



# Busy Bee Tools

## Metal Band Saw

### BBMBS87



## User's Manual



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V1.0-2026

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## WARNING

**DO NOT DISCARD THE PACKAGING MATERIAL UNTIL AFTER ASSEMBLY AND FIRST RUN IS PERFORMED. THIS WILL FACILITATE ALL WARRANTY CLAIMS IN CASE OF ANY DAMAGE.**

This manual serves as an indispensable source of critical safety instructions pertaining to the correct setup, operation, maintenance, and servicing of this machine/tool. It is of paramount importance that you not only retain this document but also reference it regularly. Furthermore, use it to educate and inform other individuals operating this equipment. Neglecting to thoroughly read, comprehend, and adhere to the directives contained within this manual could result in severe consequences, including fire hazards or life-threatening personal injuries such as amputations, electrocution, or even fatalities. The owner of this machine/tool assumes complete responsibility for ensuring its safe utilization. This responsibility encompasses, but is not restricted to, the following:

1. Proper Installation: Ensure the machine/tool is installed in a secure and safe environment.
2. Personnel Training: Conduct comprehensive training for all personnel authorized to operate the equipment.
3. Usage Authorization: Authorize individuals to use the machine/tool only after ensuring their competence.
4. Inspection and Maintenance: Regularly inspect and maintain the equipment to guarantee its continued safe operation.
5. Manual Availability: Make this manual readily available and ensure that all relevant individuals understand its content.
6. Safety Devices: Implement and maintain all prescribed safety devices.
7. Tool Integrity: Ensure the integrity of cutting/sanding/grinding tools.
8. Personal Protective Equipment (PPE): Enforce the usage of appropriate personal protective equipment.

It is crucial to recognize that the manufacturer cannot be held responsible for any injuries or property damage resulting from negligence, inadequate training, unauthorized machine modifications, or improper use. It is incumbent upon the owner and operators to exercise utmost diligence and care in the safe operation of this equipment. Your commitment to safety is paramount, and it is essential to mitigate any risks associated with its usage.



It is crucial to be aware that certain dust generated during power sanding, sawing, grinding, drilling, and various construction activities may contain chemicals recognized that have the potential to cause cancer, birth defects, or other reproductive harm. Examples of these chemicals include:

- Lead, typically found in lead-based paints.
- Crystalline silica, which can be present in materials like bricks, cement, and other masonry products.
- Arsenic and chromium, originating from chemically treated lumber.

The level of risk associated with exposure to these chemicals can vary, depending on the frequency of engagement in such activities. To mitigate your exposure to these chemicals and safeguard your well-being, consider the following precautions:

1. Work in a Well-Ventilated Area: Perform your tasks in an environment that is adequately ventilated. Proper ventilation helps disperse harmful particles and reduces the concentration of airborne contaminants.
2. Utilize Approved Safety Equipment: Employ approved safety equipment specifically designed for the task at hand. Dust masks engineered to filter out microscopic particles are particularly effective in safeguarding your respiratory health.

By adhering to these safety measures, you can significantly reduce the potential risks associated with exposure to these chemicals and ensure a safer work environment for yourself and those around you. Prioritizing safety and responsible handling of materials is essential in all construction activities.

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# Introduction

It is with distinct honor and excitement that we present to you the BBMBS87 Busy Bee Tools Metal Band Saw, a premier addition to our esteemed line of precision Metalworking equipment. At Busy Bee Tools, we are committed to engineering excellence, and this machine exemplifies our dedication to providing craftsmen with superior tools for their trade.

This manual has been meticulously crafted to guide you through the setup, safe operation, and maintenance of your new BBMBS87 Professional Metal Band Saw. By following the detailed instructions and recommendations contained within these pages, you can anticipate many years of dependable and satisfying performance. This commitment to quality underscores Busy Bee Tools' promise of enhancing customer satisfaction through innovation and reliability.

Included within this manual are precise specifications, illustrations, and photographs that represent the BBMBS87 in its current configuration. Please note that in our pursuit of continual improvement and to exceed industry standards, Busy Bee Tools reserves the right to make enhancements to this model without prior notice.

For your convenience, we continuously update all our product manuals which are available on our website at [www.busybeetools.com](http://www.busybeetools.com) . We encourage you to visit this site regularly to download the latest updates and ensure that you are always informed about the best practices for operating and maintaining your machine. At Busy Bee Tools, your safety and satisfaction are our utmost priority, and we are dedicated to ensuring that your experience with the BBMBS87 is exceptional.

**Welcome to the Busy Bee Tools family, where craftsmanship meets innovation.**

# General Machine Information

## Machine Identification



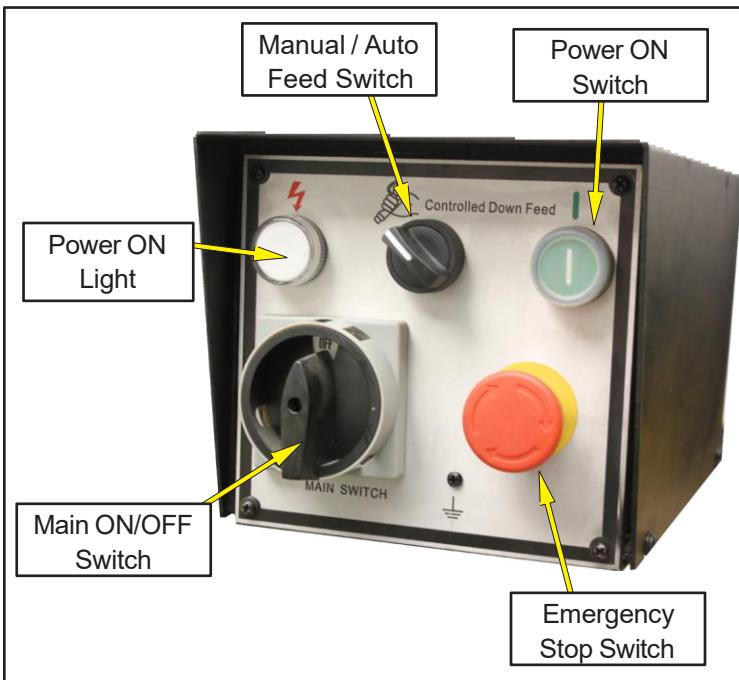
Figure 1: Machine Identification

# Controls and Components

## Machine Functional Parts

### Control Panel

Contains the main ON/OFF switch, the emergency switch, the coolant pump's ON/OFF switch, and the manual/Auto feed switch.



### Base, Coolant Pump and Coolant Container

This part is an assembly of the saw base, vice, and coolant pump system.

### Hydraulic Piston Control

The hydraulic piston controls the speed of the descent of the blade onto the material. There are two controls for this piston; the first is a shutoff valve that will function as an immediate OFF feature, and the second is a knob that will control the speed of the descent of the blade onto the material. Refer to Figure 3.



Coolant Pump and Container

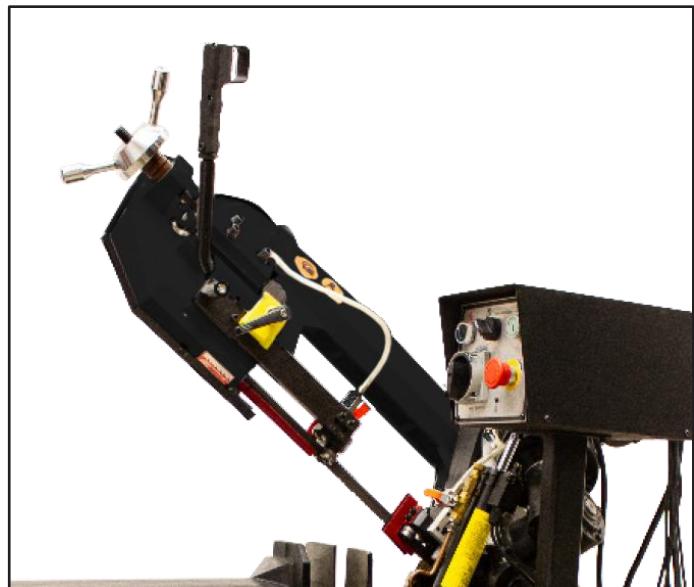


Figure 1: The Saw Arm

### The Saw Arm

This part of the machine consists of the drive part (gearbox, motor, and control arm), the blade tensioning and guide slide and blocks' part, see figure 1.

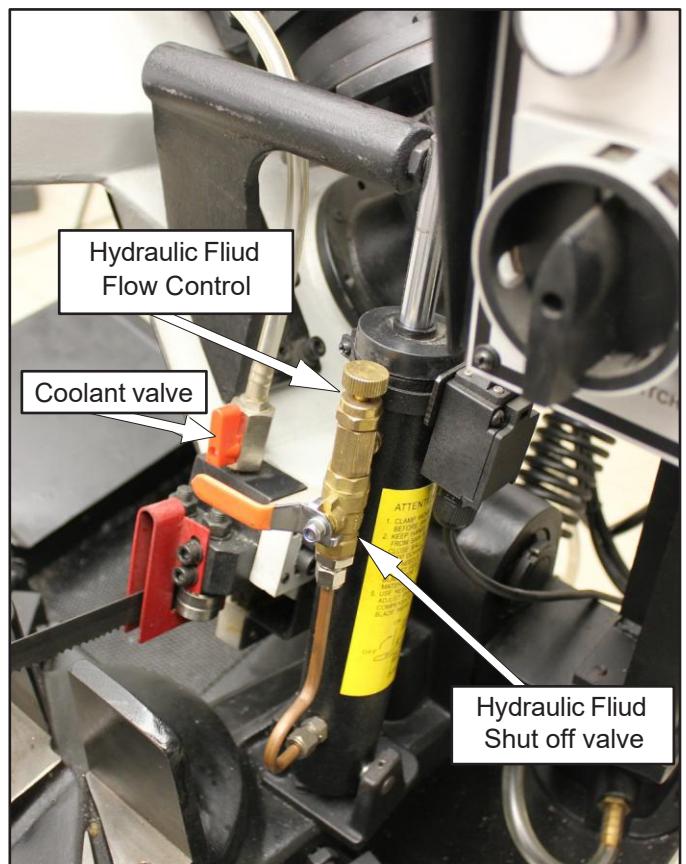


Figure 3: Hydraulic Control.

# Machine Data Sheet

Specification	Capacity
Circular Cutting @90°	170mm (6.7")
Rectangular Cutting @90°	200X170mm (7.8"X6.7")
Circular Cutting @60°	70mm (2.7")
Rectangular Cutting @60°	60X60mm (2.3"X2.3")
Circular Cutting @45°	120mm (4.7")
Rectangular Cutting @45°	110X110mm (4.3"X4.3")
Blade Speed at 60Hz	50 MPM
Blade Size	20X0.9X2085 mm
Motor Power	1.1 KW- 1.5HP- 14.1 Amp- 120Volts
Drive Type	Gear Box
Packaging Size	125X51X115 cm
N.W./ G.W.	173/ 225 KG

## Features:

Centralized control panel centralized next to the saw arm.

Heavy-duty steel base.

Single phase.

Adjustable Hydraulic Down feed.

Worm gear box has hardened steel gears.

Quick release vise for fast changes.

Miter cutting ability blade.

Wheels with Heavy-duty ball bearings.

Magnetic safety switch.

Coolant pump and reservoir.

# General and Specific Safety Instructions

## General Shop Safety instructions

 Your safety is of the utmost importance. Prior to starting the assembly of this machine, it is imperative that you thoroughly read the instruction manual. Safety symbols and signal words have been incorporated into this manual to draw your attention to potentially hazardous conditions and to convey the significance of the safety messages. It is essential to remember that these safety messages alone cannot eliminate danger and should not replace the implementation of proper accident prevention measures.

(Minor or Moderate Injury): This symbol indicates a potentially hazardous situation that, if not avoided, MAY result in minor or moderate injury. It may also serve as a warning against unsafe practices.



Warning Symbol (Death or Serious Injury): The warning symbol signifies a potentially hazardous situation that, if not avoided, COULD result in death or serious injury.



Danger Symbol (Imminent Death or Serious Injury): The danger symbol is used to indicate an imminently hazardous situation that, if not avoided, WILL result in death or serious injury.



In addition to these symbols, you will also come across a notice symbol, which is employed to alert the user to valuable information regarding the proper operation of the machine. By diligently adhering to these safety symbols and heeding the information in this manual, you can significantly enhance your safety while operating the equipment.

## General Machine Safety

1. Thoroughly Review the Entire Manual Before Operating Machinery: It is crucial to read and understand the complete manual before commencing any machinery operations. Machinery can pose serious injury hazards to individuals who lack proper training and familiarity with its operation.
2. Always utilize CSA Approved Safety Glasses During Machinery Operation: For your safety, it is imperative to wear safety glasses that meet ANSI (American National Standards Institute) standards when using machinery.

Conventional eyeglasses are not equipped with impact-resistant lenses and should not be considered a substitute for proper safety glasses.

3. Always Wear a CSA Approved Respirator When Operating Dust-Producing Machinery: When operating machinery that generates dust, it is essential to wear a respirator that has been approved by NIOSH (National Institute for Occupational Safety and Health). Wood dust is classified as a carcinogen and can lead to cancer and severe respiratory illnesses. Your respiratory protection is paramount to your health and safety.
4. Utilize Hearing Protection When Operating Machinery: Always wear hearing protection when operating machinery. Prolonged exposure to machinery noise can result in permanent hearing damage, and protecting your hearing is vital for your long-term well-being.
5. Adhere to Proper Apparel Guidelines: Avoid wearing loose clothing, gloves, neckties, rings, or jewelry that could potentially become entangled in moving parts of the machinery. Additionally, wear a protective hair covering to confine long hair and ensure you have non-slip footwear to prevent accidents.
6. Do Not Operate Machinery When Fatigued, or Under the Influence of Substances: Never operate machinery when you are tired, or if you are under the influence of drugs or alcohol. It is crucial to be always mentally alert when running machinery to maintain your safety and the safety of those around you.
7. Authorize Trained and Supervised Personnel Only: Permit only individuals who have received proper training and supervision to operate machinery. Ensure that operational instructions are not only safe but also clearly understood by those using the equipment.
8. Keep Children and Visitors at a Safe Distance: Maintain a safe distance between all children and visitors and the work area where machinery is in use.
9. Secure Your Workshop for Child Safety: Take measures to childproof your workshop, including the use of padlocks, master switches, and the removal of start switch keys to prevent unauthorized use by children.
10. Never Leave Machinery Running Unattended: It is essential never to leave machinery unattended while it is still running. Turn off the power and allow all moving parts to come to a complete stop before leaving the machine unattended.
11. Avoid Dangerous Environments: Refrain from using machinery in locations that are damp, wet, or where flammable or noxious fumes may be present. Always ensure a safe operating environment.
12. Maintain a Clean and Well-Lit Work Area: Keep your work area clean and well-lit to prevent accidents. Clutter and dark shadows can pose significant safety risks.



13. Use Properly Rated Extension Cords: When necessary, use a grounded extension cord rated for the amperage of the machine. Undersized cords can overheat and lose power. Replace damaged extension cords promptly. Do not use extension cords with 220V machinery.
14. Disconnect from Power Source Before Servicing: Always disconnect the machinery from the power source before servicing it. Ensure the switch is in the OFF position before reconnecting.
15. Maintain Machinery with Care: To ensure the best and safest performance, maintain your machinery with care. Keep blades sharp and clean and follow the manufacturer's instructions for lubrication and changing accessories.
16. Verify Guards Are in Place and Functional: Before using machinery, confirm that all safety guards are in place and functioning correctly. Never operate machinery if guards are missing or not working as intended. Your safety relies on the proper functioning of these guards.
17. Remove Adjusting Keys and Wrenches: Prior to turning on the machinery, it is essential to cultivate the habit of checking for adjusting keys and wrenches and ensuring they are removed. Leaving such tools in place can result in accidents.
18. Inspect for Damaged Parts Before Use: Before using the machinery, conduct a thorough inspection for damaged parts. Check for any issues such as binding or misalignment of parts, broken components, improperly mounted parts, loose bolts, or any other conditions that might impact the safe operation of the machine. Any damaged parts should be promptly repaired or replaced.
19. Utilize Recommended Accessories: Consult the instruction manual to identify the recommended accessories for your machinery. Using improper accessories can pose a risk of injury, so it's essential to adhere to the manufacturer's recommendations.
20. Avoid Forcing Machinery: Operate the machinery at the speed for which it was designed and avoid forcing it beyond its intended capabilities.
21. Secure the Workpiece: Whenever possible, use clamps or a vise to secure the workpiece. A properly secured workpiece not only protects your hands but also allows you to use both hands to operate the machine safely.
22. Avoid Overreaching: Always maintain proper footing and balance. Overreaching can compromise your stability and pose a risk of accidents.
23. Beware of Workpiece Ejection: Be aware that certain machines may eject the workpiece toward the operator. Take precautions and avoid conditions that could lead to workpiece "kickback."
24. Lock Mobile Bases (If Used) Before Operation: If your machinery is equipped with mobile bases, ensure they are locked securely before operating the equipment. This prevents unintended movement during use.
25. Understand Dust Hazards: Recognize that some dust types can be hazardous to respiratory systems, both for people and animals, particularly fine dust particles. Familiarize yourself with the hazards associated with the specific type of dust you will be exposed to and always wear a respirator approved for that specific type of dust to protect your respiratory health.

### **Metal Band Saw Specific Safety Instructions**

1. Maintain Blade Condition: Do not operate the machine with a dull, cracked, or excessively worn blade. Inspect the blades for cracks and missing teeth before each use to ensure they are in proper working condition.
2. Mind Your Hand Placement: Never position your fingers or thumbs in line with the cut. There is a risk of fingers being crushed in the vise or by falling machine components or being cut by the blade.
3. Beware of Entanglement Hazards: Do not operate the bandsaw without the blade guard securely in place. Otherwise, loose clothing, jewelry, long hair, and work gloves could be drawn into the moving parts, leading to dangerous entanglements.
4. Exercise Caution During Blade Replacement: When replacing blades, ensure that the teeth are facing toward the workpiece. Wear protective gloves to shield your hands and safety glasses to safeguard your eyes during this process.
5. Handle Workpieces Safely: Always provide adequate support for the workpiece using the table, vise, or another appropriate support fixture. Flagging long pieces helps prevent tripping hazards. Never attempt to hold the workpiece with your hands during a cut.
6. Prevent Loss of Stability: Be cautious with unsupported workpieces, as they can compromise the machine's stability and potentially lead to the machine tipping over, resulting in serious injuries.
7. Address Power Interruptions: After a power interruption, unplug the machine. Machines without magnetic switches can restart automatically when power is restored, posing a safety hazard. Disconnecting the power source ensures your safety during these situations.
8. Fire Hazard with Magnesium Cutting: Exercise extreme caution when cutting magnesium. The use of incorrect cutting fluid can result in chip ignition and a potential explosion.
9. Safety in Handling Cutting Fluid: Always adhere to the manufacturer's cutting fluid safety instructions. Pay close attention to guidelines regarding contact,



contamination, inhalation, storage, and disposal warnings. Spilled cutting fluid can create slipping hazards and pose toxicity risks.

10. Work Area Awareness: Never leave a machine running unattended. Be attentive to the actions of others in the vicinity to prevent unintended accidents.
11. Maintenance and Service Safety: When performing inspections, adjustments, and maintenance, ensure the machine is OFF and disconnected from the power source. Wait for all moving parts to come to a complete stop before proceeding with any service work.
12. Hearing Protection and Hazards: Be aware of the potential hazards associated with noise generated by the blade, workpiece vibration, material handling, and power transmission. Prolonged exposure to such noise can lead to permanent hearing loss, and interfere with communication, and audible signals. Always wear hearing protection to safeguard your hearing.
13. Caution with Hot Surfaces: Due to friction during operation, the workpiece, chips, and certain machine components may become hot enough to cause burns. Exercise caution and avoid direct contact with these hot surfaces to prevent injury.

## Power Supply Requirements

### Circuit Requirements and Motor Information

The motor Draws 14.1 Amps at 120 Volts.

For optimal safety and performance, we strongly recommend the use of a dedicated circuit for this machine. It is imperative that you connect your machine to a grounded circuit that is rated for the specified amperage as outlined below. It is essential to note that you should never replace a circuit breaker on an existing circuit with one of higher amperage without seeking guidance from a qualified electrician to ensure compliance with local wiring codes. If you have any doubts regarding the wiring codes applicable in your area or if you intend to connect your machine to a shared circuit, it is highly advisable to consult a qualified electrician for professional guidance and assistance.

### Circuit Breaker Requirement..... 20 Amps

By adhering to these electrical requirements and consulting with a qualified electrician when needed, you can ensure both the safety and efficient operation of your machine. The recommended plug and receptacle are NEMA 5-15P.

### Grounding

Grounding plays a critical role in minimizing the risk of electric shock in the event of an electrical short. It is essential to ensure that the grounding wire within the power cord is correctly and securely connected to the grounding prong on the plug. Additionally, the electrical outlet used must be properly installed and grounded to effectively provide this safety feature.



All electrical connections must be established in strict accordance with the local electrical codes and ordinances governing your area. By adhering to these grounding guidelines and local regulations, you can significantly enhance the safety of your electrical system and reduce the risk of electric shock hazards.

### Extension Cords

The use of extension cords is not recommended. It is advisable to plan the placement of your equipment and the installation of wiring in a manner that eliminates the necessity for extension cords.

However, in cases where it is essential to use an extension cord with your 120 V machine, please follow these guidelines:

- Utilize a cord that is at least **10 gauge** in thickness.
- Ensure the extension cord does not exceed a length of **50 feet**.
- The extension cord **must include a ground wire** and plug pin for safety.



Figure 4: NEMA5-15 Plug and receptacle.

For extension cords exceeding 50 feet in length, it is imperative that a qualified electrician appropriately sizes the cord to prevent motor damage and ensure safe operation.

By adhering to these guidelines and seeking professional assistance, when necessary, you can maintain the safety and effectiveness of your equipment while using extension cords as a temporary solution.

## Set-up Instructions

### Tools Needed

To successfully complete the setup process for your machine, please note that the following items are required but not included with your purchase:

- Safety Glasses... ..... 1 pair per person
- Solvent Cleaner ..... 1 bottle
- Shop Towels ..... 1 roll
- Mounting Hardware ..... optional
- Forklift or Hoist ..... 1 unit
- Assistant ..... 1 person
- Wrench set ..... 1 set

These essential items will contribute to a safe and efficient setup of your machine. Please ensure you have these on hand before proceeding with the installation. Your safety, and the effectiveness of your setup are our top priorities.

### Unboxing the Machine

We take great care to ensure that the Model BBMBS87 is securely packed before it leaves our warehouse. In the rare event that you notice any damage to the machine after signing for delivery, we urge you to take immediate action. Please call our Customer Service team at 1-800-461-2879 for guidance on how to proceed.

It's crucial to retain both the crate and all the packing materials in case they need to be inspected by the carrier or their representative. This precaution will greatly facilitate the process of filing a freight claim, should that become necessary.

Once you have thoroughly assessed the condition of your shipment and are entirely satisfied, we recommend conducting an inventory of the contents. Your satisfaction and confidence in the received product are of paramount importance to us.

## Hardware Packing List

### Initial Clean up

Unpainted surfaces of the components are initially coated with a protective layer of waxy oil, a preventive measure aimed at preventing corrosion during the shipping process. The removal of this protective coating necessitates the utilization of a solvent cleaner or degreaser, before using the cleaner test it on an inconspicuous part of the machine to make sure that it'll not remove or damage the paint. In cases where comprehensive cleaning is warranted, certain components may require disassembly. To ensure peak operational efficiency, it is essential to thoroughly clean all mobile components and sliding-contact surfaces.

**It is crucial to refrain from using chlorine-based solvents, such as acetone or brake parts cleaner, as these can potentially cause damage to painted surfaces.** In all instances, strict adherence to the manufacturer's guidelines pertaining to the application of cleaning products is of paramount importance.

**During the process of initiating the machine cleanup, it is imperative to operate within a well-ventilated environment. This precaution is particularly crucial because certain degreasers and cleaning agents may comprise chemicals that pose health hazards.**

### Machine Installation

This machine comes mostly assembled with the exception of the base. Use the 8 bolts and nuts to assemble the base make sure it is secured and tightened well. When lowering the machine on to the base it is important to ensure that the base is sitting correctly under the machine see figure 5.

### Machine Placement and Floor Mounting.

To ascertain the weight and footprint specifications of your machine, please consult the Machine Data Sheet. It's important to note that certain flooring may necessitate supplementary reinforcement to adequately support both the machine and the operator. In your considerations, consider both current requirements and anticipated future needs, as well as the dimensions of the material to be processed through each machine and provisions for auxiliary stands, worktables, or other machinery.



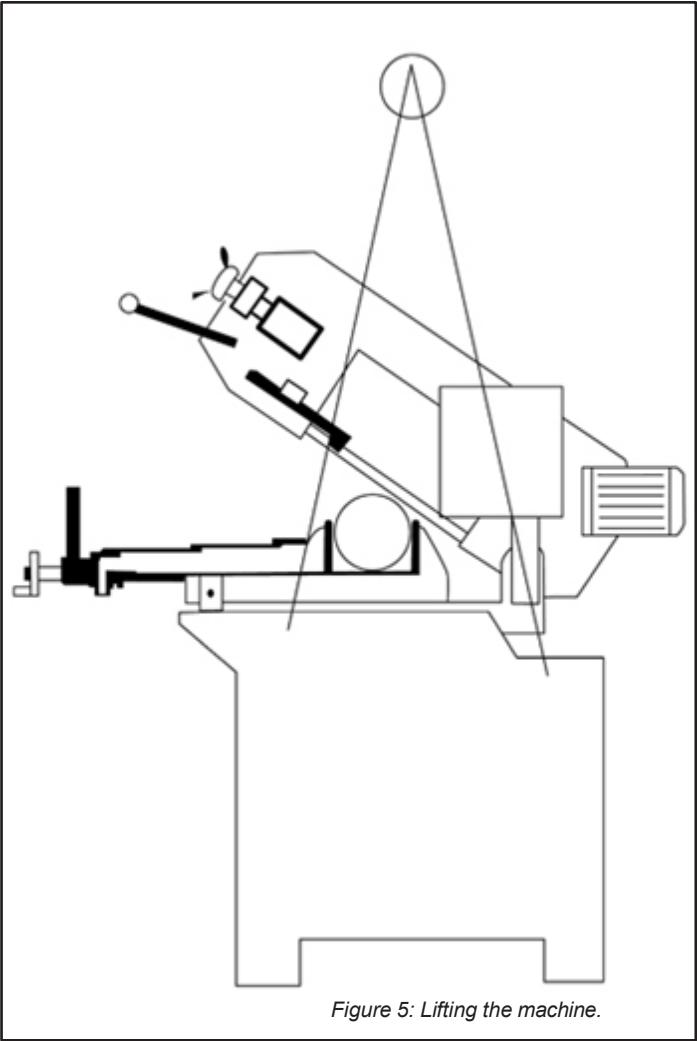


Figure 5: Lifting the machine.

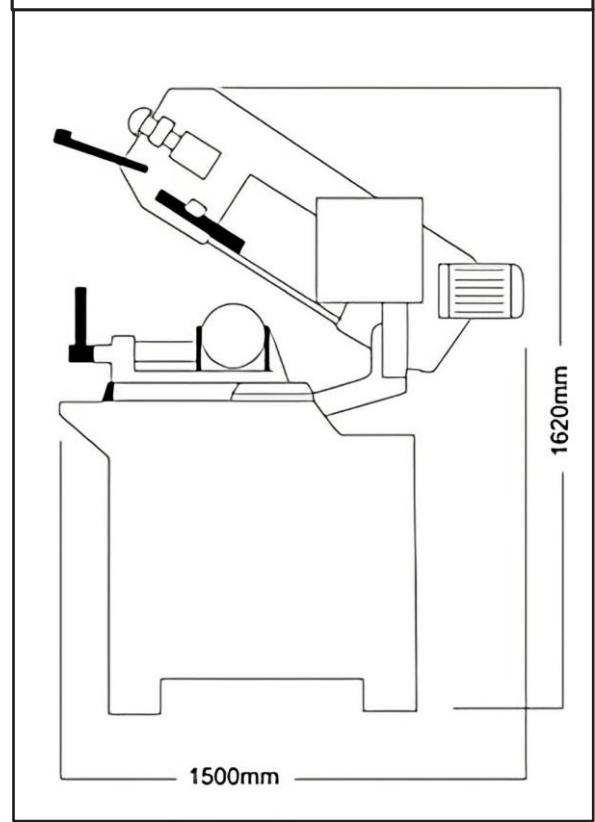
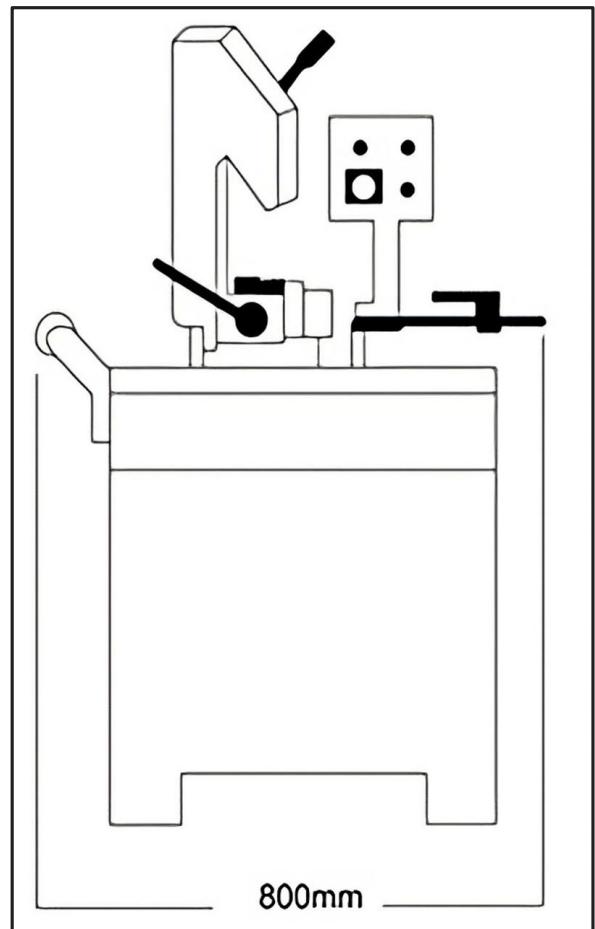


Figure 6: Machine's Footprint and measurements.

Reference Figure 6 for guidance on the minimum working clearances. To enable the move of the band saw, the initial step necessitates the unboxing of the equipment. Subsequently, a suitable means for transport must be made, a forklift, a truck, or a hoisting apparatus equipped with straps, as exemplified in the figure presented below. This machinery should be precisely positioned at the designated site, allowing for a substantial perimeter clearance to facilitate maneuverability and accommodate the machining of lengthy metal stock pieces. The area behind the machine must remain unobstructed, ensuring a minimum distance of no less than 800 millimeters (0.8 meters) away from any wall. Once the machinery has been carefully placed in the desired location, anchoring is completed, mark and drill the concrete floor, then use robust anchors to securely fasten the machinery in position.

### How to Use Your Band Saw

This saw has been designed to cut all types of metal, with different shapes and profiles, it is used in general workshops, as well as mechanical/ structural work. Only one operator is needed to use this saw, please refer to the figure 7 for the best operator position.

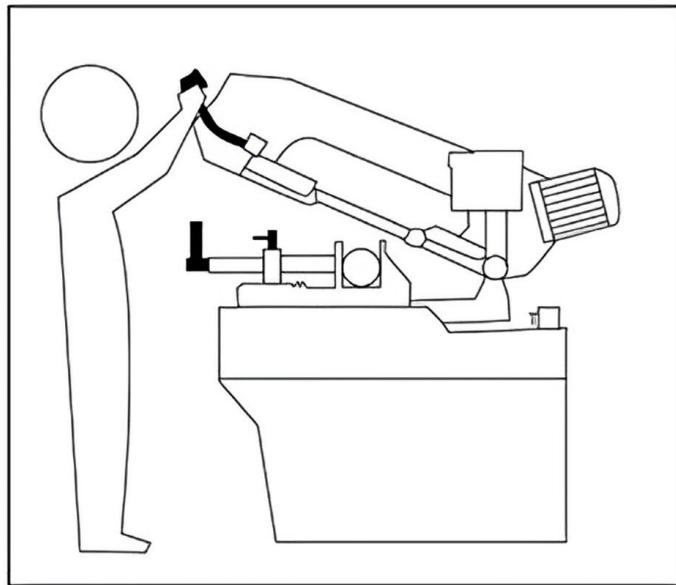


Figure 7: Operator's Position.

Before starting each cutting operation, ensure that the part is firmly clamped in the vice and that the end is properly supported.

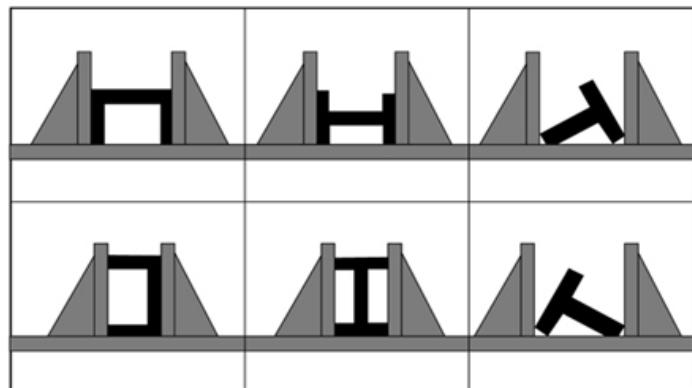


Figure 8: bare profile positioning.

Figure 8 illustrates some examples of the correct way to clamp the different bar profiles. Consider the cutting capacity of the machine to achieve a good efficient cut and to protect the blade.

Ensure the size of blade installed meets the specifications outlined in the Machine Data Sheet of the manual.

If the blade gets stuck in the cut, stop the machine immediately, disconnect the machine from the power source, open the vice slowly, and remove the part; then check the part and the blade for any damage.

Before carrying out any repairs please consult with our technical support team.



# Adjustments and Tuning

## Blade tension

The blade tension is very important for the proper and safe operation of this saw. Proper blade tension ranges from 108 to 138.5 Kgs/Cm<sup>2</sup> as measured on a blade tension gauge.

To set the blade tension without the use of a tension gauge:

- Disconnect the machine from the power.
- Install the blade between the wheels and insert the blade between the guide bearings.
- Tension the blade slightly to remove any sag.
- Turn the blade tension Knob 1-3/4 to 2 revolutions clockwise, see the figure below. To test press the flat side of the blade with your thumb, if it moves within the range of 2 to 3mm then it is set up correctly, if not tighten or loosen accordingly.

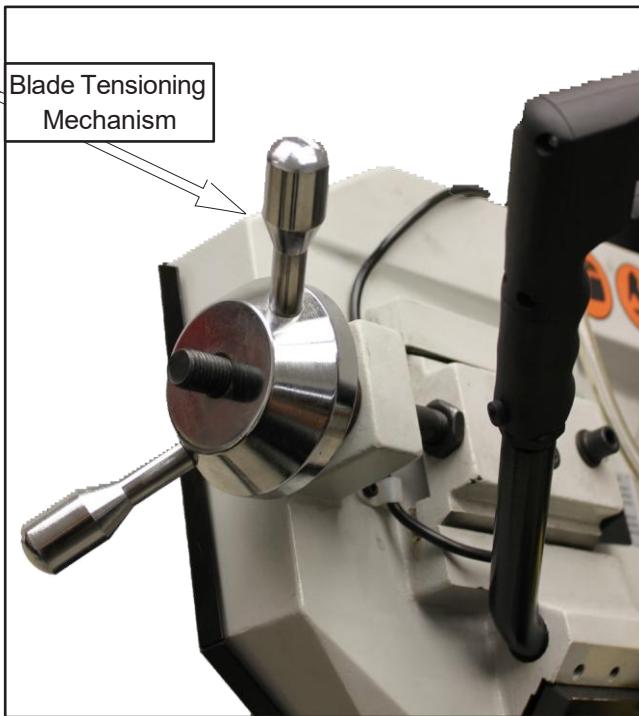


Figure 9: Blade Tensioning Mechanism.

- After the blade has been installed close the cover, connect the saw to the power source, and run it for 2 or 3 minutes so the blade can sit properly on the wheel.
- Stop the machine and disconnect it from the power source, then loosen the tension just enough to see a very slight sag. Once again tighten the blade until it becomes straight between the guide wheels and all the sag has been eliminated. This will take about 2 revolutions.
- Close the cover and reconnect the saw to the power source, the saw is ready to use.

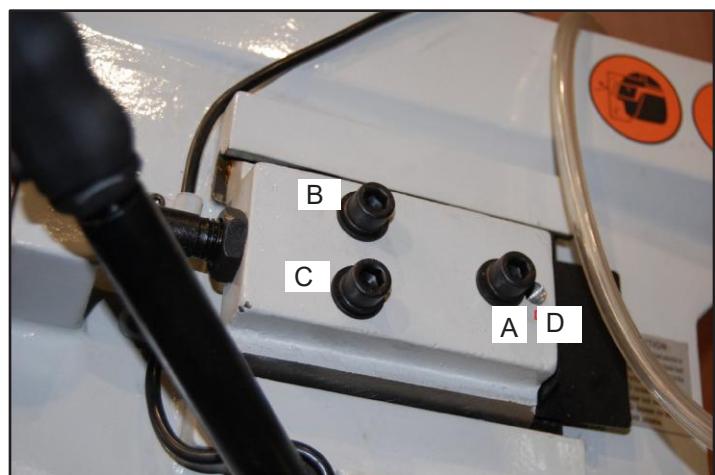


Figure 10: Adjusting the Upper Wheel.

## Adjusting the Blade to the wheel

- Disconnect from power source.
- Loosen the hex screws (A, B, C)
- Use an Allen wrench to loosen the set screw D this will allow you to adjust the tilt of the wheel.
- Turning set screw D clockwise will tilt the wheel in such a way that the blade will ride closer to the flange.
- Turning the set screw D counterclockwise will tilt the wheel in such way the blade will ride further away from the flange.
- Finally, when the wheel is adjusted tighten the hex screws A,B, and C see figure 10.

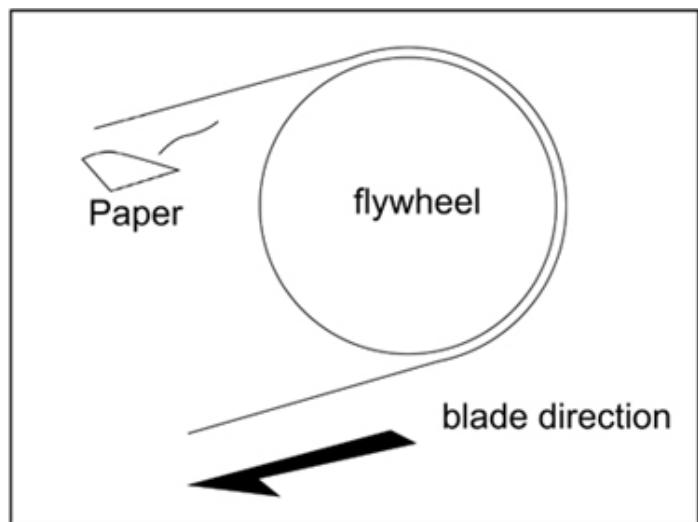


Figure 11: Blade Tracking Adjustments.

## Checking the Adjustment of the Blade

1. Use a piece of scrap paper and slide it between the blade and the wheel while it is running see figure 11.
2. If the paper is cut, the blade is riding too close to the flange, readjust.
3. If the paper folds or creases, then the blade is sitting properly.
4. If you notice that the blade is riding away from the flange, then readjust it as per the previous section.

## Adjusting the Blade Guide

Please follow these steps to adjust the blade guides:

- DISCONNECT THE MACHINE FROM THE POWER SOURCE.
- Loosen the hex screw (K) on the square lock plate.
- Hold The handle (L) and slide the blade guide as close as possible to the material without impeding the cut.
- Tighten Screw (K).
- Reconnect the machine to the power source.

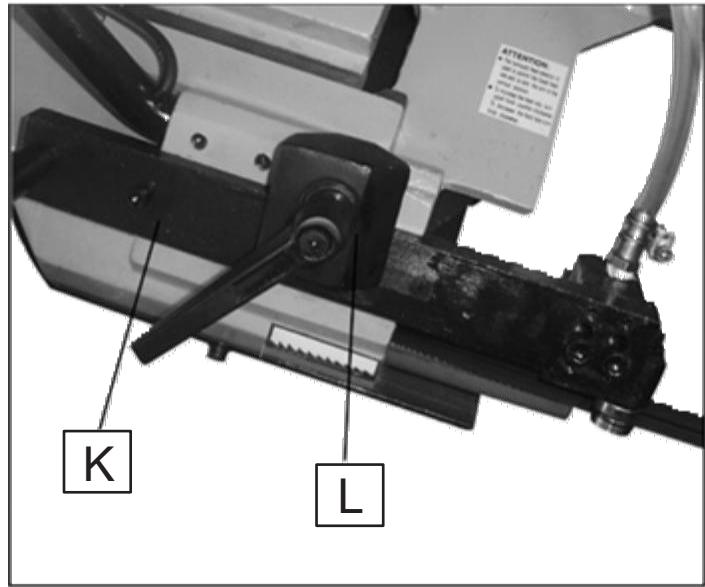


Figure 12: Blade Guides.

## Adjusting the Guide Blocks

The blade on this saw is guided by two bearing assemblies; these blocks must be adjusted according to the size and the thickness of the blade leaving a minute amount of play. In case the blade needs to be replaced install a 0.9mm thick blade (this is a pre-adjusted setting) if the blade is of a different thickness the blocks must be adjusted according to the following steps:

1. DISCONNECT THE MACINE FROM THE POWER SOURCE.
2. From the bottom of the guide block, use a wrench to turn the adjustment nut (eccentric shafts will move the bearings closer or further away).

Figure 13: guide block adjustment.

3. Turning the adjustment nuts clockwise will move the eccentric shaft away from the blade.
4. Turning the adjustment nut counterclockwise will move it closer to the blade.

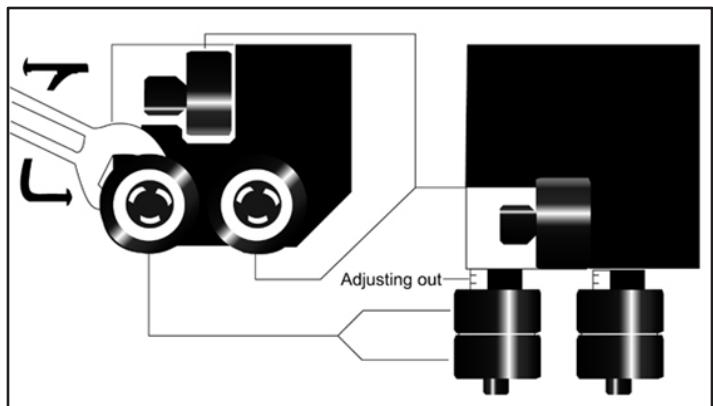


Figure 13: Adjusting the blade guides

## Changing the blade

These are the steps to change the blade :

- DISCONNECT THE MACHINE FROM THE POWER SOURCE.
- Lift the saw arm all the way up.
- Loosen the blade tensioning mechanism by turning the hand wheel see Figure 9.
- Remove the old blade from the wheels and the guiding block (exercise caution this is a potentially hazardous operation).
- To install the new blade, place it first between the two pads and then on the face (flat surface) of the two wheels, paying attention to the cutting direction of the teeth.
- Tension the blade and make sure it perfectly fits inside the seat of the wheel.
- Assemble the mobile blade-guide end first, the fly wheel guard second, then fasten it with the respective knobs. Check the safety microswitch (M) is engaged and activated otherwise the machine will not start.
- **WARNING: Always install blades that are of the same dimensions as stated in this manual.**

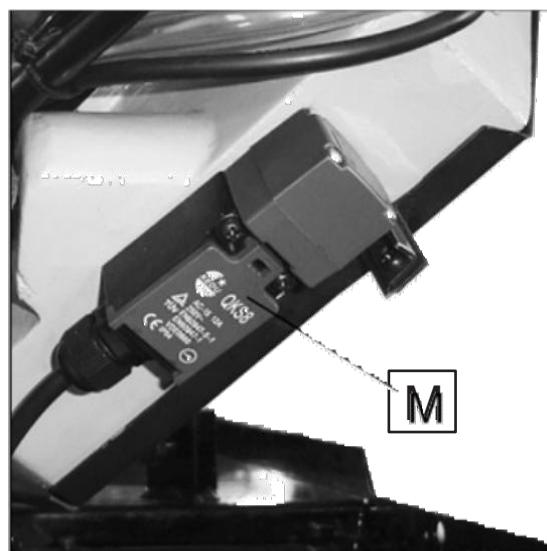


Figure 14: Micro Switch



# First Run

The first run of the Busy Bee Tools metal band saw, model BBMBS87 requires meticulous setup and adherence to safety protocols to ensure optimal performance and operator safety. Begin by securing the saw on a stable, level surface and confirming that all parts are correctly assembled according to the user manual. Before initiating the first cut, conduct a thorough inspection to ensure the blade is properly tensioned and aligned. Always wear appropriate personal protective equipment, including safety glasses and gloves, to guard against flying debris and sharp edges. Once the saw is powered on, allow the motor to reach full speed before contacting the workpiece. Maintain a steady feed rate and avoid forcing the material through the blade, as this can cause binding and potential injury.

Regularly check for any unusual vibrations or noises during operation and immediately shut down the machine if any irregularities are detected. By following these guidelines, users can achieve precise cuts while maintaining a safe working environment.

## Test Run Procedure:

1. Read the Manual: Thoroughly read the entire instruction manual.
2. Remove Tools and Objects: Ensure all tools and foreign objects have been removed from the machine.
3. Verify Adjustments: Confirm the Recommended Adjustments listed on this page have been made.
4. Fill Cutting Fluid Reservoir: Fill the cutting fluid reservoir if not already done. DO NOT run the pump without cutting fluid, as this will damage the pump.
5. Wear Safety Gear: Put on safety glasses and secure any loose clothing or long hair.
6. Connect to Power: Connect the bandsaw to a power source.
7. Raise the Bandsaw: Raise the bandsaw and close the feed rate control knob to keep the saw in place.
8. Ensure that the saw is turning in the right direction, see Figure 15.
9. Start the Bandsaw: Start the bandsaw while keeping your finger near the EMERGENCY STOP/OFF button at all times during the test run. The bandsaw should run smoothly with little or no vibration.

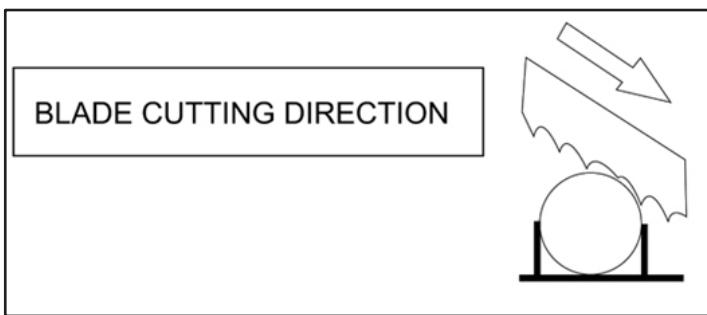


Figure 15: Blade Cutting Direction.

Note: If the EMERGENCY STOP/OFF button is pressed, it needs to be twisted until it pops out, or the bandsaw will not restart.

Attention: If you hear or see any problems, immediately stop the bandsaw and correct them before continuing.

# Operations

## Overview

The following tips will help you safely and effectively operate your bandsaw and extend the life of your saw blades.

### Tips for Horizontal Cutting:

- Use the Work Stop: To quickly and accurately cut multiple pieces of stock to the same length use the work stop.
- Clamp Firmly: Ensure a straight cut by firmly clamping the material in the vise jaws and using the positive lock to speed up production.
- Reach Full Speed: Let the blade reach full speed before engaging the workpiece.
- Avoid Starting on Contact: Never start a cut with the blade in contact with the workpiece and avoid starting on a sharp edge.
- Chip Quality: Chips should be curled and silvery. If they are thin and powder-like, increase your feed rate.
- Burned Chips: Burned chips indicate a need to reduce your blade speed.
- Wait Before Removing: Wait until the blade has completely stopped before removing the workpiece from the vise and avoid touching the cut end as it could be very hot.
- Support Long Pieces: Support long pieces to prevent them from falling when cut and flag the ends to alert passers-by of potential danger.
- Adjust Blade Guides: Adjust the blade guides as close as possible to the workpiece to minimize side-to-side blade movement.
- Use Cutting Fluid: Use cutting fluid when possible to increase blade life.

## Using Cutting Fluids

While simple in concept and function, selecting and using the correct cutting fluid involves several considerations to optimize performance and safety. Factors to evaluate include the type and hardness of the workpiece, its shape, blade feed rate, teeth per inch (TPI), tooth type, blade type, and cutting speed. Always adhere to product warnings and consult the fluid manufacturer if you have any questions.

### Selecting the Appropriate Cutting Fluids:

- Low Alloy, Low Carbon, and General-Purpose Metals: For these materials, when using a bi-metal blade, a water-soluble cutting fluid is recommended.
- Stainless Steels, High Carbon, and High Alloy Metals, Brass, Copper, and Mild Steels: Use “Neat Cutting Oil,” which is typically undiluted mineral oil with extreme pressure (EP) additives.
- Cast Iron: Cutting fluid is not recommended for cutting cast iron.

**Remember, excessive flow of cutting fluid at the nozzle can create a hazardous work environment by making the area messy, while insufficient fluid can cause the blade to overheat, leading to tooth loading and breakage. Proper fluid application is essential to maintaining a safe and efficient workspace.**

Selecting the right blade for your specific needs requires thorough research to ensure optimal performance and longevity. Here are some key factors to consider:

1. Material Type: Different materials require different blade types. For example, cutting metal demands a bi-metal blade, while wood cutting might be best served by a carbon steel blade.
2. Material Hardness: Harder materials need blades with more robust teeth and higher durability, whereas softer materials can be cut with less aggressive blades.
3. Material Shape: The shape of the material—whether it is round, square, or irregular—can influence the blade selection. Specific blade geometries are designed to handle different shapes more efficiently.
4. Machine Capability: Ensure that the blade you select is compatible with your bandsaw's specifications, including its speed, tension capacity, and size.
5. Operator Technique: The skill and experience of the operator also play a role. More experienced operators might opt for blades that allow faster cutting speeds, while less experienced users might prioritize blades that are more forgiving and easier to handle.

By considering these factors and conducting thorough research, you can select a blade that best matches your

specific requirements and operational conditions. For blade selection and recommendations please see the troubleshooting section.

CUTTING CAPACITY			
0°	170	170x170	210x170
45°	120	110x110	
60°	70	60x60	

Figure 16: Cutting Angles and Capacity in MM.

## Safety Accessories

Our extensive product offerings encompass a diverse selection of personal safety gear, both in-store and online, catering to various budget considerations. In the realm of eye protection, we present a range of options designed to meet the needs of our clientele. Noteworthy recommendations in this category include the following models: B4114, B3183, and B4105, each meticulously curated to offer exceptional protection for the eyes. For individuals requiring bifocal eye protection, we offer specialized items such as item #703050125, affording a tailored solution to address unique visual requirements.

## Recommended Accessories

Busy Bee Tools carry many types of metal cutting blades to accommodate all your needs. Please talk to one of our knowledgeable associates for further assistance.

## Maintenance

Your new metal band saw is a precision machine, and it needs periodic maintenance. Maintenance is divided into daily, weekly, monthly, and semiannually intervals. If these operations are neglected, this will result in poor performance and premature wear of the machine. Please note that all parts numbers mentioned in this section can be found on the diagrams at the end of this manual.

### List of lubricants required.

Water Soluble Coolant 20:1 dilution B1624, Machine grease to lubricate moving parts, and Gear oil for the gearbox for your reference, use SHELL gear oil or MOBILE gear oil #90.



# Scheduling

## Daily Maintenance

- General cleaning of the machine to remove accumulated metal shavings.
- Clean the lubricating coolant drain hole to avoid excess fluid.
- Always top off the level of the coolant fluid.
- Inspect the blade for any wear and tear.
- At the end of the workday raise the saw frame to the top position and slightly loosen the tension on the blade to avoid unnecessary tension.
- Check the functionality of the protective shields, switches, and the emergency stop switch.

## Weekly Maintenance

- Thoroughly clean the machine to remove all metal shavings specifically from the coolant tank and use a strong degreaser to flush the coolant tank.
- Remove the coolant pump and clean the suction head area and filter.
- Use compressed air to clean the blade guides (guide bearings and drain holes of the lubricating coolant).
- Clean the wheel housing and wheel surfaces to ensure smooth blade sliding.

## Monthly Maintenance

- Check and tighten the driver wheel and motor bolts to make sure they are tight.
- Check the blade guide bearings for any damage.
- Check the gearbox bolts and make sure they are tight.

## Semi-Annual Maintenance

A thorough inspection of all the electrical and electronic components. Inspect the equipotential protection circuit (Please refer to a certified electrician to perform all electrical inspections).

# Lubrication

In the evaluation of coolant options for lubrication applications, the market offers a diverse array of products. We recommend the utilization of our water-soluble lubricant, namely, our B1624 sold in house, which is formulated to function optimally at a specified 20:1 dilution ratio. It is imperative to adhere to rigorous disposal protocols when dealing with this lubricant, as it is classified as a controlled substance. Disposal should be executed in strict accordance with regulatory guidelines, and under no circumstances should it be discharged into sewage or drainage systems. Proper disposal measures must be observed to ensure compliance with environmental and safety regulations.

## Coolant System Care

For cleaning the coolant tank, follow these steps:

- Use a 19mm wrench to open plug(O #40) and allow the coolant to drain out completely.
- Remove the filter (#33) by loosening the (4) cap screws (#34).
- Remove the pump (#39) by loosening the (2) cap screws (#35).
- Use gentle degreaser to loosen and clean the residue.
- Use a dry/wet vacuum to remove all the metal shavings and debris from the tank.
- Reinstall plug (O #40).
- Thoroughly clean the pump (P) and reinstall it back.

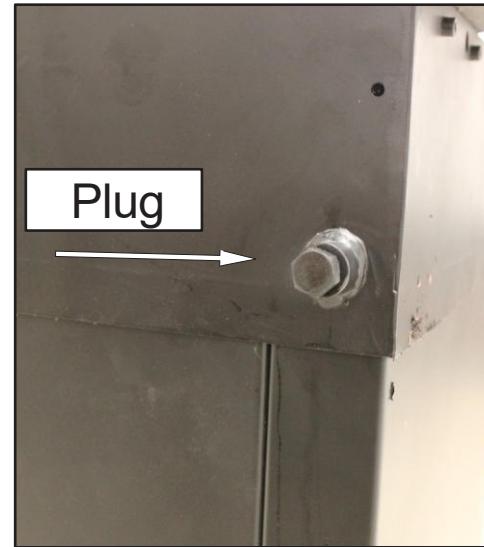


Figure 17: Coolant Drainage Plug Location.

Use a 5mm Allen key to unscrew the coolant pump. Use a gentle degreaser to clean the pump periodically. You can better clean the coolant tank when the pump is removed. Make sure all debris and sludge is removed.



Figure 18: Coolant Pump disassembly.

Refill the tank with a 20:1 concentration coolant all the way to about 25mm below the filter.

- Put the filter back in place and secure it with the screws.
- You are all done the coolant tank and pump are now perfectly clean and ready to be used.

## Gearbox Care

Like any other machinery with a gearbox, this machine's gear box requires a periodic oil change every 4 months for light to moderate use; more frequently if the saw is used for prolonged periods of time or production environment prolongs its life and to ensure smooth and problem free operation.

To change the gearbox oil please follow these instructions:

- DISCONNECT THE MACHINE FROM THE POWER SOURCE.
- Raise the saw arm to vertical position.
- Release the drain hold (R) to drain off the oil by loosening the socket screw.
- Once the all the used oil is drained off, replace the screw (R) and tighten it.
- Return the saw arm to the horizontal position.
- Refill the gearbox with approximately 3 liters of new and clean oil through hole (Q).
- Once the refill is complete secure the plug for hole (Q).

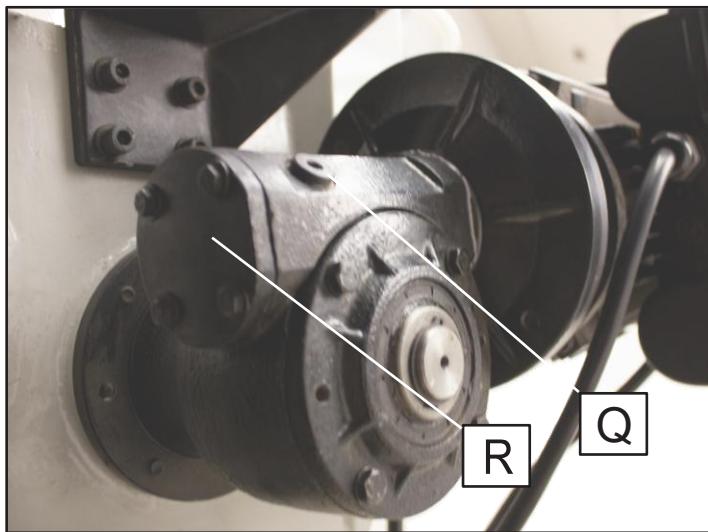


Figure 19: gearbox.

For your reference you can use shell type gear oil or Mobile gear oil #90 (these are just few examples, you can use any gearbox oil).

## Special Maintenance

All special maintenance must be performed by a skilled person. We advise that you employ a trained professional for these tasks. Also, the reset of protective and safety equipment and devices, the motor, the motor pump and other electrical components require special maintenance.

## Technical Characteristics

This saw has the following cutting capacity.

- Flywheel diameter 260mm.
- Blade Dimensions 20X0.9X2085 MM.
- Blade feed speed 5 to 40 mm/min.
- Vice's opening 215 mm.
- Saw Frame Tilting 40°.
- Working Table Height 890 mm.
- Machine Weight 156 Kg.

## Material and Choice of Blade

To achieve excellent cutting quality on a bandsaw, it is essential to harmonize several parameters, such as the hardness, shape, and thickness of the material, the transverse cutting section, and the blade type and section. Additionally, selecting the right cutting speed and controlling the saw frame's lowering rate are crucial factors. These variables must be balanced to create a unified operating condition. By applying practical considerations and common sense, you can optimize cutting performance, extend the machine's life, and reduce repair and downtime. When issues arise, this holistic approach will make troubleshooting more intuitive and efficient.

## Blade Selection Guidelines

When selecting a bandsaw blade, the pitch of the teeth (teeth per inch or TPI) is a critical factor that must be tailored to the material being cut. The number of teeth should ensure smooth and efficient cutting, based on the following criteria:

1. Thin or Variable Cross Sections: For materials such as thin plates, pipes, or parts with irregular thicknesses, a higher TPI blade is recommended. This ensures that at least 3 to 6 teeth are always in contact with the material at once, preventing snagging and reducing the risk of damaging the workpiece. A finer tooth pitch helps provide smoother cuts in these delicate sections, improving cut quality and minimizing blade wear.
2. Large Cross Sections and Solid Parts: For cutting materials with large cross sections or solid parts, a lower TPI blade with widely spaced teeth is ideal. The



increased spacing between teeth allows for better chip clearance, ensuring that shavings and debris are easily evacuated from the cutting area. This prevents the blade from becoming clogged and overheating, enabling more efficient cutting through thicker or denser materials. The larger tooth size also enhances material removal rates, making it better suited for these types of cuts.

3. **Soft Materials or Plastics:** For parts made of soft materials, such as bronze, Teflon, or other plastics, a low TPI blade is recommended. The larger teeth allow for efficient cutting by reducing friction and preventing material buildup between the teeth. This setup helps maintain a smooth cut without gumming up the blade, which can occur with higher TPI blades on softer materials.
4. **Bundle Cutting:** When cutting multiple pieces stacked together in a bundle, a combo tooth design is optimal. This design alternates between larger and smaller teeth, providing a versatile balance of cutting efficiency and smoothness. It ensures that various cross sections within the bundle are handled effectively, minimizing the chance of snagging and promoting efficient debris removal for a clean, consistent cut across all bundled materials.

### **Cutting and Feed Speed**

The cutting speed of a bandsaw is measured in meters per minute (m/min) and refers to how quickly the saw blade moves along the workpiece. The feed speed, on the other hand, is defined in square centimeters per minute (cm<sup>2</sup>/min) and represents the area that the blade cuts through of the material over time. Both of these speeds are crucial for maintaining cutting efficiency and are limited by the heat generated at the tip of the teeth due to friction. Excessive heat can cause the blade to dull prematurely or even damage the material being cut. Therefore, balancing cutting speed and feed rate is essential to avoid overheating, for optimal cutting quality and prolong blade life. Proper cooling, lubrication, and blade selection are also important factors in managing friction and heat buildup.

1. **Cutting Speed and Material Resistance:** The cutting speed is directly influenced by the material's resistance, hardness, and the dimensions of its widest section. Harder materials and those with larger cross sections require slower cutting speeds to maintain control and prevent excessive heat buildup at the blade's teeth. Softer materials or thinner sections can be cut at higher speeds without compromising blade performance or cut quality. Matching the cutting speed to the material's properties ensures precision and prolonged blade life.

2. **Effects of High Feed Speed:** If the feed speed is too high, it can cause the blade to deviate from the intended cutting path. This deviation often results in non-perpendicular cuts on both the horizontal and vertical planes, leading to inaccurate or skewed cuts. Excessive feed speed puts undue pressure on the blade, causing it to flex or bend, which negatively affects the accuracy of the cut and may increase wear on the blade and machine components. Controlling the feed speed is crucial to maintaining cutting precision and blade longevity.

The best combination of cutting speed and feed speed can be determined by examining the metal shavings produced during cutting. Long, spiral-shaped shavings are an indication that both parameters are well-balanced, resulting in efficient material removal and minimal stress on the blade. These shavings suggest that the blade is cutting smoothly without excessive friction or heat buildup, which is key to achieving optimal cutting performance. In contrast, short or broken shavings may indicate that adjustments to cutting speed or feed rate are needed, as they often point to excessive speed, improper blade selection, or poor cutting conditions.

### **Brake-in the blade**

It is advisable to run the saw for the first time using low feed speed make few cuts on an average size material make sure you are using a laser welded HSS bandsaw blade and use a generous amount of the cooling spray.

### **Blade Structure and types**

The most commonly used blades are Bi-metal blades, they consist of silicon-steel blade backing with an HSS high speed steel cutting edge laser welded together. These blades are classified in M2, M42, M51. These blades differ from one another by hardness due to the increased amount of cobalt and molybdenum contained in the metal alloy.

They differ essentially in their constructive characteristics, such as:

- Shape and cutting angle of tooth
- Pitch
- Set
- Regular Tooth 0° rake and constant pitch:



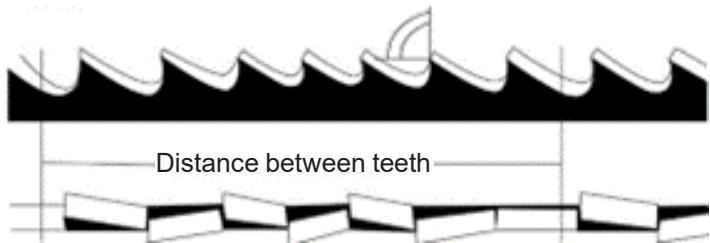
Most common form for transversal or inclined cutting of solid small and average cross-sections or pipes in laminated mild steel and gray iron or general metal.

Positive Rake Tooth 9°-10° positive rake and constant pitch:



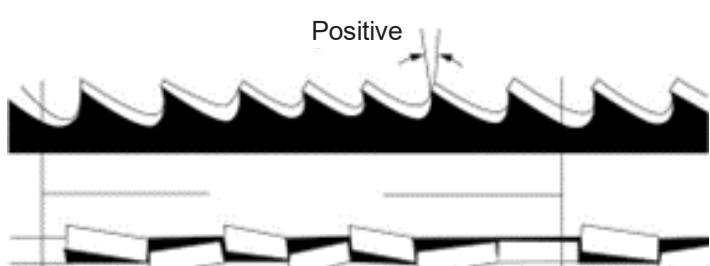
Particular use for crosswise or inclined cuts in solid sections or large pipes, but above all harder materials (highly alloyed and stainless steels, special bronze and forge pig iron).

Combo Tooth 0° Rake: pitch varies between teeth and consequently varying teeth size and varying gullet depths. Pitch varies between teeth, which ensures a smoother, quieter cut and longer blade life due to the lack of vibration.



Another advantage offered in the use of this type of blade in the fact that with an only blade it is possible to cut a wide range of different materials in size and type.

Combo Tooth 9°-10° positive rake:



This type of blade is the most suitable for the cutting of section bars and large and thick pipes as well as for the cutting of solid bars at maximum machine capacity.

Available pitches: 3-4/4-6.

## SETS

Saw teeth bent out of the plane of the saw body, resulting in a wide cut in the workpiece.



Regular or Raker Set: Cutting teeth right and left, alternated by a straight tooth. Of general use for materials with dimensions superior to 5mm. Used for the cutting of steel, castings and hard nonferrous materials.



Wavy Set: this set is in smooth waves.

This blade is associated with fine teeth and is main use is for cutting pipes and thin cross section material and bars from 1-3 mm.

Alternate Sets in Groups: this blade has groups of cutting teeth alternating left to right separated by a straight tooth.



Alternate Sets Individual: the cutting teeth are alternating left to right. This set can be used for cutting no-ferrous soft metals.



# Wiring and Electrical Diagrams

## WARNING

**STOP, READ, AND UNDERSTAND THE SAFETY SECTION ON PAGES 12 through 15.**

### Electrical Safety

#### Shock Hazard

When working on this machine there is a high risk of touching exposed parts of wiring and connectors; this will result in injuries such as burns, electrocution, or death. **ALWAYS DISCONNECT THE MACHINE FROM THE POWER OUTLET.**

#### Qualified personnel

Working with electrical machinery has an inherent danger of electric shock, only a qualified electrician should perform all wiring jobs on this machine. **IF YOU ARE NOT QUALIFIED, PLEASE SEEK THE HELP OF A PROFESSIONAL.**

#### Wires and Connections

When connecting wires make sure that the connections are very tight this will help prevent the loosening of the wires during the operation of this machine. **ALWAYS DOUBLE CHECK THE CONNECTIONS** when working on the electrical part of this machine.

#### Wire and electrical component damage

All wires and electrical components must be replaced immediately if any damage occurs. Damaged electrical components may cause electrocution, fire, and injury to the personnel operating the machine. **STOP WORK IMMEDIATELY AND REPAIR THE DAMAGES.**

#### Alterations

Any alterations, or modifications to the wiring of this machine other than what is shown in this manual will result in unpredictable outcomes, including serious injuries.

#### The Motor

All the wiring shown in the next section is accurate and up to date at the time of printing this manual. Occasionally, there might be a slight difference between the diagrams and your machine. **ALWAYS USE THE DIAGRAM LOCATED IN THE MOTOR'S WIRING BOX.**

### Capacitors

All capacitors may store an electrical charge for an extended period after the machine is shut-off, **DISCONNECT THE MACHINE FROM THE POWER SOURCE** and wait for about 10 minutes before working on the capacitors. It is advisable to use the assistance of a professional electrician. Do not attempt to do the repairs on your own.

### Circuit Requirements

At the start of this manual in the power requirement section, there's important information regarding the electrical circuit requirements, please refer to that section and **FOLLOW THE INSTRUCTIONS EXACTLY.**

### Difficulties and issues

In the event that you are experiencing any difficulties or issues understanding any part of this manual, please **STOP** what you are doing and contact our customer service and technical support department at the phone number mentioned at the start of this manual.

### Motor's Electric Box



Figure 20: Motor's Electric wiring.

# Machine's Wiring Diagram

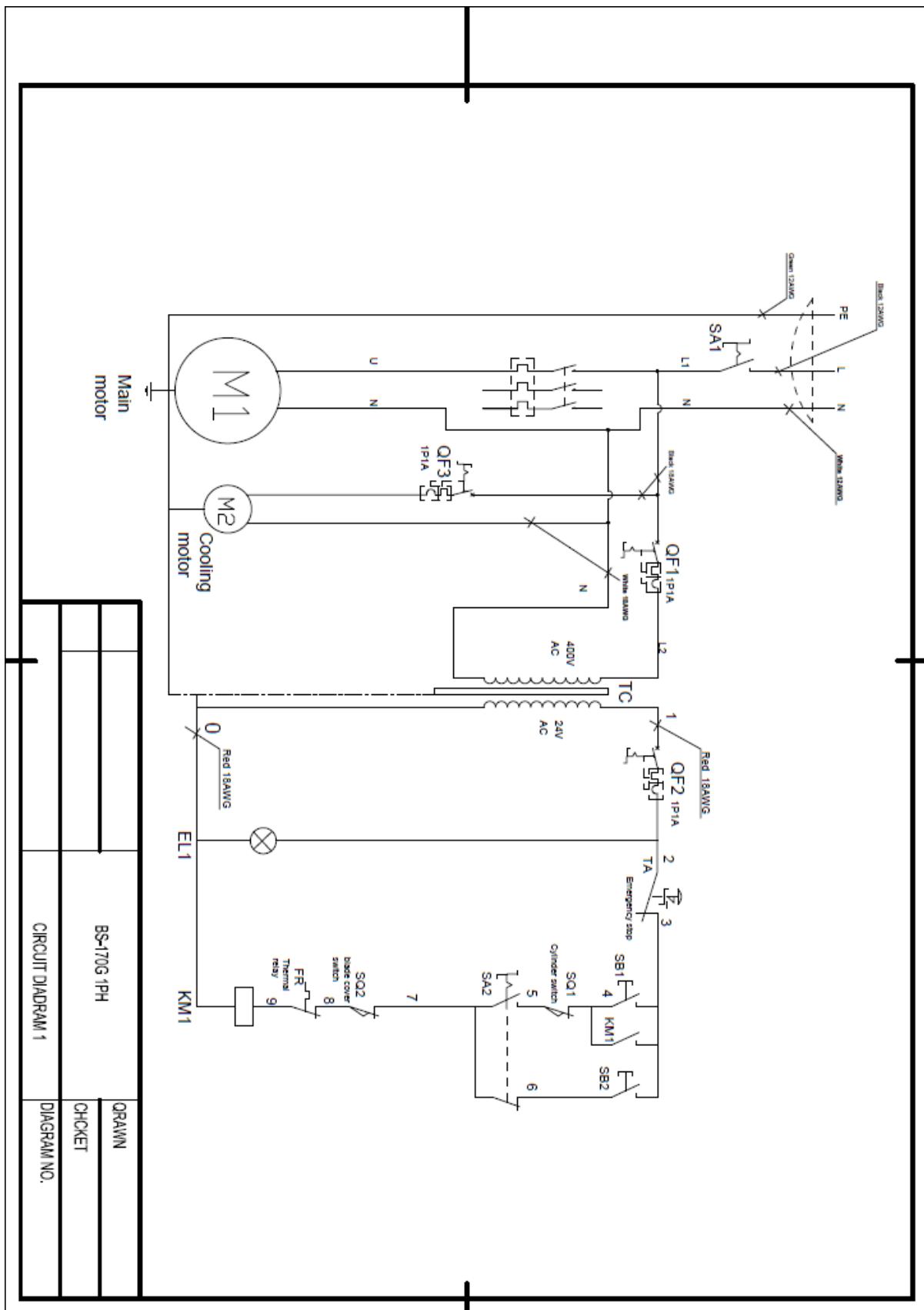


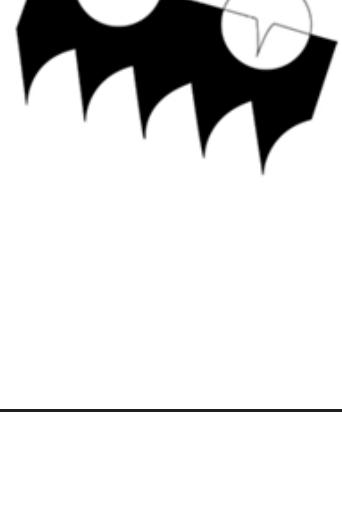
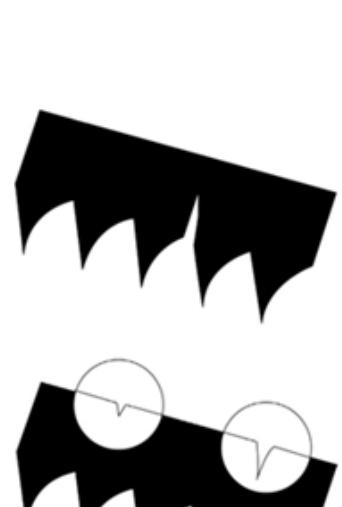
Figure 21: Electrical Wiring Diagram



## Section 9: Troubleshooting

Issue	Possible Cause	Solution
 	Teeth are breaking.	Feed speed too fast Decrease the blade feeding speed, less cutting pressure. Adjust the hydraulic speed controller.
	Wrong cutting speed.	Change the blade speed and/or the type of blade; see material specification and blade selection in the section below.
	Wrong tooth pitch.	Switch to a blade with a tooth pitch suited to the material thickness and hardness to prevent breakage.
	Chips Sticking onto teeth and in the throats or the material has gum like fluid on it.	Check the coolant drain holes on the guide blocks and make sure the flow is consistent and plentiful. Clear the drain at the bottom of the tray to ensure a constant flow.
	Defects on the material or the material is too hard.	Oxidization on the material will create impurities that will make the material harder on the surface than the blade itself or they may have impurities that will interfere with the cut as well. Avoid cutting these materials or use extreme caution when cutting these materials and slow the blade feed rate as slow as possible.
	The vise is not gripping the material or insufficient grip.	Ensure the gripping is tight on the part to avoid any unnecessary movement.
	The blade stalls and gets stuck in the material.	Reduce feed speed and use less pressure while cutting.
	Poor quality blade	Exchange for a high-quality blade. Carefully remove all parts.
	A cut tooth left in the material.	Change the location of the cut.
	Cutting is resumed on a previously made groove.	Check the vise and make sure it is properly tightened.
	Excessive vibration.	Replace the blade with the correct size; Ensure all components are tightly secured, adjusting blade tension, and verifying that the wheels are properly aligned. Regularly check the level of the cutting fluid. Make sure you are using water soluble cutting fluid and use the correct emulsion percentage. Make sure blade direction is correct.

Issue	Possible Cause	Solution
Teeth are breaking.	Wrong tooth pitch or shape.	Check the vise and make sure it is properly tightened. Replace the blade with the correct size; see page 19 and 20
	Insufficient or wrong lubrication.	Regularly check the level of the cutting fluid. Make sure you are using water soluble cutting fluid and use the correct emulsion percentage.
	Teeth positioned in the wrong direction.	Inspect the direction the blade is installed in and reverse it if necessary.
 <b>Premature Blade Wear</b>	Incorrect blade	Replace the blade with the correct size; see material specification and blade selection in the section below. Turn the blade in the right direction.
	Teeth positioned in the opposite direction of cutting.	Replace the blade with a high-quality blade.
	Poor quality blade.	Replace the blade with a higher quality blade.
	The blade-feed is too fast.	Modulate the blade's speed according to the material being cut.
	Wrong cutting speed	Oxidization on the material will create impurities that will make the material harder on the surface than the blade itself or they may have impurities that will interfere with the cut as well.
	Defects and impurities in the material, material too hard.	Avoid cutting these materials or use extreme caution when cutting these materials and slow the blade-feed as slowly as possible. Ensure the gripping is tight on the part to avoid any unnecessary movement.
	Insufficient lubrication/ wrong coolant emulsion percentage.	Regularly check the level of the coolant and make sure the mixing percentage of the emulsion is correct.

Issue	Possible Cause	Solution
	Faulty Welding of the blade	Welding the blade is very important. The meeting surfaces must be perfectly touching when welded, they must have no inclusions or bubbles, and they should be very smooth at the weld. If they are not the blade will break.
	The down-feed is too fast.	Decrease the down-feed speed by controlling the hydraulic piston valve.
	Wrong cutting speed	Modulate the blade's speed to a lower speed and be sure that this speed matches the down-feed rate.
	Wrong tooth pitch/ count.	Use a blade with the correct tooth pitch/count for the material thickness
	The vice is too loose.	Make sure the vise is clamping tightly the material tightly.
	The blade is touching the material at the beginning of cut.	Check the vise if not tight. Please note that at the start of the cutting process, you should not lower the blade before starting the saw.
	The blade guide pads are not set up correctly or dirty due to lack of maintenance.	Check the distance between the guide pads and the blade regularly. Set the guiding blocks when necessary. See machine adjustment section.
	The blade-guide block is too far from the material to be cut.	When cutting material make sure that the blade guides both front and rear are set as close to the material as possible, this offers support for the blade. If the back of the blade rubs against the wheel or the support this will cause the blade to deform and eventually it will be damaged. Regularly check the level of the coolant and make sure the mixing percentage of the emulsion is correct.

Issue	Possible Cause	Solution
Blade Breakage	Improper position of the blade on the wheel.	If the back of the blade rubs against the wheel or the support this will cause the blade to deform and eventually it will be damaged.
	Insufficient lubrication/ coolant or the emulsion percentage is incorrect.	Regularly check the level of the coolant and make sure the mixing percentage of the emulsion is correct.
Streaked or etched band	Damaged or chipped guide pads.	Replace the chipped guide pads.
	Tight or damaged guide bearings.	Adjust the bearings or replace them if damaged.
The cuts aren't straight (perpendicular to the blade).	The blade's angle to the vise isn't set properly at 90°.	Reset the guide blocks and tighten them well. Set the blocks vertically to bring them to the perpendicular position. If necessary, adjust the stop screws of the angular cut.
	The blade is not perpendicular due to excessive play between the blade guide pads and misalignment of the blocks.	Check and readjust the guide blocks vertically to the proper position, see machine setup section.
	Too fast down feeding speed.	Decrease the speed of down-feeding, to relieve the pressure on the blade.
	The blade is worn down and dull.	Replace with new Blade
	The teeth pitch is incorrect.	If the tooth count or pitch of the blade is not adequate for cutting the material replace it with the correct pitch blade.
	Some of the teeth are broken	When the blade loses some of the teeth it is no longer safe to work with, it must be replaced immediately.



Issue	Possible Cause	Solution
The cuts aren't straight	Insufficient lubrication or wrong emulsion mix percentage.	Regularly check the level of the coolant and make sure the mixing percentage of the emulsion is correct.
Incorrect and damaged cuts	The flywheel is worn out or dirty.	If the support and guide flange of the band are excessively worn out, they will not ensure the proper blade alignment, this will cause faulty cutting. Blade rolling and the cutting track can become tapered. The guide-flange and its support must be replaced immediately.
	Down feed is too fast.	Decrease the down-feed speed, relieving the pressure off the blade.
	Poor quality blade	Replace the blade with higher quality blade.
	The blade is worn out, chipped or with broken teeth.	Replace it.
	Incorrect tooth pitch.	The blade you are using probably has too large teeth, use a blade with higher tooth count and put less pressure on the blade.
	The blade guide blocks too far from the material.	Bring the blade guide blocks as close to the material as possible; this will provide the proper support to the blade section in contact with the material.
	Insufficient lubrication or wrong emulsion.	Regularly check the level of the coolant and make sure the emulsion's mixing percentage.
Excessive noise on the guide blocks	Chipped bearings or worn-out pads.	Dirt or material chips between the blade and the guide will cause bearing damage, they must be replaced immediately if damaged.

## Blade Selection and Material Guide

Carbon Tool Steel Blade	Material Thickness	Bimetal Premium Blad
24 Racker	1/16" to 1/4"	20-24 Variable
18 Raker	1/8" to 3/8"	14-18 Variable
14 Raker	3/16" to 7/16"	10-14 Variable
10 Raker	1/4" to 1/2"	8-12 Variable
10 Raker	5/16" to 5/8"	6-10 Variable/ 6 Hook
6 Hook	3/8" to 1"	5-9 variable/ 6 Hook
6 Hook	1/2" to 2"	4-6 Variable/ 6 Hook
4 Hook	3/4" to 4-1/2"	3-4 Variable/ 4 Hook
3 Hook	1" to 6"	3 Hook
2 Hook	2" to 12"	2 Hook

## Electrical Components Diagnosis

Issue	Possible Cause	Remedy
Machine will not start, or it will trip a breaker	<ol style="list-style-type: none"> <li>1. E-Stop Button is engaged.</li> <li>2. Plug/Receptacle is erroneous or wired improperly.</li> <li>3. The start capacitor is defective.</li> <li>4. The wall breaker is tripping.</li> <li>5. The motor is wired incorrectly.</li> <li>6. Power supply is OFF.</li> <li>7. the motor ON/OFF switch.</li> <li>8. The wiring is open (it has high resistance).</li> <li>9. Motor is defective.</li> </ol>	<ol style="list-style-type: none"> <li>1. Twist the E-Stop button until it disengages.</li> <li>2. Test for proper contact; correct the wiring if incorrect.</li> <li>3. Test/replace capacitor if faulty.</li> <li>4. Ensure the correct size for machine load; replace the weak breaker.</li> <li>5. Correct motor wiring connections.</li> <li>6. Ensure hot lines have correct voltage on all legs and main power supply is switched ON.</li> <li>7. Replace faulty ON/OFF switch.</li> <li>8. Check for broken wires or disconnected/corroded connections, and repair/replace, as necessary.</li> <li>9. Test/repair/replace.</li> </ol>

Issue	Possible Cause	Remedy
The saw stalls or it is underpowered.	<ol style="list-style-type: none"> <li>1. The blade installed is not the a suitable blade for the job.</li> <li>2. The material is not suitable.</li> <li>3. using the incorrect feed rate (too fast).</li> <li>4. the tension on the blade isn't enough the blade is slipping.</li> <li>5. incorrect voltage.</li> <li>6. damaged motor bearings.</li> <li>7. faulty plug or receptacle.</li> <li>8. The motor is wired incorrectly.</li> <li>9. The motor is overheated.</li> <li>10. faulty motor.</li> </ol>	<ol style="list-style-type: none"> <li>1. Use a blade with correct properties for your type of cutting.</li> <li>2. Use metal with correct properties for your type and size of cutting.</li> <li>3. Decrease feed rate/cutting speed.</li> <li>4. Adjust blade guides and tension.</li> <li>5. Ensure hot lines have correct voltage on all legs.</li> <li>6. Test by rotating shaft; rotational grinding/loose shaft requires bearing replacement.</li> <li>7. Test for good contacts; correct the wiring.</li> <li>8. Correct motor wiring connections.</li> <li>9. Clean off the motor, let it cool, and reduce workload.</li> <li>10. Test/repair/replace</li> </ol>

Issue	Possible Cause	Remedy
The band saw is noisy and/or vibrating	<ol style="list-style-type: none"> <li>1. The Motor fan is rubbing on fan cover.</li> <li>2. Blade is at fault.</li> <li>3. Worm gear is at fault.</li> <li>4. Wrong blade for material.</li> <li>5. Speed is set too slow.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace dented fan cover; replace loose/damaged fan.</li> <li>2. Replace/resharpen blade.</li> <li>3. Rebuild gearbox for bad gear(s)/bearing(s).</li> <li>4. Change blade.</li> <li>5. Adjust speed as required.</li> </ol>
The machine is loud when cutting or bogs down in the cut.	<ol style="list-style-type: none"> <li>1. Excessive feed rate.</li> <li>2. The blade TPI is too great, or the material is too coarse.</li> </ol>	<ol style="list-style-type: none"> <li>1. Refer to Feed-Rate section or Blade Speed section and adjust as required.</li> <li>2. Refer to Blade Selection section and adjust as required.</li> </ol>
Blades break often.	<ol style="list-style-type: none"> <li>1. Blade is not tensioned correctly.</li> <li>2. The workpiece is loose in the vise.</li> <li>3. The feeding or cut speed is wrong.</li> <li>4. The blade TPI is too great, or the material is too coarse.</li> <li>5. The blade is rubbing on the wheel flange.</li> <li>6. The bandsaw starts with the blade resting on the workpiece.</li> <li>7. The guide bearings are misaligned, or the blade is rubbing on the wheel flange.</li> <li>8. The blade is too thick, or the blades are of low quality.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check to see that the blade is not excessively tight or too loose.</li> <li>2. Clamp the workpiece tighter or use a jig to hold the workpiece.</li> <li>3. Refer to Feed Rate section , or Blade Speed section, and adjust as required.</li> <li>4. Refer to <b>Blade Selection section</b> and choose the right blade for the job..</li> <li>5. Refer to Blade Squaring section and adjust as required.</li> <li>6. Start bandsaw and then slowly lower the headstock by setting the feed rate.</li> <li>7. Refer to Blade Squaring section, or Blade Guides adjustment section , and adjust as required.</li> <li>8. Use a higher quality blade.</li> </ol>

Issue	Possible Cause	Remedy
Blade dulls too soon	<ol style="list-style-type: none"> <li>1. The cutting speed is too fast.</li> <li>2. The blade TPI is too coarse.</li> <li>3. The blade feed pressure is too light.</li> <li>4. The workpiece has hard spots, welds, or scale.</li> <li>5. The blade is twisted.</li> <li>6. The blade is slipping on the wheels.</li> </ol>	<ol style="list-style-type: none"> <li>1. Refer to <b>Blade Selection section</b> and decrease the feeding pressure. Refer to Feed- Rate section and adjust as required.</li> <li>2. Re-clamp the workpiece in the vise and use a jig if required.</li> <li>3. Use a coarser-tooth blade.</li> <li>4, 5, &amp; 6. Check and reset the guide bearings</li> </ol>
Blade wears on one side.	<ol style="list-style-type: none"> <li>1. The blade guides are worn.</li> <li>2. The blade guide slide bracket is loose.</li> <li>3. The wheels are out of alignment.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace the blade guides</li> <li>2. Tighten the bracket</li> <li>3. Check and align the wheels</li> </ol>
The cuts are jagged	<ol style="list-style-type: none"> <li>1. The feed pressure is too high.</li> <li>2. The guide bearings are out of adjustment, or too far away from the workpiece.</li> <li>3. The blade tension is low.</li> <li>4. The blade is dull.</li> <li>5. The blade speed is wrong.</li> </ol>	<ol style="list-style-type: none"> <li>1. Refer to Feed Rate on Page and adjust as required.</li> <li>2. Refer to <b>Blade Guides section</b> and replace or adjust.</li> <li>3. Refer to Blade Tension section and adjust as required.</li> <li>4. Refer to Blade Change section and replace the blade.</li> <li>5. Refer to Blade Speed section and adjust as required.</li> </ol>

## Machine Diagrams and Parts

## Machine Diagrams

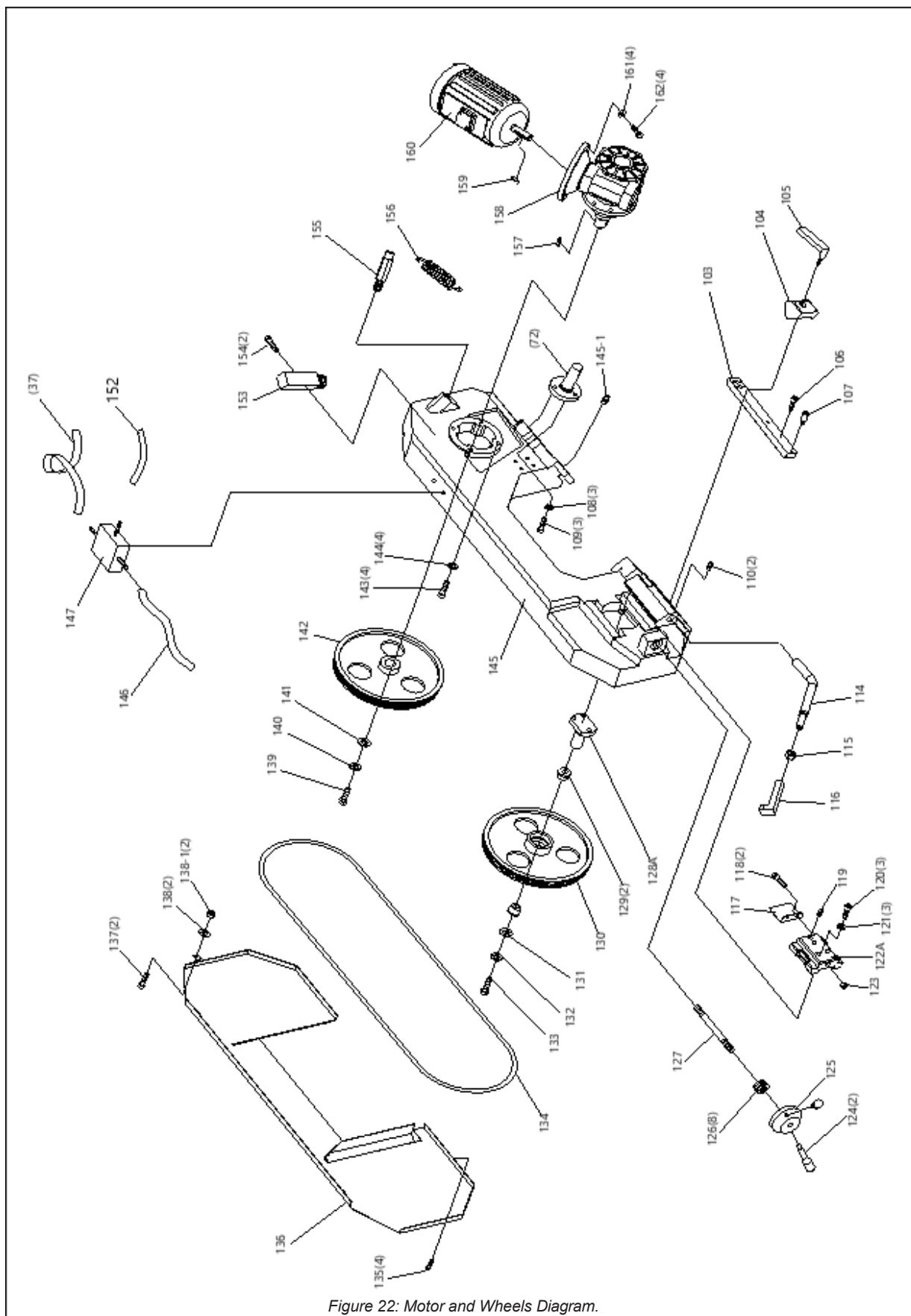


Figure 22: Motor and Wheels Diagram.

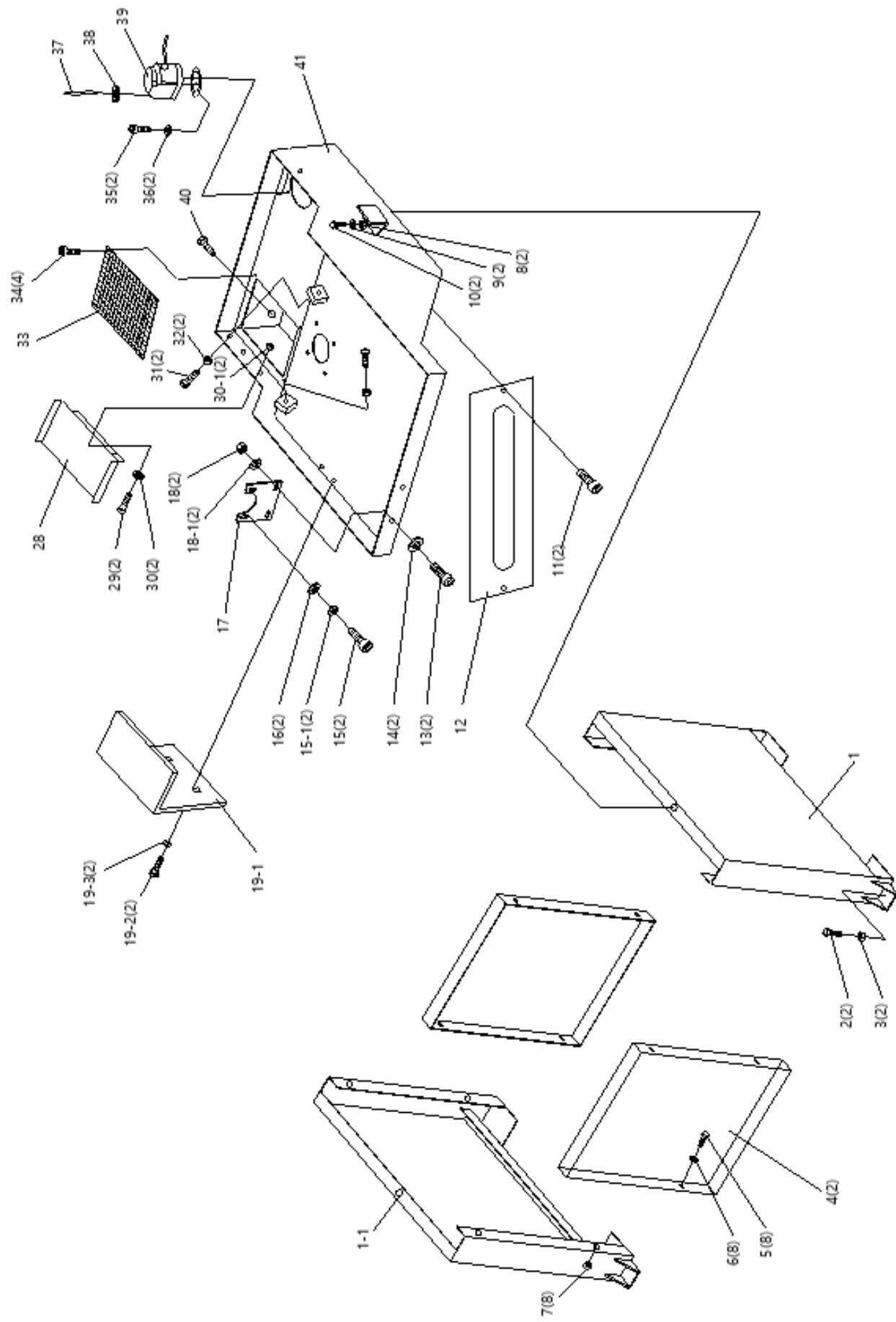


Figure 23: Cabinet and cooling system.

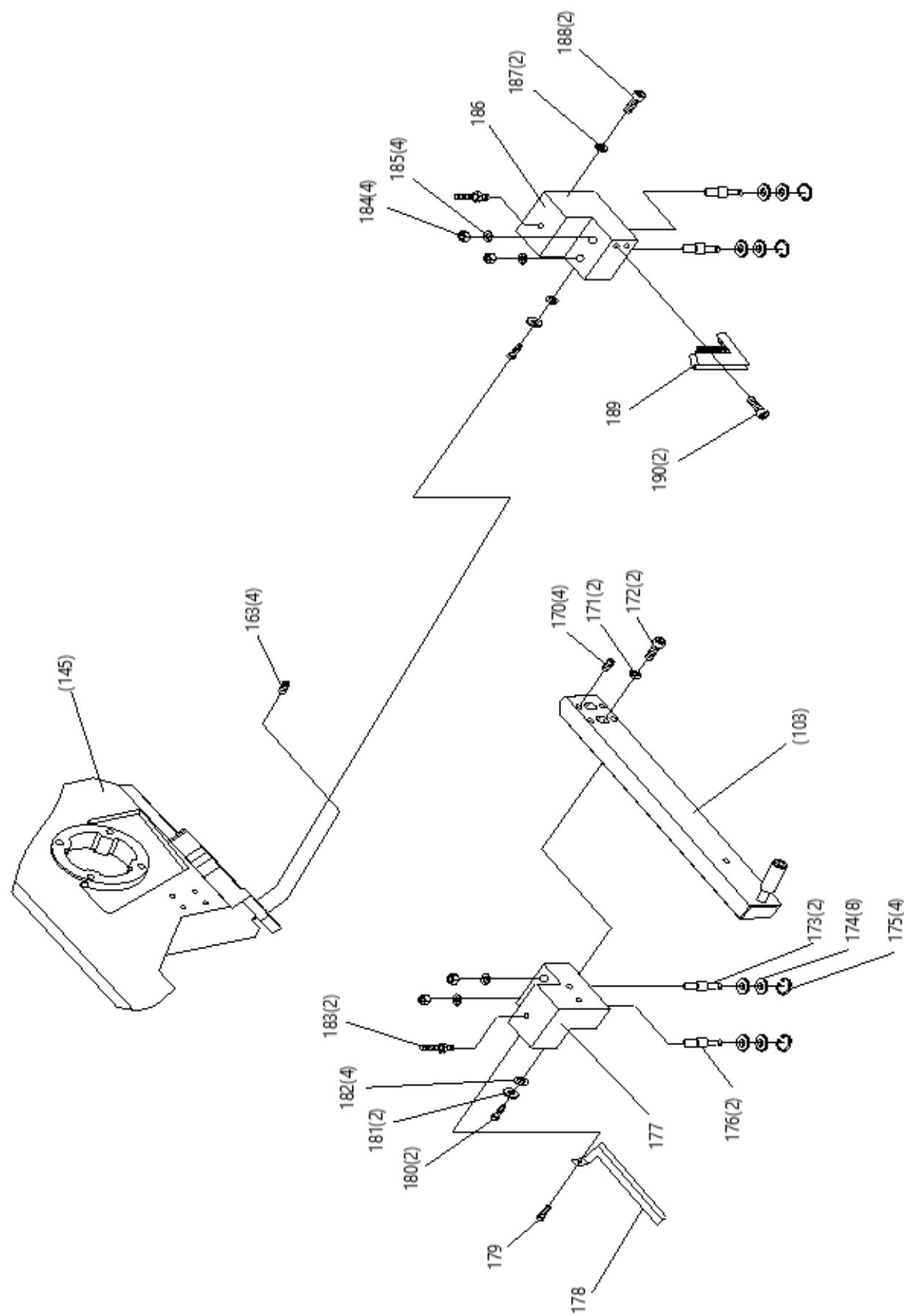


Figure 24: Blade Guide Assembly

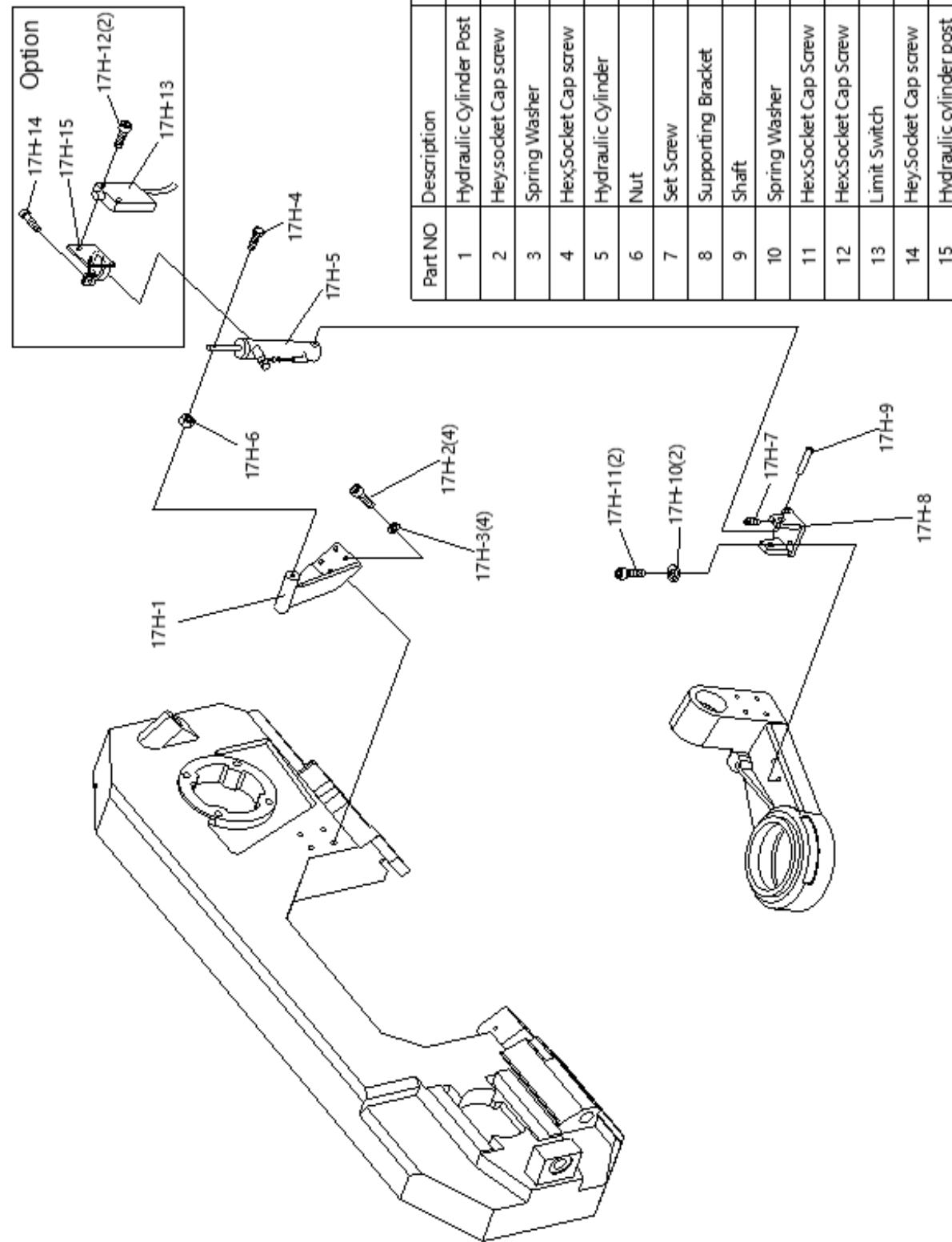


Figure 25: Hydraulic Arm System.

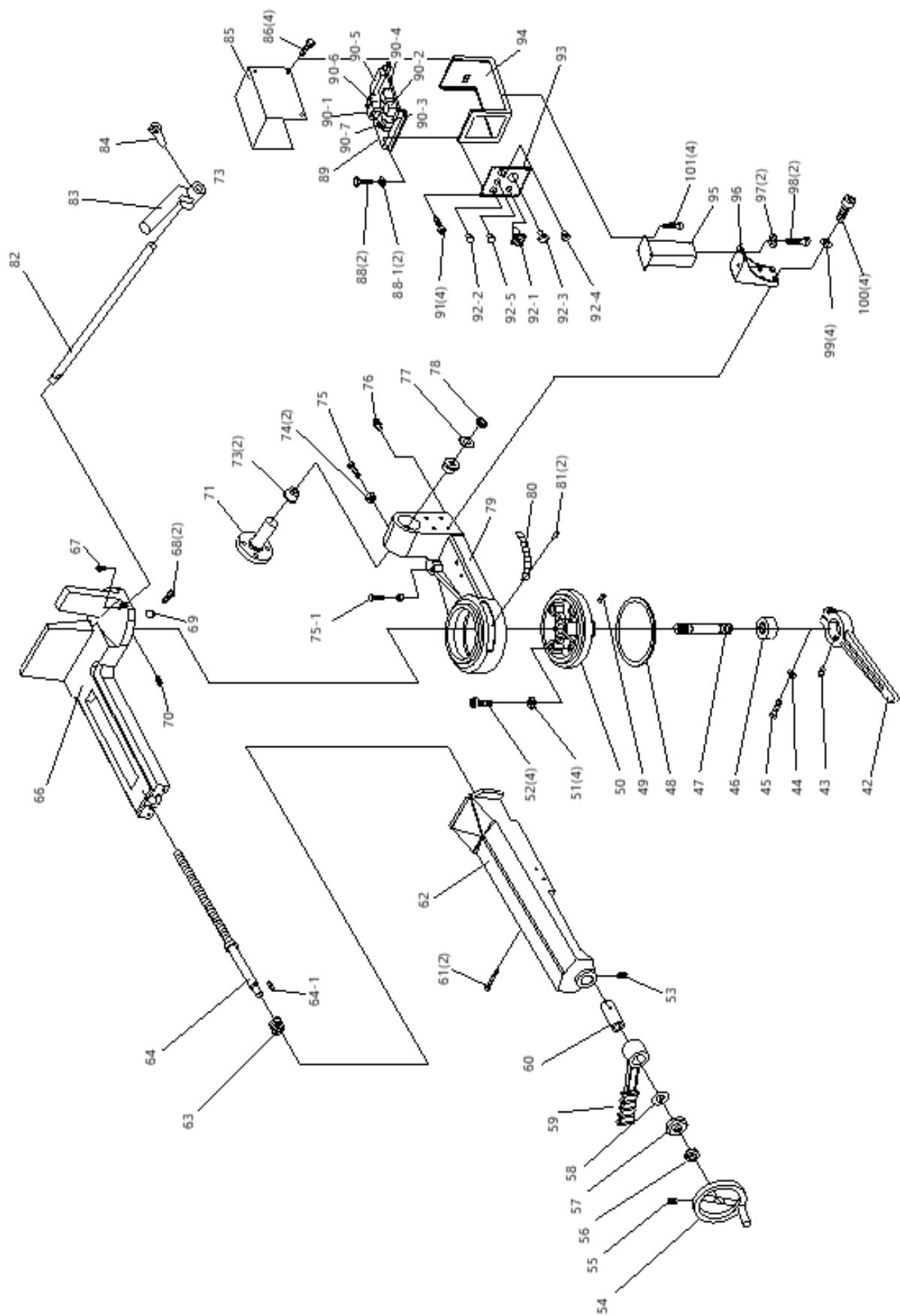


Figure 26 Vice and Control Box.

Parts List

MFG Item No.	Item	Description
1	PBBMBS8701	Base (right part)
1-1	PBBMBS8701-1	Base (left part)
2	ZHXBMB1217540	Bolt Hex M12-1.75X40mm
3	ZHXMN12175	Nut Hex M12-1.75
4	PBBMBS8704	Base cover plate
5	ZHXBMB12516	Bolt Hex M8-1.25X16mm
6	ZFWM8000000	Flat washer M8
7	ZHXMN8125	Nut Hex M8-1.25
8	ZFWM10OD20	Flat washer M10-20mm
9	ZSWM1000000	Spring washer M10
10	ZHXBMB1015020	Bolt Hex M10-1.5X20mm
11	ZCHSM61008	Screw Cap M6-1.0X8mm
12	PBBMBS8712	Plate
13	ZCHSM812520	Screw Cap M8-1.25X20mm
14	ZSWM8000000	Spring washer M8
15	PBBMBS8715	Screw Cap M8-1.25 X 20mm
15-1	ZSWM8000000	Spring washer M8
16	ZFWM8000000	Flat washer M8
17	PBBMBS8717	Supporting plate
17H-5	PBBMBS817H5	Hydraulic Cylinder
18	ZHXMN8125	Nut Hex M8-1.25
18-1	ZFWM8000000	Flat washer M8
19-1	PBBMBS8719-1	Support plate
19-2	ZCHSM1015020	Screw Cap M10-1.5X20mm
19-3	ZSWM1000000	Spring washer M10
28	PBBMBS8728	Block plate
29	ZCHSM61008	Screw Cap M6-1.0X8mm
30	ZFWM6000000	Flat washer M6
30-1	ZHXMN6100000	Nut Hex M6-1.0
31	ZHXBMB11217540	Bolt Hex M12-1.75X40mm
32	ZHXMN1217500	Nut Hex M12-1.75
33	PBBMBS8733	Filter net (Plate)
34	ZRHSM507010	Screw Round HD M5-0.7X10mm
35	ZCHSM610015	Screw Cap M6-1.0X15mm
36	ZFWM6000000	washer Flat M6
37	PBBMBS8737	Hose 5/16"X125cm

MFG Item No.	Item	Description
38	PBBMBS8738	Hose clamp
39	PBBMBS8739	Pump
40	PBBMBS8740	Plug M3/8"
41	PBBMBS8741	Coolant and chip tray
42	PBBMBS8742	Locking lever 232X170 mm
43	ZSTSM1015010	Set screw M10-1.5X10mm
44	ZSWM1000000	Spring washer M10
45	ZCHSM1015035	Cap Screw M10-1.5X35mm
46	ZHXMN1017500	Nut Hex M10-1.50
47	PBBMBS8747	Shaft
48	PBBMBS8748	Oil seal 160X3.55 mm
49	STSM812510	Set screw M8-1.25X10mm
50	PBBMBS8750	Disk 180X85 mm
51	ZSWM8000000	Spring washer M8
52	ZCHSM812525	Cap Screw M8-1.25X25mm
53	ZSTSM812510	Set screw M8-1.25 X 10mm
54	PBBMBS8754	Hand wheel 5"
55	ZSTSM812510	Set screw M6-1.25X8mm
56	ZHXMN20250	Nut Hex M20-2.5
57	PBBMBS8757	Bearing bushing 49X13 mm
58	ZBRG51104TH	Thrust Ball bearing #51104
59	PBBMBS8759	Lock handle 250X45X40 mm
60	PBBMBS8760	Bushing 30X60 mm
61	ZCHSM610025	Cap Screw M6-1.0X25mm
62	PBBMBS8762	Upper vise
63	PBBMBS8763	Compressed spring
64	PBBMBS8764	Lead screw M6-1.0X100mm
64-1	ZKEY552000000	Key 5X5X20 mm DR
66	PBBMBS8766	Vise
67	ZSTSM812510	Set screw M8-1.25X10mm
68	ZCHSM81258	cap screw M8-1.25X8mm
69	PBBMBS8769	Scale point
70	ZSTSM812510	Set screw M8-1.25X10mm
71	PBBMBS8771	Pivot
73	ZBRG32006ZZ	Ball bearing 32006ZZ
74	ZHXMN10175	Nut Hex M10-1.5
75	ZHXBMM1015040	Hex bolt M10-1.5X40mm
75-1	PBBMBS8776	Hex bolt M10-1.5X25mm
76	ZHXBMM1015025	Spring hook



MFG Item No.	Item	Description
77	ZHWM1000000	Toothed washer
78	ZHXM30350	Nut M30-3.5
79	PBBMBS8779	Swivel arm
80	PBBMBS8780	Scale
81	PBBMBS8781	Rivet 2mm
82	PBBMBS8782	Bar-stop-rod
83	PBBMBS8783	Bracket
84	ZBFSS51634	Butterfly screw 5/16"X3/4"
85	PBBMBS8785	Cover
86	ZCHSM50808	Cap Screw M5-0.8X8mm
88	ZCHSM50808	Cap Screw M5-0.8X8mm
88-1	ZFWM500000	Flat Washer M5
89	PBBMBS8789	Control box bottom plate
90-1	PBBMBS8790-1	Transformer
90-2	PBBMBS8790-2	AC contactor
90-3	PBBMBS8790-3	Breaker
90-4	PBBMBS8790-4	Thermal relay
90-5	PBBMBS8790-5	Terminal block
90-6	PBBMBS8790-6	Ground copper bar
90-7	PBBMBS8790-7	Breaker
91	ZCHSM50808	Cap Screw M5-0.8X8mm
92-1	PBBMBS8792-1	Switch
92-2	PBBMBS8792-2	Power indicator light
92-3	PBBMBS8792-3	Emergency stop
92-4	PBBMBS8792-4	Start button
92-5	PBBMBS8792-5	Manual/auto selector
93	PBBMBS8793	Control box panel
94	PBBMBS8794	Control box bottom part
95	PBBMBS8795	Support
96	PBBMBS8796	Setting bracket
97	ZAWM800000	Spring washer
98	ZCHSM812520	Cap Screw M8-1.25 X 20mm
99	PBBMBS8799	Spring washer M8
100	ZCHSM812520	Cap Screw M8-1.25 X 20mm
101	ZCHSM81258	Cap Screw M5-0.8X8mm
103	PBBMBS87103	Front ball bearing bracket
104	PBBMBS87104	Setting bracket
105	PBBMBVS87105	Handle
106	ZCHSM61008	Cap Screw M6-1.0 X 8mm

MFG Item No.	Item	Description
107	PBBMBS87107	Plastic handle M6
108	ZSWM8000000	Spring washer M8
109	ZCHSM812530	Cap Screw M8-1.25X30mm
110	ZSTSM812530	Set screw M8-1.25X30mm
114	PBBMBS87114	Rod
115	ZHXM16200	Nut Hex M16-2.0
116	PBBMBS87116	Handle with switch
117	PBBMBS87117	Cover plate
118	ZCHSM61008	Cap Screw M6-1.0 X 8mm
119	ZSTSM1015016	Set screw M10-1.5X16mm
120	ZCHSM1015040	Cap Screw M10-1.5X40mm
121	ZSWM1000000	Spring washer M10
122A	PBBMBS87122A	Slide
123	ZHXM16200	Nut Hex M16-2.0
124	PBBMBS87124	Handle
125	PBBMBS87125	Handle wheel
126	ZTW361720000	Thrust spring washer 36X17X2mm
127	PBBMBS87127	Tension shaft
128A	PBBMBS87128A	Shaft
129	ZBRG6006ZZ	Ball bearing 6006ZZ
130	PBBMBs87130	Idle flywheel
131	ZFWM16382	Washer 38X17X2mm
132	ZSWM1000000	Spring washer M10
133	ZHXB1015025	Hex bolt M10-1.5X25mm
134	PBBMBS87134	Blade 20X0.9X2085mm
135	ZKBOM610010	Knob bolt M6-1.0X10mm
136	PBBMBS87136	Blade cover
137	ZRHSM40708	Round HD screw M4-0.7X8mm
138	ZSWM40000000	Spring washer M4
138-1	ZHXM4070	Nut Hex M4-0.7
139	ZHXB1015025	Hex bolt M10-1.5X25mm
140	ZSWM8000000	Spring washer M10
141	ZFWM10385	Washer 38X11X5mm
142	PBBMBS87142	Drive flywheel
143	ZCHSM812530	Cap Screw M8-1.25 X 30mm
144	ZSWM8000000	Spring washer M8
145	PBBMBS87145	Saw arm
145-1	PBBMBS87145-1	Set shaft
146	PBBMBS87146	Hose 5/16"X75cm



MFG Item No.	Item	Description
147	PBBMBS87147	Pipe fitting 1/4"X5/16"
152	PBBMBS87152	Hose OD9mm ID 6mmX1.2 M
153	PBBMBS87153	Limit switch
154	ZCHSM61008	Cap Screw M6-1.0 X 8mm
155	PBBMBS87155	Spring shaft 25X25X145 mm
156	PBBMBS87156	Spring 52X150 mm
157	ZKEY88250000	Key 8X25mm
158	PBBMBS87158	Gear box
159	ZKEY88250000	Key 8X25mm
160	PBBMBS87160	Motor
161	ZSWM8000000	Spring washer M6
162	ZHXB812520	Hex Bolt M8-1.25 X 20mm
163	ZSTSM610012	Set screw M6-1.0X12mm
170	ZSTSM610012	Set screw M6-1.0X12mm
171	ZSWM8000000	Spring washer M8
172	ZCHSM812530	Cap Screw M8-1.25 X 30mm
173	PBBMBS87173	Centric shaft
174	ZBRG0608ZZ00	Ball bearing 608ZZ
175	ZERG70000000	E ring E-7
176	PBBMBS87176	Eccentric shaft
177	PBBMBS87177	Front ball bearing seat
178	PBBMBS87178	Front blade guard
179	ZRHSM61008	Round HD Screw M6-1.0 X 8mm
180	ZCHSM812520	Cap Screw M8-1.25X20mm
181	ZBRG0608ZZ	Ball bearing 608ZZ
182	ZFWM8000000	Flat washer M8
183	PBBMBS87183	Pipe fitting 45X45X65 mm
184	ZHXM8125	Nut Hex M8-1.25
185	ZSWM8000000	Spring washer M8
186	PBBMBS87186	Rear ball bearing seat
187	ZSWM8000000	Spring washer M8
188	ZCHSM812530	Cap Screw M8-1.25 X 30mm
189	PBBMBS87189	Rear Blade Guard
190	ZRHSM61008	Screw Round HD M6-1.0 X 8mm
191	ZECSCA250250	Start Cap250 $\mu$ F 250VAC 4"-1/8X1"-7/16
192	ZECRCA090250	Run CAP 90 $\mu$ F 250VAC 4"-1/8X1"-7/16



## BUSY BEE TOOLS 2 YEARS LIMITED WARRANTY

Busy Bee Tools warrants every product to be free from defects in materials and agrees to correct such defects where applicable. This warranty covers two years for parts and 90 days for labor (unless specified otherwise), to the original purchaser from the date of purchase but does not apply to malfunctions arising directly or indirectly from misuse, abuse, improper installation or assembly, negligence, accidents, repairs or alterations or lack of maintenance.

***Proof of purchase is necessary.***

All warranty claims are subject to inspection of such products or part thereof and Busy Bee Tools reserves the right to inspect any returned item before a refund or replacement may be issued.

This warranty shall not apply to consumable products such as blades, bits, belts, cutters, chisels, punches etc.

Busy Bee Tools shall in no event be liable for injuries, accidental or otherwise, death to persons or damage to property or for incidental contingent, special or consequential damages arising from the use of our products.

***RETURNS, REPAIRS AND REPLACEMENTS***

To return, repair, or replace a Busy Bee Tools product, you must visit the appropriate Busy Bee Tools showroom or call 1-800-461-BUSY.

For replacement parts directly from Busy Bee Tools, for this machine, please call 1-800-461-BUSY (2879), and have your model number and part number & payment option ready.

- All returned merchandise will be subject to a minimum charge of 15% for re-stocking and handling with the following qualifications.
- Returns must be pre-authorized by us in writing.
- We do not accept collect shipments.
- Items returned for warranty purposes must be insured and shipped pre-paid to the nearest warehouse
- Returns must be accompanied with a copy of your original invoice as proof of purchase. Returns must be in an un-used condition and shipped in their original packaging a letter explaining your reason for the return. Incurred shipping and handling charges are not refundable.
- Busy Bee will repair or replace the item at our discretion and subject to our inspection.
- Repaired or replaced items will be returned to you pre-paid by our choice of carriers.
- Busy Bee reserves the right to refuse reimbursement or repairs or replacement if a third party without our prior authorization has carried out repairs to the item.
- Repairs made by Busy Bee Tools are warranted for 30 days on parts and labor.
- Any unforeseen repair charges will be reported to you for acceptance prior to making the repairs.
- The Busy Bee Parts & Service Departments are fully equipped to do repairs on all products purchased from us with the exception of some products that require the return to their authorized repair depots. A Busy Bee representative will provide you with the necessary information to have this done.
- For faster service it is advisable to contact the nearest Busy Bee location for parts availability prior to bringing your product in for repairs.

