists of an actuator mechanically linked to a set of contacts; when an object comes into contact with the actuator, the device operates the contacts to make or break an electrical connection
load arms	arms that load lumber from the lumber feed system (Auto Deck or) to the Infeed Rail
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
lumber	A group of boards or a non-specific board; no consideration given to the final size or shape
lumber exit chain	outfeed chain, part of the outfeed assembly
lumber pusher	on Auto Deck, pushed the lumber onto the Infeed Rail
Lumber Yard	The virtual lumber yard in the saw software that lists lumber available to use and allows the operator to assign each board in a job to a specific lumber in the virtual inventory.
Manual Mode	the mode the saw is in when operating it from the Diagnostics screen
operator interface	the method in which the operator controls the machine; it may be a touch screen, a control panel, etc.
part	A piece of a board, cut to the exact size and shape required for the job
plate	see *connector plate*
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
potentiometer	a control knob that is a dial; allows a range of values to be set by turning the dial, commonly found on the PLC
proximity switch	a switch that uses an electromagnetic field to detect when an object is near, there is no physical contact between the object and the switch; inductive proximity switches detect only metal objects, capacitive proximity switches can sense both metallic and non-metallic objects
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
Ranger	an automated lumber retrieval system that picks the correct lumber (without an operator) and delivers it, in order, to the Infeed Rail
regulator	a component of the pneumatic system that connects to the main air source and regulates the air pressure allowed into the system

side clamp	roller clamp on infeed side of saw that contacts the face of the lumber
Skewed Conveyor	powered skewed conveyor that integrates with the system to transport and sort the lumber
solenoid	an assembly used as a switch consisting of a coil and a metal core free to slide along the coil axis under the influence of the magnetic field
station	a physical location on a *Ranger* system
stroke	the axis that moves the saw blade in and out (toward or away from operator)
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
tape liner	tape liner provides friction resistance for the seal plate assembly that slides up and down with the elevation axis located inside the stroke/elevation chamber
top clamp	roller clamp on infeed side of saw that contacts the top edge of the lumber; has been called a hold-down
torque	a turning or twisting force
transmitter bar	the light bar that transmits the signal to the receiver bar; every light bar set consists of a receiver bar and a transmitter bar
VFD	(variable frequency drive) controls the speed of a paired motor
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 on the rest of the board
waste conveyor	a conveyor under the saw blade that transports waste lumber to a waste receptacle supplied by customer

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