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To the Reader

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ABOUT THIS DOCUMENT

SAVE THESE INSTRUCTIONS!

This document contains important safety warnings and operating instructions for your machine. Before operating this machine in any way, you and all other operators must read and understand all instructions. If you don't, there's a risk of voided warranty, property damage, serious injury, or death. Keep these instructions with your machine so that they're readily accessible.

PURPOSE AND SCOPE

This document is intended to provide sufficient information to allow you to install, configure, and use your machine. It assumes that you have appropriate experience and/or access to training.

GETTING HELP

We provide no-cost technical support through multiple channels. The quickest way to get the answers you need is normally in this order:

1. Read this document.
2. Read related documents at tormach.com/support.
3. If you still need answers, gather the following information so that we may help you as quickly as possible:
 - Your phone number, address, and company name (if applicable).
 - Machine model and serial number, which are located next to the Main Disconnect switch.
 - Any accessories that you have for your machine.
 - A clear and concise description of the issue.
 - Any supporting media and information that you can share with us. For example, you could:
 - Analyze what might have changed since the machine last worked correctly.
 - Record a short video.
 - Take a picture of a part.
 - Use a digital multimeter for voltage readings.
4. Once you've gathered the information in Step 3, contact us in the following ways:
 - a. Create a support ticket: Go to tormach.atlassian.net/servicedesk
 - b. Phone: (608) 849-8381 (Monday through Friday, 8 a.m. to 5 p.m. U.S. Central Standard Time)

ADDITIONAL INFORMATION

For additional technical information and support videos, see tormach.com/support.

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This document provides guidance on safety precautions and techniques, but because the specifics of any one workshop or other local conditions can vary greatly, we accept no responsibility for machine performance or any damage or injury caused by its use. It's your responsibility to verify that you fully understand the implications of what you're doing and comply with any legislation and codes of practice applicable to your city, state, or nation.

SAFETY

IN THIS SECTION, YOU'LL LEARN:

- About the standards and safety precautions associated with this machine.

 Before operating the machine in any way, you must read and understand this section.

Safe operation of the machine depends on its proper use and the precautions you take. Only trained personnel — with a clear and thorough understanding of its operation and safety requirements — shall operate this machine.

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1: SAFETY

1.1 SAFETY OVERVIEW

Before operating the machine in any way, you must read and understand this section.


- Read and understand all safety messages used in this document.
- Locate and understand all safety decals on the machine.
- Locate and become familiar with all information decals on the machine.


1.1.1 Safety Messages


The following examples show the standard safety message types used to draw your attention to important information. The standards distinguish between personal injury safety messages and property damage warning messages.

Personal Injury

Personal injury safety messages have safety alert symbols and the following hazard level labels:

 **DANGER!** Indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

 **WARNING!** Indicates a hazard with a medium level of risk which, if not avoided, can result in death or serious injury.

 **CAUTION!** Indicates a hazard with a low level of risk which, if not avoided, can result in minor or moderate injury.

Property Damage

NOTICE! Indicates a hazard which, if not avoided, can cause property damage.

1.2 MACHINE SAFETY



Before operating the machine in any way, you must read and understand this section.

Safe operation of the machine depends on its proper use and the precautions you take. Only trained personnel — with a clear and thorough understanding of its operation and safety requirements — shall operate this machine.

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1.2.1 General Shop Safety

- ✓ Verify that only qualified machinery maintenance professionals install, set up, or perform maintenance on this machine.
- ✓ Keep the work area well-lit. Use additional lighting if needed. The work area should be illuminated to a minimum of 500 lx.
- ✓ Keep the work area temperature- and humidity-controlled.
- ✓ Remove loose-fitting clothing, neckties, gloves, and jewelry.
- ✓ Tie up long hair and secure it under a hat.
- ✓ Wear safety eye protection rated for ANSI Z87+.
- ✓ Wear closed-toed safety shoes.
- ✓ Wear ear protection when you expect the machine or the machining processes to exceed safe exposure limits.
- ✓ Keep the work area clean and free of clutter. Machine motion can occur if controls are accidentally activated.
- ✓ Immediately clean up spills after they occur.
- ✗ Never operate the machine after consuming alcohol or taking medication that could prevent you from safely operating the machine.
- ✗ Never operate the machine while tired or otherwise impaired.
- ✗ Never operate the machine in an explosive (ATEX) atmosphere. Such explosive atmospheres include explosive gases, vapors, mists, powders, and dusts.

1.2.2 Operational Safety

General

- ✓ Understand that the machine is automatically controlled and can start at any time.
- ✓ Become familiar with all physical controls.
- ✓ Always use a chip scraper or brush when clearing away chips, oil, or coolant.

- ✓ Examine all blades, fixtures, workpieces, and guarding for signs of damage. Replace any damaged components as soon as you find them.
Guards may not stop all types of projectiles, like broken blades or loose workpieces.
- ✓ Stop the machine and verify that all machine motion has completely stopped before doing any of the following:
 - ✓ Adjusting a part, fixture, or coolant nozzle.
 - ✓ Changing blades or parts.
 - ✓ Clearing away chips, oil, or coolant.
 - ✓ Reaching into any part of the machine's motion envelope.
 - ✓ Removing protective shields or safeguards.
 - ✓ Taking measurements.
 - ✓ Doing any other action inside the guard.
- ✓ Use flood or MQL (mist) coolant as required by the machining operation.
- ✓ Only use coolants designed for metal working applications such as soluble oils, semi-synthetic, or synthetic coolants.
- ✓ Read the Safety Data Sheet (SDS) for all workpiece materials, coatings, coolants (flood or MQL), lubricants, and other consumables. Chips, dust, and vapors from certain materials can be toxic or otherwise harmful.
- ✓ Dispose of scrap and swarf according to local regulations and guidelines.
- ✓ Thoroughly read all safety precautions and instructions.
- ✗ Never reach around a guard.
- ✗ Never allow the machine to run unattended.
- ✗ Never obstruct the Emergency Stop button or any other controls.
- ✗ Never allow untrained operators to install, operate, or maintain the machine.
- ✗ Never modify, defeat, or bypass safety devices or interlocks.
- ✗ Never machine abrasive, carcinogenic, explosive, flammable, radioactive, or toxic materials. Such materials include, but are not limited to:
 - ✗ Beryllium and its alloys
 - ✗ Ceramic
 - ✗ Fiberglass
 - ✗ G10 fiberglass laminate

- ✗ Graphite
- ✗ Lead and its alloys
- ✗ Magnesium and its alloys
- ✗ Never allow swarf to accumulate on or within the machine.
- ✗ Never use flammable liquids (like alcohol, diesel fuel, or kerosene) in the machine's coolant system.
- ✗ Never use water, coolants without rust inhibitors, or straight cutting oil in the machine's coolant system.

Blades

- ✓ Examine blades for signs of damage or missing teeth. Replace any damaged blades, or blades with missing teeth, as soon as you find them.
- ✓ Wear gloves and safety eye protection when replacing blades.
- ✓ Verify that the teeth on the blade point toward the workpiece.
- ✗ Never use worn or damaged blades, or blades with missing teeth. Blades can break and become dangerous projectiles.

Workholding

- ✓ Secure workpieces with appropriate workholding devices.
- ✓ Verify that the workpiece is adequately secured.
- ✓ Remove cutoff workpieces and other large chips before starting the machine.
- ✗ Never leave tools, stock, or other loose items inside the machine.
- ✗ Never use your hands to hold the workpiece during machining operations.

1.2.3 Electrical Safety



WARNING! Electrical Shock Hazard: You must power off the machine before making any electrical connections. If you don't, there's a risk of electrocution or shock.

- ✓ Power off the machine before servicing.
- ✓ Understand that certain electrical components can retain dangerous electrical voltages, even after the machine is powered off and all power is removed from the system.

1: SAFETY

- ✔ Understand that certain installation, maintenance, and troubleshooting procedures — for the machine and certain accessories — require access to or modification of wiring inside of the electrical cabinet. Only qualified electrical machinery technicians shall perform these procedures.
- ✔ Confirm that the mains voltage conforms to requirements before connecting the machine.
For more information, see "Electrical and Power Requirements" (page 16).
- ✔ Confirm that the machine installation meets all codes and regulations of your locality.
- ✔ Confirm that electrical connections are performed by a certified electrician.
- ✔ Lock the electrical cabinet door and remove the keys when the machine is not being serviced to prevent unqualified or unauthorized personnel from accessing the electrical cabinet.
- ✘ Never operate the machine with the electrical cabinet door open.
- ✘ Never reach into the electrical cabinet with the machine powered on.
- ✘ Never modify the machine's electronics.
- ✘ Never drill into the electrical cabinet.

ABOUT YOUR MACHINE

IN THIS SECTION, YOU'LL LEARN:

- About this machine's specifications.

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2: ABOUT YOUR MACHINE

2.1 SPECIFICATIONS REFERENCE

Programmable Automatic Workpiece Positioning	
Per Stroke	Up to 10 in. (254 mm)
Maximum Strokes	5
Lengths	0.157 in. to 50 in. (4 mm to 1270 mm)
Maximum Parts per Program	999
Remnant Length	10 in. (254 mm)
Maximum Capacity	
Rectangular Stock	6 in. tall × 8 in. wide (152 mm tall × 203 mm wide)
Round Stock	7 in. (178 mm) diameter
Material Weight	250 lbs (113 kg), subject to air supply pressure
Motor Power	
1 hp (0.75 kW)	
Blade Speeds	
60 Hz	135, 161, 226, 394 ft/min (41, 49, 69, 120 m/min)
50 Hz	112, 135, 194, 322 ft/min (34, 41, 59, 98 m/min)
Blade Size	
Length	93 in. (2362 mm)
Width	0.75 in. (19 mm)
Thickness	0.035 in. (0.9 mm)
Coolant Capacity	
2.3 gal (8.7 L)	
Dimensions	
Floor-To-Table Height	22 in. (559 mm)
Typical System Weight	450 lb (205 kg)
Power and Air Requirements	
Primary Power	115 Vac, 50/60 Hz, single-phase
Required Circuit Amperage	15 A
Compressed Air Source	90 psi to 120 psi (620 kPa to 827 kPa)
Space Requirements	
Minimum Depth	36 in. (0.91 m) plus the length of stock


Minimum Height	67 in. (1.71 m)
Minimum Width	60 in. (1.53 m)



SITE REQUIREMENTS

IN THIS SECTION, YOU'LL LEARN:

- About the site requirements of this machine (including electrical and power requirements).

 Before operating the machine in any way, you must read and understand this section.

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3: SITE REQUIREMENTS


3.1 GENERAL SITE AND SPACE REQUIREMENTS

When choosing a location for your machine, you must verify that it meets all requirements outlined in this section.

3.1.1 Site Requirements

You must verify that the area:

- Allows for unrestricted access to machine controls.
- Conforms to the following:
 - **Primary Power Required** Single-Phase 115 Vac, 50/60 Hz
 - **Recommended Circuit Amperage** Dedicated 15 A breaker

 **Note:** For more information, see "Electrical and Power Requirements" (below).

- Has clean, dry, compressed air.
- Is a dry, properly ventilated, and well-lit internal space.
- Provides for unobstructed machine motion and operation.

3.1.2 Space Requirements

The area must meet the following space requirements. Allow more space to access the rear of the machine for maintenance and repairs.

- **Machine Size** 69" × 56" (1.8 m × 1.4 m)
- **Machine Height** 65 inches

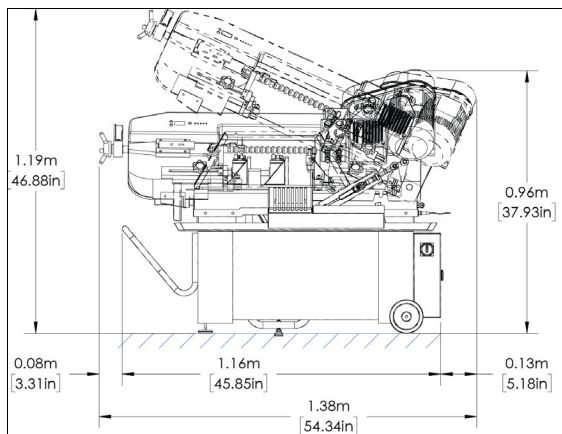


Figure 3-1: Dimensions of the machine itself, as viewed from the front.

- **Typical System Footprint** 89" × 67" (2.3 m × 1.7 m)

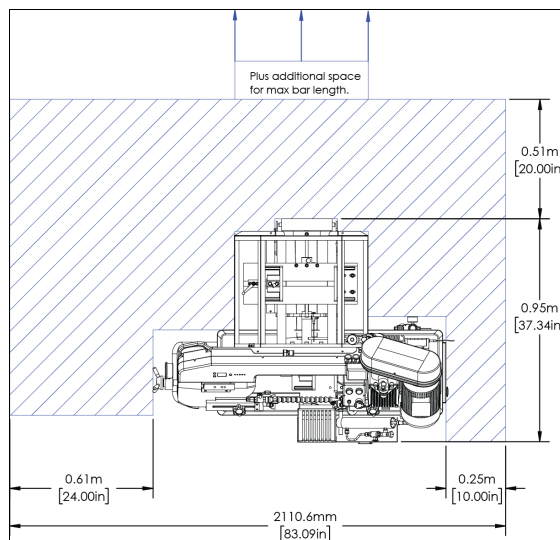


Figure 3-2: Dimensions of the machine and its required added space, as viewed from above.

3.2 ELECTRICAL AND POWER REQUIREMENTS

You must verify that the site conforms to the following electrical and power requirements.

3.2.1 Electrical Requirements

A certified electrician must make all electrical connections, and it's your responsibility to verify that the electrical installation of the machine meets all local regulations and electrical codes.

- **Primary Power Required** Single-Phase 115 Vac, 50/60 Hz
- **Recommended Circuit Amperage** Dedicated 15 A breaker

3.2.2 Power Requirements

If the site conforms to the electrical requirements, verify that it meets the following power requirements:

- **Proper Grounding** You must properly ground the power input to the machine. Examine the continuity between bare metal on the machine frame and true earth ground (a water pipe or similar) to verify that it's properly grounded.
- **Correct Plug Pattern** The machine is shipped with a NEMA 5-15P plug, designed for use with a NEMA 5-15R receptacle.

3.3 AIR REQUIREMENTS


- **Air Pressure** Between 90 psi and 120 psi (620 kPa to 825 kPa).
If the air supply is more than 120 psi (825 kPa), you must use a regulator.
- **Dry Air** We recommend using a compressed air dryer, desiccator, or filter between the air compressor and the machine.
- **Lubricated Air** You must lubricate the air with air tool oil.



INSTALLATION

IN THIS SECTION, YOU'LL LEARN:

- About the installation process required for this machine.

 Before operating the machine in any way, you must read and understand this section.

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4: INSTALLATION

4.1 BEFORE YOU BEGIN

1. Inspect the item(s):
 - Photograph any damage that may have occurred during shipping.
 - Note any damage on the delivery receipt before signing for the shipment.
 - Verify the received goods against the packing list.If there is any damage or shortages, you must contact Tormach within 30 days of receipt. Create a support ticket with Tormach Technical Support at tormach.atlassian.net/servicedesk for guidance on how to proceed.
2. Before uncrating your machine, collect the following tools and items:
 - Metric hex wrench set
 - Pallet jack
 - Pry bar
 - Safety eyewear that meets ANSI Z87+
 - Snips
 - Work gloves

4.2 MOVE THE CRATE

⚠ WARNING! Transportation and Lift Hazard: Before moving the machine, you must confirm that all persons are clear of the area below the machine. Qualified professionals must transport, lift, and move the machine. Moving parts can entangle, pinch, or cut you, causing death or serious injury.

- Verify that the ground surface is smooth and clean of debris, and then use a pallet jack to move the pallet(s) to the desired installation location.



Note: If the ground is not smooth, you may need to use a forklift (or similar lifting equipment rated for uneven surfaces) to move the pallet(s).

4.3 UNPACK THE CRATE

⚠ CAUTION! Sharp Objects Hazard: Before opening the shipping crate, you must put on work gloves and safety eyewear that meets ANSI Z87+. If you don't, the shipping crate and steel straps could cut you, causing serious injury.

1. Put on work gloves and eye protection.
2. Open and disassemble the machine's shipping crate with snips and a pry bar. Start with the top and follow by the four sides, then remove the plastic machine wrap and discard. When finished, the contents will look similar to the following image.



Figure 4-1: Bandsaw after opening the shipping crate.

3. Inspect the item(s):
 - Photograph any damage that may have occurred during shipping.
 - Verify the received goods against the packing list.If there is any damage or shortages, you must contact Tormach within 30 days of receipt. Create a support ticket with Tormach Technical Support at tormach.atlassian.net/servicedesk for guidance on how to proceed.
4. Cut all shipping straps securing the machine to the pallet with snips.

⚠ CAUTION! Team Lift Required: You must have the aid of more than one person to lift and move the object. The object is heavy, and lifting it by yourself can cause serious injury.

- Before you lift the machine, verify that you have assistance to help you move it off of the pallet. We recommend three to four people.

NOTICE! While lifting the machine, don't use the infeed table as a lifting point. If you do, there's a risk of machine damage.

- Lift the machine off of the pallet, and then carefully and slowly set it on the floor.
- Move the machine to the desired installation location with its handle and wheels.

4.4 SET UP THE MACHINE

Before you begin machining operations, you must setup and align the machine. Complete the following steps in the order listed:

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4.4.1 Level the Machine

Before operating the machine, you must verify that it's approximately level. While this helps with things like coolant flow, it doesn't impact machine performance.

To level the machine:

- Make note of any high or low spots, and, if required, adjust the leveling feet.

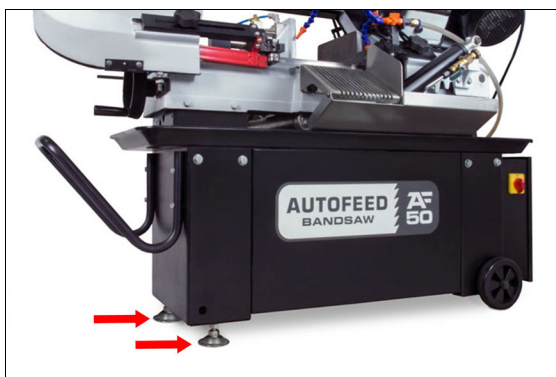


Figure 4-2: Leveling feet on the machine.

4.4.2 Install the Coolant Tank

- Find the coolant tank inside the machine's stand.

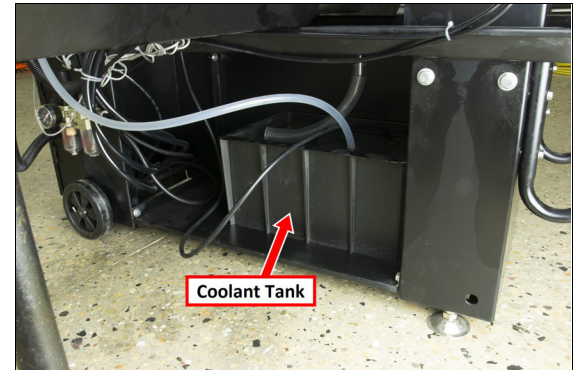


Figure 4-3: Coolant tank inside the machine's stand.

- Remove all parts from inside the coolant tank:
 - Coolant screen
 - Coolant tube
 - Roller
- Set aside the roller for later installation.
- Put the coolant screen on the machine's base below the saw, as shown in the following image.

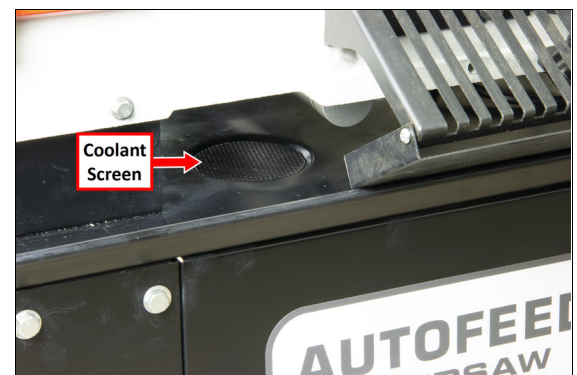


Figure 4-4: Coolant screen put on the machine's base.

4: INSTALLATION

5. Connect the coolant tube to the port below the machine's base, and then put it on top of the tray on the coolant tank, as shown in the following image.

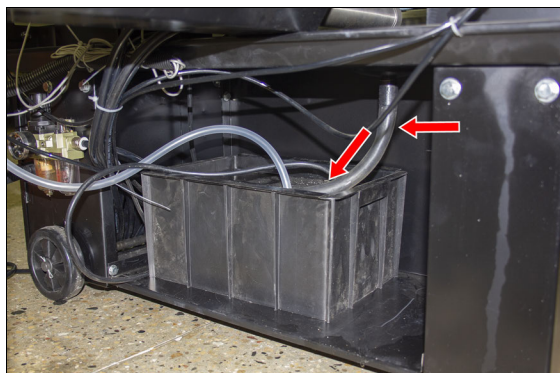


Figure 4-5: Coolant tube connected to the machine's base and the coolant tank.

4.4.3 Install the Blade Tensioner Handles

- Install and hand-tighten the three blade tensioner handles.

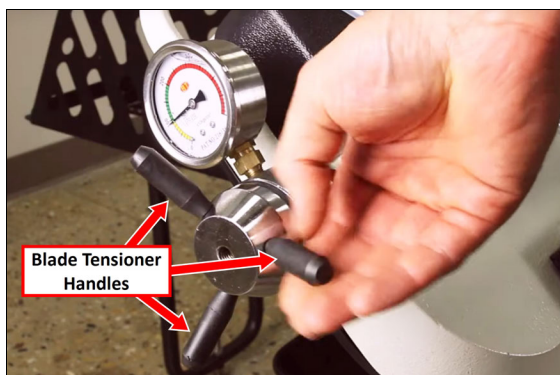


Figure 4-6: Installing the blade tensioner handles.

4.4.4 Remove the Shipping Bolts on the Rear Cage

- The rear cage is secured to the frame for shipment. Remove the two bolts.

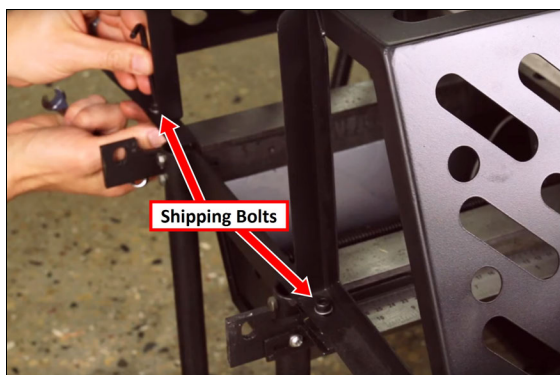


Figure 4-7: Removing the shipping bolts from the rear cage and the frame.

4.4.5 Install the Rear Roller

1. Install the two spacers on either end of the roller posts.

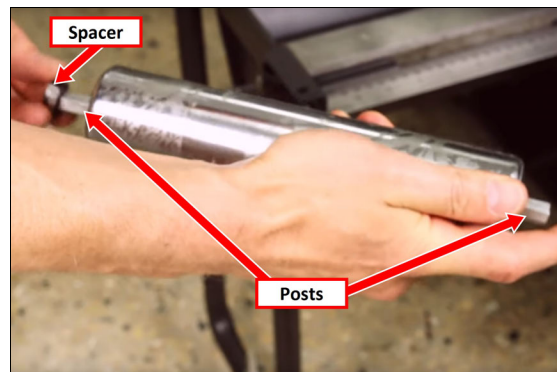


Figure 4-8: Installing the spacer on one end of the roller's post.

2. Put one roller post into the frame, and then squeeze in the spring-loaded post and slide it into the opposite end of the frame.



Figure 4-9: Squeezing the spring-loaded post.

4.4.6 Verify Motor Belt Tension

To properly validate the installation of your machine, you must verify that the motor belt is properly tensioned.

To verify the motor belt tension:

1. Verify that the air supply and the machine's main power cable aren't yet connected to the machine.
2. Open the pulley cover.
3. Firmly push the belt between the pulleys. If it's properly tensioned, the belt should move approximately 1/2 in. If it's not properly tensioned, complete the steps in "Change the Speed" (page 31).
4. Close the pulley cover.

4.4.7 Make Air Connections

- Connect the air line from your site to the input port on the FRL Filter-Regulator-Lubricator (on the back of the machine).

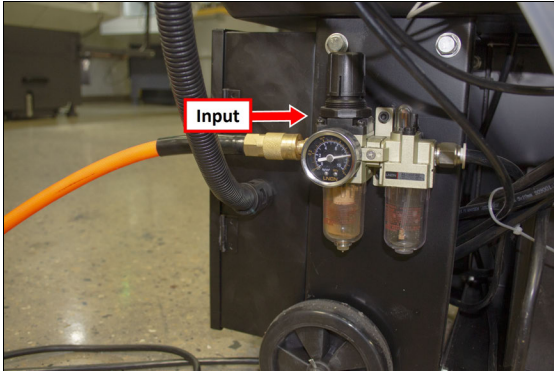


Figure 4-10: Input port on the FRL Filter-Regulator-Lubricator.

Air Requirements

- **Air Pressure** Between 90 psi and 120 psi (620 kPa to 825 kPa).
If the air supply is more than 120 psi (825 kPa), you must use a regulator.
- **Dry Air** We recommend using a compressed air dryer, desiccator, or filter between the air compressor and the machine.
- **Lubricated Air** You must lubricate the air with air tool oil.

4.4.8 Verify the Alignment of the Fixed Jaw

1. Open the jaws so that there's enough space to put a square in between them.
2. Put a square on the base casting between the jaws.
3. Push the square until it's flush with the side of the blade.



Note: The square must be flush with the side of the blade, not the blade's teeth.

4. Confirm that the bottom of the square is flush with the side of the blade, as shown in the following image. If it's not, go to "Align the Fixed Jaw" (page 47).

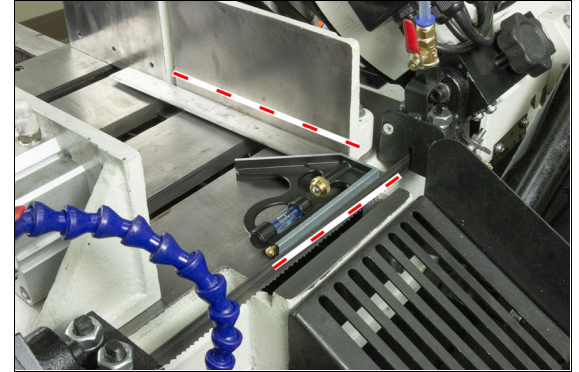


Figure 4-11: Fixed jaw aligned with the blade.

4.4.9 Verify the Alignment of the Infeed Table

1. Move the infeed table so that it meets the base casting.
2. Put a square on the base casting as shown in the following image.

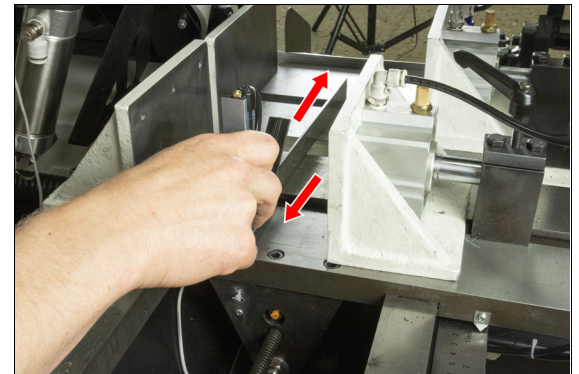


Figure 4-12: Square on the base casting.

3. Keeping the square flat on the base casting, move it back over the infeed table. Make note of any height inconsistencies. If there are height inconsistencies, go to "Adjust the Height of the Infeed Table" (page 46).

4: INSTALLATION

- 4. Put a square along the fixed jaws, as shown in the following image. Verify that the square is flush against both jaws. If it's not, go to "Adjust the Fixed Clamp Jaw" (page 47).

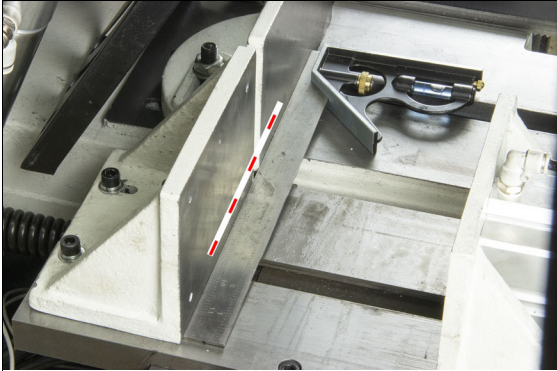


Figure 4-13: Square on the fixed jaws.

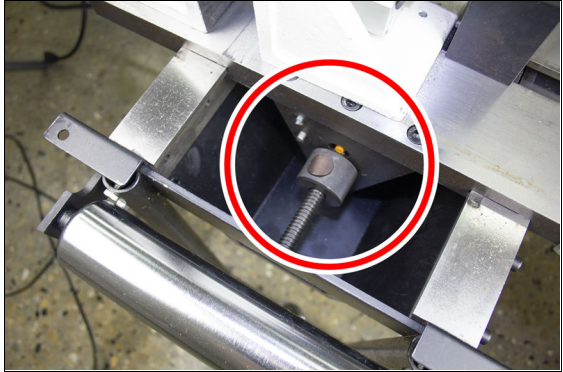


Figure 4-15: Proximity sensor.

- 3. Verify that all proximity sensor wires are neat and secure, and that none are pinched or have kinks.
- 4. You've successfully verified the proximity sensor installation. Now, you must verify the machine's electronics. Go to "Power On the Machine" (below).

4.5 VERIFY THE INSTALLATION

After setting up the machine you must verify the installation. Complete the following steps in the order listed:

- 4.5.1 Verify the Proximity Sensor Installation 24
- 4.5.2 Power On the Machine 24
- 4.5.3 Power Off the Machine 24

4.5.1 Verify the Proximity Sensor Installation

To properly validate the installation of your machine, you must verify that the proximity sensors are correctly installed, and that their wiring is free of knots or obstruction.

To verify the proximity sensor installation:

- 1. Find the four proximity sensors on the machine as shown in the following image.

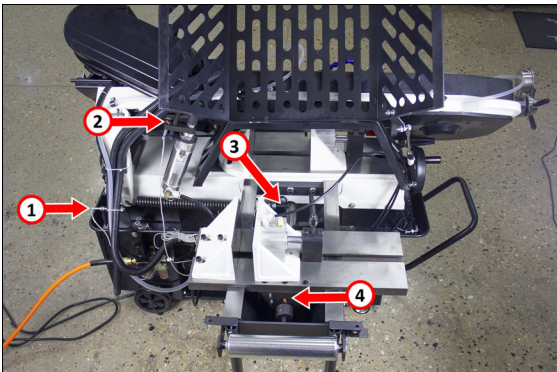


Figure 4-14: Proximity sensors on the bandsaw.

- 2. Inspect each proximity sensor to verify that there's a 0.55 mm to 0.75 mm gap.

4.5.2 Power On the Machine

To properly validate the installation of your machine, you must understand how to power on and off the machine and use the controls.

To power on the machine:

- 1. Connect the machine's mains power cable to the verified electrical service.
- 2. Find the Main Disconnect switch, and then turn it to **ON**. Mains power is now connected to the machine.
- 3. Rotate the Emergency Stop button on the operator panel one-quarter turn clockwise to release it.
- 4. Verify that the lights on the control panel come on.
- 5. You've successfully verified that you can power on your machine. Now, you must verify that you can power off the machine. Go to "Power Off the Machine" (below).

4.5.3 Power Off the Machine


- 1. Push the Emergency Stop button on the operator panel to lock it into the disabled position.
- 2. Turn the Main Disconnect switch to **OFF**. Mains power is disconnected from the machine. You're done verifying that you can power off the machine.

You've successfully verified the installation of your machine.

SYSTEM BASICS

IN THIS SECTION, YOU'LL LEARN:

- About the main components of the machine and how it moves.

 Before operating the machine in any way, you must read and understand this section.

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5: SYSTEM BASICS

5.1 CONTROLS OVERVIEW

To safely and effectively operate your machine, you must become familiar with its basic controls.

5.1.1 Machine Controls

The following controls energize the machine's control electronics:

- **Main Disconnect Switch** On the front of the electrical cabinet.
- **Cycle Start Button** On the operator panel.



Figure 5-1: Operator panel.

- **Coolant Switch** On the operator panel.
- **Pause Button** On the operator panel.
- **Emergency Stop Button** On the operator panel.

5.1.2 Program Controls

The control panel has the following controls, used to switch between automatic and manual mode, and to set the parameters for machine operations:

- **Up and Down Arrow Buttons** On the control panel. For information, see "Set the Number of Cuts" (page 32).
- **Stroke Button** On the control panel. For information, see "Set the Number of Cycles" (page 32).



Figure 5-2: Control panel.

BASIC OPERATIONS

IN THIS SECTION, YOU'LL LEARN:

- About the basic operations required for most projects, organized as a suggested project workflow.

CONTENTS

6.1 Choose a Blade.....	28
6.2 Change a Blade.....	28
6.3 Change the Speed.....	31
6.4 Change the Feed Rate.....	31
6.5 Change the Clamping Pressure.....	32
6.6 Set the Number of Cuts.....	32
6.7 Set the Number of Cycles.....	32

6: BASIC OPERATIONS

6.1 CHOOSE A BLADE

Using the correct blade for the material is important to reduce cost and to operate the bandsaw efficiently. Because there's a wide variety of bandsaw blade types, you must first know the specifications of the material you want to cut.

Choosing a blade depends on a number of different factors. Use this section as a reference; for more information, see your blade manufacturer's reference materials.

 **Note:** AF50 Autofeed Bandsaw blades are 93 in. x 3/4 in. x 0.35 in.

To choose a blade, determine the following:

- Teeth Per Inch (TPI)** Based on the size and shape of the material, select the TPI. A high TPI cuts slower and smoother, while a low TPI cuts faster and rougher. While cutting, you must always have three teeth engaged with the part.


Material Thickness Range	TPI Range
1/8 in. (6 mm) to 1/4 in.	10 to 14
1/4 in. to 1/2 in. (12 mm)	8 to 12
1/2 in. (12 mm) to 1 in.	6 to 10
1 in. to 2 in.	5 to 8
2 in. to 4 in.	3 to 4
4 in. to 7 in.	2 to 3
7 in. to 12 in.	1-2/5 to 2-1/2

- Tooth Form** Select the tooth form (the shape of the cutting edge). The tooth form affects how the blade cuts through the material.
- Tooth Set** Based on the required chip clearance, select the tooth set (the angle at which the tooth is offset from the blade). The particular tooth set is what carries the chip away from the cut, and is important for surface finish.

6.2 CHANGE A BLADE

The bandsaw arrives with a blade installed. To change the blade, complete the following steps in the order listed:

6.2.1 Install a New Blade	28
6.2.2 Verify the Blade Installation	30
6.2.3 Break in the Blade	30

 **Note:** For simplicity, you must verify the blade installation before you set the saw head down.

6.2.1 Install a New Blade

- Put on work gloves, eye protection, and any other appropriate personal protective equipment. We recommend a long-sleeved shirt and long pants.
- Power off the bandsaw and disconnect it from the main air supply.
 - Push the Emergency Stop button on the operator panel to lock it into the disabled position.
 - Turn the Main Disconnect switch to **OFF**. Mains power is disconnected from the machine.
 - Disconnect the air line from your site from the input port on the FRL Filter-Regulator-Lubricator.
- On the back of the machine, identify the air cylinder, as shown in the following image.

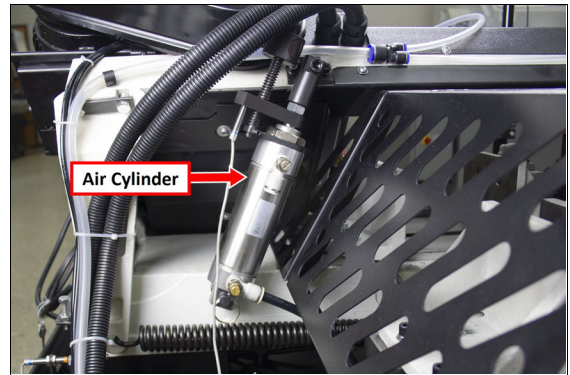


Figure 6-1: Air cylinder on the back of the machine.

- Turn the air line valve, which allows you to access the air cylinder's quick-release pin, as shown in the following image.

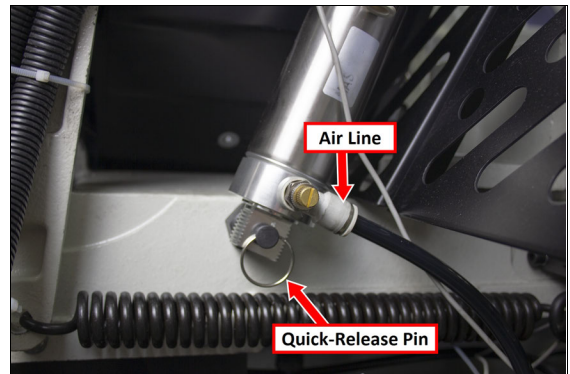


Figure 6-2: Quick-release pin on the air cylinder.

5. Pull the quick-release pin out of the air cylinder, and set it aside.
The air cylinder hangs from the saw head.
6. Remove the bolt securing the air cylinder to the bandsaw with an 8 mm hex wrench.

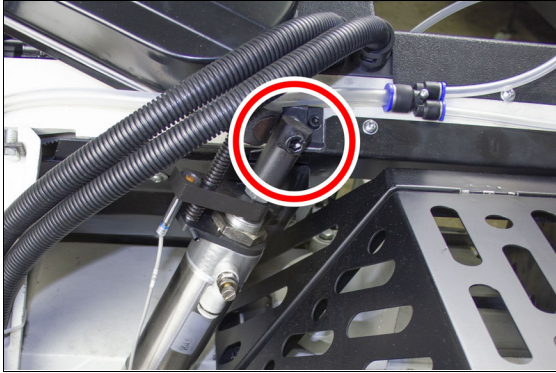


Figure 6-3: Bolt on the air cylinder.

7. Set aside the bolt and the air cylinder.
8. Lift the saw head to the upright position, as shown in the following image.

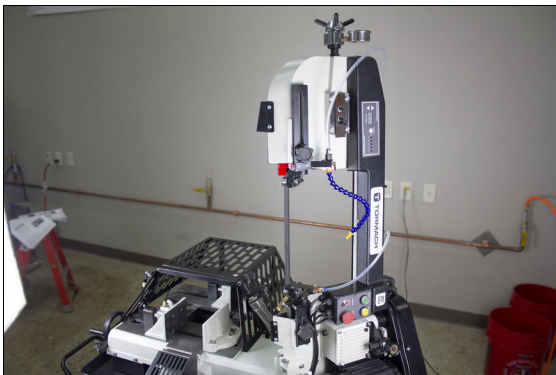


Figure 6-4: Bandsaw head lifted upright.

9. Loosen the two screws on the bottom of the blade cover with a Phillips screwdriver, and then slide the blade cover up until it clears the base casting.

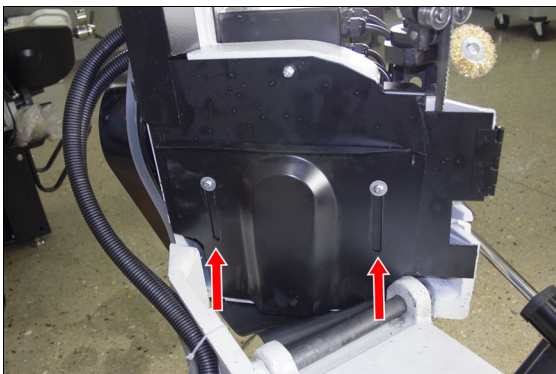


Figure 6-5: Two screws on the blade cover.

10. Remove the two screws from the side of the blade cover, and then set aside the screws.



Figure 6-6: Removing the screws securing the blade cover to the bandsaw.

11. Open the blade cover, as shown in the following image.

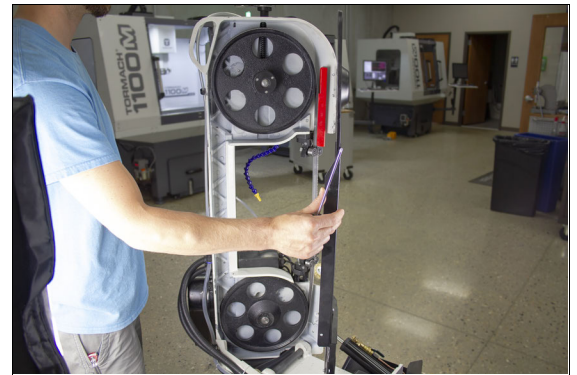


Figure 6-7: Blade cover opened.

12. Identify the tensioner on the top of the saw head.

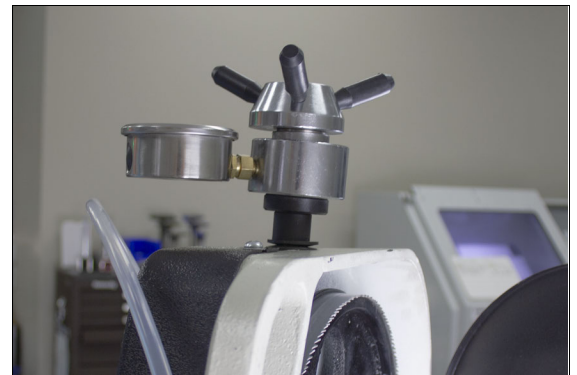


Figure 6-8: Tensioner on top of the saw head.

6: BASIC OPERATIONS

- Loosen the tensioner to remove the tension on the blade.

CAUTION! Cut Hazard: Bandsaw blades can cut you, causing serious injury. Before handling any bandsaw blades, you must put on work gloves, eye protection, and any other appropriate personal protective equipment (like a long-sleeved shirt and long pants).

- Carefully remove the blade from the wheels.
- Put the new blade into the blade guides so that its teeth are pointing away from the blade guide's rollers, and so that its tooth direction is pointing toward the motor (from the blade guides).
- Use one hand to hold the blade in between the blade guides, and use the other hand to put the blade around the wheels.
- Keep one hand on the blade to hold it in between the blade guides, and use the other hand to tighten the tensioner. Continue tightening until the needle on the blade tensioning gauge is aligned with the tip of the arrow, as shown in the following image.

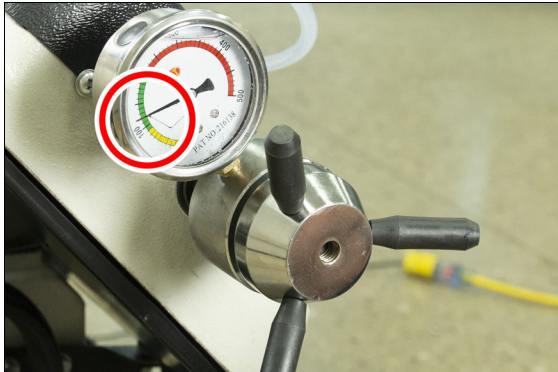


Figure 6-9: Tensioner dial aligned with the tip of the arrow.

- Close the blade cover, and then secure it using the two screws you set aside in Step 10.
- Move the bottom of the blade cover down, and tighten its two screws.
Before you put the saw head down, you must verify that the blade is seated.

6.2.2 Verify the Blade Installation

- Power on the bandsaw.
 - Rotate the Emergency Stop button on the operator panel one-quarter turn clockwise to release it.
 - Turn the Main Disconnect switch to **ON**. Mains power is connected to the machine.
- Set the bandsaw to manual mode: from the control panel, push the Down Arrow and Up Arrow buttons at the same time. The control board displays ---.

WARNING! Crush Hazard: Moving parts can entangle, pinch, or cut you, causing death or serious injury. While operating the machine in vertical position, you must keep your hands away from the blade.

- From the operator panel, push the Cycle Start button. The blade moves through the blade guides and around the blade wheels.
- Let the blade move for three seconds. Then, on the operator panel, press the Emergency Stop button.
- Examine the position of the blade on the wheels, and do one of the following:
 - Blade Correctly Positioned on the Wheels** Go to Step 6.
 - Blade Moved off the Wheels** Power off the machine and disconnect it from the power supply. Then, adjust the blade until it's correctly positioned on the wheels, and repeat Steps 1 through 5.
- Carefully set the saw head down.
- Find the air cylinder and its bolt that you set aside earlier. Then, attach the air cylinder back on the bandsaw.
- Find the quick-release pin that you set aside earlier. Then, put it through the air cylinder and into the base casting.

6.2.3 Break in the Blade

All new bandsaw blades are manufactured with extremely sharp teeth, which need to be worn down slightly so that they don't fracture under the high cutting pressure used in bandsawing. Your blade will cut more consistently and last

much longer if you hone the teeth to create a small radius on the tip.

To break in a new blade:

- Use the band speed recommended for the material you are cutting.
- **For Easy-To-Cut Materials (like carbon steel and aluminum)** Reduce the feed rate to half the normal rate for 50-100 square inches.
- **For Hard-To-Cut Materials (like nickel-based alloys, hardened steels, tool steels and stainless steels)** Reduce the feed rate to 3/4 the normal rate for 25-75 square inches.
- Gradually increase to the normal cutting rate over the next few cuts, adjusting speed slightly if necessary to avoid vibration.

6.3 CHANGE THE SPEED



Note: For information on selecting a blade cutting speed, see a machinist's handbook.

To change the blade cutting speed:

1. Power off the bandsaw and disconnect it from the main air supply.
 - a. Push the Emergency Stop button on the operator panel to lock it into the disabled position.
 - b. Turn the Main Disconnect switch to **OFF**. Mains power is disconnected from the machine.
 - c. Disconnect the air line from your site from the input port on the FRL Filter-Regulator-Lubricator.
2. Open the pulley cover.
3. Loosen the clamping bolt under the motor.
4. Turn the belt tensioning bolt counterclockwise to loosen the tension on the belt. Continue to turn the bolt until you can remove the belt from the pulleys.
5. Move the belt from one position on the pulleys to another.

The following speed ranges are available:

- 60 Hz: 135, 161, 226, 394 ft/min (41, 49, 69, 120 m/min)

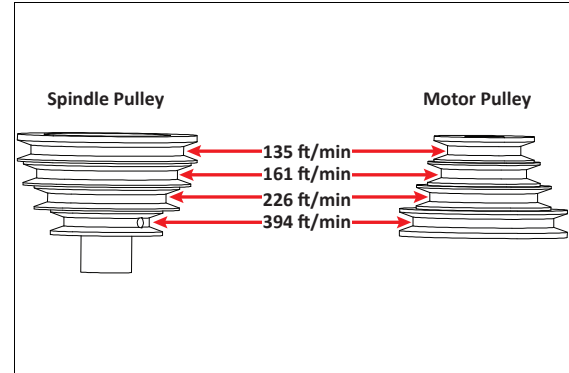


Figure 6-10: Pulley speed configurations.

- 50 Hz: 112, 135, 194, 322 ft/min (34, 41, 59, 98 m/min)
6. Turn the belt tensioning bolt clockwise to increase the tension on the belt.
 7. Firmly push the belt between the pulleys. If it's properly tensioned, the belt should move approximately 1/2 in. If it's not properly tensioned, repeat Steps 6 through 7.
 8. Tighten the clamping bolt.
 9. Close the pulley cover.

6.4 CHANGE THE FEED RATE

Determine the feed rate by observing how the bandsaw is operating and the chip formations that it's cuts are producing.

NOTICE! If the feed rate is too high, it could cause stalling or the blade to break. If the feed rate is too low, it could dull the blade too quickly.

To change the feed rate:

1. Open the hydraulic flow on the blade feed lever: turn the lever up, so that it's perpendicular to the cylinder.

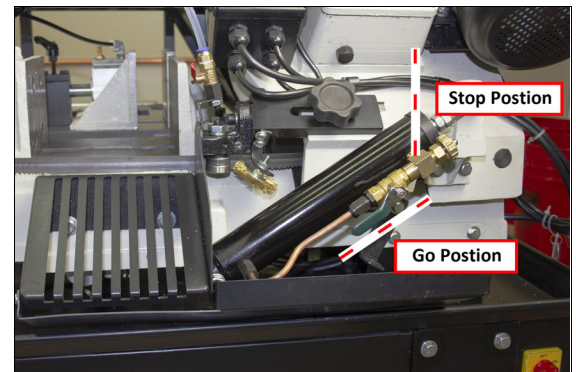



Figure 6-11: Blade feed lever.

6: BASIC OPERATIONS

- Adjust the feed rate:
 - To Increase the Feed Rate** Turn the dial on the blade feed lever counterclockwise.
 - To Decrease the Feed Rate** Turn the dial on the blade feed lever clockwise.
- Close the hydraulic flow: turn the lever on the blade feed lever down, so that it's parallel to the cylinder.

6.5 CHANGE THE CLAMPING PRESSURE

 **Note:** Choosing the clamping pressure — or the amount of force that the jaws exert onto the part — depends on the type of material you're cutting. For more information, see a machinist's handbook.

To change the clamping pressure:

- Adjust the pneumatic regulator on the gearbox to increase or decrease the clamping pressure.




Figure 6-12: Pneumatic regulator.

6.6 SET THE NUMBER OF CUTS


Use the Up Arrow and Down Arrow buttons on the control panel to indicate the number of cuts.

To set the number of cuts:

- **Automatic Mode** Select a number from 1 to 999.
- **Manual Mode** Do one of the following:
 - Push the Down Arrow and Up Arrow buttons at the same time. The control board displays ---.
 - Push the Down Arrow button until the control board displays ---.

 **Note:** A display of --- on the control panel indicates that the machine is in manual mode.

6.7 SET THE NUMBER OF CYCLES

 **Note:** You'll only set the number of cycles in automatic mode. The Stroke button isn't used in manual mode.

If the required length is longer than a full stroke can move, use the stroke multiplier.

To set the number of cycles:

- Use the Stroke button to indicate the number of cycles: select a number from 1 to 5.

AUTOMATIC OPERATION

IN THIS SECTION, YOU'LL LEARN:

- How to operate the machine in automatic mode.

CONTENTS

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7: AUTOMATIC OPERATION

7.1 USE AUTOMATIC MODE

To use the bandsaw in automatic mode:

1. Confirm that the blade is appropriate for the material.
If the blade is not appropriate for the material, you must first change it. Go to "Change a Blade" (page 28).
2. Open the clamps on both vises with the handwheel and the clamp handle. Then, load the material between the vises.

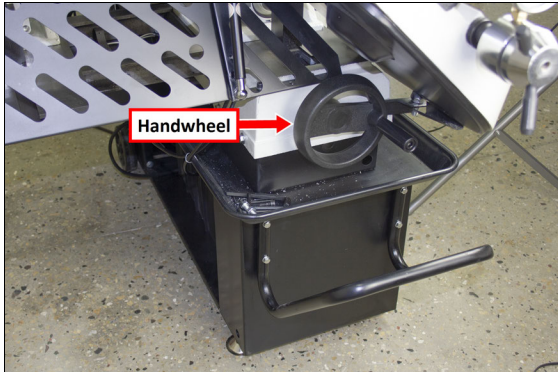


Figure 7-1: Handwheel.

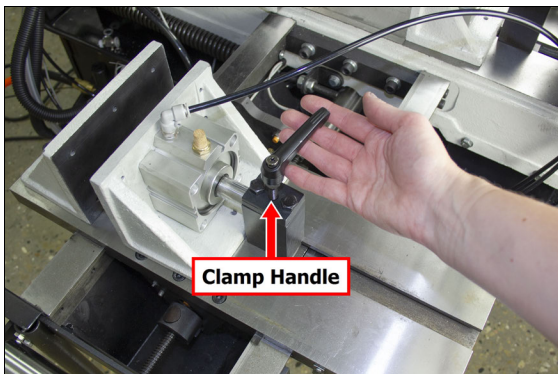


Figure 7-2: Clamp handle.

3. Push the material up to the back of the blade.
4. On the infeed table, identify the horizontal quick-adjustment nut. Press the button on the quick-adjustment nut to loosen it. Then, move it away from the blade and past the desired length of cut.

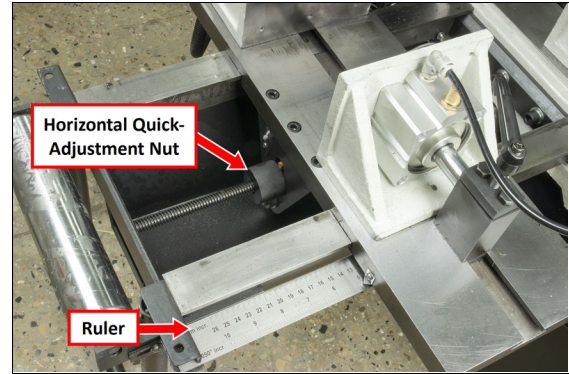


Figure 7-3: Horizontal quick-adjustment nut.

The horizontal quick-adjustment nut controls the length to which the infeed table moves.



Note: Use the ruler to determine how far to move the components to achieve the desired cut.

5. Adjust the infeed table until the back edge of the table is just past the desired length of cut on the ruler.
6. Rotate the horizontal quick-adjustment nut to make fine adjustments to the infeed table until the back edge of the table is aligned with the desired length of cut on the ruler.
If the length needed is longer than a full stroke can move, use the stroke multiplier on the control panel to achieve the required length. For more information, go to "Set the Number of Cycles" (page 32).
7. Use the handwheel to close the fixed vise clamp until it is approximately 1/8 in. from the material.
8. Remove any backlash: pull the fixed vise by hand toward the handwheel. Then, verify that there's still approximately 1/8 in. gap between the vise and the material.
9. Loosen the clamp handle to close the feeding vise clamp until it is approximately 1/8 in. from the material.
10. Tighten the clamp handle to lock it in place.
11. Remove any backlash: pull the feeding vise by hand toward the clamp handle. Then, verify that there's still approximately 1/8 in. gap between the vise and the material.
12. Adjust the clamping pressure to the desired amount using the regulator (mounted by the gearbox).

13. On the front of the machine, locate the blade support guide. Move the blade support guide until it is as close to the material as possible, but so that it's not past the outfeed guide.

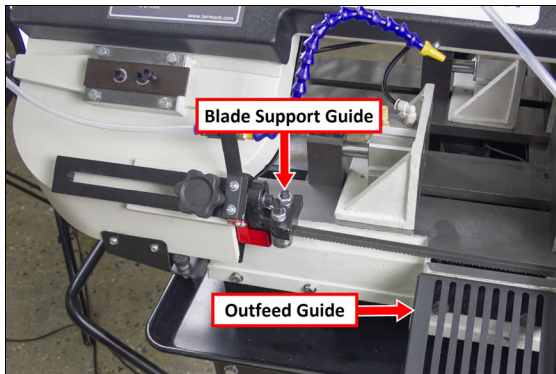


Figure 7-4: Blade support guide on the front of the machine.

14. Position the coolant nozzle so that it points at the blade ahead of the material.
15. On the front of the machine, identify the blade feed lever, and then move it up.

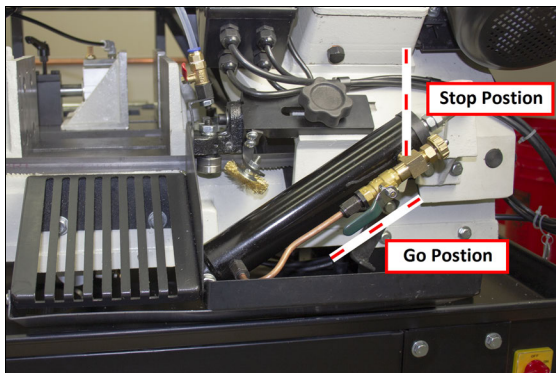


Figure 7-5: Blade feed lever.

The blade feed lever is now in the **Stop** position. While in the **Stop** position, the saw head doesn't move down.

16. On the back of the machine, identify the vertical quick-adjustment nut. Press the button on the quick-adjustment nut to loosen it. Then, move it to the top of the threaded rod.
17. Lift the saw until the blade is about two inches above the material.
18. Press the button on the quick-adjustment nut to loosen it. Then, lower it until it meets the lift height sensor as shown in the following image.

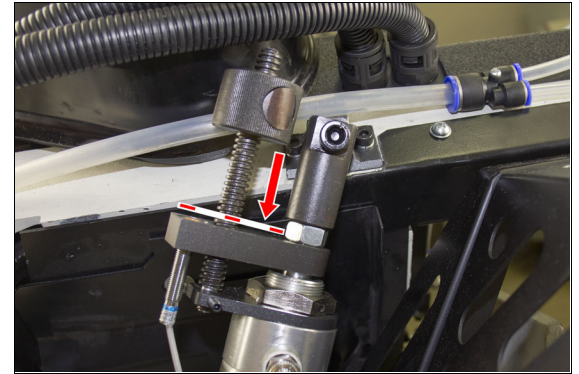


Figure 7-6: Vertical quick-adjustment nut.

The vertical quick-adjustment nut controls the level to which the saw head lifts after completing one cut and before beginning another cut.

19. On the operator panel, twist out the Emergency Stop button, which powers on the control board.
20. On the control panel, do the following:
 - Use the Down Arrow and Up Arrow buttons to indicate the number of cuts desired.
 - Use the Stroke button to indicate the number of strokes desired.
21. On the operator panel, push the green Cycle Start (⏻) button twice, which activates the blade.
22. Verify that the blade feed lever is down (in the **Go** position).
23. On the front of the machine, above the blade feed lever, locate the feed adjustment knob. Use the feed adjustment knob to set the cutting rate.



MANUAL OPERATION

IN THIS SECTION, YOU'LL LEARN:

- How to operate the machine in manual mode.

CONTENTS

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8: MANUAL OPERATION

8.1 USE MANUAL MODE

To use the bandsaw in manual mode:

1. Confirm that the blade is appropriate for the material.
If the blade is not appropriate for the material, you must first change it. Go to "Change a Blade" (page 28).
2. Open the clamps on both vises with the handwheel and the clamp handle. Then, load the material between the vises.

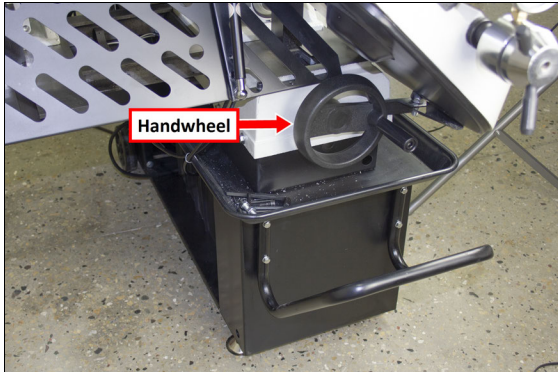


Figure 8-1: Handwheel.

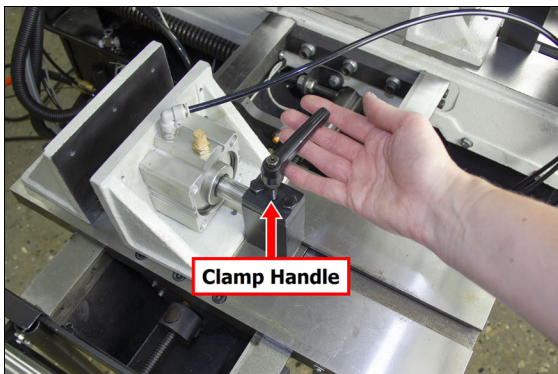


Figure 8-2: Clamp handle.

3. On the front of the machine, identify the blade feed lever, and then move it up.

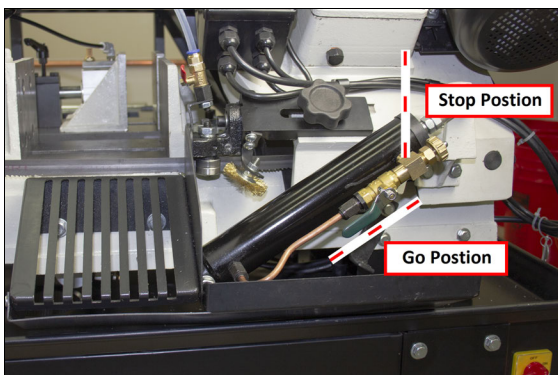


Figure 8-3: Blade feed lever.

The blade feed lever is now in the **Stop** position. While in the **Stop** position, the saw head doesn't move down.

4. On the back of the machine, identify the vertical-quick adjustment nut. Press the button on the quick adjustment nut to loosen it. Then, move it to the top of the threaded rod.

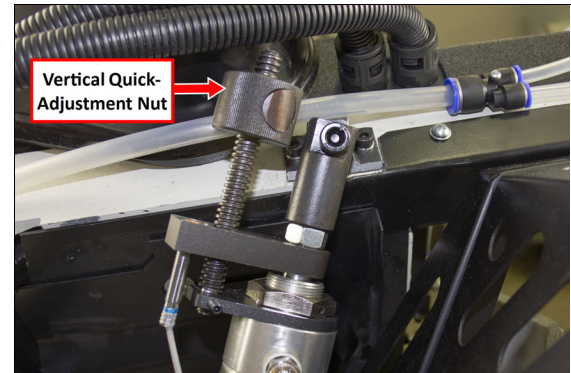


Figure 8-4: Vertical quick-adjustment nut.

5. Lift the saw head up to its maximum allowed height.
6. Move the material forward until it is at the desired length for the cut.
7. Use the handwheel to close the vise until the material is secure.



Note: Only the front clamp is used in manual mode.

8. On the front of the machine, locate the blade support guide. Move the blade support guide until it is as close to the material as possible, but so that it's not past the outfeed guide.

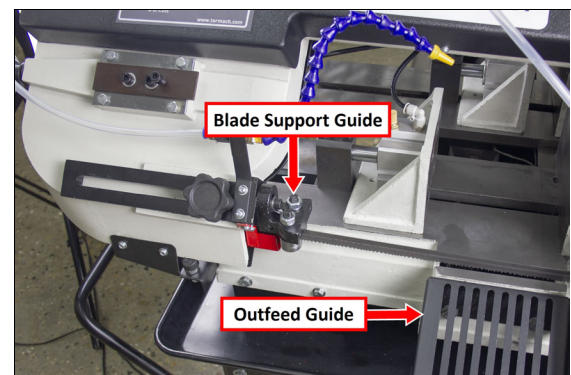


Figure 8-5: Blade support guide on the front of the machine.

9. Position the coolant nozzle so that it points at the blade ahead of the material.


10. On the operator panel, twist out the Emergency Stop button, which powers on the control board.
11. On the control panel, push the Down Arrow and the Up Arrow buttons at the same time.
The control board displays ---.
A display of - - - on the control panel indicates that the machine is in manual mode.
12. On the operator panel, push the green Cycle Start (E5) button twice, which activates the blade.
13. Move the blade feed lever down (in the **Go** position), and adjust the feed as necessary.
14. On the front of the machine, above the blade feed lever, locate the feed adjustment knob. Use the feed adjustment knob to set the cutting rate.



MACHINE MAINTENANCE

IN THIS SECTION, YOU'LL LEARN:

- About the required maintenance procedures that you must do so that this machine operates as designed.

 Before operating the machine in any way, you must read and understand this section.

CONTENTS

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9: MACHINE MAINTENANCE

9.1 MACHINE SAFETY



Before operating the machine in any way, you must read and understand this section.

Safe operation of the machine depends on its proper use and the precautions you take. Only trained personnel — with a clear and thorough understanding of its operation and safety requirements — shall operate this machine.

9.2 MAINTENANCE SCHEDULES

To keep your machine running as smoothly as possible, you must regularly do the following maintenance procedures.



Note: Before you begin any maintenance procedures, read and understand Maintenance Safety.

If you disassemble any components, refer to the machine's reference drawings when you've completed the maintenance procedure. For information, see "Diagrams and Parts Lists" (page 69). For any additional support, we can help. Create a support ticket with Tormach Technical Support at tormach.atlassian.net/servicedesk for guidance on how to proceed.

9.2.1 Daily

- Clean the Blade Brush (PN 38033) of swarf.
- Clean the drip pan of swarf.
- Examine the drip pan grate for clogs.
- Examine the coolant level and condition.
- Use a rust inhibitor on all exposed, non-lubricated, non-painted metal surfaces.



Note: Don't use rust inhibitor on the guide rails or vice lead screw.

- Verify that the FRL Filter-Regulator-Lubricator has at least 90 psi compressed air, and that the lubricator has air tool oil above the bottom of the plastic tube.

9.2.2 Weekly

- Clean all exterior surfaces with a clean rag.
- Examine the blade brush and adjust it if it's not in contact with the blade.

9.2.3 Monthly

- Clean the electrical cabinet of dust with a clean cloth or compressed air.
- Put #2 tube grease on each guide rail within the travel path of the infeed table.
- Clean fine swarf from the coolant tank.

9.2.4 Semi-Annually



Note: After the first 90 days of operation, complete the items on this list. After that, complete the items every six months.

- Examine the motor belt for wear.
- Lightly lubricate the vise lead screw with #2 tube grease.
- Replace the gearbox oil.


9.3 REPLACE THE GEARBOX OIL

1. Power off the bandsaw and disconnect it from the main air supply.
 - a. Push the Emergency Stop button on the operator panel to lock it into the disabled position.
 - b. Turn the Main Disconnect switch to **OFF**. Mains power is disconnected from the machine.
 - c. Disconnect the air line from your site from the input port on the FRL Filter-Regulator-Lubricator.
2. Put a catch pan for the gear oil below the gearbox drain plug.
3. Remove the four bolts from the gear box, and set aside the cover plate and gasket.
4. Remove the drain plug and allow the oil to drain out.
5. Remove the remaining oil with a rag.
6. Install the drain plug and fill the gearbox with approximately 10 oz (0.3 liters) of SAE 90 Gear Oil (ISO 220).
7. Replace the cover plate and gasket, and secure them in place with the bolts that you set aside in Step 3.

MECHANICAL ADJUSTMENTS

IN THIS SECTION, YOU'LL LEARN:

- About adjustments that may be required to operate your machine as expected.

 Before operating the machine in any way, you must read and understand this section.

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10.4 Adjust the Height of the Infeed Table	46
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10: MECHANICAL ADJUSTMENTS

10.1 ADJUST THE BLADE GUIDES

1. Power off the bandsaw and disconnect it from the main air supply.
 - a. Push the Emergency Stop button on the operator panel to lock it into the disabled position.
 - b. Turn the Main Disconnect switch to **OFF**. Mains power is disconnected from the machine.
 - c. Disconnect the air line from your site from the input port on the FRL Filter-Regulator-Lubricator.
2. Identify the knob on the blade support guide. Then, loosen it.

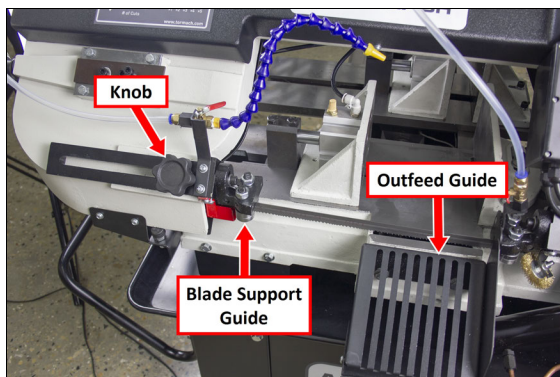


Figure 10-1: Blade support guide and its knob.

3. Move the blade support guide toward the material. Stop when it's close to the material, but not past the outfeed guide.
4. Tighten the knob on the blade support guide.

10.2 ADJUST THE BLADE TRACKING

1. On the back of the machine, identify the air cylinder, as shown in the following image.

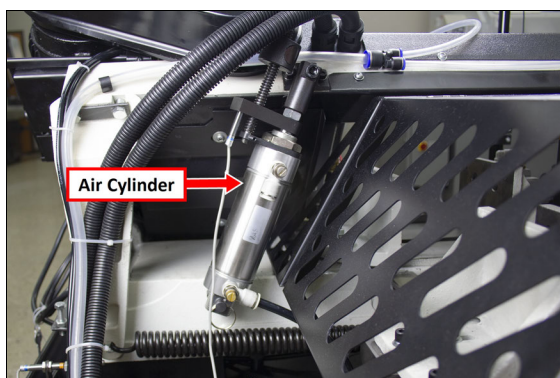


Figure 10-2: Air cylinder on the back of the machine.

2. Turn the air line valve, which allows you to access the air cylinder's quick-release pin, as shown in the following

image.

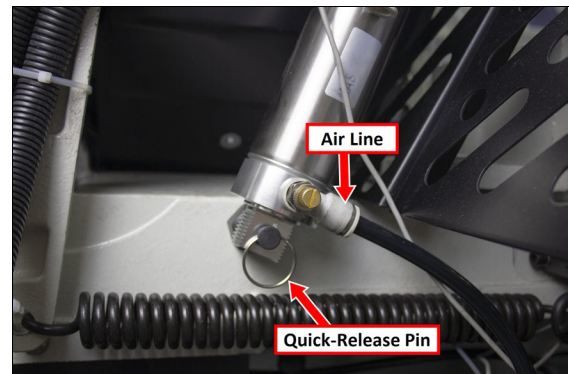


Figure 10-3: Quick-release pin on the air cylinder.

3. Pull the quick-release pin out of the air cylinder, and set it aside.
The air cylinder hangs from the saw head.
4. Remove the bolt securing the air cylinder to the bandsaw with an 8 mm hex wrench.



Figure 10-4: Bolt on the air cylinder.

5. Set aside the bolt and the air cylinder.
6. Lift the saw head to the upright position, as shown in the following image.



Figure 10-5: Bandsaw head lifted upright.

10: MECHANICAL ADJUSTMENTS

7. Loosen the two screws on the bottom of the blade cover with a Phillips screwdriver, and then slide the blade cover up until it clears the base casting.

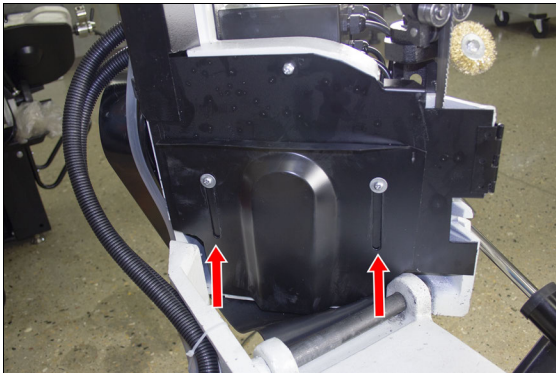


Figure 10-6: Two screws on the blade cover.

8. Remove the two screws from the side of the blade cover, and then set aside the screws.



Figure 10-7: Removing the screws securing the blade cover to the bandsaw.

9. Open the blade cover, as shown in the following image.

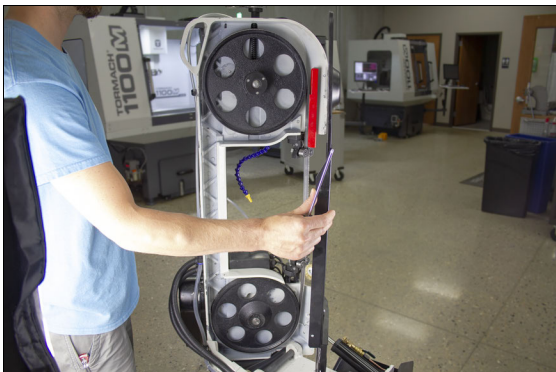


Figure 10-8: Blade cover opened.

10. Identify the tensioner on the top of the saw head.

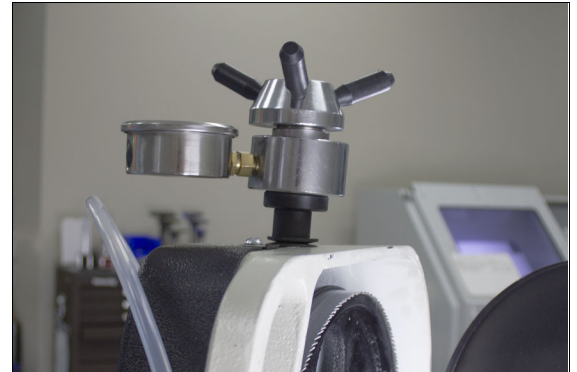


Figure 10-9: Tensioner on top of the saw head.

11. Verify that the blade tension is set correctly.
12. Power on the bandsaw.
 - a. Rotate the Emergency Stop button on the operator panel one-quarter turn clockwise to release it.
 - b. Turn the Main Disconnect switch to **ON**. Mains power is connected to the machine.
13. Set the bandsaw to manual mode: from the control panel, push the Down Arrow and Up Arrow buttons at the same time. The control board displays ---.

WARNING! Crush Hazard: Moving parts can entangle, pinch, or cut you, causing death or serious injury. While operating the machine in vertical position, you must keep your hands away from the blade.

14. From the operator panel, push the Cycle Start button. The blade moves through the blade guides and around the blade wheels.
15. Observe the blade as it moves:
 - **Correct Tracking** The blade runs next to, but not directly against, the wheel shoulder.
 - **Incorrect Tracking** Go to Step 16.

NOTICE! You must not let the blade run directly against the wheel shoulder. If you do, it could cause damage to the bandsaw or the blade.

10: MECHANICAL ADJUSTMENTS

16. Identify the two socket head cap screws with washers on the front of the bandsaw. Then, loosen them with a 6 mm hex key wrench.

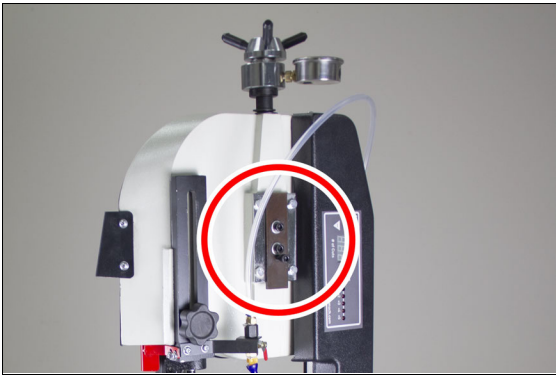


Figure 10-10: Socket head cap screws used to adjust the blade tracking.

17. Identify the socket head cap screw without a washer.
18. Use the socket head cap screw without a washer to adjust the blade tracking. While observing the blade as it moves, do one of the following:
 - **Track Closer to Wheel Shoulder** Turn the socket head cap screw without a washer clockwise.
 - **Track Away from Wheel Shoulder** Turn the socket head cap screw without a washer counterclockwise.
19. Put a piece of paper between the blade and the wheel to test the blade tracking.
20. With the paper held in place, slowly turn the socket head cap screw without a washer to track the wheel closer to the shoulder. Continue turning until the paper is cut into two pieces.
21. Slowly back off the socket head cap screw without a washer to move it slightly away from the wheel shoulder.
22. Tighten the two socket head cap screws with washers on the front of the bandsaw.

10.3 ADJUST THE BLADE BRUSH

NOTICE! You must verify that the blade brush is adjusted correctly and regularly maintained. If you don't, it could cause damage to the blade. For information, see "Machine Maintenance" (page 41).

To adjust the blade brush:

1. Identify the blade brush.

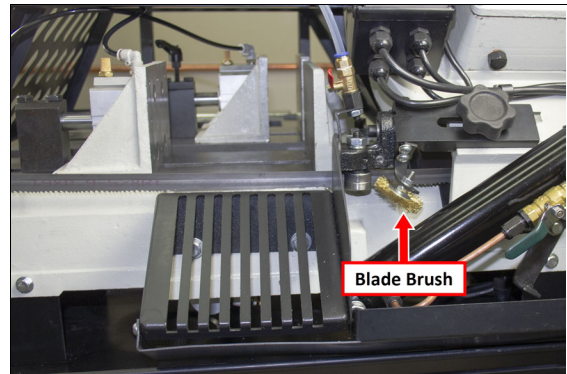


Figure 10-11: Blade brush.

2. Adjust the blade brush until its bristles overlap the blade. If the Blade Brush (PN 38033) is worn or damaged, you must replace it.

10.4 ADJUST THE HEIGHT OF THE INFEEED TABLE

1. Find a piece of 24 in. stock. We recommend using one of the following:
 - Cold-rolled steel (that's at least 1 in. square)
 - Extruded aluminum (that's at least 1-1/2 in. square)
 - Structural tubing (that's at least 1-1/2 in. square)
2. Move the infeed table so that it's approximately in the center of travel.
3. Loosen three M10 socket head cap screws on the base casting. This allows you to adjust the height of the infeed table.

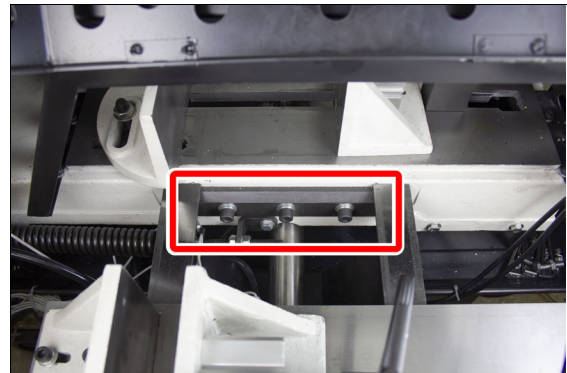


Figure 10-12: M10 socket head cap screws on the base casting.

10: MECHANICAL ADJUSTMENTS

- 4. Open the clamps on both vises with the handwheel and the clamp handle. Then, load the stock between the vises as shown in the following image.

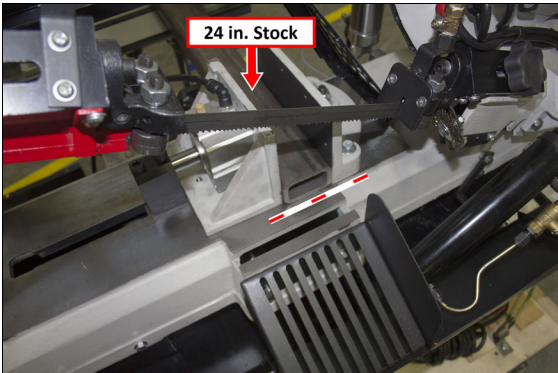


Figure 10-13: Stock loaded between the vises.

- 5. Close the vise with the handwheel until the material is secure. Verify that the stock is flat against the entire length of the base casting.
- 6. Lift and secure the guide rail and the infeed table to the stock with clamps, as shown in the following image.



Figure 10-14: Clamp secured to the 24-in. stock.

- 7. Tighten the three M10 socket head cap screws that you loosened in Step 3.
- 8. If required, adjust the leveling foot.

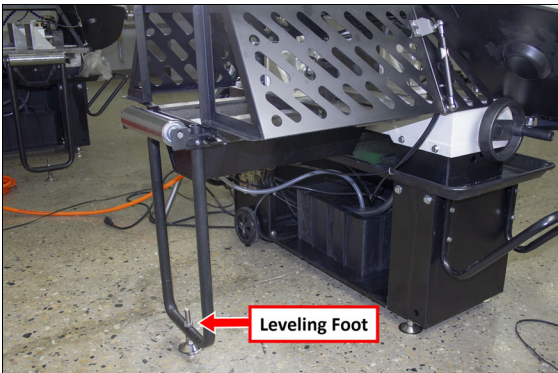


Figure 10-15: Leveling foot.

- 9. Remove the clamps from the machine.
- 10. Remove the stock from the machine.

10.5 ADJUST THE JAWS

Complete the following steps in the order listed:

- 10.5.1 Align the Fixed Jaw 47
- 10.5.2 Adjust the Fixed Clamp Jaw 47

10.5.1 Align the Fixed Jaw

- 1. Open the jaws so that there's enough space to put a square in between them.
- 2. Put a square on the base casting between the jaws.
- 3. Push the square until it's flush with the side of the blade.

Note: The square must be flush with the side of the blade, not the blade's teeth.

- 4. Loosen the two screws securing the fixed jaw to the base casting with a box end wrench.
- 5. Tap the fixed jaw until it's flush with the side of the square. Verify that the square is still flush with the side of the blade.

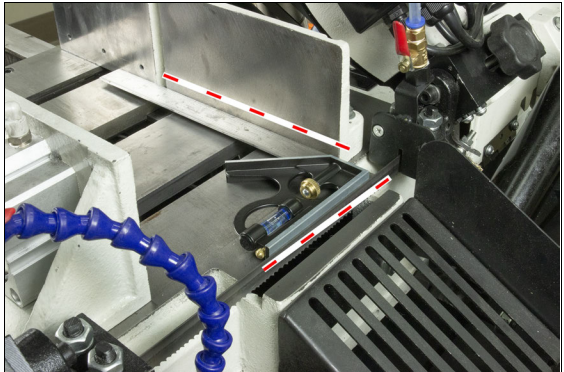


Figure 10-16: Fixed jaw aligned with the blade.

- 6. Tighten the two screws securing the fixed jaw to the base casting. Confirm that it remains flush with the square.
- 7. Remove the square from the base casting.

10.5.2 Adjust the Fixed Clamp Jaw

- 1. Find a piece of 24 in. stock. We recommend using one of the following:
 - Cold-rolled steel (that's at least 1 in. square)
 - Extruded aluminum (that's at least 1-1/2 in. square)
 - Structural tubing (that's at least 1-1/2 in. square)

10: MECHANICAL ADJUSTMENTS

2. Open the clamps on both vises with the handwheel and the clamp handle. Then, load the stock between the vises as shown in the following image.

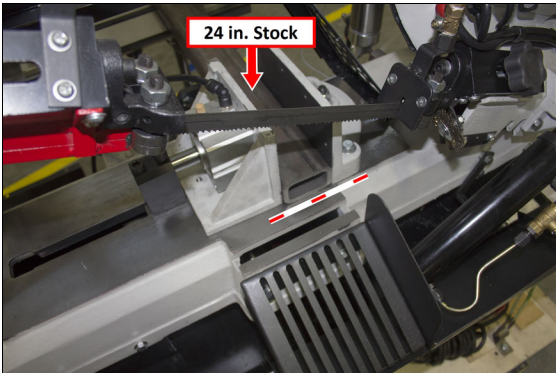


Figure 10-17: Stock loaded between the vises.

3. Close the vise with the handwheel until the material is secure. Verify that the stock is flat against the entire length of the base casting.
4. Loosen the four M8 socket head cap screws securing the fixed clamp jaw to the infeed table.

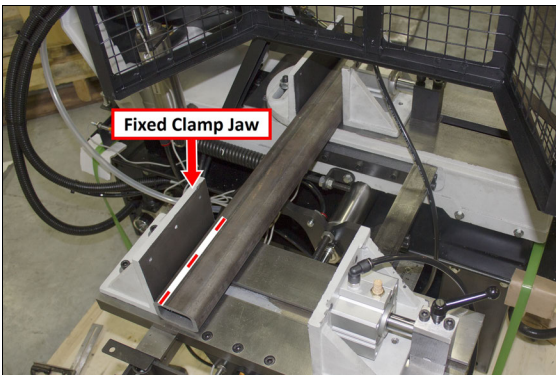


Figure 10-18: M8 socket head cap screws on the fixed clamp jaw.

5. Secure the stock to the fixed jaw with a clamp.
6. Tap the fixed clamp jaw until it is flush with the side of the stock.
7. Tighten the four M8 socket head cap screws that you loosened in Step 4. Verify that the fixed clamp jaw remains flush with the stock.
8. Remove the clamp from the machine.
9. Remove the stock from the machine.

TROUBLESHOOTING

IN THIS SECTION, YOU'LL LEARN:

- About common causes of failure in this machine, and our recommendations for diagnosing and correcting them.



WARNING! Electrocution Hazard - Electrical Cabinet: Do not make or disconnect connections under power.



Before operating the machine in any way, you must read and understand this section.

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11: TROUBLESHOOTING

11.1 OPERATIONS TROUBLESHOOTING

If your machine isn't operating as expected, there are many tips and procedures that you can follow to solve the problem.

- 11.1.1 Blades Break Too Frequently51
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- 11.1.3 Blades Lose Teeth 54
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11.1.1 Blades Break Too Frequently

- **Problem** Blades break more often than expected when cutting materials.
- **Cause** The feed rate may be too high, you may be using the wrong blade, or you may need to make adjustments to the blade or workpiece.

You May Need To...	Probability	How-To Steps	Need More?
Clean the bandsaw.	High	Examine the bandsaw for chip build-up between the blade and it's wheels. If necessary, clean it of chips.	For information, see "Machine Maintenance" (page 41).
Adjust the feed rate.	High	Verify that the feed rate isn't too high: lower the feed rate, and then do a test cut. Examine the behavior of the machine as it cuts.	For information, see "Change the Feed Rate" (page 31).
Raise the vertical quick-adjustment nut.	High	During automatic operation, verify that the blade can't collide with the material while it initially lowers: raise the vertical quick-adjustment nut. The blade can break or stall when it drops from the raised position and then collides with the part before the feed rate is controlled.	For information, see "Use Automatic Mode" (page 34).
Examine the blade, material, and size of cut.	High	Verify that the blade's TPI isn't too fine or too course for the size and type of material being cut. If not, you may need to choose a new blade. Verify that the blade isn't dulling too quickly.	For information, see "Choose a Blade" (page 28) and "Blades Dull Too Quickly" (page 53).
Adjust the blade's tension.	Medium	Verify that the blade isn't too tight or too loose between the wheels. If necessary, use the tensioner on the top of the saw head to adjust the blade's tension.	For information, see "Change a Blade" (page 28).
Move the blade above the workpiece.	Medium	During manual operation, verify that the blade isn't on the workpiece when the operation begins: you must move the blade above the workpiece before you begin cutting.	For information, see "Use Manual Mode" (page 38).
Examine the workpiece setup.	Low	<ul style="list-style-type: none"> • Manual Operation Verify that the workpiece isn't too loose: use the handwheel to tighten the clamp on the front vise. If necessary, use a jig to hold the workpiece. • Automatic Operation Examine the vise clamps: verify that there is 1/8 in. or less of a gap between the clamps and the material. Then, verify that the vise jaw clamping pressure isn't set too low for the material. 	For information, see "Use Automatic Mode" (page 34) or "Use Manual Mode" (page 38).
Verify that the blade doesn't rub on the wheel flange.	Low	Verify that the blade isn't incorrectly tracking so that it runs directly against the wheel flange during operations. Follow the procedure to adjust the blade tracking.	For information, see "Mechanical Adjustments" (page 43).

11: TROUBLESHOOTING

You May Need To...	Probability	How-To Steps	Need More?
Align the guide bearings.	Low	Verify that the guide bearings are correctly aligned. If they're not, adjust them.	For information, see "Mechanical Adjustments" (page 43).
Use a high-quality blade.	Low	Verify that you're using a high-quality blade. If you're not, you may need to choose a new blade.	For information, see "Choose a Blade" (page 28).
Follow the blade break-in procedure.	Low	To maximize blade life, you must follow the procedure to break in the blade.	For information, see "Break in the Blade" (page 30).
Adjust the clamping pressure.	Low	During automatic operation, verify that the clamp pressure regulator isn't set too low: increase the pressure, and then do a test cut. Examine the behavior of the machine as it cuts.	For information, see "Change the Clamping Pressure" (page 32).

11.1.2 Blades Dull Too Quickly

- **Problem** Blades dull earlier than expected when cutting materials.
- **Cause** The cutting speed or feed rate may be incorrect, you may be using the wrong blade, or you may need to make adjustments to the blade.

You May Need To...	Probability	How-To Steps	Need More?
Clean the bandsaw.	High	Examine the bandsaw for chip build-up between the blade and it's wheels. If necessary, clean it of chips.	For information, see "Machine Maintenance" (page 41).
Adjust the feed rate.	High	Verify that the feed rate isn't too high: lower the feed rate, and then do a test cut. Examine the behavior of the machine as it cuts.	For information, see "Change the Feed Rate" (page 31).
Adjust the cutting speed.	High	Verify that the cutting speed isn't too high: lower the cutting speed, and then do a test cut. Examine the behavior of the machine as it cuts.	For information, see "Change the Speed" (page 31).
Examine the blade, material, and size of cut.	High	Verify that the blade's TPI isn't too fine or too course for the size and type of material being cut. If not, you may need to choose a new blade. Verify that the blade isn't breaking too frequently.	For information, see "Choose a Blade" (page 28) and "Blades Break Too Frequently" (page 51).
Follow the blade break-in procedure.	High	To maximize blade life, you must follow the procedure to break in the blade.	For information, see "Break in the Blade" (page 30).
Replace the blade.	Low	Examine the blade for twists or kinks. If there are any, replace the blade.	For information, see "Change a Blade" (page 28).
Adjust the position of the blade on the wheels.	Low	Verify that the blade is correctly positioned on the wheels: open the blade cover and examine the blade. If necessary, adjust the tracking.	For information, see "Mechanical Adjustments" (page 43).

11: TROUBLESHOOTING

11.1.3 Blades Lose Teeth

- **Problem** Blades lose teeth when cutting materials.
- **Cause** The feed rate may be too high, you may need to make adjustments to the workpiece, or you may be using the wrong blade.

You May Need To...	Probability	How-To Steps	Need More?
Clean the bandsaw.	High	Examine the bandsaw for chip build-up between the blade and it's wheels. If necessary, clean it of chips.	For information, see "Machine Maintenance" (page 41).
Adjust the feed rate.	High	Verify that the feed rate isn't too high: lower the feed rate, and then do a test cut. Examine the behavior of the machine as it cuts.	For information, see "Change the Feed Rate" (page 31).
Examine the workpiece setup.	High	<ul style="list-style-type: none"> • Manual Operation Verify that the workpiece isn't too loose: use the handwheel to tighten the clamp on the front vise. If necessary, use a jig to hold the workpiece. • Automatic Operation Examine the vise clamps: verify that there is 1/8 in. or less of a gap between the clamps and the material. Then, verify that the vise jaw clamping pressure isn't set too low for the material. 	For information, see "Use Automatic Mode" (page 34) or "Use Manual Mode" (page 38).
Examine the blade for excessive chip build-up.	High	If the blade has excessive chip build-up in the gullets, use a coarser-tooth blade.	For information, see "Choose a Blade" (page 28).
Adjust the clamping pressure.	Medium	During automatic operation, verify that the clamp pressure regulator isn't set too low: increase the pressure, and then do a test cut. Examine the behavior of the machine as it cuts.	For information, see "Change the Clamping Pressure" (page 32).

11.1.4 Cuts Are Crooked

- **Problem** The machine makes crooked cuts through materials.
- **Cause** The feed rate or cutting speed may be incorrect, you may be using the wrong blade, or you may need to make adjustments to the blade.

You May Need To...	Probability	How-To Steps	Need More?
Clean the bandsaw.	High	Examine the bandsaw for chip build-up between the blade and it's wheels. If necessary, clean it of chips.	For information, see "Machine Maintenance" (page 41).
Adjust the feed rate.	High	Verify that the feed rate isn't too high: lower the feed rate, and then do a test cut. Examine the behavior of the machine as it cuts.	For information, see "Change the Feed Rate" (page 31).
Replace the blade.	High	Examine the blade for dullness. If it's too dull, replace it.	For information, see "Change a Blade" (page 28).
Replace or adjust the guide bearings.	Medium	Examine the guide bearings: they may be out of adjustment, or too far away from the workpiece. If they are, adjust them.	For information, see "Use Automatic Mode" (page 34), "Use Manual Mode" (page 38), or "Mechanical Adjustments" (page 43).
Adjust the blade's tension.	Medium	Verify that the blade isn't too tight or too loose between the wheels. If necessary, use the tensioner on the top of the saw head to adjust the blade's tension.	For information, see "Change a Blade" (page 28).

11: TROUBLESHOOTING

11.1.5 Material Doesn't Advance

- **Problem** The material isn't moving forward during operations to continue the cut.
- **Cause** You may need to make adjustments to the machine, or adjust the clamping pressure.

You May Need To...	Probability	How-To Steps	Need More?
Clean the bandsaw.	High	Examine the bandsaw for chip build-up. If necessary, clean it of chips.	For information, see "Machine Maintenance" (page 41).
Remove any obstructions from the air line.	High	Verify that the air line isn't pinched. If it is, remove the obstruction.	For information, see "Air Requirements" (page 17).
Adjust the clamping pressure.	High	During automatic operation, verify that the clamp pressure regulator isn't set too low: increase the pressure, and then test.	For information, see "Change the Clamping Pressure" (page 32).
Align the jaws.	Medium	Examine the vise clamps for correct alignment. If they're not correctly aligned, adjust them.	For information, see "Mechanical Adjustments" (page 43).
Adjust the air pressure.	Low	Verify that the air pressure is set to at least 90 psi. If it's not, adjust your regulator. Otherwise, examine your air supply.	For information, see "Air Requirements" (page 17).
Adjust the infeed table.	Low	Examine the infeed table for correct alignment. If it's not correctly aligned, adjust it.	For information, see "Mechanical Adjustments" (page 43).

11.1.6 Material Slips in Vise Clamps

- **Problem** The material slips in the vise clamps during operations.
- **Cause** The air pressure to the vise jaws may be too low.

You May Need To...	Probability	How-To Steps	Need More?
Clean the bandsaw.	High	Examine the bandsaw for chip build-up. If necessary, clean it of chips.	For information, see "Machine Maintenance" (page 41).
Adjust the air pressure to the vise jaws.	High	Verify that the air pressure is set to at least 90 psi. If it's not, adjust your regulator. Otherwise, examine your air supply.	For information, see "Air Requirements" (page 17).
Tighten the handwheel.	High	During manual operation, verify that the handwheel is completely tightened. If it's not, tighten it.	For information, see "Manual Operation" (page 37).

11: TROUBLESHOOTING

11.1.7 Noise or Problems Moving Through the Cut

- **Problem** The machine is loud while cutting, or it doesn't move freely while cutting.
- **Cause** The feed rate may be too high, or you may be using the wrong blade.

You May Need To...	Probability	How-To Steps	Need More?
Clean the bandsaw.	High	Examine the bandsaw for chip build-up between the blade and it's wheels. If necessary, clean it of chips.	For information, see "Machine Maintenance" (page 41).
Adjust the feed rate.	High	Verify that the feed rate isn't too high: lower the feed rate, and then do a test cut. Examine the behavior of the machine as it cuts.	For information, see "Change the Feed Rate" (page 31).
Examine the blade and the material.	High	Verify that the blade's TPI isn't too high, or that the material isn't too course: you must use the correct blade for the material. If you're not, you may need to choose a new blade.	For information, see "Choose a Blade" (page 28).
Adjust the clamping pressure.	Medium	During automatic operation, verify that the clamp pressure regulator isn't set too low: increase the pressure, and then do a test cut. Examine the behavior of the machine as it cuts.	For information, see "Change the Clamping Pressure" (page 32).
Tighten the handwheel.	Medium	During manual operation, verify that the handwheel is completely tightened. If it's not, tighten it.	For information, see "Manual Operation" (page 37).
Adjust the cutting speed.	Medium	Verify that the cutting speed isn't too high: lower the cutting speed, and then do a test cut. Examine the behavior of the machine as it cuts.	For information, see "Change the Speed" (page 31).

11.2 MOTOR AND ELECTRICAL TROUBLESHOOTING

If you're having problems with your machine's electronics or motor, there are many tips and procedures that you can follow to solve the problem.



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11: TROUBLESHOOTING

11.2.1 Coolant Pump Doesn't Work

- **Problem** The coolant pump doesn't work.
- **Cause** The coolant pump may not be receiving power, or there may be faulty components.

You May Need To...	Probability	How-To Steps	Need More?
Turn on the coolant pump.	High	Examine the coolant pump's switch. If necessary, turn it to the ON position.	For information, see "Controls Overview" (page 26).
Fill the coolant tank.	High	Examine the coolant level in the coolant tank. If necessary, fill it to an appropriate level.	For information, see "Machine Maintenance" (page 41).
Examine the coolant pump.	Medium	Examine the coolant pump for blockages or mechanical damage. If necessary, remove blockages or replace the coolant pump.	Create a support ticket with Tormach Technical Support at tormach.atlassian.net/servicedesk for guidance on how to proceed.
Examine the main motor.	Low	Verify that the motor that drives the blade (main motor) is powered on and operating. If it's not on, turn it on.	Create a support ticket with Tormach Technical Support at tormach.atlassian.net/servicedesk for guidance on how to proceed.
Replace the main fuse.	Low	Examine the main fuse. If necessary, replace it.	For information, see "Electrical Schematics" (page 85).

You May Need To...	Probability	How-To Steps	Need More?
Replace the coolant pump.	Low	<p>Verify that the:</p> <ul style="list-style-type: none"> • Main motor is running • The blade is running <div data-bbox="607 384 1089 613" style="border: 1px solid orange; padding: 5px;"> <p> WARNING! Crush Hazard: Moving parts can entangle, pinch, or cut you, causing death or serious injury. While operating the machine, you must keep your hands away from the blade.</p> </div> <ul style="list-style-type: none"> • Coolant switch is in the ON position <p>Then, use a digital multimeter to measure AC voltage at wires 208 and 102/N at the operator panel.</p> <div data-bbox="545 758 1089 1178" style="border: 1px solid orange; padding: 5px;"> <p> WARNING! Electrocutation Hazard: When servicing the machine from inside the operator panel, always use caution. Even after you've powered off the machine, electronic devices in the operator panel may retain dangerous electrical voltages. Only qualified electrical machinery technicians should perform maintenance or troubleshooting procedures inside the operator panel while power is still on.</p> </div> <p>If there's no voltage, replace the coolant pump.</p>	For information, see "Electrical Schematics" (page 85).
Examine the wiring.	Low	Examine the coolant pump's wiring for breaks, disconnection, or corrosion. If necessary, replace or repair the wires.	For information, see "Electrical Schematics" (page 85).


11: TROUBLESHOOTING

11.2.2 Error on the Control Panel

For information on bandsaw error codes, see "Bandsaw Error Codes Reference" (below).

Control Panel Displays C5

- **Problem** The control panel displays C5.

 **Note:** This message display isn't an error. It indicates that the machine is ready for the cycle start command.

- **Cause** The machine is ready to operate: push the green Cycle Start (C5) button.

You May Need To...	Probability	How-To Steps	Need More?
Push the green Cycle Start (C5) button.	High	C5 on the control panel display indicates that the machine is ready for the cycle start command. Push the Cycle Start (C5) button, and the machine begins automated function.	For information, see "Use Automatic Mode" (page 34) or "Use Manual Mode" (page 38).

Control Panel Displays E**

- **Problem** The control panel displays E**.
- **Cause** You may need to make adjustments to the machine, or adjust the air pressure.

You May Need To...	Probability	How-To Steps	Need More?
Adjust the proximity switch.	High	Verify that the proximity switch is properly adjusted: it must be about 1 mm from the activating position.	For information, see "Verify the Proximity Sensor Installation" (page 24).
Adjust the air pressure.	High	Verify that the machine's automated movement can move to the endpoint in the allowed time window. Examine the machine's air pressure. If it's below 90 psi, adjust it.	For information, see "Air Requirements" (page 17).
Adjust the vise jaws.	Low	Verify that the machine advances the material in the allowed time window. Examine the vise jaws to confirm that they're properly adjusted, and that they don't allow the material to drag. If the vise jaws constrict the material, adjust them.	For information, see "Mechanical Adjustments" (page 43).

Bandsaw Error Codes Reference

Error	Description
C5	Waiting for user input. Press the Cycle Start button.
E 10	The saw lift timed out. It never reached it's required height.
E 11	Incorrect user input; cut canceled. To start the operation, press the Cycle Start button twice.
E 12	Saw lift proximity sensors (up and down) are both active.
E 13	Infeed and outfeed proximity sensors (forward and rear) are both active.

Error	Description
E 15	The infeed table retract stroke timed out (on the initial stroke).
E 1b	The infeed table advance stroke timed out.
E 17	The infeed table retract stroke timed out (on a subsequent stroke).

While troubleshooting error codes, examine the Stroke LEDs on the control panel, which correspond to the proximity sensors on the bandsaw. If the LED light is illuminated, the proximity sensor is active.

- ×1 LED: Infeed (advance) proximity sensor
- ×2 LED: Outfeed (retract) proximity sensor
- ×4 LED: Saw down proximity sensor
- ×5 LED: Saw up proximity sensor



11: TROUBLESHOOTING

11.2.3 Machine Doesn't Start or a Panel Breaker Trips

- **Problem** The machine doesn't start or a panel breaker trips.
- **Cause** There may be incorrect wiring or faulty components.

You May Need To...	Probability	How-To Steps	Need More?
Power on the main power supply, or examine the main power supply voltage.	High	<ul style="list-style-type: none"> • Test all hot lines to confirm that they have the correct voltage on all legs. • Verify that the main power supply is switched to the ON position. 	For information, see "Electrical Schematics" (page 85).
Replace the main fuse.	High	Examine the main fuse. If necessary, replace it.	For information, see "Electrical Schematics" (page 85).
Examine the pulley cover safety switch.	Medium	Examine the pulley cover safety switch wiring. If necessary, make the correct connections.	For information, see "Electrical Schematics" (page 85).
Rewire the plug/receptacle.	Low	Test the contacts. If necessary, make the correct connections.	For information, see "Electrical Schematics" (page 85).
Rewire the motor.	Low	Inspect the motor wiring. If necessary, make the correct connections.	For information, see "Electrical Schematics" (page 85).
Replace the start capacitor.	Low	Test the start capacitor. If necessary, make the correct connections.	For information, see "Electrical Schematics" (page 85).
Replace the panel breaker.	Low	Verify that the panel breaker is the correct size for the machine load. If it's not, replace it.	Create a support ticket with Tormach Technical Support at tormach.atlassian.net/servicedesk for guidance on how to proceed.
Examine all wiring.	Low	Examine all wiring for breaks, disconnections, or corrosion. If necessary, repair or replace the wires.	For information, see "Electrical Schematics" (page 85).
Replace the motor.	Low	Test the motor. If necessary, repair or replace it.	Create a support ticket with Tormach Technical Support at tormach.atlassian.net/servicedesk for guidance on how to proceed.

11.2.4 Machine Stalls or It's Underpowered

- **Problem** The machine stalls, or you find that it's underpowered during operations.
- **Cause** The feed rate may be too high, or you may be using the wrong blade.

You May Need To...	Probability	How-To Steps	Need More?
Raise the vertical quick-adjustment nut.	High	During automatic operation, verify that the blade can't collide with the material while it initially lowers: raise the vertical quick-adjustment nut. The blade can break or stall when it drops from the raised position and then collides with the part before the feed rate is controlled.	For more information, see "Use Automatic Mode" (page 34).
Use a different blade.	High	Verify that the blade's TPI isn't too high, or that the material isn't too course: you must use the correct blade for the material. If you're not, you may need to choose a new blade.	For information, see "Choose a Blade" (page 28).
Adjust the feed rate or cutting speed.	High	<ul style="list-style-type: none"> • Verify that the feed rate isn't too high: lower the feed rate, and then do a test cut. Examine the behavior of the machine as it cuts. • Verify that the cutting speed isn't too high: lower the cutting speed, and then do a test cut. Examine the behavior of the machine as it cuts. 	For information, see "Change the Feed Rate" (page 31) or "Change the Speed" (page 31).
Examine the workpiece setup.	Medium	<ul style="list-style-type: none"> • Manual Operation Verify that the workpiece isn't too loose: use the handwheel to tighten the clamp on the front vise. If necessary, use a jig to hold the workpiece. • Automatic Operation Examine the vise clamps: verify that there is 1/8 in. or less of a gap between the clamps and the material. Then, verify that the vise jaw clamping pressure isn't set too low for the material. 	For information, see "Use Automatic Mode" (page 34) or "Use Manual Mode" (page 38).
Adjust the blade's tension.	Low	Verify that the blade isn't too tight or too loose between the wheels. If necessary, use the tensioner on the top of the saw head to adjust the blade's tension.	For information, see "Change a Blade" (page 28).
Examine the main power supply voltage.	Low	Test the hot lines to confirm that they have the correct voltage on both legs.	For information, see "Electrical Schematics" (page 85).
Replace the motor bearings.	Low	Rotate the shaft: if there's rotational grinding or if the shaft is loose, this indicates that you must replace the motor bearings.	Create a support ticket with Tormach Technical Support at tormach.atlassian.net/servicedesk for guidance on how to proceed.
Rewire the plug/receptacle.	Low	Test the contacts. If necessary, make the correct connections.	For information, see "Electrical Schematics" (page 85).

11: TROUBLESHOOTING

You May Need To...	Probability	How-To Steps	Need More?
Rewire the motor.	Low	Inspect the motor wiring. If necessary, make the correct connections.	For information, see "Electrical Schematics" (page 85).
Replace the motor.	Low	Test the motor. If necessary, repair or replace it.	Create a support ticket with Tormach Technical Support at tormach.atlassian.net/servicedesk for guidance on how to proceed.

11.2.5 Noise or Machine Vibration

- **Problem** The machine vibrates or operates loudly.
- **Cause** There may be damaged components, or you may need to use a different blade or cutting speed.

You May Need To...	Probability	How-To Steps	Need More?
Change the blade or the cutting speed.	High	<ul style="list-style-type: none"> • Verify that the blade's TPI isn't too high: you must use the correct blade for the material. • Verify that the cutting speed isn't too high: lower the cutting speed, and then do a test cut. Examine the behavior of the machine as it cuts. 	For information, see "Choose a Blade" (page 28) or "Change the Speed" (page 31).
Examine the workpiece setup.	High	<ul style="list-style-type: none"> • Manual Operation Verify that the workpiece isn't too loose: use the handwheel to tighten the clamp on the front vise. If necessary, use a jig to hold the workpiece. • Automatic Operation Examine the vise clamps: verify that there is 1/8 in. or less of a gap between the clamps and the material. Then, verify that the vise jaw clamping pressure isn't set too low for the material. 	For information, see "Use Automatic Mode" (page 34) or "Use Manual Mode" (page 38).
Replace or sharpen the blade.	Medium	Examine the blade for dullness. If it's too dull, sharpen or replace it.	For information, see "Change a Blade" (page 28).
Fill the oil in the gearbox.	Medium	Examine the oil level in the gearbox. If necessary, fill it to an appropriate level.	For information, see "Replace the Gearbox Oil" (page 42).
Replace the motor fan cover or the fan.	Low	Examine the motor fan cover and the fan: <ul style="list-style-type: none"> • Motor Fan Cover If it's dented, replace it. • Fan If it's damaged or loose, replace it. 	Create a support ticket with Tormach Technical Support at tormach.atlassian.net/servicedesk for guidance on how to proceed.



DIAGRAMS AND PARTS LISTS

IN THIS SECTION, YOU'LL LEARN:

- About this machine's components.

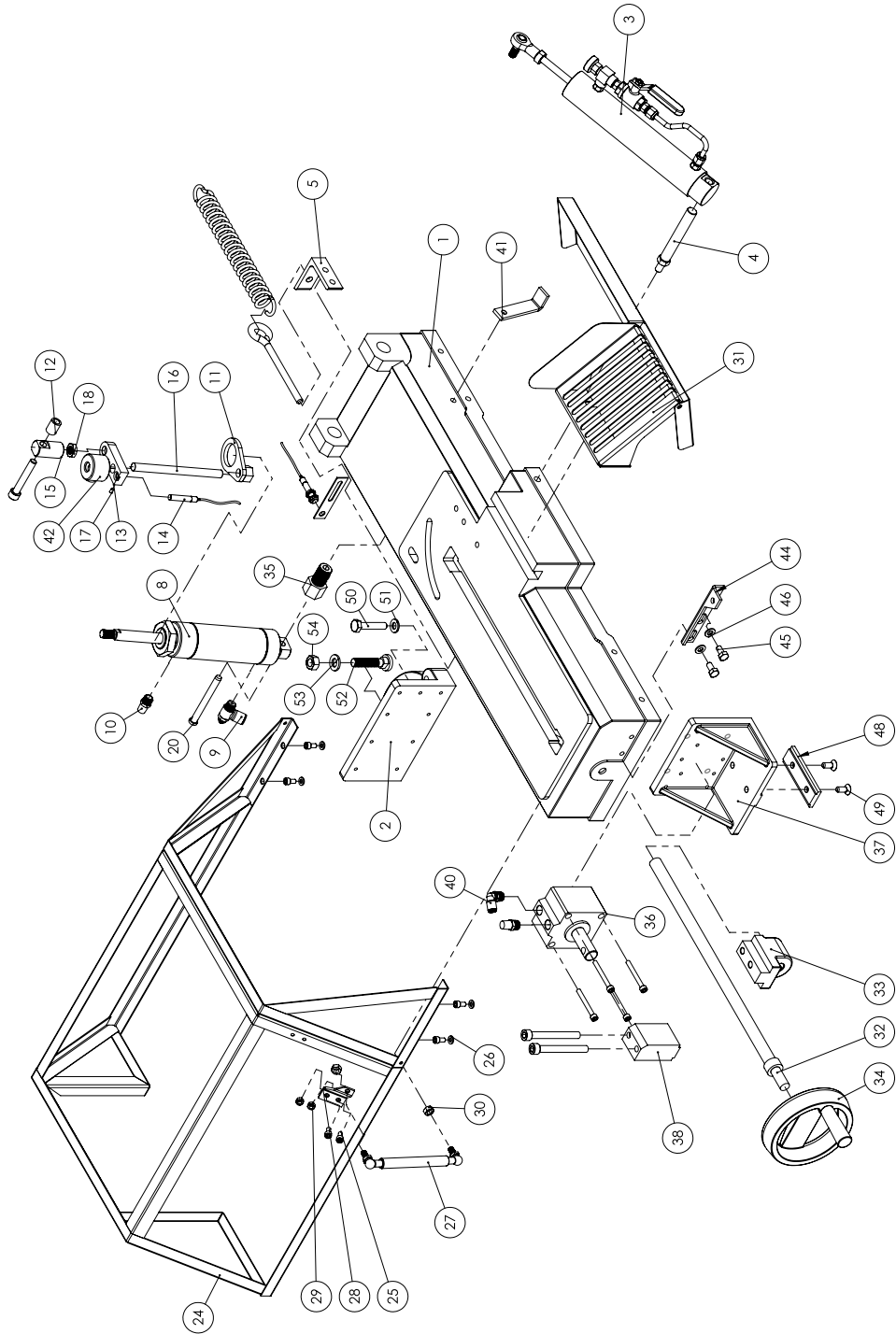
NOTICE! Only use Tormach-approved parts when making replacements. If you don't replace parts with those listed in this section, you may void your warranty.

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12: DIAGRAMS AND PARTS LISTS

12.1 BASE CASTING EXPLODED VIEW



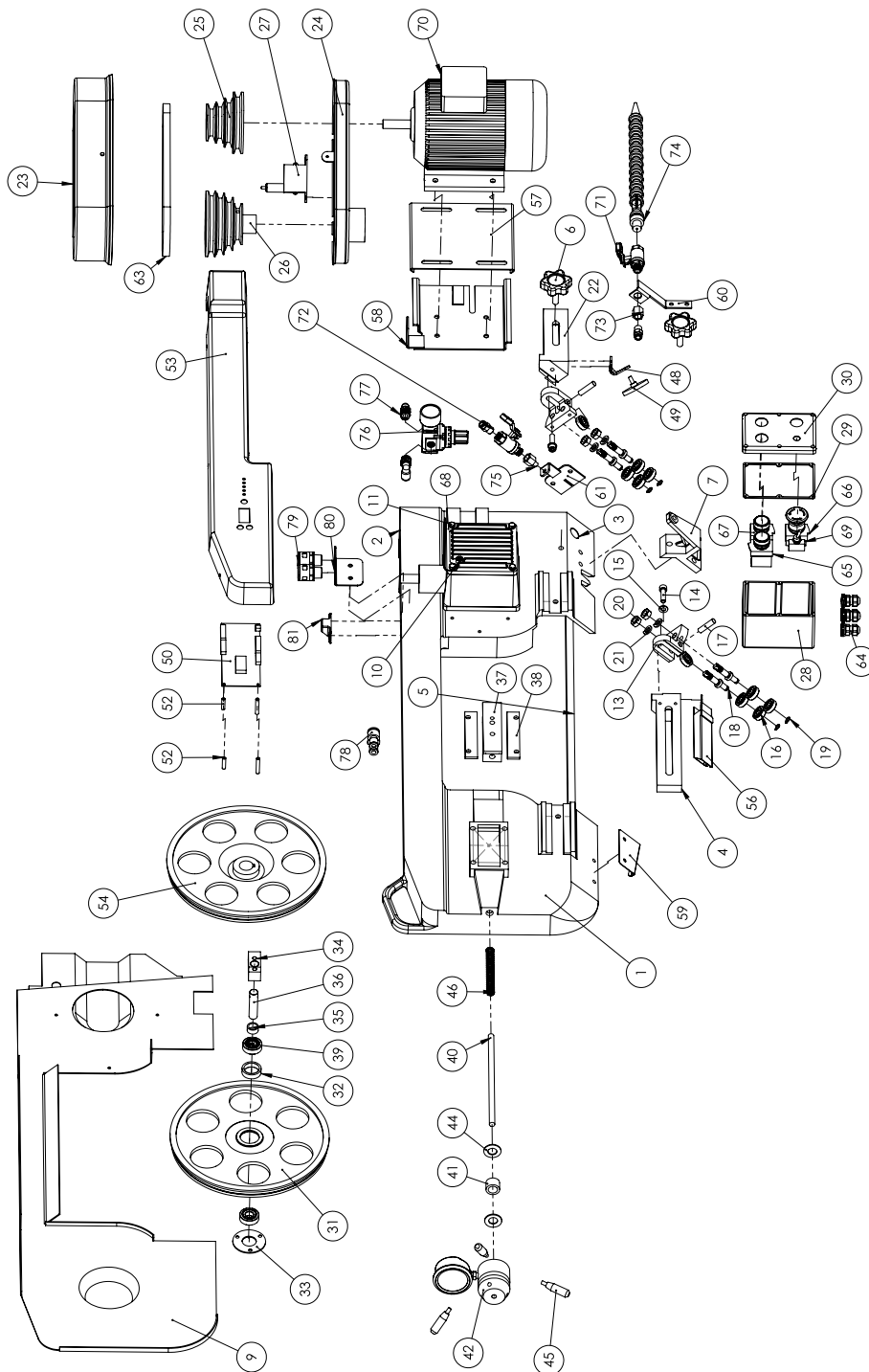
12.2 BASE CASTING PARTS LIST

ID	Description	Quantity
1	Base Casting	1
2	Rear Vise Jaw	1
3	Hydraulic Descent Cylinder (Feed) (PN 38035)	1
4	Feed Cylinder Axle	1
5	Spring Handle Bracket	1
8	Lift Cylinder (PN 34928)	1
9	3/8 in. - 1/4 in. NPT Flow-Control Elbow	1
10	1/4 in. NPT Muffler	2
11	Lift Cylinder Stop Base	1
12	Top Spacer Pivot — Lift Cylinder	1
13	Lift Cylinder Stop Base	1
14	Proximity Sensor (PN 38065)	2
15	Clevis Lift Cylinder	1
16	M12 × 3 - 150 mm Height Adjustment Rod	1
17	Screw, Cone Point Set, M4 × 8, 90°	1
18	12 mm Lift Cylinder Jam Nut	1
19	Screw, Socket Head Cap, M10 × 1.5 - 65 mm	1
20	Lift Cylinder Axle	1
23	Proximity Bracket — Saw Down Position	1
24	Motion Guard Lid	1
25	Screw, Socket Head Cap, M06 × 1 - 12 mm	6
26	Washer, Flat, M6	4
27	Gas Spring — Motion Guard (PN 38091)	1
28	Bracket — Nitrogen Shock	1
29	Nut, Hex, M6	2
30	Nut, Hex, M8	2
31	Outfeed Slide	1
32	Vice Lead Screw	1
33	Vice Lead Screw Nut	1
34	Hand Wheel (PN 38037)	1

12: DIAGRAMS AND PARTS LISTS

ID	Description	Quantity
35	Bottom Pivot — Lift Cylinder	1
36	Clamp Air Cylinder (PN 39381)	1
37	Infeed Movable Jaw	1
38	AF50 Clamp Block — Saw Table	1
39	Screw, Socket Head Cap, M06 × 1 - 55 mm	7
40	5/16 in. - 1/4 in. NPT Push-to-Connect Elbow	1
41	Kickstand	1
42	M12 × 3 Acme Speed Nut Body (38092)	1
43	Cord Grip, M16 × 1.5	5
44	Lower Head Bump Stop	1
45	Screw, Hex Head Cap, M08 × 1.25 - 16 mm	2
46	Washer, Flat, M8	2
47	Screw, Socket Head Cap, M10 × 1.5 - 90 mm	2
48	Clamp Jaw T-Nut	1
49	Screw, Socket Head Countersunk, M8 × 1.25 - 20 mm	2
50	Screw, Hex Head Cap, M10 × 1.5 - 50 mm	1
51	Washer, Flat, M10	1
52	Stud M12 — Rear Vise Jaw	1
53	Washer, Flat, M12	1
54	Nut, Hex, M12	1

12.3 HEAD CASTING EXPLODED VIEW



12: DIAGRAMS AND PARTS LISTS

12.4 HEAD CASTING PARTS LIST

ID	Description	Quantity
1	Saw Head Casting	1
2	Rear Pivot Casting	1
3	Saw Head Pivot Rod	1
4	Front Blade Guide	1
5	Saw Blade Section	1
6	Blade Guide Knob	2
7	Hydraulic Pivot Arm Casting	1
8	Pivot Arm Mounting Plate	1
9	Blade Cover	1
10	M8 × 10 Vent ScREW	1
11	Screw, Hex Head Cap, M06 × 1 - 20 mm	4
12	Washer, Flat, M6	4
13	Blade Guide Head	2
14	Screw, Socket Head Cap, M08 × 1.25 - 30 mm	2
15	Washer, Flat, M8	2
16	Blade Guide Bearing (PN 38107)	10
17	Axle – Blade Bearing	2
18	Blade Guide Cam	4
19	Snap Ring	4
20	Nut, Hex, M10	4
21	Washer, Split Lock, M10	4
22	Rear Blade Guide	1
23	Belt Cover	1
24	Belt Cover	1
25	Motor Pulley	1
26	Drive Wheel Pulley	1
27	Pulley Door Switch (PN 38081)	1
28-30	Control Box Assembly (PN 38132)	1
	Control Box	1
	Control Box Gasket	1

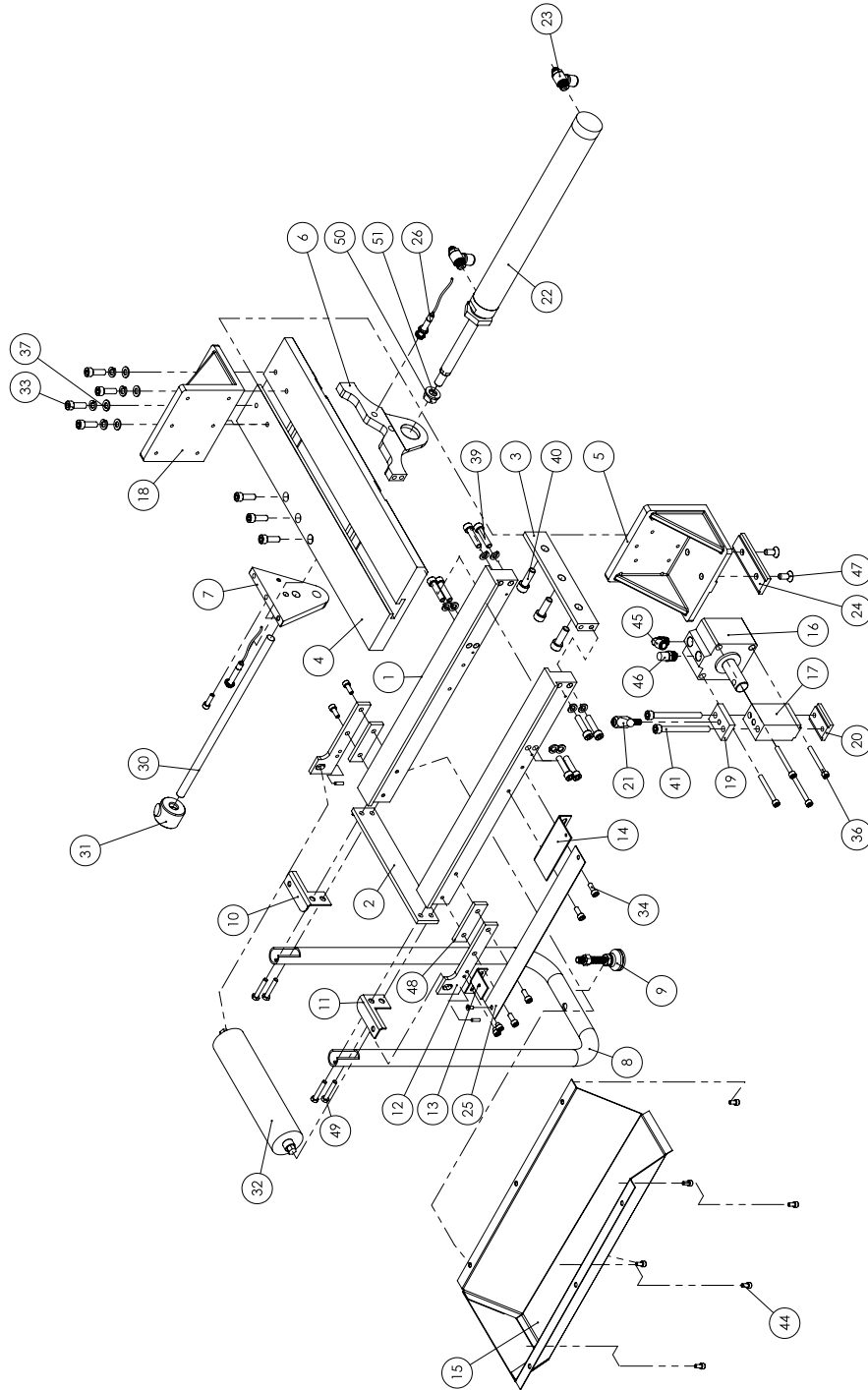
12: DIAGRAMS AND PARTS LISTS

ID	Description	Quantity
	Control Box Top	1
31	Blade Wheel	1
32	Bearing Spacer	1
33	Blade Wheel Bearing Cover	1
34	Wheel Axle Mount	1
35	Axle Spacer	1
36	Blade Wheel Axle	1
37	Blade Wheel Sliding Mount	1
38	Wheel Adjustment Guided	2
39	Bearing	2
40	Tension Rod	1
41	Spacer (Pressure Gauge)	1
42	Tension Handle Hub	1
43	Pressure Gauge	1
44	Belleville Washer 16 mm Shaft Diameter, 16.3 mm ID, 31.5 mm OD, 2 mm Thick	2
45	Tension Handles (PN 38145)	3
46	Blade Tension Spring	1
48	Angled Brush Bracket	1
49	<u>Blade Brush (PN 38033)</u>	1
50	Control Board (PN 34924)	1
51	Control Board Long Spacer	2
52	Control Board Short Spacer	2
53	Molded Saw Cover	1
54	Lower Blade Guide Wheel	1
55	Lower Wheel Axle	1
56	Upper Blade Guard	1
57	Lower Motor Mount	1
58	Upper Motor Mount	1
59	Drip Guard	1
60	Upper Coolant Bracket	1
61	Lower Coolant Bracket	1
62	Chip Flap	1

12: DIAGRAMS AND PARTS LISTS

ID	Description	Quantity
63	Motor Belt (PN 38046)	1
64	Cord Grip, M16 × 1.5	4
65	Pushbutton, 22 mm, Green	1
66	Emergency Stop Switch (PN 30462)	1
67	Pushbutton, 22 mm, Yellow	1
68	Bracket – Clamp Pressure Regulator	1
69	Coolant Switch	1
70	AF50 Motor (PN 38084)	1
71	Ball Valve, 1/4 in. NPT Male and 1/4 in. NPT Female (PN 39352)	2
72	Push-to-Connect, 8 mm OD to 1/4 in. Male NPT	2
73	Straight 1/4 in. Female Coupler	1
74	1/4 in. Coolant Hose	1
75	Reducer, 1/4 in. Female to M8 x 1.25 in.	1
76	Air Regulator (PN 39356)	1
77	3/8 in. tube OD to 3/8 in. NPT	2
78	Push-to-Connect, 12 mm to 8 mm Y Reducer	1
79	Flexible Plastic Conduit End	2
80	Saw Head Conduit Mounting Bracket	1
81	Top Pivot Mount – Lift Cylinder	1
82	Proximity Target – Bottom Position	1

12.5 INFEEED TABLE EXPLODED VIEW



12: DIAGRAMS AND PARTS LISTS

12.6 INFEED TABLE PARTS LIST

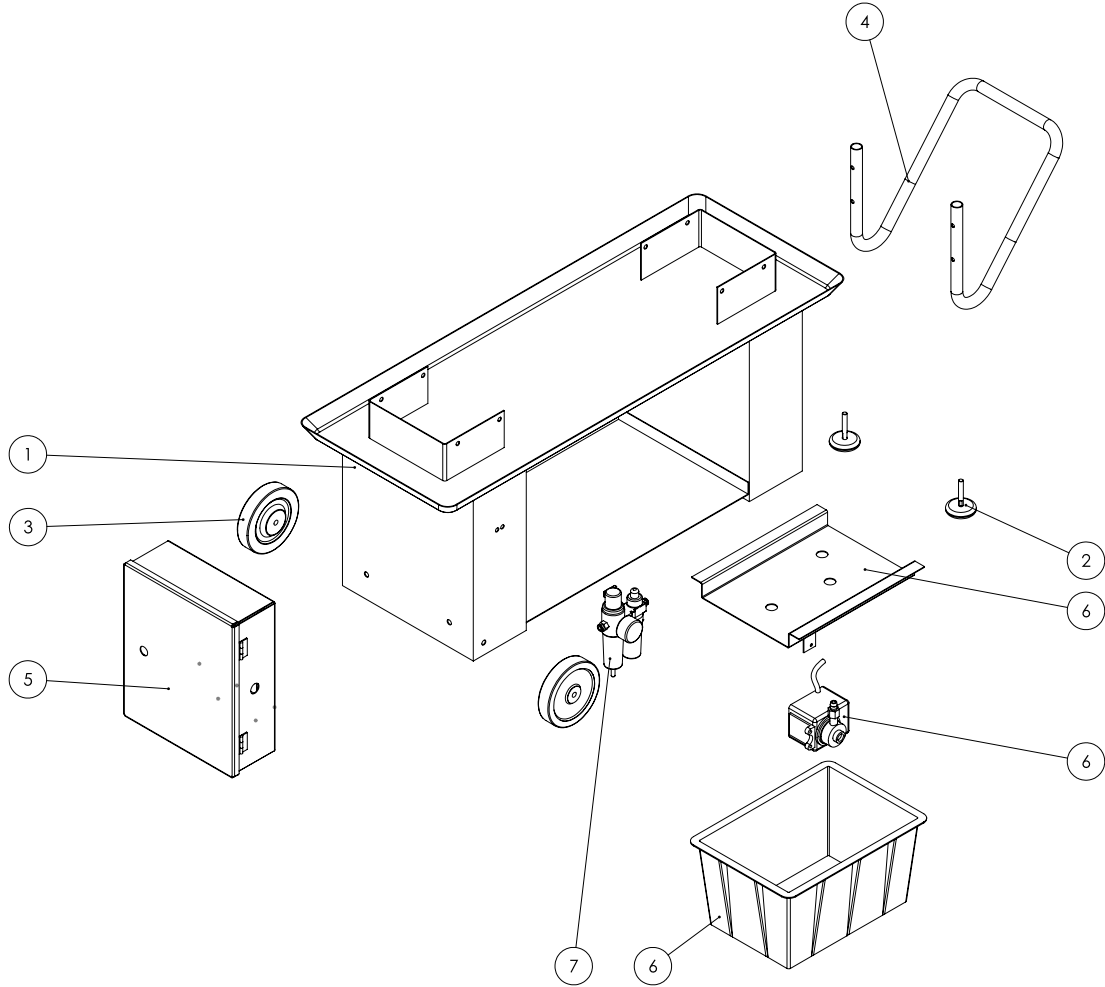
ID	Description	Quantity
1	Infeed Guide Rail	2
2	Infeed End Plate A	1
3	Infeed End Plate B	1
4	Infeed Table	1
5	Infeed Movable Jaw	1
6	Infeed Air Cylinder Mount	1
7	Infeed Table Bracket	1
8	Infeed Support Leg	1
9	Infeed Leveling Foot	1
10	Motion Guard Support — Back	1
11	Motion Guard Support — Front	1
12	Infeed Roller Bracket	2
13	Scale Mounting Bracket — Outboard	1
14	Scale Mounting Bracket — Inboard	1
15	Infeed Table Bottom Cover	1
16	60 mm Air Cylinder (PN 38068)	1
17	Clamp Block — Infeed Table	1
18	Infeed Fixed Vise Jaw	1
19	Top Plate — Clamp Block	1
20	Clamp Block T-Nut	1
21	M8 × 1.25 Clamp Handle	1
22	Infeed Air Cylinder — Body (PN 38069)	1
23	3/8 in. - 1/4 in. NPT Flow-Control Elbow (PN 38099)	2
24	Clamp Jaw T-Nut	1
25	Stainless Scale	1
26	Proximity Sensor (PN 38065)	2
29	Screw, Socket Head Cap, M06 × 1 - 20 mm	1
30	M12 × 3 - 330 mm Acme Length Adjustment Screw (PN 38093)	1
31	M12 × 3 Acme Speed Nut Body (38092)	1
32	Roller — Infeed Table	1

12: DIAGRAMS AND PARTS LISTS

ID	Description	Quantity
33	Screw, Socket Head Cap, M08 × 1.25 - 25 mm	7
34	Screw, Socket Head Cap, M06 × 1 - 16 mm	6
36	Screw, Socket Head Cap, M06 × 1 - 55 mm	7
37	Washer, Flat, M8	4
38	Washer, Split Lock, M8	12
39	Screw, Socket Head Cap, M08 × 1.25 - 35 mm	8
40	Screw, Socket Head Cap, M10 × 1.5 - 30 mm	3
41	Screw, Socket Head Cap, M08 × 1.25 - 90 mm	2
42	Screw, Cone Point Set, M4 × 0.07 - 16 , 90°	3
43	Screw, Socket Head Cap, M06 × 1 - 6 mm	2
44	Screw, Socket Head Cap, M05 × 0.8 - 10 mm	6
45	5/16 in. - 1/4 in. NPT Push-to-Connect Elbow	1
46	1/4 in. NPT Muffler	1
47	M8 × 1.25 - 20 mm, Screw, Socket Head Countersunk	2
48	Infeed Roller Spacer Plate	2
49	Screw, Hex Head Cap, M06 × 1 - 35 mm	4
50	Nut, Hex, M12	1
51	Washer, Flat, M12	1
52	Cord Grip, M16 × 1.5	2

12: DIAGRAMS AND PARTS LISTS

12.7 STAND EXPLODED VIEW



12.8 STAND PARTS LIST

ID	Description	Quantity
1	AF50 Stand Base	1
2	Stand Leveling Foot	2
3	Stand Wheel	2
4	Handle	1
5	Electrical and Air Cabinet	1
6	Coolant Tank	1
7	FRL Filter-Regulator-Lubricator (PN 38829)	1



PNEUMATIC SCHEMATICS

IN THIS SECTION, YOU'LL LEARN:

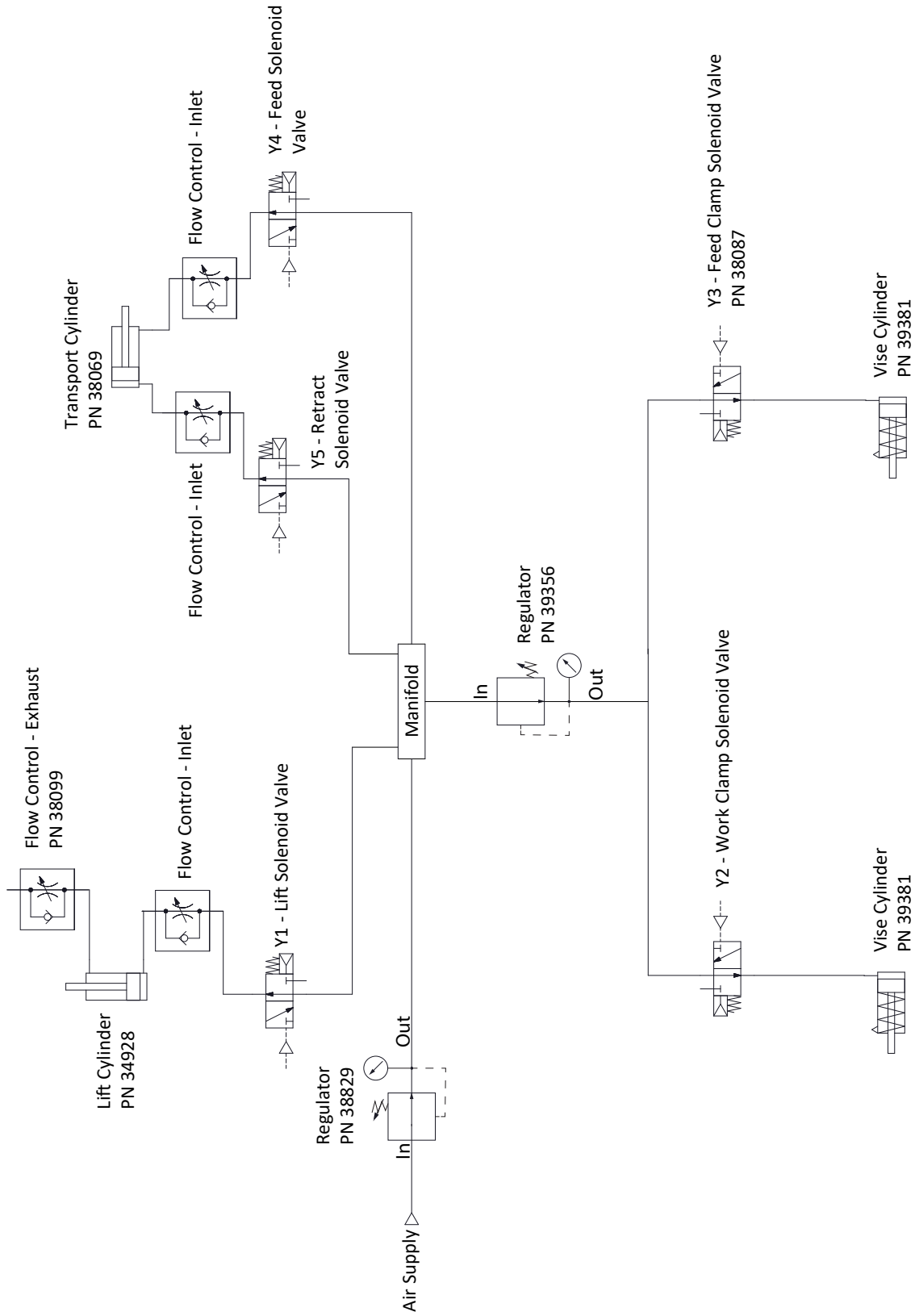
- About the pneumatic schematics for this machine's pneumatic systems.

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13: PNEUMATIC SCHEMATICS

13.1 BANDSAW PNEUMATICS



ELECTRICAL SCHEMATICS

IN THIS SECTION, YOU'LL LEARN:

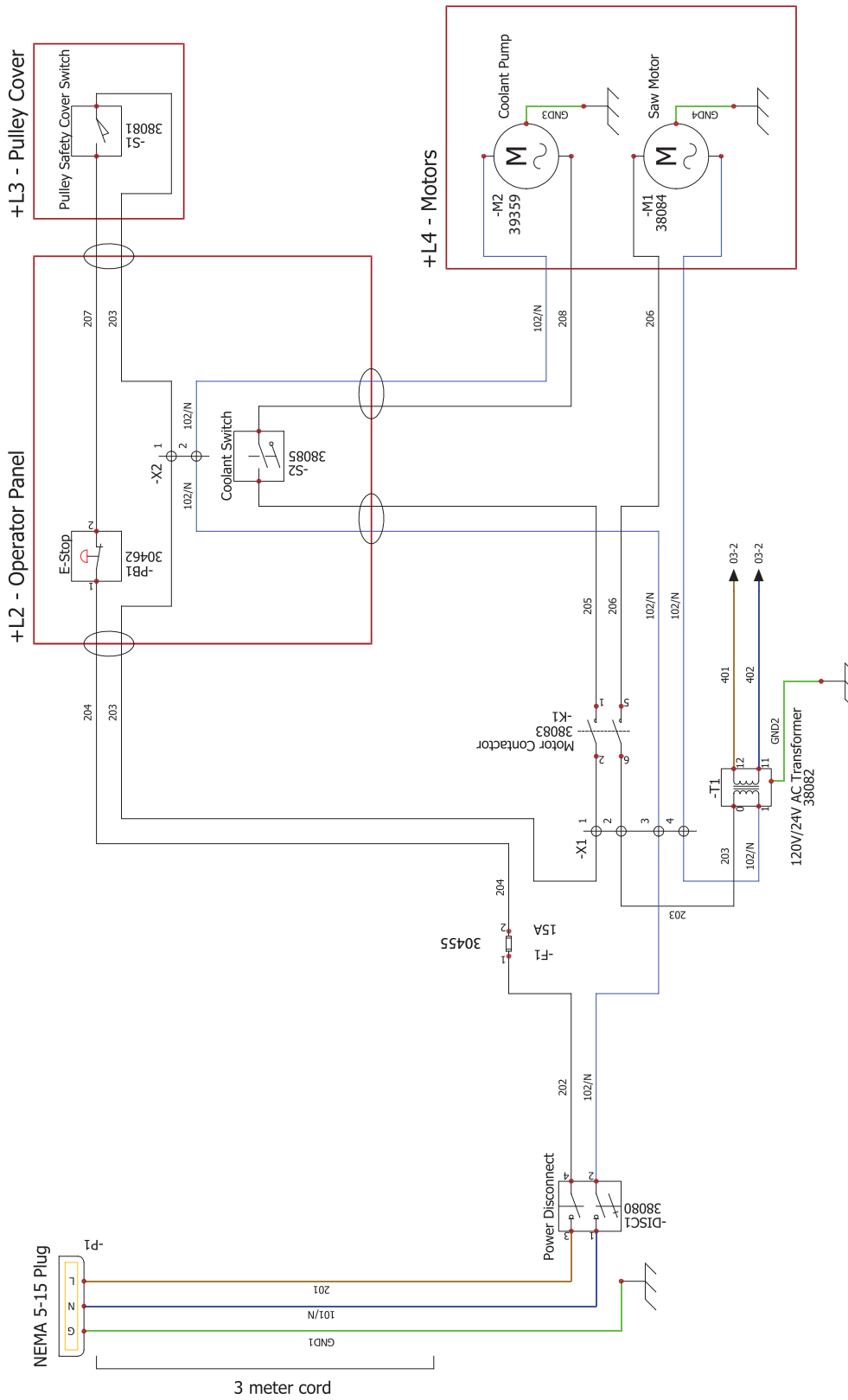
- About the electrical schematics for this machine's electronics.

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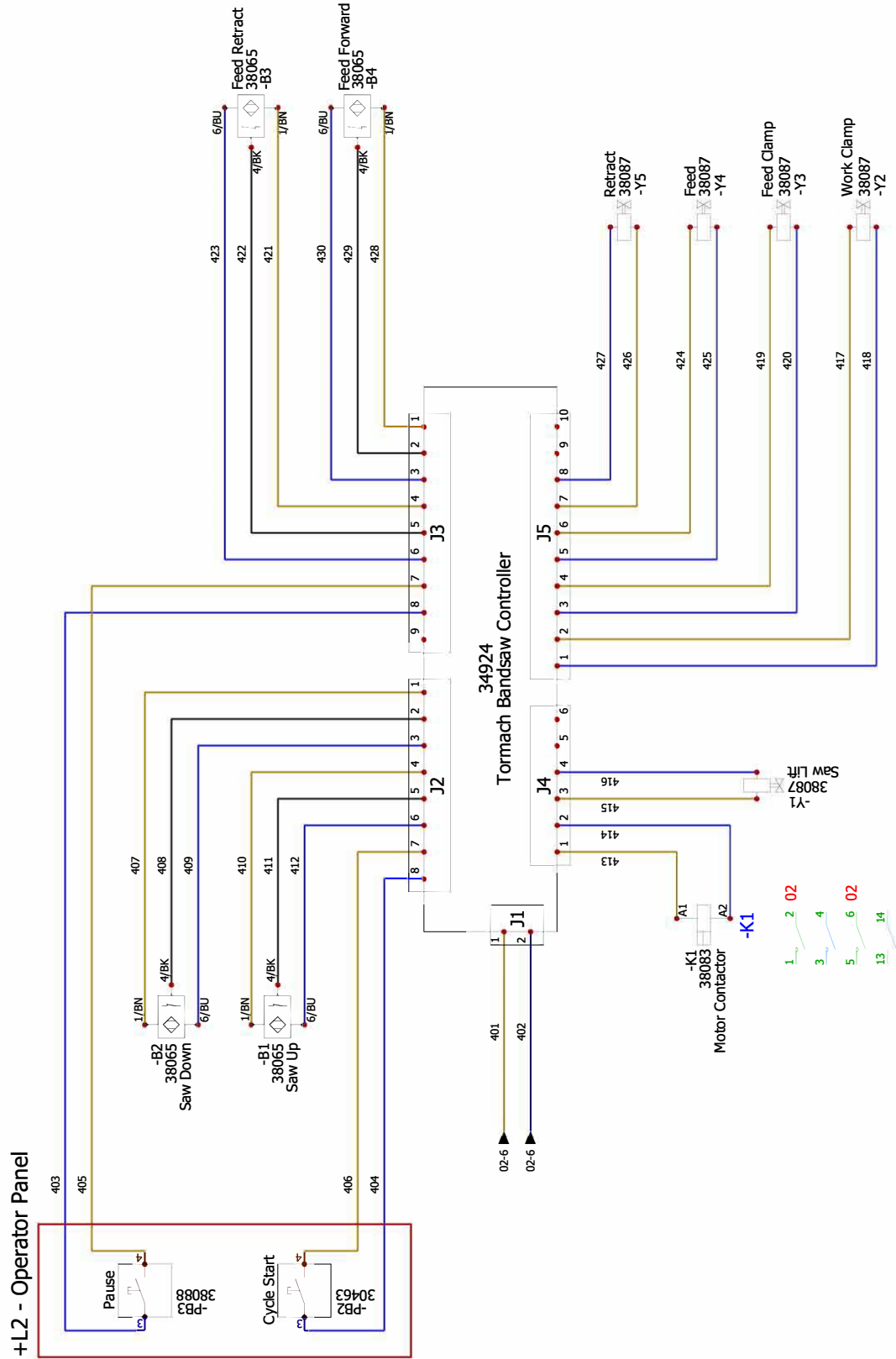
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14: ELECTRICAL SCHEMATICS

14.1 115 VAC POWER

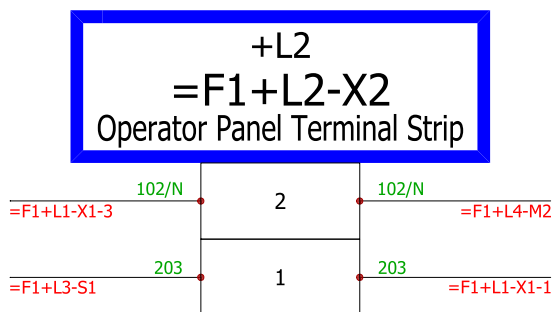
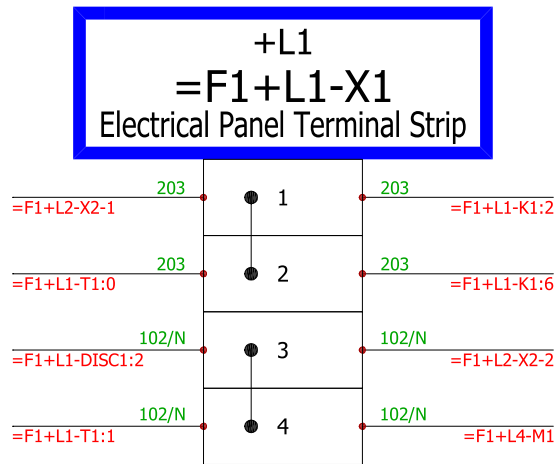


14.2 CONTROLS AND SENSORS

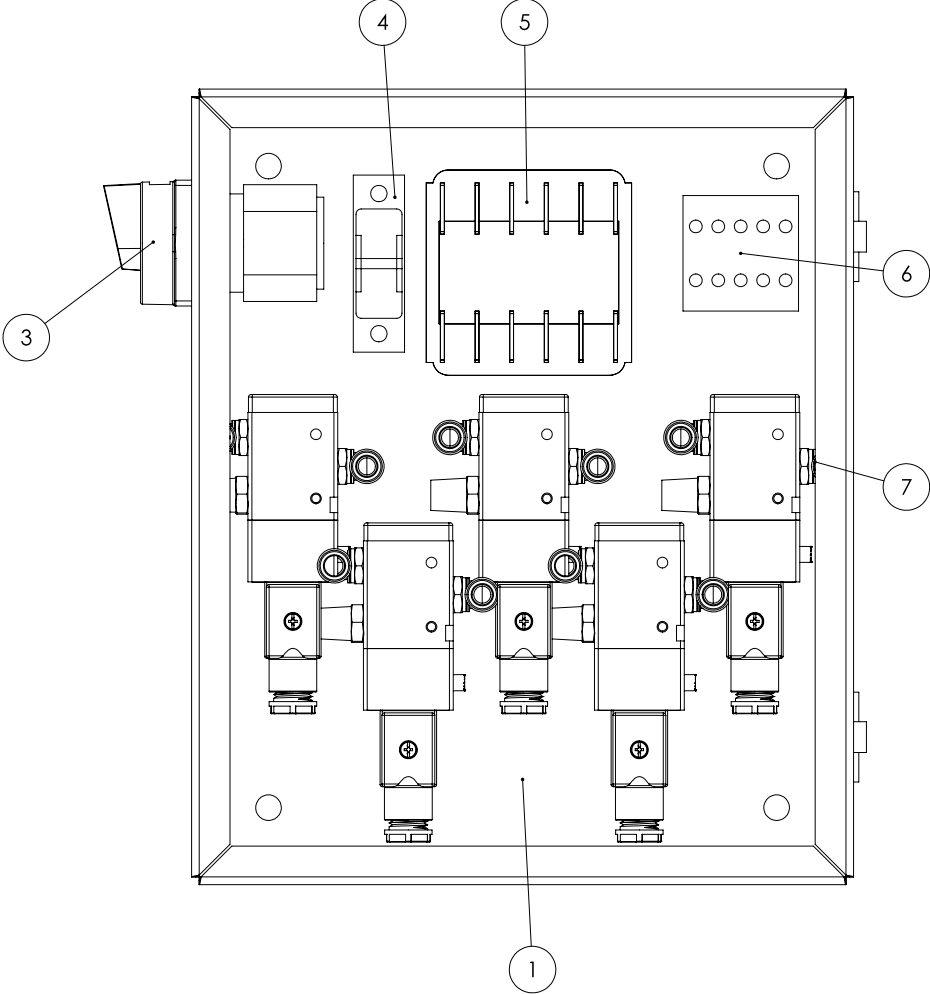


14: ELECTRICAL SCHEMATICS

14.3 TERMINAL STRIPS



14.4 ELECTRICAL PANEL LAYOUT



14: ELECTRICAL SCHEMATICS

14.5 ELECTRICAL PANEL PARTS LIST

ID	Description	Quantity
1	Electrical and Air Cabinet	1
3	Main Disconnect Switch	1
4	Single Block 10 × 38 mm Fuse Holder	1
5	Transformer (120 Vac - 24 Vac, 50 VA)	2
6	K1 Contactor	1
7	24 Vac Solenoid (with fittings) (38087)	5