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Patents

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

- U.S. 37,797
- U.S. 5,553,375
- U.S. 6,145,684
- U.S. 6,405,916
- U.S. 6,807,903
- U.S. 5,468,118
- U.S. 6,079,325
- U.S. 6,330,963
- U.S. 6,651,306
- Other Patents Pending

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To report errors or recommend improvements to this manual, please complete the Document Evaluation Form in the appendices. Mail or fax the form to:

MiTek, Machinery Division
301 Fountain Lakes Industrial Drive
St. Charles, MO 63301
Attn: Engineering Manager
Fax: 636-328-9218

Your support in helping MiTek provide unsurpassed machinery and support is appreciated.
Use this page to record Service Bulletins and Notices that you receive to keep your manual updated.

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For safety information in Spanish, refer to page xviii.

Para información sobre la seguridad en español, consulte la página xviii.

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. The definitions below can also be found in ANSI z535.4-2002.

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, will result in death or serious injury.

**WARNING**

Indicates a potentially hazardous situation which, if not avoided, could 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**

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

**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 xii.

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 xvii.
- Perform safety tests to ensure all E-stops are working properly before operating the equipment at the initial startup, after performing any maintenance, and in accordance with the maintenance schedule.
- 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 xv.

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

1. Engage an E-stop on the machine.

2. Turn the disconnect switch handle to the “off” position. See Figure iv-1.

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

4. Restrain or de-energize all pneumatic components, hydraulic components, and other parts that could have live or stored power.

**WARNING**

**ELECTROCUTION HAZARD.**

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

Sample of a Lock and Tag Attached to a Machine's 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 iv-2.

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

4. Open the door to the enclosure in which you need access, and using a multimeter, verify that the power is off.

Figure iv-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.

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

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![Diagram of STT™ Tables with labels for Conveyors, Finish Roller, Gantry Head, Stackers (Not Shown), Tables, and Parking Stand.](image-url)
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. Las definiciones incluidas a continuación también pueden consultarse en la norma ANSI z535.4-2002.

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, producirá la muerte o lesiones graves.

**ADVERTENCIA**

Indica una situación potencialmente peligrosa que, si no se evita, podría 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**

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

**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, purge 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 xxi.

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 xxviii.
• Realice pruebas de seguridad para verificar que todos los frenos de emergencia funcionen adecuadamente antes de utilizar el equipo por primera vez, después de realizar cualquier tarea de mantenimiento y según 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 xxvi.

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 en la posición "apagado/apagada". Vea la figura 2-1.

<table>
<thead>
<tr>
<th>RIESGO DE ELECTROCUCIÓN.</th>
</tr>
</thead>
<tbody>
<tr>
<td>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!</td>
</tr>
</tbody>
</table>

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

4. Trabe o desenergice todos los componentes neumáticos, componentes hidráulicos y otras piezas que tengan alimentación directa o almacenada.
Figura v-1: Bloqueo/etiquetado en el gabinete eléctrico principal

Ejemplo de un candado y etiqueta fijados al gabinete eléctrico de una máquina
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 al que necesita acceder y usando un multímetro verifique que la alimentación esté apagada.

Figura v-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.

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

| Manténgase alejado 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. |

Bandas transportadoras

Cabeza de caballete

Apiladores (no ilustrados)

Rodillo de acabado

Bandas transportadoras

Tablas

Soporte de aparcamiento
Introduction to the Manual

<table>
<thead>
<tr>
<th><strong>DANGER</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Purpose of Chapter</strong> This chapter explains how to navigate through the equipment manual and how to contact MiTek.</td>
</tr>
</tbody>
</table>

**Purpose and Scope of This Equipment Manual**

In order for this equipment manual to be useful, it must be kept in a location where operators and maintenance personnel have easy access to it.

This manual addresses the most recent versions of the equipment as of the creation or revision date on the title page. For earlier revisions, contact MiTek Machinery Division Customer Service and order the part number listed on the title page.

This manual can also be a valuable training tool.

- The General Information chapter contains information on truss terminology and provides basic information about the equipment.
- The Operation chapter teaches operators how to efficiently operate the machine.
- The Maintenance chapter is written specifically for maintenance personnel.
- The appendices provide valuable technical information to keep your equipment running.
Navigation

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**

<table>
<thead>
<tr>
<th>Graphic</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Graphic" /></td>
<td>Indicates tools required before beginning a procedure.</td>
</tr>
<tr>
<td><img src="image" alt="Graphic" /></td>
<td>Gives additional information to the steps or text.</td>
</tr>
<tr>
<td><img src="image" alt="Graphic" /></td>
<td>Refers reader to another section, table, graphic, or drawing for further explanation.</td>
</tr>
</tbody>
</table>

Additional Resources

Visit the MiTek Web site at www.mii.com for up-to-date information on all MiTek equipment. View the latest revision of this manual and all Service Bulletins, or order parts on-line through our eStore.

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**

**MiTek Machinery Division**
Customer Service Department
301 Fountain Lakes Industrial Drive
St. Charles, MO 63301

Parts Orders (with part number)
eStore™ at http://estore.mii.com
E-mail: mitekparts@mii.com

Web Site
www.mii.com/machinery

Technical Assistance
Phone: 800-523-3380
Fax: 636-328-9218
Introduction to the Equipment

Purpose of the Equipment

The STT tables provide a stable, durable jigging surface for the production of trusses.

The ejectors lift the trusses off the table and offset them for easy removal. The receiver stands receive the trusses from the table line and lower them onto the Stand-Alone Conveyors.

In auto-eject or high-slope auto-eject systems, the transfer rollers receive the trusses from the ejectors and transfer them onto the Stand-Alone Conveyors.

Description of the Equipment

The STT tables, ejectors, and receivers compose a table line for the production of trusses. The tables provide a stable surface for trusses to be assembled and pressed. The ejectors and receivers allow finished trusses to be ejected from the tables and moved to a conveyor system, reducing manual labor.

The STT tables and ejectors are available in a variety of designs to suit your individual needs.

Figure 2-1 shows an overall view of the equipment. Refer to the Maintenance chapter for more detailed graphics.
Figure 2-1: STT Tables
Figure 2-2: Getting to Know Your System

Air Valve

Aisle Cover (Optional)

Ejector

Air Cylinder
Main Components and Optional Equipment

Table 2-1 lists the main components that comprise this system.

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Part #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table</td>
<td>Provides a stable surface for the jigging and pressing of trusses</td>
<td>Varies based on table model</td>
</tr>
<tr>
<td>Air kit for auto-eject, side-eject, long throw, tall side-eject, and high-slope auto-eject systems</td>
<td>Provides pneumatic power to the lifters</td>
<td>63845-5xx</td>
</tr>
<tr>
<td>Air kit for end-eject systems</td>
<td>Provides pneumatic power to the end-eject rollers</td>
<td>63845-6xx</td>
</tr>
</tbody>
</table>

Table 2-2 lists the options available with this system.

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Part #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aisle cover</td>
<td>Creates a continuous-top table system by covering walk-through aisles</td>
<td>Varies based on table model</td>
</tr>
<tr>
<td>Aisle pad</td>
<td>Enable plate embedment into truss lumber where it crosses the walk-through aisles</td>
<td>Varies based on table model</td>
</tr>
<tr>
<td>MatchPoint Planx</td>
<td>Automated jigging plank; bolts on to table and controlled with a PC. The MatchPoint Planx is covered in a different manual, PN 001091.</td>
<td>Varies based on width of plank</td>
</tr>
<tr>
<td>Blank plank for Planx table</td>
<td>Bolt-on filler plank can be switched with automated jigging Planx to created unique jigging configurations. Blank planks are covered in a different manual, PN 001091.</td>
<td>Varies based on width of plank</td>
</tr>
<tr>
<td>High-slope auto-eject lifter</td>
<td>Automatically lifts the truss off the table and offsets it for easy removal</td>
<td>68615-501</td>
</tr>
<tr>
<td>Auto-eject lifter</td>
<td>Automatically lifts the truss off the table and offsets it for easy removal</td>
<td>68588-501</td>
</tr>
<tr>
<td>Side-eject lifter</td>
<td>Automatically lifts the truss off the table and offsets it for easy removal</td>
<td>68760-501</td>
</tr>
</tbody>
</table>
Table 2-3 lists the models available for this equipment and the part numbers that identify each model.

**System Identification**

Table 2-3 lists the models available for this equipment and the part numbers that identify each model.

<table>
<thead>
<tr>
<th>Model</th>
<th>Plate Thickness</th>
<th>Lifter Options</th>
<th>Other Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>STT 050</td>
<td>1/2</td>
<td>High-slope auto-eject, auto-eject, side eject, long throw, tall side-eject</td>
<td>Aisle covers, aisle pads</td>
</tr>
<tr>
<td>STT 051</td>
<td>1/2</td>
<td>High-slope auto-eject, auto-eject, side eject, long throw, tall side-eject</td>
<td>Aisle covers</td>
</tr>
<tr>
<td>STT 060</td>
<td>1/2</td>
<td>High-slope auto-eject, auto-eject, side eject, long throw, tall side-eject</td>
<td>Aisle covers, aisle pads</td>
</tr>
<tr>
<td>STT 075</td>
<td>1/2</td>
<td>High-slope auto-eject, auto-eject, side eject, long throw, tall side-eject</td>
<td>Aisle covers</td>
</tr>
<tr>
<td>STT 100</td>
<td>3/4</td>
<td>High-slope auto-eject, auto-eject, side eject, long throw, tall side-eject</td>
<td>Aisle covers</td>
</tr>
<tr>
<td>STT 110</td>
<td>3/4</td>
<td>High-slope auto-eject, auto-eject, side eject, long throw, tall side-eject</td>
<td>Aisle covers, MatchPoint</td>
</tr>
<tr>
<td>STT 101</td>
<td>3/4</td>
<td>High-slope auto-eject, auto-eject, side eject, long throw, tall side-eject</td>
<td>Aisle covers, MatchPoint</td>
</tr>
</tbody>
</table>
## Table 2-3: Available Models (Continued)

<table>
<thead>
<tr>
<th>Model</th>
<th>Plate Thickness</th>
<th>Lifter Options</th>
<th>Other Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>STT 102</td>
<td>3/4</td>
<td>High-slope auto-eject, auto-eject, side eject, long throw, tall side-eject</td>
<td>Aisle covers</td>
</tr>
<tr>
<td>STT 112</td>
<td>3/4</td>
<td>High-slope auto-eject, auto-eject, side eject, long throw, tall side-eject</td>
<td>Aisle covers</td>
</tr>
</tbody>
</table>
## General Specifications

### Table 2-4: General Specifications

<table>
<thead>
<tr>
<th>General</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Table width</strong></td>
<td>82&quot;</td>
</tr>
</tbody>
</table>
| **Table length**      | 178-3/4" for tables made to work with a *RoofTracker* or *RoofGlider* gantry head  
  177-3/4" for tables made to work with a *Tee-Tracker* gantry head  
  Refer to equipment drawings for all other designs |
| **Table height**      | 30-7/8" to 34-1/8", adjustable |

### Pneumatics

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Recommended Operating Pressure</strong></td>
<td>100 psi</td>
</tr>
</tbody>
</table>
| **Avg. SCFM**    | 0.39 per cylinder for auto-eject, end-eject, side-eject and tall side-eject systems  
  0.42 per cylinder for high-slope auto-eject and long throw systems |
| **Pneumatic Cylinders: Bore**  | High-slope auto-eject, end-eject, and long throw systems: 2.5  
  Side-eject, tall side-eject, and auto-eject systems: 3.0 |
| **Pneumatic Cylinders: Stroke** | High-slope auto-eject and long throw systems: 15  
  End-eject systems: 4  
  Side-eject, tall side-eject, and auto-eject systems: 16 |
| **Minimum Receiver Tank Capacity** | 60 gal                      |
| **Minimum Recommended Supply Line** | 1 in.                       |

### Dimensions of System Components

See Table 3-1

### Weight of System Components

See Table 3-4
Truss Terminology

Table 2-5: Truss Terminology

<table>
<thead>
<tr>
<th>Length Types</th>
<th>Height Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall length</td>
<td>H1  Board height</td>
</tr>
<tr>
<td>Centerline length</td>
<td>H2  Centerline height</td>
</tr>
<tr>
<td>Top length</td>
<td>H3  Centerline height</td>
</tr>
<tr>
<td>Bottom length</td>
<td>H4  Centerline height</td>
</tr>
</tbody>
</table>

Figure 2-3: Terminology Diagram

[Diagram showing truss terminology with labels for Overall Length, Top Length, Center Line Length, Bottom Length, Pivot Axis Length, and various heights H1, H2, H3, and H4.]
Figure 2-4: Parts of a Truss

- Shoulder
- Cantilever
- Peak
- Overhang
- Bottom Chord
- Top Chord
- Heel
- Web
- Splice
- Slope (Pitch)
- Wedge Block
MiTek’s Responsibilities

Prior to Installation

MiTek will provide the following items and information prior to the installation date:

1. A Prior to Installation package that:
   - Outlines this chapter and requests your signature of agreement.
   - Gives dates to expect shipment, delivery, and installation.
   - Explains the number of people required to help with installation.
   - Provides guidelines on providing an electrician, welder, and other specialists.
   - Describes payment information.

2. A layout of the equipment, specifically prepared for your building, upon request.

During Installation

A MiTek Customer Service Technician (CST) may be present to manage the installation of your equipment.
Customer Responsibilities

Before the installation of your equipment, the items and procedures in this chapter must be arranged, purchased, or assembled. Table 3-1 provides an overview of these items. Each topic listed in the table is explained in detail in the text following the table.

If these requirements are not satisfied before the scheduled installation date, it may be necessary to reschedule the installation. Any additional cost may be the customer’s responsibility.

Figure 3-1: Summary of Customer Responsibilities

<table>
<thead>
<tr>
<th>Space Requirements</th>
<th>This equipment requires enough space to allow for the machine dimensions listed in Table 3-1, plus additional working space for operation and maintenance. Space should have adequate lighting.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location Requirements</td>
<td>Concrete, a minimum of 6 in. thick 3,000 psi, is required under the weight of the press head and tables. The equipment discussed in this manual must be used in dry conditions under a roofed area according to Type 1 electrical enclosure requirements.</td>
</tr>
<tr>
<td>Electrical Requirements</td>
<td>Electrical requirements are shown in your gantry manual or MatchPoint manual, if applicable. Contact your MiTek representative immediately if custom power specifications need to be arranged.</td>
</tr>
<tr>
<td>Pneumatic Requirements (Compressed Air)</td>
<td>See Table 3-2.</td>
</tr>
<tr>
<td>Shipping Requirements</td>
<td>See Table 3-4 for shipping weights.</td>
</tr>
<tr>
<td>Customer-Supplied Items</td>
<td>The customer is responsible for having the supplies listed in Table 3-5 available at the time of installation.</td>
</tr>
</tbody>
</table>
Space Requirements

MiTek can provide help with plant layout and space utilization upon request. Refer to your individual layout for measurements.

Figure 3-2: Sample of a Layout for a Complete System
Space for the Equipment

It is the customer’s responsibility to provide adequate space for the installation, operation, and protection of the equipment. Use Figure 3-3 in combination with your individual layout to determine the physical dimensions of your equipment. Additional space is required for operation, maintenance, and optional equipment.

Figure 3-3: Terminology for Dimensioning
Determining the Space Needed for Your System

Table 3-1: Approximate Equipment Dimensions

<table>
<thead>
<tr>
<th>Table, for Gantry Head</th>
<th>Dimension A</th>
<th>Dimension B</th>
<th>Dimension C</th>
<th>Space Between</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feet &amp; Inches</td>
<td>Feet &amp; Inches</td>
<td>Feet &amp; Inches</td>
<td>Feet &amp; Inches</td>
</tr>
<tr>
<td></td>
<td>Only</td>
<td>Only</td>
<td>Only</td>
<td>Only</td>
</tr>
<tr>
<td>1 Table, for RoofTracker or RoofGlider</td>
<td>14’ 10-3/4”</td>
<td>178-3/4”</td>
<td>6’ 10”</td>
<td>30 7/8 - 34 7/8”</td>
</tr>
<tr>
<td>1 Table, for Tee-Tracker</td>
<td>14’ 9-3/4”</td>
<td>177-3/4”</td>
<td>6’ 10”</td>
<td>30 7/8 - 34 7/8”</td>
</tr>
</tbody>
</table>

Space for Operation and Maintenance

Additional space must be allocated for operation and maintenance. Operation space should provide safety, freedom of movement, storage space, and free flow of raw and finished materials. There must also be adequate space for safe handling of the raw and finished materials throughout the process.

Electrical enclosures must have the required amount of space clear in front of them (usually 3 ft).

Refer to your gantry and MatchPoint manuals to ensure adequate space is allocated for the entire system.

Location Requirements

Floor Structure

A level and structurally sound concrete slab must be provided for the installation of the equipment. This slab should be designed and installed in accordance with local building code requirements and, if required, under supervision of a professional engineer. Concrete should be a minimum of 6 in. thick. Three thousand (3,000) psi concrete is recommended. Refer to your layout drawing.

Environment

The equipment must be used in dry conditions under a roofed area according to Type 1 electrical enclosure requirements.

Lighting should be adequate for safe operation and maintenance.
Electrical Requirements

The tables themselves have no electrical requirements. Refer to your gantry manual or MatchPoint manual for electrical requirements.

Pneumatic System Requirements

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIGH PRESSURE HAZARD. Compressed air and hydraulic lines should be installed only by qualified personnel familiar with all governing regulations. Failure to use proper materials and installation practices can result in ruptured lines leading to personal injury, equipment damage, and equipment failure.</td>
</tr>
</tbody>
</table>

This equipment uses compressed air, also referred to as pneumatic power. Your current air compressor may be adequate. If you need to install a new compressor, the air source must be supplied and installed prior to the scheduled installation date of the MiTek equipment. Table 3-2 and Table 3-3 describe the pneumatic system requirements.

Table 3-2: Pneumatic System Specifications

<table>
<thead>
<tr>
<th>Air Source Tank</th>
<th>Connecting Air Source to System</th>
<th>Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum of 60 gal</td>
<td>Minimum of 1-in. diameter tube between air source and air regulator; discuss location of air regulator with your MiTek representative before installation</td>
<td>100 psi</td>
</tr>
</tbody>
</table>

Table 3-3: Average Flow Rate

<table>
<thead>
<tr>
<th>Ejector</th>
<th>Avg. Flow Rate (Per Cylinder)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto-eject</td>
<td>0.39 scfm</td>
</tr>
<tr>
<td>High-slope auto-eject</td>
<td>0.42 scfm</td>
</tr>
<tr>
<td>Side-eject</td>
<td>0.39 scfm</td>
</tr>
<tr>
<td>Tall side-eject</td>
<td>0.39 scfm</td>
</tr>
<tr>
<td>Long throw</td>
<td>0.42 scfm</td>
</tr>
<tr>
<td>End-eject</td>
<td>0.39 scfm</td>
</tr>
</tbody>
</table>
Shipping Information

When the equipment arrives, you must have the proper transport and lifting equipment available to remove it from the truck and place it in your facility. Table 3-4 lists the weight of the individual components of a typical system.

<table>
<thead>
<tr>
<th>Contents of Shipment</th>
<th>Approximate Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STT table</strong></td>
<td>5500 lb</td>
</tr>
<tr>
<td>Aisle cover</td>
<td>1000 lb</td>
</tr>
<tr>
<td>Auto-eject roller</td>
<td>175 lb</td>
</tr>
<tr>
<td>Auto-eject roller stand</td>
<td>50 lb</td>
</tr>
<tr>
<td>Receiver stand</td>
<td>250 lb</td>
</tr>
</tbody>
</table>

**DANGER**

Transport and lifting equipment such as forklifts and cranes must be designed and rated for the load and application. The weight of each major component is given in Table 3-4.

Inadequate transport equipment may result in property damage, personal injury, or death.

Table 3-5: Customer-Supplied Parts

The customer must supply the parts shown in Table 3-5. Some must be installed before installation of the equipment and some must be available for use at the time of installation.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressed Air</td>
<td>Supply line from air compressor to air regulator that meets the requirements in Table 3-2</td>
</tr>
<tr>
<td></td>
<td>Air compressor that can meet the requirements in Table 3-2</td>
</tr>
<tr>
<td></td>
<td>Connector for tube from air source to 3/4-in. NPT port on the air regulator</td>
</tr>
<tr>
<td>Transport Equipment</td>
<td>A heavy-duty forklift or truck wrecker is required to move the equipment during unloading and placement of the machine</td>
</tr>
<tr>
<td></td>
<td>All transport and lifting equipment must meet the requirements given in the Shipping Information section</td>
</tr>
</tbody>
</table>
**Training Provided**

In the case where MiTek is overseeing the installation of your equipment, the MiTek representative will ensure that your operators and maintenance personnel understand how to operate and maintain this equipment. They will explain warranty information and ensure that the equipment manual is present.

---

**Table 3-5: Customer-Supplied Parts (Continued)**

<table>
<thead>
<tr>
<th>Tools That May Need to be Rented</th>
<th>General Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transit with measuring stick</td>
<td>Tape measures (2)</td>
</tr>
<tr>
<td>Industrial hammer-drill</td>
<td>Soft tape measures (2) (longer than total length of tables)</td>
</tr>
<tr>
<td>Hydraulic jack</td>
<td>Adhesive tape</td>
</tr>
<tr>
<td>Welding equipment and welder</td>
<td>String line, longer than the total length of tables</td>
</tr>
<tr>
<td></td>
<td>Pliers to cut skid bands</td>
</tr>
<tr>
<td></td>
<td>Chalk line</td>
</tr>
<tr>
<td></td>
<td>Hammers (2)</td>
</tr>
<tr>
<td></td>
<td>Sledge/mallet for concrete anchors</td>
</tr>
<tr>
<td></td>
<td>Pry bars, 6’, on one end (2)</td>
</tr>
<tr>
<td></td>
<td>Ratchet</td>
</tr>
<tr>
<td></td>
<td>Sockets: 3/4&quot;, 9/16&quot;</td>
</tr>
<tr>
<td></td>
<td>Open-end wrench 1-1/2&quot; (2)</td>
</tr>
<tr>
<td></td>
<td>Standard wrench set</td>
</tr>
<tr>
<td></td>
<td>Wrench 3/4&quot;</td>
</tr>
<tr>
<td></td>
<td>Allen wrenches: 1/8&quot;, 5/32&quot;</td>
</tr>
<tr>
<td></td>
<td>1/2” masonry drill bit, 12” long</td>
</tr>
<tr>
<td></td>
<td>C-clamps (2)</td>
</tr>
<tr>
<td></td>
<td>#21 drill bit (.159&quot;) for steel</td>
</tr>
</tbody>
</table>
MiTek can provide installation supervision to ensure that the system is installed properly and operates correctly. We can also provide operating and maintenance training.

**Delivery**

**Unloading**

Even if a MiTek representative is present, it is the customer’s responsibility to provide equipment and labor for unloading, placement, and wiring of the STT Tables. Exercise extreme caution to avoid damage or misalignment during unloading. Do not apply pressure on any moving parts or fittings. Support the weight at the bottom of the machine base.

A heavy-duty forklift is required to move the equipment during unloading and placement of the machine. If there are any questions regarding the unloading or placement process, please contact your MiTek representative.

<table>
<thead>
<tr>
<th><strong>CAUTION</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Chains and spreader bars used to lift and unload the equipment must be rated appropriately. See Table 3-4 for the weight of each component.</td>
</tr>
<tr>
<td>If a chain breaks while moving equipment, personal injury and equipment damage may result.</td>
</tr>
</tbody>
</table>

Exercise extreme caution to avoid damage or misalignment during unloading. Do not apply pressure on any moving parts or fittings. If using a forklift, the table should be lifted from the middle, with forks evenly spaced on both sides of the center table supports. Note the locations of the cylinders and hoses under the table before lifting with a forklift. Figure 4-1 shows how to lift and move the equipment safely.
Unpacking

After successful unloading, remove the protective crating material from the pallets. Detach and set aside all loose parts. Move the equipment to the desired location using a forklift or crane appropriate to the weight of each unit. Lift the equipment to remove the pallet, and gently place each unit in its new location.
Equipment Layout

The different components of a STT table line must be located in specific locations. A sample layout is shown in Figure 3-2, but refer to your own layout during installation. Your MiTek representative will provide your layout to you before the equipment is installed.

Installing the Tables

Installation Tips

The Finish Roller should be the first component installed in the STT table line. Refer to your Finish Roller manual for installation instructions.

The tips below are intended to supplement the information provided in the Finish Roller manual.

- When taking measurements from a wall, always measure off of the same wall so all components will be square with that wall. Keep in mind that most walls are not perfectly square with each other.
- Determine the exact location of the Finish Roller before locating any other component. This determination must take into account the approximate locations of the indoor and outdoor conveyors to ensure space is adequate.
- The Finish Roller must be level and perfectly parallel with the planned placement of the conveyors. If it is not square with that wall, care must be taken to keep the conveyors square with the Finish Roller. At the same time, there must be adequate space between the conveyors and the wall and between the conveyors and the tables.
- When setting the height, the top of the bottom roller should be in the same plane as the top of the conveyor rollers. The measurement from the floor to the top of the bottom roller should be between 31-1/2 in. and 32-1/2 in. To adjust the height, lift the machine with a forklift and turn the plate that is located on each leg the appropriate amount to raise or lower the machine.
- Assuming you stack completed trusses outdoors, place the Finish Roller parallel to the outside wall through which the trusses will pass to get to the stacker. It should be as close to the wall as possible, but not so close that the wall makes contact with the push bar.

After determining the location of the Finish Roller but before installing it, the hole in the wall that the trusses will need to pass through to reach the stacker must be cut and finished. Cutting and finishing this pass-through hole is solely the responsibility of the customer. The hole must be at least 16 ft wide by 18 in. high and must allow the largest possible truss to pass freely through the Finish Roller and then through the wall without hindrance.
Supplies Needed

Customer-supplied parts required (also found in Table 3-5):

- 8-ton forklift
- Transit w/measuring stick
- Industrial hammer drill

Additional supplies needed for the Installing the Table Anchor Plates and Installing the Parking Stands sections that follow:

- Tape measure
- Pliers to cut skid bands
- Chalk line
- Hammers (2)
- Sledge/mallet for concrete anchors
- Sockets: 3/4", 9/16"
- Ratchet
- Allen wrenches: 1/8", 5/32"
- 1/2" concrete drill bit

Additional supplies needed for the Placing the Tables, Aligning the Tables, Welding the Tables, and Installing Scales Beds sections that follow:

- Pry bar, 6' long, wedge on one end (2)
- Open-end wrench 1-1/2"
- Standard wrench set
- Tape measure (2)
- Soft tape measure, longer than the total length of tables (2)
- C-clamp (2)
- Hydraulic jack
- Adhesive tape
- Hammer or mallet (2)
- String line, longer than the total length of tables
- Welding equipment and welder
- #21 drill bit (.159") for optional scale beds
When placing the STT tables, keep the following in mind:

- There is a minimum space requirement for the parking area on both ends of the table system. Approximate space requirements are listed below. Refer to your individual layout for exact dimensions.
  - 9 ft 3 in. for RoofTracker gantry
  - 11 ft 1-3/4 in. for RoofGlider gantry
  - 11 ft 6-1/2 in. for AutoPress 14TL gantry
  - 6 ft for Tee-Tracker gantry
  - 6 ft 8 in. for MiTek Track Gantry

- Enough space must be allowed for the cable trolleys to gather for a festoon cable system. The space that the cable trolleys will need depends on the length of your table system. Refer to your individual layout for exact dimensions.

- Personnel must be able to walk completely around the table assembly, with the gantry head in any position, and must have adequate space to perform maintenance.

Follow the procedure below to determine the location of each table system component. Refer to Figure 4-2 during the procedure.

1. Mark the location of the base at the Stand-Alone Conveyors’ end, closest to the tables.
2. Mark the location of the edge of the table anchor plates on the side closest to the conveyors.
   
a) Measure from the center of the Finish Roller the distance indicated on your layout.
   
   • A minimum of 16 ft 5 in. from the center of the Finish Roller to the center of the tables is required for a standard RoofTracker gantry head
      
   • A minimum of 17 ft 2-3/8 in. from the center of the Finish Roller to the center of the tables is required to use an AutoPress 14TL gantry head with the STT table line
   
b) Measure and mark in several spots along the line of conveyors.
   
c) Use a chalk line to mark a straight line the complete length of the tables and parking areas.
   
3. Place the first anchor plate, labeled “A” on Figure 4-2, in place with the blue painted side up per your specific layout.
   
4. Double-check the factors below:
   
a) Adequate space between walls and the equipment for maintenance purposes.
   
b) Safety regulations requiring a minimum of 3 ft of clear space in front of electrical enclosures.
   
c) The space required by your cable trolleys, which varies depending on the length of your table system and the number of gantry heads operating.

**Installing the Table Anchor Plates**

1. Install the first table anchor plate.
   
a) Determine the anchor configuration and locate the hardware.
   
   1) The anchor plates must be attached using all four holes.
   
   2) Concrete anchors (1/2 in. x 4-1/2 in.), washers, and nuts are supplied (50 of each per box).
3) Additional boxes can be ordered if needed.

b) Install four (4) concrete anchors per anchor plate
   1) Using an industrial hammer drill and a 1/2-in. drill bit, drill a hole at least 6 in. deep. For best results, drill the hole completely through the concrete pad.

   If you do not drill completely through the concrete, you must vacuum out the concrete dust before proceeding with the next steps.

   2) Assemble a concrete anchor so one washer is placed onto the anchor, and a nut is screwed onto the end.
   3) Place the anchor in the hole, flanged end first.
   4) Use a mallet or hammer to pound the anchor into the hole until the nut reaches the anchor plate.
   5) Use an industrial hammer-drill and 3/4-in. hex head socket to tighten the nut onto the anchor. The nut should be slightly above the threads.

2. Place the second anchor plate (B) in place as shown in Figure 4-2.

   Always measure subsequent anchor plates from the first anchor plate installed in that row!

3. Install the remaining anchor plates using the same procedure as for the first two. Refer to your individual layout for anchor plate locations.
Placing the Tables

Each table foot consists of two (2) leveling screws. Your table foot may not be identical to Figure 4-4, but the design concept and adjustment procedure are the same.

1. Assemble the 1-in. leveling screws and nuts per Figure 4-4 on every table foot.
   a) Place a bottom nut on each supplied leveling screw approximately 2-1/2 in. from the head of the screw. This is “Dim. A” in Figure 4-4. (This will allow approximately 1-3/4 in. movement in both directions when adjusting the table.)
   b) Raise one table off the floor with a jack or crane capable of holding 5,500 lb.
   c) Insert a leveling screw through each hole in the foot from the bottom side.
   d) Place a top nut and lock washer on both leveling screws inserted into the foot.
   e) Repeat for every leg on every table.

2. Place the tables so both leveling screws on one foot are in contact with the same anchor plate.
3. Set up a transit in a location where you will be able to read the measuring stick at every leg. **This is very important!** The transit will be useless if you have to move it because the concrete floor will never be at the same level. See Figure 4-5.

4. Measure the height of each table with a tape measure to ensure the leveling screws have been set at approximately the same place. If necessary, use a hydraulic jack to lift the table and adjust the leveling screws.

5. Using the measuring stick and transit, measure the concrete in several places along the length of the tables to determine the variation in the flooring level and to ensure that the variation fits within the distance you have available to move the feet up and down.

6. Choose the desired height by measuring a table in the middle range of the flooring level. Ensure that Dim. A in Figure 4-4 is set at 2-1/2 in. This will allow you the minimum amount of average adjustment. If you need to adjust the height, use the 1-1/2-in. wrenches with the following procedure.

   a) Loosen the top nut on one leveling screw on each foot.

   b) Loosen or tighten the supporting nut on the chosen leveling screw on each foot, depending on which direction the table needs to go.

   c) Tighten the top nut.

**WARNING**

CRUSH HAZARD.

A table can cause serious damage or injury if it falls.

The distance between the leveling screw head and the bottom nut should never exceed 4-1/2".
7. Set the measuring stick on the table top, directly above one leg, and set the transit to read at a whole number. See Figure 4-5.

8. Set the remaining legs on every table to the same height, so the transit is reading in the same spot on the measuring stick.
Aligning the Tables

1. Attach a string to one end of the tables and wrap it around the edge of the tubing with a spacer (a small piece of 2x4 lumber works well) to hold it away from the tubing. See Figure 4-6.

Figure 4-6: Aligning the Tables With a String and a Tape Measure

2. Run the string to the other end of the entire length of tables and wrap it around the edge using a spacer the same size as the first spacer.

3. Using a soft tape measure and a C-clamp, clamp the tape measure to the table top on each end of the length of tables. The tape measure should be pulled tight so there is no slack.

4. Place a second tape measure across the table tops on the opposite end of the tables in the same manner.

5. Align the tables so the distance from the ejector slot on one table to the ejector slot matches the distance listed on your individual layout.
   a) Always measure from the first table. Never rely on measuring between ejector slots on adjacent tables, except the first and second table. Never measure the spaces between tables to determine the location. This step is imperative for the aisle pads to fit correctly!
   b) The distance between the edge of the tubing and the string must be exactly the same for each table. Measure at least two (2) locations on each table to ensure it is straight and square.
   c) Use the two soft tape measures to ensure the tables are the same distance apart and double-check that they are square with each other.
d) Refer to your individual layout to determine the measurement between the first ejector slot and the ejector slots on the other tables. Use the same edge of each ejector slot every time.

Welding the Tables to the Anchor Plates

1. Weld the leveling screw on each foot that is closest to the outside of the anchor plate.

2. Repeat the leveling process to ensure that all tables are EXACTLY level. This is necessary to ensure smooth pressing of the connector plates.

3. Lower the second leveling screw on each leg until it is snugly resting against the anchor plate.

   Do not force the leveling screws down. This will move the table out of level.

4. Tack the second leveling screw to the anchor plate.

Installing the Parking Stands and Gantry Head

 Discuss with your MiTek representative when to install the parking stands. Your options vary depending on the amount of space available at either end of the tables for placing the gantry head. It may be necessary to install the gantry head before one of the parking stands is installed.

When installing the parking stands, the sides of the stands must be even with the sides of the tables. Place each parking stand up to 15 in. from the end of the first (or last) table for a RoofTracker system of up to 20 in. for a RoofGlider system. The anchor plates are already attached to the parking stands. Drill and anchor them to the floor using the same anchors and procedure used to install the table anchors.
Installing Scale Beds

Four (4) 14-ft scales and scale beds can be purchased for every table ordered. They are optional and may not be included with your system. Systems using laser-light technology do not need the scales. Scales are not recommended for MatchPoint systems.

1. Adhere the adhesive-back flexible scale to the metal scale bed.

2. Place each scale in the preferred spot, making sure all the scales in the table system align evenly with each other. See Figure 4-7. The scales must be placed on the table frame under the slotted-table top but located so it can be easily viewed through the slot.

3. Locate the 10-16x1/2 screws provided.

4. Using a #21 drill (.159 in.), drill a hole through the middle of the existing slots in the scale bed, drilling into the frame beneath a slot in the table top.

5. Screw the self-tapping screws through the scale bed into the table frame.

6. Repeat the procedure to place three (3) scale beds on each table.

**CAUTION**

Scales must be accurately placed to be used effectively. Inconsistent scale placement may result in inaccurate trusses.
Figure 4-7: Installing Scales on Tables

Mark Each Table at Same Spot
(from edge of table surface at bottom-chord end)
Installing the Receiver Stands (For Side-Eject)

Place one receiver stand, or receiver, between each conveyor unit. It receives the truss and places it onto the conveyor. To determine the placement of the receivers, the ejectors must already be installed in the tables.

To install the receivers, weld the three (3) legs to an anchor plate that bolts to the floor using the procedure described below.

1. Physically pull the first and last ejectors into their fully extended positions.

2. Place each receiver in its appropriate location.
   a) Each receiver should be between two conveyors so it is adjacent to but slightly offset from an ejector.
   b) The end of the receiver, when fully extended, should overlap the end of its adjacent ejector by several inches.

   *The height of the receiver will be adjusted in step 5. Do NOT weld the receiver until the height is correct!*

3. Mark the location of each anchor plate. The receiver foot can be welded anywhere in the center area between the anchor holes.

4. Each anchor plate has four (4) holes. Bolt the anchor plates to the floor using the same 1/2-in. concrete anchors and procedure used to install the table anchor plates. A minimum of two (2) anchors must be placed in each plate, and the anchors must be positioned diagonally from each other.

5. Adjust the feet on all three (3) legs to the correct height before welding. The top of the skate wheels on the receiver should be 1/2 in. below the top of the skate wheels on the ejector.

6. Ensure that the receiver is level. The legs cannot be adjusted once welded to the anchor plate.

7. Weld the receiver legs to their anchor plates.
Installing the Transfer Rollers (For Auto-Eject)

Auto-eject systems have transfer rollers instead of receiver stands. The transfer rollers grab the truss as it slides off the ejectors and they carry the truss directly onto the conveyors. Because they are somewhat unstable until connected together, at least three (3) people need to participate in the transfer roller installation. Refer to Drawing 82862.

Determining the Location of the Transfer Rollers

Place the transfer rollers perpendicular to each table ejector, as shown in Figure 4-9. One transfer roller spans approximately three (3) tables and is 14 ft long. Your layout should indicate how much space to allow between the table edge and the transfer rollers.

The transfer rollers are designed to be connected in groups of two or three, depending on where their locations fall in reference to the location of other obstacles. You must tentatively determine where the rollers will fall and how the groupings will fall before attaching the legs to each roller. See Figure 4-10.

Figure 4-9: Location of Transfer Roller
Assembling the Transfer Rollers

Figure 4-10: Legs Used in a Set of 3 Transfer Rollers

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>A</th>
<th>B</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td>2</td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Both Legs Assembled</td>
<td></td>
<td>1 Leg Assembled</td>
<td></td>
<td>1 Leg Assembled</td>
<td></td>
</tr>
</tbody>
</table>

1. Assemble the legs.
   - Refer to Figure 4-10 to determine the configuration of the legs on each transfer roller.
   - The conveyors are assembled in sets of two (2) or three (3).

2. Attach the conveyors to each other in each set. Refer to Figure 4-10.
   a) Follow the instructions in the Stand-Alone Conveyors manual. Note a few differences between the Stand-Alone Conveyors and the transfer rollers.

Figure 4-11: Connecting Transfer Rollers

- The roller bearing is already on the leg.
• The hardware circled in Figure 4-11 consists of 3/8”-16 cap screws, each with a lock washer and flat washer.

b) Attach the point at 3A to 2B so two rollers are sharing one leg.

c) Attach the point at 2A to 1B so two rollers are sharing one leg.

3. After the rollers are assembled together, attach the truss guard that is shown in Figure 4-11. It attaches to each leg with two (2) 1/4”-20x1/2” cap screws and lock washers.

4. Place the belt guard so it covers the screws circled in Figure 4-11 to prevent the moving belt from causing damage. Don’t forget the belt on the motor end of the shaft.

**Anchoring the Transfer Rollers**

After ALL of the transfer rollers have been placed, secure them to the floor using 1/2x5-1/2-in. concrete anchors supplied specifically for the transfer rollers. Each transfer roller requires eight (8) anchor bolts. For detailed instruction on installing concrete anchors, follow the table anchor plate installation procedure.

**Adjusting the Height**

Adjust the height of the transfer rollers so they will grab a sliding truss and place it gently onto the Stand-Alone Conveyors. The transfer roller legs design match the stand-alone conveyor legs, so follow the procedure described in the Stand-Alone Conveyors manual. The height can be adjusted at any time. The height should be determined by the design drawing, and should be the minimum height possible for proper function.
Pneumatic System

Supplies Needed

Compressed air source that meet specs in Table 4-1
Piping from air source to regulator, min. 1-in. diameter
3/4-in. NPT connection between pipe and regulator

The table ejector and receiver stands operate off of common pneumatic system that requires an air flow source. The customer is responsible for supplying air from the main air source to the air regulator supplied by MiTek. The specifications in Table 4-1 can also be found in the Prior to Installation chapter.

Table 4-1: Compressed Air Requirements

<table>
<thead>
<tr>
<th>Air Source Tank</th>
<th>Connecting Air Source to System</th>
<th>Pressure</th>
<th>Avg. Flow Rate</th>
<th>Max. Flow Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum of 60 gal.</td>
<td>Minimum of 1&quot; diameter tube between air source and air regulator; discuss location of air regulator with your MiTek representative before installation</td>
<td>100 psi</td>
<td>0.39 for auto-eject, end-eject, side-eject and tall side-eject systems; 0.42 for high-slope auto-eject and long throw systems</td>
<td>Varies based on system length; consult your MiTek sales representative</td>
</tr>
</tbody>
</table>

*A tube cutter and pincers are provided with the air kit.

Securing Hoses Off the Floor

For maintenance reasons, the supplied cable ties should be used to secure all flexible hoses so they are not touching the floor. If the hoses are dragging on the floor, they may be cut by nail plates or crushed by tools, lumber, and equipment. Securing the hoses away from the floor will also make cleaning and sweeping easier. Two examples of securing hoses with cable ties are shown in Figure 4-12.
Figure 4-12: Securing Air Hoses Off the Floor

Overview of Pneumatic Components

Information about the components, including location of each, is shown in Table 4-2. Also refer to Figure 4-3 through Figure 4-15.

Table 4-2: Components and Connections in the Pneumatic System

<table>
<thead>
<tr>
<th>Component</th>
<th>Purpose</th>
<th>Location</th>
<th>Connector/Mount Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table Cylinder Assembly</td>
<td>To raise ejectors that lift the truss off the table</td>
<td>1 mounted under each table</td>
<td>4 screws and 1 pin/washer (supplied)</td>
</tr>
<tr>
<td>Receiver Cylinder Assembly</td>
<td>To raise the receivers to accept the truss</td>
<td>1 mounted on each receiver stand</td>
<td>4 screws and 1 pin/washer (supplied)</td>
</tr>
<tr>
<td>Setup Valve</td>
<td>Allows air to flow through the system</td>
<td>On top-chord end of tables with setup</td>
<td>Bolt plate to table with strap</td>
</tr>
<tr>
<td>Lubricator</td>
<td>Lubricates the lines</td>
<td>On top-chord end of tables with setup</td>
<td>Bolt plate to table with strap</td>
</tr>
<tr>
<td>Pilot Valve</td>
<td>To initiate air flow through the system for operation</td>
<td>On bottom-chord end of tables with setup</td>
<td>Bolt plate to table with strap</td>
</tr>
<tr>
<td>Ball Valve</td>
<td>Allows each setup to work independently</td>
<td>In the retract and extend 22-mm air lines</td>
<td>Splice directly into tubing</td>
</tr>
<tr>
<td>Table Valve</td>
<td>Allows each table to work independently</td>
<td>On bottom-chord end of each table</td>
<td>U-bolts (supplied)</td>
</tr>
<tr>
<td>Air Regulator</td>
<td>Regulates the pressure of the air flowing to the pneumatic system</td>
<td>On a wall within 30 ft of the 28-mm tube</td>
<td>Customer-supplied pipe and connector to the main air source; customer-supplied screws to mount to wall</td>
</tr>
</tbody>
</table>
## Table 4-2: Components and Connections in the Pneumatic System

<table>
<thead>
<tr>
<th>Component</th>
<th>Purpose</th>
<th>Location</th>
<th>Connector/Mount Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>28-mm Tube</td>
<td>Provides the main pressure</td>
<td>On the floor, near the receiver stands</td>
<td>Straight connectors (supplied): Push tube into the stop, ¼ turn to lock it in place; to remove, push up on collet and pull off the connector; Secure to floor with tube clamp</td>
</tr>
<tr>
<td>22-mm Tube</td>
<td>2 separate air lines; provides air for the extend and retract strokes</td>
<td>On the floor, near the receiver stands</td>
<td>Straight connectors (supplied): Push tube into the stop and the O-ring seals it; Secure to floor with tube clamp</td>
</tr>
</tbody>
</table>
Table 4-3: Pneumatic Setup Assembly

Red = Main Power Source
Blue = Retract Line
Black = Extend Line
Green = Pilot Line (extend or retract)

<table>
<thead>
<tr>
<th>Label</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Main air source, from 28-mm tube to lubricator</td>
</tr>
<tr>
<td>B</td>
<td>Main air line, from lubricator to setup valve</td>
</tr>
<tr>
<td>C</td>
<td>Main retract line, from setup valve to 22-mm tube</td>
</tr>
<tr>
<td>D</td>
<td>Main extend line, from setup valve to 22-mm tube</td>
</tr>
<tr>
<td>E</td>
<td>Pressure line, from setup valve to pilot valve</td>
</tr>
<tr>
<td>F</td>
<td>Pilot retract line, setup valve to pilot valve</td>
</tr>
<tr>
<td>G</td>
<td>Pilot extend line, from setup valve to pilot valve</td>
</tr>
<tr>
<td>H</td>
<td>Extend line, from table valve to 22-mm tube</td>
</tr>
<tr>
<td>I</td>
<td>Extend line, from table valve to table cylinder assembly</td>
</tr>
<tr>
<td>J</td>
<td>Extend line, from receiver cylinder assembly to table cylinder assembly</td>
</tr>
<tr>
<td>K</td>
<td>Retract line, T-fitting used for line from table cylinder and receiver cylinder</td>
</tr>
</tbody>
</table>

Tee will also connect with the receiver cylinder assembly on side-eject systems. On auto-eject systems, it will be a standard tee.
Figure 4-13: Location of Pneumatic Valves

Top-Chord End

- **Lubricator** (on setup tables only)
- **Setup Valve** (on setup tables only)
- **14 3/4” to edge of plate**
- **13 1/2” to edge of plate**

Bottom-Chord End

- **Pilot Valve** (on setup tables only)
- **Table Valve** (on every table)
- **15 1/4” to edge of plate**

Red = Main Power Source
Blue = Retract Line
Black = Extend Line
Green = Pilot Line (May be extend or retract.)

These images are also shown on Drawing 63650
Figure 4-14: Pneumatic System Connection Points (Described in Table 4-4)

These items are also shown on Drawing 84868
Figure 4-15: Cylinder and Table Valve Assemblies (Described in Table 4-4)

These items are also shown on Drawing 84870, 84871, and 84873.
Installing the Air Regulator

1. Connect the air regulator to the wall by screwing the mounting bracket securely into a wall through the two (2) holes in the mounting bracket (screws not supplied). A filter should already be installed in the regulator bowl.

   The location:
   • Must be within 30 ft of the 28-mm tube.
   • Can be connected to the closest end of the 28-mm tube (standard location) or an alternate location is to plug the end and use a tee to splice into the 28-mm tube.

2. Attach the air source to the 3/4-in. NPT port on the air regulator with a customer-supplied line and connector. A hose that will lead from the air regulator to the 28-mm tube should already be attached to the 1/2-in. NPT port on the regulator.

Assembling the 28-mm Tube and Regulator

1. Refer to Drawing 63650, sheet 2, to determine the number of lengths of 28-mm and 22-mm tube and the number of setups your system requires. It will depend on the number of tables in your system. Additional setups can be installed, but this must be specified before installation.

2. Determine if you want to connect the air source to the 28-mm tube at the end of the tubing or in the middle of the tubing using a supplied tee.

3. Connect the correct number of 28-mm tube (434550) together with straight unions (434557) to form a 28-mm air line. Push the tubes into the union and turn the screwcap 1/4 turn to lock it in place. Refer to the column labeled PRIMARY HEADER TUBE 28 MM on the Drawing 63650 to determine the quantity.

4. Place the 28-mm air line so it is approximately centered in the length of tables.
5. Determine how long the 1-in. hose that is attached to the air regulator should be. It needs to reach from the air regulator on the wall to the point determined in step 2.

   If the hose is too long:

   a) Loosen the hose clamp on the free end of the hose and cut the barb out of the hose clamp.

   b) Trim the hose to the correct length.

   c) Replace the barb and the attached assembly into the hose and tighten the hose clamp securely.

6. Attach the opposite end of the hose to the 28-mm air line assembled in step 3.

   a) The standard installation requires that the hose is attached to the closest end of the 28-mm air line. For this location, use the union already attached to the hose.

   b) An optional location is spliced anywhere along the 28-mm air line. Use the supplied tee (434553). This is also explained in note #15 on sheet 1 of Drawing 63650.

7. Insert a plug (434559) into the open end of the 28-mm air line.

   *If using the optional method of splicing the main air source line into the 28-mm air line, use a second plug (supplied) to plug the other end of the 28-mm air line.*

**Installing and Connecting the Setup Valves**

**Connecting the Lubricator and Setup Valve Assemblies**

1. To connect the lubricator to the rest of the pneumatic system, refer to Drawing 84868. For splicing information, refer to the note on Drawing 63650, sheet 1, and the illustration on sheet 5.

   a) Locate the 1x80-in. red hose that is attached to the left side of the lubricator.

   b) Splice the tee into the 28-mm air line.

      1) Using the provided tube cutter, cut the 28-mm air line at the location the tee is needed.

         *If you like, you can cut out a section 2 1/4” long to keep the total length of the air line the same. If you do not, every tee or valve spliced into the air line will extend the total length of the line.*

      2) Remove any burrs or sharp edges.
3) Push the newly cut tubes into the tee, one on each side, until the tube reaches the tube stop inside the tee.
4) Turn the screw cap approximately 1/4 turn to lock the collet. Pull on the tube to ensure it is secure.

2. Attach the hose (B) that is already on the right port of the lubricator (when facing the lubricator) to the left side of the setup valve next to it.

**Connecting the Pilot Valve**

1. Locate the three (3) green hoses that are attached to each pilot valve on the bottom-chord end of the setup tables.

2. Attach each hose to the setup valve according to Figure 4-14.
Installing and Connecting the Cylinders and Air Lines

Connecting the Extend Air Line and the Table Valves

1. Locate the 22-mm tubes, but do not connect them yet.
   a) The total quantity needed is shown in the column labeled SECONDARY HEADER TUBE 22MM on Drawing 63650, sheet 2.
   b) You will need an extend air line and a retract air line, so divide the number of 22-mm tubes in half to determine the number of tubes per row.

2. Lay the two rows parallel with one another and parallel with the row of tables.
   a) Lay the retract stroke air line closer to the tables than the extend stroke air line because it will make reading the drawings easier. The retract stroke air line is shown in blue, and the extend stroke air line is shown in black on the drawings and figures.
   b) Lay the air lines with approximately 8-10 in. between them to allow space for the fittings.

3. While facing the table valve, take the 3/8 in. x 25-ft hose that is attached to the left side of the valve and run it under the table to the location of the 22-mm extend air line. The table valve and tee are shown in Drawing 84873.

4. Connect two (2) 22-mm tubes with the tee on each table valve extend hose to form the extend air line.

5. Repeat the previous step until the entire extend air line is formed.

6. Plug both ends with a 22-mm plug (434560).
Connecting the Retract Tube and the Receiver Cylinder Assembly  
(Side-Eject Only)

For auto-eject systems, proceed to the next section.

1. At the receiver cylinder assembly, locate the tee (84867) on the end of the retract hose. It is labeled L in Figure 4-16 and also shown in Drawing 84871.

2. Connect two (2) 22-mm tubes with each side-eject tee until the retract air line is formed.

3. Attach the free end of that hose to the remaining port on the table cylinder assembly.

4. Plug both ends of the air line with a 22-mm plug (434560).

Connecting the Retract Air Line and the Table Cylinder Assembly  
(Auto-Eject Only)

1. Locate the blue retract hose on each table cylinder assembly that is labeled K in Figure 4-17. Connect each hose to the 22-mm retract tube with the tee (84866) already attached to the hose.

2. Connect two (2) 22-mm tubes with each side-eject tee until the retract air line is formed.

3. Repeat the steps above until every table cylinder assembly is attached to the retract air line.

4. Plug both ends of the air line with a 22-mm plug (434560).
5. Return to the table-cylinder assembly and locate the black hose labeled J in Figure 4-17.

6. Attach the free end of hose J to the receiver cylinder assembly.

**Connecting the Setup Valve Assembly With the 22-mm Air Line**

1. By now, you should have assembled both the extend and retract 22-mm air lines. Locate the tee on the black extend hose on each setup valve (one per setup). It is labeled D in Figure 4-14 and also shown on Drawing 84868.

2. Splice the tee into the extend 22-mm air line.
   a) Using a tube cutter, cut the 22-mm tube at the location the tee is needed.
      
      *If you like, you can cut out a section 2-1/4 in. long to keep the total length of the air line the same. If you do not, every tee or valve spliced into the air line will extend the total length of the line.*
   
   b) Remove any burrs or sharp edges.
   
   c) Push the newly cut tubes into the tee, one on each side, until the tube reaches the tube stop inside the tee.
   
   d) Pull out gently on the tube to ensure it is secure.

3. Repeat for the retract line.
   
   *The hose in front and to the left of the extend hose is for the retract stroke. It is shown in blue on the drawing.*

**Connecting the Table Cylinder to the Table Valve**

A 3/8 in. x 8 ft hose (I) is attached to the port on the right side of the table valve. Attach the free end of that hose to the extend port on the table cylinder assembly. See Figure 4-17.

**Installing the Ball Valve in the 22-mm Air Lines**

1. Splice a ball valve (PN 434561) into both 22-mm air lines. See Drawing 63650, sheet 2, for the recommended location. You may vary from the recommended location to provide different options in your setups. This ball valve will allow you to control all setups at the same time or use each setup independently of the others.

   a) Use a tube cutter to cut the 22-mm tube at the location the tee is needed.
      
      *If you like, you can cut out a section 2-3/16” long to keep the total length of the air line the same. If you do not, every tee or valve spliced into the air line will extend the total length of the line.*
valve spliced into the air line will extend the total length of the line.

b) Remove any burrs or sharp edges.

c) Push the newly cut tubes into the tee, one on each side, until the tube reaches the tube stop inside the tee. Turn the locking nut until the compression fitting is adequately tightened.

**Anchoring the Tubing to the Floor**

It is recommended that the 22-mm and 28-mm tubing be anchored to the floor after all connections are complete. The following items are included in your installation package to secure the tubes in place. Refer to the note on Drawing 63840.

- 8 tube clamps for the 22-mm tubing (511253)
- 4 tube clamps for the 28-mm tubing (511252)
- A 3/16" masonry drill bit (176001)
- 1 package containing 50 screws, 1/4 x 1-1/4" (305129)
Electrical

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical hazard!</td>
</tr>
<tr>
<td>All electrical work must be performed by a qualified electrician.</td>
</tr>
<tr>
<td>Follow approved lockout and tagout procedures (OSHA 29 CFR 1910.147).</td>
</tr>
</tbody>
</table>

Connecting Power to the Gantry Head

Refer to your gantry manual for installation instructions.

Connecting Power to the Stand-Alone Conveyors

Refer to your Stand-Alone Conveyors manual to connect power to the Stand-Alone Conveyors.

Connecting Power to the Transfer Rollers

All electrical work is the customer’s responsibility and must be performed by a qualified electrician. The machine design addresses electrical components starting with the disconnect enclosure. Installation and maintenance of all electrical requirements between the power source and the disconnect enclosure are the responsibility of the customer.

Refer to your electrical schematic for detailed wiring instructions.

Connecting Power to MatchPoint Automated Jigging

Refer to your MatchPoint manual for installation instructions.

Connecting Power to the Finish Roller

Refer to the Finish Roller manual for installation instructions.
Installation Checklist

- Unload the equipment
- Unpack the equipment
- Determine the location of the system components
- Install the table anchor plates
- Place the tables
- Align the tables
- Weld the tables to the anchor plates
- Install the parking stands and gantry head
- Install the scale beds
- Install the receiver stands
- Determine the location of the transfer rollers
- Assemble the transfer rollers
- Anchor the transfer rollers
- Adjust the height of the transfer rollers
- Install the air regulator
- Connect the 28-mm tube and air regulator
- Install the pneumatic setup valves
- Install and connect the air cylinders and air lines
- Anchor the pneumatic tubing to the floor
- Connect power to the gantry head
- Connect power to the Stand-Alone Conveyors
- Connect power to the transfer rollers
- Connect power to MatchPoint automated jigging
- Connect power to the Finish Roller

**WARNING**

HIGH PRESSURE, CRUSH AND CUT HAZARDS!

Do not attempt to start the system without a MiTek representative present!

Serious injury and/or equipment damage may result.
This chapter describes the operating mechanisms on this equipment and the procedure to operate it in most circumstances.

### Before You Begin

#### Safety Operating Notes

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRUSH AND CUT HAZARDS!</td>
</tr>
<tr>
<td>Read this section AND the safety section in the preliminary pages before operating or maintaining this equipment.</td>
</tr>
<tr>
<td>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.</td>
</tr>
<tr>
<td>Read and observe all warnings. Failure to do so may result in economic loss, property damage, and/or personal injury.</td>
</tr>
<tr>
<td>This manual must always be available to personnel operating and maintaining this equipment.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRUSH AND CUT HAZARD.</td>
</tr>
<tr>
<td>Before turning on the equipment, make sure that all personnel and equipment are clear. Do not operate the gantry head if personnel are in the aisles or on or near the tables.</td>
</tr>
</tbody>
</table>
Understanding This Chapter

Once the installation and startup procedures are complete, the equipment is ready to operate. The following sections provide instructions for everyday operation of the STT tables.
Stopping the Machine

Emergency stops (E-stops) immediately cease electrical power transmitting to the control circuit. The tables themselves do not have E-stops, but associated machines do.

Before using the STT tables, make sure you know the E-stop locations of all associated machines, including gantry heads, MatchPoint automated jigging, Stand-Alone Conveyors and Finish Rollers. Refer to the manuals for these pieces of equipment for E-stop locations.

There is no way to immediately stop an ejector or receiver from moving once movement has begun. The table valve controls the motion of ONLY the ejector in that table. Use of the table valve will stop the upward motion of the ejector, but the response may not be immediate. This should not be regarded as a reliable stopping method.

Starting the Machine

Refer to the Operating Procedure section on page 59 for the operating procedure.
The pneumatic system controls the ejectors on the tables and the receiver stands. The entire length of tables can be controlled by any one pilot valve if all ball valves are open, or each setup can be operated independently. You can remove any table from the setup by turning off the table valve.

**Figure 5-1: Bottom-Chord End of Setup Table**

Refer to your gantry head or *MatchPoint* manual for information on operating gantries or automated jigging.

Figure 5-2 and Table 5-1 show the setup pilot valve that controls the ejectors and receivers, and explains how the position of the valve will affect the ejectors and receivers.
Figure 5-2: Overview of Control Mechanisms

Table 5-1: Functions of Control Mechanisms

<table>
<thead>
<tr>
<th>Pilot Valve Position</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up</td>
<td>Ejectors and receivers extend</td>
</tr>
<tr>
<td>Neutral</td>
<td>Default position</td>
</tr>
<tr>
<td>Down</td>
<td>Ejectors and receivers retract</td>
</tr>
</tbody>
</table>
Operating Procedure

Operating the Tables

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRUSH AND CUT HAZARD.</td>
</tr>
<tr>
<td>Before turning on the equipment, make sure that all personnel and equipment are clear.</td>
</tr>
</tbody>
</table>

1. Set up the truss configuration and jigging. Refer to the Setting Up for Operation—Jigging section.

2. Refer to your gantry manual for gantry operation.

3. When you are finished pressing the truss, remove the truss from the table and place it on the Stand-Alone Conveyors.
   a) For systems without ejectors, manually lift or slide the truss over onto the conveyors.
   b) For systems using pneumatic ejectors and receivers, refer to the Pneumatics Operation section.

Operating the Transfer Rollers (Auto-Eject, High-Slope, and Long Throw Systems)

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRUSH AND CUT HAZARD.</td>
</tr>
<tr>
<td>Before turning on the equipment, make sure that all personnel and equipment are clear.</td>
</tr>
</tbody>
</table>

The transfer rollers will operate continuously once they are turned on.

1. Turn on power to the transfer rollers. The power switch is located in the transfer roller control box, usually next to the control box for your Stand-Alone Conveyor system.

2. Use the FORWARD/REVERSE button to start the motion of the transfer rollers.

3. When you are finished using the transfer rollers, use the STOP button to stop the motion of the transfer rollers.
Pneumatics Operation

Operating the Entire Pneumatic System as One System

After the connector plates have been pressed into the truss:

1. Remove ALL slider pads from the tables.

2. Ensure the ball valves between each setup on the 22-mm tubing are open.

3. Ensure all table valves are open.

4. Ensure all pilot valves are in the neutral position.

5. Actuate any pilot valve by turning the handle to the up position.
   a) The ejectors will lift the truss off the table.
   b) On side-eject systems, the receivers will also raise.

6. Remove the truss from the tables.
   a) On side-eject and tall side-eject systems, someone must push or pull the truss from the ejectors onto the receivers.
   b) On auto-eject, high-slope auto-eject, and long throw systems, the truss will slide over the transfer rollers and onto the conveyors.
   c) On end-eject systems, push or pull the truss across the pop-up rollers to transfer the truss to the end of the table line and onto the conveyors.

7. Turn the handle (on the pilot valve previously actuated) to the down position.

CAUTION

Remove slider pads before actuating ejectors!

WARNING

CRUSH HAZARD.

When removing a truss from an end-eject system, personnel should use caution to avoid coming into contact with the Finish Roller.

Failure to exercise caution may result in severe personal injury or death.
a) The ejectors will retract into the table.

b) On side-eject systems, the receivers will retract and place the truss onto the conveyors.

8. If building another truss, return the handle to the neutral position so any pilot valve in the system can be used.

All pilot valves must be in the neutral or down position for a setup to operate.

Operating Two or More Setups Independently of Each Other

1. Close the ball valve(s) on the 22-mm tube that is between the setups that are to be controlled independently of each other.

2. Ensure all table valves are open on the tables involved.

3. Actuate the setup pilot valve by turning the handle to the up position.

   a) The ejectors will lift the truss off the table.

   b) On side-eject systems, the receiver will also raise.

4. Remove the truss from the tables.

   a) On side-eject systems, someone must push or pull the truss from the ejectors onto the receivers.

   b) On auto-eject systems, the truss will slide over the transfer rollers and onto the conveyors.

5. Turn the handle (on the pilot valve previously actuated) to the down position.

   a) The ejectors will retract into the table.

   b) On side-eject systems, the receivers will retract and place the truss onto the conveyors.

6. If building another truss, return the handle to the neutral position so any pilot valve in the system can be used.
Removing a Table From a Cycle

1. Close the table valve on the table or tables not involved in this cycle.
2. Continue to operate the rest of the setup as normal.

To Auto-Eject, High-Slope Auto-Eject and Long Throw Customers:

The transfer rollers are part of the operating equipment, but have no pneumatic functions. They constantly run while power is on. The rollers grab the truss as it slides off the auto-ejector and place it onto the conveyors.

Operating the Scale Beds

Four (4) scales may be placed on each table in the table system at the time of installation. Some customers who use a laser-projection system choose not to purchase this option. If your tables have scales on them, they are to be used as a measuring tool. The zero (0) point is at the bottom-chord edge of the table surface.

Scale beds are shown in Figure 4-7 in the Installation chapter.
Introduction to Maintaining Your Equipment

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.

Review the table of contents and utilize the index to locate the information you need. The following appendices will also assist in maintaining and repairing your equipment:

- Troubleshooting
- Parts List
- Maintenance Checklists
- Drawing Set

Refer to Figure 6-1 through Figure 6-3 for an overview of component locations that may require maintenance during the life of your equipment.

Read the Performing Maintenance Safely section before beginning maintenance on this equipment.
Performing Maintenance Safely

Read the safety pages in the preliminary pages and adhere to all rules and guidelines. This section provides additional safety information specific to maintenance topics.

Before Operating This Equipment

Adhere to these warnings before operating this equipment:

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRUSH, CUT, AND CHEMICAL HAZARDS!</td>
</tr>
<tr>
<td>Read this section AND the safety section in the preliminary pages before operating or maintaining this equipment.</td>
</tr>
<tr>
<td>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.</td>
</tr>
<tr>
<td>Read and observe all warnings. Failure to do so may result in economic loss, property damage, and/or personal injury.</td>
</tr>
<tr>
<td>This manual must always be available to personnel operating and maintaining this equipment.</td>
</tr>
</tbody>
</table>

Lockout/Tagout

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.

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELECTROCUTION AND HIGH PRESSURE HAZARDS.</td>
</tr>
<tr>
<td>Always turn the power off by activating an E-stop when the equipment is not in operation.</td>
</tr>
<tr>
<td>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.</td>
</tr>
<tr>
<td>If it is absolutely necessary to troubleshoot an energized machine, follow NFPA 70E for proper procedures and personal protective equipment.</td>
</tr>
<tr>
<td>Turn off the air switch or shutoff valve if appropriate.</td>
</tr>
<tr>
<td>Bleed pneumatic lines if appropriate.</td>
</tr>
</tbody>
</table>
Making Adjustments

Be careful when making mechanical or pneumatic adjustments. Untrained personnel may damage the machine or cause harm to themselves and others.

<table>
<thead>
<tr>
<th>CAUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Failure to follow the step-by-step procedure may result in incorrect adjustment of this machine and could cause incorrect setup of trusses and damage to finished trusses. Only trained personnel should make mechanical or pneumatic adjustments to this machine.</td>
</tr>
<tr>
<td>Use the exact replacement parts that are specified by MiTek.</td>
</tr>
</tbody>
</table>

Replacing Parts

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. Order all replacement parts through MiTek.

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.

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRUSH AND CUT HAZARD.</td>
</tr>
<tr>
<td>You must be familiar with all safety rules listed in the Safety (English) or Seguridad (Español) section beginning on page viii or page xviii before performing any maintenance on this machine.</td>
</tr>
</tbody>
</table>
Overview Graphics

Figure 6-1 through Figure 6-3 provide an important overview of the equipment to help you better understand the procedures in the Maintenance chapter.

**Figure 6-1: Receiver Stand Components**

![Receiver Stand Components Diagram](image-url)
Figure 6-2: Transfer Roller Components

- Bearings
- Belt (Under Guard)
Figure 6-3: Pneumatic System

Top-Chord End

Bottom-Chord End

Pneumatic Setup Assembly

Top-Chord End

Tee will also connect with the receiver cylinder assembly on side-eject systems. On auto-eject systems, it will be a standard tee.

Refer to the Pneumatic section in the Installation chapter to see these hoses labeled.
MatchPoint Automated Jigging

If your equipment has MatchPoint automated jigging, refer to your MatchPoint manual for information on maintaining and replacing automated jigging.

Pneumatic System Maintenance

The pneumatic system controls the ejectors on the tables and the receiver stands (on a side-eject system) at the Stand-Alone Conveyors. Refer to Figure 6-3 on page 68 for a complete pneumatic system diagram. You will also find helpful pneumatic system information in the Installation chapter.

Lubricator

The pneumatic system lubricator is shown in Figure 6-4.

Checking the Oil Reservoir

Check the oil level by viewing the sight gauge located on the reservoir weekly. The sight glass turns red where the oil is contacting it. Refill or top off the oil every 2-3 months. The exact amount of time depends on the density of the fog injected into the system.

Filling the Oil Reservoir

Use a misting type oil rated 50 to 200 SSU that is compatible with the materials of construction.

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIGH PRESSURE HAZARD.</td>
</tr>
<tr>
<td>To avoid injury, bleed all pressure from the lines before removing the reservoir.</td>
</tr>
<tr>
<td>Ensure that the reservoir is securely attached to the lubricator body before returning pressure to the lines.</td>
</tr>
</tbody>
</table>
1. When refilling the oil, the system must be free of pressure. To depressurize the system:

   a) Close the shut-off valve on the Regulator that is in the same setup as the lubricator being filled. The regulator and shut-off valve are shown in Figure 6-5.

   b) Bleed the pressure from all the lines in that setup by opening the setup’s pilot valve. Check the air pressure gauge to make sure all pressure has been bled from 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 and the sight gauge can be easily viewed.

*Adjusting the Density of the Lubricant Fog*

The pneumatic system lubricator is a Micro-Fog Lubricator. It injects a finely divided fog of oil into a flowing stream of compressed air to provide internal lubrication. The density of the lubricant is controlled by the drip rate adjusting knob that is labeled “1” in Figure 6-4. Using a slotted screwdriver, turn the knob counterclockwise to increase the Micro-Fog density or clockwise to decrease it. The knob should be open approximately 1/2 turn under most conditions.

*Additional Maintenance*

Proper preventive maintenance for the lubricator also includes replacing the O-rings, seals, and gaskets at regular intervals. We recommend that you replace these items every two (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.
Regulator

The regulator can be purchased directly from MiTek. Refer to the Replacement Parts appendix for the part number.

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
</table>
| **HIGH PRESSURE HAZARD.**  
To avoid injury, bleed all pressure from the lines before removing the filter guard.  
Ensure that the filter guard is securely attached to the regulator body before returning pressure to the lines. |

Replacing the Filter Element

The regulator uses a 40-micron filter element that must be replaced every six (6) months. This filter can be purchased from MiTek. Refer to the Replacement Parts appendix for the part number.

1. When replacing the filter element, the system cannot be pressurized. To depressurize the system:
   a) Close the shut-off valve on the regulator. See Figure 6-5.
   b) Bleed the pressure from all the lines in that setup by opening any setup pilot valve.
   c) Ensure the gauge reads “0” before unscrewing the filter guard.
2. Remove the bowl from the regulator body by twisting approximately 1/4 turn clockwise while pushing up on the filter guard. Then pull down and remove the filter guard from the body.

3. Unscrew the filter element and remove it from the regulator. Be sure to keep the spring that is resting in the filter element.

4. Place the spring in the new filter element.

5. Screw the new filter element in its place.

6. Place the bowl back onto the regulator body by pushing up and turning counterclockwise. Make sure it is securely attached before returning pressure to the lines.

**Adjusting the Pressure**

The operating pressure of the pneumatic system should be 100 psi. The pressure adjustment knob shown in Figure 6-6 controls the operating pressure. Do not adjust this knob to change the speed of the ejectors and receivers. Adjustments to individual cylinders can be made using the flow control valves on each cylinder. Refer to the *Cylinders* section for this procedure.

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.
Manual Drain

At the bottom of the regulator is a thumbscrew that operates a drain. Condensation can form in pneumatic lines due to temperature changes. When condensation gathers, it will show up in the bowl’s sight glass. Where the sight glass comes in contact with water, it turns red, indicating the water level. Open this drain periodically to drain fluid from the system. If condensation becomes a serious problem, an air dryer is required.

The system must be pressurized to drain the condensation.

If the handle on the drain breaks, you can replace it by ordering the valve only. If the entire drain must be replaced, order the valve plus the valve body and O-ring. All three parts can be purchased by contacting MiTek or the manufacturer directly.

Additional Maintenance

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. You can order a service kit including these preventive maintenance parts from MiTek or the manufacturer.

Setup Valve

Each setup has one setup valve. Preventive maintenance for the setup valve consists of replacing the O-rings, seals, and valve head gasket when the quality of the air pressure begins to diminish. To order a service kit, contact MiTek and refer to the part number of the setup valve in the Replacement Parts appendix.

If you need to replace a setup valve, refer to the Installation chapter.
Pilot Valve

A pilot valve controls the air flow for one setup. Each pilot valve is mounted on the bottom-chord end of one table in each setup.

If the handle on the pilot valve breaks, remove the shoulder screw and replace the handle. Replacement handles are available from MiTek.

A service kit is available to replace the seals, valve inserts, springs, etc. when needed. To reach these components, remove the four (4) small screws on the front of the valve assembly and move the valve assembly away from the blue anchor plate. Unscrew the two (2) screws on the back side and remove the oval plate.

If you need to replace a pilot valve, refer to the Installation chapter.

Refer to the Replacement Parts appendix to locate the MiTek part number for the pilot valve.

Cylinders

There are pneumatic cylinders on the underside of the tables and also under the receiver stands (on side-eject systems). They are Bimba® Original Line air cylinders with adjustable cushions.

Adjusting Movement

The pneumatic cylinders have rear-head cushion to help decelerate the load and reduce potentially destructive energy. If the ejectors or receivers seem to stop exceedingly hard, the screw shown in Figure 6-9 can be turned to adjust the cushion on each cylinder.

Turn the screw clockwise to increase the cushion or counter-clockwise to decrease it.
Adjusting Speed

Both ends of the table cylinders and receiver stand cylinders have a flow control valve to adjust the speed that the ejectors and receivers raise and lower. To adjust the flow control valve, use a slotted screwdriver in the set screw at the bottom of the valve. See Figure 6-9. Turn the screw clockwise to increase the speed or counter-clockwise to decrease it.

If you need to replace a cylinder, refer to the *Installation* chapter. Refer to the *Replacement Parts* appendix to order new cylinders.

Scale Bed

Refer to the *Installation* chapter for instructions on replacing a scale bed.

Adjustments

The level of the tables, receiver stands and transfer rollers should be checked annually. Refer to the *Installation* chapter for information on adjusting the leveling bolts.

Refer to the *Pneumatic System Maintenance* section beginning on page 69 for information on pneumatic system adjustments.

Belts

Check the tension of the transfer roller belts every three (3) months. See Figure 6-2 on page 67 for belt locations.

The belts should have approximately 1/2 in. of deflection. Make sure all guards are in place before operating the transfer rollers.
Lubricating and Inspecting

Lubricating

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 parts 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. The information is also in the Maintenance Checklist appendix.

**CAUTION**

Never mix synthetic lubricants with mineral lubricants!

Lubricating With Grease

Grease the bearings in the transfer rollers every three (3) months. See Figure 6-2 on page 67 for bearing locations.

Inspecting the Receiver Stands

Check the clevis pin in the bell crank and all bolts for wear every three (3) months. Replace worn parts. See Figure 6-1 on page 66 for clevis pin and bolt locations.
Navigating the Troubleshooting Appendix

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 for assistance.

Safety Notes for Troubleshooting

Adhere to these guidelines to ensure a safe troubleshooting experience:

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HIGH PRESSURE, CRUSH, CUT, AND CHEMICAL HAZARDS!</strong></td>
</tr>
<tr>
<td>Read all notes in this section AND the safety section in the preliminary pages before operating or maintaining this equipment.</td>
</tr>
<tr>
<td>Most solutions are described in more detail in the <em>Maintenance</em> chapter and may have more safety notes included there.</td>
</tr>
</tbody>
</table>

- Obey all hazard warnings located in the safety section in the preliminary pages 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

Clean and lubricate the equipment as a first step in most troubleshooting processes. Most malfunctions are caused by inadequate preventive maintenance.
## Symptoms and Solutions

### Table A-1: Troubleshooting the Pneumatic System

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Cause</th>
<th>Possible Solution</th>
<th>See Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>End fitting blown off of hose</td>
<td>Improper assembly procedures, improper skiving, incorrect hose-end series, mixing competitor's components with Weatherhead® components</td>
<td>Ensure that the hose-end is the correct fitting and is properly installed; never intermix components</td>
<td>39</td>
</tr>
<tr>
<td>Hose end appears to have been pinched on one side</td>
<td>Collet is becoming worn</td>
<td>Replace the collet</td>
<td>—</td>
</tr>
<tr>
<td>Hose has burst or cracked</td>
<td>Abrasion, hose is twisted or kinked</td>
<td>Remove possible abrasives and twists or kinks in the hose</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Incompatible lubricant in lubricator</td>
<td>Always use a recommended lubricant in lubricator</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>Excessive pressure</td>
<td>Check pressure relief for damage or improper setting</td>
<td></td>
</tr>
<tr>
<td>Receivers and ejectors not actuating at same time</td>
<td>Flow controls need adjustment</td>
<td>Adjust flow controls on receiver or lifter cylinder</td>
<td>74</td>
</tr>
<tr>
<td>One table in setup not working (receiver and ejector)</td>
<td>Table valve shut off</td>
<td>Open table valve</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Table isolated from rest of setup</td>
<td>Ensure 22-mm ball valve on secondary header is open between table and setup</td>
<td>60</td>
</tr>
<tr>
<td>The ejectors and receivers on one setup do not function with the other setups when operating entire system together</td>
<td>The pilot valve for the setup that is not operating correctly is shut off</td>
<td>Turn all pilot valves to the neutral position when operating the entire system as one setup</td>
<td>60</td>
</tr>
<tr>
<td>Ejectors do not have enough power to lift truss off table</td>
<td>System pressure set too low</td>
<td>Increase pressure regulator to recommended 100 psi</td>
<td>72</td>
</tr>
<tr>
<td></td>
<td>Air loss in system</td>
<td>Check all connections and hoses for air leaks</td>
<td></td>
</tr>
<tr>
<td>Air leak at aluminum tube fittings</td>
<td>Loose connection</td>
<td>Ensure system is depressurized. Disconnect tube from fitting and re-connect</td>
<td></td>
</tr>
<tr>
<td></td>
<td>O-ring damaged</td>
<td>Replace fitting and remove burrs and sharp edges from tube</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>Loose connection</td>
<td>Ensure system is depressurized. Disconnect hose and ensure hose has clean 90° cut</td>
<td></td>
</tr>
<tr>
<td>Air leak in hose</td>
<td>Hose damaged</td>
<td>Replace hose; ensure area is free and clear of debris including nail plates</td>
<td>39</td>
</tr>
</tbody>
</table>
Navigating the Parts List Appendix

Parts are grouped first according to their location and then presented in alphabetical order by part name. The far right column indicates if the part should be kept in stock to minimize downtime.

Safety Notes for Replacing Parts

<table>
<thead>
<tr>
<th>CAUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only use the exact replacement parts that are specified by MiTek. Substitutions may harm your equipment.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRUSH AND CUT HAZARD.</td>
</tr>
<tr>
<td>You must be familiar with all safety rules listed in the Safety (English) or Seguridad (Español) section beginning on page viii or page xviii before performing any maintenance on this machine.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIGH PRESSURE HAZARDS.</td>
</tr>
<tr>
<td>Always turn the power off on equipment associated with the STT Tables by activating an E-stop when the equipment is not in operation.</td>
</tr>
<tr>
<td>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.</td>
</tr>
<tr>
<td>Turn off the air switch or shutoff valve if appropriate.</td>
</tr>
<tr>
<td>Bleed pneumatic lines if appropriate.</td>
</tr>
</tbody>
</table>
## Part Numbers

### Mechanical Parts

Table B-1: Mechanical Replacement Parts

<table>
<thead>
<tr>
<th>Part Location Category</th>
<th>MiTek Part #</th>
<th>Part Description</th>
<th>Refer to Drawing #</th>
<th>Keep in Stock</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table</td>
<td>63824-501</td>
<td>Anchor plate kit (1 per table)</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Table</td>
<td>349102</td>
<td>Hardware for scale bed (order 3 for each scale bed)</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Table (optional)</td>
<td>563081</td>
<td>Scale for scale bed</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Table</td>
<td>63761-601</td>
<td>Scale kits for tables (includes scale, scale bed, and hardware)</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>
# Pneumatic Parts

## Table B-2: Pneumatic Replacement Parts

<table>
<thead>
<tr>
<th>Part Location Category</th>
<th>MiTek Part #</th>
<th>Part Description</th>
<th>Keep in Stock</th>
</tr>
</thead>
<tbody>
<tr>
<td>—</td>
<td>See Drawing 63845</td>
<td>Entire air kit</td>
<td>—</td>
</tr>
<tr>
<td>Ball Valve Assembly</td>
<td>See Drawing 84873</td>
<td>Ball valve</td>
<td>—</td>
</tr>
<tr>
<td>Ball Valve Assembly</td>
<td>See Drawing 84873</td>
<td>Tees, connectors, and hoses</td>
<td>1</td>
</tr>
<tr>
<td>Cylinder Assembly—Receivers</td>
<td>See Drawing 84871</td>
<td>Cylinder, connectors, and hoses</td>
<td>1</td>
</tr>
<tr>
<td>Cylinder Assembly—Tables</td>
<td>See Drawing 84870</td>
<td>Cylinder, connectors, and hoses</td>
<td>1</td>
</tr>
<tr>
<td>Main Pressure Source</td>
<td>See Drawing 84869</td>
<td>Air regulator, hose, and connectors</td>
<td>—</td>
</tr>
<tr>
<td>Regulator</td>
<td>438575</td>
<td>Filter for regulator</td>
<td>1</td>
</tr>
<tr>
<td>Regulator</td>
<td>438579</td>
<td>Service kit for filter/regulator</td>
<td>—</td>
</tr>
<tr>
<td>Setup Assembly Kit</td>
<td>63840-505-1</td>
<td>Air kits for 5-table setup</td>
<td>—</td>
</tr>
<tr>
<td>Setup Assembly Kit</td>
<td>84868-501</td>
<td>Entire installation kit, JHFM-84868-501</td>
<td>—</td>
</tr>
<tr>
<td>Setup Valve Assembly</td>
<td>434587</td>
<td>Seal kit for inline valve</td>
<td>—</td>
</tr>
<tr>
<td>Setup Valve Assembly</td>
<td>See Drawing 84868</td>
<td>Lubricator</td>
<td>—</td>
</tr>
<tr>
<td>Setup Valve Assembly</td>
<td>See Drawing 84868</td>
<td>Setup valve</td>
<td>—</td>
</tr>
<tr>
<td>Setup Valve Assembly</td>
<td>434345</td>
<td>Pilot valve</td>
<td>—</td>
</tr>
<tr>
<td>Setup Valve Assembly</td>
<td>434355</td>
<td>Replacement handle for pilot valve</td>
<td>1</td>
</tr>
<tr>
<td>Setup Valve Assembly</td>
<td>434358</td>
<td>Repair kit for pilot valve (includes seals, valve inserts, and springs)</td>
<td>—</td>
</tr>
<tr>
<td>Setup Valve Assembly</td>
<td>438580</td>
<td>Service kit for lubricator (includes seals and gaskets)</td>
<td>—</td>
</tr>
<tr>
<td>Setup Valve Assembly</td>
<td>See Drawing 84868</td>
<td>Tees, connectors, and hoses</td>
<td>1</td>
</tr>
<tr>
<td>Setup Valve Assembly</td>
<td>See Drawing 84870</td>
<td>Cylinder, connectors, and hoses</td>
<td>—</td>
</tr>
</tbody>
</table>
Navigating the Maintenance Checklists

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

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

<table>
<thead>
<tr>
<th>Checklist</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekly Checklist</td>
<td>84</td>
</tr>
<tr>
<td>Periodic Checklist</td>
<td>85</td>
</tr>
</tbody>
</table>

Safety Notes For Maintenance Checklists

**WARNING**

CRUSH AND CUT HAZARD.

You must be familiar with all safety rules listed in the Safety (English) section beginning on page viii before performing any maintenance on this machine.

**WARNING**

HIGH PRESSURE HAZARDS.

Always turn the power off and activate an E-stop when the equipment is not in operation.

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.

Turn off the air switch or shutoff valve if appropriate.

Bleed pneumatic lines if appropriate.
# Weekly Checklist

Year: _____________  Month: _________________

<table>
<thead>
<tr>
<th>Action</th>
<th>See Page</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check oil level in air lubricator</td>
<td>69</td>
<td></td>
</tr>
<tr>
<td>Lubricator service kit</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>Check regulator filter (every 3 weeks)</td>
<td>71</td>
<td></td>
</tr>
<tr>
<td>Grease transfer roller bearings (every 12 weeks)</td>
<td>67</td>
<td></td>
</tr>
<tr>
<td>Check transfer roller belt tension (every 12 weeks)</td>
<td>67</td>
<td></td>
</tr>
<tr>
<td>Check receiver stand bolts for wear (every 12 weeks)</td>
<td>66</td>
<td></td>
</tr>
<tr>
<td>Check receiver stand clevis pin for wear (every 12 weeks)</td>
<td>66</td>
<td></td>
</tr>
</tbody>
</table>

**Notes**

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# STT Tables

## Periodic Checklist

Year: _____________

<table>
<thead>
<tr>
<th>Action</th>
<th>See Page</th>
<th>Sign and Date When Action is Performed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examine and replace damaged scales or scale beds (optional equipment)</td>
<td>Every year 32</td>
<td></td>
</tr>
<tr>
<td>Check that the tables, receiver stands and transfer rollers are level</td>
<td>Every year 27</td>
<td></td>
</tr>
<tr>
<td>Observe the operation of ejectors and receivers (optional equipment); replace or repair any parts necessary</td>
<td>Every 2 years —</td>
<td></td>
</tr>
<tr>
<td>Purchase and install new lubricator service kit</td>
<td>Every 2 years 70</td>
<td></td>
</tr>
</tbody>
</table>

Notes

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________
This appendix provides general information that will help you better understand how this equipment works.

Understanding Overloads

Purpose and Scope

The information below has been collected to help you understand the role of an overload, how an overload works, and how to calculate the overload setting to protect the motor.

The Importance of Protecting Your Motor

The following statement describes the importance of protecting electric motors and is a good illustration of why we need overloads.

Proper Motor Protection Safeguards Your Investments

With electric motors driving the majority of today's manufacturing processes, proper motor protection is critical. Not surprisingly, a significant amount of effort and resources have recently been invested in motor protection technology, resulting in cost-effective solutions to many of today's common motor problems.

Motors fail for a number of reasons—moisture and contamination, short circuits, mechanical problems and old age—but the primary reason is excessive heat, caused by excess current (greater than normal motor full load current), high ambient temperatures, and poor ventilation of the motor. If a motor is continuously overheated by only 10 degrees, its life can be reduced by as much as 50%.

Steve Zimmerman
Control Engineering
December 1, 1997
What is an Overload?

So, what is an overload? The term literally means that too much load (what the motor is driving) has been placed on the motor. A motor is designed to run at a certain speed, called its synchronous speed. If the load on the motor increases, the motor draws more current to continue running at its synchronous speed.

It is quite possible to put so much load on a motor that it will draw more and more current without being able to reach synchronous speed. If this happens for a long enough period of time, the motor can melt its insulation and burn out, resulting in damage to the motor windings. This excessive load condition is called an overload.

In fact, the motor could stop turning altogether (called a locked rotor) under a large enough load. This is another example of an overload condition. Even though the motor shaft is unable to turn, the motor continues to draw current, attempting to reach its synchronous speed.

Although the running motor may not draw enough current to blow the fuses or trip circuit breakers, it can produce sufficient heat to burn up the motor. This heat, generated by excessive current in the windings, causes the insulation to fail and the motor to burn out. We use the term “locked rotor amps” to describe when the motor is in this state and is drawing the maximum amount of current.

Due to the possibility of excessive current draw, an overload protection device is required that does not open the circuit while the motor is starting, but opens the circuit if the motor gets overloaded.

Starting Current

When a motor is started, it must perform work to overcome the inertia of the rotating portion of the motor and the attached load. The starting current measured on the incoming line is typically 600% of full-load current when rated voltage and frequency is first applied to a NEMA B motor. The stationary portion of the motor current decreases to its rated value as the rotor comes up to speed.
An overload condition will occur when the rotor has difficulty turning and draws more current than it normally would need to keep it turning. When an overload occurs the current being drawn is usually between 2 to 6 times the normal operating current.

For example if a conveyor belt becomes jammed and does not allow the rotor to turn, the motor will draw about as much amperage as it would on startup to try to get the rotor to turn. As long as the rotor does not turn, this increased current will continue to flow. The key thing to remember in an overload condition is that the current flows through the normal circuit path. Continued overload current will cause excess heating in the motor and the motor circuit. If the over current protective device does not operate in a timely manner, the motor could short out a winding, or cause insulation damage to a winding which could lead to a short circuit later.

**Overload Relays**

The overload relay is the device used in starters for motor overload protection. It limits the amount of current drawn to protect the motor from overheating.

An overload relay consists of:

- A current sensing unit (connected in the circuit to the motor)
- A mechanism to break the circuit, either directly or indirectly

Overload relays have the following features:

- A time delay which ignores harmless temporary overloads caused by normal motor starting, without breaking the circuit
- A means of resetting the circuit once the overload is removed
• A design that meets the special protective needs of motor control circuits
• Allow harmless temporary overloads, such as motor starting, without disrupting the circuit
• Will trip and open a circuit if current is high enough to cause motor damage over a period of time
• Can be reset once the overload is removed

Bimetallic Overload Relays

Overload protection is accomplished with the use of a bimetallic strip. This component consists of a small heater element wired in series with the motor and a bimetallic strip that can be used as a trip lever. A bimetallic strip is made of two dissimilar metals bonded together. The two metals have different thermal expansion characteristics, so the bimetallic bends at a given rate when heated.

Under normal operating conditions the heat generated by the heater element will be insufficient to cause the bimetallic strip to bend enough to trip the overload relay.

As current rises, heat also rises. The hotter the bimetallic becomes, the more it bends. In an overload condition the heat generated from the heater will cause the bimetallic strip to bend until the mechanism is tripped, stopping the motor.

If heat begins to rise, the strip bends, and the spring pulls the contacts apart, breaking the circuit, as shown in Figure D-2.

![Figure D-2: The Warping Effect of the Bimetallic Strip](image)

Once the tripping action has taken place, the bimetallic strip cools and reshapes itself, automatically resetting the circuit. The motor can be restarted even when the overload
condition has not been cleared, and will trip and reset itself again and again. (This assumes an automatic reset and can also be equipped with a manual reset.)

**Electronic Overload Relay**

Electronic overload relays are another option for motor protection. The features and benefits of electronic overload relays vary but there are a few common traits. One advantage offered by electronic overload relays is heater-less design. This reduces installation cost and the need to stock a variety of heaters to match motor ratings. Electronic overload relays can detect a phase loss and disconnect the motor from the power source. This feature is not available on mechanical types of overload relays.

**Overload Classifications**

Overload relays also have an assigned trip class. The trip class is the maximum time in seconds at which the overload relay will trip when the carrying current is at 600% of its current rating. Bimetallic overload relays can be rated as Class 10, meaning that they can be counted on to break the circuit no more than ten seconds after a locked rotor condition begins. Melting alloy overload relays are generally Class 20.

American industry has standardized on Class 20 overload protection. The Europeans have standardized on Class 10.

Class 20 will give a nominal 590-second trip (9.83 minutes) at an overload of 125% of full load amps, a 29-second trip at a 500% overload, and a 20-second trip at a 600% overload. Thus, a motor that is stalled and drawing locked rotor amperage will be taken off-line in 20 to 29 seconds. However, a motor that draws a continuous locked rotor current can be expected to burn out before 20 seconds.

Class 10 will give a nominal 230-second trip (3.83 minutes) at 125% overload, 15 seconds at 500% overload, and 10 seconds at 600% overload.

Class 30 has a longer time delay to be used on high inertia loads that require a long acceleration or have shock loading that causes repetitive motor inrush.

The overload class that MiTek normally specifies for equipment is a Class 10. Since it is possible to burn out a motor in less than 20 seconds, we have chosen to protect the motor with the highest degree of protection.
Codes And Standards

NFPA 79—Electrical Standard for Industrial Machinery, 2002

7.3.1.1 Motors. Motor overload protection shall be provided to each motor in accordance with Article 430, Part III, of NFPA 70, National Electrical Code.

NEC 2002—National Electrical Code

430.32 (A) (1) Separate Overload Device. A separate overload device that is responsive to motor current. This device shall be rated at no more than the percentages shown in Table D-1.

<table>
<thead>
<tr>
<th>Nameplate Full Load Current Rating</th>
<th>% Allowed Above Full Load Current Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service Factor of 1.15</td>
<td>125%</td>
</tr>
<tr>
<td>Motors with a marked temperature rise of 40°C or less</td>
<td>125%</td>
</tr>
<tr>
<td>All other motors</td>
<td>115%</td>
</tr>
</tbody>
</table>

Example 1

15 hp, 208V, 3 phase, induction motor, 40°C rise, design B, FLA 48 amps. Overload Protection = 48 amps times 125% = 60 amps

Example 2

25 hp, 208V, 3 phase, induction motor, 1.15 s.f., design C, FLA 72A. Overload Protection = 72 amps times 125% = 90 amps
Example 3

40 hp, 208V, 3 phase, wound rotor motor, FLA 118 amps. Overload Protection = 118 amps times 115% = 136 amps

The motor overloads must be calculated using the nameplate current and not from Tables 430-148 or 430-150 of the National Electrical Code.

In Example 1, the motor has a 40°C rise, the O.L. unit is sized at 125% of the full load motor current.

In Example 2, the motor has a s.f. (service factor) of 1.15. The O.L. unit is sized at 125% of the full load motor current.

In Example 3, where neither of the two conditions exists, it is sized at 115%.
Glossary of Overload Terms

**Full Load Amps (FLA)**

This is the current flow required by a motor during normal operation under normal loading to produce its designated horsepower. Motors having nothing attached to their shaft will draw less than the FLA current.

**Insulation Class**

The National Electrical Manufacturers Association (NEMA) has established insulation classes to meet motor temperature requirements found in different operating environments. The four insulation classes are A, B, F, and H. Class F is commonly used. Class A is seldom used. Before a motor is started, its windings are at the temperature of the surrounding air. This is known as ambient temperature. NEMA has standardized on an ambient temperature of 104°F, or 40°C for all motor classes.

Temperature rises in the motor as soon as it is started. The combination of ambient temperature and allowed temperature rise equals the maximum winding temperature in a motor. A motor with Class F insulation, for example, has a maximum temperature rise of 221°F (105°C). The maximum winding temperature is 293°F (145°C) [104°F (40°C) ambient plus 221°F (105°C) rise]. A margin is allowed for a point at the center of the motor’s windings where the temperature is higher. This is referred to as the motor’s hot spot.

The operating temperature of a motor is important to efficient operation and long life. Operating a motor above the limits of the insulation class reduces the motor life expectancy. A 50°F (10°C) increase in the operating temperature can decrease the life expectancy of a motor by as much as 50%.

**Table D-2: Motor Operating Temperature**

<table>
<thead>
<tr>
<th></th>
<th>Class A</th>
<th>Class B</th>
<th>Class F</th>
<th>Class H</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rise</strong></td>
<td>176°F (80°C)</td>
<td>176°F (80°C)</td>
<td>320°F (160°C)</td>
<td>176°F (80°C)</td>
</tr>
<tr>
<td><strong>Hot Spot</strong></td>
<td>41°F (5°C)</td>
<td>50°F (10°C)</td>
<td>50°F (10°C)</td>
<td>59°F (15°C)</td>
</tr>
</tbody>
</table>

**Locked Rotor Amps**

Also known as inrush current, locked rotor amps is the amount of current the motor can be expected to draw under starting conditions when full voltage is applied. This is the current taken from the supply line at rated voltage and frequency with the rotor at rest.
Motor Load

A motor provides the conversion of electrical energy to mechanical energy that enables a machine to do work. The energy that a machine requires from a motor is known as the motor load. The motor load “seen” by a motor is dependant upon how the load is connected to the motor, the dimensions of the load, and the weight of the load.

A load connected to a motor by a gearbox reduces the load by the square of the gear ratio. If a load is attached to a motor through a 3:1 gear ratio, the load is 1/9 of the load the motor would see if the load were attached directly to the motor.

A round object attached to the motor shaft has a load related to the square of the radius of the object. If a 16" saw blade is a load of weight multiplied by the radius squared, the load is $8^2 \times \text{weight} = 64 \times \text{weight}$. A 20" saw blade is a load of $10^2 \times \text{weight} = 100 \times \text{weight}$. The 20" saw blade is 56% more load than the 16" saw blade due to the dimensions.

A motor load is directly related to the weight of an object. A 16" blade weighs 9.28 pounds. A 20" blade weighs 14.61 pounds, or 5.33 pounds more. The 20" blade is 56% more load than the 16" blade due to weight. Remember, weight is the volume of an object times its density, so weight is also related to the dimensions.

In the example of the saw blades, the combined effect of the longer radius, and longer weight means the 20" saw blade is approximately 125% more load on a motor than a 16" saw blade, which partially explains why motors on quads 1 and 4 are more likely to burn out or trip an overload.
NEMA Design Ratings

NEMA ratings refer to the torque ratings. The following ratings apply to motors:

NEMA B

The NEMA B motor’s percentage of slip ranges from 2 to 4%. It has medium values for starting or locked rotor torque, and a high value of breakdown torque.

NEMA A

The NEMA A motor is similar in many ways to the NEMA B motor. It typically has a higher value of locked rotor torque and its slip can be higher.

NEMA C

The NEMA C motors are well suited to starting high-inertia loads. This is because they have high locked rotor torque capability. Their slip is around 5%, and their starting current requirement is average.

NEMA D

The NEMA D motor is found in heavy duty, high-inertia applications. It has high values of slip (up to 8%), and very high locked rotor torque capability.

Service Factor (s.f.)

A motor designed to operate at its nameplate horsepower rating has a service factor of 1.0. Some applications may require a motor to exceed the rated horsepower. In these cases a motor with a service factor of 1.15 can be specified. The service factor is a multiplier that may be applied to the rated power. A 1.15 service factor motor can be operated 15% higher than the motor’s nameplate horsepower.

Trip Class

Overload relays are rated by a trip class, which defines the length of time it will take for the relay to trip in an overload condition. The most common trip classes are Class 10,
Class 20, and Class 30. Class 10, for example, has to trip the motor off-line in 10 seconds or less at 600% of the full load amps. This is usually sufficient time for the motor to reach full speed.

Understanding Motor Starting Problems

There are three major sources of motor starting problems: voltage source problems, control circuit problems, and drive faults. Diagnosing and resolving these problems can be a time-consuming process, but some time can be saved by using an organized process of elimination. The following sections address the most common sources of motor starter problems.

**Voltage Source Problems**

1. Check the incoming power source. Verify that all three phases of power have the proper voltage using a digital multimeter set to voltage mode. If any of the three phases of incoming power are low or missing, disconnect power at the primary disconnect switch and reset the circuit breaker or replace the fuse.

2. Before restoring power at the primary disconnect, verify that there are no phase-to-phase or phase-to-ground shorts at the motor starter line contactors. If necessary, replace starter contacts to correct shorts.

3. Check that motor thermal overloads have not been tripped. Reset the overloads by pressing the reset pushbutton.

4. Check the motor starter leads for phase-to-phase and phase-to-ground shorts. Check for discoloration, hot spots, melted wire or damaged fuses. Correct the motor lead wiring if necessary.
5. Check the motor leads for phase-to-phase and phase-to-ground shorts. Check for discoloration, hot spots, melted wire or damaged fuses. Replace the motor if necessary.

6. Determine if motor windings are breaking down by testing the motor insulation with an insulation tester or taking the motor to a repair shop for testing.

7. Disconnect the motor from its load. Start the motor. If it runs correctly, the problem is associated with the mechanical drive train. If it does not run correctly, replace the motor bearings.

Control Circuit Problems

1. If the incoming power source has all three phases of power, check the motor starter overloads. Reset the motor starter overloads by pressing the reset button.

2. Verify that the control voltage transformer fuse is operating correctly using a digital multimeter set to Ohms. The multimeter should have a low reading. If the multimeter registers no reading or an infinite reading, replace the fuse.

3. Disconnect the motor starter contactor coil. Check for a short or ground. If necessary, replace the motor starter coil.

4. Check the control circuit wiring to the contactor coil while the coil is still disconnected. If a short or ground is present, disconnect the field wiring circuit to the motor starter. Determine whether the problem is with the motor contactor overload circuit or the field control wiring.

5. If a ground is found in the motor starter overloads circuit, replace the overloads. Reconnect the starter coil and control field wiring.

6. If a ground is found in the field wiring circuit, clear the ground. Reconnect the starter coil and control field wiring.

7. Check for an open circuit in the motor overloads or control circuit by using a digital multimeter set for Ohms to verify the motor overloads control circuit is working correctly.

8. Check the PLC contact closure, relay contact closure or start/stop pushbutton circuit that supplies the start signal to the motor starter.

Drive Faults

Before troubleshooting a drive fault, determine whether the fault is a motor, drive, or application fault. Use the fault codes of the drive. If you are unable to locate the source of the fault, contact MiTek Customer Service.
Drawings are inserted at the back of the manual.

Table E-1: Attached Drawings

<table>
<thead>
<tr>
<th>Description</th>
<th>Drawing Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>STT 110 table with auto-eject assembly</td>
<td>44159-501</td>
</tr>
<tr>
<td>STT 110 table with long throw ejector assembly</td>
<td>44163-501</td>
</tr>
<tr>
<td>Receiver assembly</td>
<td>63635</td>
</tr>
<tr>
<td>Air kit, 4-table, side-eject and auto-eject</td>
<td>63840</td>
</tr>
<tr>
<td>Air kit, end-eject</td>
<td>63845-601</td>
</tr>
<tr>
<td>Powering kit for transfer rollers, 2 roller</td>
<td>66457</td>
</tr>
<tr>
<td>Powering kit for transfer rollers, 3 roller</td>
<td>66468</td>
</tr>
<tr>
<td>Table cylinder assembly, high-slope and long throw</td>
<td>68767-501</td>
</tr>
<tr>
<td>STT 100 table with auto-eject ejector</td>
<td>68932-501</td>
</tr>
<tr>
<td>STT 100 basic weldment</td>
<td>69174-501</td>
</tr>
<tr>
<td>Table cylinder assembly, end-eject</td>
<td>69183-501</td>
</tr>
<tr>
<td>Transfer roller, auto-eject</td>
<td>82862</td>
</tr>
<tr>
<td>Setup valve assembly</td>
<td>84868</td>
</tr>
<tr>
<td>Main pressure source</td>
<td>84869</td>
</tr>
<tr>
<td>Table cylinder assembly, side-eject</td>
<td>84870-501</td>
</tr>
<tr>
<td>Receiver cylinder assembly</td>
<td>84871</td>
</tr>
<tr>
<td>Ball valve assembly</td>
<td>84873</td>
</tr>
<tr>
<td>Table cylinder assembly, auto-eject</td>
<td>84883-501</td>
</tr>
</tbody>
</table>
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<th>Fair</th>
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<th>Excellent</th>
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<td>☐</td>
<td>☠</td>
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### Glossary

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>aisle pad</td>
<td>a type of jigging used when a connector plate needs to be embedded where the table surface gives way to a walk-through aisle</td>
</tr>
<tr>
<td>amperage</td>
<td>the strength of an electric current, expressed in amperes</td>
</tr>
<tr>
<td>anchor plate</td>
<td>a steel plate that holds the tables in place; it is anchored to the concrete floor and the tables are welded to it</td>
</tr>
<tr>
<td>auto-eject</td>
<td>a pneumatic system that raises the truss off the tables and automatically places the truss on the Stand-Alone Conveyors with the use of a transfer roller</td>
</tr>
<tr>
<td>connector plate</td>
<td>the nail-plate that is embedded into the production material to hold it together</td>
</tr>
<tr>
<td>end-eject</td>
<td>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</td>
</tr>
<tr>
<td>gantry head</td>
<td>the entire traveling weldment that houses the Roller to embed the connector plates</td>
</tr>
<tr>
<td>jigging</td>
<td>any of several devices used to hold the truss in place on the tables</td>
</tr>
<tr>
<td>layout</td>
<td>a scaled diagram of the location of components and the space that they occupy</td>
</tr>
<tr>
<td>leveling screws</td>
<td>large cap head screws that thread into the table legs and allow the table height to be adjusted and leveled</td>
</tr>
<tr>
<td>limit switch</td>
<td>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</td>
</tr>
<tr>
<td>lockout/tagout</td>
<td>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</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>--------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>lubricator</td>
<td>a device that allows controlled amounts of lubricants into the pneumatic system</td>
</tr>
<tr>
<td>operator control</td>
<td>the method in which the operator controls the machine; it may be a touch screen, a control panel, etc.</td>
</tr>
<tr>
<td>interface</td>
<td></td>
</tr>
<tr>
<td>pilot valve</td>
<td>a pneumatic valve that operates the setup valve to control the release or cessation of air in each setup; it is located on the bottom-chord end of one table in each setup</td>
</tr>
<tr>
<td>plate</td>
<td>see connector plate</td>
</tr>
<tr>
<td>puck</td>
<td>a type of jigging that is small and round</td>
</tr>
<tr>
<td>qualified person</td>
<td>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</td>
</tr>
<tr>
<td>regulator</td>
<td>a component of the pneumatic system that connects to the main air source and regulates the air pressure allowed into the system</td>
</tr>
<tr>
<td>setup valve</td>
<td>a component of the pneumatic system that control the flow of air to the rest of the setup</td>
</tr>
<tr>
<td>side-eject</td>
<td>a pneumatic system that raises the truss off the tables and allows the truss to be manually pushed or pulled off the side of the table and onto the Stand-Alone Conveyors</td>
</tr>
<tr>
<td>slider pad</td>
<td>a type of jigging used when a connector plate needs to be embedded where the table surface gives way to a slot for the Ejector</td>
</tr>
<tr>
<td>Stand-Alone</td>
<td>the conveyor system that carries the truss from the tables to the Finish Roller and out to the stacker</td>
</tr>
<tr>
<td>Conveyor</td>
<td></td>
</tr>
<tr>
<td>stop</td>
<td>a type of jigging that is long and straight</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>------------------</td>
<td>---------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>torque</td>
<td>a turning or twisting force</td>
</tr>
<tr>
<td>transfer roller</td>
<td>a motorized roller sitting perpendicular to the tables on an auto-eject system; it automatically transfers the truss from the Ejectors to the Stand-Alone Conveyors</td>
</tr>
<tr>
<td>voltage</td>
<td>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</td>
</tr>
</tbody>
</table>
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