

Maintenance Manual



Cyber[®] A/T

Component Cutting Saw

Maintenance Manual

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Component Cutting Saw



U.S. and other patents pending.

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Legal Notice

Patents

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U.S. 6,539,830

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Other Patents Pending

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Maintenance

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Safety (English)

For safety information in Spanish, refer to page MT-15.

**Be Careful.
Be Safe.**



Safety Indicators

The following safety alert symbols and signal words are used throughout this document to indicate safety hazards. Please pay careful attention when you see them. The level of severity differs for each symbol or signal word.

Failure to comply with the instructions accompanying each safety alert symbol 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

When CAUTION is used **with** the safety alert symbol shown here, it indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

When CAUTION is used **without** the safety alert symbol shown here, it indicates a potentially hazardous situation which may result in equipment damage.

NOTICE

NOTICE

Calls attention to information that is significant to understanding the operation at hand.

ENVIRONMENTAL

ENVIRONMENTAL

Applies to conditions that may affect the environment but do not have an immediate, direct effect on personnel or equipment.

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

Installing the Equipment

- Follow installation instructions completely.

Lockout/Tagout

- Before performing maintenance on the pneumatic or hydraulic systems, bleed the lines to eliminate pressure.
- Lockout/tagout all energized systems before performing maintenance on them. Refer to the *Lockout/Tagout Guidelines* section on page 5.

Keeping a Safe Environment

- 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.

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 MT-10.
- Perform the safety tests recommended in the Safety Test section on page 12 before operating the equipment at the initial startup, after performing any maintenance, and in accordance with the maintenance schedule.
- In case of machine malfunction, stop the machine immediately using an E-stop and report the malfunction to a supervisor.
- Never leave the machine running unattended. Turn the power off! Do not leave the machine until all parts have come to a complete stop and all electrical power has been shut off.
- Check for worn or damaged parts regularly. Repair or replace them immediately.
- 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 safety devices are 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.
- Periodically inspect the quality of the finished product.

Electrical Safety

- 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. Wear protective clothing, gloves, and safety glasses.

Lockout/Tagout

Lockout/Tagout Guidelines

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 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. The photos on the next page show where the electrical disconnects are located for this machine.



- 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.
- A lockout device is usually a keyed padlock.
- 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.

Electrical Lockout/Tagout Procedures


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



If working on the electrical transmission line to the machine, follow the procedure on page 8.

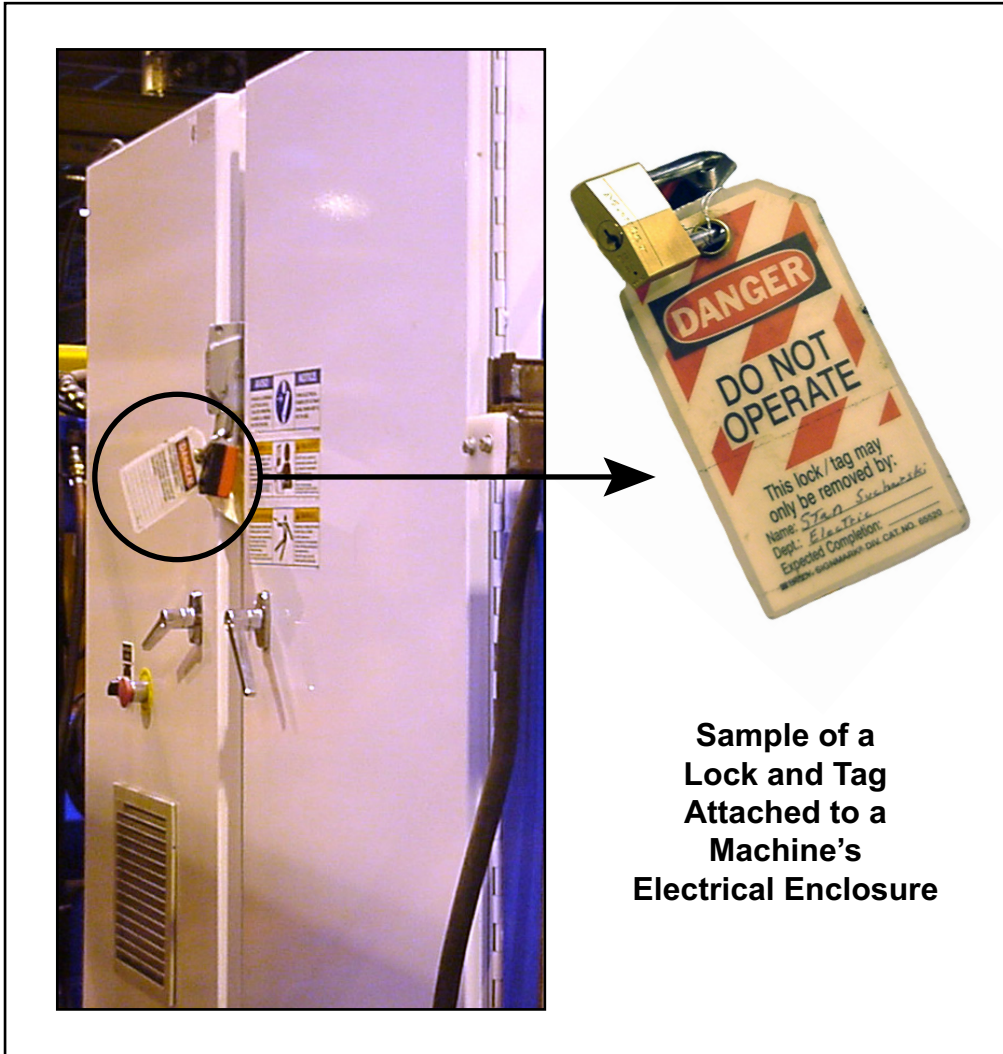
Before performing maintenance on any machine with electrical power, lockout/tagout the machine properly. When working on a machine outside of the machine's main electrical enclosure, not including work on the electrical transmission line to the machine, follow your company's approved lockout/tagout procedures 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 on the machine's main electrical enclosure to the "off" position. See Figure SAFETY-1.

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

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

Figure SAFETY-1: Lockout/Tagout on the Main Electrical Enclosure



When 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 SAFETY-2.
3. Attach a lock and tag that meets OSHA requirements for lockout/tagout.
4. Open the door to the main electrical enclosure, and using a multimeter, verify that the power is off.

Figure SAFETY-2: Lockout/Tagout on the Power Source Panel



Pneumatic System Lockout/Tagout Procedure

When Lockout/Tagout is Not Required

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

When Lockout/Tagout is Required

Before attempting repair or maintenance on a pneumatic line or component, 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. Follow instructions in the electrical and hydraulic lockout/tagout sections to lockout/tagout or prevent movement of these components.
2. Attach a lock and tag that meet OSHA requirements for lockout/tagout to the air regulator.
3. Bleed all pressure from the reservoir.
4. Bleed all pressure from all pneumatic lines by actuating all pneumatic valves associated with that air source

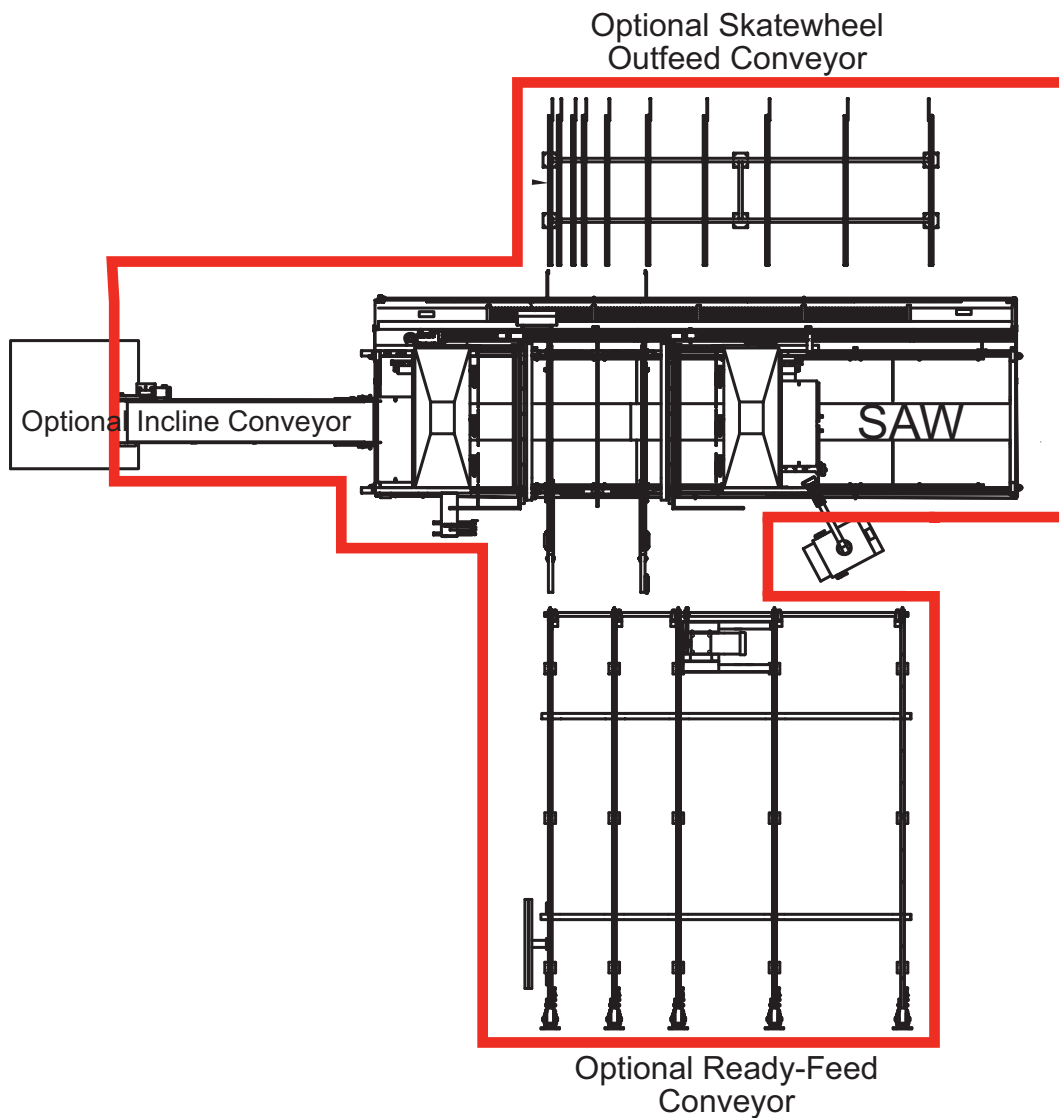
Troubleshooting With an Energized Machine

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.

Restricted Zone

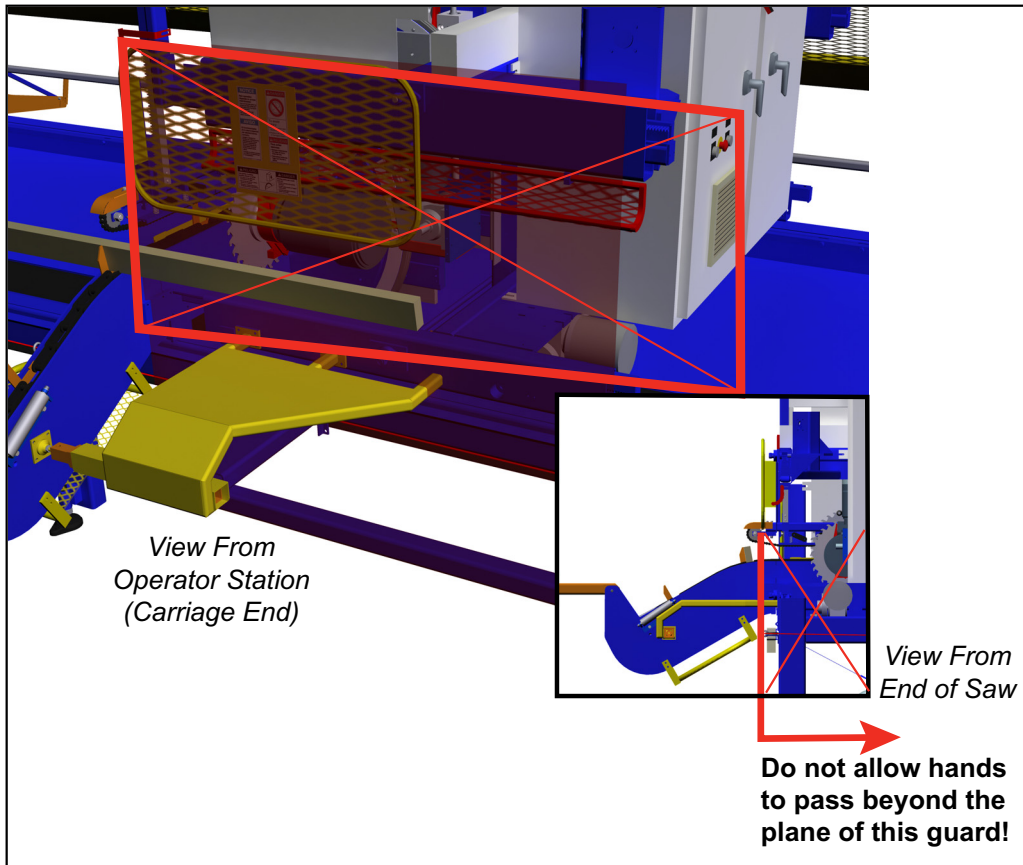
DANGER	
	<p>Stay out of the restricted zone when equipment is in use. Serious injury or death may result if personnel are in the restricted zone.</p>




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.



Safety Test

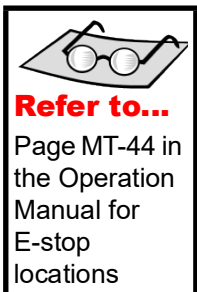
DANGER	
	<p>CRUSH HAZARD.</p> <p>Perform the safety tests described before operating the equipment at the initial startup, after performing any maintenance, and in accordance with the maintenance schedule.</p> <p>Failure to perform these tests could result in severe injury or death.</p>

Perform these safety tests daily before operating the saw and after performing any maintenance.


Testing Emergency Stops (E-Stops)


Test that all E-stops are operating correctly at the beginning of each shift. To do so:

1. Start the blades using any operating mode.
2. Activate one E-stop.
 - a) Ensure that all movement stops within 6 seconds. If not, refer to page MT-163 in the *Troubleshooting* appendix to correct the problem and repeat the test.
 - b) The E-stop icon in the alarm bar at the top of the screen should blink in red.
If it did not blink, there is a problem with the saw controls or E-stop circuit wiring.
 - c) Try to start one of the saw blades by pressing and holding one of the start buttons.
If the blade starts, there is a problem with the saw controls or E-stop circuit wiring.
 - d) Clear the E-stop.
 - e) The emergency stop icon in the alarm bar at the top of the screen should stop blinking.
3. Repeat until all E-stops have been checked and passed the test.



Checking Saw Blades

DANGER	
	<p>ELECTROCUTION, HIGH PRESSURE, CRUSH, AND CUT HAZARDS!</p> <p>De-energize electrical and hydraulic power using approved lockout/tagout procedures on the power and air supplies before climbing into the saw. Failure to properly lockout/tagout this saw and remove the air supply may allow a blade to move causing severe personal injury or death.</p>

WARNING	
	<p>CUT HAZARD.</p> <p>Saw blades are sharp and can cause severe cuts when being handled during installation and removal. Always wear gloves designed for use with sharp objects when handling the blades.</p>

1. Check the condition of all saw blades.



- a) Rotate the blade in the cutting direction (toward the operator side). The blade should spin freely without touching the brake and have no indication of wobble. Refer to page MT-160 in the *Troubleshooting* appendix to correct a wobble.
- b) Check for the following items on a daily basis, and replace, repair, or re-tip the blades if any of the following characteristics are found.
 - Chipped or missing teeth or dull edges
 - Pitch build-up
 - Bending or warping of the blade or cracks in the blade plate (look carefully around the teeth and screw holes for cracks)

2. Test the saw blade brakes:

- a) To do so, start all saw blades, using any operating mode
- b) Press an E-stop or the stop sign on the touch screen.
- c) Using a stop watch, measure the time from the moment the stop button is pushed until all saw blades are completely still.




stop watch

The smaller blades will stop more quickly than the larger blades. All blades must stop within 6 seconds. If they do not, refer to page MT-163 in the *Troubleshooting* appendix.

Inspecting the Saw



- 1. While standing in the saw waste conveyor, and with all power still locked and tagged out, visually check for cables that may interfere with movement of the blades, conveyors, or carriage. Secure cables as necessary.
- 2. Check that all guards are in place and secure.
 - a) Check the stationary and movable hold-down guards.
 - b) Check the lumber stop guard.
 - c) Check the left and right feed guards.
 - d) Check the stationary and movable operator guards.
 - e) Check the rear supports.

DANGER	
	<p>ELECTROCUTION, HIGH PRESSURE, CRUSH, AND CUT HAZARDS!</p> <p>Failure to operate the saw with all safety devices in proper working order and all safety guards in place may result in severe personal injury or death.</p>

- 3. When all safety tests are completed and passed satisfactorily, restore air and electrical power to the saw.

Seguridad (Español)

**Sea cuidadoso.
Protéjase.**



Indicadores de seguridad

Los siguientes símbolos de alerta de seguridad y palabras de advertencia se utilizan a lo largo de este documento para indicar riesgos de seguridad. Preste suma atención cuando los vea. Cada símbolo o palabra indica un nivel de gravedad diferente.

El no cumplimiento de las instrucciones que acompañan a cada símbolo de alerta de seguridad 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 riesgo inminente que, si no se evita, pudiera producir la muerte o lesiones graves.



ADVERTENCIA

Indica una situación potencialmente peligrosa que, si no se evita, puede producir la muerte o lesiones graves.



PRECAUCIÓN

Cuando la PRECAUCIÓN se utiliza **con** el símbolo de alerta de seguridad aquí ilustrado, indica una situación potencialmente peligrosa que, si no se evita, puede producir lesiones menores o moderadas.

Cuando PRECAUCIÓN se utiliza **sin** el símbolo de alerta de seguridad aquí ilustrado, indica una situación potencialmente peligrosa que podría producir daños al equipo.

AVISO

AVISO

Llama la atención a información importante para entender la operación que se desea realizar.

AMBIENTAL

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

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

Instalación del equipo

- Siga las instrucciones de instalación al pie de la letra.

Procedimientos de Bloqueo/Etiquetado

- Antes de realizar el mantenimiento de los sistemas neumáticos o hidráulicos, purgue las líneas para eliminar la presión.
- Bloquee y etiquete todos los sistemas energizados antes de realizar tareas de mantenimiento en ellos. Refiérase a la sección *Pautas de bloqueo/etiquetado* en la página 20.

Cómo mantener un entorno seguro

- 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.

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 26.
- Realice las pruebas de seguridad recomendadas en la sección Prueba de seguridad en la página 28 antes de utilizar el equipo por primera vez, después de cualquier tarea de mantenimiento y conforme a la frecuencia de mantenimiento establecida.
- 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 abandone la máquina 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.
- Mantenga los sistemas hidráulicos, 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 al comienzo de 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.

- Inspeccione periódicamente la calidad del producto terminado.

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 anteojos de seguridad.

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.

Las fotos de la página siguiente muestran los lugares en los que se encuentran los interruptores de desconexión eléctrica de esta máquina.



- 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.

"Etiquetado" significa que debe colocarse una advertencia fácil de ver en un dispositivo aislador de energía que indique que el equipo no debe utilizarse.

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 página 23.

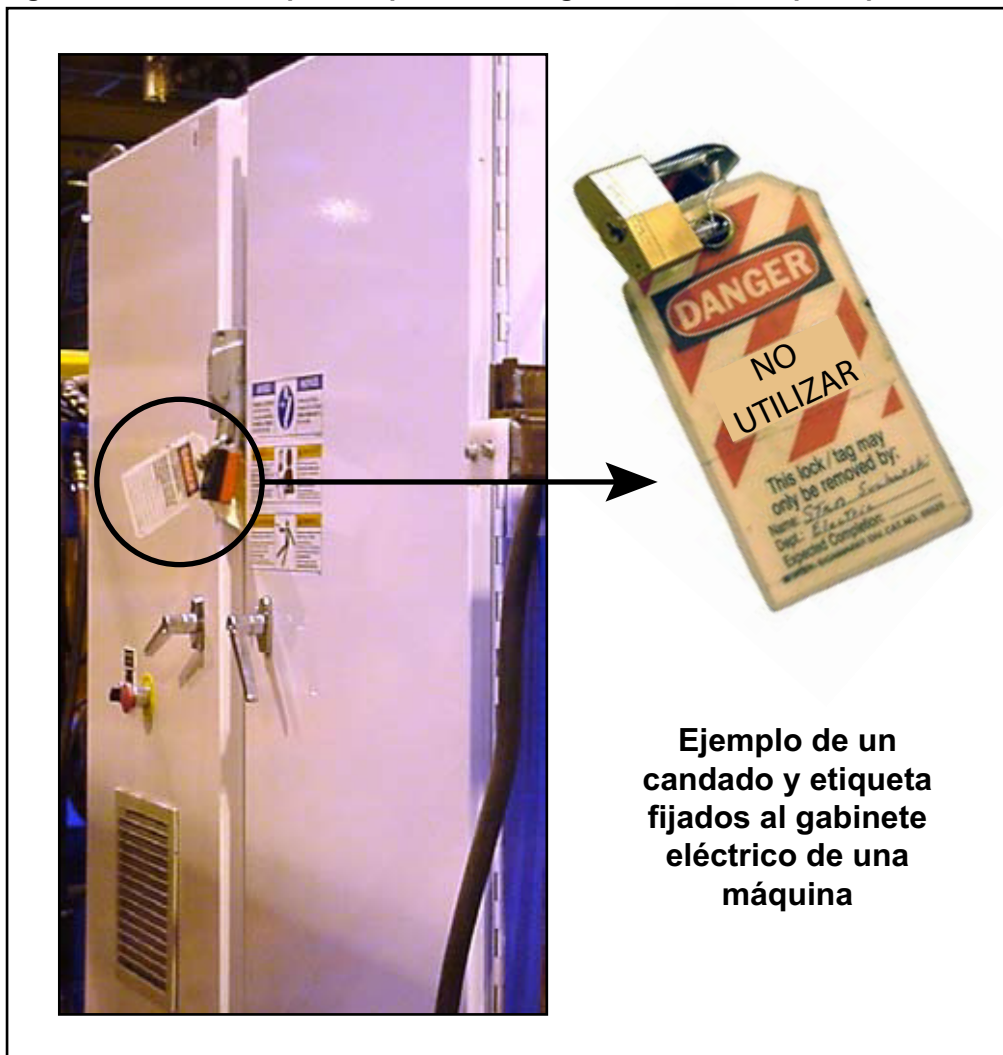
Antes de realizar el mantenimiento de cualquier máquina con alimentación eléctrica, bloquee y etiquete la máquina de forma adecuada. Cuando trabaje en una máquina fuera del gabinete eléctrico principal de la máquina, salvo en el caso de trabajos en la línea de transmisión eléctrica a la máquina, siga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

1. Coloque un freno de emergencia sobre la máquina.
2. Coloque el mango del interruptor con fusibles del gabinete eléctrico principal de la máquina en la posición "apagado/apagada". Vea la figura 2-1.

WARNING	
	<p>RIESGO DE ELECTROCUCIÓN.</p> <p>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!</p>

3. Coloque un candado y una etiqueta que cumplan con los requisitos de bloqueo/etiquetado de la OSHA.
4. Trabe o desenergice todos los componente neumáticos y otras piezas que tengan alimentación directa o almacenada.

Figure SAFETY-1: Bloqueo/etiquetado en el gabinete eléctrico principal



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 etiqueta 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 freno 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 2-2 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 eléctrico principal al que necesita acceder y usando un multímetro verifique que la alimentación esté apagada.

Figure SAFETY-2: Bloqueo/Etiquetado del panel de fuente de alimentación



Procedimiento de bloqueo/etiquetado del sistema neumático

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, los cuales deberían incluir, entre otros, los pasos aquí indicados.


1. Siga las instrucciones de las secciones de bloqueo/etiquetado eléctrico y neumático para bloquear y etiquetar o evitar el movimiento de estos componentes.
2. Coloque un candado y una etiqueta que cumplan con los requisitos de bloqueo/etiquetado de la OSHA en el regulador de aire.
3. Purgue toda la presión del reservorio.
4. Purgue la presión de todas las líneas neumáticas activando las válvulas neumáticas asociadas con dicha fuente de aire.

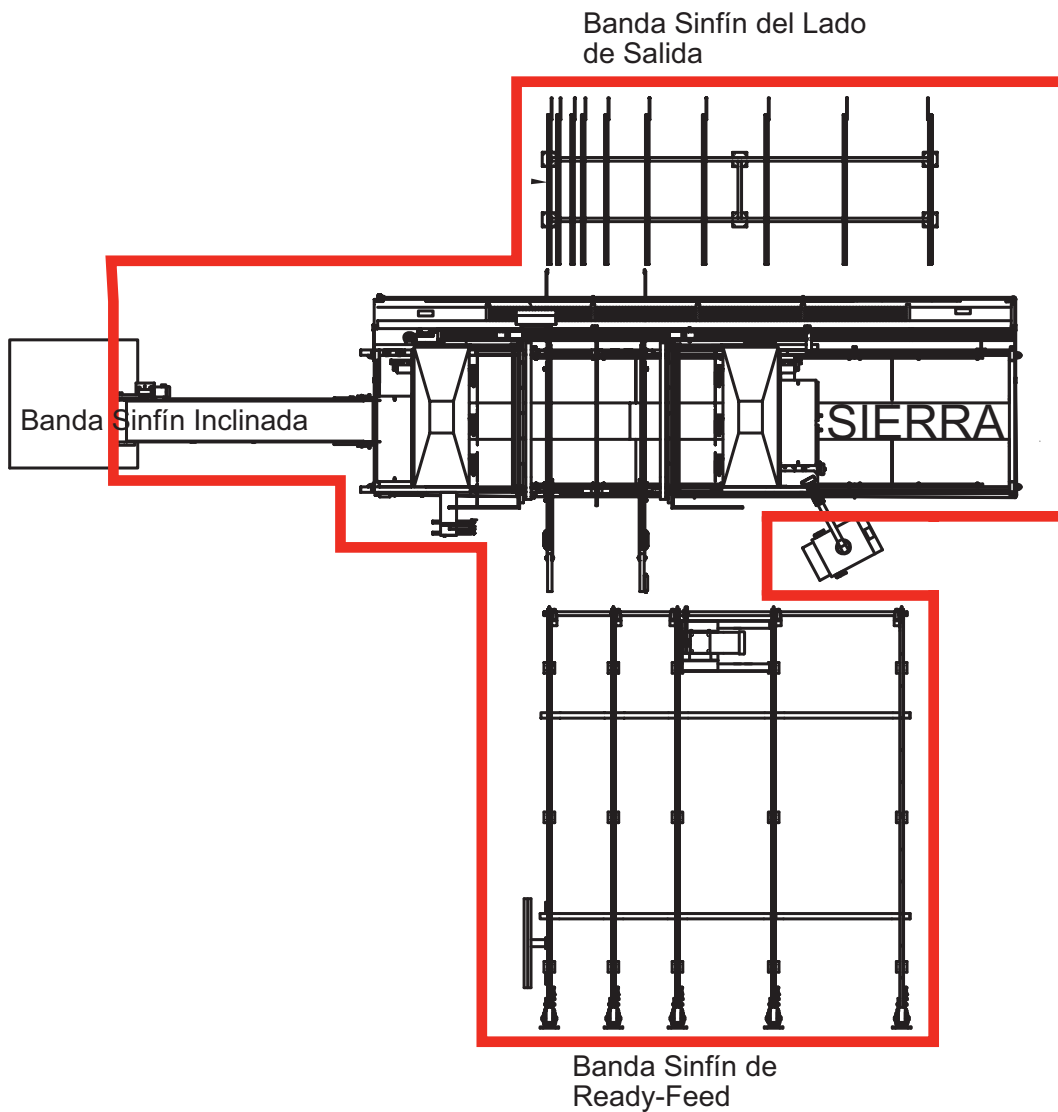
Solución de problemas con una máquina energizada


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.

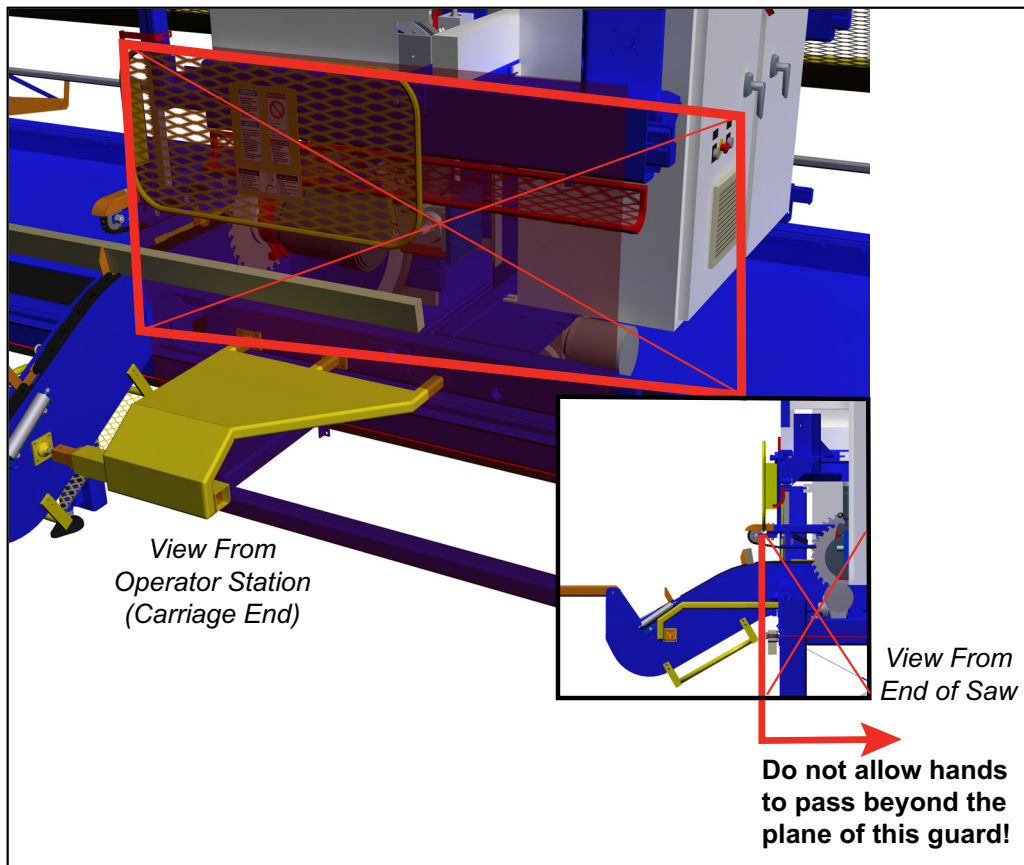
Cada vez que se realizan tareas de mantenimiento mientras el equipo está eléctricamente energizado, existe un riesgo potencial de formación de un arco eléctrico. Consulte en la norma NFPA 70E el equipo de protección personal requerido para trabajar con componentes eléctricamente energizados. Los componentes 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.

Zonas restringida


DANGER	
	<p>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.</p>



DANGER	
	<p>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.</p>



Prueba de seguridad

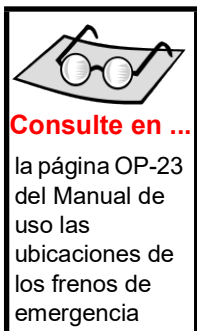
DANGER	
	<p>RIESGO DE APLASTAMIENTO.</p> <p>Realice las pruebas de seguridad que se describen antes de utilizar el equipo por primera vez, después de cualquier tarea de mantenimiento y conforme con la frecuencia de mantenimiento establecida. Si no se realizan estas pruebas, pueden producirse lesiones graves e incluso la muerte.</p>

Realice estas pruebas de seguridad a diario antes de utilizar la sierra y después de cualquier tarea de mantenimiento.


Prueba de frenos de emergencia


Verifique que todos los frenos de emergencia estén funcionando correctamente al comienzo de cada turno. Para ello, proceda como se indica a continuación:

1. Ponga en marcha las hojas en cualquier modo de funcionamiento.
2. Active un freno de emergencia.
 - a) Asegúrese de que las hojas se detengan completamente dentro de los 6 segundos. Si esto no ocurre, refiérase a la página MT-136 del apéndice de *Solución de problemas* para remediar el problema y repita la prueba.
 - b) El icono de freno de emergencia en la barra de alarma en la parte superior de la pantalla debería parpadear de color rojo.
Si no parpadea, hay un problema con los controles de la sierra o con las conexiones del circuito del freno de emergencia.
 - c) Intente poner en marcha una de las hojas de la sierra presionando y manteniendo presionado uno de los botones de arranque.
Si la hoja se pone en marcha, hay un problema con los controles de la sierra o con las conexiones del circuito del freno de emergencia.
 - d) Desconecte el freno de emergencia.
 - e) El icono de freno de emergencia en la barra de alarma en la parte superior de la pantalla debería dejar de parpadear.
3. Repita el procedimiento hasta que todos los frenos de emergencia hayan sido verificados y pasen la prueba.



Verificación de las hojas de la sierra

DANGER	
	<p>¡RIESGO DE ELECTROCUCIÓN, ALTA PRESIÓN, APLASTAMIENTO Y CORTE!</p> <p>Desconecte la energía eléctrica e hidráulica utilizando procedimientos de bloqueo/etiquetado aprobados en el suministro de alimentación y aire antes de subirse a la sierra. Si no bloquea/etiqueta la sierra y elimina el suministro de aire, la sierra podría moverse y causar lesiones personales graves e incluso la muerte.</p>

WARNING	
	<p>RIESGO DE CORTE.</p> <p>Las hojas de la sierra son afiladas y pueden producir cortes graves cuando están siendo manejadas durante la instalación y la eliminación. Use siempre guantes diseñados para trabajar con objetos afilados cuando manipule las hojas.</p>

1. Verifique el estado de todas las hojas de la sierra.
 - a) Haga girar la hoja en la dirección de corte (hacia el lado del operador). La hoja debería girar libremente sin tocar el freno y sin tambalearse. Si tambalea, refiérase a la página MT-133 del apéndice de *Solución de problemas* para remediar el problema.
 - b) Verifique lo siguiente a diario y cambie, repare o afile las hojas si encuentra cualquiera de las características enumeradas a continuación.
 - Dientes muescados o faltantes o bordes desafilados
 - Acumulación de brea
 - Doblado o pandeado de la hoja o grietas en la placa de la hoja (mire con atención alrededor de los dientes y los orificios de los tornillos para asegurarse de que no haya grietas)

2. Pruebe los frenos de la hoja de la sierra:

- a) Para ello, ponga en marcha todas las hojas en cualquier modo de funcionamiento.
- b) Presione un freno de emergencia o el signo STOP (ALTO) en la pantalla táctil.
- c) Con un cronómetro, mida el tiempo transcurrido desde el momento en que presiona el botón STOP (ALTO) hasta que todas las hojas de la sierra se hayan detenido completamente.




cronómetro

Las hojas más pequeñas se detendrán con más rapidez que las más grandes. Todas las hojas deben detenerse dentro de los 6 segundos. Si esto no ocurre, refiérase a la página MT-136 del apéndice de *Solución de problemas*.

Inspección de la sierra



- 1. Mientras está de pie en la banda transportadora de desperdicios, y con toda la alimentación aún bloqueada y etiquetada, inspeccione visualmente que no haya cables que interfieran con el movimiento de las hojas, las bandas transportadoras o el carro. Fije los cables cuando sea necesario.
- 2. Verifique que todos los protectores estén en su lugar y bien fijados.
 - a) Verifique los protectores sujetadores fijos y móviles.
 - b) Verifique el protector de tope de la madera.
 - c) Verifique los protectores de alimentación izquierdo y derecho.
 - d) Verifique los protectores fijos y móviles del operario.
 - e) Verifique los soportes traseros


DANGER	
	<p>¡RIESGO DE ELECTROCUCIÓN, ALTA PRESIÓN, APLASTAMIENTO Y CORTE!</p> <p>Si la sierra no se utiliza con todos los dispositivos de seguridad en perfecto estado de funcionamiento y con todos los protectores de seguridad en su lugar, pueden producirse lesiones personales, incluida la muerte.</p>

- 3. Una vez realizadas todas las pruebas de seguridad y una vez que hayan sido aprobadas en forma satisfactoria, restaure la alimentación de aire y eléctrica a la sierra.

Purpose of Chapter

This chapter explains how to navigate through the entire equipment manual and how to contact MiTek.

Introduction to the Equipment Manual

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

Purpose and Scope of This Equipment Manual






This equipment manual (set of three books) provides the information necessary to operate and maintain this equipment. In order for this equipment manual to be useful, it must be easily accessible to the operators and maintenance personnel. Review the table of contents to understand the structure of the chapters. The appendices, indices, and glossary are also valuable tools for getting the most out of your equipment. They are located at the back of the Maintenance Manual.

This equipment manual addresses the current versions of the *MiTek® Cyber® A/T* saw although some major features and components on previous versions of the saw are addressed to clarify certain items.

Graphics Used to Help Navigate

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

Table 1-1: Navigational Tools Used Throughout the Manual

Graphic	Explanation
	<p>Important safety note!</p> <p>Indicates that you must lockout/tagout the equipment using approved methods described in OSHA 29 CFR 1910.147 before continuing with the procedure.</p>
	<p>Indicates tools required before beginning a procedure.</p>
	<p>Gives additional information to the steps or text.</p>
	<p>Indicates how to get to or from the item discussed.</p>
	<p>Refers reader to another section, table, graphic, or drawing for further explanation.</p>

Using This Manual

The Equipment Manual Set

All of the information you need to install, operate, and maintain your equipment is contained in a three-manual set as described in Table 1-2. Each of the three manuals has its own table of contents and index. The appendices and a glossary for the entire manual set are located at the back of the Maintenance Manual.

Table 1-2: Manual Set 001055

Manual Title	Page # Prefix	Description	Part #
Book 1 Operation Manual	OP	Includes operation procedures and defines the control user interface	001055-OP
Book 2 Maintenance Manual	MT	Includes preventive maintenance, repair maintenance, troubleshooting, parts list, drawing set list, and glossary	001055-MA
Book 3 Installation Manual	IN	Includes requirements prior to installation, installation procedures, and startup procedures.	001055-IN

The Drawing Set

The drawing set is part number 001069. A list of the drawings can be found in the Maintenance Manual, but the actual drawings are in a separate 11x17 binder. The binder may be labeled 001055, like the manuals, or it may have a separate part number, 0014069. Both of these part numbers apply to the *Cyber A/T* saw made at the time of the purchase.

Formatting Cues

To follow the procedures in this manual, you must first understand the formatting cues used. Table 1-3 describes how to read the cues provided in this text.

Table 1-3: How to Read the Formatting Cues

If Text Looks Like...	It Indicates...	Example in Text
All caps	Key on keyboard or button on screen	Press ENTER
Initial cap and italics	Menu or field or virtual button that you must find or select	Click on the <i>File</i> menu
Initial cap only, no italics	Menu or field or virtual button when simply referring to it	While in the Main Menu
Plus sign (+)	Hold buttons at the same time	CTRL+ALT+DELETE
Greater Than sign (>)	Next selection	<i>File>Open</i>

Screen Shots

Most screen shots are from *Cimplicity*[®] Project version 20.11. Screens from other Project versions may differ slightly.

Contacting MiTek

For technical assistance or to order parts, contact the Machinery Division Customer Service Department using one of the methods listed in Figure 1-1.

Figure 1-1: Contacting MiTek

<p>MiTek Machinery Division Customer Service Department 301 Fountain Lakes Industrial Drive St. Charles, MO 63301</p> <p>Parts Orders (with part number) E-mail: mitekparts@mii.com</p> <p>Technical Assistance Phone: 800-523-3380 Fax: 636-328-9218 machinerysupport@mii.com</p> <p>Web Site www.mitek-us.com</p>	 The MiTek logo, consisting of the letters 'MII' in a bold, black, sans-serif font with three horizontal blue lines through the 'I', positioned to the right of the contact information.
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Purpose of Chapter

This chapter provides step-by-step instructions as well as information to help you understand how your equipment works to enable you to make repairs and perform preventive maintenance.

Introduction to Maintaining Your Equipment

Getting the Most From This Chapter

This manual contains sufficient information for proper maintenance under most conditions. Certain operating environments may necessitate preventive maintenance at more frequent intervals. Because consistent preventive maintenance is so important for keeping mechanical equipment in good operating condition, MiTek recommends that you stock certain replacement parts to minimize downtime.

The following appendices will assist you in maintaining and repairing your equipment:


- Troubleshooting
- Parts List
- Maintenance Checklists
- Drawings

Some General Advice

- Maintaining the saw is the best way to ensure accurate cutting over the life of the equipment. Well-maintained saws will experience far less downtime and more accurate cutting.
- For the highest level of technical support from MiTek, network your saw with a high-speed connection. This will allow MiTek to use on-board diagnostics from our call center that will greatly enhance the capabilities we have to help resolve problems with your saw.
- Always follow the procedures outlined in this manual carefully. If you find a procedure incorrect, contact MiTek Machinery Division Customer Service or fill out the form in the *Document Evaluation* in Appendix F.

Performing Maintenance Safely


Before Operating This Equipment

DANGER	
	<p>ELECTROCUTION, HIGH PRESSURE, CRUSH, AND CUT HAZARDS!</p> <p>Read this section AND the safety section in the preliminary pages before operating or maintaining this equipment.</p> <p>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.</p> <p>Read and observe all warnings. Failure to do so may result in property damage, personal injury, or death.</p> <p>This manual must always be available to personnel operating and maintaining this equipment.</p>


Before Getting Close to Any Parts That Could Move




- The lock and tag symbol shown here indicates that proper lockout/tagout procedures must be used prior to starting the procedure where the symbol occurs.
- Always lock and tag the stationary-end disconnect switch. The carriage-end disconnect switch only shuts off power to the carriage end.

WARNING	
	<p>Always turn the saw off by activating an E-stop when the saw is not in operation.</p> <p>Always verify that all power to the machine has been turned off and follow approved lockout/tagout safety procedures (OSHA 29 CFR 1910.147) before performing any maintenance on this equipment.</p> <p>Turn off the air switch. Bleed lines if appropriate.</p>

Making Adjustments to the Machine

WARNING	
	<p>The components on this machine can cause severe injury if adjusted improperly. Follow all procedures in this manual thoroughly and do not make adjustments to the machine without guidance from MiTek or MiTek documentation.</p> <p>Only trained personnel should make mechanical adjustments to this machine.</p>

Performing Electrical Work

WARNING	
	<p>ELECTROCUTION HAZARD!</p> <p>Always verify that all power to the machine has been turned off and follow approved lockout/tagout safety procedures (OSHA 29 CFR 1910.147) before performing any maintenance on this equipment.</p> <p>All electrical work must performed by a qualified electrician.</p> <p>If it is absolutely necessary to troubleshoot an energized machine, follow NFPA 70E for proper procedures and personal protective equipment.</p>

Understanding the Disconnect Switches

Both disconnect handles should always be turned off when the machine is not in use. Refer to the *Overview Graphics* starting on page MT-39 for the location of the disconnect switches.

Main Disconnect (Stationary Enclosure)

The main disconnect switch controls the power supplied to the entire machine. Turning off the main disconnect shuts down all power. The main disconnect is located on the stationary-end electrical enclosure. Power runs through it into the stationary-end enclosure and also continues to the carriage-end disconnect.

Secondary Disconnect (Carriage Enclosure)

The power in the carriage enclosure is running through the main disconnect first, then to the carriage disconnect. All of the carriage-end loads are distributed after the carriage-end disconnect. The carriage-end loads power the motors on the carriage end

of the saw. Turning off the carriage-end disconnect will shut down only the carriage-end power.

Wearing Personal Protective Equipment

Follow OSHA guidelines regarding the proper personal protective equipment (PPE) while performing maintenance. The most common guidelines are in regards to eye protection, hearing protection, dust masks while blowing off sawdust, gloves while working with solvents, and fire-retardant clothing when troubleshooting an energized machine.

Understanding the Profibus Network (Encoders)

If the Profibus network is disconnected at any point and an E-stop pushbutton is not activated, movement of saw components may occur.

The Profibus network consists of the cable, connectors, encoder interfaces, and the Profibus network card on the PLC (slot 2). A communication error will occur when the Profibus network is disconnected, unless an E-stop is activated first. Removing the terminating resistor, breaking a quick disconnect connection, or cutting the communication cable will disconnect the Profibus network. Any disconnection of the Profibus network could cause an instance of motion from the hold-downs, infeeds, and possibly the carriage. While this motion is slight, personnel should be cautioned to use proper shutdown procedures. Activate an E-stop and use proper lockout/tagout procedures to prevent unexpected motion.

Replacing Parts on Your Saw

Special materials have been used for some of the components of this equipment. It is critical to the future performance of this machine that only specified replacement parts are used. When a replacement part is needed, the part should be ordered from MiTek. No substitution should be made without first consulting MiTek to determine whether an appropriate substitution can be safely and effectively used. No electrical system component, cable, connector, or device should be modified, removed, disconnected, or changed without specific approval and guidance from MiTek.

Conducting Safety Tests

Refer to page MT-12 for safety procedures that should be done every day and after completing any maintenance. See page MT-28 for the safety tests translated to Spanish.

Overview Graphics

Figure 2-1 through Figure 2-7 provide an important overview of this equipment. Review these graphics before attempting any maintenance or troubleshooting on this equipment and refer to them for further explanation of the procedures in this manual.

Figure 2-1: Main Components

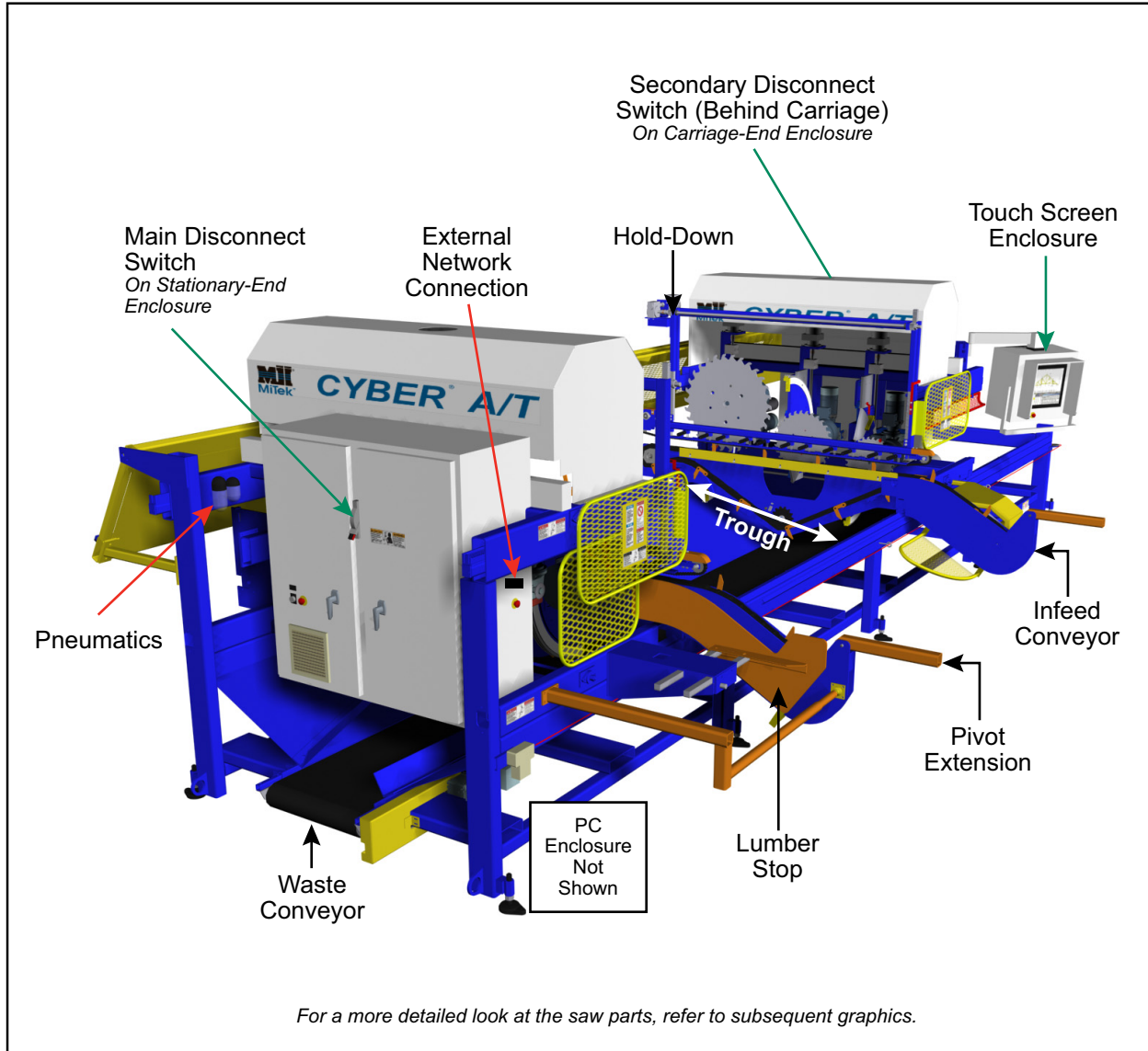


Figure 2-2: Carriage and Quad Components

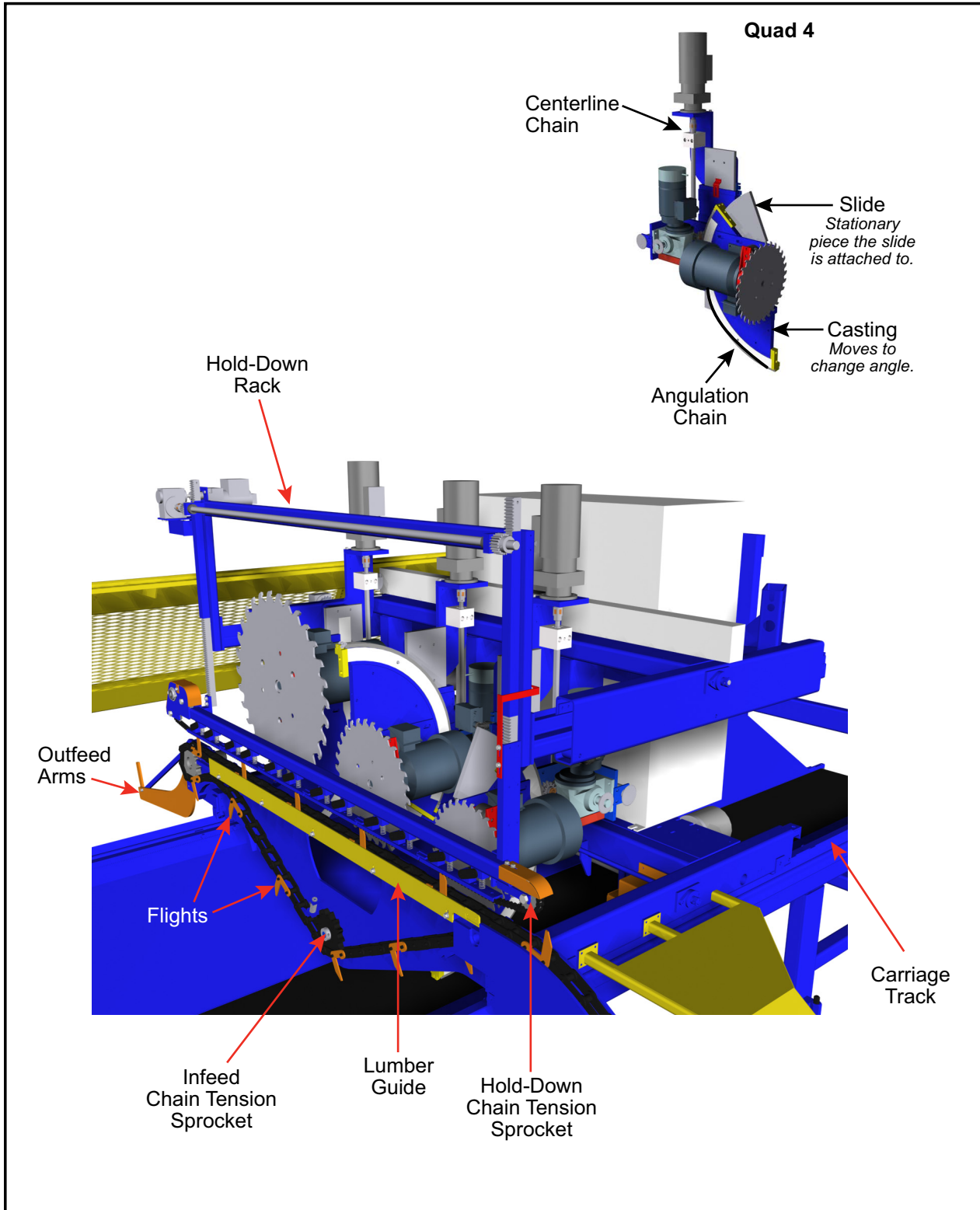


Figure 2-3: Motors and Preventive Maintenance Required

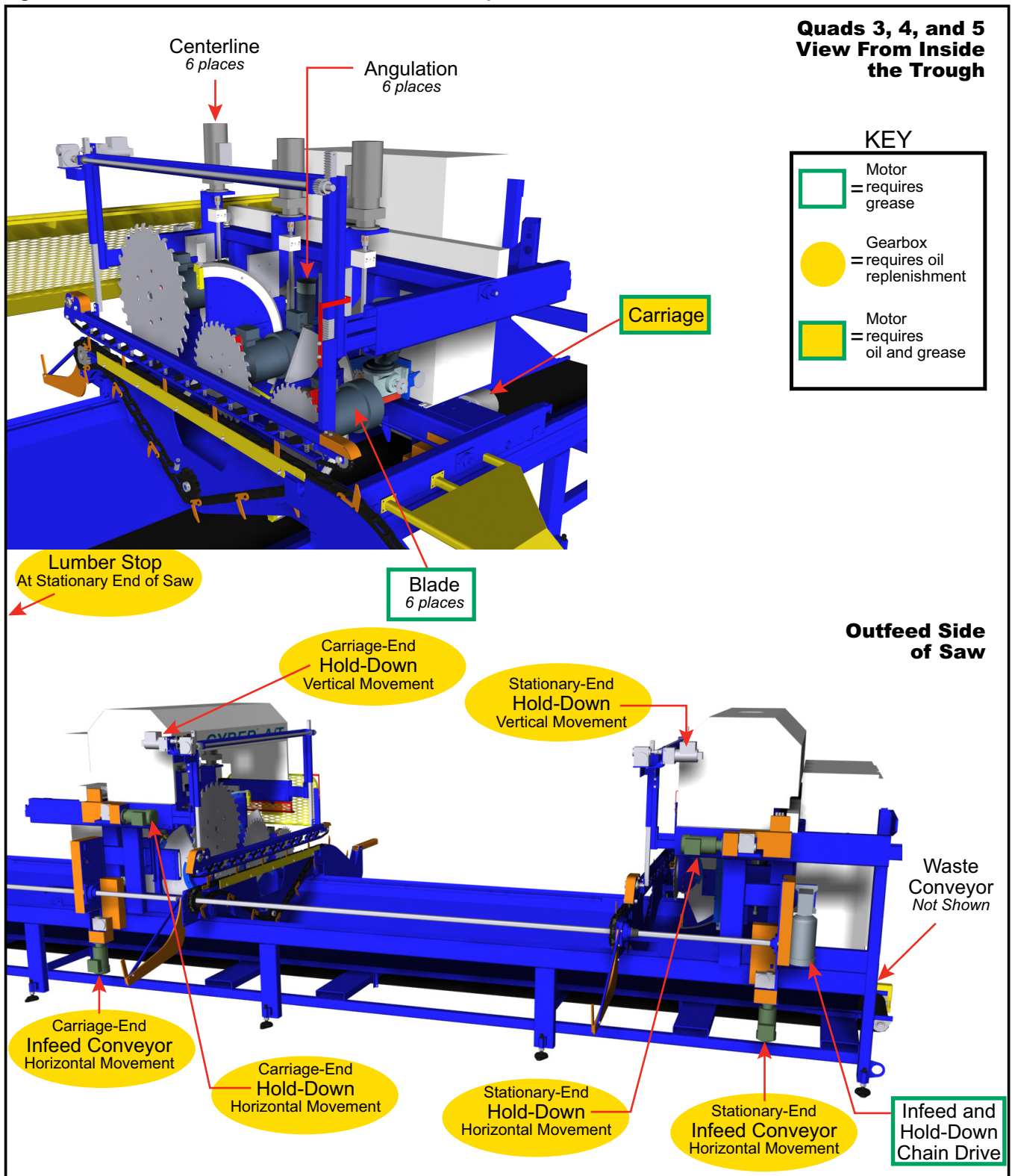


Figure 2-4: Bearings to Grease (Not Including Motor Bearings)

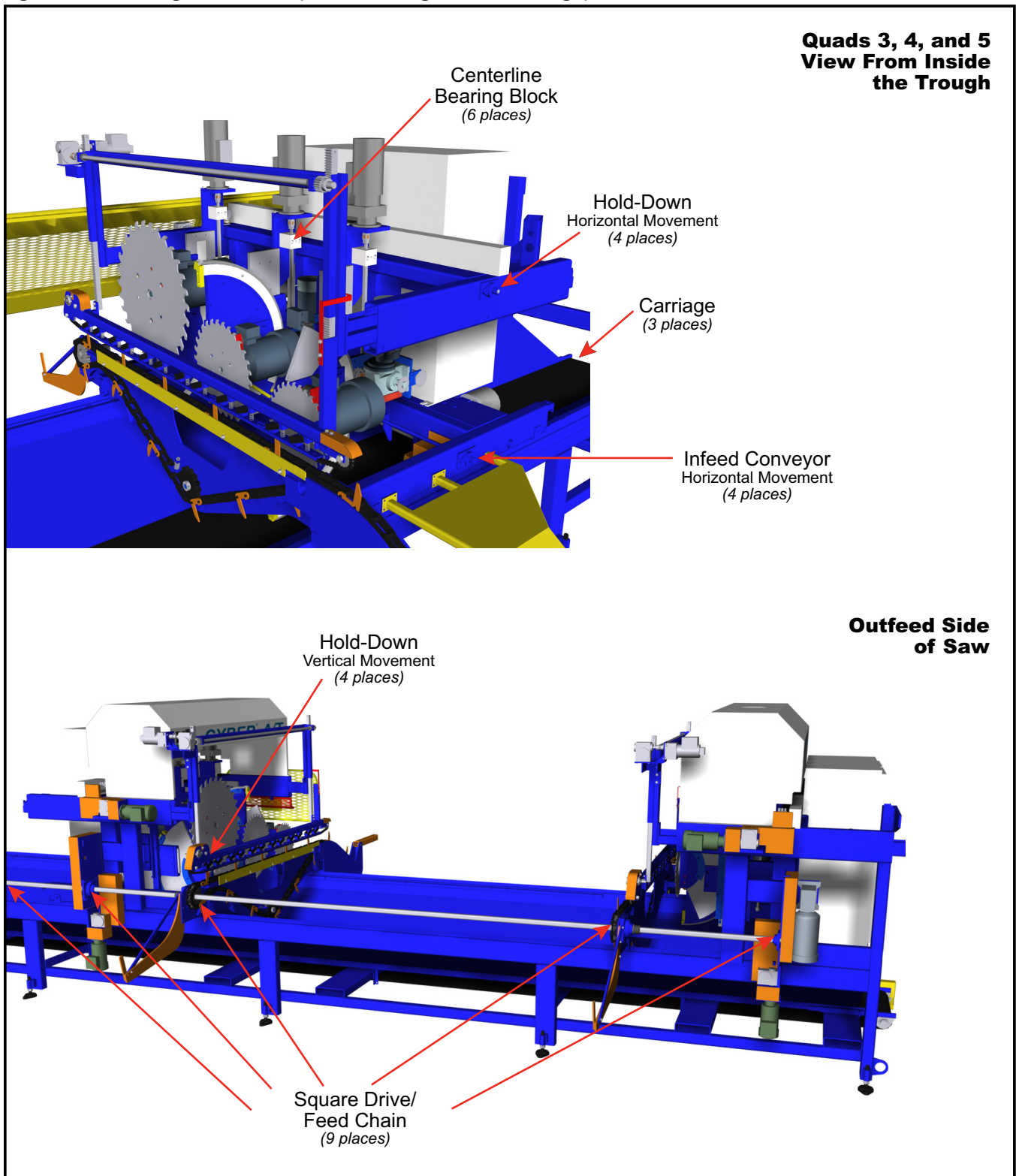


Figure 2-5: Encoders and Prox Switches

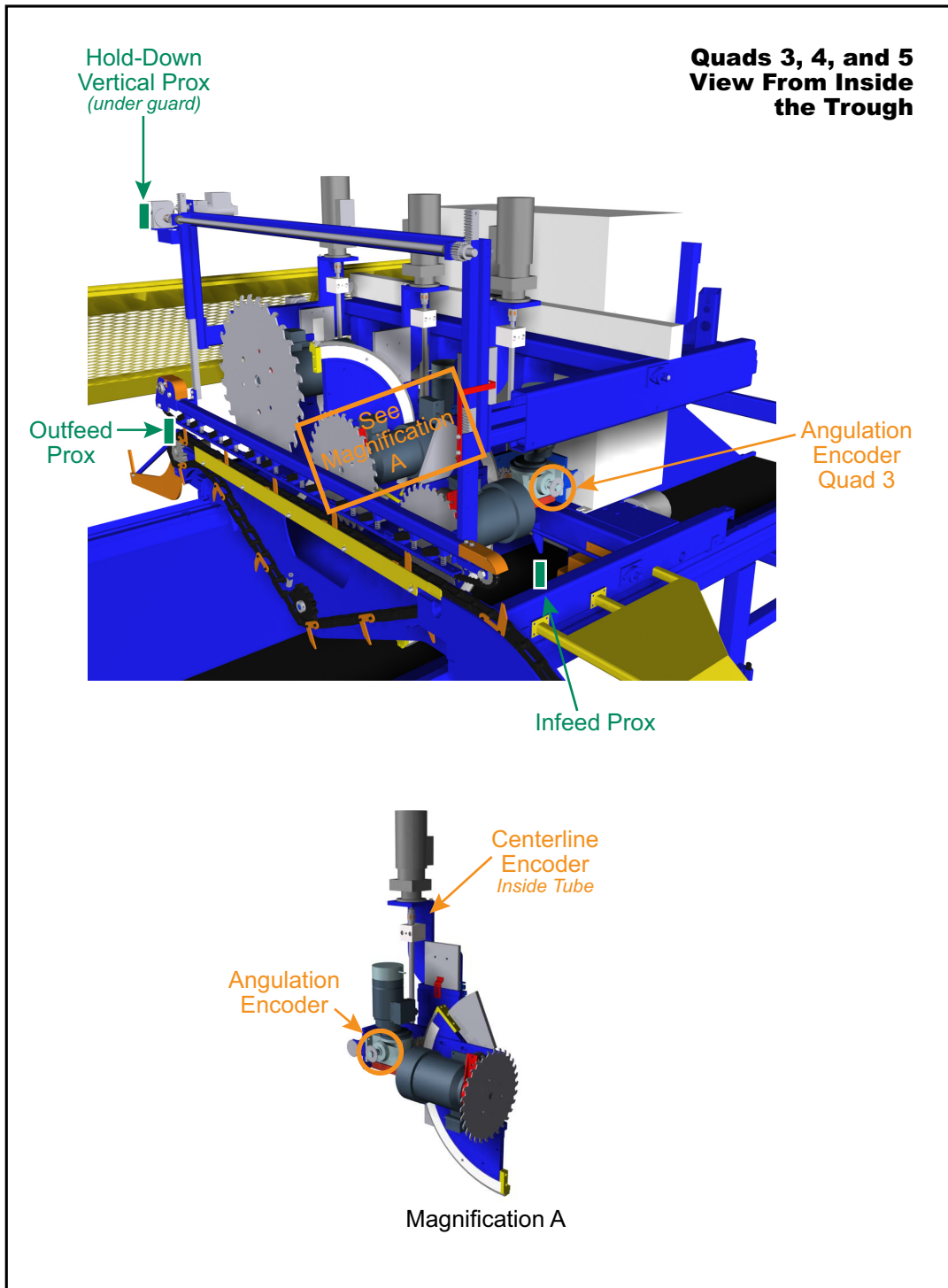


Figure 2-6: Carriage-End Electrical Enclosure

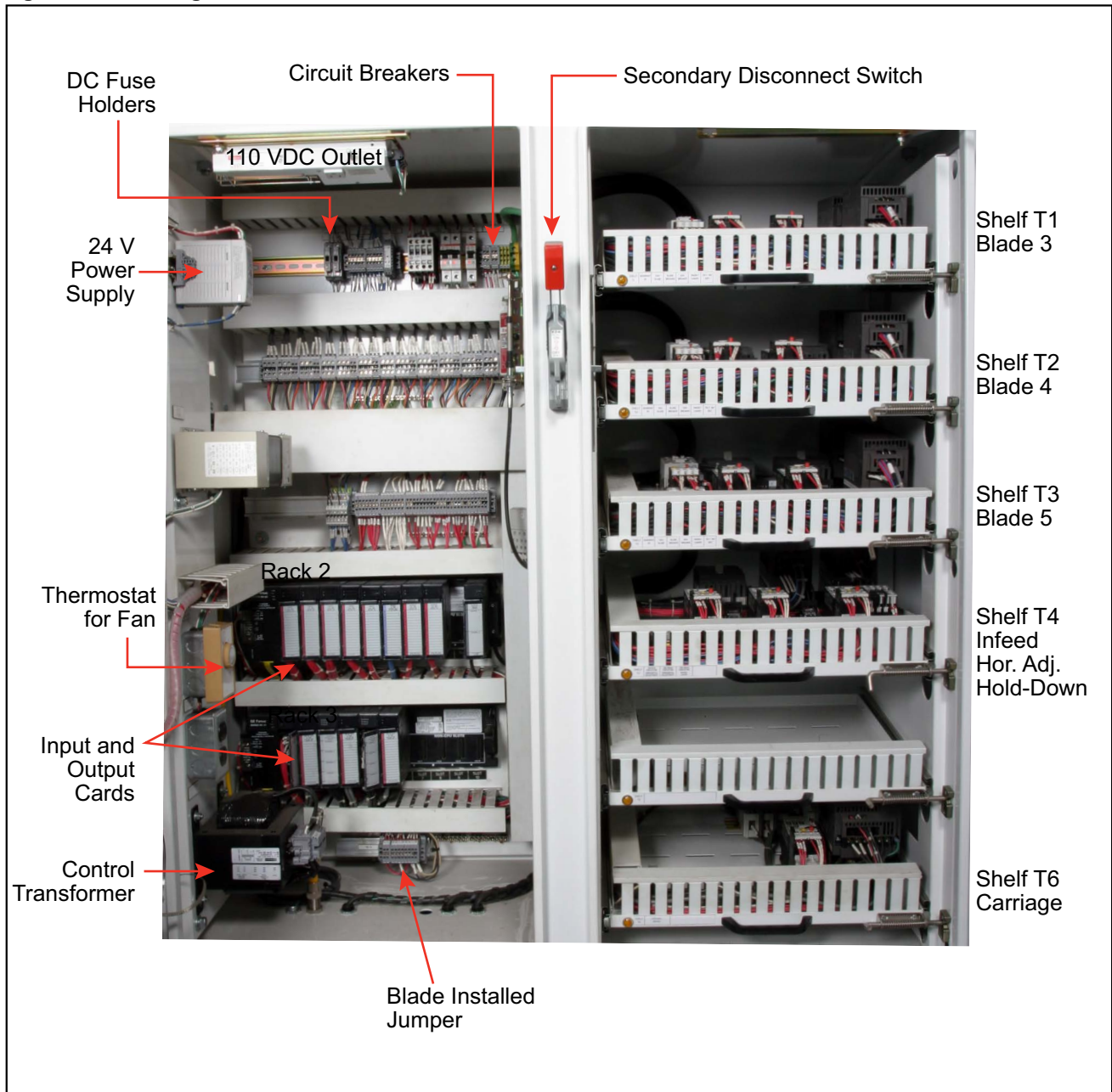
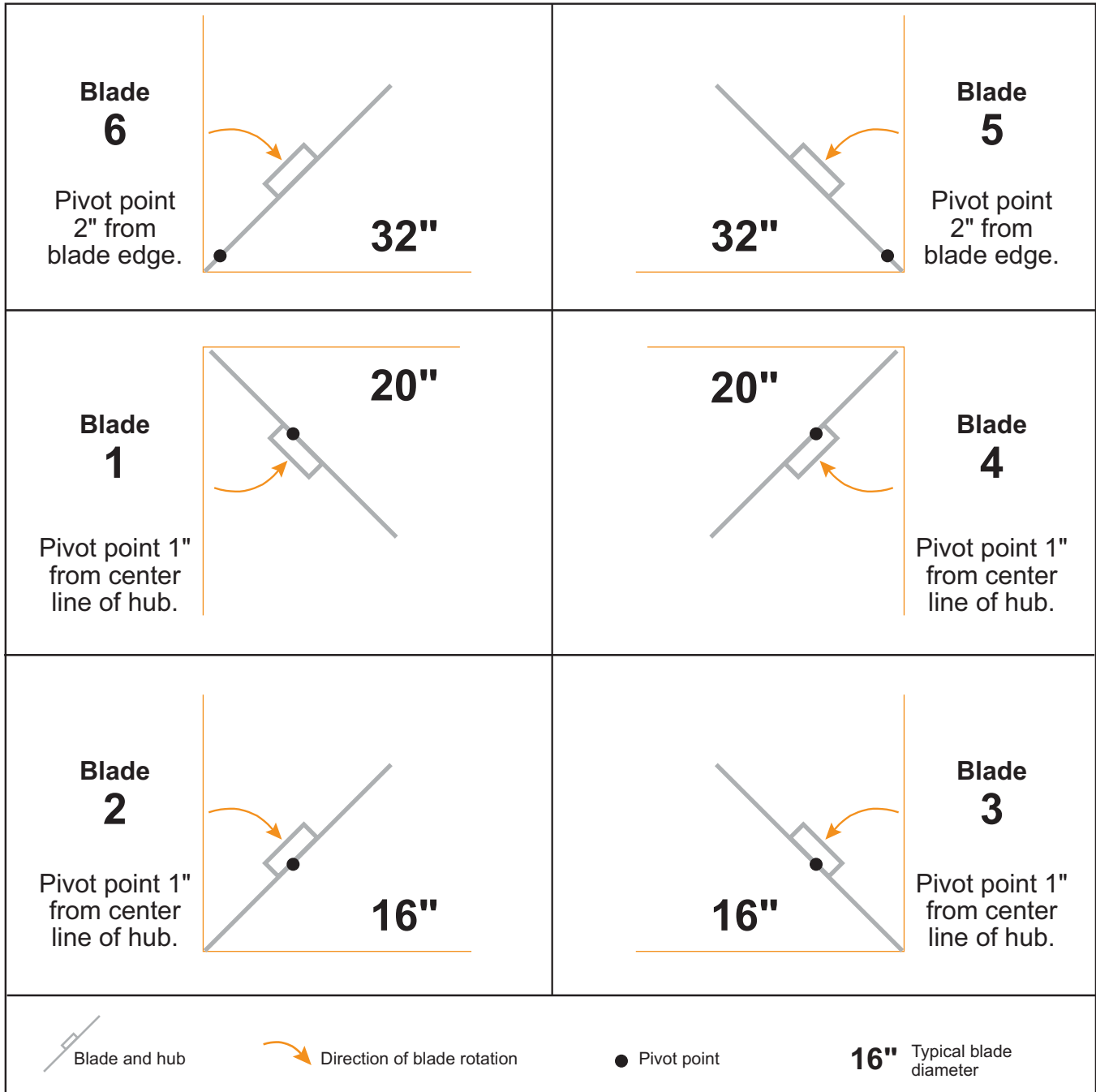


Figure 2-7: Direction of Blade Rotation, Pivot Point Location, and Blade Size for Each Quad



Operating Procedures for Maintenance Personnel

Changing Default Settings

Access the Default screen from the Main Menu to change any of the following parameters:

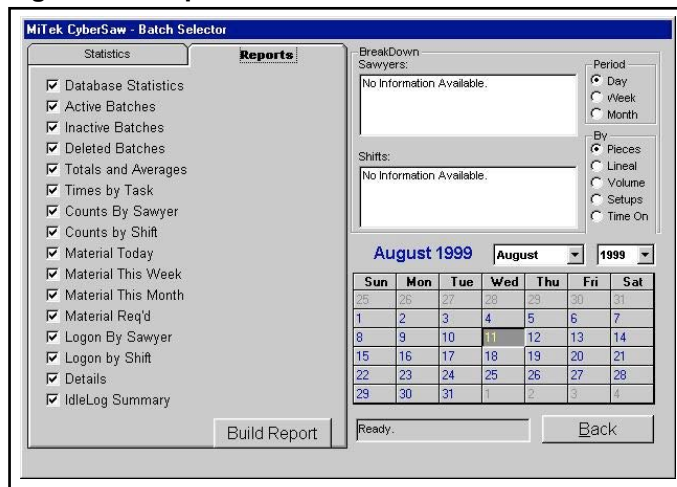
- Blade size
- Imperial versus metric units of measurement
- Length of saw carriage
- Infeed conveyor maximum speed
- Carriage speed
- Carriage brake control

Refer to the *Default Parameters Screen* section on page OP-93 for instructions on how to make these changes.

Generating Reports

Access the Reports Menu from the Main Menu.

Figure 2-8: Reports Menu



To generate a report:

1. Press the FILE button from the Automatic Screen.
2. Select the *Reports* tab.
3. Check the reports you want to print.

4. Press BUILD REPORT to open the report in Wordpad.
5. Save the file to any location you desire from the *File* menu of Wordpad.
6. Pressing the BUILD REPORT button will write a copy to the floppy drive if a disk is present.

Reports can also be viewed and printed with Notepad, *Microsoft*[®] Word, or any program supporting .txt files.

In addition to the basic reports, you can query the database directly if you have *Microsoft* Access software.

It is possible for you to extract the exact information you may be looking for. A few sample SQL queries are provided as examples for those interested in developing custom reports with *Microsoft* Access software.

Using Idle Time Reason Codes

The keyboard must be plugged in before starting the computer.



Idle time reason codes require the keyboard to be plugged in to be able to enter the codes.

To Change Settings for Existing Reason Codes

1. Ensure that the following requirements are met:
 - The touch screen computer is on (if computer is inside touch screen enclosure)
 - The computer in the PC enclosure is on and the touch screen monitor is on (if computer is inside a PC enclosure)
 - MiTek Project software is running and logged into
 - The calibration key (on the front of the touch screen) is in the ON position
2. From the Main Menu, go to the *Defaults* screen, then *Speeds*, and finally *Advanced*.
3. Press OK when the keypad appears.
4. Press OK under the Setup Excess Idle dialog box.
5. Press the checkbox next to *Enabled* and set the desired time interval in seconds.

If creating a new reason code, set this time interval to 5 seconds. You will come back later to set it to the desired time.

6. Press OK to save the changes made.

If you are not able to change the settings, contact MiTek Machinery Division Customer Service.

7. Turn the calibration key to OFF.

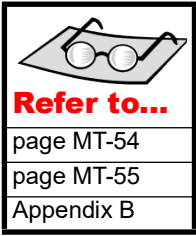
To Create New Reason Codes

1. Perform all of the steps in the *To Change Settings for Existing Reason Codes* section.
2. Go to the Semiautomatic screen and push the ALL HOME button, but do not push INITIATE SETUP.
3. Wait at least 30 seconds longer than the time interval set in step 5 above (5 seconds + 30 seconds = 35 seconds), then push the INITIATE SETUP button. This should bring up the Excess Idle pop-up window.
4. Press the EDIT button and a password box will appear.
5. Enter mitek in lowercase letters in the password box. If you need to change the password, call MiTek Machinery Division Customer Service for assistance.
6. Type the name of the new reason code in the field at the top of the window. It can be called anything that aptly describes its purpose.
7. Press the ADD button to accept the name.
8. When finished adding all reason codes, highlight any one of the reason code names and the OK button will become active.
9. Press OK and the Excess Idle window will disappear.
10. Repeat the steps in the *To Change Settings for Existing Reason Codes* section to set the new reason code time allotment to the desired value.



If the Excess Idle Log Summary Report option is checked when building a standard report, the excess idle times are included at the end of the report. The times will be reported by shift, sawyer, batch, and description.

Calibration Check



Review the sections *Overview of the Calibration Screen* on page MT-54 and *Changing Calibration Settings* on page MT-55 if you are unfamiliar with the calibration process.

Appendix B gives the complete calibration procedure for use if the calibration check fails and you're unsure how to fix it.

Checking Daily Calibration

Check calibration of the saw every day to ensure the accuracy of the cuts. The daily procedure includes checking:

- Angles
- Centerlines
- Lumber stop and carriage positions
- Hold-down position and tension

Summary



2 straight boards,
2x4x12

framing square
tape measure

Using good, straight lumber, perform a test by cutting two boards as shown in Figure 2-10. Check the angles, centerlines, and length of these cuts. If all measurements are within the calibration accuracies listed in Table 2-9, no further calibration is required. If any measurement is outside of tolerance, resolve the inaccuracy by using Figure 2-13.

Figure 2-9: Calibration Accuracies

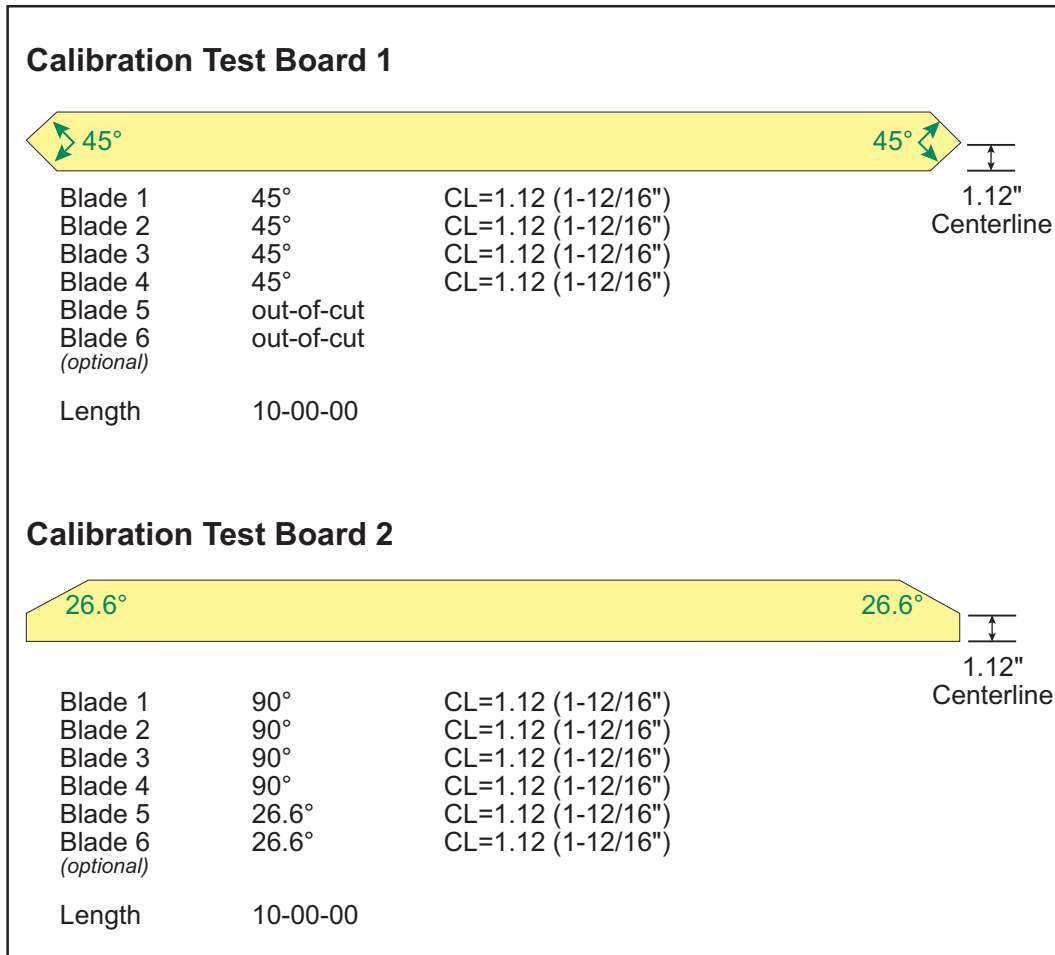
Specification	Attainable Accuracy
Length	± 1/16"
Angle	± 1/10°
Centerline	± 1/16"



Remember that when entering measurements in the Manual, Semiauto, or Automatic screens, measurements are entered in 1/16 in. When entering a measurement into the Calibration screens, most measurements are entered in the decimal form. The decimal conversion chart on your saw will assist you.

Also refer to Table 3-4 on page OP-51 in the Operation Manual for more explanation.

Figure 2-10: Daily Calibration Test Boards



Procedure

1. In Semiauto Mode, set up the angles and centerlines for Test Board 1 as shown in Figure 2-10. Refer to Table 3-4 on page OP-51 for specific instructions on entering values in Semiauto Mode.
2. Watch the hold-downs as the board passes through the saw. They should hold the board firmly and the hold-down springs should compress slightly.
3. Start the blades and infeed conveyors and run a 2x4x12-in. board through the saw.
4. Set up the angles and centerlines for Test Board 2 as shown in Figure 2-10.
5. Watch the second board as it passes through the saw to verify that the hold-downs are tensioned properly.
6. Start the blades and infeed conveyors and run a 2x4x12-in. board through the saw.

7. Check the length of both boards with a tape measure. Allow 1/16-in. tolerance.
8. Check the angles with a framing square. Allow 1/16-in. tolerance.
9. Check the centerlines with a framing square. Measure from the bottom, which is always the side with the notch in it. Allow 1/16-in. tolerance.

Figure 2-11: Checking Angles on Test Boards

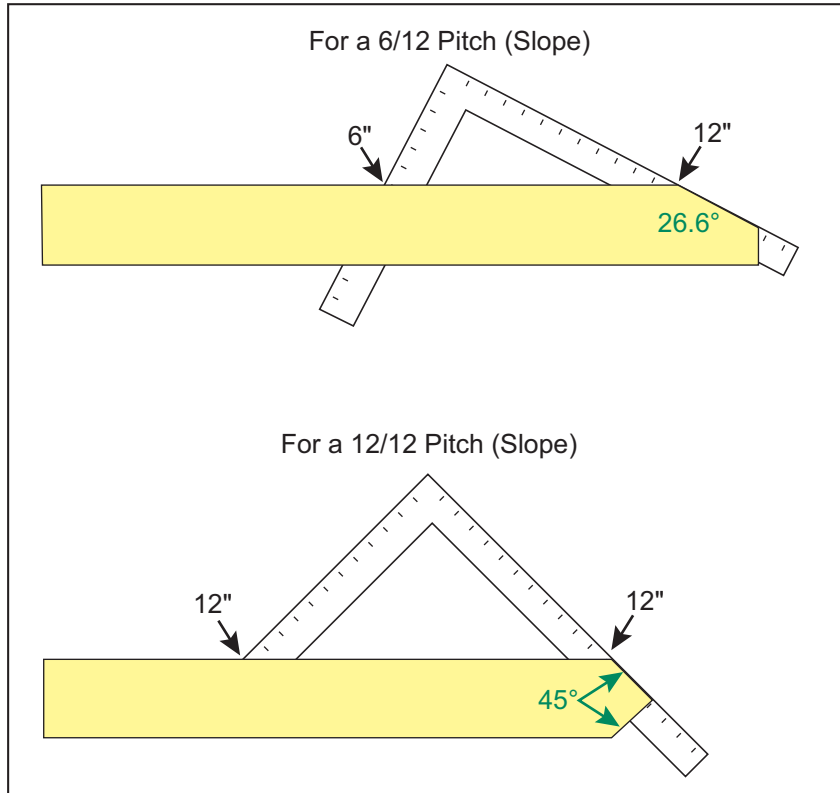
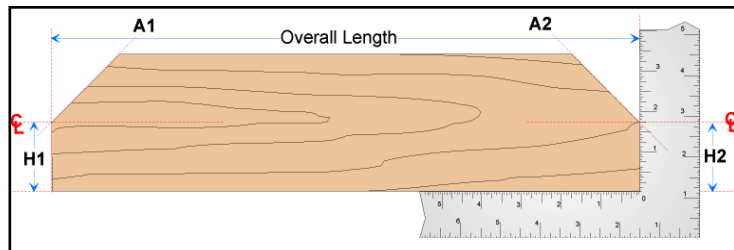


Figure 2-12: Checking Length and Centerline on Test Boards



Always measure the centerline from the bottom of the board.

10. Check the infeed conveyors and hold-downs horizontal location calibration.
 - a) Place blades 2 and 3 at 90°.
 - b) Measure the distance from the edge of the blade to the closest point on each infeed conveyor or hold-down.
 - c) Go to the Manual screen and ensure that the numbers displayed match the measurements taken. Allow for 1/16-in. tolerance.

11. Check the lumber stop position calibration.
 - a) Set the lumber stop to 1 in.
 - b) Start the blades.
 - c) Place a board on the infeed conveyor and against the lumber stop.
 - d) Jog the feed conveyor until the board is cut halfway through.
 - e) Reverse the infeed conveyor to remove the board and stop the blades.

12. Measure from the end of the board to the far side of the notch cut. This equals the lumber stop's actual position. If the measurement is 1 in., there is no need to change the calibration.

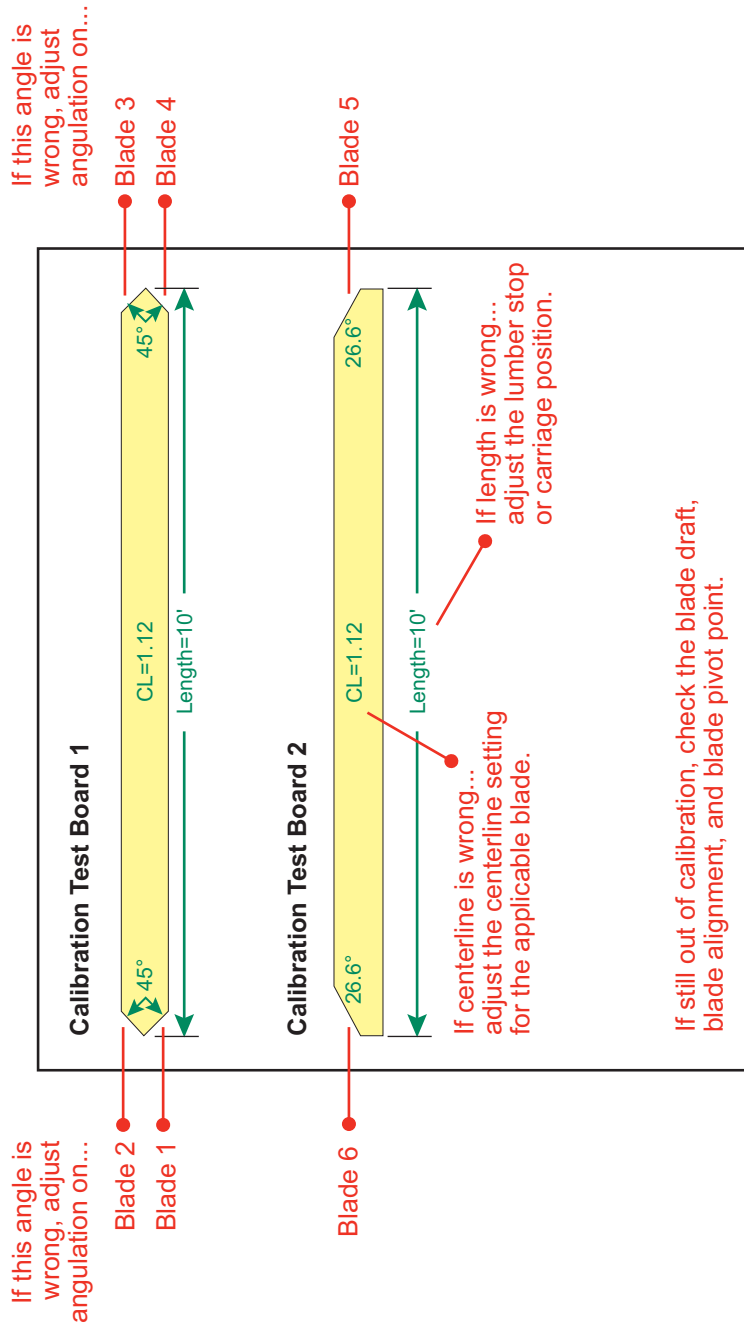
13. If any measurement taken during this check does not match what was expected, refer to the applicable section of this manual for instructions on how to adjust the specific component.

14. While calibrating, you may need to “teach” the saw that its new value is correct. Refer to the *Teaching the Saw Its Calibration Setting* section.

Teaching the Saw Its Calibration Setting

Teaching the saw required that you move the axis past its home position and bring it back to its original set point while calibrating. Repeat this 2 to 3 times for saw to accurately determine where its target is.

Figure 2-13: Resolving Calibration for a Failed Test



Making adjustments to one component or feature may affect other components. Refer to Appendix B if you are uncertain about the calibration process.

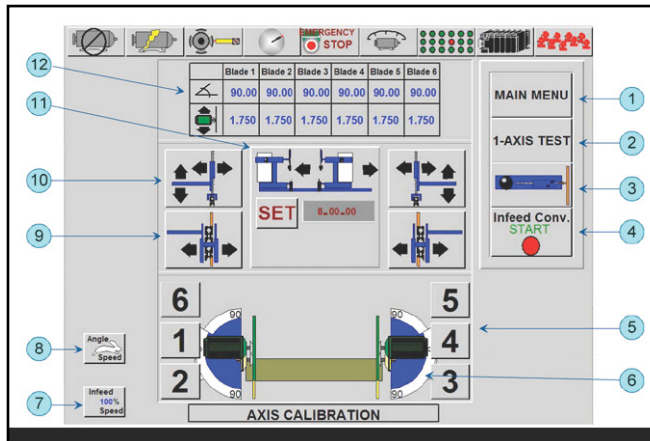
Overview of the Calibration Screen



The key switch on the touch screen enclosure must be ON to enable Calibration Mode.

The Calibration screen, shown in Figure 2-14, allows the operator to calibrate each axis of the *Cyber A/T*. Each axis of the saw has a button on the screen that gives the operator access to that blade, hold-down, etc. Each axis has manual controls that allow the axis to be moved. On the vertical hold-downs and lumber stop, the axes will stop momentarily at the calibration point, to prove that the automatic calibration is working. If the axis is still out of calibration, the current or actual axis location must be entered.

Figure 2-14: Calibration Screen



1. MAIN MENU - Opens Main Menu
2. 1-AXIS TEST - Opens a screen where each axis can be tested by allowing the saw to position that axis automatically
3. LUMBER STOP - Opens a menu where the settings for the lumber stop can be adjusted
4. Infeed Conv. START - Starts or stops the infeed conveyor
5. Motor Buttons - Open a menu where the settings of quad can be adjusted
6. Display - A visual display of the current setup
7. INFEEED SPEED - Changes the infeed conveyor speed
8. ANGLE SPEED - Changes the speed differential between fast and slow at which the angles move
9. INFEEED CONVEYOR - Opens a menu where the settings for the infeed conveyor can be adjusted
10. HOLD-DOWN - Opens a menu where the settings of the hold-downs can be adjusted

11. CARRIAGE - Opens a menu where the settings for the carriage can be adjusted
12. SET - Sets the carriage position
13. SETTINGS - This display show the current values stored in the computer

Changing Calibration Settings



If you attempt to adjust a setting before checking these items, the miscalibration may get worse instead of better!

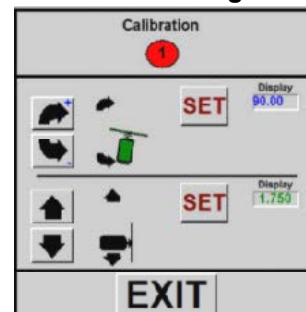
If the numbers displaying on the touch screen do not match the numbers measured on the cut board, change the calibration settings. Before recalibrating:

- Check the quality of the test lumber. If it is bowed, twisted, or distorted in any way, it will make the test unusable.
- Check that you entered the numbers on the touch screen correctly during the calibration test.

Adjusting Angle and Centerline Settings

1. Go to the Main Menu.
2. Turn the calibration key switch to ON.
3. Press the CALIBRATE button.
4. Press the corresponding button for the blade you are checking. This will bring up a box where you can change both the angle and centerline settings for that head.
5. Push the SET button and enter the correct value.
 - a) 90° is entered as 9000 = 90.00
 - b) 1-in. center line is entered as 1000 = 1.000
 - c) 1-1/2 in. centerline is entered as 1500 = 1 8/16
6. Press OK.
7. Press EXIT to return to the Calibration Menu.
8. Ensure the angle scale pointer matches the touch screen reading and the actual measurement. If not, adjust the pointer.

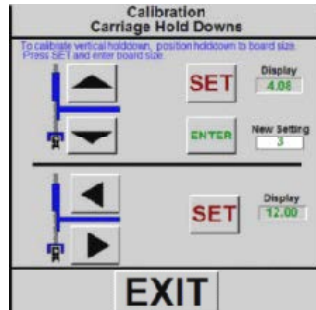
Figure 2-15: Angle and Centerline Settings



Always measure from the bottom of the board to determine where the blade is cutting the centerline.

Adjusting Hold-Down Settings

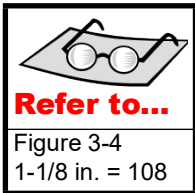
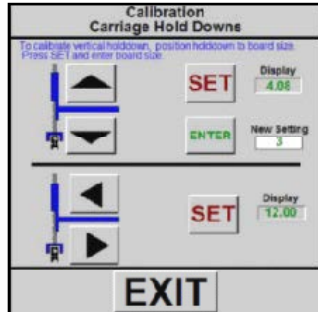
Figure 2-16: Setting for Hold-Down



1. Use the hold-down buttons to move hold-down until it touches the board.
2. Pencil a line on the rack gear under the tube.
3. Lower the hold-down another 1/2 in. downward.
4. If necessary, adjust the pointer to 2x4.
5. Turn the calibration key switch to ON.
6. Press the CALIBRATE button.
7. Press the corresponding button for the carriage hold-down. This will open a menu where you can change both the height and extension settings for the hold-down.
Enter (4) for 2x4.
8. Press SET to display a keypad.
9. Enter the numeric value of the actual location and press OK.
10. Press ENTER to confirm the new location setting and update the calibration point.
11. Ensure the vertical scale pointer matches the touch screen reading and the actual measurement. If not, adjust the pointer.

Adjusting Lumber Stop Settings

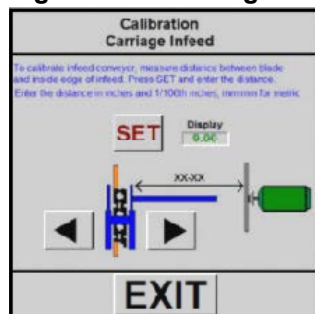
Figure 2-17: Setting for Lumber Stop



1. Turn the calibration key switch to ON.
2. Press the CALIBRATE button.
3. Press the corresponding button for the lumber stop.
4. Use the adjustment buttons to change the reading for the lumber stop.
5. Press SET to display a keypad.
6. Enter the numeric value of the actual location and press OK.
7. Press ENTER to confirm the new location setting and update the calibration point.
8. Ensure the length scale pointer matches the touch screen reading and the actual measurement. If not, adjust the pointer.

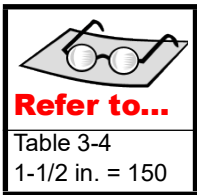
Adjusting Infeed Settings

Figure 2-18: Setting for Infeed



1. Place the saw in Semiautomatic Mode by pressing the SEMI-AUTO button on the touch screen's Main Menu.
2. Set blades 2 and 3 to 90°.

3. Press the INITIATE SETUP button.
4. Turn off power to the saw following approved lockout/tagout procedures.
5. Measure the distance from blade 2 to the infeed conveyor and from blade 3 to the infeed conveyor, as shown in the picture displayed on the touch screen.
6. Return power to the machine following approved lockout/tagout procedures.
7. Press the MAIN MENU button.
8. Turn the calibration key switch to ON.
9. Press the CALIBRATE button.
10. Press the button corresponding to the infeed conveyor the you are checking. A window displays where you can change the setting for that infeed.
11. Push the SET button and enter the actual value.
12. Repeat for the other infeed.
13. Press EXIT to return to the Calibration screen.



Adjusting the Centerline Scale and Pointer

If the measured centerline on the board is different than expected:

- Set the calibration (refer to the *Calibration Check* section for procedure).
- Adjust the pointer to the measured amount.
- Change the computer setting to the measured amount.

Calibrating the Blades

See the sections on *Checking and Adjusting the Blade Draft* (page MT-80), *Checking and Adjusting the Blade Alignment* (page MT-83), and *Checking and Adjusting the Blade Pivot Point* (page MT-86) for instructions on adjusting the saw blades to be calibrated with the rest of the saw.

Cleaning, Lubricating, and Inspecting

Cleaning and Lubricating

The saw must remain clean and lubricated to maintain its accuracy. You must clean pitch from saw blades and moving components and lubricate moving components at regular intervals. Follow the recommended preventive maintenance schedule in the *Maintenance Checklists* appendix. The recommended methods of cleaning and lubricating are:




To blow off dust, use compressed air.

To lubricate chains and sprockets, rack and pinions, spur gears, slides, castings, and Acme screws, use a kerosene and oil mixture:

10 parts kerosene: 1 part 30-weight motor oil

For the carriage V-track and the square drive shaft, use straight kerosene to avoid sawdust buildup.

Do NOT use diesel fuel.

CAUTION	
	<p>AIRBORNE PARTICLES, CHEMICALS, SLIP, AND NOISE HAZARD.</p> <p>Wear ear and eye protection for all cleaning activities. When using cleaning and lubrication solutions, wear a properly rated respirator and gloves. Clean up overspray from the floor to prevent a slip hazard.</p> <p>Do NOT spray electrical parts with lubricant or compressed air. Spraying electrical components will damage them.</p>

CAUTION
<p>Do not use compressed air inside the electrical enclosures! It may force contaminants into the electrical connections.</p>

Figure 2-19: Never Use Compressed Air Inside an Electrical Enclosure



ENVIRONMENTAL
<p>Environmental regulations vary according to location. It is the customer's responsibility to adhere to environmental regulations.</p>

Every Two (2) Hours

1. On the Semiauto screen, press the CLEANING POSITIONS button, then the INITIATE SETUP button.
2. Lockout/tagout the equipment.
3. Using a 4-ft long wand (with an L-shaped end for the blower), blow off all sawdust and wood chips that have accumulated on the saw. The *Maintenance Checklists* list specific components that are affected.
4. Lubricate all moving axes by spraying with a kerosene and oil mixture. The *Maintenance Checklists* list specific components that are affected.



Every Month

The daily cleaning that occurs using compressed air and a kerosene and oil mixture prevents extreme buildup, but some components should be cleaned by hand every month. To manually clean metal parts on this equipment, wipe the part with a rag and a light solvent. Any household cleaner containing ammonia works well. The components that should be concentrated on are listed in the *Maintenance Checklists* in Appendix D.



Inspecting

Every Day

Every day, visually examine the saw for loose components such as sprockets, gears, and bearings. Look at the condition of the blades, guards, and labels. Be aware of the general condition of the saw, and fix or replace damaged parts.



Quarterly Inspection

Every three months, perform a thorough inspection of the saw, looking for loose or missing parts including bolts, nuts, screws, and electrical connections. Look at all gears and sprockets and ensure they are clean and lubricated. Ensure that safety devices are in place and working properly, and labels are legible. Watch for loose set screws that hold the keys in gearbox sprockets. Replace or repair any damaged parts.

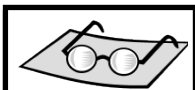


Lubricating With Grease

Proper amounts of motor oil and grease must be maintained at all times. The type of lubrication used, frequency of application, oxidation, and contamination of the lubricant affect service life and efficiency of gears and bearings. Improved performance will be obtained by following the guidelines in this manual. Lubrication guidelines are given in this chapter for each part or system that requires lubrication.

CAUTION

Never mix synthetic lubricants with mineral lubricants.



Refer to...

Figure 2-3 for
motor bearings

Figure 2-4 for all
other bearings

Bearings

Grease flange bearings by pumping two shots of grease into each grease fitting approximately once a month.

Motor bearings should be greased at least every three (3) months.

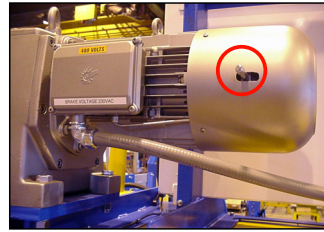
All other bearings should be monitored and greased at regular intervals according to their needs. It is recommended that they be greased at least monthly.

Motors and Gearboxes

Manually Releasing a Brake

When at rest under normal conditions, the blade brakes are on. If the blade will spin by hand, the brakes are released.

Figure 2-20: Manual Brake Lever



Electric Brakes

Some motors have a manual brake lever that will release the brake and allow you to manually move the component. See Figure 2-20.

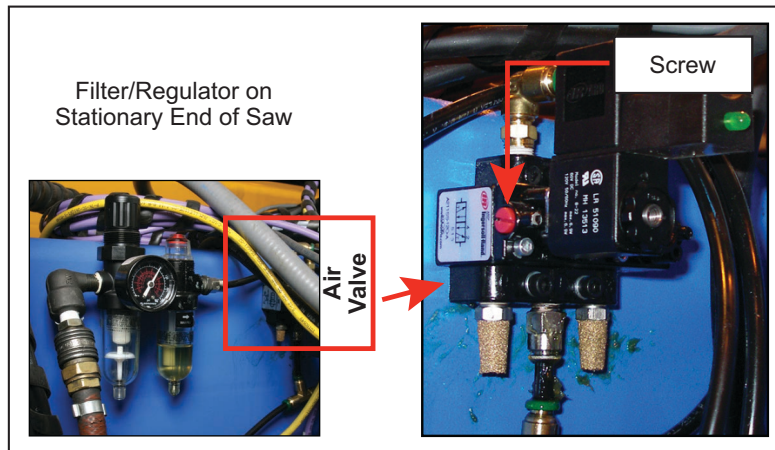
Pneumatic Brakes

Motors using pneumatic brakes do not have a manual brake lever, but you can manually release them using the correct air valve. Figure 2-21 shows the air valve for all blade brake motors. The air valve for the carriage motor is under the carriage frame near the motor.



small slotted screwdriver

Figure 2-21: Override for Blade Brakes



To release the pneumatic brakes manually:

1. Using a small slotted screwdriver, turn the screw head shown in Figure 2-21 approximately 1/4 turn to release the brakes.
2. Perform the maintenance work.
3. Return the valve to its original position.

Cleaning Motors



Remove motor guards every week to clean and lubricate the motors, gearbox assemblies, chains, and sprockets that are under the guards.

DANGER	
	<p>CRUSH AND CUT HAZARD</p> <p>Guards must always be in place during operation to avoid serious injury and possibly death.</p> <p>Always replace guards after maintenance is complete and before removing the lockout/tagout device.</p>

Lubricating Motors



grease gun

Dow Corning 44 medium grease



Older blade motors do not have grease fittings. These instructions apply only if your blade motors have grease fittings on them.

Lubricate saw blade motors every 90 days to prevent motor damage, which can occur from excessive temperatures due to contaminated grease. Use the grease fitting supplied to administer the grease.

1. Locate both grease fittings on a saw blade motor.
2. Add the recommended amount of Dow Corning 44 medium consistency grease to the motor. See Table 2-1 for quantity specifications.

Table 2-1: Recommended Grease Replenishment Quantities

Bearing Number	Saw Quadrant	Amount of Grease (fl oz)
6206	1-4	0.2
6208	5-6	0.4

CAUTION

Failure to use the specified type and amount of grease can cause motor failure. Take care when lubricating the motors.

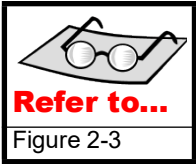
3. Grease all of the blade motors at their fittings.
4. Ensure that all personnel are clear and restore power to the saw.

5. Run the motor for 15 to 30 minutes to allow purging of any excess grease.
6. Return motor to normal service.



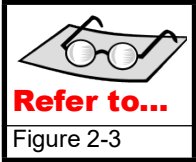
It is the responsibility of saw owners and operators to choose cleaning and lubrication solutions that comply with all local, state, and federal regulations, especially, environmental regulations. In the event kerosene and oil mixtures are prohibited, select a cleaning and lubrication solution that will remove pitch and protect against rust and corrosion.

Greasing All Other Motors



Most motors on the saw are sealed and do not need to be greased. Figure 2-3 on page MT-41 shows which motors require grease.

Adding and Changing Oil in Gearboxes



When additional oil is needed, use an oil recommended in Table 2-2 or a comparable type.

Table 2-2: Recommended Motor Oils

Ambient Temperature	-30° to 15°F	16° to 50°F	51° to 110°F	111° to 165°F
Max. Operating Temp.	150°F	185°F	200°F	200°F
Viscosity @ 100°F, SUS	—	1,919 to 2,346	2,837 to 3,467	4,171 to 5,098
ISO Viscosity Grade	320	460	680	1000
Compounded with:	3% to 10% fatty or synthetic fatty oils or mild EP additives			
AGMA Lubricant No.	—	#7 Comp.	#8 Comp.	#8A Comp
Recommended Types	Mobil Oil Corp.	SHC 629	Mobil 600W	Mobil 600W Super Mobil Extra Hecla
	Shell Oil Corp.	Omala 68	Omala 460	Omala 680 Omala 800
	Sun Oil Corp.	Sunep 1050	Sunep 1110	Sunep 1150 Sunoco Gear Oil 8 AC
	Texaco, Inc.	Meropa 68	Vanguard Cyl. Oil 460	Honor Cyl. Oil 680 650T Cyl. Oil 1000
	Chevron	NL Gear Comp. 100	NL Gear Comp. 460	NL Gear Comp. 680 NL Gear Comp. 1500

Adding Oil

Some motors are sealed, but others are not and require the oil to be replenished occasionally. Check the oil level in these gearboxes every month and add oil when necessary. Figure 2-3 on page MT-41 shows which motors require oil.

Replacing Oil

Once a year, follow these steps to drain and refill the oil in unsealed gearboxes:



1. Remove the gearbox from the motor and the bracket holding it to the saw frame.
2. Remove the drain plug and drain the oil into an approved container.
3. Replace the drain plug and open the fill plug on top of the gearbox.
4. Fill until the oil seeps out of the vent plug on the side of the gearbox.
5. Replace square head vent plug on the side of the gear reducer housing.
6. Replace the vent plug.

ENVIRONMENTAL
Please recycle used oil.

Replacing Motors

Read Before Replacing a Saw Blade Motor


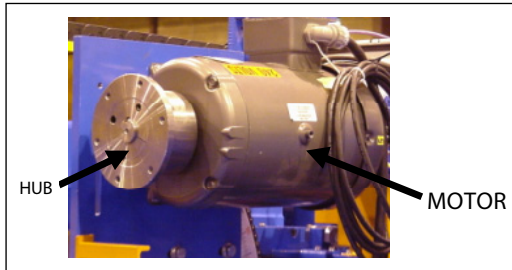
DANGER	
	<p>The motor assembly, which consists of the motor and hub, is not serviceable by customers. Only MiTek personnel shall make adjustments to the hub on the motor shaft. If service is required, remove the entire motor and call MiTek Customer Service to arrange for service. Failure to follow this restriction may result in blades coming loose from the motor shaft, which can result in severe injury, including death.</p>

Figure 2-22: Blade Motor and Hub



Removing Motors




If you are replacing a Baldor motor with an Emerson (US) motor, additional steps will need to be taken. Request Service Bulletin 155 for these instructions.

The following steps list the basic procedure for replacing any motor on the *Cyber A/T* saw:

1. Place the saw in the Semiauto Mode by pressing the SEMI-AUTO button on the touch screen's Main Menu.
2. Press the CLEANING POSITIONS button.
3. Press the INITIATE SETUP button.





4. Lockout/tagout.

WARNING	
	<p>CUTTING HAZARD.</p> <p>Lockout/tagout before removing any motor.</p> <p>Before removing a blade motor, remove the blade. Never separate the saw blade hub and motor. Only MiTek personnel are trained to re-assemble the hub with a motor.</p> <p>Before removing an angulation motor, lock the quad in place.</p>

5. Disconnect appropriate components and lines per Table 2-3:

Table 2-3: Disconnecting Each Motor

If...	See Warning	Then...
Blade motor		<p>Remove blade. Disconnect air supply.</p> <p>Remove hub and motor assembly and send to MiTek to assemble new motor with hub.</p> <p>Align the brakes after new motor is in place.</p>
Carriage motor		<p>Disconnect coupler. You will need to remove the plug to view if the coupler is properly seated in the gear reducer when re-assembling.</p>
Hold-down motor		<p>There may be a coupler to disconnect.</p>
Angulation motor		<p>Lock quad in place with a 1/2"-13 set screw.</p> <p>Disconnect two output shafts from the gear reducer.</p>
Centerline motor		<p>Disconnect coupler.</p>

6. Disconnect wiring from the motor.


CAUTION
<p>Motor is heavy. Use proper lifting techniques to avoid back strain.</p>

7. Remove the bolts attaching the motor to the motor plate and remove the motor.

Installing a New Motor



Hold-down and lumber stop motors have high- and low-voltage wiring options. Ensure it's wired for low voltage.

DANGER	
	<p>Do not attempt to replace a blade motor. MiTek must re-attach blade motor to hub at MiTek's facility. If the motor and hub are incorrectly serviced, severe injury or death may occur.</p>

1. Place the motor on the mounting plate and re-install the mounting bolts.
2. Reconnect the wiring.
3. Reconnect all components that were removed per Table 2-3.
4. Start the motor and check the motor rotation (verify that the component is moving in the correct direction).
 - Saw blades should rotate toward the operator.
 - All other components should move in the direction of the arrow that you are pressing on the touch screen (in Manual Mode).
5. If the motor rotation is incorrect:
 - a) Reverse any two wires at the motor.
 - b) Recheck the direction.
6. If replacing a blade motor, continue to the *Additional Steps for Installing a Blade Motor* section. For all other motors, remove the lockout/tagout devices, and restore the air supply.
7. Make test cuts to verify current calibration of the component affected. Refer to the instructions to correct any calibration problems that may occur.



Additional Steps for Installing a Blade Motor

Read the DANGER message on page MT-66 before proceeding.

1. Check the brake stopping time. Follow the procedure in the *Safety Test* procedure on page MT-12. See page MT-28 for the Spanish translation.
2. Install the saw blade as directed in the *Saw Blades* section.
3. Make test cuts to verify current calibration of the saw head. Refer to the instructions to correct any calibration problems that may occur.

Changing the Rotation of a Motor



All motors are 3-phase motors. If a motor is rotating in the wrong direction, swap two (2) of the 3-phase wires and retest.

Chains

Lubricating Chains

Lubricate the chains with a kerosene and oil mixture (10 parts kerosene: 1 part 30-weight motor oil). Spray the mixture directly onto the chain.

- Lubricate angle chains every 2 hours.
- Lubricate all other chains a minimum of once a week.

Checking and Adjusting Chain Tension

Tension Requirements

The various chains on the equipment have different tension requirements.

- Hold-down chain: Center of chain should just barely touch bottom of channel. There should be no visible sag, but just tight enough to barely touch.
- Infeed chain: Chain should have about 3-4 in. of slack when lifted at the middle of the conveyor.
- Drive chain (connects motor to square drive shaft): Chain should be snug, but slightly move when pushed between the drive shafts.
- Angulation chain: When blade is in its horizontal position, chain should have approximately 1/4 in. of side-to-side movement but can not be pulled away from sprockets.
- Encoders: Centerline encoder chain should be straight and snug. Angulation encoder should have slight movement at the center of the chain.

Checking Tension

Check all the chain tensions approximately once per month. Slack in a chain can cause the saw to fall out of calibration. A chain that is too tight can cause premature motor failure.



1. Adjust the component so you can reach the chain at about the midpoint of its span.
2. Turn off all power to the saw following approved lockout/tagout procedures.

- Grab the chain in the middle of the open span and determine if the tension is correct per the guidelines in *Tension Requirements* on page MT-69.

Adjusting the Tension for Chains With a Take-Up Bracket

If the chain has too much or too little slack, adjust using these steps. Refer to Figure 2-23 to see the angulation chain.

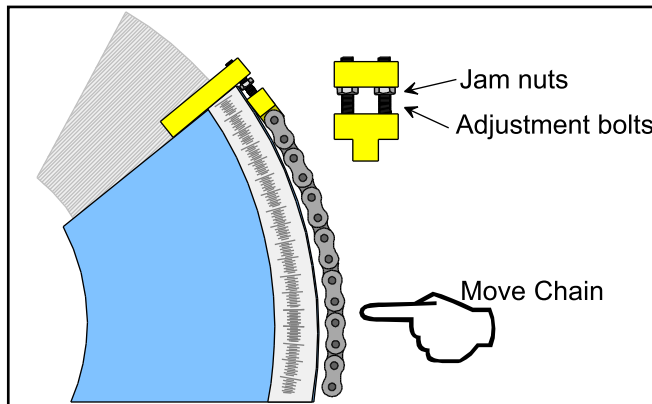
CAUTION

Do not remove links to adjust the chain tension!



- Loosen the jam nut(s).
- Tighten the adjustment bolt(s) evenly until the chain meets the guidelines in *Tension Requirements* on page MT-69.
- Tighten the jam nut(s).

Figure 2-23: Adjusting the Tension on the Angulation Chain



Adjusting the Tension for Encoder Chains

Encoders are held in place with a mounting bracket that has slotted holes. To adjust the encoder chain tension, loosen the bolts in the slotted holes and move the mounting bracket to increase or decrease the chain tension so the tension conforms to the guidelines in *Tension Requirements* on page MT-69.

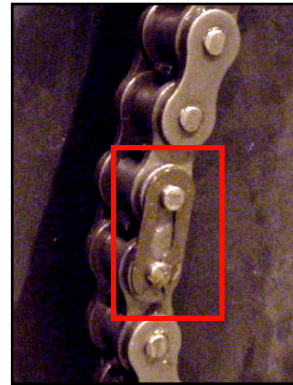
Replacing a Chain

When replacing a chain, pay careful attention to how the chain is threaded before removing it.

1. Position the chain so the master link is clear of the sprockets so it can easily be reached. A typical master link is shown in Figure 2-24.
2. Lockout/tagout the machine at the stationary-end disconnect switch.
3. Loosen the tension on the chain.
4. Remove the master link on the chain by pulling out the two (2) pins using pliers. The chain will come apart and can be removed from the sprockets.
5. Thread the new chain around the sprockets.
6. Connect the chain to itself by placing the master link between two links and pressing together with pliers.
7. Adjust the tension. Refer to *Tension Requirements* for the tension of each chain.
8. Replace any guards that were removed.




Figure 2-24: Master Link on a Chain



Air Brakes for Saw Blades

Inspecting Air Brakes

- As you run and stop each blade, watch to determine if all blades are stopping correctly.

DANGER	
	<p>CUT HAZARD!</p> <p>The blade must stop in under 6 seconds. If they do not stop in the recommended time, severe injury or death may occur.</p>



- Lockout/tagout the machine at the stationary-end disconnect switch.
- Inspect the saw blade brake lining:
 - Turn each blade by hand and visually check:
 - That the brake lining is not rubbing the blade hub.
 - That the air gap is adequate and adjust if necessary (using the *Aligning Air Brakes* procedure on page MT-73).
 - That there is no drag causing the motor to work harder than it should.
 - Check that the brake lining is not pulling away from the metal.
- Remove the inlet line to each brake air cylinder and add two drops of oil.
- If the breaks are in good condition but do not stop in under 6 seconds, adjust the brakes using the *Aligning Air Brakes* procedure on page MT-73.

Aligning Air Brakes

Aligning the brakes adjusts the gap between the brake shoes (pads) and hub. They should be as close as possible without rubbing. As the brake

Adjust the brakes to get the brake pads as close to the hub as possible without letting them rub. The adjustment screws hold the shoes close to the hub. As the brake pads wear, it may become necessary to adjust the brakes.

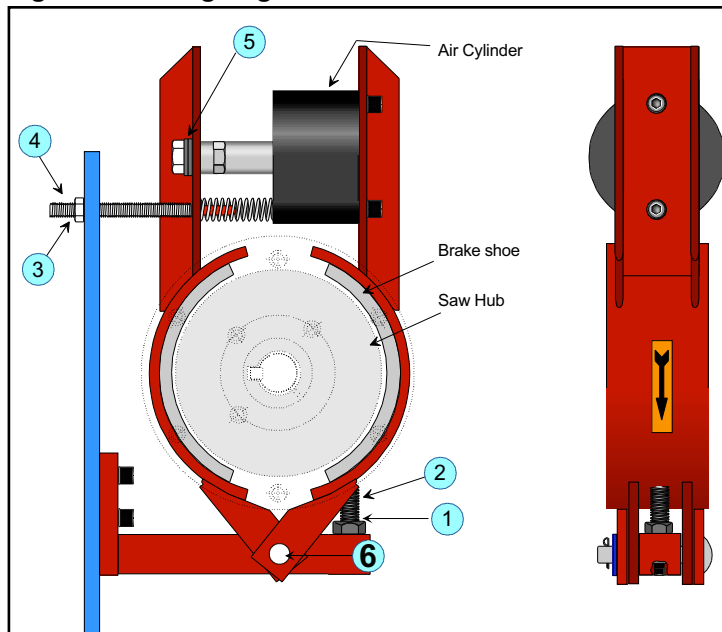
All brakes are adjusted in the same basic manner, even though configuration differs from front to rear saws. All brakes have two halves that are adjusted independently of each other. If only a small adjustment is needed, adjusting one half may be adequate. When the brakes are adjusted correctly, the brake should stop in under 6 seconds. If aligning the brakes do not solved the problem, replace the brake pads.

The procedure below is for blade 1, but the procedure applies to all saw heads.



1. Disconnect the air supply at the rear of the machine.
2. Remove the saw blade. It is helpful for the brakes to be locked on when doing so.
3. Manually override the brakes (see *Manually Releasing a Brake* on page MT-62) or disconnect the air lines to release the saw blade brakes.

Figure 2-25: Aligning Air Brakes

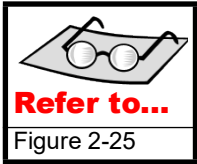


4. Loosen the jam nuts (labeled 1 and 3).
5. Turn in the adjustment bolts (labeled 2 and 4) until the pads touch the hub, then back off the bolt a full turn.
6. Visually verify that the clearance is just enough for hub to spin freely.
7. Tighten the jam nuts (labeled 1 and 3).
8. Make sure the spherical washers (labeled 5) are snug. If loose, the washers will vibrate and create excessive noise.
9. Spin the saw hub by hand to make sure it still rotates freely. If the hub binds on the shoes, back out the adjusting screw until the hub rotates freely.
10. Remove the brake override or reconnect the air lines.
11. Reconnect power to the saw and start the motor without the blade.
12. Test the stopping time before reattaching the saw blades. Follow the procedure in the *Safety Test* section on page MT-12. See page MT-28 for the Spanish translation.
13. Lockout/tagout power before reattaching the blades.
14. Reattach the saw blades.



Replacing Brake Pads

The brake lining, or brake pads, should be replaced when the blade stopping time exceeds 6 seconds and adjusting the brakes doesn't solve the problem. Even if the blade stopping time is within 6 seconds, replace the brake lining if the pad or hub has grooves worn in it.



1. Remove the air lines from the pneumatic assembly on the stationary end.
2. Remove the screw in the air cylinder shaft (labeled 5) in Figure 2-25.
 - a) Hold the shaft with a wrench to prevent it from turning.
 - b) Turn the screw (labeled 6) and remove it from the shaft.
3. Loosen the jam nuts and adjustment screws (labeled 1, 2, 3, 4)
4. Loosen the set screw under the pin (labeled 6).
5. Remove the cotter pin and remove the pin (labeled 6).
6. Remove the right shoe first. The air cylinder will come with it.
7. Remove the left shoe next, being careful not to lose the spring.
8. Install the new left shoe and then the new right shoe by reversing the disassembly steps.
9. Align the brakes by completing the relevant steps in the *Aligning Air Brakes* section on page MT-73.
10. Reconnect air and power to the saw.
11. Test the stopping time before reattaching the saw blades. Follow the procedure in the *Safety Test* section on page MT-12. See page MT-28 for the Spanish translation.
12. Lockout/tagout power before reattaching the blades.
13. Reattach the saw blades.



Saw Blades


Inspecting Saw Blades

Follow the procedure in the *Safety Test* procedure on page MT-12 to keep the saw blades working safely. See page MT-28 for the Spanish translation.

Replacing Saw Blades

When to Replace Blades

Sharp, high-quality blades are essential for proper saw operation.

CAUTION	
	<p>Keep saw blades sharp and in good condition. Have the saw blade re-tipped if carbide tips become chipped or come off.</p> <p>Dull blades cause high kickback forces, which can cause injury.</p> <p>Motor life and quality of cut also diminish due to dull blades.</p>



Individual plant circumstances including wood, quality of blades, and actual working hours may require modification of this schedule.

The frequency of blade changes and of repairs depend on the amount of use and the species and grade of lumber that is cut. Certain blades will wear faster than others because of their location to the incoming lumber. Table 2-4 gives minimum recommendations for when to replace the blade on each quad, but you may find your plant needs to change the blades more often for optimum saw operation.

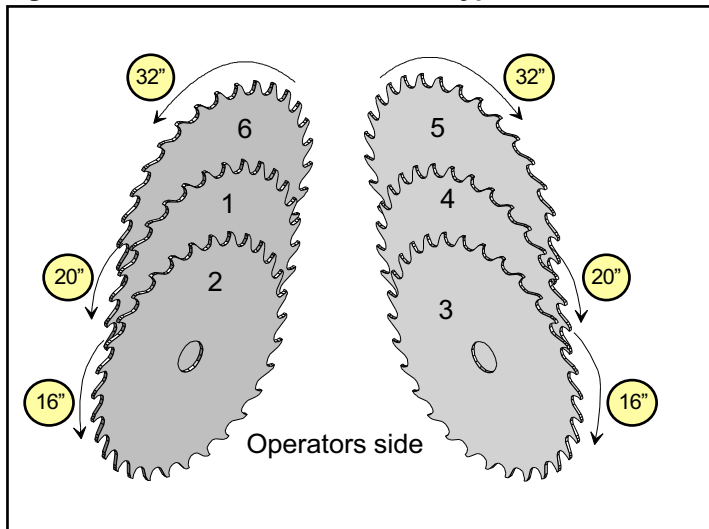
Table 2-4: Recommended Minimum Schedule for Replacing Blades

	40-Hour Work Week	80-Hour Work Week
Every 2 weeks	—	Blades 1-4
Every month	Blades 1-4	Blades 5-6
Every 2 months	Blades 5-6	—

Correct Direction of Blade Teeth

Correct tooth direction is achieved when the tooth at the top of the blade looking from the operator's side of the machine is facing the operator. The location and recommended size of each saw blade is shown in Figure 2-26. Notice the direction of the teeth in relation to the operator's side.

Figure 2-26: Blade Orientation and Typical Size



How to Replace a Saw Blade


CAUTION	
	<p>CUT HAZARD. Saw blades are sharp. Wear gloves when handling blades.</p>



Some blades are covered with a wax coating over the teeth to make them easier to handle and to protect the teeth from breakage during shipping. Remove this coating before starting the blade.

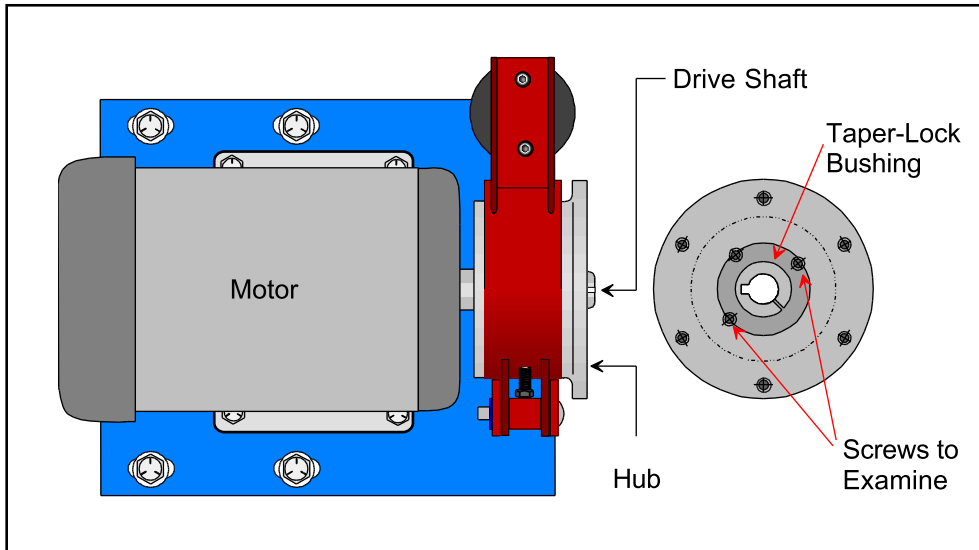
1. Turn off all power to the saw following approved lockout/tagout procedures, but leave the air on so the brakes will hold the hub in place.
2. Using an Allen wrench, remove the screws that attach the blade to the hub.
3. Remove the blade and install a new blade, ensuring the teeth are facing the correct direction, as illustrated in Figure 2-26.
4. Replace the screws.
5. Using a torque wrench fitted with an Allen bit, tighten the screws to a torque between 18 to 20 ft-lb.

Adjusting the Saw Blade Taper-Lock Bushing Screws

DANGER	
	<p>Do not attempt to perform any maintenance that requires the removal or repositioning of the hub from the motor shaft, e.g., replacement of a damaged or worn hub, motor shaft, or motor. This activity must be performed at MiTek's factory to eliminate any risk of the hub and blade coming off the motor shaft during operation due to improper installation. Even with proper installation, the tightness of the screws must be checked regularly. See the <i>Adjusting the Saw Blade Taper-Lock Bushing Screws</i> section.</p>

The drive shaft on each blade motor holds a saw hub. They are attached to each other with a taper-lock bushing in the center of the saw hub. The saw blades are then attached to the saw hub face. See Figure 2-27 for clarification.

Figure 2-27: Taper-Lock Bushing Screws



Checking the Tightness

In order to ensure a safe operating environment, MiTek recommends that you check the tightness of all taper-lock bushings on a monthly basis and whenever a saw blade is changed. Use the recommended torque settings in Table 2-5.

Table 2-5: Recommended Bushing Tightness

Quad on Saw	Bushing ID	in-lbs		ft-lbs	
		Min.	Max.	Min.	Max.
1-4	1215	175	193	14.6	16

Table 2-5: Recommended Bushing Tightness

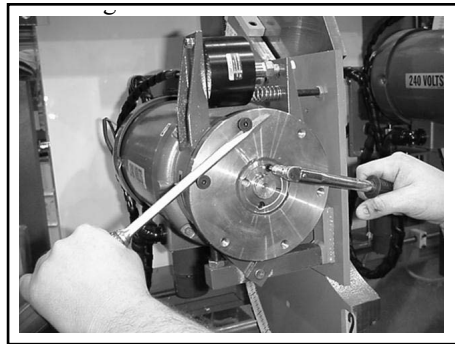
Quad on Saw	Bushing ID	in-lbs		ft-lbs	
		Min.	Max.	Min.	Max.
5-6	2517	430	473	35.8	39.4

Tightening the Hub to the Motor



1. Set a torque wrench to the appropriate minimum and maximum settings as shown in the table above.

Figure 2-28: Tighten Hub Screws



2. To hold the hub in position, fasten two (2) cap screws to the saw hub. They should be the same size as, but not the same ones used on, the saw blade.
3. Position a large screwdriver between the two (2) cap screws, as shown in Figure 2-28.
4. Hold the hub in place with the screwdriver while tightening the taper lock bushing with the torque wrench set to the appropriate settings.

Adjusting the Angulation

It is important to keep the angulation chain tightened properly. Slack in the chain can cause the angulation of the saw to fall out of calibration. A chain that is too tight can cause premature angulation motor failure. Tension guidelines and adjustment procedures are given in the *Checking and Adjusting Chain Tension* section starting on page MT-69.

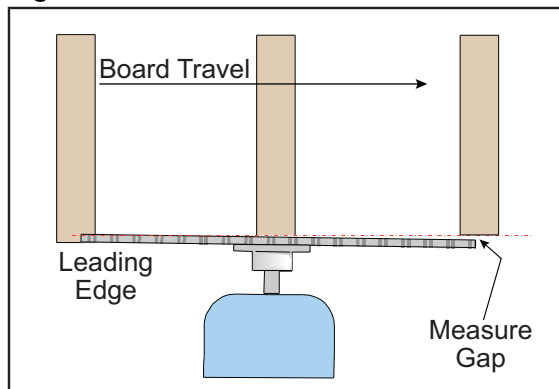
Blade Adjustments

Checking and Adjusting the Blade Draft

Blade draft refers to the correct angle of a saw blade so that the leading edge of the blade contacts the lumber and the trailing edge does not. An accurate blade draft prevents splintering of the lumber. Figure 2-29 illustrates proper blade draft.

The angle should be very slight and is set by MiTek during manufacturing. Small adjustments may be necessary after certain maintenance is performed.

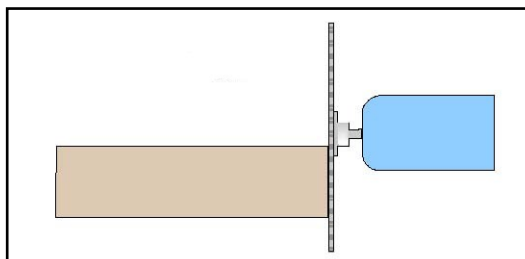
Figure 2-29: Overhead View of Blade Draft



Checking the Blade Draft at 90°

1. Place the saw in the Semiautomatic Mode by pressing the SEMI-AUTO button on the touch screen's Main Menu.
2. Enter 90° for all blade angles.

Figure 2-30: Checking Blade Draft With Blades at 90°



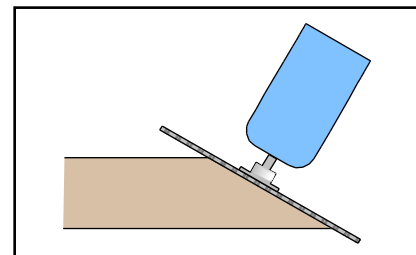
3. Enter 1-3/4 for all the blade centerlines.
4. Enter the board length.

5. Press the INITIATE SETUP button.
6. Press the START button to start the blades.
7. Using the infeed conveyor FORWARD jog button, cut the board.
8. Press STOP to stop the blades.
9. Using the infeed conveyor FORWARD jog button, move the board to the trailing side of the blade.
10. Measure the distance between the board and the blade. It must measure between 1/32 and 3/32 in.
11. Repeat the check for each blade.
12. Continue to the *Checking the Blade Draft at 30°* section.

Checking the Blade Draft at 30°

1. Place the saw in the Semiautomatic Mode by pressing the SEMI-AUTO button on the touch screen's Main Menu.
2. Set all the blades to 30°.
3. Press the INITIATE SETUP button.
4. Press the START button to start the blades.
5. Using the infeed conveyor FORWARD jog button, cut the board.
6. Press STOP to stop the blades.
7. Using the infeed conveyor FORWARD jog button, move the board to the trailing side of the blade.
8. Measure the distance between the board and the blade. It must measure between 1/32 and 3/32 in.
9. Repeat the check for each blade.
10. If the blade draft needs to be adjusted refer to *Checking and Adjusting the Blade Draft* for the procedure.

Figure 2-31: Checking Blade Draft With Blades at 30°



Adjusting the Blade Draft

After checking the blade draft, if an adjustment is required, follow these steps and refer to Figure 2-32.

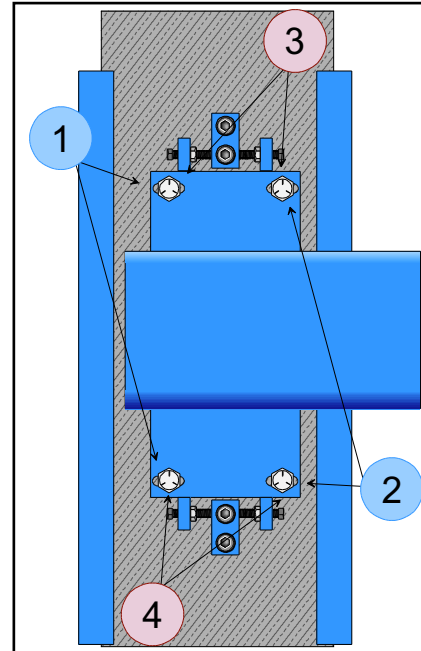


1. To increase draft in the 90° position add shims to the back (labeled 2).
2. To decrease draft in the 90° position add shims to the front (labeled 1).
3. To increase draft at the 30° position for blades 2,3,5, and 6, add shims to the top (labeled 3).
4. To increase draft at the 30° position for blades 1 and 4, add shims to the bottom (labeled 4).



If using more than 3/16 in. of shim material, use longer mounting bolts.

Figure 2-32: Locations of Shims





Do not adjust the blade alignment until you have checked that the blades are not bent and the draft is set properly.

Checking and Adjusting the Blade Alignment

Blade alignment is how well the blades line up with each other. When blades are aligned properly and in home position, the next blade in line should touch the board but not cut more than 1/64 in. off the board.

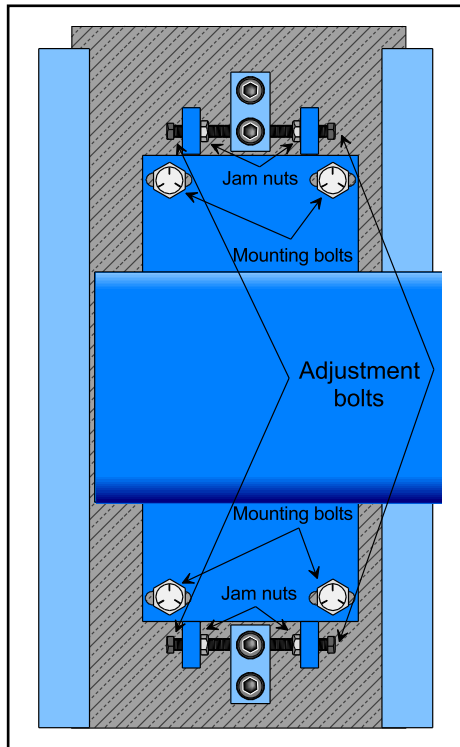
Checking Blade Alignment

1. Check that the blades are not warped.
2. Check the blade draft. See *Checking and Adjusting the Blade Draft*.
3. Place the saw in the Semiautomatic Mode by pressing the SEMI-AUTO button on the touch screen's Main Menu.
4. Enter 90° for all blade angles.
5. Enter 1.750 for all the blade centerlines when using a 2x4.
6. Enter the board length.
7. Press the INITIATE SETUP button.
8. Press the START button to start the blades.
9. Using the infeed conveyor FORWARD jog button, cut the board with blade 3.
10. Continue to move the board toward blade 4, and begin to cut it, but do not go all the way through the board.
11. Press the STOP button to stop the blades.
12. Using the infeed conveyor REVERSE jog button, back the board out of the saw. A properly aligned blade just barely graze the end of the board when backing it out. It should cut off less than 1/64 in.
13. Repeat to check blade 5.
14. Repeat for the stationary end of the saw, using blades 1, 2, and 6.
15. If any blade is out of alignment, make the necessary adjustments as described in this section.

Adjusting the Blade Alignment for Blades 1-4

Follow this procedure and refer to Figure 2-33 to adjust the alignment of blades 1 through 4.

Figure 2-33: Blade Alignment for Blades 1-4



1. Loosen all jam nuts and mounting bolts.

CAUTION

Be careful not to lose any shim material behind the mounting bolts. This material is used for blade draft.

2. To have the blade touch the board more, tighten the bolts away from the motor. Adjust the bolts evenly on the top and bottom.
3. To have the blade touch the board less, tighten the bolts closest to the motor. Adjust the bolts evenly on the top and bottom.
4. Tighten all the jam nuts.
5. Tighten the mounting bolts using 75 ft-lb of torque.
6. Recheck the alignment.

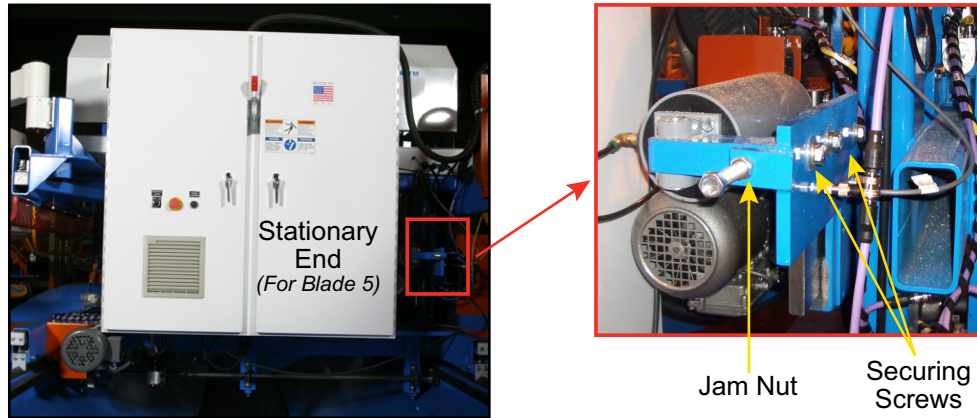


One turn on the adjuster equals 1/16 in. movement in the plate.

Adjusting the Blade Alignment for Blades 5 and 6

Follow this procedure and refer to Figure 2-34 to adjust the alignment of blade 5 and blade 6.

Figure 2-34: Adjusting Blade Alignment for Blade 5

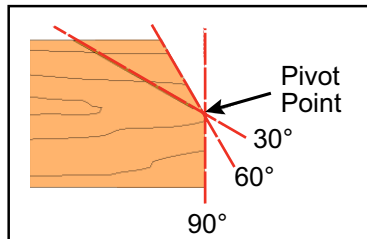


1. Loosen the securing screws and jam nuts.
2. Adjust the adjustment screw located at the jam nuts to move the blade either in or out.
3. Tighten the jam nuts and the securing screws.
4. Recheck the alignment.

Checking and Adjusting the Blade Pivot Point

The pivot point is the point on the lumber where the blade pivots.

Figure 2-35: Blade Pivot Point



Checking Blade Pivot Point

Summary

Make a 90° cut, a 60° cut, and a 30° cut. On the first two cuts, cut all the way through the board. On the third cut, cut only halfway through the board. Make sure the board stays in place under the hold-downs and on the lumber guide as you back it away from the blades.

Procedure

1. Place the saw in the Semiautomatic Mode by pressing the SEMI-AUTO button on the touch screen's Main Menu.
2. Enter 30° for all blade angles.
3. Enter 1-3/4 for all the blade centerlines.
4. Enter the board length.
5. Move the blades not being used out of the cut.
6. Press the INITIATE SETUP button.
7. Press the START button to start the blades.
8. Use the infeed conveyor FORWARD jog button to cut the board.
9. Press STOP to stop the blades.
10. Use the REVERSE jog button to back the board out far enough to clear the blade, but do not move it past the end of the hold-downs or lumber guide.
11. Set the angle to 60°, and repeat steps 6-10.
12. Set the angle to 90° and take the following steps:
 - a) Press the INITIATE SETUP button.

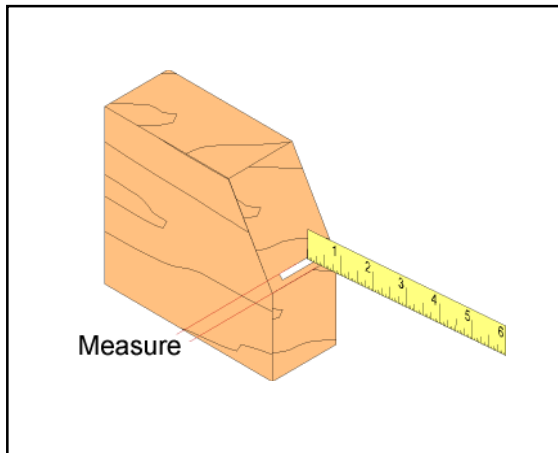
- b) Using the infeed conveyor FORWARD jog button, move the board so that the blade cuts halfway through the board.
 - c) Press STOP to stop the blades.
 - d) Using the REVERSE jog button, move the board out of the machine.
13. All three cuts should intersect at one place. If not, refer to *Checking and Adjusting the Blade Pivot Point* for the procedure.

Adjusting the Blade Pivot Point

Procedure

1. Measure the distance from the inside of the 60° cut to the edge of the board, as shown in Figure 2-36.

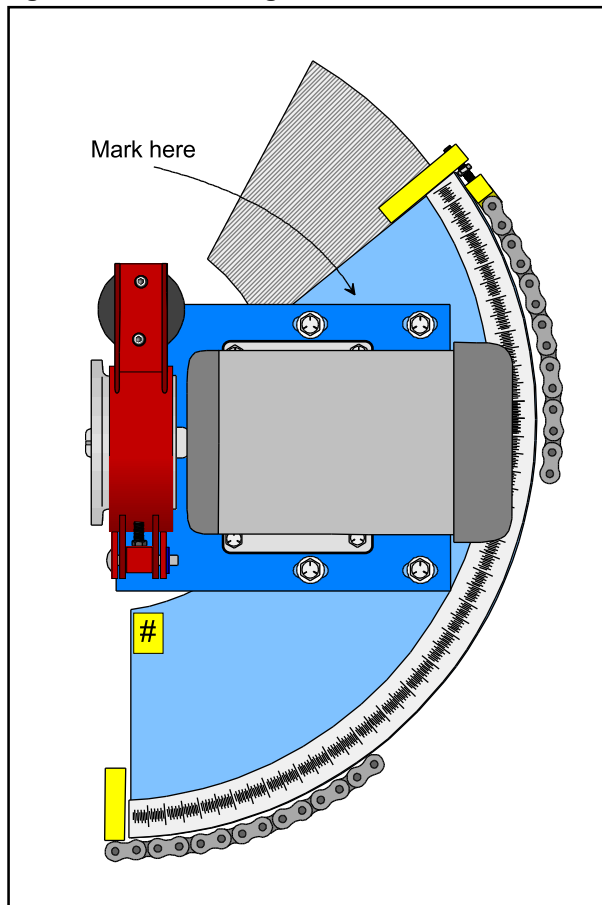
Figure 2-36: Measuring the Pivot Point Discrepancy



2. Multiply this measurement by two (2).
3. Lockout/tagout.

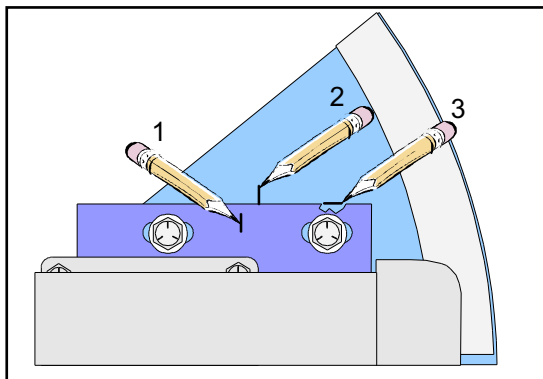


Figure 2-37: Mounting Plate on the Slide



4. Mark the mounting plate for height.
5. Mark the mounting plate for depth (mark 1 on Figure 2-38).

Figure 2-38: Marking the Mounting Plate



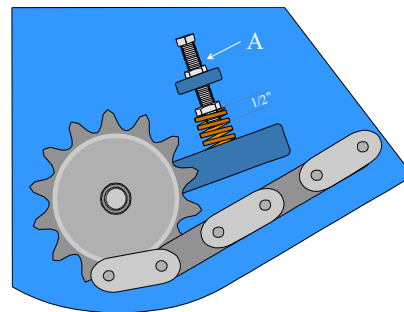
6. Make a second line for the amount needed to move the head (mark 1 on Figure 2-38).
7. Mark along the top of the motor mount as a reference point for alignment (mark 1 on Figure 2-38).
8. Loosen the mounting bolts.
9. Move the plate back to the measured distance from Mark 1 to Mark 2.
10. Ensure the reference line (Mark 3):
 - a) Is perpendicular to the plate
 - b) Is at the same height as the motor mount plate
11. Tighten the mounting bolts and torque to 75 ft-lb.
12. Recheck the pivot point.

Infeed Conveyors

Adjusting the Infeed Conveyor Chain Tension

The infeed conveyor chain should have enough slack so that you can gently pull up on the chain and see approximately 1 chain link distance of slack. Tension guidelines are given on page MT-69.

Figure 2-39: Infeed Conveyor Chain Tension Assembly



Adjust as follows:

1. Adjust the bolt (labeled A in Figure 2-39) so it is halfway through the spring.
 - a) Loosen the top jam nut.
 - b) Loosen the bottom jam nut until the bolt is halfway through the spring.
2. Tighten the top jam nut.
3. Tighten the bottom jam nut to add tension to the chain.



Aligning the Infeed Conveyors With the Blades

Checking the Infeed Conveyor Alignment

1. Place the saw in the Semiautomatic Mode by pressing the SEMI-AUTO button on the touch screen's Main Menu.
2. Enter 90° for all blade angles.
3. Place a board on the conveyor so that it will not touch the blades as it passes them.
4. Use the infeed conveyor FORWARD jog button to move the board until it is under the hold-down and on the lumber guide.
5. Mark the board on both sides of the flight on both sides of the machine.
6. Move the board to the exit side and stop it before it leaves the lumber guide.
7. Measure the distance between the mark and the flights.
8. If the measurement is more than 1/16 in., adjust to parallel.

Adjusting the Infeed Conveyor Alignment

Always start with the stationary-end infeed conveyor and align the carriage-end infeed conveyors immediately afterward.

1. Move the stationary-end infeed conveyor a comfortable distance away from the saw blades.
2. Lockout/tagout.
3. Choose two points within the cutting chamber of the saw and measure from the frame (under the saw blades) to the conveyor edge to determine how far out of alignment it is from front to back.
4. Loosen the bearing bolts on the front (infeed) side only, and push or pull to make it even with the saw frame.
5. Repeat this procedure for the carriage-end infeed conveyor.



Aligning the Infeed Conveyors and Hold-Downs

See *Keeping the Hold-Downs Aligned With the Infeed* on page MT-96.

Maintaining the Lumber Guide

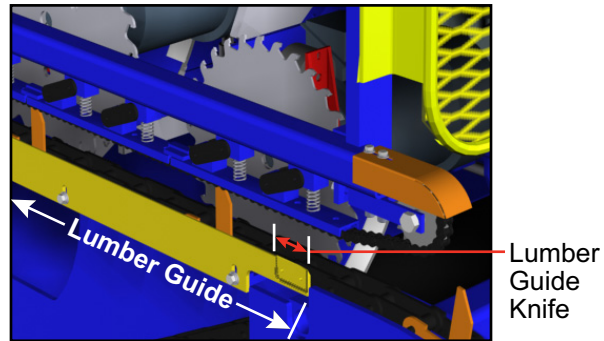


If the knife has a notch, the lumber may “jump” out of position before moving to the next blade.

Inspecting the Lumber Guide and Knife

Inspect the lumber guide weekly. Figure 2-40 shows the location of the lumber guide and lumber guide knife. Check for missing teeth at the beginning of the knife, and ensure that the top of the knife is not notched or chipped. Replace the knife if it shows signs of damage.

Figure 2-40: Location of Lumber Guide and Knife



Check that the blade edge on the lumber guide knife is the correct height. See Figure 2-41.

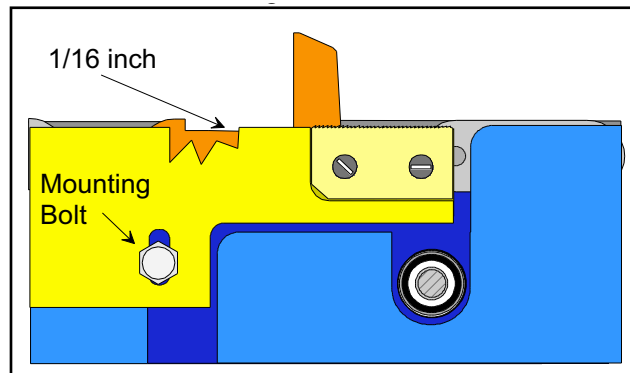
Replacing the Lumber Guide Knife

To replace the lumber guide knife, remove the two (2) bolts holding it to the lumber guide and replace the knife.

Adjusting the Lumber Guide Height

The blade edge should be set at 1/16 in. above the surface of the flight (dog) that supports the board.

Figure 2-41: Adjusting the Lumber Guide and Knife



1. Loosen the five (5) mounting bolts.

2. Use a rule to measure the height of the tracking blade.
3. Tighten the bolt and check the other end and do the same and tighten the bolt.
4. Tighten the three (3) middle bolts.

Replacing the Infeed Conveyor Sprocket

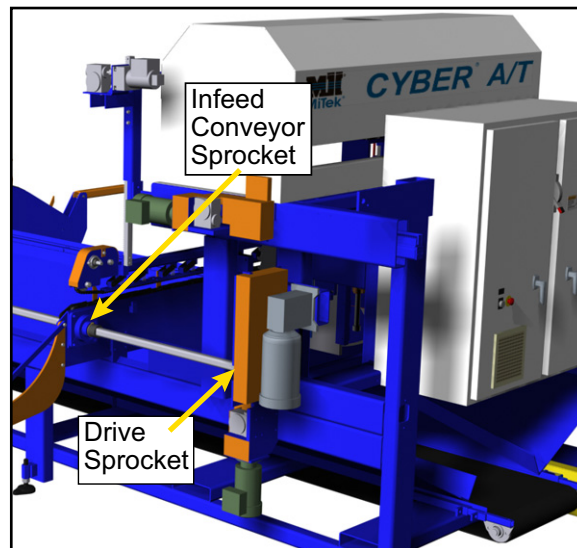
The feed chain sprockets should be replaced every three (3) years or sooner, depending on use.

Disassembly



1. Relieve the chain tension at the take-up sprocket.
2. Remove the feed chain.
3. Remove the square tube drive.
4. Remove the bolts holding the drive sprockets.
5. Remove the axle bolts holding the take-up sprocket and nose sprocket.

Figure 2-42: Stationary End, Outfeed Side



Assembly



1. Install new sprockets after coating axle bolts with Lubriplate lubricant.
2. Install the infeed chain.
3. Tension the infeed chain with the take-up sprocket.
4. Adjust the chain tension.

Adjusting the Drive Sprocket Tension

The tension should be set where the drive chain can deflect about 1 chain link when pushed between the drive sprocket and the idler sprocket.

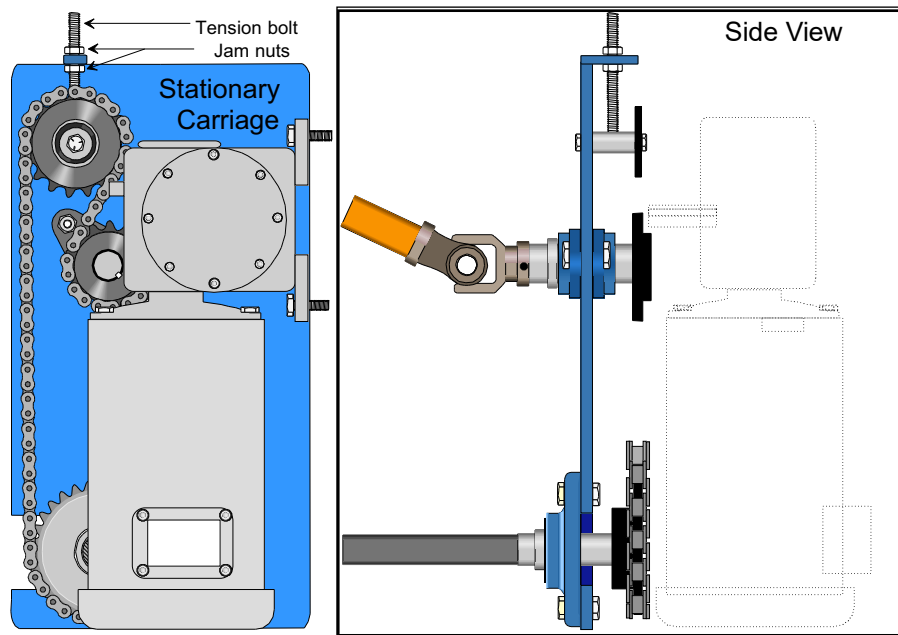


1. Loosen the idler bolt.
2. Loosen the two jam nuts on the adjuster.
3. Use the top jam nut to draw up the idler sprocket until the tension is correct.
4. Tighten the bottom jam nut.
5. Tighten the idler bolt.

Replacing the Drive Sprocket

The drive sprockets are normally replaced at three (3) year intervals. Use the following guide when replacing these sprockets.

Figure 2-43: Drive Sprocket Assembly, Front and Side View



Disassembly



1. Remove the chain from the drive clusters.
2. Loosen the setscrews from the universal joints of the hold-down drive shaft, next to the sprocket drive cluster.

3. Slide the universal joint off the shaft, being careful not to lose the key.
4. Remove the long square drive shaft.
5. Remove the main drive sprocket in the following manner:
 - a) Loosen the setscrews on the square shaft drive sprockets.
 - b) Slide the sprocket and tube out of the square bore bearings.
6. Remove the hold-down drive sprockets by removing the shaft collar tapping shaft through bearings, being careful not to lose the key from the keyway.
7. Remove the idler (top) sprocket by loosening the nut on the axle bolt and withdrawing the bolt from the cluster assembly.
8. Remove the main gearbox drive sprocket by loosening the set screws and pulling the sprocket from the motor shaft, being careful not to lose the key from the keyway.
9. Repeat this procedure for the other drive sprocket.

Assembly



1. Install the new sprocket on the main gearbox shaft, with the hub of the sprocket toward the motor. Be sure the key is in the keyway and tap the sprocket on the motor shaft until it is flush with the end of the shaft. Tighten the set screws.
2. Install the twin drive sprocket assembly at the motor drive end, through the first square bore bearing. Then, slip the shaft collar over the square tube before going through the second bearing. Slip the second square shaft collar on after going through the second bearing.
3. Install the single drive sprocket assembly at the stationary end, using the same basic procedure.
4. Install the hold-down drive sprocket next, using washer spacers to align it with the square tube sprocket below.
5. Install the idler sprocket with the axle bolt, but do not tighten.
6. Install the square tube drive shaft.
7. Align all sprockets with a straight edge and tighten all the set screws.
8. Slide universal joints onto the hold-down drive shaft with the key in the keyway and tighten the set screws.
9. Install the drive chain.

10. Tension the motor to the main drive shaft sprocket chain, using the slotted holes at the machine end of the motor mounting bracket.
11. Tension the hold-down drive chain pushing the idler (top) sprocket up in the slotted hole and tighten the axle nut.
12. Repeat this procedure for the other drive sprocket.

Inspecting and Replacing Infeed Roll Pins

If the infeed conveyors will not move horizontally or are not calibrating properly, a roll pin that attaches the spur gears to the drive shaft could be sheared. To inspect and replace the roll pin, do the following:

1. Cut the welds on the tabs at the end of the racks.
2. Disconnect the chain that turns the shaft and the infeed encoder chain, both located on the outfeed side of the saw.
3. With the spur gear disengaged from the racks, pull both racks out of the frame until they completely lose contact with both spur gears.
4. On the infeed end of the shaft, remove the pin from the locking nut and unscrew the locking nut.
5. Loosen the set screws on the infeed-side bearing.
6. On the outfeed end, unscrew the bolts holding the bearings to the frame.
7. Pull bearing and shaft assembly from the outfeed side to reach both spur gears.
8. Try to rotate each spur gear by hand.
 - If a spur gear rotates on the shaft, the roll pin is broken, and you should continue this procedure.
 - If neither spur gear rotates on the shaft, the roll pin is still in place, and you should reverse the steps to re-assemble the saw.
9. If a roll pin is broken, drive the old roll pin out of the spur gear, being careful not to let the spur gear fall.
10. Drive a new roll pin in place.
11. Examine the spur gear to ensure the teeth are in good condition. If the spur gear needs to be replaced, now is the ideal time.
12. Reverse these steps to re-assemble the parts.
13. Weld the tabs back on the end of the racks.

Hold-Downs



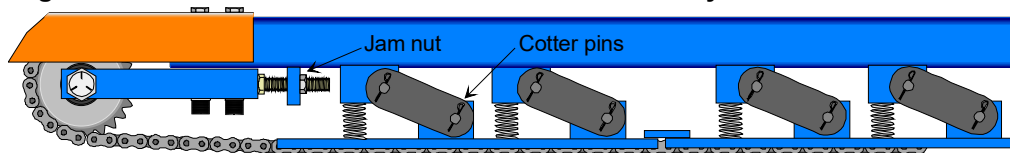
The hold-down chains must be the proper length of 207-1/4 in. Chains that are too long could result in improper tension on the shoes and loose springs.

Adjusting the Hold-Down Chain Tension

Refer to the *Tension Requirements* section on page MT-69 for the correct tension guidelines. If the tension is incorrect, see Figure 2-44 and perform these steps to adjust the tension:

1. Loosen the jam nut on the tension bolt.
2. Adjust the tension bolt on the hold-down until the chain tension loosens or tightens the desired amount.
3. Tighten the jam nut.

Figure 2-44: Hold-Down Shoes on Hold-Down Assembly



Keeping the Hold-Downs Aligned With the Infeed

Checking the Hold-Down Alignment

1. Place the saw in the Semiautomatic Mode by pressing the SEMI-AUTO button on the touch screen's Main Menu.
2. Enter 90° for all blade angles.
3. Place a board on the conveyor so that it will not touch the blades as it passes them.
4. Use the infeed conveyor FORWARD jog button to move the board until it is under the hold-down and on the lumber guide.
5. Press an E-stop.
6. Mark the board on both sides of the flight on both sides of the machine.
7. Move the board to the exit side and stop it before it leaves the lumber guide.
8. Measure the distance between the mark and the flights.
9. If the measurement is more than 1/16 in., continue with this procedure.

Adjusting the Hold-Down Alignment

1. Move the stationary-end infeed conveyor and hold-down a comfortable distance away from the saw blades.
2. Lockout/tagout the machine at the stationary-end disconnect switch.
3. Loosen the bearing bolts on the front (infeed) side only and push or pull to make it perfectly aligned above the infeed conveyor.
4. Repeat this procedure for the carriage-end hold-down.



Replacing Hold-Down Shoes

Disassembly

1. Place the saw in the Semiautomatic Mode by pressing the SEMI-AUTO button on the touch screen's Main Menu.
2. Use the infeed conveyor FORWARD jog button to move the chain connection link near the front sprocket.
3. Lockout/tagout the machine at the stationary-end disconnect switch.
4. Relieve chain tension by loosening the jam nut shown in Figure 2-44.
5. Remove the cotter pins in the chain links in the shoe that needs replacement and remove the link.



Assembly

1. Install the new shoe using the original links and cotter pins.
2. Tension the chain with front sprocket adjustment until the chain has the correct amount of tension as described in the *Tension Requirements* section on page MT-69.



Replacing Hold-Down Sprockets

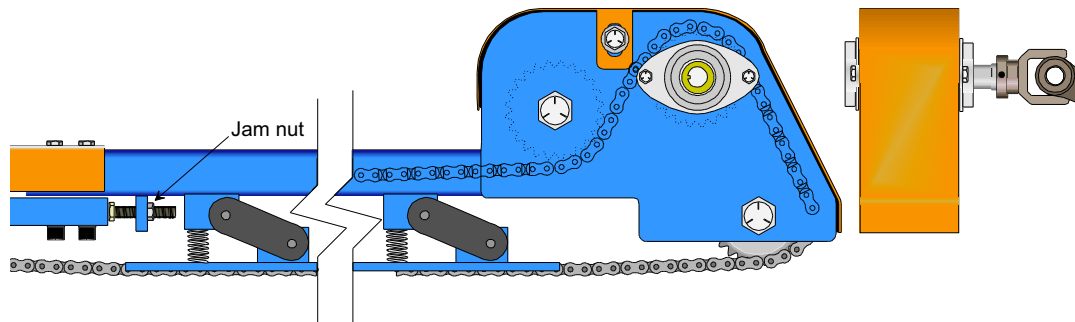
The hold-down sprockets should be replaced at least every three (3) years, depending on use.

Disassembly

1. Place the saw in the Semiautomatic Mode by pressing the SEMI-AUTO button on the touch screen's Main Menu.
2. Use the infeed conveyor FORWARD jog button to move the chain connection link near the front sprocket.
3. Turn off all power to the saw.
4. Relieve chain tension by loosening the jam nut on the tension bolt and loosening the tensioning bolt on the hold-down until the chain droops in the center.
5. Disengage the chain connecting link and allow the chain to hang at each end.
6. Remove the rear sprocket as follows:
 - a) Disengage the universal joint by loosening the set screw at the hold-down sprocket shaft
 - b) Pull the universal joint off the sprocket shaft. Taking care not to lose the key in the keyway.
 - c) Loosen the three (3) set screws that hold the shaft to the two shaft collars and sprocket.
 - d) Using a 1/2-in. diameter steel rod approximately 6 in. long and a hammer, tap the sprocket shaft out through the bearing and sprocket until the sprocket falls free. Do not lose the key.
7. Remove the front sprocket as follows:
 - a) Loosen the hex nut and take the cap screw out of the take-up fork.
 - b) Remove the nut, lock, cap screw, and sprocket.



Figure 2-45: Hold-Down Sprocket and Hold-Down Assembly



Assembly



1. Replace the front sprocket as follows:
 - a) Place the new sprocket in place and line it up with the bolt hole.
 - b) Place the cap screw back in place and attach with the lock washer and nut.
 - c) Tighten the cap screw.

2. Replace the rear sprocket as follows:
 - a) Insert the shaft from the drive side through the first bearing.
 - b) Thread a shaft collar, the new sprocket with the square key stock in the keyway, and the second shaft collar over the shaft before going through the second bearing.
 - c) The end of the shaft should be flush with the second (inboard) bearing, leaving approximately 3 in. of the shaft protruding on the drive side.
 - d) Position the shaft collars adjacent to the bearing and tighten the set screws. Do not tighten the set screws on the sprocket aligned with the wear strips.
 - e) Bring the universal joint up to the protruding shaft and position the key in the keyway.
 - f) Slip the universal joint over the shaft making sure the key stays in its position between the two keyways.
 - g) Tighten the universal joint set screws.

3. Install the chain as follows:
 - a) Bring the chain around both sprockets and connect it with the connecting link.

- b) Position the rear sprocket for chain alignment with the rear strips and tighten the set screws.
- c) Adjust the chain tension with front adjusting bolts to where the chain is on a horizontal plane with the slack indicated on page MT-69.
- d) Tighten the jam nut on the tension bolt.
- e) Remove lockout devices.

Replacing a Roll Pin in the Hold-Down Spur Gears

If a roll pin breaks in a hold-down spur gear, contact Machinery Division Customer Service.

Carriage

Preventive Maintenance for the Carriage

Lubricate the axes of the carriage V-wheels with a light coat of WD-40. (Excessive oil attracts sawdust.)

Replacing a Roll Pin in the Hold-Down Spur Gears

The carriage drive spur gear on the outfeed side has a roll pin that could shear if put in a bind. If the pin breaks, drive the remainder of the broken pin out of the hole and replace it with a new pin.

The carriage drive spur gear on the infeed side is keyed, so there is no roll pin.

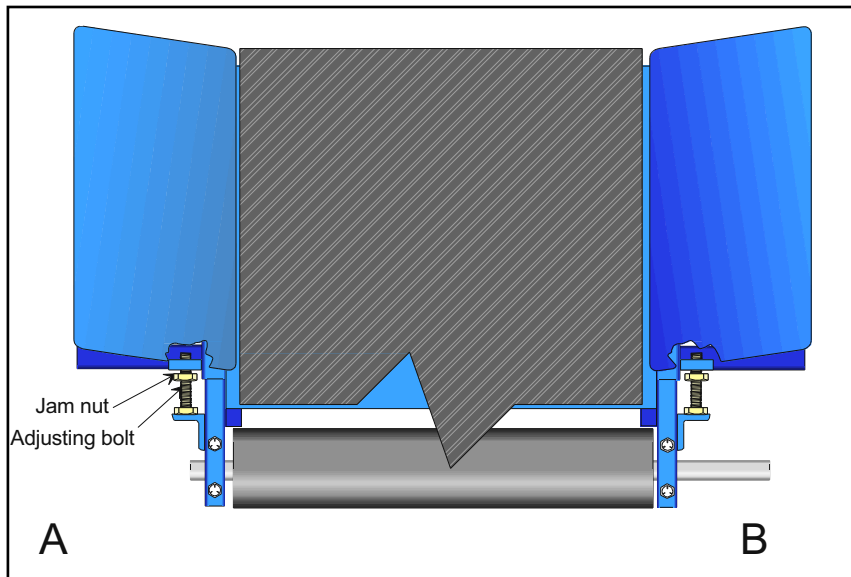
Waste Conveyor and Incline Conveyor

Adjusting the Belt Tracking/Tension

Correct belt tracking (alignment) and tension is achieved when the belt sag between the idler rollers is approximately 1-1/2 in. and the belt tracks in the center of the pan. If the belt is moving toward one side and climbing the side guides, adjust the roller on that side only.

Refer to Figure 2-46 while following the adjustment procedure.

Figure 2-46: Adjusting the Conveyor Belt Tension



1. Place the saw in Semiautomatic Mode by pressing the SEMI-AUTO button on the touch screen's Main Menu.
2. Activate an E-stop.
3. Using two 15/16-in. open end wrenches, loosen the locknut from the rear of the tension adjusting screw on the side to be adjusted.
4. Tighten the adjusting bolt. Turn the bolt only one (1) turn of the wrench at a time.



When the adjustment is made at the drive end, loosen the bolts that hold the gear reducer to its mounting plate to allow it to move with the roller as the adjustment takes place. Retighten these gear reducer bolts before conveyor start-up. In addition, the drive chain must be checked for proper tension before final lock up of adjusting bolts.

Be careful not to loosen the bolts too much and lose tension in the belt.

5. Start the conveyor by pushing the waste conveyor button. Run the conveyor for approximately 5 minutes, and observe tracking.
It may take more than a single adjustment to align the belt correctly.
6. Activate an E-stop.
7. Repeat this procedure at each end of the conveyor, making sure the conveyor is off during each adjustment.

8. Check the belt tracking (alignment) every 2 hours until the conveyor remains aligned.

Replacing a Conveyor Belt

The waste conveyor and optional incline conveyor belting usually needs replacing every 3 years, depending on use and maintenance. Use the following steps as a guide for replacing either the main belt or the incline belt.

1. Place the saw in the Semiautomatic Mode by pressing the SEMI-AUTO button on the touch screen's Main Menu.
2. Use the WASTE CONVEYOR button to run the conveyor until the lacing connection is near the head roller at the drive end.
3. Turn off all power to the saw, following approved lockout/tagout procedures.
4. Relieve the tension on the belt using the tensioning bolts (next to the roller).
5. Using a pair of pliers, remove the wire that is threaded through the lacing and save the wire for reassembly.
6. Remove the old belt.
7. Clean the sawdust and chips from the entire length of the metal conveyor bed.



Assembly

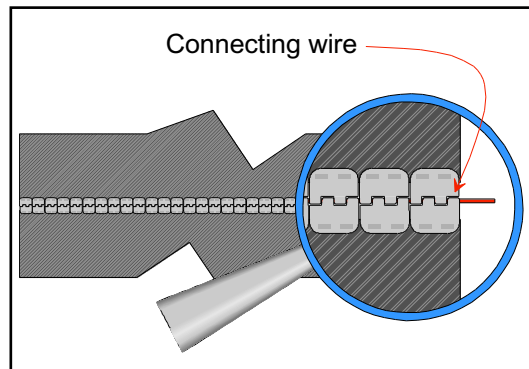
1. Install a new belt with the lacing connection near the head roller.



To pull the new belt through the machine more easily, thread the new belt to the old one and pull it through the machine. This will help thread the belt into the rollers on the bottom.

2. Bring the belt together so the lacing intermeshes, and slide the rod or wire through the lacing as shown in Figure 2-47.

Figure 2-47: Connecting Wire on Belt Lacing



3. Bend the ends of the rod or wire to prevent it from coming out.
4. Adjust the belt tension evenly at the head roller adjusting bolts. See the *Adjusting the Belt Tracking/Tension* section for correct tensioning guidelines.
5. Run the conveyor for at least five (5) minutes and check the belt tracking. If the belt does not track correctly, follow the *Adjusting the Belt Tracking/Tension* section.

Pneumatic System Maintenance


Figure 2-48 shows both pneumatic assemblies.

The pneumatic system located on the saw frame controls the saw blade brakes, carriage brakes, and moves blades 5 and 6 out-of-cut.

The pneumatic system located on the PC enclosure operates the PC enclosure's cooler.



Only saws with frame #412 and higher have a PC enclosure.

WARNING	
	<p>COMPRESSED AIR HAZARD.</p> <p>To avoid injury, bleed all pressure from the lines before removing the reservoir.</p> <p>Ensure that the reservoir is securely attached to the lubricator body before returning pressure to the lines.</p>

At the beginning of the day, check the saw pneumatics:

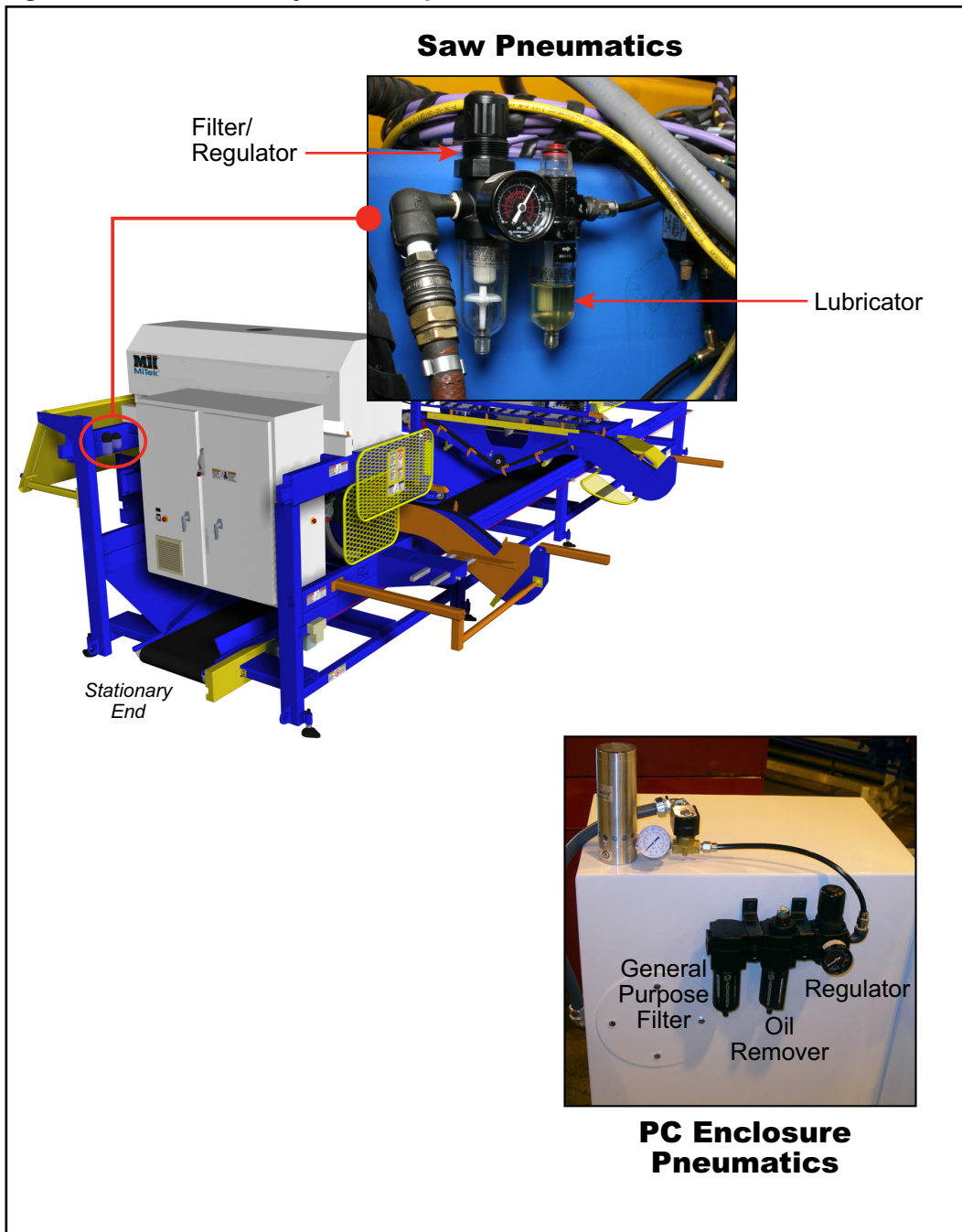
- Filter/regulator should read approximately 100 psi
- Lubricator oil level should be 1/4 to 3/4 full
- Ensure the filter is draining the water out of its bowl

At the beginning of the day, check the PC enclosure pneumatics:



- Filter/regulator should read approximately 100 psi
- Ensure the filter is draining the water out of its bowl

Figure 2-48: Pneumatic System Components



Maintaining the Lubricator on the Saw


The saw's pneumatic system uses a lubricator to keep gaskets and seals in good condition.

Checking the Oil Reservoir

Check the oil level daily by viewing the sight gauge located on the reservoir daily. Refill or top off the oil when the reservoir is less than 3/4 full.

Filling the Oil Reservoir

Use a misting type pneumatic oil that is suitable for compressed air tools. To refill the oil reservoir:

WARNING	
	<p>COMPRESSED AIR HAZARD.</p> <p>To avoid injury, bleed all pressure from the lines before removing the reservoir.</p> <p>Ensure that the reservoir is securely attached to the lubricator body before returning pressure to the lines.</p>

1. Depressurize the system.
2. Remove the reservoir from the lubricator body by twisting approximately 1/4 turn clockwise while pushing up on the reservoir. Then pull down and remove the reservoir from the body.
3. Pour the oil into the reservoir to the fill line.
4. Place the reservoir back onto the lubricator body by pushing up and turning counterclockwise. Make sure it is securely attached.


Adjusting the Density of the Lubricant Fog

The pneumatic system lubricator injects a fog of oil into a flowing stream of compressed air to provide internal lubrication. The density of the fog can be controlled. Turn the socket-head fitting counterclockwise to increase the fog density or clockwise to decrease it.



Excessive oil seepage from valves and cylinder seals may be an indication of too much oil being injected. Minor oil seepage from valve exhaust ports is expected.

Additional Maintenance

WARNING	
	<p>COMPRESSED AIR HAZARD.</p> <p>To avoid injury, bleed all pressure from the lines before removing the reservoir.</p> <p>Ensure that the reservoir is securely attached to the lubricator body before returning pressure to the lines.</p>

Proper preventive maintenance for the lubricator also includes replacing the O-rings, seals, and gaskets at regular intervals. We recommend that these items be replaced every 2 years. Contact the lubricator manufacturer to purchase the seal kit components.

To perform maintenance on the lubricator, remove the lubricator from the table by removing the two (2) screws on the front side.

Maintaining the Regulators

This section applies to the regulators on the saw and the PC enclosure.



The saw's regulator is combined with the filter assembly.

Adjusting the Pressure


The operating pressure of the saw's pneumatic system and the PC enclosure's pneumatic system should be 100 psi or slightly below. To adjust the system pressure to 100 psi:

1. Unlock the pressure adjustment knob on the regulator by pulling it straight up.
2. Turn the knob clockwise to increase pressure or counterclockwise to decrease pressure.
3. Once a pressure of 100 psi is achieved, push the knob down to lock it in place.



Both the saw regulator gauge and the PC enclosure regulator gauge must register 80-100 psi at all times! If the pressure drops below 80 psi, the pneumatic system will not function properly.

Additional Maintenance

WARNING	
	<p>COMPRESSED AIR HAZARD.</p> <p>To avoid injury, bleed all pressure from the lines before disassembling the regulator.</p>

If a regulator is not operating at its optimum capacity, we recommend cleaning the regulator and replacing the O-rings, gaskets, diaphragm, and valve assembly.

Mufflers on the filter/regulator should be replaced periodically, when air pressure becomes inefficient. Keep muffler vents clean and free of dust to extend their lives.

Maintaining the Oil Remover on the PC Enclosure


Maintaining the Oil Remover

The oil remover, or coalescing filter, removes particles down to .01 micron in size. The filter provides Air Quality Class 2 Hydrocarbon and Class 1 Particulate Removal according to ISO 8573-1.

The oil remover features an automatic drain. Once the fluid in the bowl raises the float to a certain height, the fluid automatically drains out the bottom of the bowl.

The oil remover's bowl has a sight gauge on it that turns a different color where water is touching it. This feature is not necessary if a hose is connected to the auto drain port, but it is very helpful if required to manually drain the bowl.

Replacing the Oil Remover's Filter Element

WARNING	
	<p>COMPRESSED AIR HAZARD.</p> <p>To avoid injury, bleed all pressure from the lines before removing the reservoir.</p> <p>Ensure that the reservoir is securely attached to the lubricator body before returning pressure to the lines.</p>

A service life indicator on top of the oil remover unit changes from green to red when the filter element needs to be replaced. To replace the filter element:

1. Depressurize the system.
 - a) Turn off the main air source.

- b) Bleed the pressure from the lines by disconnecting the air line.
 - c) Ensure the gauge reads “0” before unscrewing the filter guard.
2. Push up on the bowl and turn to the left to unlock the bowl.
 3. Pull straight down to remove the bowl from the unit.
 4. Unscrew the filter and replace it with a new filter.
 5. Ensure the float is still inside the bowl. The spoke inside the bowl should rest inside the hole in the float.
 6. Lock the bowl back onto the unit.




Do not lose the float that is inside the bowl!

Draining the PC Enclosure’s Oil Remover

The general purpose filter and oil remover both feature an automatic drain. Once the fluid in the bowl raises the float to a certain height, the fluid automatically drains out the bottom of the bowl.

Because fluid gathering at the location of the PC enclosure is a slip hazard, connect a hose to the port on the bowl and run it to a safe place for the fluid to drain. Secure the hose to the floor to prevent a trip hazard.

- The general purpose filter has a 1/8-in. NPT threaded port on the bowl
- The oil remover has a 1/4-in. threaded port on the bowl

CAUTION	
	<p>SLIP HAZARD. TRIP HAZARD.</p> <p>Do not allow water or oil to gather on the floor. Injury may result from personnel slipping and falling.</p> <p>If using a hose to drain the fluid, secure it to the floor. Injury may result from personnel tripping on the hose and falling.</p>

Maintaining the Filtering Components

The filter on the saw is combined with the regulator assembly. The PC enclosure has a general purpose filter. Both filters remove water and fine particles from the compressed air.

Draining the Saw's Pneumatic Filter


The filter assembly features an automatic drain port. Once the fluid in the bowl raises the float to a certain height, the fluid automatically drains out the bottom of the bowl. The fluid should fall onto the saw's pan. The small quantity of fluid is fine and will not affect operation of the saw.

Draining the PC Enclosure's General Purpose Filter

The general purpose filter and oil remover both feature an automatic drain. Once the fluid in the bowl raises the float to a certain height, the fluid automatically drains out the bottom of the bowl.

Fluid will automatically drain out of the bottom of the bowl as needed. Because fluid gathering at the location of the PC enclosure is a slip hazard, connect a hose to the port on the bowl and run it to a safe place for the fluid to drain. Secure the hose to the floor to prevent a trip hazard.


- The general purpose filter has a 1/8-in. NPT threaded port on the bowl
- The oil remover has a 1/4-in. threaded port on the bowl

CAUTION	
	<p>SLIP HAZARD. TRIP HAZARD.</p> <p>Do not allow water or oil to gather on the floor. Injury may result from personnel slipping and falling.</p> <p>If using a hose to drain the fluid, secure it to the floor. Injury may result from personnel tripping on the hose and falling.</p>

Replacing the PC Enclosure's General Purpose Filter Element


The auto-drain uses a 40-micron filter element that must be replaced every 6 months. To replace the filter element:

1. When replacing the filter, the system must be free of pressure. To depressurize the system.

WARNING	
	<p>COMPRESSED AIR HAZARD.</p> <p>To avoid injury, bleed all pressure from the lines before removing the filter body.</p> <p>Ensure that the filter body is securely attached to the unit before returning pressure to the lines.</p>

- a) Turn off the main air source.

- b) Bleed the pressure from the lines by disconnecting the air line.
 - c) Ensure the gauge reads “0” before unscrewing the filter guard.
2. Push up on the bowl and turn to the left to unlock the bowl.
 3. Pull straight down to remove the bowl from the unit.

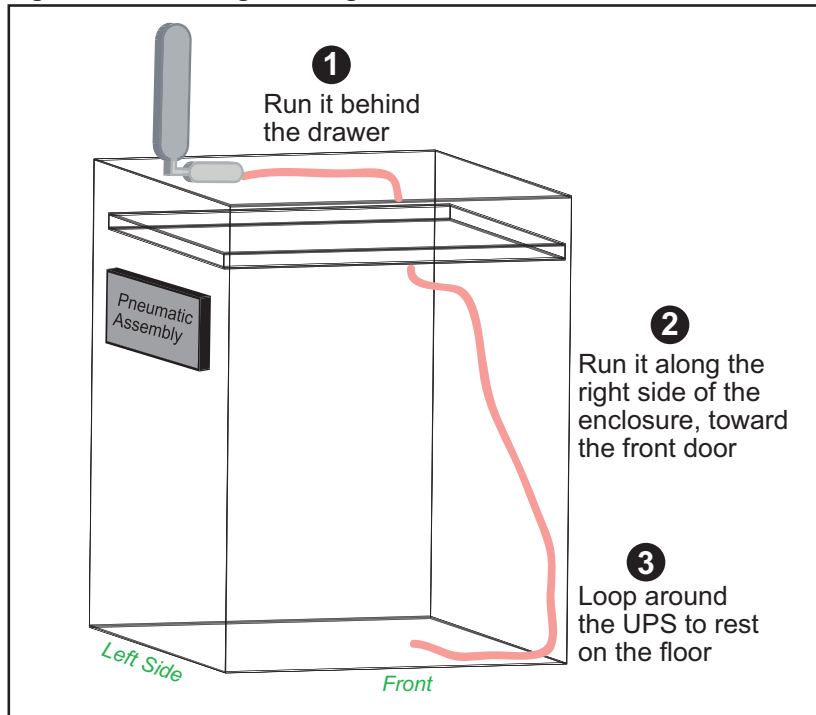


Do not lose the float that is inside the bowl!
 4. Unscrew the plastic stop and remove the filter.
 5. Replace it with a new filter and screw the plastic stop on to hold the filter in place.
 6. Ensure the float is still inside the bowl. The spoke inside the bowl should rest inside the hole in the float.
 7. Lock the bowl back onto the unit.

Routing the Cooler Tubing Inside the PC Enclosure

The cooler tubing should be routed inside the PC enclosure as shown in Figure 2-49.

Figure 2-49: Tubing Routing Inside PC Enclosure



Computer and Touch Screen



On frame 0 through frame 411, computers were inside the touch screen enclosure. Frames 412 and higher have the computers in a PC enclosure. To retrofit a saw to move the computer to a PC enclosure, order SB160 and the appropriate kit.

Determining What Version of Software You Are Using

- The *Cimplicity* Project software version is shown in the bottom right-hand corner of the Main Menu.
- The PLC software version is shown at the bottom of the PLC Status Screen accessed from the Alarm Conditions Menu or the alarm status bar.

Communications Specifications

- COM Port 1
- Baud rate: 9600

Getting Technical Assistance and Warranty Information

Touch Screens

Contact MiTek Machinery Division Customer Service for technical assistance and warranty information regarding a touch screen computer or monitor. See page MT-34 for contact information.

Dell Computers

For *Dell*[®] computers (provided by MiTek) that are housed in a PC enclosure and communicate with a separate touch screen monitor, contact Dell for technical assistance. The Dell Gold Technical Support Agreement and the operating system license are registered to an individual name at your company. For technical assistance with any hardware-related problems on the computer, call Dell directly at 1-800-624-9897. To prepare for this call, have the following information ready:

- Service tag number
- Express service code
- Model name
- Model number
- Operating system

This information, specific to your computer, was in a letter Dell sent when the computer was registered to your company. At the time of installation, MiTek recommended that letter be kept with the *Cyber A/T* manual.

Selecting a Language

The *Cyber A/T* software allows you to choose different languages for operating the saw. The available languages built into the software as of Project version 12.0 are:

- English
- Spanish

Selecting Language at Startup

The default setting is to display in English and automatically display a language selector screen when you turn on the saw computer, after logging into *Windows*[®] software. When the language selector screen appears, choose the language you want the software to display and press OK.

Bypassing the Language Selector Screen

If you want to prevent the language selector screen from appearing every time you logon, click the DON'T ASK ME AGAIN box before hitting OK. This option sets the language chosen at the time as the default, and the screen will not appear again until you manually change it.

Manually Changing the Language Selected

To manually change the language after the DON'T ASK ME AGAIN box has been clicked on, double click the shortcut on your desktop called CYBER AT CHANGE LANGUAGE. The language selector screen will appear, and you can change the language and/or click the DON'T ASK ME AGAIN box off.

The check box itself cannot be removed. The operator will always have the option to change languages.

Calibrating the Touch Screen

1. With the computer off:
 - a) Plug in the keyboard.
 - b) Turn the computer on.
2. To keep the *Cimplicity* Project software from starting, when the network login screen comes up, hold the SHIFT key down while you hit ENTER. Hold the shift key for a few seconds until the cursor goes from a pointer and an hourglass to just a pointer.
3. On the *Windows* taskbar, click *Start*.
4. Highlight *Programs*, then *UPDD*, and then press *Calibrate*. The Touch Screen Utilities window appears.
5. Calibrate the axis when prompted.
6. Click EXIT when you are finished.

Replacing the Touch Screen Overlays

An overlay must be kept on your touch screen at all times!

The overlay protects the bezel from excessive wear, scratching, and other damage. The bezel assembly covers the front of the monitor and allows it to recognize human touch. If it is damaged, the saw will not operate correctly. Keeping an overlay on the bezel will greatly increase the life of the bezel and help to maintain the quality of the image on-screen.

To replace an overlay, peel off the old overlay (look for a small tab to pull on) and stick a new one to the front of the monitor, which is actually the bezel. This machine was shipped with five (5) spare overlays.

Replacing the Touch Screen (CTC Touch Screens Only)

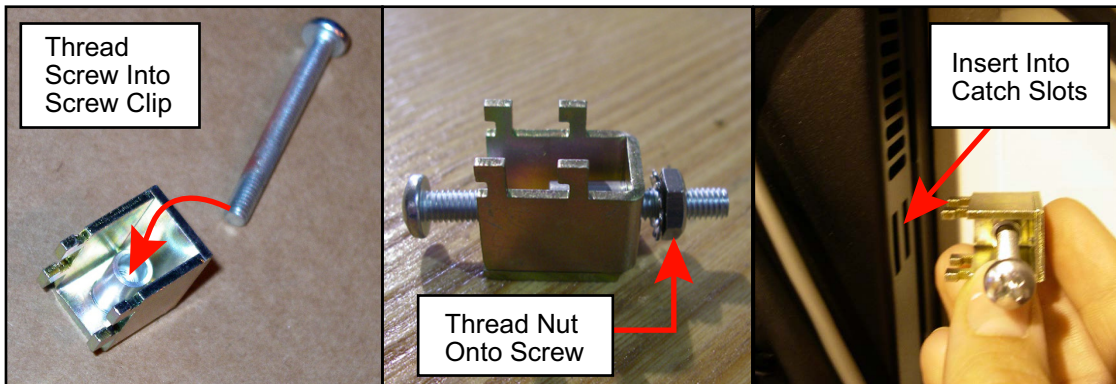
1. Remove the faulty touch screen:

CAUTION

Hold the touch screen from the front before loosening the screw clips to prevent it from falling out of the enclosure. This requires a second person.

- a) Label, then disconnect all wiring from the touch screen inside the touch screen enclosure.
 - b) Remove the screw clips inside the touch screen enclosure, and put them aside for re-assembly.
 - c) Pull the touch screen out of the enclosure from the front side.
2. Place two (2) screw clips in the catch slots on each side of the new touch screen by following the steps below.
 - a) Assemble a screw clip and screw as shown in Figure 2-50.

Figure 2-50: Installing Screw Clips



- b) Place a screw clip in the pair of catch slots near the top or bottom of each side of the touch screen back. See Figure 2-50.

CAUTION

If screw clips are overtightened, they can break the touch screen. Use moderate pressure on a hand-held screwdriver.

- c) Adjust the nut to the desired location and tighten the screw with a hand-held screwdriver.
 - d) Repeat to install two (2) screw clips on each side of the touch screen until all eight (8) screw clips are in place and securely holding the touch screen against the bezel or mounting plate.
3. Apply a new overlay when finished.

Replacing the Bezel (CTC Touch Screens Only)

The bezel is an assembly consisting of a touchpad and plastic frame that holds the touchpad in place on the front of the monitor. A plastic overlay should be kept on the bezel at all times, with enough use, the touchpad portion of the bezel can become worn or damaged. To replace the bezel assembly:

1. Remove the cabling to the computer, making note of which cable goes where.
2. Remove the entire monitor assembly from the touch screen enclosure as directed in *Replacing the Touch Screen (CTC Touch Screens Only)* on page MT-115.
3. Place the monitor assembly face down on a soft surface.
4. Remove the back shell from the display assembly by completing these steps:

- a) Remove 2 screws on the right side of the back of the monitor and set aside.
 - b) Remove the screw holding the L-bracket to the top hinge and set aside.
 - c) Pivot the back shell open and gently disconnect the 2 cables underneath.
 - d) Pull the back shell toward the top of the monitor to free it from the hinges.
 - e) Set the back shell aside.
5. Remove the 3 screws from the top edge of the back of the display assembly.
 6. Lift the display assembly off of the bezel while sliding it up and out of the lower bezel tabs and sliding the touch screen cable through the slot to free it from the display assembly.
 7. Discard the old bezel, but save all hardware.
 8. Attach the new bezel and re-assemble the monitor.
 - a) Reverse the disassembly steps to attach a new bezel.
 - b) Apply a new overlay on the front of the bezel's touchpad.

Replacing a Touch Screen Monitor's Face Plate

If upgrading the touch screen monitor or temporarily using a different monitor, you may need to replace the face plate. Follow the instructions below.

1. Open the touch screen enclosure.
2. Remove the cabling to the computer, making note of which cable goes where.
3. Have a second person hold the front of the touch screen to support its weight when the bolts are removed in the next step.
4. Loosen the securing bolts or screw clips on the back of the touch screen.

5. Pull the touch screen out of the enclosure using the instructions in *Replacing the Touch Screen (CTC Touch Screens Only)*.

6. If your touch screen enclosure has a floppy drive port, remove the floppy drive, labeled *A*, by unscrewing the four (4) screws.

7. If necessary, remove the keyboard port, labeled *B*, by unscrewing the two (2) small screws.

8. Remove the E-stop switch, labeled *C*, using the following steps.

- a) From inside the touch screen enclosure, remove the terminal connector by pushing the black lever on top toward the left and pulling the connector straight back.
- b) Remove the locking ring from inside the touch screen enclosure.
- c) Go to the front of the touch screen enclosure and remove the E-stop button from its cutout.

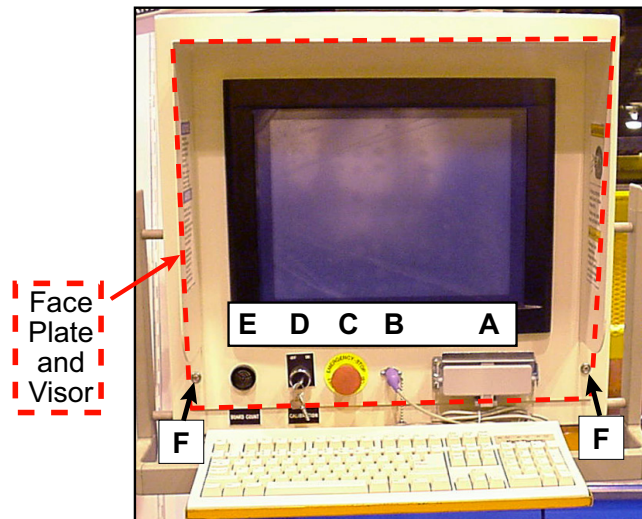
9. Remove the calibration key switch, labeled *D*, by using the same method used to remove the E-stop switch.

10. From the front of the enclosure, unscrew the ring around the board count sensor, labeled *E*.

11. Remove the ten (10) screws along the side edges of the face plate with a Phillips screwdriver. They are labeled *F*. Note that older models have screws on the top edge of the face plate.

12. Pull off the entire face plate and visor.

13. Attach a new face plate and visor by reversing the previous steps.

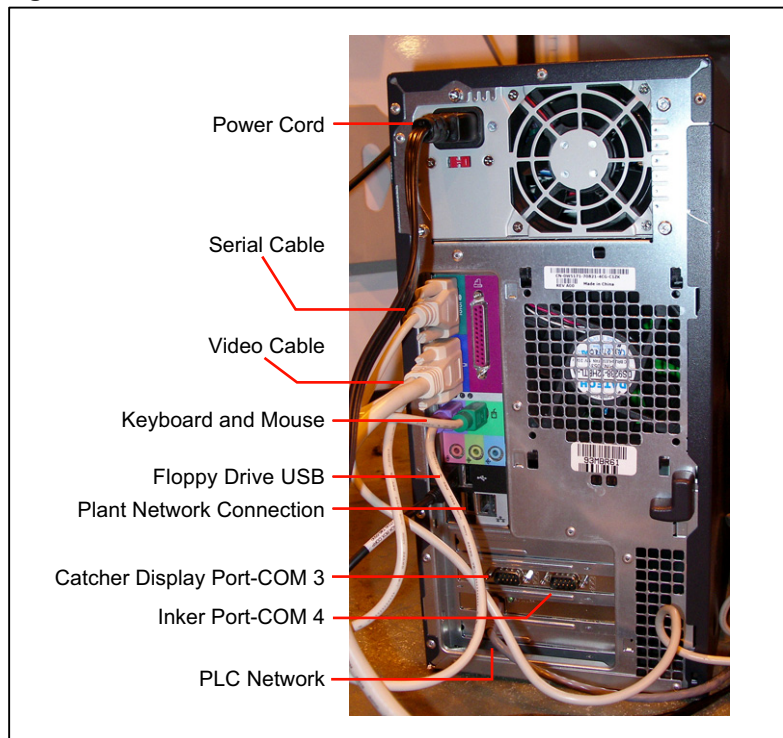


Replacing the Computer (PC)

Cable Connections

If you have to move or replace the computer inside the PC enclosure, Figure 2-51 shows the locations of the original cable connections. The port locations on your original computer may vary slightly from those shown in Figure 2-51.

Figure 2-51: Cable Connection on the PC Inside the PC Enclosure



PC Requirements

Table 2-6 lists the minimum requirements for a replacement computer.

Table 2-6: Specifications for the PC

RAM	Minimum of 512 MB
Network Card (NIC)	1 integrated network interface card for the plant network. A second card should be purchased separately.
Keyboard (And Mouse if Desired)	Any PS/2 keyboard and mouse that will work with your CPU and monitor. Must be PS/2 to use with KVM extender.
Video Card	Min. 4 MHz
Operating System	Windows XP, Service Pack 2 with latest upgrades

Configuring the Integrated NIC for Your Plant Network

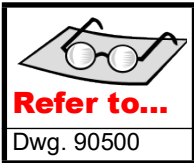
You are responsible for configuring the integrated NIC to interface with your plant network.

Configuring the Saw's Internal Communication NIC

If you sent your computer and NIC to MiTek for configuration, MiTek probably configured the saw's internal communication NIC. If MiTek did not configure it, you must do so for the icons to display correctly on your monitor.

1. On the saw's desktop, highlight *My Network Places*.
2. Right-click and choose *Properties*.
3. Highlight the NIC that will be connected to the saw's PLC.
4. Right-click and choose *Properties*.
5. In the Connect Using section, click *Configure*.
6. Select the *Advanced* tab.
7. Under property, set Link Speed/Duplex Mode to *10 Full* and click *OK*.
8. Click on the *Properties* button for the NIC again.
9. In the This Connection Uses the Following Items, ensure the following are listed:
 - Client for Microsoft Networks
 - File and Printer Sharing for Microsoft Networks
 - QoS Packet Scheduler
 - Internet Protocol (TCP/IP)
10. Select *Internet Protocol (TCP/IP)* and click *Properties*.
11. Select *Use the Following IP Address* and enter the data listed here:
 - IP Address: 128.1.0.10
 - SubNet Mask: 255.255.0.0
12. Click *OK*, then *OK* again, and close Network Connections.

Replacing the KVM Extender



Saws with a the computer in a PC enclosure have a KVM extender that allow the computer and the touch screen to communicate. An exact replacement must be used. Refer to Drawing 90500 for an illustration of the connections.

Replacing a Hard Drive

If you replace your computer or hard drive, all software specific to the saw will need to be loaded again. Refer to the *Reloading Software* section.

Reloading Software

For saws prior to frame #497, your CDs from other manufacturers are with the manufacturer's documentation that came with your saw, but *Cimplicity* and Project software was not supplied at that time. For frames 497 and later, *Cimplicity* and Project software is included in the CD case provided by MiTek.

Reloading *Cimplicity* Project Software

Your current *Cimplicity* license won't transfer to the reloaded software. Call MiTek Machinery Division Customer Service and request Service Bulletin 169 for instructions on transferring an existing *Cimplicity* license to a new computer and registering for a new *Cimplicity* license. If you do not have your current *Cimplicity* and Project software, request the entire SB169KIT.

Upgrading Software

All software must be compatible as shown in Table 2-7.

- Upgrading Project software may be possible if you have the correct *Cimplicity* software version and PLC software version that will allow you to upgrade to the next Project version. A MiTek Machinery Division Customer Service Representative can tell you how to upgrade your Project software.
- If the next Project version requires a higher *Cimplicity* version, *Cimplicity* is a licensed software. Upgrading will require a new license purchased through MiTek.

- If required, PLC software must be upgraded by a MiTek Machinery Division Customer Service Representative.

Table 2-7: Compatible Software Versions

Cimplicity Software	Project Software Version	PLC Software Version
Version 5.5	11.01	11.1
	11.60 and 11.61	11.5
	11.70 and 11.71	11.5 or higher (11.8 preferred)
	12.03	12.1
	12.10	12.1
Version 6.1	20.00	12.2, 12.3, 12.4
	20.10 and 20.11	12.4
	20.11 and 20.12	12.4 or higher (12.6 preferred)
	20.20	12.9

Reloading the Touch Driver

To install the touch screen driver under *Windows*, you will first identify the driver COM port and then install the driver and configure the driver settings.

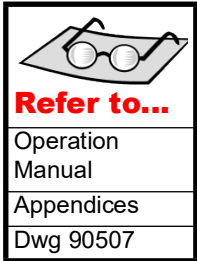
Determine the present touch screen driver COM port, by completing the following steps:

1. With the computer off, plug in the keyboard.
2. Turn on the computer.
3. When the network login screen comes up, hold the SHIFT key down on the keyboard while you press the ENTER key. This will bypass the *Cimplicity* Project software.
4. Continue holding the SHIFT key for a few seconds, until the cursor goes from a pointer and an hourglass to just a pointer.
5. Double click *My Computer*, then *C:*, then *Install for Windows*[®].
6. Choose the correct driver.
7. Double click *Drivers*, then *UPDD*, then *Setup* to run an automated process.
8. Once the computer finishes, click *Finish*.
9. A window will pop up to ask you to restart *Windows*. Click *OK*.
10. Recalibrate the touch screen.



Refer to the drivers and utilities CD that shipped with the touch screen.

Profibus System (Encoders)



Overview of the Profibus System

A Profibus system links the PLC to the components that actually do the work such as sensors, actuators, motors, etc. In the case of the *Cyber A/T* saw, the sensors are encoders.

The saw and all encoders have indicators to help troubleshoot the Profibus system. The saw indicates a red Profibus fault or a yellow Profibus fault when there is an error. See the *Alarm Conditions* section in the *Troubleshooting* appendix.

The encoders have lights on them to indicate their status. See Table A-15 in the *Troubleshooting* appendix for an explanation of the status lights.

Encoders are used to tell the computer how far a component has turned or moved. The encoder is mounted to an adjustable bracket and a chain is connected between the encoder to the axis being moved. This procedure is a generic adjustment. The encoder you are tensioning may be configured differently, but the steps are the same.

Two (2) LEDs provide a visual indication of the operating status of the encoder. The red LED displays errors, while the green LED displays the general status. Both can be in one of three states: on, off, or flashing. Refer to the *Troubleshooting* section to determine what the different combinations mean

Adjusting the Encoder Chain Tension

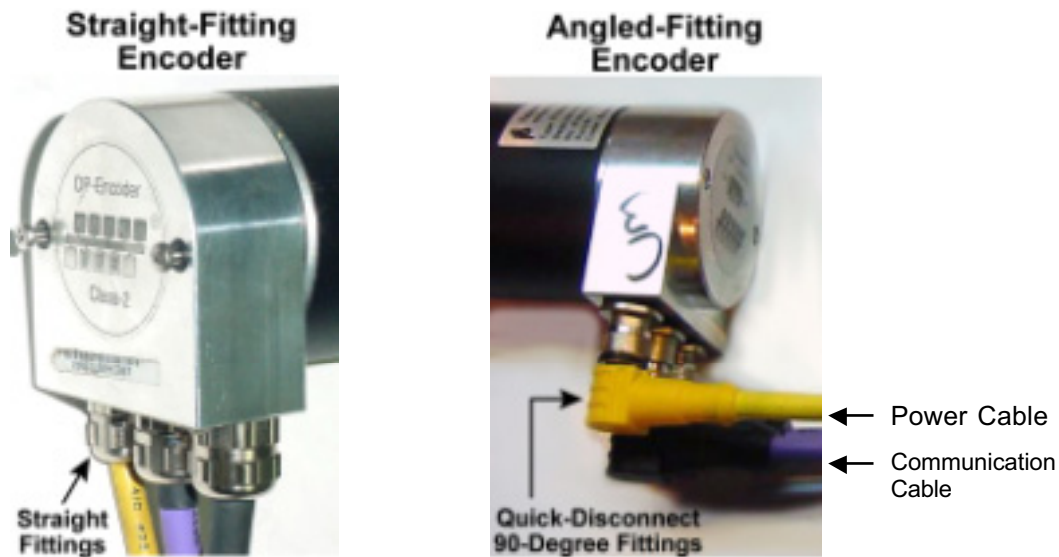
Most encoders are mounted behind a guard. Removal of the guard is necessary to check the encoder chain. Check that there is only about chain link of deflection in the chain when pushed in the center of the travel distance. If the chain has more than one chain link of deflection, adjust as follows:

1. Loosen the bolts on the mounting bracket.
2. With hand pressure only, push or pull on the encoder to remove the excess play from the chain.
3. Retighten the bolts.
4. Replace the guard.

Replacing the Encoders

There are two (2) different styles of encoders, depending on when your saw was built or encoders were replaced last. An encoder with a straight fitting on the bottom is labeled straight-fitting encoder in Figure 2-52. A newer model of this encoder has angled fittings on the bottom. It is labeled angled-fitting encoder in Figure 2-52.

Figure 2-52: Types of Encoders



If any encoder on the saw needs to be replaced, refer to the following instructions. If the encoder is the angulation encoder for quad 5 or quad 6, you must also modify the guard to fit over the angled-fitting encoder. The procedure for modifying the guard is at the end of this section. All spare parts needed for this procedure are listed at the end of this section.

1. Identify the defective encoder. On angled-fitting encoders, the indicator light labeled ERR for error indicates if the encoder has power. The indicator light labeled STA for status indicates if the computer is communicating with the encoder.
2. Look at Figure 2-52 to identify the encoder style. Notice the angled fitting has a 90° quick-disconnect on the cable.
3. Prepare the saw.

- a) Move the carriage away from the stationary end as far as necessary so that you can move the horizontal hold-down and horizontal infeed conveyors away from the saw blades.
- b) Put all blades in their home position (90°).
- c) If you are replacing an angle encoder (encoder that tracks angulation), raise the vertical centerline up so the encoder is accessible.
- d) Lockout/tagout.
- e) Remove all saw blades on the side that has the defective encoder.
- f) Remove the encoder's guard, shown in Figure 2-54. The attachment hardware may vary for different guards.



Figure 2-53: Move the Hold-Down and Conveyor

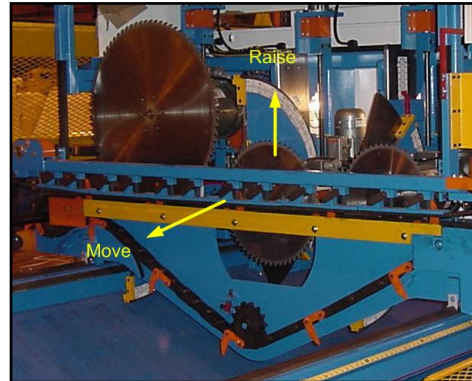
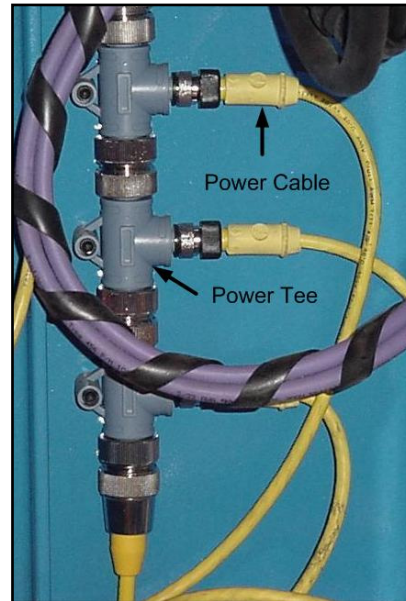
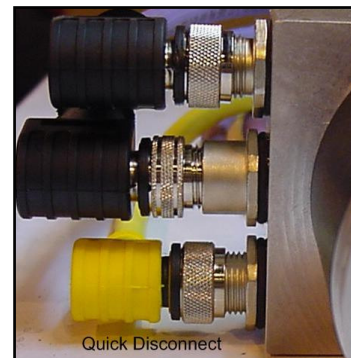


Figure 2-54: One Encoder Guard Style

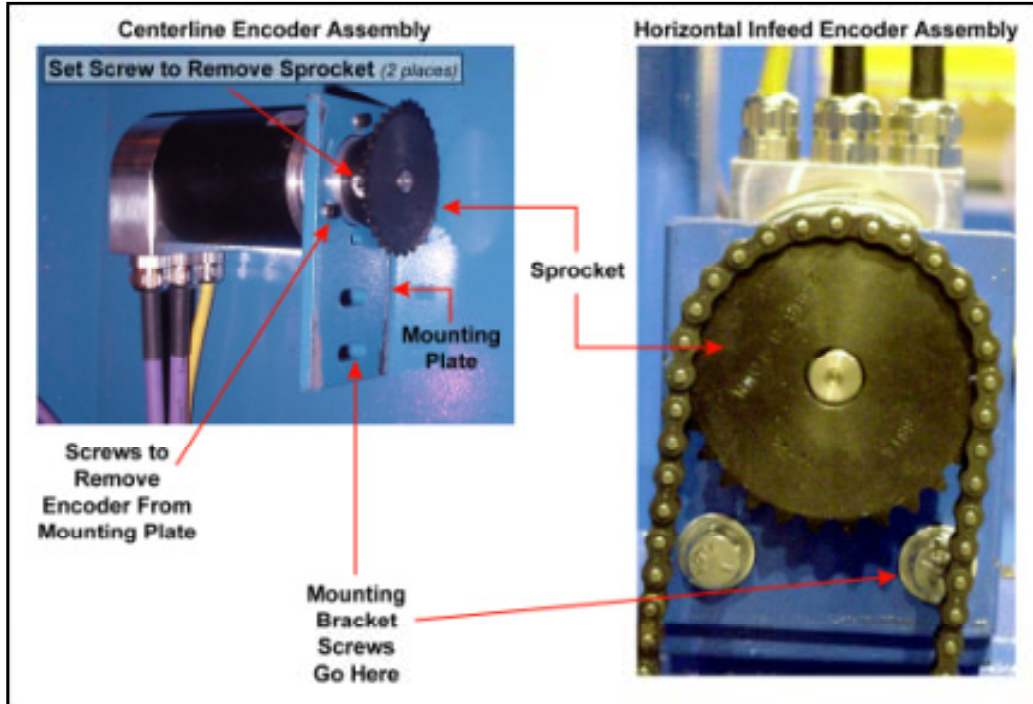


4. Disconnect the defective encoder.
 - a) Disconnect the encoder's power cable from the power tee on straight-fitting encoders. See Figure 2-55. For angled-fitting encoders, use the quick-disconnect at the rear of the encoder housing.
 - b) Disconnect the encoder's Profibus data cable from the busline on straight-fitting encoders. On angled-fitting encoders, disconnect the Profibus data cable at the quick-disconnect at the rear of the encoder housing.

Figure 2-55: Power Tee**Figure 2-56: Quick Disconnect**

5. Remove the defective encoder from the saw.

Figure 2-57: Removing an Encoder



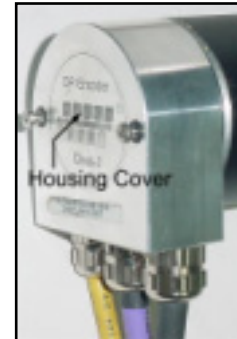
- a) Remove the mounting bracket screws shown in Figure 2-57.
- b) Disconnect the sprocket (or coupling) from the mounting plate by removing the set screws labeled in Figure 2-57.
- c) Remove the screws to remove the encoder from the mounting plate by using a 10-mm socket wrench.
- d) Discard the defective encoder, unless it is still under warranty. You may also discard the cable and use the quick-disconnect cable that comes with the angled-fitting encoder replacement part. If you are replacing an angled-fitting encoder, it is easier to use the same cable that was previously used.



If your saw frame is less than one year old, the encoders should be covered under warranty. Do not discard the encoder if it is under warranty. Contact MiTek Machinery Division Customer Service to obtain instructions on returning the defective encoder to receive warranty credit.

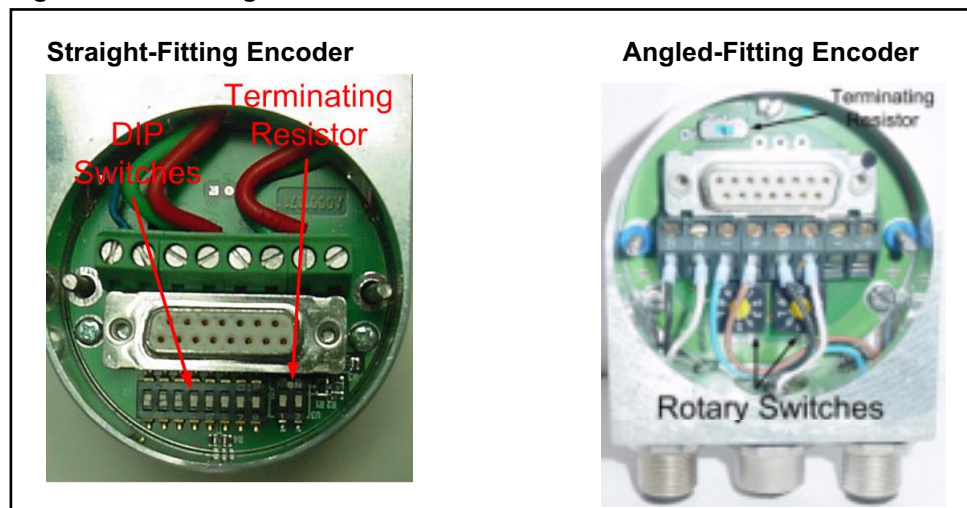
6. Remove the encoder housing cover on the replacement encoder by removing the two (2) screws shown on the housing cover in Figure 2-58.
7. The procedure for setting the correct address depends on the replacement encoder.
 - a) Replacing a straight-fitting encoder with another straight-fitting encoder:
 - 1) Note the settings on the DIP switches on the faulty encoder before discarding. See Figure 2-59.
 - 2) Set the replacement encoder's node address to match the address on the encoder that is being discarded.

Figure 2-58: Cover



The address on the replacement encoder must match the address used on the encoder it is replacing! If the address is set incorrectly, the saw will not function properly. Refer to your electrical drawing if you do not know the address that was used on the encoder being replaced.

Figure 2-59: Setting the Addresses



- b) Replacing a straight-fitting encoder with an angled-fitting encoder:
 - 1) Note the DIP switch settings on the faulty encoder.
 - 2) Find the address that the straight-fitting encoder was using in the DIP switch column in Table 2-8.
 - 3) Note its encoder address number in the left column.
 - 4) Find that number in the Address column in Table 2-9.
 - 5) Set the replacement encoder rotary switches to the address indicated in Table 2-9.
 - 6) Set the terminating resistor to the off position. It is the position opposite the side marked ON.

Table 2-8: Straight-Fitting Encoder Addresses



The terminating resistor must be set to the off position on straight-fitting encoders.

0=OFF

1=ON

Address (NOT encoder #)	Dip Switch Positions								Terminating Resistor	
	1	2	3	4	5	6	7	8	1	2
2	0	1	0	0	0	0	0	0	0	0
3	1	1	0	0	0	0	0	0	0	0
4	0	0	1	0	0	0	0	0	0	0
5	1	0	1	0	0	0	0	0	0	0
6	0	1	1	0	0	0	0	0	0	0
7	1	1	1	0	0	0	0	0	0	0
8	0	0	0	1	0	0	0	0	0	0
9	1	0	0	1	0	0	0	0	0	0
10	0	1	0	1	0	0	0	0	0	0
11	1	1	0	1	0	0	0	0	0	0
12	0	0	1	1	0	0	0	0	0	0
13	1	0	1	1	0	0	0	0	0	0
14	0	1	1	1	0	0	0	0	0	0
15	1	1	1	1	0	0	0	0	0	0
16	0	0	0	0	1	0	0	0	0	0
17	1	0	0	0	1	0	0	0	0	0
18	0	1	0	0	1	0	0	0	0	0

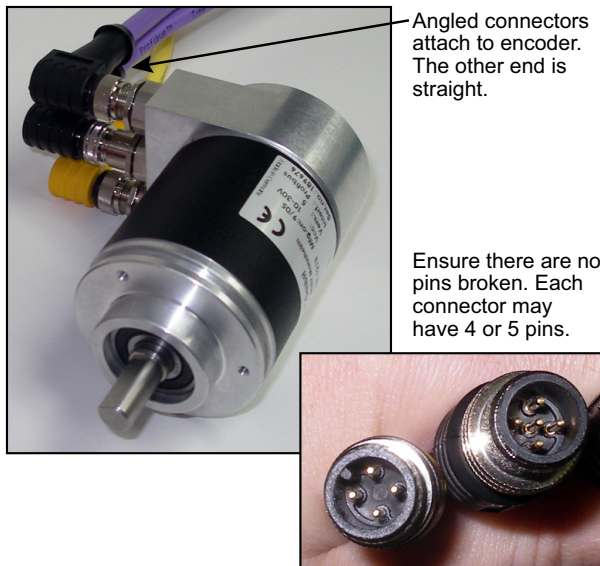
Table 2-9: Angle-Fitting Encoder Addresses

Address (NOT encoder #)	Rotary Switches	
	x10	x1
2	0	2
3	0	3
4	0	4
5	0	5
6	0	6
7	0	7
8	0	8
9	0	9
10	1	0
11	1	1
12	1	2
13	1	3
14	1	4
15	1	5
16	1	6
17	1	7
18	1	8

- c) Replacing an angled-fitting encoder with an angled-fitting encoder:
 - 1) Note the address on the rotary switches of the defective encoder.
 - 2) Set the address on the replacement encoder to match the defective encoder.
8. Once the address has been programmed, secure the new encoder in its place.
 - a) Reattach the mounting bracket and sprocket (or coupling) to the encoder.
 - b) Replace the encoder assembly in its position and secure the hardware.
 - c) Connect the new cables to the encoder.

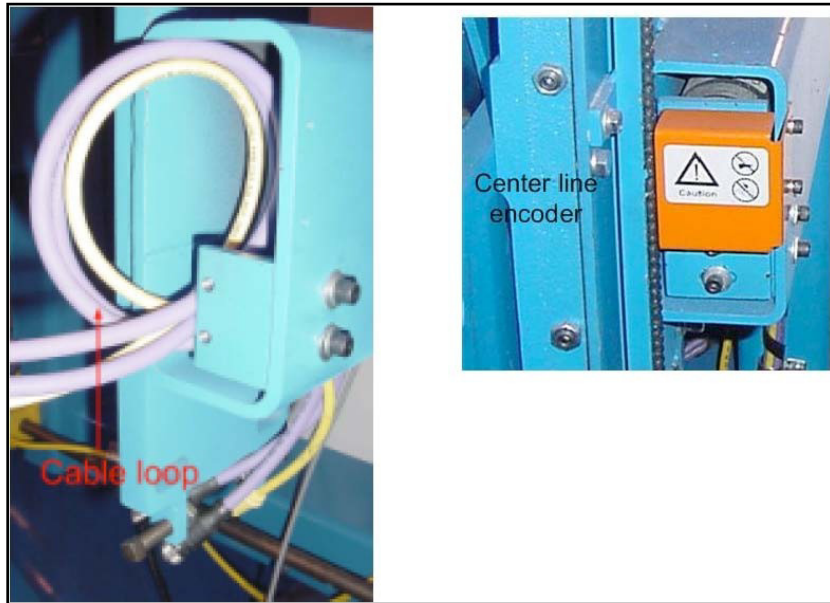
For angled-fitting encoders, connect the angled end to the encoder. The pins and holes are arranged so only the correct cable will fit each port. Ensure you have the keyway and holes and pins aligned properly or a pin may break.

Figure 2-60: Installing and Maintaining



- d) Reconnect all cables.
 - 1) If you are replacing a centerline encoder using an angled-fitting encoder, group all encoder cables together and make a loop.
 - 2) Put the loop inside the tube and insert all the fittings through the hole at the bottom of the tube.

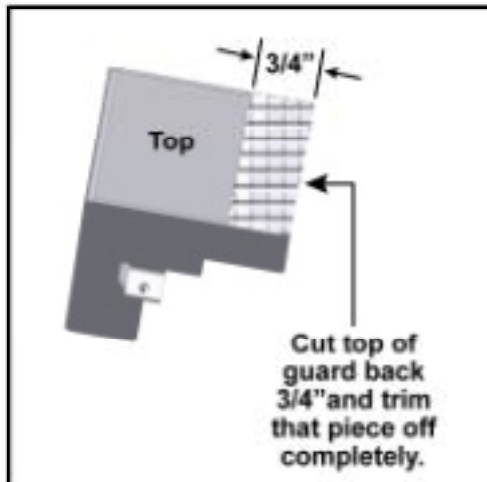
Figure 2-61: Hiding the Wires



9. Return power to the saw. Remove the lockout/tagout equipment.
10. Recalibrate the component that is controlled by the newly installed encoder. Refer to the *Calibration Check* section starting on page MT-49.

To modify the guard when replacing the angulation encoders on quad 5 and quad 6:

Figure 2-62: Modifying an Angulation Encoder Guard



If your angulation encoder guards on quad 5 and quad 6 were designed for the straight-fitting encoders, they must be modified to fit over the angled-fitting encoders.

To modify a guard for a quad 5 or quad 6 angulation encoder, remove the guard from the saw. Trim the top of the guard back 3/4 in. and trim that section completely off. File all sharp edges to prevent a safety hazard.

If you prefer to order an angled-fitting guard rather than modifying the existing guard, a new guard can be purchased from MiTek.

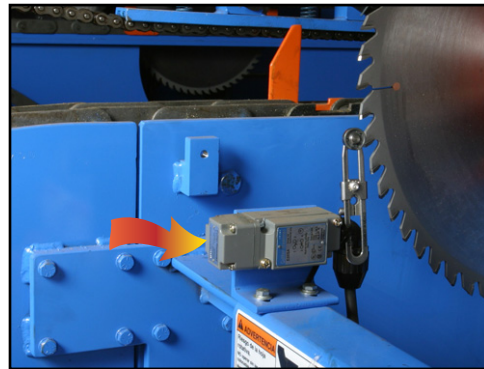
Limit Switches

Finding a Limit Switch

Limit switches count the number of boards in and out of the saw.

- An infeed count switch is located on the saw frame near the stationary-end infeed conveyor on the infeed side, as shown in Figure 2-63.
- An outfeed count switch is located on the stationary-end infeed conveyor on the outfeed side.

Figure 2-63: Infeed Count Limit Switch



Adjusting a Limit Switch

To adjust the location of a limit switch:

1. Loosen the screws in the mounting bracket and move the bracket and limit switch assembly along the slotted holes.
2. Retighten the screws.

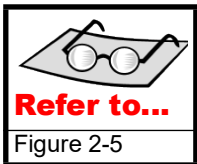
Proximity (Prox) Switches

How a Prox Switch Works

Proximity (prox) switches communicate certain information to the PLC regarding the location of components. They use an electromagnetic field to detect when an object is near.

The prox switches on this equipment monitor a shaft or cam with holes drilled at specific points. The prox switch “sees” the metal on the shaft, and when the component moves, the shaft moves. When the hole in the shaft passes by the prox switch, it stops “seeing” metal, which indicates the location of that component.

Finding a Prox Switch



Each prox switch is described in Table 2-10. The locations of the prox switches are shown in Figure 2-5 on page MT-43.

Table 2-10: Prox Switch Locations

Prox Switch	Component It Affect	Description
Count	Hold-Down, Vertical Movement, Stationary End	Tracks the distance the stationary-end hold-down moves vertically
Home		Tracks when the stationary-end hold-down has reached its home position
Count	Hold-Down, Vertical Movement, Carriage End	Tracks the distance the carriage-end hold-down moves vertically
Home		Tracks when the carriage-end hold-down has reached its home position
Count	Lumber Stop	Tracks the distance the carriage-end hold-down moves vertically
Home		Tracks when the hold-down has reached its home position
Out-Of-Cut	Blade 5	Tracks when blade 5 is positioned out-of-cut
Out-Of-Cut	Blade 6	Tracks when blade 6 is positioned out-of-cut

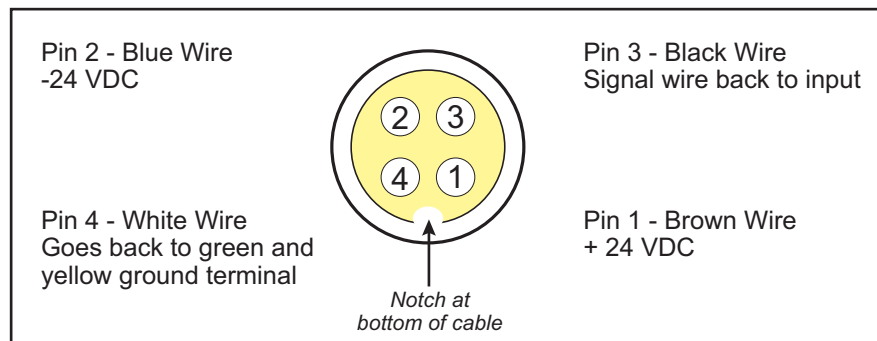
Adjusting a Prox Switch

Each prox switch should be .025 to .040 in. from its target. To adjust this distance, screw the prox switch in or out while using a feeler gauge to establish the desired distance from the target.


Testing a Prox Switch Cable

If a prox switch is not communicating with the PLC, it may be caused by faulty cabling. Using a voltmeter and referring to Figure 2-64, follow these steps:

Figure 2-64: Prox Switch Cable at the Switch



1. Disconnect the cable from the prox switch.
2. Turn the voltmeter to DC VOLTS. If it does not have auto-range, set it to at least 24 VDC.

WARNING	
	<p>All electrical work must be performed by a qualified electrician.</p>

3. To determine if voltage is going out to the prox switch:
 - a) Place the positive (red) voltmeter lead in pin 4 and the negative (black) voltmeter lead in pin 2.
 - b) If the cable is operating to the switch, the voltmeter will display 24 volts.
4. To determine if the cable back to the PLC input is working:
 - a) Create a jumper by stripping a piece of wire at both ends.
 - b) Place the jumper between pins 2 and 3.
 - c) Check the appropriate green LED light on the appropriate 24 VDC input card in the PLC rack.
 - d) If the cable is working, the green LED light will be on.

Thermostats in Electrical Enclosures

Setting the Thermostats on the Saw

A thermostat controls the cooling fans in the stationary-end electrical enclosure and the carriage-end electrical enclosure. Because the fan pulls air into the enclosure that contains unwanted dust, it is best to run the fan as little as possible while maintaining an adequate temperature inside the enclosure.

Adjust the thermostat by turning the dial located inside the electrical enclosure. See Figure 2-6.

- In winter or cold environments, set the thermostat to approximately 95°-100°F.
- In summer or warm environments, set the thermostat to approximately 80°F.

Setting the Thermostat in the PC Enclosure



Only saws with frame #412 and higher have a PC enclosure.

The thermostat inside the PC enclosure was set by the manufacturer to keep the cabinet at or below 95°F, which should be adequate for your computer's needs. If it becomes necessary to adjust the thermostat, follow these instructions.

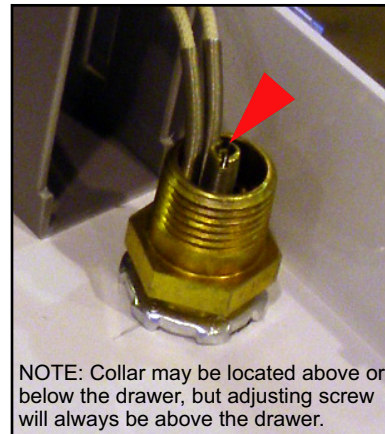
CAUTION

Do not remove the adjusting screw or turn the adjusting screw in too far. This can permanently damage the thermostat.

The slotted adjusting screw is shown in Figure 2-65. Turning the adjusting screw 1/4 turn changes the temperature approximately 25°F. Since you should never adjust this thermostat more than a few degrees at a time, turn the head only a very small amount. Then operate the saw and computer for several hours to test the adjustment.

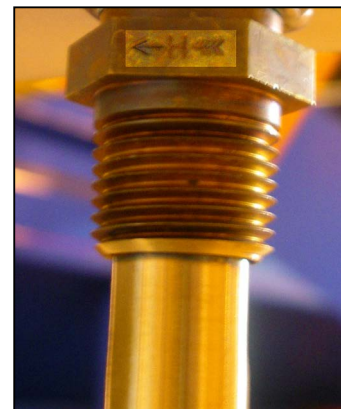
An arrow on the head of the thermostat directs you to turn the screw clockwise to increase the temperature setting or counterclockwise to decrease the temperature setting. See Figure 2-66.

Figure 2-65: Adjusting Screw



NOTE: Collar may be located above or below the drawer, but adjusting screw will always be above the drawer.

Figure 2-66: Direction to Turn Screw to Increase Temperature




Electrical Components



The stationary-end disconnect switch shuts off power to the entire saw. The carriage-end disconnect switch shuts off power only to the carriage end.

This equipment relies on highly technical electrical components to operate correctly. Most of the electrical components are located in the stationary-end electrical enclosure and the carriage-end electrical enclosure. They are labeled in Figure 2-6.

The stationary-end electrical enclosure is the main electrical enclosure. Although the 3-phase wiring enters into this enclosure to power the entire saw, most components in this enclosure control the stationary end of the saw. Likewise, most components in the carriage-end electrical enclosure control only the carriage end of the saw. Table 2-11 describes the function of the components on each shelf in both electrical enclosures.

WARNING	
	<p>ELECTRICAL HAZARD!</p> <p>Always verify that all power to the machine has been turned off and follow approved lockout/tagout safety procedures (OSHA 29 CFR 1910.147) before performing any maintenance on this equipment.</p> <p>All electrical work must performed by a qualified electrician.</p> <p>If it is absolutely necessary to troubleshoot an energized machine, follow NFPA 70E for proper procedures and personal protective equipment.</p>

For more specific information on the electrical components located on each shelf, refer to the panel layout sheets in Drawing 90501.

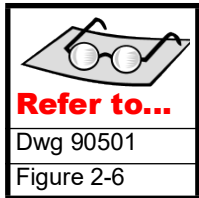
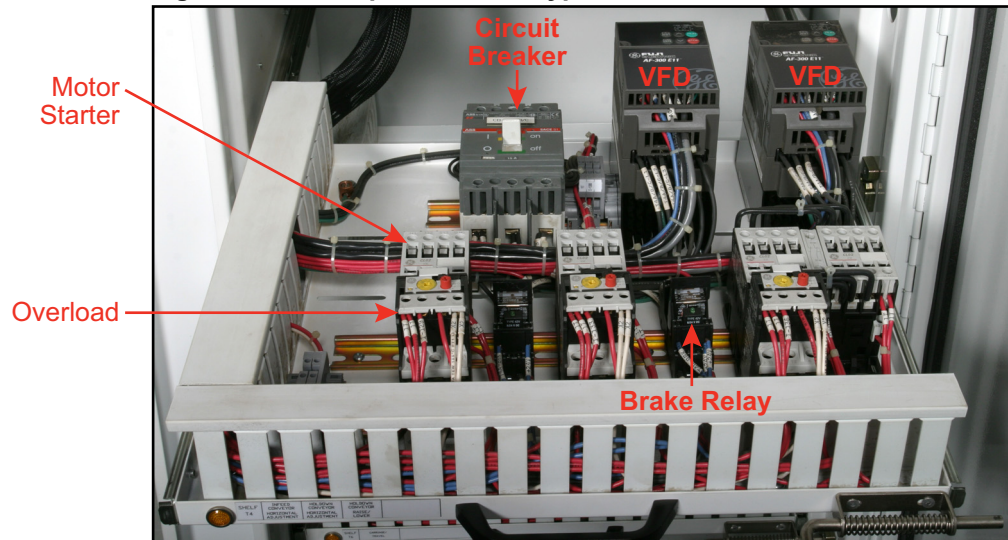


Table 2-11: What the Components on Each Electrical Enclosure Shelf Control

Enclosure	Shelf #	What the Shelf Controls
Stationary-End Enclosure	S1	Quad 2
	S2	Quad 1
	S3	Quad 6
	S4	Stationary-end infeed conveyor, horizontal travel Stationary-end hold-down, horizontal and vertical travel
	S5	Lumber stop Waste conveyor
	S6	Infeed conveyor chain
Carriage-End Enclosure	T1	Quad 3
	T2	Quad 4
	T3	Quad 5
	T4	Carriage-end infeed conveyor, horizontal travel Carriage-end hold-down, horizontal and vertical travel
	T5	Empty
	T6	Carriage

Figure 2-67: Components in a Typical Enclosure Drawer



Inspecting Electrical Connections

Every month, check the wiring outside the electrical enclosures for damage. Ensure the cable insulation is completely covering all cables and no wires are showing where they enter connectors. Repair any damaged wires or loose connections that you find.



Once every three (3) months, check to ensure all electrical connections inside the enclosures are secure. With the equipment de-energized, gently pull on each connection point. If any wires come loose, re-secure it to the proper connection terminal.

Keeping Electrical Enclosures Clean

CAUTION

**Do NOT use compressed air inside electrical enclosures.
Remove the filter from the enclosure before blowing out dust.**

Cleaning Filters



Clean the filters in all electrical enclosures every week:

1. Remove the filter from the enclosure.
2. Close the enclosure door out and carry the filter away from the enclosure so dust will not be forced inside the enclosure while cleaning the filter.
3. Blow out the filter with compressed air.
4. Place the filter back in the enclosure.
5. Shut the door after all filters are clean.

Replacing Filters

Replace the filters every year.




Vacuuming

Vacuum dust from the electrical enclosures every week.

Troubleshooting With an Energized Machine

It is recommended that you always de-energize the machine before performing service or repairs. However, sometimes it is necessary for the machine to stay energized to perform troubleshooting functions. If it is absolutely necessary to troubleshoot an energized machine, follow NFPA 70E and your company's energy control program for proper procedures and personal protective equipment.

WARNING	
	<p>ELECTROCUTION HAZARD!</p> <p>All electrical work must be performed by a qualified electrician.</p> <p>If it is absolutely necessary to troubleshoot an energized machine, follow NFPA 70E for proper procedures and personal protective equipment.</p>

If the Enclosure Door Is Shut

1. Ensure that all personnel in the area are aware of the status of the machine and never leave the machine unattended while it has power.

Figure 2-68: Opening the Door



2. Using a small, slotted screwdriver, turn the screw head shown in Figure 2-68 to manually release the interlock feature. This will allow you to open the enclosure door while leaving the disconnect switch in the ON position.

If the Enclosure Door Is Already Open

1. Ensure that all personnel in the area are aware of the status of the machine and never leave the machine unattended while it has power.
2. Leaving the stationary-end enclosure door open for troubleshooting purposes, remove the lock and tag from the electrical power source.
3. Pull down on the lever shown in Figure 2-69 and turn the disconnect handle to the ON position.

Figure 2-69: Turning On the Disconnect Switch



Checking for Voltage To and From Components

One of the first steps to take when troubleshooting an electrical component problem in the saw is to determine which electrical component is not working properly and why.

Determining If a Component Is Powered

To determine which electrical component is not working, you must first determine if power is getting to the component, then determine if power is proceeding on to the next component in the loop. Here are some pointers:

- Use an auto-ranging digital multimeter or voltmeter to measure the voltage.
- Wires entering the top of a component are generally for incoming power, but read your electrical schematics to confirm.
- Wires exiting the bottom of a component are generally for outgoing power, but read your electrical schematics to confirm.

Using the Maintenance Jumper When Checking Voltage

Some electrical components on the saw receive power only when they are receiving or sending a signal to act which makes troubleshooting more difficult. To work around this constraint, pull the maintenance jumper and the component will think it is receiving a constant signal. The maintenance jumper is discussed further in the *Maintenance Jumper* section on page MT-150.

PLC and Input/Output Cards

A PLC is a programmable logic controller. It houses input cards that supply information to the PLC and output cards that allow the PLC to supply information to the rest of the saw. It is the “brain” of the entire electrical system.

Placing the PLC into Run Mode

When troubleshooting, one of the first steps is to determine if the PLC is in Run Mode. In Run Mode, all 3 lights should be on: Power, Ok, and Run.

To reset the PLC and place it in Run Mode, refer to Figure 2-70. Turn the key to its horizontal position and back to vertical twice (2 times).

Figure 2-70: Turn Key TWICE to Reset the PLC



Replacing an Input or Output Card



The different types of input and output cards on the saw are NOT interchangeable.

The terminal strips must remain with their original assigned slot.

CAUTION

Turn power off to the PLC before removing an input or output card. Removing cards while power is on can cause a fatal fault in the PLC and drop it out of Run Mode.

An input card sends messages from components on the saw to the PLC. An output card sends messages from the PLC to the components.

When troubleshooting, start by attempting to move or activate the component in question while another person monitors the indicator light on the input and/or output card to determine if it is receiving input and sending output. If you suspect a card is not working, replace it. Use the electrical drawings to determine which output card to monitor.

To replace an input or output card:

1. Remove the terminal strip:

Each input and output card has a terminal strip on it so you can replace the card without removing individual wires. Remove the terminal strip by opening the front cover and pushing up on the small lever located at the arrow in Figure 2-71. Tilt the terminal strip downward to remove it.

Keep each terminal strip with its assigned slot; do NOT move the terminal strip with the card. The saw will not function unless all wires are running to the correct slot.

Figure 2-71: Push Lever Up to Release Terminal Strip

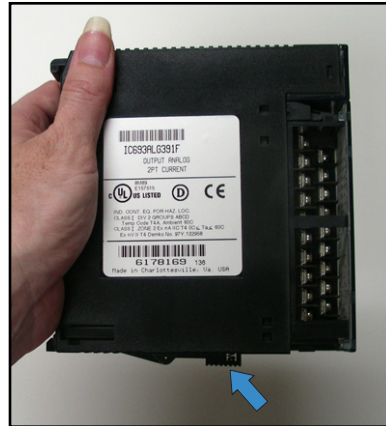


2. Remove the card:

Remove the card from its rack by pressing the release latch located on the bottom of the card. Tilt the card upward to remove it from the rack. See Figure 2-72.

Install the new PLC card by locating the top hinge and tilting the card downward until the catch snaps into place. Then locate the hinge on the terminal strip and tilt the terminal strip upward until the catch snaps into place.

Figure 2-72: Press Release Latch to Remove Card



For troubleshooting purposes, you can temporarily switch the suspected bad card with another card of the same type. Use your electrical schematics to determine which slots hold the same type of card.

Replacing a PLC

Starting in 2007, MiTek saws use a PLC with a CPU of model number 374 or higher. When ordering a PLC, you should receive Service Bulletin 175. This Service Bulletin applies when replacing an model earlier than 374 with a model 374 or higher. It also applies to replacing a PLC CPU model 374 with a PLC CPU of the same model Plug in the battery.

Replacing the Battery in the PLC

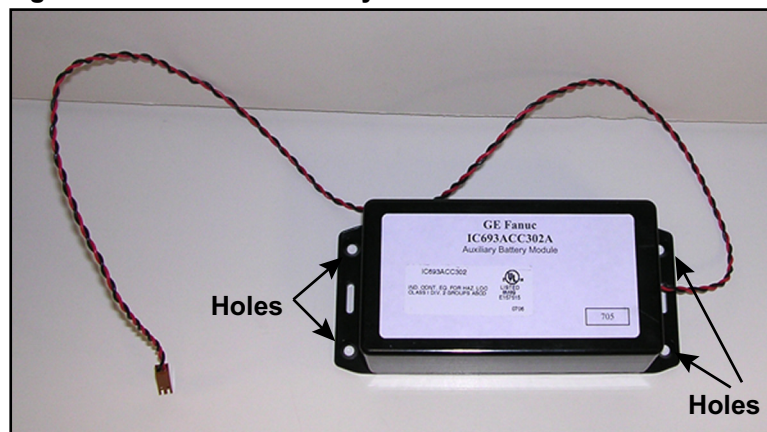


It is recommended that you replace the battery in a PLC CPU 374 or higher every 12 to 15 months. A red light on the PLC will illuminate if the battery is dead. If the battery is dead, the saw will continue to function normally while it is turned on. However, if the saw is turned off before the battery is replaced, your saw will lose important information including automatic programs, defaults, and calibration.




1. PLC CPU models 374 and higher have a separate battery.
 - a) Vacuum the bottom of the electrical enclosure.
 - b) Remove the old battery and discard, but keep the (4) 8-32 x 1/2 screws to re-use.
 - c) Line up the holes on the new battery (see Figure 2-73) with the existing holes in the enclosure, and screw the battery into place using four (4) 8-32 x 1/2 screws.

Figure 2-73: Holes on Battery



- d) Attach the battery to the electrical enclosure using the four (4) 8-32 x 1/2 round head screws included with your kit.
2. Plug the battery into the PLC by following these steps:

- a) Remove the cover from the battery compartment on the PLC rack.
- b) Plug the 2-pin plug that extends from the battery into the battery compartment.

WARNING	
	<p>ELECTROCUTION HAZARD.</p> <p>The following troubleshooting procedure should be performed only by or with the guidance of a qualified electrician.</p> <p>Follow NFPA 70E for procedures and personal protective equipment.</p>

- c) Return power to the saw and ensure the PLC is in Run Mode. Refer to page MT-139 to safely energize the saw with the enclosure door open.

VFD

Understanding VFDs



A VFD (variable frequency drive) is part of the communication loop between the PLC and electrical components that require variable speed control. Each variable speed electrical component has its own VFD. A VFD is one of the first links in the electrical circuit, so verifying voltage in and out of the affected VFD is a good first step in an electrical troubleshooting process.

The VFD display window is helpful when troubleshooting. The following scenarios may exist in the display window:

- When a VFD is powered but is not accepting any commands, “-000” flashes.
- When a VFD is receiving an input, the Run light and a speed command shows.
- If a VFD experiences a fault, one of the fault numbers listed in Table A-16 in the *Troubleshooting* appendix will appear. Refer to the *Alarm Conditions Menu* starting on page OP-97 to remedy the faults.

Setting VFD Parameters

Recommended VFD settings are listed in your electrical drawings. Contact MiTek Machinery Division Customer Service before attempting to reset any setting.

Measuring the Capacitance of the VFDs Main Circuit Capacitor

Refer to your VFD manual to predict the life of the main circuit capacitor. Depending on the VFD, it may be possible to measure its capacitance under certain conditions.

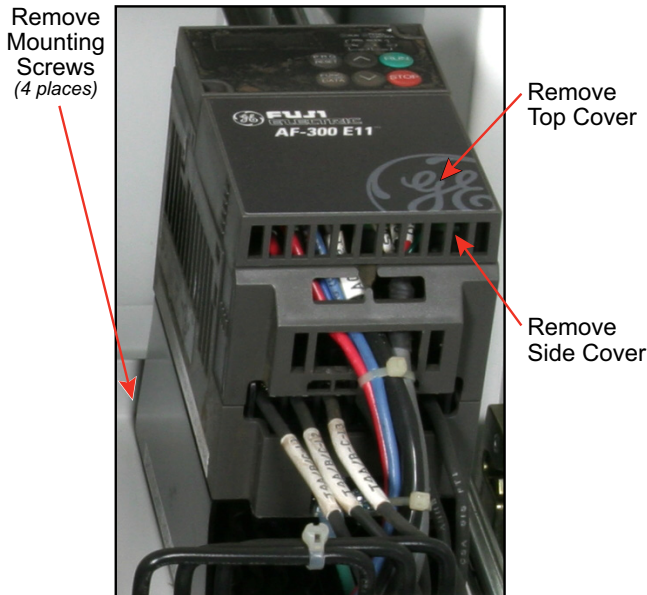
Replacing a VFD (Variable Frequency Drive)



All VFDs must be ordered through MiTek so they can be programmed before use.

There are a minimum of 16 VFDs on the saw. Refer to your electrical drawings and schematic to determine what each VFD controls and the replacement part number.

Figure 2-74: VFD



When replacing a Mitsubishi VFD with a GE VFD, you may need to add a brake relay to the electrical system. Request *Service Bulletin 157* when ordering your VFD.

To replace a GE VFD:



1. Remove the two (2) covers labeled in Figure 2-74.
2. Ensure all wires entering the VFD have wire labels. If not, refer to your electrical drawings and adhere wire labels before disconnecting anything.
3. Remove all wires from the VFD. They will need to be connected to the new VFD in the same way that they were connected to the VFD in need of repair.
4. Remove the four (4) mounting screws.
5. Install the new or repaired VFD by reversing the procedure above.



If MiTek drop ships a VFD directly from the manufacturer, your electrical schematic shows the parameter settings needed. Program the VFD according to these settings. If the new VFD is made by a different manufacturer than the original VFD, call MiTek Machinery Division Customer Service for the new settings. MiTek will provide support only for VFDs purchased through MiTek.

Circuit Breakers

Circuit breakers are used for certain components as an electrical circuit protection device.

Using the Handle

Manually operate the circuit breaker using the handle and the PUSH-TO-TRIP button on the circuit breaker. The handle has three (3) positions: On, Trip, and Off.

Manually Tripping the Circuit Breaker to Test

Manually trip the circuit breaker by pushing the PUSH-TO-TRIP button.

Resetting a Tripped Circuit Breaker

Reset the circuit breaker after it has been tripped by moving the handle to the off position, and then back to the on position.

Motor Starters and Overloads

Motor starters turn motors on and off. Overloads are usually mounted to the output side of the motor starter and act as safety switches. Certain alarms are associated with motor starter problems. A common cause of the alarms is the contacts are not making complete contact. This section describes the alarms and how to clean the contacts.

Environmental Temperature

The air temperature around the saw should never exceed 110°F. In high ambient temperatures, the motors are unable to dissipate heat effectively. When the temperature of the motor windings exceeds a preset value, the motor overload will automatically shut down the motor to prevent it from burning up.

Alarms Associated With Motor Starters

- **Motor Thermal Overload Alarm**—If an overload trips, reset it by pressing the red button located on the overload. An alarm appears on the touch screen monitor when this condition occurs.
- **Yellow Profibus Alarm**—A yellow Profibus alarm is often caused because the contacts on the motor starter are not making a good connection due to dust.
- **Motor Starter Safety Fault**—A motor starter safety fault occurs when the normally open contact connected to the PLC detects voltage on any of the inputs while that axis should not be moving. Press the reset button on the computer screen to clear the fault. If problem has not been corrected, the alarm will trip again after 2 seconds.

Cleaning Contacts

To clean the motor starter contacts:

CAUTION

Never use pneumatic air inside electrical cabinets. It will force dust and particles into electrical components causing them to fail.

1. Activate an E-stop. The starter will release (open) and the dust may be forced out.
2. If the problem continues, activate an E-stop again.
3. Lockout/tagout at the wall before opening the enclosure.
4. Vacuum dust from the enclosure and around the contacts.
5. Cycle the contacts by pressing the center spring loaded tabs of the starter up and down with a small screw driver while blowing canned air into the chamber. **DO NOT USE PNEUMATIC AIR FROM YOUR PLANT!**



Brake Relays

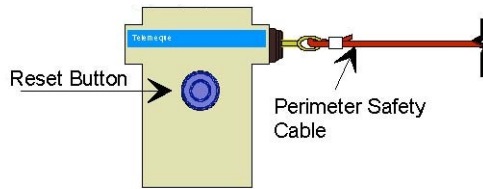
When a brake relay is energized, it releases the electrical brake in a motor. If a motor has air brakes, it does not rely on a brake relay. If the brake relay does not release when it should, you may get a yellow Profibus error.

The circuit can be manually closed by flipping the orange switch on the brake relay.

Maintaining the Perimeter Safety Cable

A properly tensioned perimeter safety cable will trip the E-stop switch when someone pulls it approximately 8 in. from its rest position at the mid-section of the saw.

Figure 2-75: Safety Cable and Switch



Resetting the Switch

Once the cable is pulled, reset the E-stop circuit by pressing the button labeled in Figure 2-75.

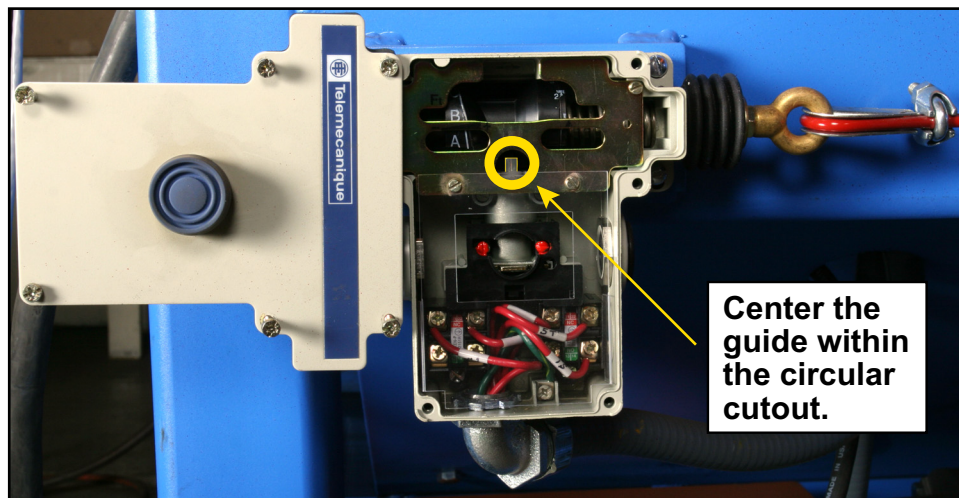
Adjusting the Perimeter Safety Cable

If the perimeter safety cable switch is not adjusted properly, a control power interrupt fault will appear, or the saw will fail to stop quickly enough.

To adjust the perimeter safety cable setting:

1. Remove the cover on the reset box.
2. Loosen the jam nut on the safety cable switch.
3. Turn the tensioning nut until the internal switch is centered in the cam. The internal switch and cam are circled in Figure 2-76.
4. Retighten the jam nut.
5. Replace the cover and tighten the screws.

Figure 2-76: Adjusting the Perimeter Safety Cable Switch



You may need to loosen the cable at the other end before tightening it at this end.

Maintenance Jumper

The maintenance jumper allows the operator to bypass certain features of the saw to make troubleshooting easier. Saw blades will not start while the maintenance jumper is pulled.

The arrow in Figure 2-77 shows the location of the maintenance jumper.


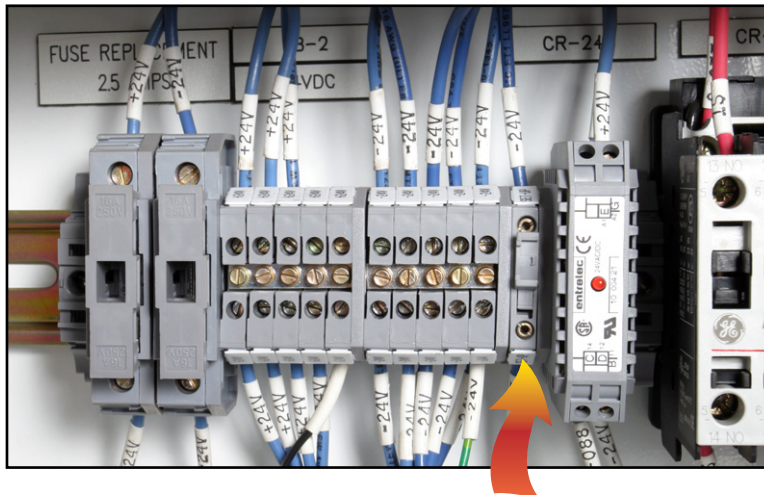
WARNING	
	<p>ELECTROCUTION HAZARD!</p> <p>The maintenance jumper provides an important safety barrier for operators during normal operation of the saw. If troubleshooting without the maintenance jumper in place, adhere to NFPS 70E guidelines.</p> <p>Always return the maintenance jumper to its working position when troubleshooting is complete.</p>

Figure 2-77: Location of Maintenance Jumper in Stationary-End Enclosure



When to Pull the Maintenance Jumper

Disable the maintenance jumper when you are troubleshooting alarms related to the Profibus system and VFD yellow faults. With the maintenance jumper disabled, the electrical system bypasses this feature and enables you to troubleshoot more easily.

How to Pull the Maintenance Jumper

Pull down the handle on the maintenance jumper to disable it. This is often referred to as “pulling the maintenance jumper.” The component remains intact and the handle stays attached to the component but in its disabled position. Figure 2-77 shows the maintenance jumper in its working position.

Blade-Installed Jumpers

The blade-installed jumpers send input to the PLC to tell it how many blades the saw has that should be operating. A blade-installed jumper is labeled in Figure 2-6.

Understanding Control Power Interrupts

The E-stop switches have a normally closed contact that has either “S” numbers or “T” numbers on both sides of it. The “S” numbers relate to stop circuit wires for the stationary end of the saw and the “T” number relate to stop circuit wires for the carriage end of the saw. Both the stationary end control power interrupt and the carriage end control power interrupt circuits use contacts on every emergency stop switch on the saw. If any of these contacts fail to close properly when the switch is reset, a Control Power Interrupt will be generated. If an emergency stop switch is tripped, the emergency stop fault will override any control power interrupt faults.

Outlets in Stationary-End and Carriage-End Enclosures

The outlets in the stationary-end and carriage-end electrical enclosures are standard 110 VAC outlets, but very little power is reserved to operate them. They exist to give MiTek personnel access to an outlet for laptops for troubleshooting purposes. Do not use the outlets for tools, high-powered vacuums, or any other electrical equipment that could draw more than 3 amps of current.

UPS (Uninterruptible Power Supply)

Always plug the monitor and computer into a UPS. It provides a battery backup which prevents damage to the components from unexpected power losses. Do not attempt to operate the saw from battery power for an extended period of time. The purpose of a UPS is to allow proper shutdown of the computer and monitor if incoming power is lost.

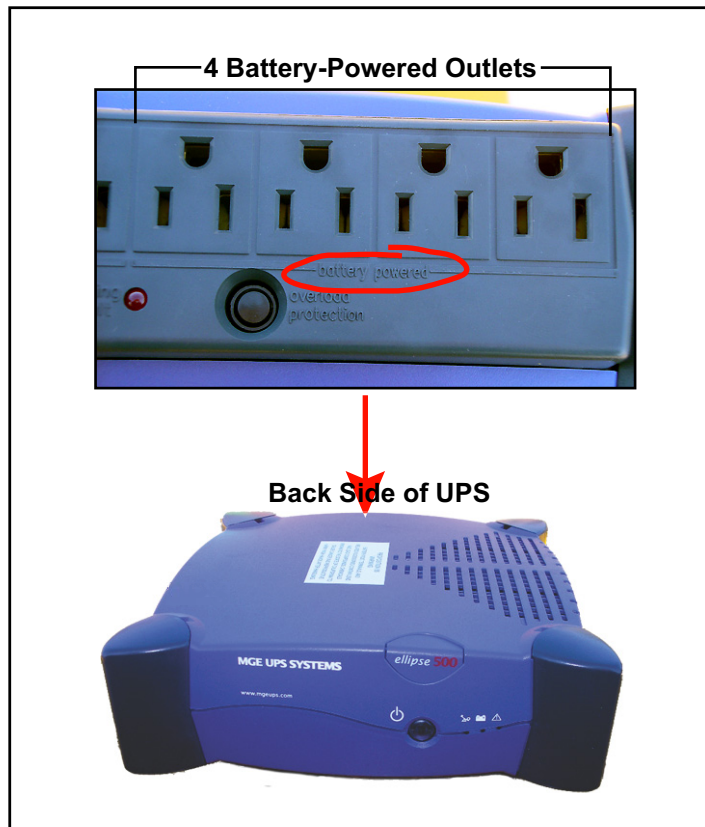
Outlet Usage

On a MiTek-supplied UPS, some outlets are battery powered and some are not. Make sure your monitor and computer are plugged into an outlet labeled “battery powered.” A typical UPS provided by MiTek is shown in Figure 2-78.

Warning Noise

When incoming power is lost and the UPS is using its battery store, it will emit a beeping sound. This means the UPS is working, but the monitor and computer should be properly shut down until the incoming power is restored.

Figure 2-78: UPS



Network Communications



You must be logged onto the saw as an administrator to perform most network communications functions.

CAUTION

Only qualified information technology professionals should modify a network or network connection. Incorrect settings could cause your equipment to stop operating or to operate incorrectly.

Understanding Network Interface Cards

The network interface cards (NICs) described in Table 2-12 may exist on your saw.

Table 2-12: Network Interface Cards

PLC network	This card allows the computer to communicate with the saw's PLC. It is an add-in card, so it can be replaced if it is faulty.
Plant network	This card is built into the computer's motherboard and is intended for use with your plant network. MiTek does not provide technical support for communication problems within your plant. If this card is faulty, the entire motherboard must be replaced.

Pinging a Network or NIC

“Pinging” is a way to tell if a specific IP address is accessible. If a “ping” gets a response, the component being pinged is receiving and sending data correctly.

1. From the *Windows* Start menu, choose *Run*.
2. Type *cmd* and click OK.
3. Type *ping ##.##.##.##* (replace the number signs [#] with your IP address).



Your plant network has a different IP address assigned by your company. MiTek can not provide technical support for plant network problems.

Entering the IP Address for the PLC Network NIC

If the PLC network loses communication with its NIC or you need to replace a PLC network NIC, follow these instructions to enter the correct IP address.

1. Right-click on *My Network Places* on the *Windows* desktop.
2. Click *Properties*.
3. Right-click *PLC* and choose *Properties*.
4. Click *Protocol TCP/IP*.
5. Click *Properties*.
6. Click *Use the following IP address*.
7. Type the IP address (128.1.0.10)
8. Type the sub net address (255.255.0.0)
9. Click OK.

Network Setup Information (Ethernet)

TCP/IP Protocol (Required by *Cimplicity*)

- IP Address - 128.1.0.10
- SubNet Mask - 255.255.0.0
- Client for Microsoft Network Properties
- Quick Logon
- Microsoft File and Printer Sharing Properties
- Browse Master - Disabled
- LM Announce - No
- Primary Network Logon
- *Windows* Logon

Replacing a NIC

To replace a NIC, simply pull the faulty NIC out of its connection port and insert a new one into the port.

Accessing the FILES Button When it Doesn't Show

When the FILES button will not display, do the following to correct it:


1. Connect the keyboard to the computer.
2. Open *Windows* Explore. See page OP-42 for instructions.
3. Highlight the C: drive.
4. Arrow down to the *Cimplicity* folder and press the right arrow key to open the folder.
5. Arrow down to the *MiTek* folder.
6. Arrow down to the *Scripts* folder.
7. On the right-hand side of the screen, you will see the contents of the Scripts folder. Locate and open the file called *cybersaw*.
8. Scroll down to the *frmSelector* section.

Here is an example of what you may see:

```
[frmSelector]
cboDisplay(0).ListIndex=1
cboDisplay(1).ListIndex=2
cboDisplay(2).ListIndex=0
cboDisplay(3).ListIndex=0
```

9. If the ListIndex numbers are different from the example or negative numbers, change them to match the text in the example.
10. Once you are finished changing the document, go to *File>Save*.
11. Try to access the FILES button on the touch screen again. If it still doesn't work:
 - a) Go to the Defaults screen, then to SPEEDS, then to ADVANCED.
 - b) On the Advanced page, press the RECONSTRUCT THE DATABASE button.

Navigating the Troubleshooting Appendix



Refer to...

Maintenance chapter for procedures and graphics

General Information chapter for truss terminology

Glossary for additional terminology

This appendix is divided into tables according to the symptoms the machine is having. Most solutions have a more detailed explanation in the *Maintenance* chapter. If you have an electronic file of this manual, click on any reference to another page or section, and it will take you there.

Symptoms and Solutions


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Fault Codes and Technical Data for Individual Components

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Table A-22	Inputs and Outputs by Function	MT-207

If you continue to have problems after performing all applicable troubleshooting steps and reviewing the topic in the *Maintenance* chapter, call MiTek Machinery Division Customer Service at the numbers listed in Figure 2-3.

Safety Notes for Troubleshooting

WARNING	
	<p>ELECTROCUTION, HIGH PRESSURE, CRUSH, CUT, AND CHEMICAL HAZARDS!</p> <p>Read all notes in this section AND the safety section in the preliminary pages before operating or maintaining this equipment.</p> <p>Most solutions are described in more detail in the <i>Maintenance</i> chapter and may have more safety notes included there.</p>



- All warnings located in the safety section in the preliminary pages apply at all times.
- When this graphic appears, you must lockout and tagout the equipment using approved methods described in OSHA 29 CFR 1910.147 before continuing with the procedure or troubleshooting.
- If the lockout/tagout graphic does not appear, it is recommended that you still de-energize the machine unless energy is required for the troubleshooting process. If it is absolutely necessary to troubleshoot an energized machine, follow NFPA 70E for proper procedures and personal protective equipment.
- All electrical work must be performed by a qualified electrician.
- Read this manual for information and procedures related to the specific maintenance or troubleshooting issue before attempting any maintenance!
- Safety goggles and a dust mask must be worn for all cleaning steps outlined in this manual. When using cleaning and lubrication solutions, a respirator rated for use with those solutions must be worn as well as gloves resistant to the solution.

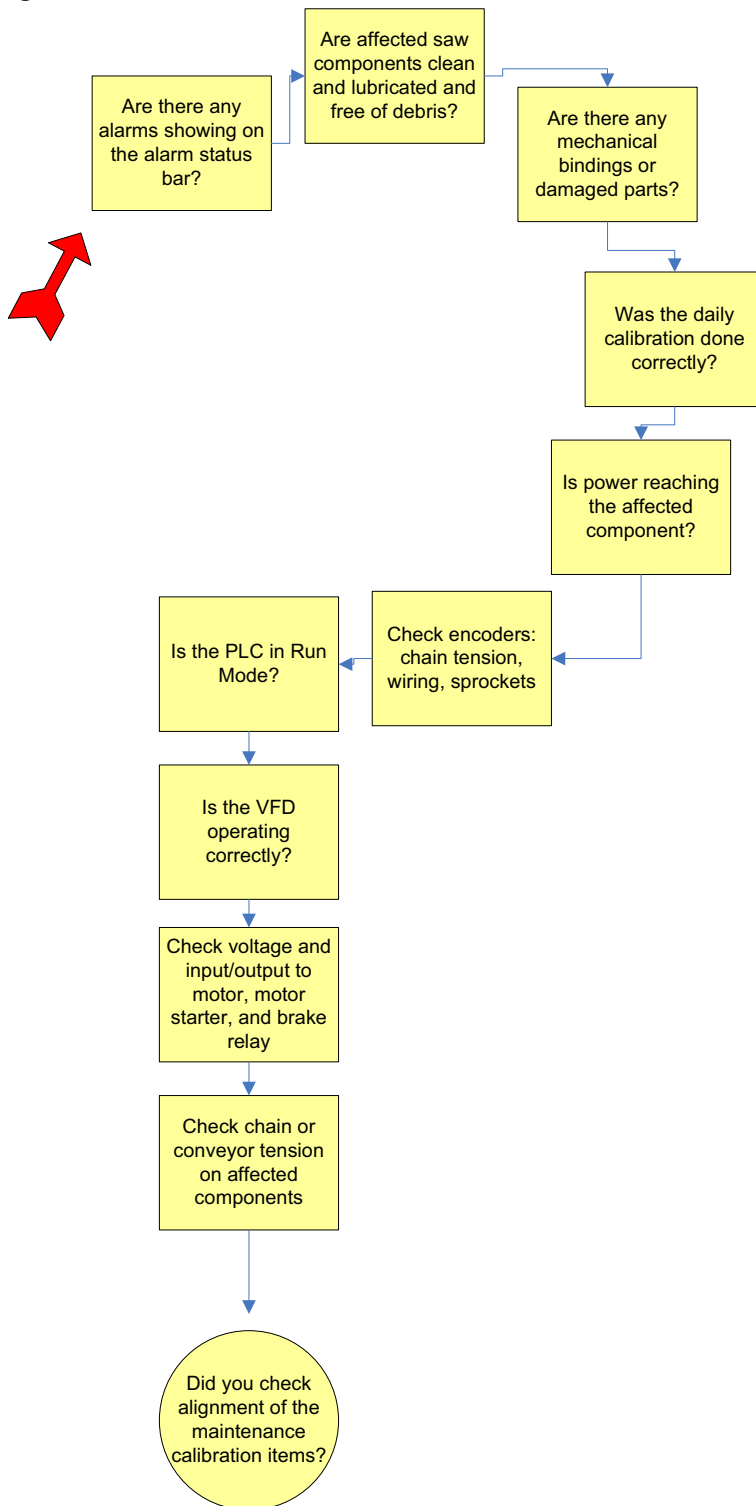
Operational Notes for Troubleshooting

- Do not use compressed air inside the electrical enclosures! It may force contaminants into the electrical connections.
- Clean and lubricate the equipment as a first step in most troubleshooting processes. Most malfunctions are caused by inadequate preventive maintenance.

Figure A-1: Never Use Compressed Air Inside an Electrical Enclosure



Figure A-2: Start Here to Determine Solutions





Symptoms and Solutions

Mis-Cut Boards

Most problems you will encounter will be due to the machine being out of calibration or adjusted incorrectly. Before spending valuable time searching for a problem, check the following:

Table A-1: Mis-Cut Boards

Problem	Possible Cause	Possible Solution	See Page
Overall lengths change from setup to setup or between types of cuts	Lumber is not fully supported	Use the center lumber support for long boards or a heel cut skid bar for log scarfs	OP-59 OP-60
	Lumber is bouncing off the lumber stop	Tighten the lumber stop. There should be little or no play in the lumber stop when you use two hands to rock it back and forth.	
	Lumber guide knife is worn or notched	Replace lumber guide knife.	MT-91
	Blades are cupped	Replace blades.	MT-76
	Blades are not parallel to the infeed conveyors	Check that infeed conveyor is parallel to blades and to the other infeed conveyor.	MT-90
	Blade pivot points are incorrect	Check the blade pivot points.	MT-86
	Blades are wobbling	Tighten the saw blade taper-lock bushing screws	
Send motor and hub assembly to MiTek to replace the motor			MT-66
Angle is wrong	Calibration is wrong	Check angle calibration	MT-55
	Angulation encoder chain too tight or too loose	Check the chain for proper tension.	MT-69
	Angulation chain too tight or loose	Check the angulation chain for proper tension.	MT-70
	Lumber guide knife dull or at wrong height	Check the lumber guide knife height setting.	MT-91
	If hold-downs are wearing out on one side and angle is wrong, infeed conveyors not aligned	Check that infeed conveyor is parallel to blades and to the other infeed conveyor.	MT-90



Should you lockout/tagout to safely perform this action?




Table A-1: Mis-Cut Boards (Continued)

Problem	Possible Cause	Possible Solution	See Page
Board has a heel when it should not	Lumber guide knife dull or at wrong height	Check the condition and height of lumber guide knife.	MT-91
	Center support not used or not adjusted correctly	If the center lumber support was used, ensure the height is adjusted properly. If it was not used, setup for the cut and check the touch screen for indication that the center lumber support should be used.	OP-59
	Centerline position is wrong	Check centerline actual position on screen compared to set point. Check centerline calibration.	MT-55
	Lumber stop incorrectly positioned	Check that the lumber stop is calibrated correctly and not set too far back. Check that the lumber stop is secure. There should be little or no play in the lumber stop when you use two hands to rock it back and forth.	MT-52
Scissor bottom chord heel (butt cut) is too short or tall	Lumber guide knife dull or at wrong height	Check the condition and height of lumber guide knife.	MT-91
	Blades are not parallel to the infeed conveyors	Check that infeed conveyor is parallel to blades and to the other infeed conveyor.	MT-90
	Centerline of blade 4 or 5 is wrong	Check centerline actual position on screen compared to set point. Check centerline calibration.	MT-55
Height of butt cuts are different within the same setup	Lumber is not fully supported	Use the center lumber support for long boards or a heel cut skid bar for long scarfs	OP-59 OP-60
	Lumber is bowed, twisted, or warped	Use heel cut skid bar. Improve lumber quality in the future.	OP-60
	Blades are not square at 90°	Check that the vertical dimension of the blades are a true 90° and recalibrate if necessary.	MT-55
	Blades are not parallel to the infeed conveyors	Check that infeed conveyor is parallel to blades and to the other infeed conveyor.	MT-90
	Hold-downs not parallel or square to the blades and infeed	Check hold-down alignment.	MT-96



Table A-1: Mis-Cut Boards (Continued)

Problem	Possible Cause	Possible Solution	See Page
Scarf cut is too short	Lumber guide knife dull or at wrong height	Check the condition and height of lumber guide knife.	MT-91
	Blades are not parallel to the infeed conveyors	Check that infeed conveyor is parallel to blades and to the other infeed conveyor.	MT-90
	If the scarf cut is too short and the butt (heel) cut and lengths are correct, then the actual angle cut is wrong.		
Not enough boards were cut for the setup, but saw DID shut off	Outfeed limit switch bad or counting board twice	Adjust or replace limit switch	MT-132
	Saw doesn't combine grades but pick list does.	Check the <i>Combine Like Grades</i> setting in <i>CyberSort</i> and on the saw.	
Not enough boards were cut for the setup, and saw did NOT shut off	Outfeed limit switch arms not adjusted to contact every board.	Adjust the limit switch.	MT-132
	Saw combines grades but pick list does not.	Check the <i>Combine Like Grades</i> setting in <i>CyberSort</i> and on the saw.	
Too many boards were cut for the setup	Boards not consistently hitting infeed and outfeed limit switches	Adjust the limit switch.	MT-132
	Saw combining grades and pick list is not	Check the <i>Combine Like Grades</i> setting in <i>CyberSort</i> and on the saw.	
Boards were not separated by species or grade	Grades get combined on import	Check the <i>Combine Like Grades</i> setting in <i>CyberSort</i> and on the saw.	
Boards were separated by species or grade	Grades get separated on import	Check the <i>Combine Like Grades</i> setting in <i>CyberSort</i> and on the saw.	
When the boards are laid out on assembly table, there are large gaps at joints	Assembly table setup is wrong	Verify jiggging is in the correct location. Due to variations in lumber quality, it may be necessary to reposition jiggging.	
	Lumber is not straight	Check the straightness of the board along all edges. Lumber that is not straight will result in incorrect cuts.	
	Accuracy or quality of the cut is not sufficient	Perform the calibration test and correct any miscalibrated components.	MT-49



Should you lockout/tagout to safely perform this action?




Saw Not Operating or Stopping Correctly

Setup problems specifically related to a centerline, angle, infeed, hold-down are covered in other tables in this appendix.

Table A-2: Saw Not Operating or Stopping Correctly

Problem	Possible Cause	Possible Solution	See Page
E-stops do not stop all movement, including blades, within 6 seconds	Faulty E-stop circuit or control power interrupt system	A qualified electrician must refer to electrical schematics to determine the circuitry problem immediately.	
Saw blades do not stop within 6 seconds of pressing STOP button on touch screen or E-stop	Faulty E-stop circuit or control power interrupt system	A qualified electrician must refer to electrical schematics to determine the circuitry problem immediately.	
	Air pressure is low	Check air pressure at the regulator. If it is below 100 psi, repair or replace the air source. If it is above 100 psi, fix or replace pneumatic lines on the saw as necessary.	
	Air brake gap is incorrect	Align air brakes immediately.	MT-73
	Brakes are worn	Replace brake pads immediately.	MT-75
Power is reaching saw (maintenance lights come on), but it does not run	E-stop is engaged	Pull any depressed pushbuttons and reset pull cord switch and swing guard switch.	OP-44 MT-194
	An alarm condition exists	Check for alarm conditions and reset or correct problem causing alarm. See Table A-10.	MT-192
	Voltage is not transmitting through a faulty component, cable, or connection	Determine where in the circuit the voltage stops transmitting and troubleshoot those components.	MT-139
	Control power relay(s) not engaged	Using the electrical schematics, check control power relays for proper operation.	
	PLC is faulty or not in Run Mode	See Table A-10.	MT-196
Saw will not turn on	Touch screen locked up	Shut down touch screen completely and restart.	
	Incoming power is turned off	Ensure the main power source from your plant electrical system is on. Ensure the disconnect switches on both the stationary and carriage-end enclosures are on.	OP-44
	Transformer feeding the saw has failed	Check that there is power on the output side of the transformer using a voltmeter.	MT-139



Should you lockout/tagout to safely perform this action?




Table A-2: Saw Not Operating or Stopping Correctly (Continued)

Problem	Possible Cause	Possible Solution	See Page
No blades will turn ON	E-stop is engaged	Pull any depressed pushbuttons and reset pull cord switch and swing guard switch.	OP-44 MT-194
	Loss of control power	Replace burned-out fuses on primary side of transformer or the output of 24 VDC power supply.	
		Make sure 120 VAC is present on the secondary side of transformer and 24 VDC is present on the output of DC power supply.	
No or low air pressure	Make sure air supply valve is connected to saw and correct air pressure is set.	MT-103	
One blade will not turn on	Failed electrical component	Using the electrical schematics, inspect all components and wire connections associated with that blade.	
	Blade is out of cut	Pull the maintenance jumper, move axis back to operating zone.	MT-150
		Push the maintenance jumper back in.	
Motor locked up	Look for mechanical bindings, dirt build-up, etc. Check to ensure that brake valve is releasing brake.	MT-59	
One blade runs in the wrong direction	Wrong connection	Swap any two phases of supply to the motor.	MT-69
One half of the saw works, the other half does not	Disconnect switch is off	Check both disconnect switches.	MT-37
	Circuit breaker that supplies the carriage end is off	Check circuit breaker.	
	Communication loss between rack 1 and rack 2	Check that the end to end communications cable is properly connected at both ends.	
		Check the integrity of the end to end cable by checking continuity of the terminals.	
	Communications cable terminating plug is improperly connected	Check communication cable and terminating plug.	
Rack 2 or rack 3 is bad	Replace bad rack.		



Should you lockout/tagout to safely perform this action?




Table A-2: Saw Not Operating or Stopping Correctly (Continued)

Problem	Possible Cause	Possible Solution	See Page
Operation of the carriage end is intermittent or erratic	Loose connection on PLC rack 1, 2, or 3	Tighten both ends of the remote rack communication cable.	
	Communication loss between rack 1 and rack 2	Check that the end to end communications cable is properly connected at both ends. Check the integrity of the end to end cable by checking continuity of the terminals.	
	Communications cable terminating plug is improperly connected	Check communication cable and terminating plug.	
	PLC rack 2 or rack 3 is bad	Replace bad rack.	
Blade angle will not move & no alarms exist	Blade size is not properly set up in the computer	Check blade size setting in Default screen. Blade will not move if blade size is not set.	OP-93
	Blade-installed jumper missing	Blade-installed jumper must be in place. Default screen will show “Blade X Not Installed” if jumper is not in place.	MT-151
	VFD settings are not properly set	Check VFD settings. Settings are listed on the VFD HELP screen. New drives will have to be set.	MT-145
	Brake is not released	Check to make sure the angle brake is released.	
	Angle is jammed	Remove any debris that may be preventing the axis from moving. Clean and lubricate the quad. Dirt and pitch may be preventing movement.	
Carriage will not move & no alarms exist	Carriage is not properly calibrated	Verify carriage calibration.	MT-49
	Carriage drive VFD settings are incorrect	Check VFD settings. Settings are listed on the VFD HELP screen. New drives will have to be set.	MT-145
	Carriage mechanical drive components are damaged or worn	Check the carriage drive gears and coupling.	
Saw will not do semiautomatic or automatic setups	Maintenance jumper has been removed. If so, a system alarm exists.	Replace maintenance jumper.	MT-150
Several errors in rapid succession that are incorrect	PC not communicating with PLC	See <i>PC not communicating with PLC</i>	



Table A-2: Saw Not Operating or Stopping Correctly (Continued)

Problem	Possible Cause	Possible Solution	See Page
Infeed Conveyor chains will not run	A blade that is in the cut has not started or does not appear to have started	A safety interlock prevents the Infeed from starting in automatic when a blade that is in-cut is not running. Input to PLC did not function. Use electrical schematics to check the input.	
	Chain drive component has become disconnected	Check drive couplings and chains.	
	Chains are jammed	Look for debris jamming chains. Clean and lubricate.	
PC not communicating with PLC	PLC and computer started up improperly	Press the SHUTDOWN button & restart computer. Make sure power to PLC is on. The fiber optic converter (for saws with fiber optics) must be powered ON before the computer boots and tries initial test.	OP-53
	Saw's network is disconnected or faulty	Check the LAN status light on the PLC CPU (rack 0, slot 2). The light should blink green. Check the media converter send/receive status lights. They should blink green. (only on saws with fiber optics) Check for power to the media converter. (only on saws with fiber optics) Check the communication cable for damage or loose connections. Check the saw's network card settings. If someone tried to connect the saw to a plant-wide network, recently, it is likely that network card settings that are critical to saw operation have been changed. Check status lights on PLC CPU and media converter (see Section 4).	
Carriage passing set point	Carriage moving too fast	Lower the low speed setting on the Default Speeds screen. Increase carriage low speed slow-down setting on Speed Zone Settings screen.	OP-94



Table A-2: Saw Not Operating or Stopping Correctly (Continued)

Problem	Possible Cause	Possible Solution	See Page
Carriage length inaccurate	Encoder spur gear not properly meshed with rack	Ensure that encoder drive spur gear is tight in rack.	
	Spur gear or other component is loose	Check set screws that joins encoder to shaft. Check that spur gear is tight on shaft. Check coupling.	
	Encoder or encoder wiring is faulty	Check encoder and encoder wire connections.	
	Profibus network is malfunctioning	Check Profibus Master card status lights.	
Several axes will not move	One of the electrical cabinets does not have power	Ensure that power is on to both control panels.	OP-93
	Proximity switch is not properly adjusted	Check the distance between the proximity switch and cam.	MT-133
		Check alignment of proximity switch to cam. The proximity switch must be centered on the cam (not on outside edges of cam).	MT-133
	E-stop is activated	Ensure that an E-stop is not activated.	OP-44
	PLC is out of Run Mode	Ensure that PLC is in Run Mode.	MT-142
	PLC cable connections are loose	Ensure that the PWR, OK, and RUN lights on all four PLC racks are on. Check the end-to-end PLC cable and connections. This cable connects racks 1 & 2 (carriage end).	
One PLC rack has no lights on	Power supply is faulty	Replace power supply.	
	Power to the PLC is interrupted	Check the 120V input to power supply.	MT-139
	A PLC module or the PLC power supply is bad	Remove one input/output card at a time from the rack. If lights come on, the last card removed must be replaced.	MT-142
Infeed conveyor will not go faster	Maximum infeed conveyor speed setting is set too low	Change maximum speed setting on the Default screen.	OP-94
	VFD setting are incorrectly set	Check VFD settings.	MT-145
	Infeed chains are bound up	Check that nothing is preventing the chains from moving.	




Should you lockout/tagout to safely perform this action?



Table A-2: Saw Not Operating or Stopping Correctly (Continued)

Problem	Possible Cause	Possible Solution	See Page
Blades 1 through 4 will not move out of or into the cut	Angle will not move	See Table A-4.	MT-173
	Centerline will not move	See Table A-4.	MT-173
	CyberSort file is incorrect	Check touch screen for the angle and determine if the setup specifies that the quad is out of/into the cut. Regenerate EZY file with CyberSort.	
Blades 5 or 6 will not move out of or into the cut	Centerline unable to move to 3"	Check centerline movement by using Manual Mode to move the centerline. Check for obstructions.	
	Angle unable to move to 90.0 deg.	Check angle movement by using Manual Mode to move the angle. Check for obstructions.	
	Air supply is inadequate	Clean off vents in filter/regulator. Check for water in the lines or frozen lines. Replace mufflers.	MT-103
	Air valve not operating properly	Check for debris or other items that may be preventing the slide from moving. Clean and lubricate the horizontal slide. Check air valve manual override is not actuated. Manual override is a red screw on the solenoid. Check air valve solenoid is not bad by checking for continuity across the coil. Check that PLC output turns on and off.	MT-62 MT-139
Nothing moves when INITIATE SETUP is pressed	All axes are already in position	Check to see if all axes are in position which should be indicated on the Automatic Mode screen. Re-initiate setup to see if this corrects the problem.	
	Alarm condition exists	Correct cause of any faults that exist. See Table A-10.	MT-192
	E-stop is activated	Ensure that an E-stop is not activated.	OP-44
	PLC not in Run Mode	Toggle key switch on PLC CPU off and on 2 times to reset the PLC in Run Mode.	MT-142



Should you lockout/tagout to safely perform this action?




Table A-2: Saw Not Operating or Stopping Correctly (Continued)

Problem	Possible Cause	Possible Solution	See Page
One of the axis moves when the main power is on and does not stop until an E-stop is activated.	Output card is faulty	Replace card.	MT-142



Computer-Related Problems


Table A-3: Computer Related Problems

Problem	Possible Cause	Possible Solution	See Page
Touch screen is blank or black	Loose connections	Check all cable connections at components and terminal blocks.	
	Power to touch screen, computer, or a UPS is off	Turn power on to the monitor, the monitor's UPS, the computer in the PC enclosure, and the computer's UPS.	OP-53
	Voltage supplied to UPS is out of acceptable range	Check incoming power to the UPS and verify that it is 120 VAC +/- 10% (+/- 12 VAC) of nominal voltage (reading should be between 108 VAC and 132 VAC).	
	Voltage supplied from UPS to touch screen is out of acceptable range	Check power coming from the UPS and verify that it is 120 VAC +/- 10% of nominal voltage.	MT-139
Some of the touch screen buttons are black (Communications between the touch screen and PLC have been disrupted)	PLC not in Run Mode	Toggle key switch on PLC CPU off and on 2 times to reset the PLC in Run Mode.	MT-142
	<i>Applicable to fiber optic saws only:</i> Media converter is improperly set	Media converter should be set to MidiX and not Midi.	
	Ethernet card settings are incorrect	Check the network setup information.	MT-154
	Missing TCP/IP address for saw's network card or network card is faulty or settings are incorrect	Only a qualified IT person should modify network settings! Ensure card is seated properly. Ping the card. Check and adjust network settings.	MT-153 MT-154
	Internal NIC is faulty	Replace internal NIC.	MT-154
	Cable is damaged or loose connection	Inspect cables between computer and PLC, PLC and touch screen, and all KVM extender cables	
	<i>Applicable to fiber optic saws only:</i> Cable is damaged or wired incorrectly Fiber optic card is faulty Media converter bad or set incorrectly	Verify that the cable ends on the stationary end is in the opposite order as they are on the touch screen end (see electrical dwgs). Fiber optic cable was kinked and must be replaced. Replace fiber optic card. Verify that the media converter is set to midi X.	



Table A-3: Computer Related Problems (Continued)

Problem	Possible Cause	Possible Solution	See Page
Beeping noise in the touch screen enclosure or PC enclosure	Loss of incoming power	The UPS is using battery backup to power the monitor and computer. Shut the computer down properly and wait until the power is restored.	MT-152
	UPS is faulty	Replace UPS.	
A keyboard plugged into the front of the touch screen enclosure does not work	Computer did not recognize that the keyboard was plugged in prior to startup	Shut the computer down, plug in the keyboard, and restart computer.	OP-53
	Connection between the computer and the front panel may be loose	Check the connection unplug and re-plug both ends of the adapter, and restart the computer.	
	Keyboard is faulty	Determine if keyboard works at another computer. If not, replace keyboard.	
	KVM extender (in saws with a PC enclosure) is faulty	Replace KVM extender.	MT-121
No batch files appear on the list for importing	Viewing the wrong setting	Change the Batch Status field on the Batch Selector screen (FILES button) when viewing file.	
Cannot transfer files from a floppy disk	No EZY files to transfer	Use <i>Windows</i> Explore to verify there are EZY files on the disk.	
	Floppy disk is bad	Re-copy files to a new (unused), formatted floppy disk and try to transfer.	
Floppy does not work at all	Dirt in the floppy	Blow out the drive with canned air manufactured specifically for computer components. Do NOT use the plant compressed air! Be careful not to blow more dirt into the drive.	
	Cable problem	Check that the cable is connected. Check the red line is closest to pin 1. Check the power cable to the drive.	
	Drive problem	Replace the drive.	
Cannot transfer files from a network drive	Plant network card is bad	Ping the card. Check to see if the network is working from another machine within the plant.	MT-153
	Plant network not working	Contact the individual responsible for your network. <i>MiTek personnel are not trained to provide assistance with plant networking problems.</i>	
Touch screen is white	Check video card.	Check card reseat the board.	



Should you lockout/tagout to safely perform this action?




Table A-3: Computer Related Problems (Continued)

Problem	Possible Cause	Possible Solution	See Page
Floppy drive stays lit	Ribbon cable may be loose	Check the cable and ensure a snug fit. Check the red line is closest to pin 1.	
When the computer loads, it gets stuck on Scandisk and it will not complete the scan	Prior to Windows XP: Hard drive is faulty	Replace the drive. Call MiTek for guidance.	
Boot disk error	Hard drive is faulty	Replace the hard drive.	MT-121
Blue screen stating it cannot write to drive C	Hard drive is faulty	Replace the hard drive.	MT-121
Windows protection error	The touch screen computer needs a flash bios upgrade or it has a bad hard drive	Call MiTek Machinery Division Customer Service.	
Getting runtime error	Cutting files database is corrupted	Select the RECONSTRUCT DATABASE button on the Default Parameters>Default Speeds>Advanced Settings screen.	
Cursor jumps around on the screen	Touch screen membrane is worn	Replace the membrane.	
Touch screen does not respond or the wrong button responds	Touch screen membrane is worn	Replace the membrane.	MT-112
	Software or hardware settings are wrong	Fix any conflicts under the <i>Windows</i> Device Manager. Check the COM port setting for the touch screen including baud rate.	
Can't access the FILES button	Script is corrupted	Reset the script settings.	MT-155



Centerlines and Angles

Table A-4: Centerlines and Angles

Problem	Possible Cause	Possible Solution	See Page
Centerline will not hold calibration	Brakes on motor are worn	Replace brake or motor	MT-66
	Speed settings are incorrect	Adjust the VFD speed settings	OP-94
	Acme nut loose	Tighten nut	
	Encoder drive connections are not secure	Check for proper tension in the encoder drive chain. Check that the sprocket is secure.	MT-69
	Encoder is not working	Check for encoder alarms and fix the fault. See Table A-10. <i>If no alarms exist:</i> Check for loose cable connections and damaged cables. Replace Profibus card in PLC rack. Replace encoder.	MT-192 MT-142 MT-124
Centerline hunts for position during automatic or semiautomatic setup	Axis cannot move freely	Clean and lubricate. Inspect for damage.	MT-59
	Medium and/or low speed set too low or too high	Increase or decrease value.	OP-93
	Encoder sprocket to chain engagement is loose or misaligned	Tighten and align sprocket to chain.	
	ACME nut loose or misaligned	Check mounting bolts. Check alignment.	
Angle hunts for position during automatic or semiautomatic setup	Axis is dirty	Clean and lubricate. Inspect for damage.	MT-59
	Speed settings are incorrect	Adjust the VFD speed settings	OP-94
	Angle chain tension is incorrect	Check chain tension and chain tensioners.	MT-70
	Drive sprocket is damaged or not secure to shaft	Check for damage to the sprocket and that the sprocket is secure to the shaft.	

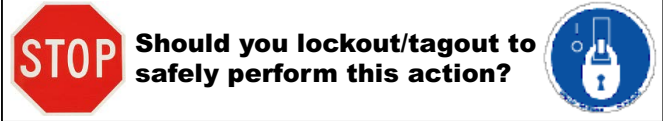


Table A-4: Centerlines and Angles (Continued)

Problem	Possible Cause	Possible Solution	See Page
Centerline does not move	Axis is already in position	Press INITIATE SETUP. If an “All axes in position” message displays, then the centerline should be in the correct position for the setup. If not, proceed with troubleshooting.	
	Spider coupling is not assembled properly	Check insert and set screws	
	Axis cannot move freely	Clean and lubricate. Inspect for damage.	MT-59
	An alarm condition exists	Check for alarms and fix the fault. See Table A-10.	MT-192
	Encoder, motor starter, brake relay, VFD, PLC or motor is faulty	See Table A-10, yellow Profibus encoder fault	MT-195
Centerline will only move in one direction	PLC output is not operating	Check that the PLC is in Run Mode. Refer to the electrical schematics. While jogging the centerline in the direction that the centerline will not move, check to see that the output card's indicator light is on	MT-142
		Check that there is power to the VFD and it is operating correctly.	MT-145
During setup, centerline moves and stops but screen indicates “All axes not in position”	Axis cannot move freely	Clean and lubricate. Inspect for damage.	MT-59
	Low speed setting too low	Increase low speed setting on the Default screen.	OP-94
Centerline does not move smoothly	Mechanical binding	Clean, lubricate and inspect the slide and acme nut.	MT-59
Centerline is abnormally noisy when it moves	Axis cannot move freely	Clean and lubricate. Inspect for damage.	MT-59
	Motor is not receiving required power or power quality	Check phase-to-phase and phase-to-ground voltage readings of all three legs of power. Readings should be within +/- 10% of each other.	
	Motor bearings are damaged	With power removed from the saw, disconnect the motor from its load. Manually release the brake. Rotate the motor shaft and listen for any abnormal noise. If noise exists in the bearings, replace them.	



Should you lockout/tagout to safely perform this action?



Table A-4: Centerlines and Angles (Continued)

Problem	Possible Cause	Possible Solution	See Page
Centerline moves in the opposite direction than it should be moving	Encoder not counting properly	Check encoder chain and sprockets to ensure they are secure and properly tensioned.	MT-123
	Centerline was improperly calibrated	Verify centerline calibration and correct if necessary.	MT-49
Centerline vibrates when moving	Axis is dirty and needs lubrication	Clean and lubricate. Inspect for damage.	MT-123
	Slide is damaged	Inspect and repair if needed.	
	Acme screw and/or nut is worn	Inspect and replace if needed.	



Should you lockout/tagout to safely perform this action?



Infeed Conveyors

Table A-5: Infeed Conveyors

Problem:	Possible Cause:	What To Do:	See Page
Infeed conveyor will not hold calibration	Infeed conveyor is not parallel to blades (misaligned)	Check for loose bearings on Infeed Conveyor drive shaft.	MT-90
		Check if infeed conveyor is parallel to blades.	
	Check for loose bearings on the infeed conveyor drive shaft.		
	Determine if the pinion has jumped one or more teeth on the rack. Check the pinions for damaged teeth. Extend the infeed conveyor and inspect the racks for damaged teeth.		
	Sprockets slipping	Inspect and replace sprockets.	
	Encoder drive connections are not secure	Check for proper tension in the encoder drive chain. Check that the sprocket is secure.	MT-123
	Encoder faulty	Check for encoder alarms. If alarm exists, refer to Table A-10. If no alarms exist: Check for loose cable connections and damaged cables. Replace encoder. Replace Profibus card in PLC rack.	MT-192 MT-124 MT-142
All blades are running but the infeed conveyor chains do not start	The PLC did not receive a run signal back from each of the blades that are in the cut. Check the following lights to determine which blade is not sending a run signal	Determine which light does not come on. Possible causes are: Loose or broken wire to the input card. Bad input card. Dirty or bad contact on motor starter.	
	Bad conveyor motor, motor starter, or overload	Determine which parts are faulty and replace them.	
	Loose or broken wiring	Use the electrical schematic to determine which connections to inspect.	
Infeed conveyor vibrates when moving	Axis is dirty and needs lubrication	Clean, lubricate and inspect the moving components.	MT-59



Should you lockout/tagout to safely perform this action?



Table A-5: Infeed Conveyors (Continued)

Problem:	Possible Cause:	What To Do:	See Page
Infeed conveyor hunts for position during automatic or semiautomatic setup	Infeed conveyors drag on square drive shaft	Clean and lubricate square drive shaft.	MT-59
		Move the carriage back and forth looking for indication that the square drive shaft is causing excessive drag on the infeed conveyor.	
		Check alignment of the square drive shaft.	
	Medium and/or low speed set too low or high	Adjust settings.	OP-94
	Axis cannot move freely	Clean, lubricate and inspect the moving components.	MT-59
	Drive chain or drive sprocket is loose	Check the tension on the drive chain.	MT-69
		Check that the drive sprocket is secure to the shaft and replace if damaged.	MT-93
Encoder sprocket to chain engagement is loose or misaligned	Check tension in the encoder drive chain. Check that the sprocket is secure.	MT-123	
Infeed conveyors chain tension is incorrect	Check tension of the infeed conveyor chains.	MT-89	
Infeed conveyor does not travel	Axis is already in position	Press INITIATE SETUP. If an “All axes in position” message displays, then the infeed conveyors should be in the correct position for the setup. If not, recalibrate the axis.	
	Axis cannot move freely	Clean, lubricate and inspect the moving components.	MT-59
	An alarm condition exists	Check for an alarm. See Table A-10.	MT-192
	Encoder, motor starter, brake relay, VFD, PLC or motor is faulty	See Table A-10, yellow Profibus encoder fault.	MT-195
	PLC output is not operating	Check that the PLC has incoming power and is in Run Mode.	MT-142
Refer to the electrical schematics and determine if output card is receiving an input.		MT-142	
Infeed conveyor only travels in one direction	PLC output is not operating	Check that the PLC has incoming power and is in Run Mode.	MT-142
		Refer to the electrical schematics and determine if output card is receiving an input.	MT-142




Should you lockout/tagout to safely perform this action?




Table A-5: Infeed Conveyors (Continued)

Problem:	Possible Cause:	What To Do:	See Page
During setup, infeed conveyor travels and stops but screen indicates "All axes not in position"	Axis cannot move freely	Clean, lubricate and inspect the moving components.	MT-59
	Low speed setting is too low	Increase low speed setting on the Default screen	OP-94
Infeed conveyor does not travel smoothly	Axis cannot move freely	Clean, lubricate and inspect the moving components.	MT-59
Infeed conveyor is abnormally noisy when it moves	Axis mechanical components are dirty or need lubrication	Clean, lubricate and inspect the moving components.	MT-59
	Infeed conveyor is not parallel to blades (misaligned)	Check for loose bearings on Infeed Conveyor drive shaft.	MT-90
		Check if infeed conveyor is parallel to blades.	
		Check for loose bearings on the infeed conveyor drive shaft. Determine if the pinion has jumped one or more teeth on the rack. Check the pinions for damaged teeth. Extend the infeed conveyor and inspect the racks for damaged teeth.	
	Infeed conveyors bind on square drive shaft	Clean and lubricate square drive shaft.	
		Move the carriage back and forth looking for any indication that the square drive shaft is causing excessive drag on the infeed conveyor.	
Check alignment of the square drive shaft.			
Motor is not receiving required power or power quality	Check phase to phase and phase to ground voltage readings of all three legs of power. Readings should be within +/- 10% of each other.		
Infeed conveyor moves in the opposite direction than it should be moving	Motor wired incorrectly	Rewire motor per electrical drawings.	
	Infeed conveyor was improperly calibrated	Recalibrate.	



Should you lockout/tagout to safely perform this action?



Hold-Downs

Table A-6: Hold-Downs

Problem:	Possible Cause:	What To Do:	See Page
Hold-down will not hold HORIZONTAL calibration	Hold-down is not parallel to blades (misaligned)	Check if hold-down is parallel to blades. If none of the following are found, the pinion may have jumped one or more teeth on the rack.	
		Check for loose bearings on hold-down drive shaft.	
		Extend the hold-down and inspect the racks for damaged teeth.	
		Check the pinions for damaged teeth.	
	Encoder drive connections are not secure	Check for proper tension in the encoder drive chain. Check that the sprocket is secure.	MT-69
	Encoder is not working	Check for encoder alarms and fix the fault. See Table A-10.	MT-192
<i>If no alarms exist:</i> Check for loose cable connections and damaged cables.			
Replace Profibus card in PLC rack. Replace encoder.		MT-142 MT-124	
Hold-down will not hold VERTICAL calibration	Axis is not moving	Check mechanical drive components to ensure they are secure and healthy.	
		Clean, lubricate and inspect the moving components.	MT-59
	Proximity switch is not adjusted properly and secure	Check the distance between the proximity switch and cam. The distance should be between 0.025" and 0.040"	MT-133
		Check to ensure the cam is tight to the shaft.	
	Proximity switch cable or wiring is bad	Monitor PLC input light--if it comes on as needed, the proximity switch and cable are working.	
		Check connection on back of proximity switch.	
		Check terminal block wiring connections. Check cable and proximity switch for damage.	



Should you lockout/tagout to safely perform this action?




Table A-6: Hold-Downs (Continued)

Problem:	Possible Cause:	What To Do:	See Page	
Hold-down hunts for position during automatic or semiautomatic setup	Axis cannot move freely	Clean, lubricate and inspect the moving components.	MT-59	
	Medium and/or low speed set too low or too high	Increase or decrease value.	OP-93	
	Hold-down chains tension is incorrect	Check chain tension and chain tensioners.	MT-96	
	Drive sprocket is damaged or not secure to shaft	Check for damage to the sprocket and that the sprocket is secure to the shaft.		
	Horizontal Movement Only: Hold-downs drag on square drive shaft		Clean and lubricate square drive shaft.	MT-59
			Move the carriage back and forth looking for indication that the square drive shaft is causing excessive drag on the hold-down.	
			Check alignment of the square drive shaft.	
	Horizontal movement only: Encoder sprocket to chain engagement is loose or misaligned		Check for proper tension in the encoder drive chain.	MT-123
			Check that the sprocket is secure.	
	Horizontal Movement Only: Drive chain or drive sprocket is loose		Check the tension on the drive chain.	
			Check that the drive sprocket is secure to the shaft.	
	Vertical Movement Only: Proximity switch cable or wiring is bad		Monitor PLC input light—if it comes on as needed, the proximity switch and cable are working.	
			Check connection on back of proximity switch.	
			Check terminal block wiring connections.	
			Check cable and proximity switch for damage.	
Vertical Movement Only: Proximity switch is not adjusted properly or secure		Check the distance between the proximity switch and cam. The distance should be between 0.025" and 0.040"	MT-133	
		Check to ensure the cam is tight to the shaft.		



Should you lockout/tagout to safely perform this action?




Table A-6: Hold-Downs (Continued)

Problem:	Possible Cause:	What To Do:	See Page
Hold-down does not move at all	<i>See Hold-down hunts for position during automatic or semiautomatic setup</i>		
	Spider coupling is not assembled properly	Check insert.	
		Check set screws.	
	Encoder, motor starter, brake relay, VFD, PLC or motor is faulty	See Table A-10, yellow Profibus encoder fault	MT-195
	Motor overload is faulty	Check overload operation and replace if necessary.	
	Axis cannot move freely	Clean, lubricate and inspect the moving components.	MT-59
	An alarm condition exists	Check for an alarm. See Table A-10.	MT-192
	Axis is already in position	Press INITIATE SETUP. If an “All axes in position” message displays, then the hold-downs should be in the correct position for the setup. If not, recalibrate.	
Motor brake is not releasing	Check voltage to motor. Motor must be wired for low voltage. Check for loose connections or other electrical problems. Repair or replace motor and brake assembly.		
Hold-down will only move in one direction	PLC output is not operating	Refer to the electrical schematics. While jogging the hold-downs in the direction that the hold-downs will not move, check to see that the indicator light for the output is on.	
		Check that the PLC is in Run Mode.	
		Check that there is power to the PLC.	
During setup, hold-down moves and stops but screen indicates “All axes not in position”	Axis cannot move freely	Clean, lubricate and inspect the moving components.	MT-59
	Low speed setting too low	Increase low speed setting on the Default screen.	OP-94




Should you lockout/tagout to safely perform this action?



Table A-6: Hold-Downs (Continued)

Problem:	Possible Cause:	What To Do:	See Page
Hold-down is abnormally noisy when it moves	Axis mechanical components are dirty or need lubrication	Clean, lubricate and inspect the moving components.	MT-59
	Hold-down is not parallel to blades (misaligned)	Check for loose bearings on hold-down drive shaft.	
		Extend the hold-down and inspect the racks for damaged teeth. Ensure that the pinion did not jump teeth on the rack.	
		Check the pinions for damaged teeth.	
	Hold-downs bind on square drive shaft	Clean and lubricate square drive shaft.	
		Move the carriage back and forth looking for any indication that the square drive shaft is causing excessive drag on the hold-down. Check alignment of the square drive shaft.	
	Motor is not receiving required power or power quality	Check phase-to-phase and phase-to-ground voltage readings of all three legs of power. Readings should be within +/- 10% of each other.	
	Motor bearings are damaged	With power removed from the saw, disconnect the motor from its load. Manually release the brake. Rotate the motor shaft and listen for any abnormal noise.	
	Motor brake is not releasing	Check voltage to motor. Motor must be wired for low voltage. Check for loose connections or other electrical problems. Repair or replace motor and brake assembly.	
	Hold-down moves in the opposite direction than it should be moving	Encoder not counting properly	Check encoder chain and sprockets to ensure they are secure and properly tensioned.
Hold-down was improperly calibrated		Verify hold-downs calibration and correct if necessary.	
Motor is wired incorrectly		Switch two of the 3-phase wires on the motor.	



Should you lockout/tagout to safely perform this action?



Table A-6: Hold-Downs (Continued)

Problem:	Possible Cause:	What To Do:	See Page
Hold-down vibrates when moving	Axis is dirty and needs lubrication	Clean and lubricate.	
	For vertical movement: Gear rack is damaged	Inspect and repair if needed.	
Hold-down wearing out on one side	Infeed conveyor is crooked	Align infeed conveyors with hold-downs.	MT-96



Should you lockout/tagout to safely perform this action?



Lumber Stops

Table A-7: Lumber Stop

Problem:	Possible Cause:	What To Do:	See Page
Lumber stop will not hold calibration	Axis cannot move freely	Clean, lubricate and inspect the moving components.	MT-59
	Proximity switch, cable, or cable connection is bad	While moving the lumber stop, check if the PLC input turns ON and OFF. If the input is coming ON, the proximity switch and cable are OK.	MT-142
		Check cord connection on the back of the proximity switch. Check the cable and proximity switch for damage.	
	Proximity switch is not adjusted properly and secure	Check the distance between the proximity switch and cam. The distance should be between 0.025" and 0.040".	MT-133
		Check to ensure the cam is tight to the shaft.	
Coupling is loose	Check the coupling between the motor and pinion shaft.		
Lumber stop does not move	Axis is already in position	Press INITIATE SETUP. If an "All axes in position" message displays, then the hold-downs should be in the correct position for the setup. If not, recalibrate.	
	Spider coupling is not assembled properly	Check insert.	
		Check set screws.	
	Axis cannot move freely	Clean, lubricate and inspect the moving components.	MT-59
		Inspect for damage.	
	An alarm condition exists	Check for an alarm. See Table A-10.	MT-192
	Encoder, motor starter, brake relay, VFD, PLC or motor is faulty	See Table A-10, yellow Profibus encoder fault.	MT-195
PLC output is not operating	Refer to the electrical schematics. While jogging the lumber stop, check to see that the indicator light for the output card is on. Do this in both directions.		
	Check that the PLC has incoming power and is in Run Mode.	MT-139 MT-142	



Should you lockout/tagout to safely perform this action?



Table A-7: Lumber Stop (Continued)

Problem:	Possible Cause:	What To Do:	See Page
Lumber stop will only move in one direction	Lumber stop is improperly calibrated	Recalibrate.	MT-49
	Motor was improperly wired	Swap two incoming lines.	MT-69
Lumber stop moves and stops but screen indicates "All axes not in position"	Axis cannot move freely	Clean, lubricate and inspect the moving components.	MT-59
Lumber stop does not move smoothly	Axis cannot move freely	Clean, lubricate and inspect the moving components.	MT-59
	Mechanical components are misaligned	Check alignment of rack and pinion and that they are properly meshed.	
		Check the drive coupling.	
	Motor brake is not releasing	Check voltage to motor. Motor must be wired for low voltage. Check for loose connections or other electrical problems. Repair or replace motor and brake assembly.	
Lumber stop is abnormally noisy when it moves	Axis cannot move freely	Clean, lubricate and inspect the moving components.	MT-59
	Mechanical components are misaligned	Check alignment of rack and pinion and that they are properly meshed.	
		Check the drive coupling.	
	Motor brake is not releasing	Check voltage to motor. Motor must be wired for low voltage. Check for loose connections or other electrical problems. Repair or replace motor and brake assembly.	
Lumber stop moves in the opposite direction that it should be moving	Lumber stop is improperly calibrated	Recalibrate.	MT-49
	Motor was improperly wired	Swap two incoming lines.	IN-77
Lumber stop vibrates when moving	Mechanical components are misaligned	Check alignment of rack and pinion and that they are properly meshed. Check the drive coupling.	




Should you lockout/tagout to safely perform this action?



Carriage

Table A-8: Carriage

Problem:	Possible Cause:	What To Do:	See Page	
Carriage will not hold calibration	Spur gear is slipping	Tighten the set screws and ensure the teeth are meshing tightly in the gear rack.		
	Binding on square drive	Clean and lubricate square drive shaft. Inspect for damage and repair any found.		
	Out of alignment	Contact Machinery Division Customer Service.		
	Encoder is faulty		Check for Profibus alarms. See Table A-10.	MT-192
			<i>If no alarms exist:</i> Check for loose cable connections and damaged cables. Replace encoder. Replace Profibus card in PLC rack.	
	Encoder drive connections are incorrect		Check that the cams of the encoder float assembly ride on the back of the rack.	
			Check alignment of rack and pinion and that they are properly meshed.	
			Check the pinion for damaged teeth.	
			Check the drive coupling.	
			Check the pinion shaft for any play which would indicate damaged bearings.	



Should you lockout/tagout to safely perform this action?




Table A-8: Carriage (Continued)

Problem:	Possible Cause:	What To Do:	See Page
Carriage hunts for position during automatic or semiautomatic setup	Speed setting is too low or high	Adjust speed settings on the Speed Settings screen.	OP-94
	Square drive shaft drive sprocket is damaged or not secure to shaft	Check for damage to the sprocket and that the sprocket is secure to the shaft.	
	Infeed conveyor sprocket dragging on square drive shaft	Clean, lubricate and inspect the moving components. Polish the drive shaft to smooth out grooves.	
	Brake advance setting too high or too low	Adjust setting on Defaults screen.	OP-93
	Encoder spur gear loose or not properly seated in rack	Check spur gear connection to rack and jack shaft and adjust as necessary.	
		Check that the cam followers ride on the back of the rack.	
	Low speed zone setting too low	Increase carriage low speed slow-down setting on Speed Zone Settings screen.	OP-93
	Axis cannot move freely	Clean, lubricate and inspect the moving components.	MT-59
		Move the carriage back and forth looking for any indication that the square drive shaft is causing excessive drag on the carriage or infeed conveyor.	
		Check alignment of the square drive shaft.	
	Square drive shaft is damaged	Inspect square drive shaft.	
	Carriage brake	Adjust brake so it does not drag on the brake hub. Test the valves and airlines to see if it is fully releasing.	
		Adjust carriage brake advance setting on the Default Speeds screen.	OP-93
Carriage speeds not set properly	Adjust carriage speed setting on Default Speeds screen.	OP-93	
VFD not set properly	Reset them, and prevent them from being changed in the future.	MT-145	
Loose wiring	Check all connections.		

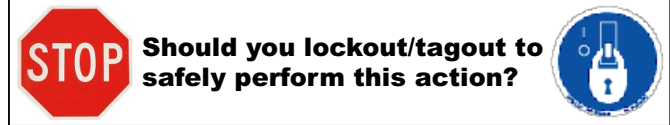


Table A-8: Carriage (Continued)

Problem:	Possible Cause:	What To Do:	See Page	
Carriage does not move	Axis is already in position	Press INITIATE SETUP. If an “All axes in position” message displays, then the centerline should be in the correct position for the setup. If not, proceed with troubleshooting.		
	Roll pin broken or spur gear worn.	Inspect spur gears and roll pins and replace if necessary.	MT-100	
	Brake not releasing	Check air pressure. Check for electrical problems (output cards, wire connections, etc.)		
	PLC output is not operating	Refer to the electrical schematics. While jogging the carriage, check to see that the indicator light for the output is ON. Do this in both directions.	Ensure that the PWR, OK, and RUN lights on all four PLC racks are on.	MT-142
		Drive gear disengaged		
	An alarm condition exists	Check for an alarm. See Table A-10.	MT-192	
	Square drive shaft or spur gear is worn	Repair damage or replace the tube/spur gear/roll pin.		
	Axis cannot move freely	Clean, lubricate and inspect the moving components.		MT-59
		Move the carriage back and forth looking for any indication that the square drive shaft is causing excessive drag on the carriage or infeed conveyor.		
		Check alignment of the square drive shaft.		
Low speed setting is too low	Increase low speed setting on the Default screen.	OP-94		
Encoder, motor starter, brake relay, VFD, PLC or motor is faulty	See Table A-10, yellow Profibus encoder fault.	MT-195		
Carriage will only move in one direction	Carriage incorrectly calibrated	Recalibrate.		
	Carriage length not entered in defaults	Enter the length of the carriage.		
	Square drive shaft worn	Repair damage or replace tube.		



Should you lockout/tagout to safely perform this action?




Table A-8: Carriage (Continued)

Problem:	Possible Cause:	What To Do:	See Page
During setup, carriage moves and stops but screen indicates “All axes not in position”	Axis cannot move freely	Clean, lubricate and inspect the moving components.	MT-59
	Low speed setting is too low	Increase low speed setting on the Default screen.	OP-94
	A fault occurred while moving	Correct fault condition. See Table A-10.	MT-192
Carriage does not move smoothly	Sawdust is stuck in rack	Blow sawdust off rack surfaces including inside the carriage tubes.	
	Square drive shaft worn	Repair damage or replace the tube.	
Carriage is abnormally noisy or vibrates when it moves	Square drive shaft worn	Repair damage or replace the tube.	
	V-wheels or angle are damaged or dirty	Clean, lubricate and inspect the moving components. Repair damage or replace the damaged part.	MT-59
Carriage moves in the opposite direction than it should be moving	Carriage was improperly calibrated	Recalibrate.	
	Encoder not counting properly	Check alignment of rack and pinion and that they are properly meshed.	
		Check the pinion for damaged teeth.	
		Check the drive coupling.	
		Check the pinion shaft for any play which would indicate damaged bearings.	
Check the pinion shaft for any play which would indicate damaged bearings.			



Should you lockout/tagout to safely perform this action?



Table A-8: Carriage (Continued)

Problem:	Possible Cause:	What To Do:	See Page
VFD trips frequently (OC2)	Axis cannot move freely	Clean, lubricate and inspect the moving components.	MT-59
		Move the carriage back and forth looking for any indication that the square drive shaft is causing excessive drag on the carriage or infeed conveyor.	
		Check alignment of the square drive shaft.	
	Square drive shaft drive sprocket is damaged or not secure to shaft	Check for damage to the sprocket and that the sprocket is secure to the shaft.	
	Carriage brake advance setting too high or too low	Adjust setting on Defaults screen.	OP-93
	Carriage brake	Adjust brake so it does not drag on the brake hub. Test the valves and airlines to see if it is fully releasing. Adjust carriage brake advance setting on the Default Speeds screen.	OP-93
	Carriage speeds not set properly	Adjust carriage speed setting on Default Speeds screen.	OP-93
	VFD not set properly	Reset them, and prevent them from being changed in the future.	MT-145
VFD trips frequently (OC3)	Loose wiring	Check all connections.	
	Bad breaker	Replace breaker.	
	Electrical problem	Inspect for loose or broken wires. Remove and inspect the motor starter and contactor. Clean or replace as necessary.	
	VFD settings are incorrect	Verify VFD settings per your electrical drawings.	

Should you lockout/tagout to safely perform this action?

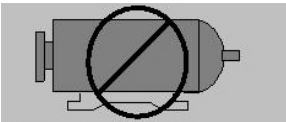
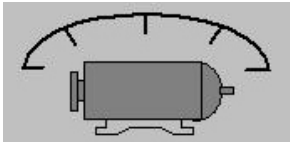
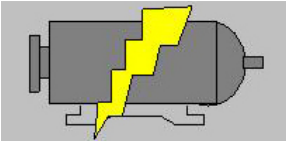
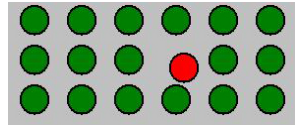
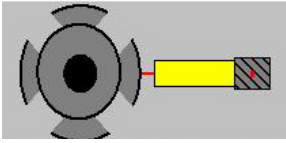

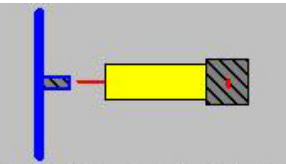



Alarm Conditions

Alarms are specific conditions recognized by the saw that notify the operator something is or could be wrong.

An alarm causes an icon on the alarms status bar located at the top of the Main Menu, Automatic, Semiautomatic, or Manual screens to illuminate. Each alarm screen can also be reached from the Alarm Conditions Menu screen accessed from the Main Menu.

To see more details about the alarm condition, press the button on the alarm status bar or Alarm Conditions Menu on your touch screen or refer to the *Alarm Conditions Menu* section starting on page OP-97 in the *Operation* chapter.

Table A-9: Definitions of Alarm Icons

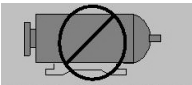
	Shows motor thermal overload alarms		Shows variable frequency drive faults
	Shows motor circuit breaker alarms		Shows position faults which indicates a collision may occur
	From Alarm Conditions Menu: Prox Switch Count Failure screen (shows only home prox switches) From alarm status bar: Prox Switch Failure screen (shows home and count prox switches)		Shows PLC faults
	From Alarm Conditions Menu: Prox switch failure (shows home and count prox switches)		Shows Miscellaneous Alarms screen
	Shows status of each E-stop		Shows Profibus (encoder) faults Located only on the alarm status bar; not found on the Alarm Conditions Menu screen




Should you lockout/tagout to safely perform this action?



Table A-10: Alarm Conditions

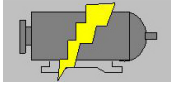
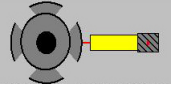
Problem	Possible Cause	Possible Solution
<p>Motor thermal overload alarm</p> 	Mechanical bind	Clean, lubricate, and inspect all axes associated with that overload.
	Chain tension is wrong	Retension the chain that moves the axis associated with that encoder.
	Low incoming voltage	Have the 3 phase power checked by a qualified electrician. Remove and inspect the motor starter and contactor. Clean or replace as necessary.
	Overload is faulty	Swap the overload with another. If the overload trips, then the original overload was OK.
	Power to motor is incorrect	Check phase to phase and phase to ground voltage readings of all three legs of power. Readings should be within +/- 10% of each other.
	Motor is faulty	Check motor for shorted or grounded winding and repair. Remove and inspect the motor starter and contactor. Clean or replace as necessary. Inspect the brakes: For air brakes (blade motors and carriage motor). For electric brakes (all other motors).
	Load on motor has changed	Clean and lubricate all components of the axis. Check and condition of mechanical drive components. If motor is a replacement, verify that the rating is the same as the old motor. Disconnect the motor from its load and, with the motor running, measure its current draw. It should not exceed the full load amp rating stamped on the nameplate.
	Temporary condition causing overload	Reset overload. If overload recurs, continue with troubleshooting.
	Motor fan is not working (does not apply to blade motors)	Inspect the fan housing for damage that may prevent the fan from turning. Disconnect the load from the motor. Remove the motor fan housing at the rear of the motor. Rotate the motor shaft while holding the fan blades. The fan should not slip on the shaft.
	Ambient temperature is high	Generally, air temperature should remain under 110°F at the operating site. Any temperature higher than 80°F may cause overloads to shut down motors.



Should you lockout/tagout to safely perform this action?



Table A-10: Alarm Conditions (Continued)

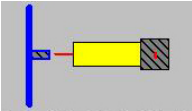
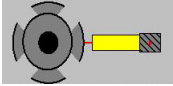

Problem	Possible Cause	Possible Solution
Motor circuit breaker alarm 	Short circuit	Check for a phase-to-phase short on motor branch circuit.
	Ground fault	Check for a phase to ground short on motor branch circuit.
Count proximity switch alarm  See Table A-17 for prox switch input locations.	Proximity switch cable or cable connection is bad	Check if PLC input turns ON and turns OFF. If input is coming on, the proximity switch & cable are okay. If not, replace input card. Check cable connection on back of proximity switch. Check cable & proximity switch for damage. Check terminal block wiring connections.
	Proximity switch is not adjusted properly	Check the distance between the proximity switch and cam. The distance should be between 0.025" and 0.040" Check alignment of proximity switch to cam.
	Proximity switch is damaged	Replace proximity switch.
	Mechanical bind	Clean, lubricate, and inspect all axes associated with that overload.
	Coupling between motor and gearbox is damaged	Replace coupling.
	Gearbox is not working	Replace gearbox.
	Loose Wiring	Check wiring at terminal blocks.
	Applies to lumber stop and all hold-down motors: Brake on motor not releasing	Check voltage to motor. Motor must be wired for low voltage. Check for loose connections or other electrical problems. Repair or replace motor and brake assembly.
	PLC input card for proximity switch is bad	Check if PLC input is coming on. If input is coming on, the proximity switch & cable are okay.
	Proximity switch wiring is loose at the terminal blocks	Check terminal block wiring connections.
VFD is faulty	Replace VFD	




Should you lockout/tagout to safely perform this action?



Table A-10: Alarm Conditions (Continued)



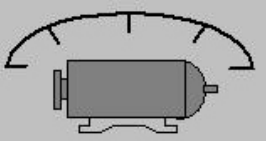
Problem	Possible Cause	Possible Solution
<p>Home proximity switch alarm</p>   <p>See Table A-18 for prox switch input locations.</p>	Axis is not calibrated properly	Recalibrate.
	Proximity switch cable or cable connection is bad	Check if PLC input turns ON and turns OFF. If input is coming on, the proximity switch & cable are okay. If not, replace input card.
		Check cable connection on back of proximity switch.
		Check cable & proximity switch for damage.
	Proximity switch is not adjusted properly	Check terminal block wiring connections.
		Check the gap. The distance should be between 0.025" and 0.040"
	Proximity switch is damaged	Replace proximity switch
	PLC input for proximity switch is bad	Check if PLC input is coming on. If input is coming on, the proximity switch & cable are okay.
Proximity switch wiring is loose at the terminal blocks	Check terminal block wiring connections.	
<p>The home prox constantly "sees" the target. It does not notice the hole in the cam that indicated "home".</p> <p>The home prox does not "see" a target. (It thinks it is only seeing the hole.)</p>	<p>This alarm cannot be reset as long as it is sensing a solid object (metal).</p> <p>Ensure gap is between .025" and .040". If so, Pull (disengage) the maintenance jumper. Move rack to a different calibration point so prox can "see" the hole in the cam. Engage the maintenance jumper. Reset the alarm and recalibrate.</p>	
	<p>Reset the alarm from the touch screen. If it continues to happen:</p> <p>Check the sensor and cable and replace if necessary.</p> <p>Ensure gap is between .025" and .040".</p>	
<p>Emergency stop alarm</p> 	E-stop is activated	Go to E-stop status screen to determine which e-stop button or switch is activated. Reset the activated E-stop.
	Loose wiring in E-stop circuit	Check wiring.



Should you lockout/tagout to safely perform this action?



Table A-10: Alarm Conditions (Continued)

Problem	Possible Cause	Possible Solution
Profibus encoder fault—YELLOW  See Figure 2-5 on page MT-43 for the location of each encoder.	Mechanical bind	Clean, lubricate, and inspect all axes associated with that overload.
	VFD is faulty	Check VFD operation and replace.
	Another fault exists	Pull the maintenance jumper to ignore Profibus fault and look on the Alarm Conditions Menus screen for other faults.
	Encoder cable or cable connection is bad	Check if PLC input turns ON and turns OFF. If input is coming on, the proximity switch & cable are okay. If not, replace input card.
		Check cable connection on back of proximity switch. Check cable & proximity switch for damage; ensure the encoder connectors have all pins intact (non broken or missing). Check terminal block wiring connections.
Encoder is faulty	Replace encoder.	
Profibus encoder fault—RED.  See Figure 2-5 on page MT-43 for the location of each encoder.	If only one (1) encoder fault is showing:	Check all power connections to the encoder. Check that the pins in the connectors are all present and none broken.
	Electrical connection is bad or	Check that the encoder end cap is secure and that all the cables into the end cap are tight.
	Encoder is faulty	Swap the encoder with another. If the problem follows the encoder then the encoder is faulty. Otherwise, check power connections.
	If more than one (1) encoder fault is showing:	Check all solutions listed for a yellow Profibus fault first.
Profibus card is loose or faulty	Check indicator lights on the card. Check the Profibus card in the PLC rack to make sure it is seated securely. Check switch on Profibus card in the PLC rack.	
Encoder or cables are loose or faulty	Check Profibus network cables and cable connections between the encoders and the Profibus card in the PLC rack.	
Terminating register is loose or faulty	Check that the terminating register at the end of the Profibus network is securely connected.	
VFD has a yellow fault 	Brake relay did not energize	Check wire connections to brake relay.
		Clean sawdust and other debris from brake relay.
		Check that the brake relay is functioning properly.
		Check for a signal from the VFD to the brake relay.



Should you lockout/tagout to safely perform this action?


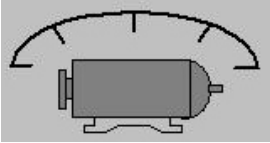
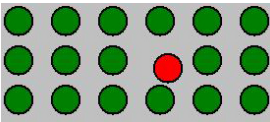




Table A-10: Alarm Conditions (Continued)

Problem	Possible Cause	Possible Solution
VFD has a red fault  See Table A-16 for definitions of all VFD faults.	VFD generated a fault	Reset fault on screen or on the VFD itself. If fault recurs, continue with troubleshooting. Read the error code displaying on the VFD and refer to Table A-16 to determine the source of the error.
	Remote reset (from Alarms screen) is not working	Reset VFD by pressing RESET on the VFD itself.
	Mechanical components of the axis are jammed	Ensure that axis is able to move freely. Check to make sure angle chains are not too loose and no obstructions such as wedge in chain.
	Chain is too tight	Check chain tension.
Position fault alarm 	Mechanical bind	Clean, lubricate, and inspect all axes associated with that overload.
	Existing alarm is present	Check PLC Status Screen to see specific fault. Press RESET ALARM to reset faults.
PLC faults alarm 	Fatal error faulted CPU out of Run Mode	Turn key switch to OFF then back to "ON" position.
	Corrupted user ram or program on power up	Turn off power to PLC system for about 5 second then return power to PLC system.
	Program missing	Call MiTek Machinery Division Customer Service. If the program is missing, either the program was not loaded into flash memory or flash memory is corrupt or faulty.
	Faulty PLC card	Ping the PLC card 128.1.0.1.
	Jumps out of Run Mode: Any other module in racks were removed or replaced with power on	Turn key switch to OFF, then back to ON position to reset faults.
	Jumps out of Run Mode: Fatal error faulted CPU out of Run Mode	Press RESET ALARMS button.
	Jumps out of Run Mode: Brown out-AC power is too low	Replace PLC power supply.
	Jumps out of Run Mode: Configuration mismatch	Turn power off before replacing any module.
Input or output card is faulty	Check operation of input and output cards.	



Should you lockout/tagout to safely perform this action?


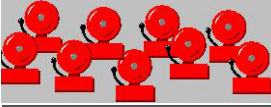
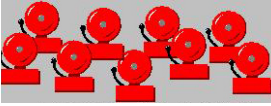
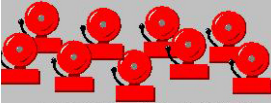
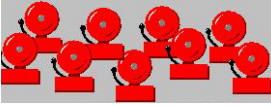


Table A-10: Alarm Conditions (Continued)


Problem	Possible Cause	Possible Solution
Maintenance jumper alarm 	Maintenance jumper is pulled out	Ensure that maintenance jumper is pushed back in.
Low air fault 	Low or no air pressure	Ensure that air supply is connected to saw and the air source is working properly. Remove moisture from the lines. Ensure lines are not frozen. Clean air valve. Replace mufflers if necessary. Listen to see if valve is shifting smoothly. If not, replace valve.
Motor starter safety fault  See Table A-20 and Table A-21 for input locations	If motor is not trying to run, the output card is faulty	Check output card to make sure a signal is sent to the motor starter. A red “F” on display indicates a fuse is blown in the output card. Replace output card.
	If motor is trying to run, motor starter contacts have welded together.	Replace motor starter.
	Starter is stuck on	Replace starter.
	False Signal to the PLC input	The input is shorted to a hot wire. Check wiring.
	Faulty input card	If input card is stuck in the “on” condition”, replace card
	Faulty output card: starter is held “on” because the output that operates it is stuck “on”.	Replace output card
	Short Circuit between a hot wire and the coil of the starter.	Check wiring
DC power supply alarm 	No 24 VDC output from DC power supply Blown fuse in power supply	Check fuses. Use voltmeter to check for 120 VAC input to power supply and 24 VDC out of power supply. Check input voltage. If needed, replace power supply. Check the drain on the power supply. Check 1.2A fuses on output of DC power supply.



Should you lockout/tagout to safely perform this action?



Table A-10: Alarm Conditions (Continued)

Problem	Possible Cause	Possible Solution
Control power interrupt alarm  See page MT-151	An emergency stop did not reset properly or is activated	Activate and reset the last emergency stop button or switch used. Re-test the emergency stop by activating the button or switch that caused the problem. If the problem recurs, replace the emergency stop button or switch. Ensure that pull-cord is reset and cable tension is set correctly.
	Perimeter safety cable is out of alignment	Adjust perimeter safety cable switch.
	Wiring to an E-stop button or switch is loose	Check wire connections and contact blocks of each emergency stop button.
	Control relay is not functioning	Check wiring.
	Faulty output card	Replace the card.
	No power to the PLC input	Stationary end: check input I-055 (rack 0, slot 7, A7). Carriage end: check input I-153 (rack 2, slot 4, B1).
	Circuit breakers are tripped	Check circuit breakers on the input & output sides of the control transformer for trip condition.

Motors

Refer to the Alarms troubleshooting chart before proceeding with this chart.

Table A-11: Motors

Problem:	Possible Cause:	What To Do:
Motor runs but slows down	Bad motor	Replace motor.
	Motor connections are loose	Check motor connections.
	Low voltage	Check incoming voltage and find source of problem
	Brake not releasing	Check voltage to motor. Check for loose connections or other electrical issues. Repair or replace motor and brake assembly.
Motor takes too long to reach full speed	Line voltage drops below motor rated voltage	Delay start one motor after another.
	Inertia of load is too high	Check motor for sign of binding. Re-align motor.
At start up, the motor makes a loud rubbing or grinding sound	Thrust from load or misalignment	Re-align coupling.



Fault Codes and Technical Data for Individual Components

PLC Faults

Table A-12: PLC Faults

Reference	Nickname	Definition
%S0009	SY_FULL	Set when the PLC fault table fills up Cleared when an entry is removed from the PLC fault table and when the PLC fault table is cleared
%S0010	IO_FULL	Set when the IO fault table fills up Cleared when an entry is removed from the IO fault table and when the IO fault table is cleared
%S0011	OVR_PRE	Set when an override exists in %I, %Q, %M or %G memory
%S0013	PRG_CHK	Set when background check is active
%S0014	PLC_BAT	Set to indicate a bad battery in a release 4 or later CPU. The contact reference is updated once per sweep
%S0017	SNPXACT	SNP-X Host is actively attached to CPU
%S0018	SNPX_RD	SNP-X Host has read data from the CPU
%S0019	SNPX_WT	SNP-X Host has written data to the CPU
%SA0001	PB_SUM	Set when a checksum calculated on the application program does not match the reference checksum. If the fault was due to a temporary failure, the discrete bit can be cleared by again storing the program to the CPU. If the fault was due to a hard RAM failure, then the CPU must be replaced.
%SA0002	OV_SWP	Set when the PLC detects that the previous sweep took longer than the time specified by the user Cleared when the PLC detects that the previous sweep did not take longer than the specified time. It is also cleared during the transition from STOP to Run Mode. Only valid if the PLC is in Constant Sweep Mode.
%SA0003	APL_FLT	Set when a application fault occurs Cleared when the PLC transitions from STOP to Run Mode
%SA0009	CFG_MM	Set when a configuration mismatch is detected during system power-up or during a store of the configuration Cleared by powering up the PLC when no mismatches are present or during a store of configuration that matches the hardware
%SA0010	HRD_CPU	Set when the diagnostics detects a problem with the CPU hardware Cleared by replacing the CPU module
%SA0011	LOW_BAT	Set when a low battery fault occurs Cleared by replacing the battery and ensuring that the PLC powers up without the low battery condition



Table A-12: PLC Faults (Continued)

Reference	Nickname	Definition
%SA0014	LOS_IOM	Set when an I/O module stops communicating with the PLC CPU Cleared by replacing the module and cycling power on the main rack
%SA0015	LOS_SIO	Set when an option module stops communicating with the PLC CPU Cleared by replacing the module and cycling power on the main rack
%SA0019	ADD_IOM	Set when an I/O module is added to a rack Cleared by cycling power on the main rack and when the configuration matches the hardware after a store
%SA0020	ADD_SIO	Set when an option module is added to a rack Cleared by cycling power on the main rack and when the configuration matches the hardware after a store
%SA0027	HRD_SIO	Set when a hardware failure is detected in an option module Cleared by replacing the module and cycling power on the main rack.
%SA0031	SFT_SIO	Set when a unrecoverable software fault is detected in an option module Cleared by cycling power on the main rack and when the configuration matches the hardware
%SB0010	BAD_RAM	Set when the CPU detects corrupted RAM memory at power-up Cleared when the CPU detects that RAM memory is valid at power-up
%SB0011	BAD_PWD	Set when a password access violation occurs Cleared when the PLC fault table is cleared
%SB0013	SFT_CPU	Set when the CPU detects an unrecoverable error in the software Cleared by cycling power to the CPU
%SB0014	STOR_ER	Set when an error occurs during a programmer store operation Cleared when a store operation is completed successfully
%SC0009	ANY_FLT	Set when any fault occurs Cleared when both fault tables have no entries
%SC0010	SY_FLT	Set when any fault occurs that causes an entry to be placed in the PLC fault table Cleared when the PLC fault table has no entries
%SC0011	IO_FLT	Set when any fault occurs that causes an entry to be placed in the I/O fault table Cleared when the I/O fault table has no entries
%SC0012	SY_PRES	Set as long as there is at least one entry in the PLC fault table Cleared when the PLC fault table has no entries
%SC0013	IO_PRES	Set there is at least one entry in the I/O fault table Cleared when the I/O fault table has no entries
%SC0014	HRD_FLT	Set when a hardware fault occurs Cleared when both fault tables have no entries



Table A-12: PLC Faults (Continued)

Reference	Nickname	Definition
%SC0015	SFT_FLT	Set when a software fault occurs
		Cleared when both fault tables have no entries
Basic Module		Set when the PLC does not detect the basic module operation
		Cleared by resetting the basic module

Catcher Display Communication Errors

Table A-13: Catcher Display Communications Errors

Constant	Value	Description
comEventBreak	1001	Break signal received
comEventFrame	1004	Framing error
comEventOverrun	1006	Port overrun
comEventRxOver	1008	Receive buffer overflow
comEventRxParity	1009	Parity error
comEventTxFull	1010	Transmit buffer full
comEventDCB	1011	Unexpected error retrieving device control block (DCB) for the port

Inker Communication Errors

Table A-14: Inker Communications Errors

Constant	Value	Description
comEventBreak	1001	Break signal received
comEventFrame	1004	Framing error
comEventOverrun	1006	Port overrun
comEventRxOver	1008	Receive buffer overflow
comEventRxParity	1009	Parity error
comEventTxFull	1010	Transmit buffer full
comEventDCB	1011	Unexpected error retrieving device control block (DCB) for the port


Should you lockout/tagout to safely perform this action?


Encoder Errors

Encoder locations shown on drawing 90500.

Table A-15: Encoder Errors

Red LED:	Green LED	Possible Cause
Off	Off	No power supply
On	On	Encoder is ready for operation but has not yet received any configuration data based on voltage; address may be set incorrectly or bus line may be incorrectly connected
On	Flashing	Error in parameter assignment or configuration; the encoder is receiving configuration or parameter assignment data of incorrect length or inconsistent data; overall resolution may be set too high
Flashing	On	Encoder is ready for operation but is not being accessed by the master; may be caused by using the wrong address
On	Off	Encoder has not received any data for some time (approx 40 seconds); data line may be interrupted
Off	On	Normal operation in data exchange mode
Off	Flashing	Commissioning mode in data exchange mode



VFD Faults

The VFDs have many protective functions that occur when there is an error. The name of the alarm will be displayed on the LED when an error occurs and the motor will coast to a stop. Table A-16 lists alarm displays and protective operations.

Table A-16: VFD Protective Operations

Name of Alarm	Display	Description of Operation
Overcurrent protection	OC1 (During acceleration)	<p>Drive output current exceeds the overcurrent detection level due to an overcurrent flowing in the motor, or a short circuit or ground fault in the output circuit.</p> <p>Remedies:</p> <p>Clean and lubricate the moving components.</p> <p>Inspect the slide and casting surfaces for damage and repair it.</p> <p>Check and correct VFD settings.</p> <p>Have a qualified electrician check incoming voltage.</p>
	OC2 (During deceleration)	<p>Remedies:</p> <p>Check and correct VFD settings.</p> <p>Have a qualified electrician check incoming voltage.</p>
	OC3 (During constant speed)	<p>Remedies:</p> <p>Inspect for loose or broken wires.</p> <p>Remove and inspect the motor starter and contactor. Clean or replace as necessary.</p> <p>Check and correct VFD settings.</p>
Overvoltage protection	OU1 (During acceleration)	<p>The regenerative power from the motor increases, causing the DC link voltage of the main circuit to exceed the overvoltage detection level (400 VDC for 230V input, 800 VDC for 460V input). Although the drive trips due to overvoltage, drive protection against the overvoltage is impossible.</p>
	OU2 (During deceleration)	
	OU3 (During constant speed)	
Undervoltage protection	LU	<p>The source voltage drops, causing the DC link voltage in the main circuit to become lower than the undervoltage detection level (200 VDC for 230V input, 400 VDC for 460V input). If F14 Restart after momentary power failure has been selected, or if the voltage drops below the control power maintenance level, no alarm is displayed.</p>
Input phase loss protection	Lin	<p>If input power L1/R, L2/3, L3/T has any phases of the 3 phase power "OPEN" or if there is a significant disparity between phases, the rectifying diode or smoothing capacitors may be damaged.</p>



Table A-16: VFD Protective Operations (Continued)

Name of Alarm	Display	Description of Operation
Heat sink overheat	OH1	The temperature of the heat sink of the drive is high, possibly due to a broken cooling fan or other reasons.
External alarm input	OH2	An external device such as the braking unit, braking resistor, and external thermal overload relay connected to the control circuit terminal (THR) has activated an alarm contact, or an overheat protective function is activated by the PTC thermometer.
Braking resistor overheat	dbH	If the electronic thermal overload relay (for the braking resistor) has been selected for code F13, the protective function is activated by a high operation frequency of the braking resistor to prevent the resistor from being burned.
Motor 1 overload	OL1	If electronic thermal overload relay 1 has been selected for code F10, the protective function is activated by a motor current exceeding the set operation level.
Motor 2 overload	OL2	If motor 2 has been selected and driven and electronic thermal overload relay 2 has been selected for code A06, the protective function is activated by the current in motor 2 exceeding the set operation level.
Drive overload	OLU	An output current has exceeded the overload current rating and the protective function has been activated to protect the semiconductor elements in the main circuit of the drive.
Memory error	Er1	A data writing error or other error in the memory has occurred.
Keypad panel communication error	Er2	A data transmission error or transmission stoppage has been detected between the keypad panel and the control section in the keypad operation mode.
CPU error	Er3	Electric noise or other errors have developed in the CPU.
Option error	Er4 Er5	An error has occurred during the operation of an option.
Operating error	Er6	A drive operating error has occurred during drive startup, or FWD or REV connected to terminal AM when Main power is applied to the drive (F02 setting 3 or 4). This error will also display if the STOP key on the keypad is pressed in terminal operation (F02 setting 1 or 3).
Output phase loss	Er7	There is a broken wire, or no connection exists in the drive output circuit during auto tuning.
RS485 communication error	Er8	A communication error has occurred during communication through RS485.



Count Proximity Switch Faults

Table A-17: Count Proximity Switch Faults

Axis	PLC Input/Wire Number	Electrical Enclosure	Input Locations		
			Rack	Slot	Light
Hold-down, stationary end, lift/lower	I-084	stationary end	0	9	A4
Hold-down, carriage end, lift/lower	I-178	carriage end	2	6	A2
Lumber stop	I-094	stationary end	0	9	B6

Home Proximity Switch Faults

Table A-18: Home Proximity Switch Faults

Axis	PLC Input/Wire Number	Electrical Enclosure	Input Locations		
			Rack	Slot	Light
Hold-down, stationary end, lift/lower	I-083	stationary end	0	9	A3
Hold-down, carriage end, lift/lower	I-177	carriage end	2	6	A1
Lumber stop	I-093	stationary end	0	9	B5

Blades

Table A-19: Blades

Blade	Input Locations		
	Rack	Slot	Light
1	0	4	B3
2	0	4	A1
3	2	1	A1
4	2	1	B3
5	2	2	B5
6 (optional)	0	5	A5



Should you lockout/tagout to safely perform this action?



Motor Starter Safety Faults

Table A-20: Stationary-End Motor Starter Safety Faults

Axis	PLC Input/Wire Number	Rack	Input Locations:	
			Slot	Light
Blade 2 run	I-001	0	4	A1
Blade 1 run	I-011	0	4	B3
Blade 6 run	I-021 OPT	0	5	A5
Vertical hold-down, lower	I-038	0	6	A6
Vertical hold-down, raise	I-039	0	6	A7
Lumber stop, extend	I-041	0	6	B1
Lumber stop, retract	I-042	0	6	B2
Waste conveyor run	I-044	0	6	B4
Incline conveyor	I-047	0	6	B7
Infeed chain conveyor run	I-068	0	8	A4

Table A-21: Carriage-End Motor Starter Safety Faults

Axis	PLC Input/Wire Number	Rack	Input Locations:	
			Slot	Light
Blade 3 run	I-097	2	1	A1
Blade 4 run	I-107	2	1	B3
Blade 5 run	I-117	2	2	A5
Vertical hold-down, lower	I-134	2	2	A5
Vertical hold-down, raise	I-135	2	3	A7
Carriage run	I-141	2	3	B5



Should you lockout/tagout to safely perform this action?



Cyber Saw Inputs and Outputs by Function

Table A-22: Inputs and Outputs by Function

Quadrant	Axis	Count Prox	Home Prox	Increase / Raise	Decrease / Lower	VFD	Contactors
1	Angle	I-072	I-071	Q229	Q230	AQ-004	Q-012
	Center Line	I-070	I-069	Q-010	Q-009	N/A	N/A
2	Angle	I-068	I-067	Q-226	Q-225	AQ-003	Q-006
	Center Line	I-066	I-065	Q-004	Q-003	N/A	N/A
3	Angle	I-164	I-163	Q-242	Q-241	AQ-007	Q-038
	Center Line	I-162	I-161	Q-036	Q-035	N/A	N/A
4	Angle	I-168	I-167	Q-246	Q-245	AQ-008	Q-044
	Center Line	I-166	I-165	Q-042	Q-041	N/A	N/A
5	Angle	I-172	I-171	Q-249	Q-250	AQ-009	Q-050
	Center Line	I-170	I-171	Q-048	Q-047	N/A	N/A
6	Angle	I-076	I-075	Q-234	Q-233	AQ-005	Q-018
	Center Line	I-074	I-073	Q-016	Q-015	N/A	N/A
N/A	Stationary Horizontal Hold-Down	I-082	I-081	Q-022	Q-021	N/A	N/A
N/A	Stationary Vertical Hold-Down	I-084	I-083	Q-024	Q-023	N/A	N/A
N/A	Stationary Infeed Conveyor	I-080	I-079 / I-089	Q-020	Q-019	N/A	N/A
N/A	Carriage Horizontal Hold-Down	I-176	I-175	Q-054	Q-053	N/A	N/A
N/A	Carriage Vertical Hold-Down	I-178	I-177	Q-056	Q-055	N/A	N/A
N/A	Carriage Infeed Conveyor	I-174	I-173 / I-083	Q-052	Q-051	N/A	N/A
N/A	Lumber Stop	I-078	I-077	Q-025	Q-026	N/A	N/A
N/A	Carriage	N/A	N/A	Q-218	Q-217	AQ-002	Q-060



Should you lockout/tagout to safely perform this action?





Calibration Procedure

Appendix B

A daily calibration check and basic guidelines for correction can be found in the *Maintenance* chapter on page MT-49. Instructions on individual steps, such as aligning blades or adjusting pivot points, are found throughout the *Maintenance* chapter. If you require a complete procedure for recalibrating the entire saw, use the instructions in this appendix.

Table B-1: Terminology

Terms Used in This Appendix	Definition
infeed side	The side of the saw that contains the touch screen where the operator loads the lumber onto the infeed conveyor
operator side	
feed side	
outfeed side	The side of the saw from which the lumber exits the saw
exit side	
catcher side	

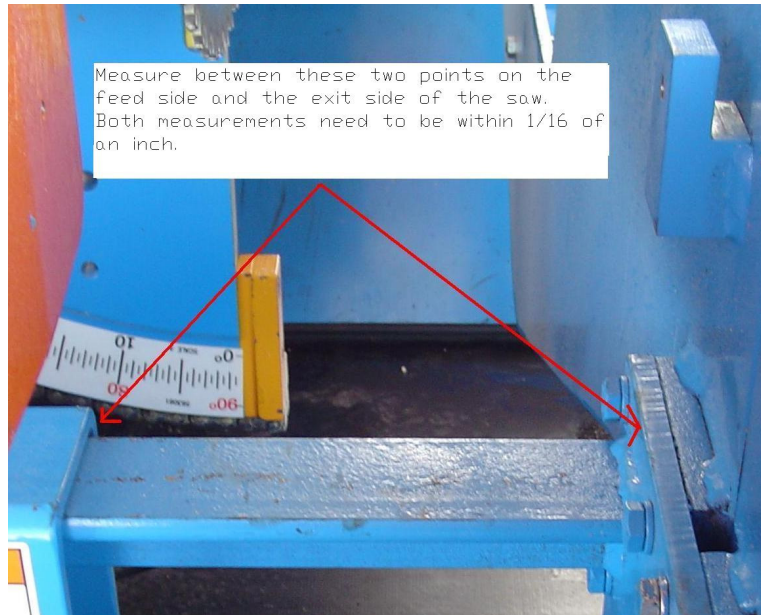
1. Check the alignment on the stationary end of the saw by following these steps:



You must start at the stationary end for measurements to be accurate!

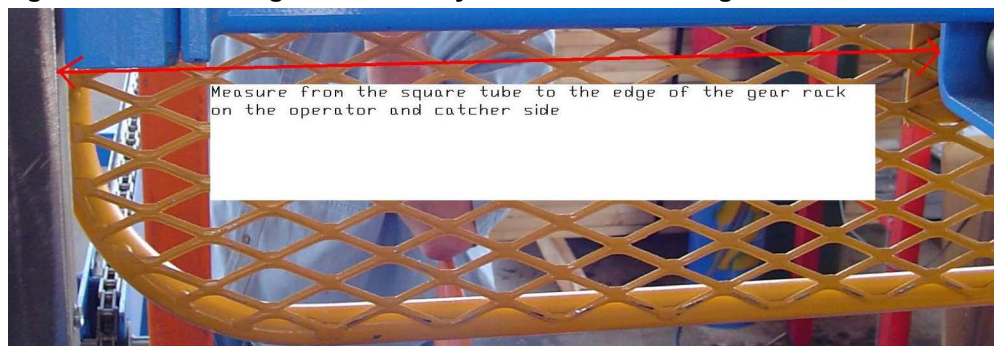
- a) Starting on the stationary end of the saw, check that the infeed alignment is square. Refer to Figure B-1.
 - Be careful that you don't set the end of your tape measure on the weld.
 - Ensure these measurements are taken from the square tube to the infeed mounting plate.

Figure B-1: Measuring the Stationary-End Infeed Alignment



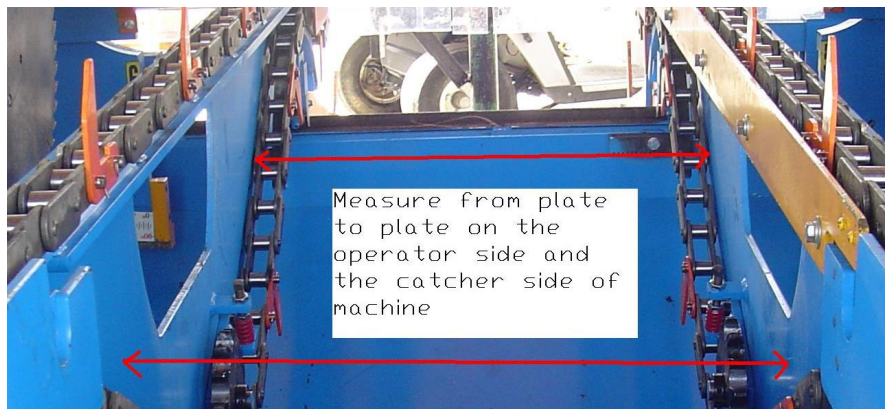
- b) Check that the lumber hold-down alignment on the stationary end is square. Take measurements on both the infeed (feed) and outfeed (exit) sides of the saw. Both measurements must be within 1/16".
 - Measure from the square tube to the gear rack.

Figure B-2: Measuring the Stationary-End Hold-Down Alignment



- c) If all these measurements are within 1/16", you may proceed. If not, refer to the *Maintenance* chapter to adjust the applicable component.
2. Check and adjust the alignment on the carriage end of the saw by following these steps:
- a) Measure the infeed conveyor assemblies from steel plate to steel plate. Measure near the infeed side and again near the outfeed side. Both measurements must be within 1/16" of each other.

Figure B-3: Measuring the Carriage-End Infeed Alignment



- b) Measure the hold-downs from gear rack to gear rack. Measure near the infeed side and again near the outfeed side. Both measurements must be within 1/16" of each other.

Figure B-4: Measuring the Carriage-End Hold-Down Alignment



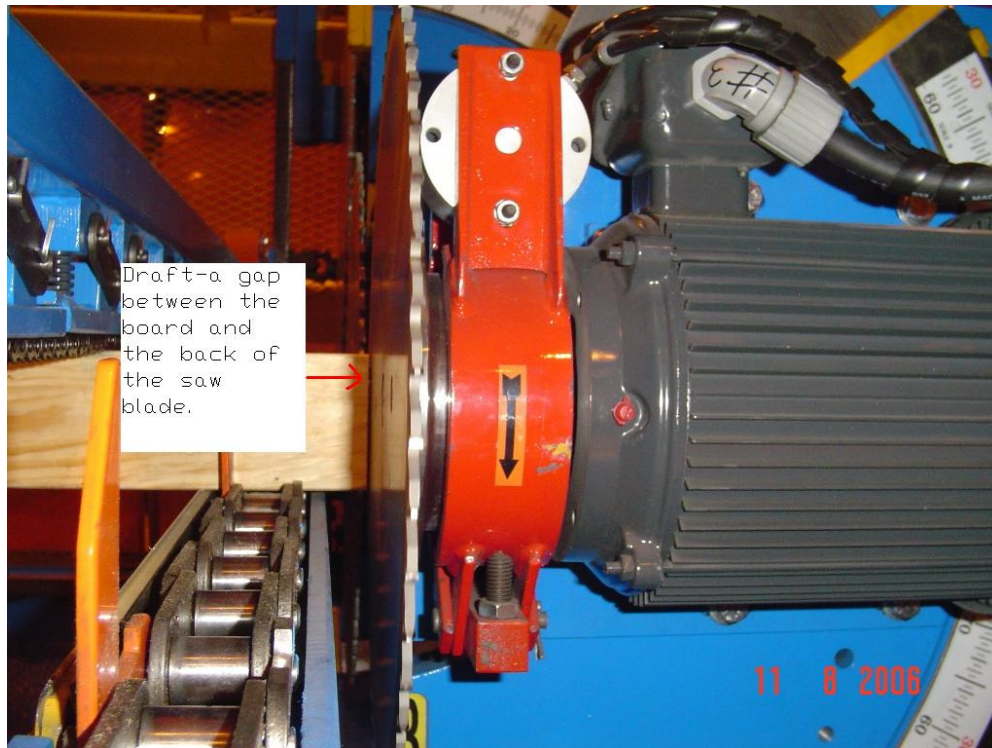
- c) If all these measurements are within 1/16", you may proceed. If not, refer to the *Maintenance* chapter to adjust the applicable component.

3. Check the saw blade draft on blades 2 and 3 and adjust accordingly by completing the following steps:



Draft is when the saw blade does not touch the board after its been cut, you should see a small gap between the board and the saw blade as the board travels along side of the saw blade toward the outfeed side of the saw.

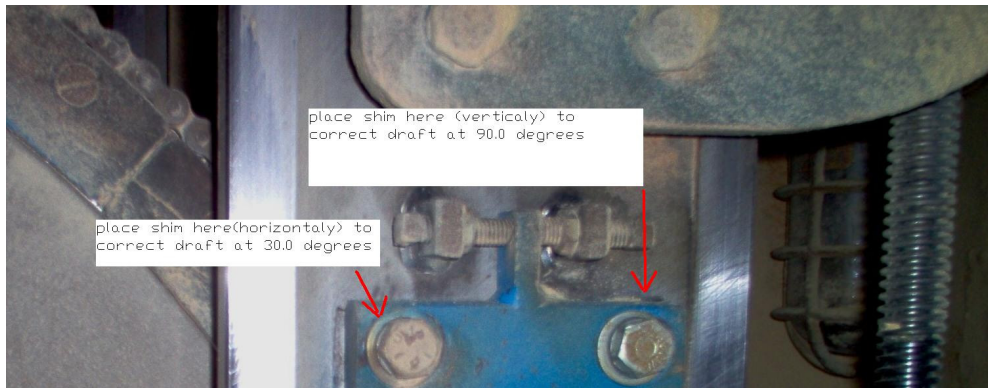
Figure B-5: The Gap Between Board and Back Half of Blade is Blade Draft



- a) Set blades 1, 2, 3, and 4 to 90.0 degrees setting.
- b) In Manual Mode, run the board through blades 2 and 3 at 90 degrees, watching carefully. Continue the board through blades 1 and 4.
 - If the blade is still touching the board as it travels over the back half of blades 2 and 3, insert a shim vertically, toward the back of the machine.
 - If the front of saw blades 1 and/or 4 are not touching the board when the board reaches those blades, a shim is needed toward the saw blade.
- c) Install shims as necessary. See Figure B-5.
- d) Set blades 2 and 3 to 30.0 degrees.
- e) In Manual Mode, run the board through blades 2 and 3 at 30 degrees, watching carefully. Continue the board through blades 1 and 4.

- If the blade is still touching the board as it travels over the back half of blades 2 and/or 3, insert a shim horizontally (generally the shim should be placed at the top of the assembly for blades 2, 3 and 5 and on the bottom for saw blades 1 and 4).
- f) Install shims as necessary. See Figure B-5.
 - g) Check and adjust the blade draft alignment for blades 1 and 4, and 5 and 6.

Figure B-6: Installing Shims to Adjust Blade Draft



4. Check the pivot point on saw blades 2 and 3.
 - a) Go into Semiautomatic Mode and set saw blades 2 and 3 to go to 30.0 degrees at a centerline height of 1.12.
 - b) Go into Manual Mode after the saw sets up, this will insure the in feed and hold down assemblies don't move during the next three test cuts.
 - c) Manually cut the board going all the way through using the jog button. Back the board up until it is clear of the saw blades, using the jog button keeping the board on the lumber guide knife. The lumber guide knife is the yellow guide on the carriage-end infeed conveyor.

Figure B-7: Checking Pivot Point

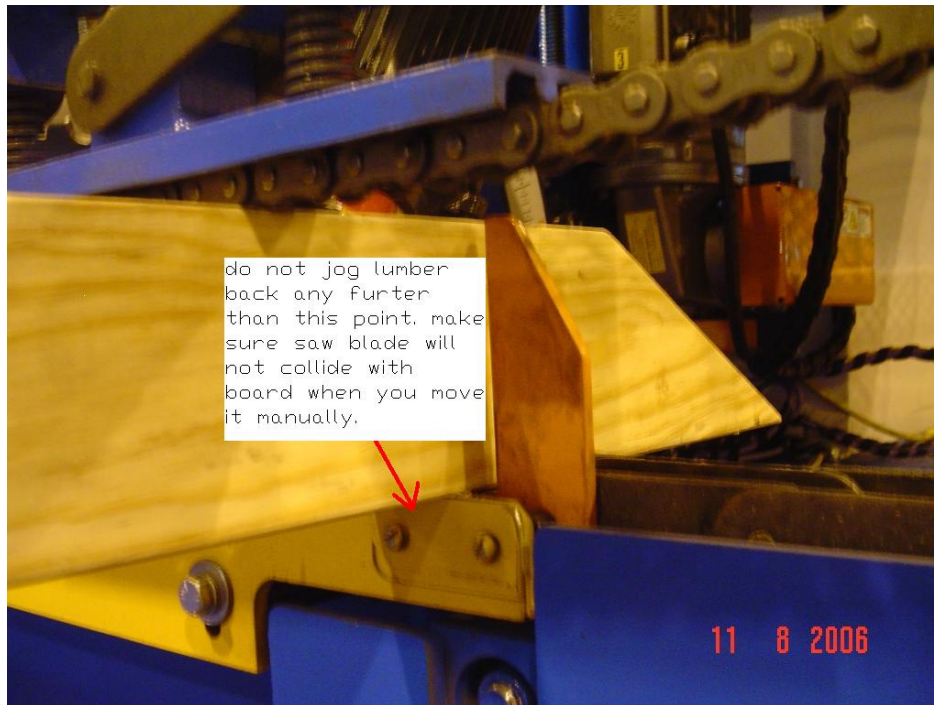
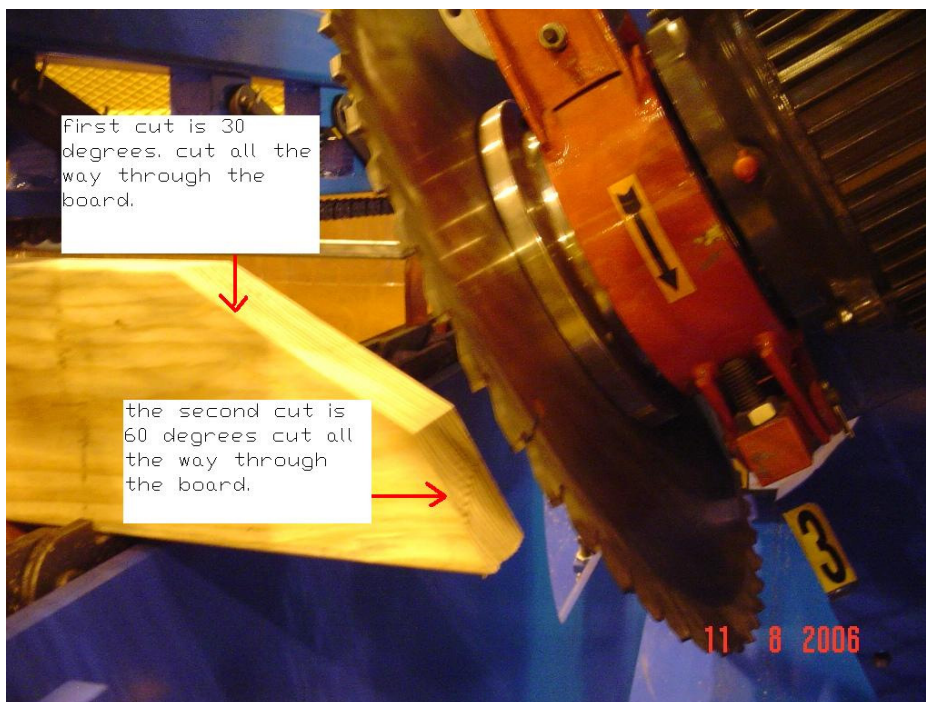


Figure B-8: Checking Pivot Point



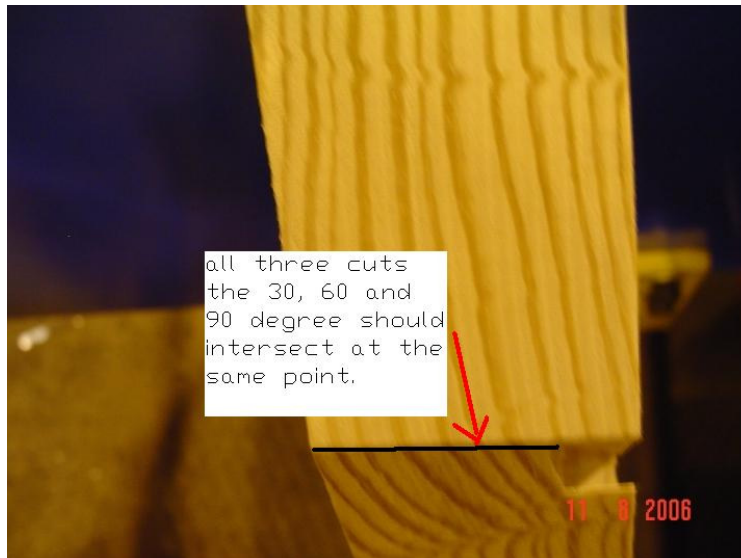
- d) Move the saw blades manually to 60.0 degrees and cut the board all the way through using the JOG button. Back the board up until it is clear of the saw blades, using the JOG button keeping the board on the knife edge.
- e) Move the saw blades 2 and 3 manually to 90.0 degrees and cut the board halfway through using the JOG button.

Figure B-9: Checking Pivot Point



- f) Back the board all the way out of the saw using the JOG button. Check to see that all three cuts intersect at the same point.

Figure B-10: Ideal Pivot Point Test Results



- 5. Make pivot point adjustments by following these steps:

- a) Determine if pivot is too far in the cut or needs to be taken out of the cut.
- b) Make a truth mark on the motor mounting plate and the casting to see how much you have to move it.
- c) Loosen the (4) mounting bolts and slide motor mounting in the direction needed for adjustment.

Figure B-11: Adjusting the Pivot Point

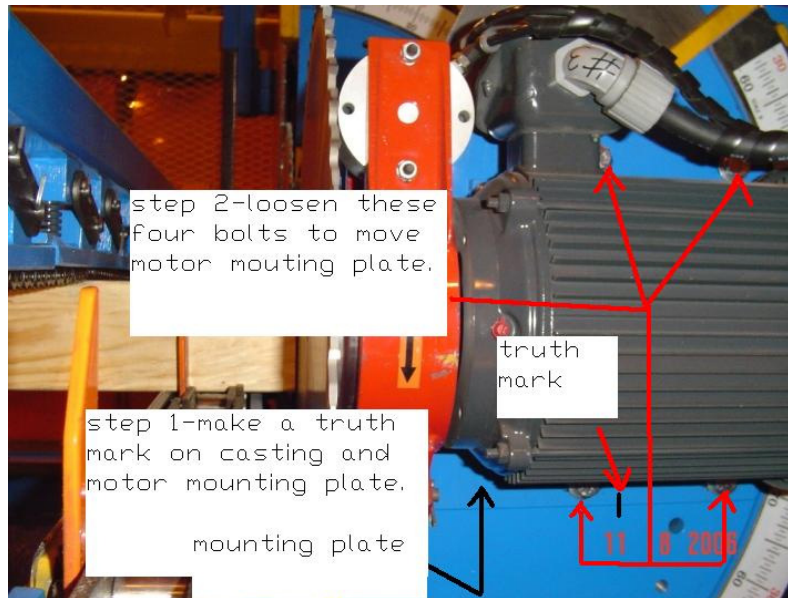
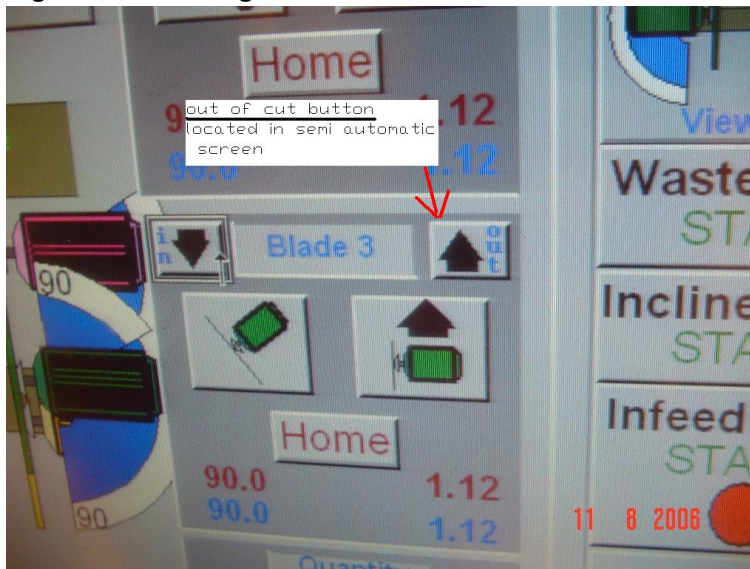


Figure B-12: Taking the Blades Out-Of-Cut



- d) Repeat this step for blades 1 and 4, with blades 2, 3, 5, and 6 out of the cut.
 - e) Repeat this step for blades 5 and 6, with blades 1, 2, 3, and 4 out of the cut.
6. Check blade alignment.

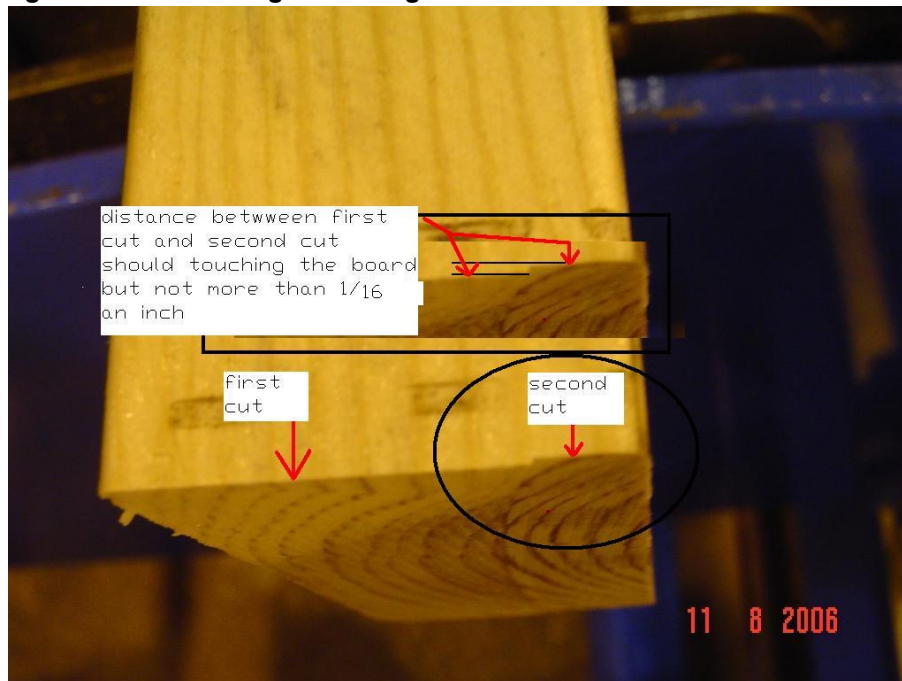


Blade alignment is how the blades are aligned horizontally with each other.

- a) Put all saw motors back in the cut.
- b) Go into manual screen and start saw motors 1, 2, 3 and 4.
- c) Using the jog button, cut the board all the way through with blades 2 and 3.
- d) Next continue jogging the board into saw blades 1 and 4 but stop about halfway through.

Saw motor blades 1 and 4 should make contact with the board but no more than 1/16".

Figure B-13: Checking Blade Alignment



7. Make blade alignment adjustments by following these steps:
 - a) There are 4 jack screws on the back of the quadrant. Paying attention to the fixed point of the assembly, back up the appropriate screws. It is important to count the number of flats you move the screw.
 - b) Move the bottom adjustment screw the same number of flats and lock both in with the jam nuts.

Figure B-14: Adjusting Blade Alignment Jack Screws

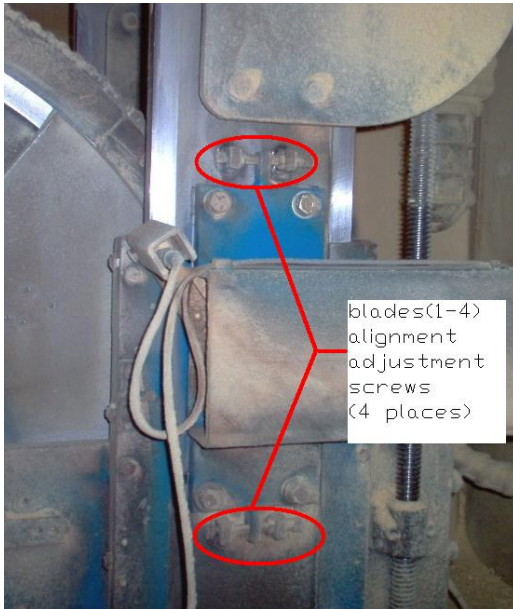
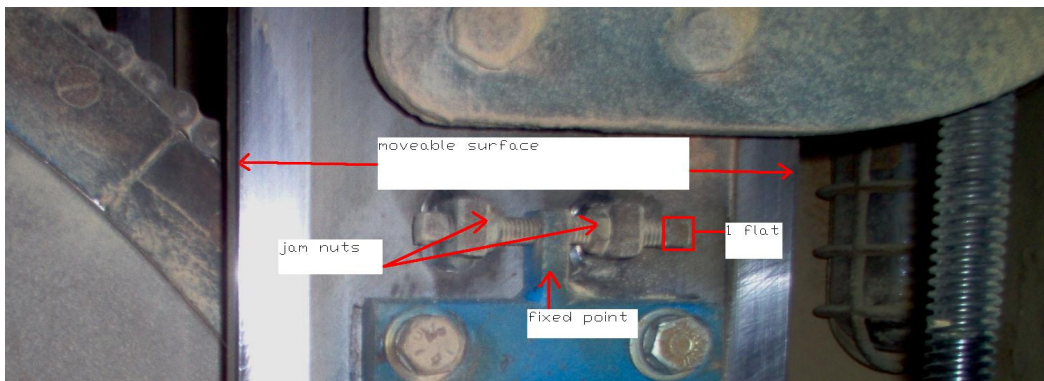


Figure B-15: Adjusting Blade Alignment Jack Screws



- c) Loosen the mounting bolts and move the saw assembly with the remaining adjustment screws.

Figure B-16: Mounting Bolts for Blade Alignment

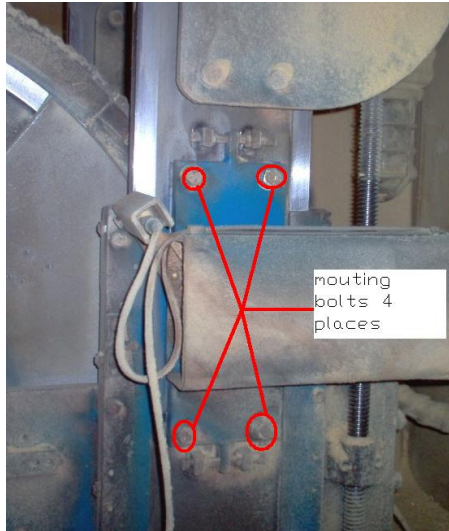
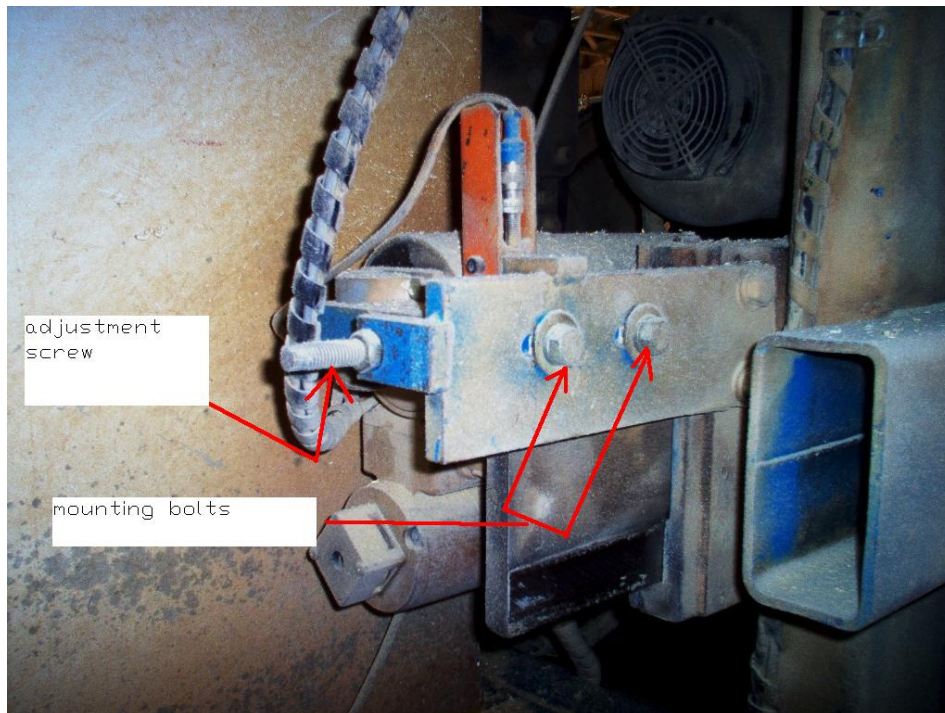


Figure B-17: Adjustment Screw for Blade Alignment



- d) Tighten the jam nuts and the mounting bolts.
- e) Adjust number 5 and (optional 6) alignment.
- f) Move jam nut accordingly and set the gap needed.
- g) Loosen the mounting bolts for the horizontal slide and tighten the opposite jam nut.
- h) Check and adjust the blade alignment for blades 1 and 4 as compared to blades 5 and 6.

It is important to take 5 or 6 quad out of the cut and bring it back in when checking 5 or 6 blade alignment.

Navigating Through the Parts List

The Parts List appendix is divided into sections and each section is divided into part location categories. The order of the sections and categories names are shown here.

Mechanical Replacement Partspage MT-222

Part Location Categories	
Chain	Motor
Conveyor	PC Enc.
Filter	Saw Blade
Guard	Scale
Hold-Down	Support Bar
Infeed	TS & PC
Misc.	

Pneumatic Replacement Partspage MT-225

Part Location Categories
Saw
PC Enc.

Electrical Replacement Partspage MT-226

Part Location Categories
Cards, contactors, limit switches, overloads, PLC, prox switches, relays, and motor starters
Cable
Controls
Encoder
VFD

Documentation Part Numberspage MT-228

Guards Part Numberspage MT-229

Part Numbers

Mechanical Replacement Parts

Table C-1: Mechanical Replacement Parts

Part Location Category	MiTek Part Number	Part Description	Drawing #	Qty on saw	Keep in Stock
	60000-901	Spare parts kit* <i>*All of the most commonly needed spare parts and maintenance items</i>	—		1
Bearing, conveyor drive	419118	Bearing, conveyor drive assembly	—		
Chain	554001-23.50	Chain for angulation encoder, quad 5	60030		
Chain	554001-20.00	Chain for angulation encoder, quads 1-4	60025		
Chain	554495-60.00	Chain for angulation on quads 1-5	60025		
Chain	554001-16.25	Chain for centerline, quad 5	60030		
Chain	554001-24.25	Chain for centerline, quads 1-4	60025		
Chain	Refer to Dwg. 7003300	Chain for infeed conveyor	7003300	2	
Chain	554006-60.00	Drive chain for hold-downs	60005	2	
Conveyor	589020	Conveyor belt, incline conveyor	7022100		
Conveyor	589003 589046	Conveyor belt, waste conveyor - 30' saw Conveyor belt, waste conveyor - 34' saw	60005		
Filter	504481	Filter replacement for carriage and stationary enclosure doors	90502-501	4	✓
Guard	60145-501	Angled-fitting guard for angulation encoders for quad 5 or quad 6	60120-530 60120-534	1-2	
Guard	See Dwg. 60120	Guards	60120		
Hold-Down	554006	Hold-down chain, 18' ea	77776	2	
Hold-Down	78578	Hold-down channel - center	77146	1	
Hold-Down	78581	Hold-down channel - front	77146	1	
Hold-Down	78582	Hold-down channel - rear	77146	1	
Hold-Down	554283	Hold-down connector link on shoe	77809, 77810	24	
Hold-Down	370100	Hold-down spring	77809, 77810	24	

Table C-1: Mechanical Replacement Parts (Continued)

Part Location Category	MiTek Part Number	Part Description	Drawing #	Qty on saw	Keep in Stock
Infeed	394159	Cotter pin connecting infeed conveyor links	77754, 77765		
Infeed	77901	Flight (dog), for CE Mark machine	—		
Infeed	7003302	Flight (dog), for US machine	77754, 77765		
Infeed	7003303	Infeed conveyor connector links	77754, 77765		
Infeed	78646	Lumber guide (entire strip, including knife)	77765	1	
Infeed	78589	Lumber guide knife only	—	1	
Infeed	77292-501	Lumber pivot extension	77754, 77765	2	
Misc.	557392	Angle coupling insert	—	5-6	
Misc.	64515	Carriage wheel assembly	—	4	
Misc.	557456	Centerline coupling inserts	—	5-6	✓
Misc.	511747	Drawer latches in stationary- and carriage-end enclosures	90501-501	12	
Misc.	77802	Lumber stop assembly	77802	1	
Misc.	77804	Lumber stop pointer	77802	1	
Misc.	395198	Roll pin (for all spur gears on saw)	—	12	
Motor	480356	Angulation motors, quads 1-6	60165	5-6	✓
Motor	46030	Brake lining (shoe), for air brakes on blades	7016600 7016700	5-6	
Motor	471222	Carriage drive motor	60165	1	✓
Motor	480357	Centerline motors, quads 1-6	60165	6	✓
Motor	480259	Horizontal hold-down motors	60165	2	✓
Motor	480259	Horizontal infeed motors	60165	2	✓
Motor	480393	Incline conveyor motor (option)	7022100	1	
Motor	471222	Infeed conveyor motor	60165	1	✓
Motor	480336	Lumber stop motor	60165	1	✓
Motor	78420-513	Saw blade motors, quads 1-4, 5 hp w/ hub	60165	4	✓
Motor	78420-514	Saw blade motors, quads 5-6, 10 hp w/ hub	60165	1	✓
Motor	480336	Vertical hold-down motors	60165	2	✓

Table C-1: Mechanical Replacement Parts (Continued)

Part Location Category	MiTek Part Number	Part Description	Drawing #	Qty on saw	Keep in Stock
Motor	480392	Waste conveyor motor	60165	1	✓
PC Enc.	90503-501	Entire kit, enclosure and all parts	90503	1	1
Saw Blade	811040	Saw blade, 16", quads 2 and 3	—	2	✓
Saw Blade	811041	Saw blade, 20", quads 1 and 4	—	2	✓
Saw Blade	811042	Saw blade, 32", quads 5 and 6	—	1	✓
Scale	563083	Scale for length (carriage location), metal, 25'	60000		
Scale	563091	Scale kit, scales for angulation, 5-bladed saw	60000	1	
Scale	563092	Scale kit, scales for hold-down, lumber stop, and centerline, 5-bladed saw	60000	1	
Support Bar	77494	Center lumber support	60005	1	
Support Bar	60104	Floor truss web riser bar	60000	2	
Support Bar	60071-501 60075-501	Heel cut skid bar, carriage end Heel cut skid bar, stationary end, for 6-bladed saws only	60005	1-2	
TS & PC	504473	Bezel kit for CTC touch screen	—	1	
TS & PC	504474	Overlays for 15" CTC touch screen	—	1 pkg	
TS & PC	519685	Swingarm (STRONGARM™) Includes accessories to attach to touch screen enclosure	90504-501	1	

Pneumatic Replacement Parts

Table C-2: Pneumatic Replacement Parts

Part Location Category	MiTek Part Number	Part Description	Drawing #	Qty on saw	Keep in Stock
Saw	79745	Filter/regulator/lubricator on saw	60005		
PC Enc.	438011	Filter element for general purpose filter	—		
PC Enc.	438010	Filter element for oil remover	—		
PC Enc.	438009	Regulator service repair kit	—	—	
PC Enc.	809040	Cooler (cooling unit only)	—		
PC Enc.	809042	Cold air distribution kit	—		
PC Enc.	809043	Solenoid valve	—		
PC Enc.	438005	Regulator	—		
PC Enc.	438006	Oil remover	—		
PC Enc.	438008	General purpose filter	—		
PC Enc.	438572	Quick clamp	—		
PC Enc.	809039	Cooler kit included cooler, air distribution kit, solenoid valve, and thermostat	90503		
PC Enc.	78485-501	Pneumatic assembly for PC Enclosure includes regulator, oil removed, filter, and quick clamp	90503		

Electrical Replacement Parts

Refer to Drawing 90501-502 for the stationary-end components that aren't listed here.

Refer to Drawing 90502-502 for the carriage-end components that aren't listed here

Table C-3: Electrical Replacement Parts

Part Location Category	MiTek Part Number	Part Description	Drawing #	Qty on Saw	Keep in Stock
Cards, contactors, limit switches, overloads, PLC, prox switches, relays, and motor starters	504405	AC output card	90501-501 90502-501	1	✓
	509215	Contactor, angulation	90501-501	1	✓
	513823	Contactor, angulation brake contact	90502-501	4	✓
	509215	Contactor, centerline	90501-501	1	✓
	504403	Input card	90501-501 90502-501	1	✓
	515069	Limit switch (lumber count, discharge count)	90500-530	2	
	515075	Limit switch (swing guard switch)	90500-530	1	
	509316	Overload, angulation	90501-501	1	✓
	514142	Overload, centerline	90501-501 90502-501	1	✓
	92109	PLC (programmed)	90501-501	1	
	528025	Pressure switch, pneumatic	90500-530		
	515831	Proximity switches	90500-530	8	✓
	504406	Relay output	90501-501	1	✓
	509214	Reverse motor starter, centerline	90501-501 90502-501	1	✓
	509111	UPS (Uninterrupted Power Supply) <i>Pulsar ELSP500 (may have 1 in TS enc. and 1 in PC enc.)</i>	90504-501	2	
VFD	92153	VFD for angulation, conveyor, and horizontal hold-down, 1 hp	—	1	✓
VFD	92155	VFD for carriage movement, 2 hp	—		✓
VFD	92154	VFD for infeed drive, 2 hp	—		✓
Cable	508056	Proximity cable, 90°	90500-534	2	✓

Table C-3: Electrical Replacement Parts (Continued)

Part Location Category	MiTek Part Number	Part Description	Drawing #	Qty on Saw	Keep in Stock
Cable	508055	Proximity cable, straight	90500-534	2	✓
Encoder	504460	Angled-fitting encoder with cable	—	1	
Encoder	504460	Angled-fitting encoder with cable	60005		
Encoder	60145-501	Angled-fitting guard for angulation encoders for quad 5 or quad 6	—		
Encoder	504460	Encoder w/cables	60005-534	up to 17	✓
Encoder	508967	Power cable quick disconnect	—		
Encoder	508969	Profibus data cable, Straight to female	—	1	
Encoder	508969	Profibus data cable, Straight to female	—		
Encoder	508968	Profibus data cable, Straight to male	—	1	
Encoder	508968	Profibus data cable, Straight to male	—		
Controls	513656	Pushbutton on stationary enclosure, red, mushroom-shaped	90501-501		
Controls	528085	Safety pull switch	90500-530		
Controls	513644	Selector switch on stationary enclosure	90501-501		
TS & PC	504548	KVM extender kit KVM-local and remote modules, 2 cables DC adapter and cable for remote module	90500	1	
TS & PC	504562	PC, <i>Dell® Optiplex GX520, Windows XP (as of 6/06)</i>	90503		
TS & PC	504552	32-bit network PCI card for Dell Optiplex	—		
TS & PC	504549	Serial dual PCI card for Dell Optiplex	—		
TS & PC	90067-502	MiTek software CD for A/T	—		
PC Enc.	809044	Thermostat for PC enclosure cooler	90503-501 (809039)		
Thermostat	504493	Thermostat for stationary enclosure fan	90501-502		
Thermostat	504493	Thermostat for carriage enclosure fan	90501-502		
TS & PC	504504	NIC, coaxial, for touch screen computer	—	1	
TS & PC	504449	NIC, fiber optic, for touch screen computer	—	1	
TS & PC	504327	Keyboard for MiTek touch screen	90500-530	1	
TS & PC	504547	Floppy drive, 3.5"	90503	1	1

Documentation Part Numbers

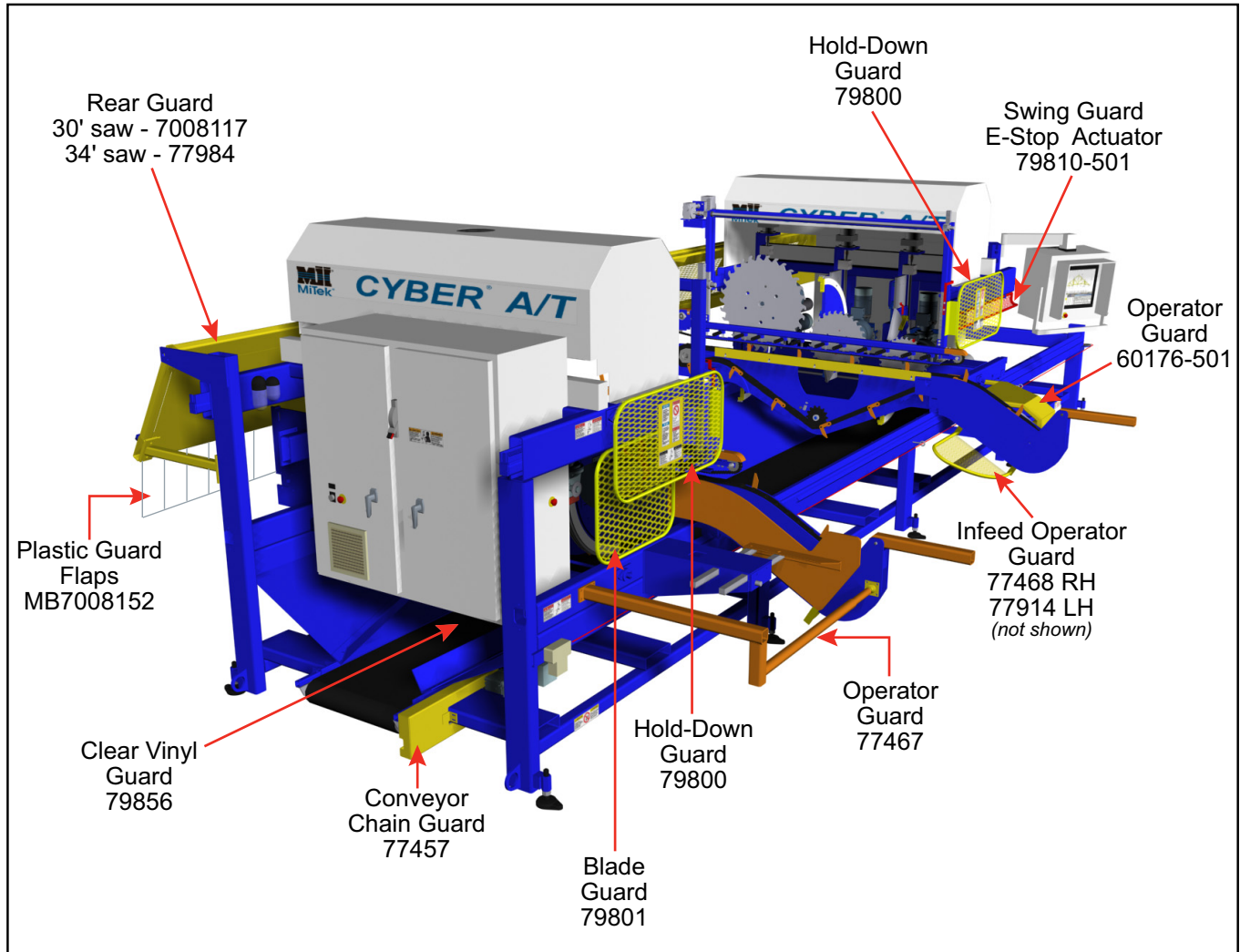
Table C-4: Documentation

Documentation	Qty	MiTek Part Number
Manual		001055
<i>Installation Guide</i>	1	001055-IN
<i>Operation Guide</i>		001055-OP
<i>Maintenance Guide</i>		001055-MN
Drawing set for manual		1
Operation and Safety Labels	See Table C-5 or Dwg. 60000	
Electrical Safety Labels	See Table C-5 or Dwg. 90500	

Guards Part Numbers

The main guards are shown in Figure C-1. For additional guards and covers, see Drawing 60120.

Figure C-1: Guards



Labels Part Numbers

Table C-5: Labels





MiTek Part #	Part Description
691519	 <p>WARNING</p> <p>Flying debris and loud noise hazards. Wear ear and eye protection.</p> <p>ADVERTENCIA</p> <p>Riesgos de desechos disparados y ruidos fuertes. Use protectores de oídos y ojos.</p>
691408	 <p>PELIGRO</p> <p>Voltaje riesgoso. Desconectar la energía, bloquear y colocar etiquetas antes de dar servicio.</p> <p>DANGER</p> <p>Hazardous voltage. Disconnect power, lockout and tagout before servicing motor.</p>
691407	 <p>DANGER</p> <p>Hazardous voltage. Disconnect power, lockout and tagout before servicing motor.</p> <p>PELIGRO</p> <p>Voltaje riesgoso. Desconectar la energía, bloquear y colocar etiquetas antes de dar servicio.</p>
691404	 <p>DANGER</p> <p>To avoid injury:</p> <ul style="list-style-type: none"> • Always inspect saw blades before use. • Replace all cracked or damaged blades. <p>PELIGRO</p> <p>Para evitar lesiones:</p> <ul style="list-style-type: none"> • Siempre inspeccionar las hojas de sierra antes del uso. • Reemplazar todas las hojas con fisuras o dañadas.

Table C-5: Labels (Continued)







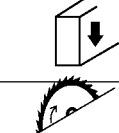
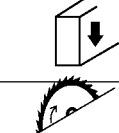
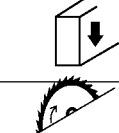






MiTek Part #	Part Description			
691702	<div data-bbox="927 407 1032 737"> <p>NOTICE</p> <p>Always use proper shutdown procedures to avoid possible damage to computer files. Refer to Operations and Maintenance Manual for proper shutdown procedure.</p> <p>AVISO</p> <p>Siempre usar los procedimientos correctos de apagado para evitar daños posibles a los archivos de computadora. Consultar los procedimientos correctos de apagado en el Manual de operaciones y mantenimiento.</p> </div>			
691601	<div data-bbox="732 789 1230 951"> <table border="1"> <tr> <td data-bbox="732 789 906 951"> <p>⚠ ATENCIÓN</p> <p>Consultar los métodos correctos de izado en el Manual de operaciones y mantenimiento.</p> </td> <td data-bbox="906 789 1052 951">  </td> <td data-bbox="1052 789 1230 951"> <p>⚠ CAUTION</p> <p>Refer to Operations and Maintenance Manual for proper lifting methods.</p> </td> </tr> </table> </div>	<p>⚠ ATENCIÓN</p> <p>Consultar los métodos correctos de izado en el Manual de operaciones y mantenimiento.</p>		<p>⚠ CAUTION</p> <p>Refer to Operations and Maintenance Manual for proper lifting methods.</p>
<p>⚠ ATENCIÓN</p> <p>Consultar los métodos correctos de izado en el Manual de operaciones y mantenimiento.</p>		<p>⚠ CAUTION</p> <p>Refer to Operations and Maintenance Manual for proper lifting methods.</p>		
691513	<div data-bbox="743 1003 1214 1157"> <table border="1"> <tr> <td data-bbox="743 1003 911 1157"> <p>⚠ ADVERTENCIA</p> <p>El equipo arranca automáticamente. NO alcanzar debajo de las defensas. NO operar sin las defensas colocadas en su lugar. Bloquear y colocar etiquetas antes de dar servicio.</p> </td> <td data-bbox="911 1003 1052 1157">  </td> <td data-bbox="1052 1003 1214 1157"> <p>⚠ WARNING</p> <p>Equipment starts automatically. Do NOT reach under guards. Do NOT operate without guards in place. Lockout and tagout before servicing.</p> </td> </tr> </table> </div>	<p>⚠ ADVERTENCIA</p> <p>El equipo arranca automáticamente. NO alcanzar debajo de las defensas. NO operar sin las defensas colocadas en su lugar. Bloquear y colocar etiquetas antes de dar servicio.</p>		<p>⚠ WARNING</p> <p>Equipment starts automatically. Do NOT reach under guards. Do NOT operate without guards in place. Lockout and tagout before servicing.</p>
<p>⚠ ADVERTENCIA</p> <p>El equipo arranca automáticamente. NO alcanzar debajo de las defensas. NO operar sin las defensas colocadas en su lugar. Bloquear y colocar etiquetas antes de dar servicio.</p>		<p>⚠ WARNING</p> <p>Equipment starts automatically. Do NOT reach under guards. Do NOT operate without guards in place. Lockout and tagout before servicing.</p>		
691403	<div data-bbox="727 1209 1230 1371"> <table border="1"> <tr> <td data-bbox="727 1209 906 1371"> <p>⚠ PELIGRO</p> <p>Riesgo de choque. NO intentar mover los transportadores de alimentación de entrada si los sujetadores mientras las hojas de la sierra están funcionando. El contacto entre los transportadores de alimentación de entrada y los sujetadores con las hojas de la sierra dañará las hojas de la sierra y creará proyectiles peligrosos.</p> </td> <td data-bbox="906 1209 1052 1371">  </td> <td data-bbox="1052 1209 1230 1371"> <p>⚠ DANGER</p> <p>Collision hazard. Do NOT move infeed conveyors or hold downs while saw blades are running. Contact between infeed conveyors or hold downs with saw blades will damage saw blades and create dangerous projectiles.</p> </td> </tr> </table> </div>	<p>⚠ PELIGRO</p> <p>Riesgo de choque. NO intentar mover los transportadores de alimentación de entrada si los sujetadores mientras las hojas de la sierra están funcionando. El contacto entre los transportadores de alimentación de entrada y los sujetadores con las hojas de la sierra dañará las hojas de la sierra y creará proyectiles peligrosos.</p>		<p>⚠ DANGER</p> <p>Collision hazard. Do NOT move infeed conveyors or hold downs while saw blades are running. Contact between infeed conveyors or hold downs with saw blades will damage saw blades and create dangerous projectiles.</p>
<p>⚠ PELIGRO</p> <p>Riesgo de choque. NO intentar mover los transportadores de alimentación de entrada si los sujetadores mientras las hojas de la sierra están funcionando. El contacto entre los transportadores de alimentación de entrada y los sujetadores con las hojas de la sierra dañará las hojas de la sierra y creará proyectiles peligrosos.</p>		<p>⚠ DANGER</p> <p>Collision hazard. Do NOT move infeed conveyors or hold downs while saw blades are running. Contact between infeed conveyors or hold downs with saw blades will damage saw blades and create dangerous projectiles.</p>		
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Table C-5: Labels (Continued)



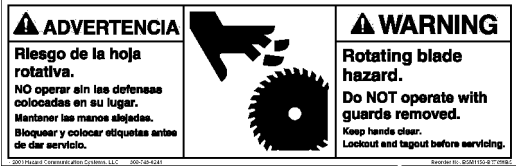
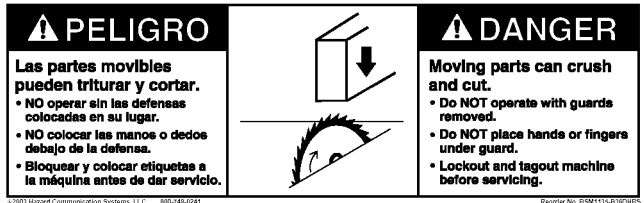

MiTek Part #	Part Description
691604	
691703	
691517	
691409	

Table C-5: Labels (Continued)

MiTek Part #	Part Description
691516	<div data-bbox="889 401 1068 949" style="border: 1px solid black; padding: 5px;"> <p style="text-align: right; font-size: small;">Max 691516</p> <p>▲WARNING</p>  <p>Pinch point. Keep hands and head clear. Carriage may strike you when it is travelling.</p> <p>▲ADVERTENCIA</p> <p>Punto de compresión. Mantener las manos y la cabeza alejadas. El carruaje puede golpearle cuando se desplace.</p> <p style="font-size: x-small;">©2010 HCS, LLC ESM1203-4034WBT</p> </div>



Maintenance Checklists

Appendix D

Checklists for Preventive Maintenance

The checklists are divided up according to how often the actions need to occur.




The *Preventive Maintenance Action* column is meant to be a brief reminder of the action required. For a more detailed explanation and for technical details, refer to the page number listed in the *See Page #* column.

Maintenance Checklist

At the Beginning of Each Shift

Month and Year: _____ Week: _____

Table D-1: Preventive Maintenance at the Beginning of Each Shift






Preventive Maintenance Action	See Page #	Dates Completed				
Check that the pneumatic system pressure on the saw and the PC enclosure are approximately 100 psi	MT-103					
Check that the saw's pneumatic lubricator oil level is at least 3/4 full and fill the oil if necessary	MT-103					
Check for water in the pneumatic system filter on the saw and the PC enclosure and drain water if necessary	MT-103					
Check E-stops for proper operation	MT-12					
Check saw blade braking time (5 to 6 seconds)	MT-12					
Check that all guards are in place and secure	MT-229					
Perform a daily calibration check to ensure that saw is ready for production cutting	MT-49					
 Check saw blades for chipped or missing teeth, dullness, pitch build-up, and warping	MT-76					
 Clean and lubricate all parts listed in the <i>Every 2 Hours</i> checklist and described in the <i>Maintenance</i> chapter	MT-59					
 Inspect the saw for damage and loose or missing parts as described in the <i>Maintenance</i> chapter	MT-60					

Maintenance Checklist

Weekly Checklist

Year: _____





Month: _____

Preventive Maintenance Action (write dates at top of column)	See Page #	1	2	3	4	5
 Vacuum inside all electrical enclosure and blow out electrical enclosure filters Do not use compressed air inside the electrical enclosures! It may force contaminants into the electrical connections. Remove filters before blowing off dust.	MT-138					
 Clean all motors and gearboxes, and lubricate the chains and sprockets under the motor guards	MT-59 MT-63					
 Replace saw blades per the designated schedule (depends on usage)	MT-76					
 Inspect the lumber guide and check its height	MT-91					
 Check the tension of: Infeed conveyor chain (square drive shaft) Hold-down chain	MT-89 MT-96					
Check alignment of: Infeed conveyors Hold-downs	MT-90 MT-96					
Check tracking/tension of: Waste conveyor belt Incline conveyor belt (option)	MT-100					
Clear batch cutting files from database	OP-58					

Maintenance Checklist

Monthly Checklist




Year: _____

MONTH (first half of year)	See Page #	JAN	FEB	MAR	APRIL	MAY	JUNE
Lubricate the lumber stop rack and pinion with a kerosene and oil mixture							
Check that all labels can be easily read							
Check external wiring for kinks and wear							
Check that heel cut skid bars, center lumber support, and floor truss web riser bars are in good condition and height is properly adjusted							
 Clean the following components with a rag and light cleaning solvent: Square drive shaft Length scale Angulation scales Slides and castings	MT-60						
 Check saw blade taper lock bushings	MT-78						
 Check oil levels in the unsealed gearboxes and add oil if necessary	MT-65						
 Lubricate bearings	MT-41, MT-42, MT-64						




Maintenance Checklist

Quarterly Checklist

Year: _____

Preventive Maintenance Action	See Page #	Sign and Date When Action is Performed			
 Lubricate saw blade motor bearings	MT-63				
 Check electrical connections inside enclosures for secure connections	MT-138				
 Quarterly inspection	MT-59				

Annual Checklist

Preventive Maintenance Action	See Page #	Sign and Date When Action is Performed			
 Replace oil in the 5 gearboxes that are not factory sealed	MT-65				
 Replace the filters in all electrical enclosures	MT-138				
 Replace the battery in the PLC					

Notes

Date

Drawings are inserted at the back of the manual.

Table E-1: Attached Drawings

Drawing Description	Drawing Number
Final Assembly	60000
Encoder Carriage Float Assembly	60004
Mechanical Assembly Cyber A/T	60005
Quadrant #1 Assembly	60010
Quadrant #2 Assembly	60015
Quadrant #3 Assembly	60020
Quadrant #4 Assembly	60025
Quadrant #5 Assembly	60030
Frame, Base, Saw, Weldment, A/T	60085
Safety, Devices & Guards, Assy	60120
Catcher Display (option), for TS enc.	60122
Quadrant #6 Assembly	60125
Carriage Drive & Conv. Adj. Assy	60130
Powered, Hold-Down/Infeed, Assy	60135
Motor Assembly Cyber A/T (50 Hz)	60144
Motor Assembly Cyber A/T	60165
Catcher Display (option), for PC enc.	60182
Carriage, Wheel, Assy	64515
Hold-Down, Carriage, Assembly	77146
Cam, Follower, Assy	77464
Lumber, Conveyor, Stat, Assembly	77754
Lumber, Conveyor, Carriage, Assembly	77765
Hold-Down, Powered Assembly, RH	77776
Lumber, Stop, Assy	77802
Hold-Down, Stationary Assembly	77809
Hold-Down, Powered Assembly, LH	77810
Inker	78848
Pneumatic, Assy, Cyber, 5 Blade	79745
Easyfeed, Lumber, Roller, S/A	79782
Cyber, A/T, Electrical, Assy	90500
Cyber, A/T, ELE, STA, PNL, 230V, US	90501
Cyber, A/T, ELE, CRG, PNL, 230V, US	90502

Table E-1: Attached Drawings

Drawing Description	Drawing Number
PC Enclosure, shows Catcher and Inker Grommets	90503
Cyber, A/T, TS, ENCL, Assy, w/Swingarm	90504
Cyber, A/T, ELE, Schem, 230V, US	90507
Comm. Cable, Configuration, Cyber	92019
Cyber Modem Comm. Cable	92049
Layout—Generic for saw w/conveyor	99002
Brake Assy for Quadrants 1-4	7016600
Brake Assy for Quadrants 5-6	7016700
Incline, Conveyor, Assy, 24"	7022100



Document Evaluation

Appendix F

This appendix contains a form to provide MiTek with feedback on the usefulness of this manual. Please follow the instructions on the form to provide us with comments or suggestions that will improve the quality of our documentation services.

Document Evaluation Form

We invite your comments to make this document more useful.

Document Identification:

Cyber A/T Saw	Equipment Manual	001055 Rev. D
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General Ratings:

	Poor	Fair	Good	Excellent
Content	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Organization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Accuracy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Clarity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Completeness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Examples/Illustrations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Readability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Compared to other truss machinery manufacturers' documentation, how would you rate this document?

Poor Fair Good Excellent

Rate the quality of service you were given on the following topics:

	Poor	Fair	Good	Excellent
Delivered on time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Installation process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Service technician	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Does the machine work as promised?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Does it handle the production load?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

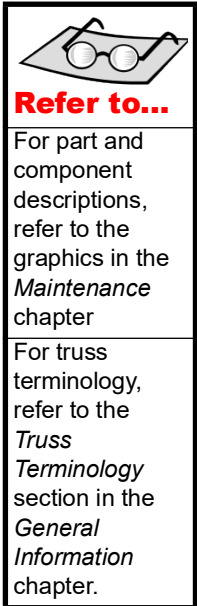
General Comments:

Document Evaluation Form (cont'd)

Instructions Please provide as much information as possible. Identify the page and paragraph, and include a proposed rewrite if possible. Attach extra sheets as needed.	Identification Information
	Cyber A/T Saw
	Equipment Manual
001055 Rev. D	
Recommendation	
Reason for Recommendation	
Your Name:	Date:
Company Name:	Address:
Phone:	
Please mail this form to: MiTek Machinery Operations 301 Fountain Lakes Industrial Dr. Saint Charles, MO 63301 Attn: Engineering Manager	Or fax this form to: Fax 636-328-9218 Attn: Engineering Manager

If you do not receive a reply within 45 days, please call our Customer Service Department and ask for the Documentation Specialist or Engineering Manager: 800-523-3380

Glossary



actuate	To activate, put into action
amperage	The strength of an electric current, expressed in amperes
angulation	The angle of the saw blade when cutting lumber
Automatic Mode	Operating the saw using the Automatic screen
axis	Straight line about which an object rotates, saw angle are measured from a vertical axis; plural is axes
bezel	A glass panel and frame on the front of the touch screen monitor that allows the screen to recognize human touch; must be in good condition for the touch feature to operate correctly
bottom chord	The piece(s) of lumber making up the bottom edge of a truss
calibration	Process of resetting all moveable parts to that actual position matches the computer position
carriage	The assembly on the saw that moves to adjust to the desired length, houses quads 3, 4, and 5
carriage end	Toward the end of the saw that houses the carriage, opposite the stationary end
casting	The part of the quad assembly that rotates to change saw blade angulation; it surrounds the slide.
Catcher Display	Digital display that is mounted to the exit side of the machine that will display information to the operator
CD-ROM	Compact Disk-Read Only Memory, on the side of the touch screen computer
center lumber support	Support bar that is used to support the center of the lumber from sagging while it is being cut, typically used on boards over 8 feet long
centerline	Imaginary line on the width of the lumber that is equidistant from the edge of the lumber
centerline length	Length as measured along the centerline

Glossary

<i>Cimplicity</i> [®]	Operating software on the touch screen that runs the <i>Cyber A/T</i> saw
connector plate	The nail-plate that is embedded into the ends of the tie
CPU	Central Processing Unit that takes information in from the computer and moves the saw to the correct position; it is located in the PLC rack that is inside the stationary cabinet
cushion	An attribute of a hydraulic cylinder that allows adjustment of the pressure in each cylinder
<i>CyberSort</i> [®]	<i>MiTek</i> software which translates data from <i>MiTek 20/20</i> into usable files for the <i>Cyber A/T</i> saw, typically in an .EZY format
directional buttons	The 2 black buttons on the pendant control station that tell the gantry head which direction to move
dog	Also called a flight or lumber pusher; see <i>flight</i>
electrical enclosure	Any enclosed area attached to or used in conjunction with the equipment that houses electrical wires and connections
encoder	A rotary device that transmits position information to the PLC and enables the accuracy of the saw
end-eject	A pneumatic system that raises the truss off the tables and allows the truss to be manually pushed or pulled off the end of the tables; this system requires that the gantry head rolls back over the truss or a device must be installed to raise the gantry head when it is parked
flight	Also called a dog or lumber pusher; a steel piece attached to the lumber conveyor chain that pushes the lumber through the saw during the cutting process
floor truss riser bars	Parts to allow the <i>Cyber A/T</i> saw to cut floor truss webs by raising the centerline of the lumber by 1/16 in.
heel	Outside end of certain chords

Glossary

heel cut skid bar	Support bar that is used to support the end of the lumber under the scarfing blade from sagging while it is being cut, typically used on scarf cut over 12 inches long
hold-down	Mechanism to hold the top of the lumber down while it is being cut. There are two hold-downs: one on the stationary end, one on the carriage end.
home	The 90° position of the saw blades
imperial measurement	The system of measurement that includes inches and feet; change between imperial and metric measurement using the Defaults screen
incline conveyor	Also <i>incline waste conveyor</i> , optional unit to transport waste (scrap lumber) from the end of the waste conveyor up to a trash receptacle
infeed conveyor	Mechanism to feed lumber into the saw. There are two infeed conveyors on the <i>Cyber A/T</i> saw, one on the stationary end, one on the carriage end.
Inker	Optional printer that prints information on the board as it is being cut
in-the-cut	When a blade is included in the cutting program and will make contact with the board
jigging	Any of several devices used to hold the truss in place on the tables
layout	A scaled diagram of the location of components and the space that they occupy
leveling screws	Large cap head screws on the feet of the saw that can be adjusted to level the machine
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

Glossary

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
lubricator	A device that allows controlled amounts of lubricants into the pneumatic system
lumber guide	Assembly that the lumber guide knife is attached to
lumber guide knife	Serrated metal edge that cuts a small notch into the edge of the board on the infeed conveyor to help hold it in place
lumber pusher	See <i>dog</i>
lumber stop	Barrier on the stationary end used to position lumber as it is placed on the infeed conveyor
main disconnect switch	Main power switch located on the stationary electrical enclosure. This switch will remove power to the entire machine. This is the location for your lockout device.
maintenance	A critical component to the operation of the <i>Cyber A/T</i> saw. No maintenance will result in no production.
Manual Mode	Operating the saw using the Manual screen
membrane	Also <i>touch screen membrane</i> ; a layer on the front of the touch screen that allows the screen to recognize human touch; must be in good condition for the touch feature to operate correctly
metric measurement	The system of measurement that includes meters and centimeters (cm); change between metric and imperial measurement using the Defaults screen
module	When referring to input and output cards in the electrical enclosures, the cards are housed inside plastic modules that snap onto the rack
MSDS	Material Safety Data Sheets, documentation on chemicals that describes the safe usage, clean up and precautions for use of a chemical

Glossary

network	Community of computers connected together so they can share information.
off-feed	To remove lumber from the outfeed side of the saw
OSHA	Occupational Safety and Health Administration
outfeed	The side of the saw where the lumber exits the saw, opposite the infeed side
out-of-cut	When a blade is not included in the cutting program and is moved away so it will not make contact with the board
overfeeding	If the sawyer feeds more boards than required, the infeed conveyor will not stop until all boards are cut and off the saw, but the count for the next batch may be inaccurate
overlay	Clear plastic sheet that sticks to the touch screen monitor to protect the screen and the touch pad
PC enclosure	Small enclosure, usually mounted on the operator side, stationary end of the saw, that houses a personal computer tower, saws that have the computer inside the touch screen enclosure do not have a PC enclosure
peak	The highest point on a truss
perimeter safety cable	Also <i>pull-cord</i> ; a cable running around the perimeter of the machine that acts as an E-stop when pulled or pushed
piece count	The number of pieces the saw recognizes as being cut in a batch
pivot extensions	Arms attached to each infeed conveyor that pivot out (horizontally) to rest boards on as you feed them onto the infeed conveyors.
plate	See <i>connector plate</i>
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.

Glossary

port	A connection point on a computer for a peripheral device
Profibus	The system that controls the encoders; stands for Process Field Bus
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
pull-cord	See <i>perimeter safety cable</i>
quad or quadrant	A name representing a saw motor assembly which includes all the mechanics that move the saw head angles and its pivot point height
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
rack	Can refer to the rack that holds the input and output cards in the electrical enclosures, or it can refer to the hold-down assembly that moves vertically
regulator	A component of the pneumatic system that connects to the main air source and regulates the air pressure allowed into the system
scrap belt	See <i>waste conveyor</i>
scrap belt takeaway	See <i>incline conveyor</i>
Semiautomatic Mode	Operating the saw using the Semiautomatic screen

Glossary

set point	The desired location for a component, where the operator intends for it to move when entering numerical calibration data
shelf	In the stationary-end and carriage-end electrical enclosures, electrical components are separated onto different shelves that slide out for easy access. Each shelf is labeled with a number to easily identify it.
slide	The stationary part of the quad assembly that the casting slides on to change saw blade angulation.
splice	To join two or more pieces of lumber at their ends
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
stationary end	The end of the saw that does not move, opposite the carriage end
top chord	The piece(s) of lumber making up the top edges of a truss
torque	A turning or twisting force
touch pad	See <i>membrane</i>
touch screen	Term used to refer to the screen on the saw used to operate the machine; it may have the computer attached to it (touch screen computer), or may be a unit by itself (touch screen monitor) with the computer inside a PC enclosure
touch screen computer	A combined computer and touch screen that is completely housed in the touch screen enclosure
touch screen monitor	The monitor housed in the touch screen enclosure when the computer is separate and housed in a separate PC enclosure or elsewhere
troubleshooting	The process of narrowing down a problems to isolate the cause of a problem
UPS	Uninterruptible Power Supply; keeps your touch screen and computer on via a battery when the power goes out

Glossary

VFD	Variable Frequency Device; controls the speed of the cycle
voltage	Equal to the difference of electric potential between two points on a conducting wire carrying a constant current of one ampere when the power between the points is one watt; use a voltmeter or multimeter to measure it
waste conveyor	The conveyor in the trough of the saw that catches scrap as it is cut off the lumber
web	Supporting pieces between the top and bottom chords
alarm	Any indication, whether visual or auditory, that an error has occurred preventing the machine from operating correctly
alarms status bar	The row of icons at the top of the touch screen on the automatic and semi-auto screen; if an icon is red or flashing, an error has occurred
All Home	A positioning of the saw blades so that all blades are in their home position (usually 90°)
batch	A group of cutting files or group of cut boards that are related due to how the truss design files are set up
blade alignment	How the saw blades line up with each other
blade draft	Refers to the correct angle of a saw blade so that the leading edge of the blade contacts the lumber and the trailing edge does not
pivot point	The point on the lumber where the blade pivots
conveyor	A mechanical apparatus that transports material, can be chains or a belt
default	A setting that is assigned automatically and remains in effect unless overridden by the operator
disconnect switch	Also fuse disconnect switch; a switch on the machine at the point of incoming power, when switched off, power is entering the disconnect enclosure but does not progress past the switch

Glossary

home	A set position for the saw blade quadrants; the default setting is at 90°
guard	A device or attachment that prevents damage, injury, or loss
jog	To slowly move a component by moving a very short distance at a time
jumper	A short length of wire used to complete an electrical circuit or to bypass a break in a circuit
network	The saw network is the communication wiring that occurs between the computer and PLC, the plant network is the network in the building that communicates between computers in building and can be connected to the saw to communicate with the saw's computer too
infeed	The side of the saw where the lumber is fed into the saw, also the same side where the operator station is located; infeed can also indicate the conveyor chains that carry the lumber into the saw
equipment manual	The entire set of manuals for this saw including the Operation Manual, Maintenance Manual, and Installation Manual

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