

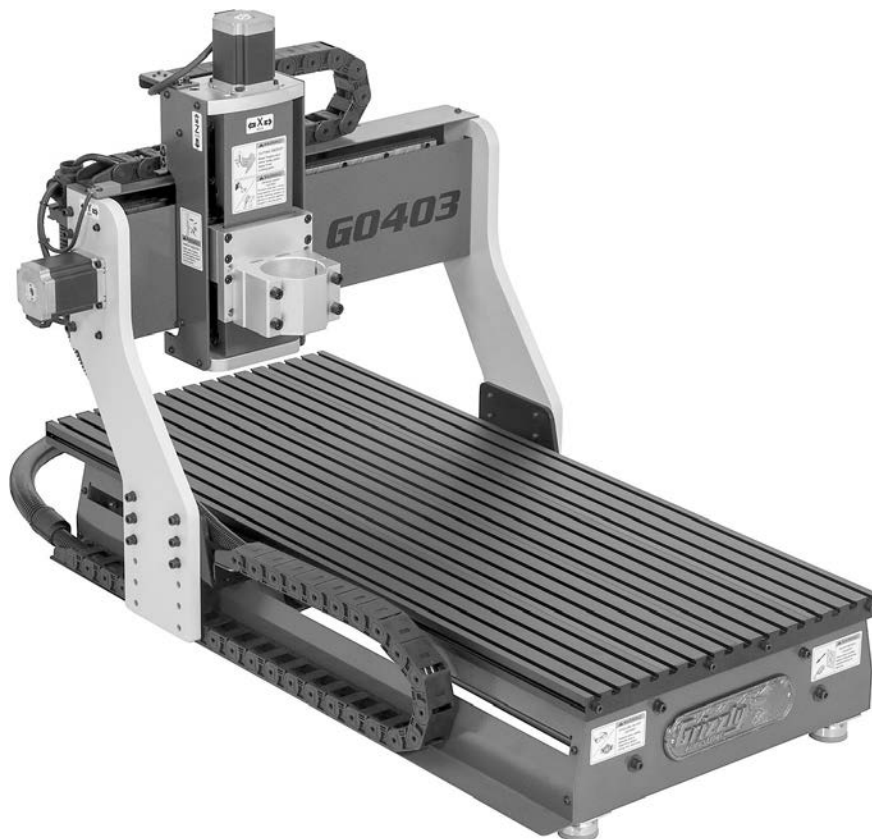


MODEL G0403

BENCHTOP CNC ROUTER

OWNER'S MANUAL

(For models manufactured since 03/25)



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*****Keep for Future Reference*****



WARNING!

This manual provides critical safety instructions on the proper setup, operation, maintenance, and service of this machine/tool. Save this document, refer to it often, and use it to instruct other operators.

Failure to read, understand and follow the instructions in this manual may result in fire or serious personal injury—including amputation, electrocution, or death.

The owner of this machine/tool is solely responsible for its safe use. This responsibility includes but is not limited to proper installation in a safe environment, personnel training and usage authorization, proper inspection and maintenance, manual availability and comprehension, application of safety devices, cutting/sanding/grinding tool integrity, and the usage of personal protective equipment.

The manufacturer will not be held liable for injury or property damage from negligence, improper training, machine modifications or misuse.



WARNING!

Some dust created by power sanding, sawing, grinding, drilling, and other construction activities contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm. Some examples of these chemicals are:

- **Lead from lead-based paints.**
- **Crystalline silica from bricks, cement and other masonry products.**
- **Arsenic and chromium from chemically-treated lumber.**

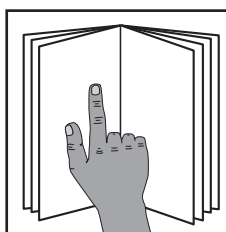
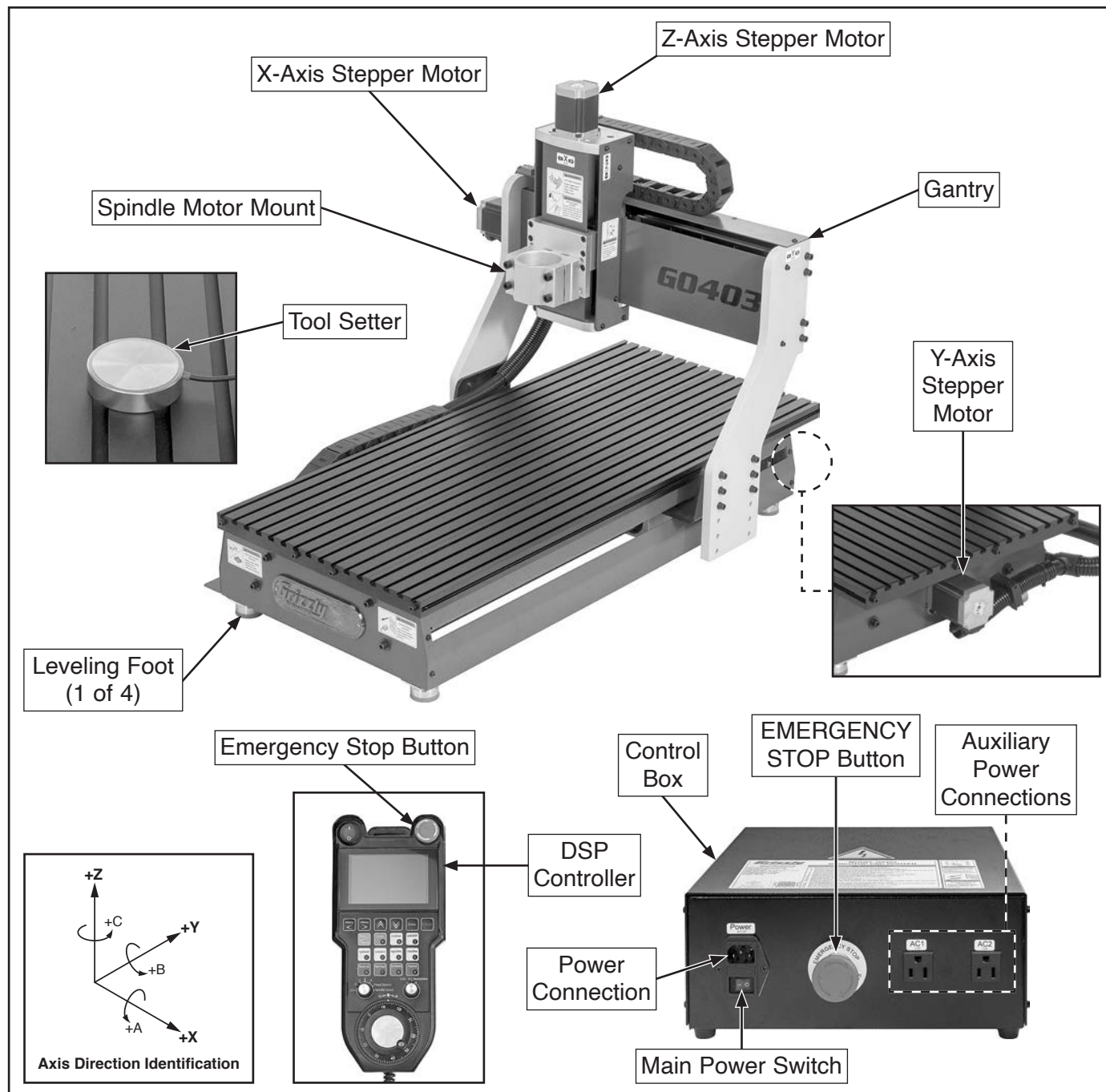
Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: Work in a well ventilated area, and work with approved safety equipment, such as those dust masks that are specially designed to filter out microscopic particles.

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Identification

Become familiar with the names and locations of the controls and features shown below to better understand the instructions in this manual.



! WARNING

To reduce your risk of serious injury, read this entire manual **BEFORE** using machine.



Controls & Components



Refer to the following figures and descriptions to become familiar with the basic controls and components of this machine. Understanding these items and how they work will help you understand the rest of the manual and minimize your risk of injury when operating this machine.

Control Box

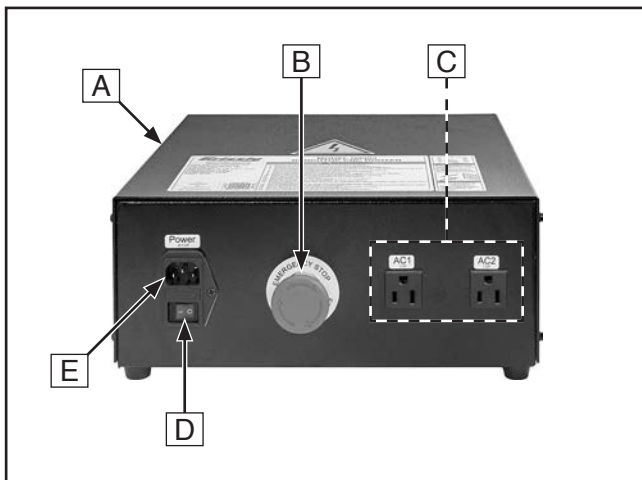


Figure 1. Front control box components.

- A. Control Box:** Contains electrical components and DSP-J2 control system. Provides power to stepper motors and components connected to auxiliary power connections.

- B. EMERGENCY STOP Button:** Disables power to control box and connected components. To reset, twist EMERGENCY STOP button clockwise until it pops out.
- C. Auxiliary Power Connections:** Connect auxiliary systems to machine power circuit.
- D. Main Power Switch:** Turns control box **ON** or **OFF**.
- E. Power Connection:** Receptacle with 10A fuse and EMI filter for connecting control box to power supply.

Tool Setter

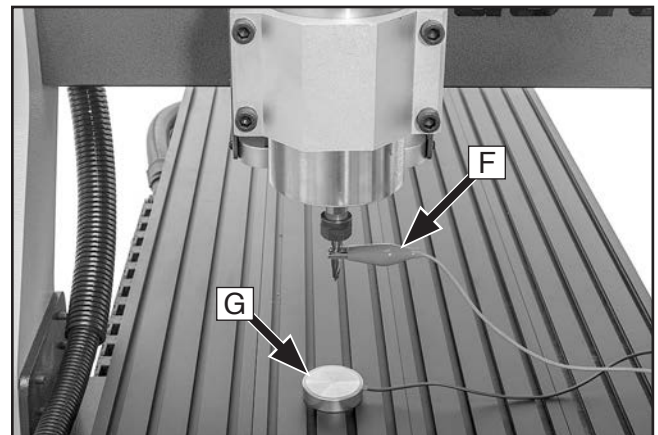


Figure 2. Tool setter (shown with accessory spindle motor installed).

- F. Test Lead:** Connects to tooling to provide electrical contact signal for tool setter.
- G. Tool Setter:** Measures tool length and sets Z-axis origin.



DSP Controller

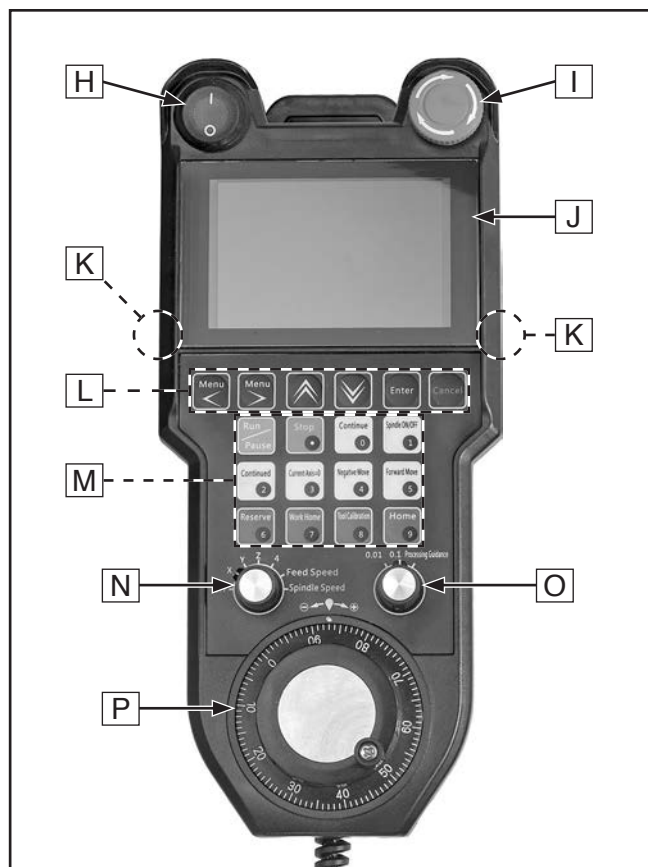


Figure 3. DSP controller button layout.

The DSP controller provides control of machine traversal and operations.

H. ON/OFF Switch: Turns DSP controller **ON** or **OFF**.

I. Emergency Stop Button: Terminates running program, disables axes movement, and prevents further operation until reset. To reset, twist button clockwise until it pops out.

J. Controller Display: Shows current machine status, programming information, controls, alarms, and system messages.

K. Enable Buttons: Safety feature that allows operation of controls only when one of the enable buttons is pressed.

L. Menu Navigation Keys: Controls menu navigation and enters/cancels inputs.

M. Function Buttons: Controls program functions and enters numerical characters:

- **Run/Pause:** Starts or pauses G-Code file. Input for "-" (minus sign).

- **Stop:** Stops G-Code file. Input for "." (decimal sign).

- **Continue:** Continues program after stopping. Input for "0".

- **Spindle ON/OFF:** Starts/stops spindle motor when compatible spindle motor has been connected. Input for "1".

- **Continued:** Allows for continuous operation. Input for "2".

- **Current Axis=0:** Clears coordinates for current program file. Input for "3".

- **Negative Move:** Jogs axis in negative direction. Press in combination with "Continued" button for extended movement. Input for "4".

- **Forward Move:** Jogs axis in positive direction. Press in combination with "Continued" button for extended movement. Input for "5".

- **Reserve:** Breakpoint save. Input for "6".

- **Work Home:** Moves axes to workpiece origin. Input for "7".

- **Tool Calibration:** Initiates tool setting function. Input for "8".

- **Home:** Moves axes to machine origin. Input for "9".

N. Axis Selection Dial: Designates axis or speed being controlled by jog mode dial and MPG wheel.

O. Jog Mode Dial: Selects slow (0.01) or fast (0.1) increments for designated axis.

P. MPG Wheel: Moves axis at incremental speed selected by jog mode dial.



DSP Controller Display

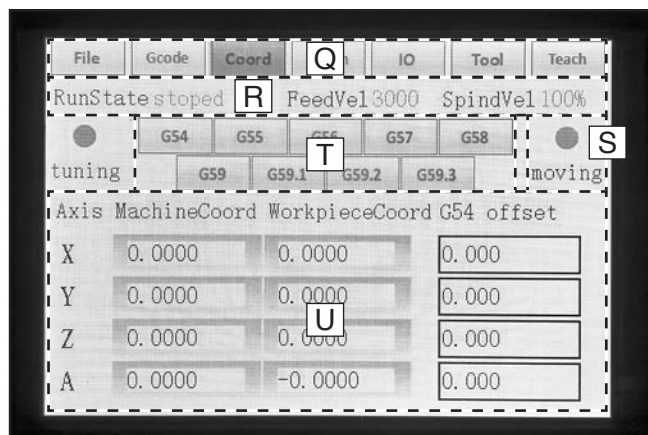


Figure 4. DSP display (Coord screen shown).

The DSP controller display shows current machine status, programming information, controls, alarms, and system messages.

Q. Menu Area: Shows soft keys for navigating through system menus. Soft keys can be selected by pressing menu navigation keys on DSP controller. A summary of each menu is described below:

- **File:** Provides access to files saved in controller memory (local), or from external source (U disk). Files can be opened, copied, deleted, and pasted through DSP controller display interface.
- **Gcode:** Shows currently loaded G-code file and operating line, total number of rows, code syntax, and download file progress as a percentage.
- **Coord:** Displays current mechanical coordinates, workpiece coordinates, and current coordinate system offset.

- **Param:** Provides soft key settings for configuring hardware-related parameters of machine and components.

IMPORTANT: Always consult Tech Support before making any modifications to Param settings.

- **IO:** Provides manual input/output signal detection for machine components.
- **Tool:** Initiates tool parameter file for operating with custom tooling.
- **Teach:** Supports linear teaching function to record and save machine processes through operations.

- R. Status Area:** Displays current machine running state as well as feed speed in inches/millimeters per minute, and spindle velocity as a percentage of full speed range.
- S. Moving Soft Key:** Allows workpiece coordinate directions to be inputted directly into axes coordinates. Shows a red light when inactive, and a green light when active.
- T. Menu Soft Key Area:** Shows soft keys related to currently selected menu. Soft keys can be selected by pressing menu navigation keys on DSP controller.
- U. Operating Area:** Shows current part program steps, coordinates, and position, with operating units in inches/millimeters.



Glossary of Terms

The following is a list of common definitions, terms and phrases used throughout this manual as they relate to this CNC router and woodworking in general. Become familiar with these terms for assembling, adjusting or operating this machine. Your safety is VERY important to us at Grizzly!

Axis: Direction of movement. On a three-axis machine, axes are typically X (left-right), Y (front-back), and Z (up-down).

Axis Direction: Described as positive or negative. Positive movement is defined as movement toward the rear (Y), right (X), and top (Z) direction of the working envelope.

Auxiliary Axis: Any axis that is in addition to the primary axes of X, Y, and Z. Axes can be rotational (A, B, and C) or linear (U, V, or W).

Ball End Mill (Ball Nose): A cutting tool that has a rounded cutting arc, where the arc diameter is equal to the cutting diameter.

Ball Screw: Drive system component. The ball screw is rotated by a motor and provides the means for moving the gantry and spindle along the axes.

Bed: The bed of the CNC consists of a welded steel frame, an extruded aluminum table top, and a tongue-and-groove table top with integrated T-slots.

Block: A single line of CNC code consisting of program syntax that identifies what activities the machine is to execute.

Breakpoint: The point in a program where a change is created. In a program file, a breakpoint will save a location to resume from later.

CAD: Computer aided design. CAD software is used to create a digital model of a project.

CAM: Computer aided manufacturing. CAM software converts CAD models into a toolpath defined by G-code that CNC machines can interpret.

Chip Load: Chip load is the thickness of chips a tool will produce. Chip load is equal to: $\text{Feed Rate} \div (\text{Spindle Speed} \times \text{Number of Flutes})$.

Climb Cut: Cut that occurs when the rotation of the tool moves in same direction as the workpiece.

CNC: Computer numerical control. Manufacturing controlled by a computer or processor via coded instructions.

Collet: Metal collar that holds the cutting tool in place within a collet nut.

Compression Bit: A cutting tool with a combination of up and down shear cutting edges. Typically used for cutting laminate material to prevent tear-out on both sides of the sheet.

Conventional Cut: Cut that occurs when the rotation of the tool moves in opposite direction as the workpiece.

Coordinates: Numerical values that define the positional location of points from a predetermined zero point or origin.

Datum: Origin from which the dimensional location of a part is established.

Digital Signal Processing (DSP): Processing method that utilizes computers (or other digital processors) to receive, send, and analyze data. This information is represented by a string or sequence of numbers that is converted into a processing function.

Down-Cut Bit: A cutting tool with edges that carve downward on the face of the toolpath. Reduces the potential for tear-out, but requires a slower feed rate.



Dry Run: Executing a CNC part program with no part mounted to verify the programmed path under automatic operation.

Dust Shoe: An accessory that channels dust and debris directly from the cutting tool through an attached dust collection system.

Dwell: Part of an operation in which axis movement stops while the spindle is running and the tool is within the workpiece. Typically used for canned drilling cycles.

End Mill: A cutting tool with a straight end, typically with spiral flute(s). It creates a channel with a flat bottom perpendicular to the sides.

Feed Rate: The speed at which the cutting tool moves along a workpiece.

Finish Cut: A 3D toolpath that reduces or eliminates the irregular contours left by a rough cut.

Flutes: Deep grooves under the cutting edges (teeth) of a bit used for chip evacuation.

Flute Length: The length of the cutting portion on a router bit or cutting tool.

Form Bit: A bit that carves a standard profile such as a roundover, ogee, or similar contour.

Gantry: The structure that straddles the bed and carries the spindle. It moves the full length of the bed along the Y-axis.

G-Code: A machine language that uses axis points and commands, which the machine uses to move and perform functions.

Hold-Down: A clamp used to firmly hold a workpiece or fixture to the table.

Home Position: A fixed point on the machine set using a relative coordinate system. It is the machine zero point on all axes.

Jog: Activating JOG feed mode allows the selection of manual feeds along a single linear or rotational axis.

Letter Address: The first letter of a G-code command. Commands with similar functions are usually grouped within the same letter address. For example, the "G" letter address deals with preparatory functions that define the machine's operation, while the "M" letter address handles miscellaneous machine functions such as turning on spindles, pumps, and other auxiliary tasks.

Manual Pulse Generator (MPG): Device for generating electrical pulses in electronic systems under the control of an operator. A typical MPG consists of a rotating knob that generates pulses that are sent to an equipment controller. The controller will then move the piece of equipment a predetermined distance for each pulse.

Origin: User designated zero point for a workpiece from which the router will reference the positioning of all cutting.

Part Program: A set of instructions that, when entered into a machine control unit, will cause the machine to function in the manner necessary to produce a particular part.

Plunge: The distance on the Z-axis that the spindle and cutting tool moves toward, into, or along the workpiece.

Pocket Toolpath: A toolpath that creates a cavity in the horizontal surface of a workpiece.

Post Processor: A software function that formats G-code into a dialect understood by a specific machine.

Profile Toolpath: A toolpath that cuts along the profile of a set of vectors. Typically used to cut out the shape of a design.

Programmable Logic Controller (PLC): Computer adapted for control of CNC processes that requires high reliability, ease of programming, and process fault diagnosis.



Proximity Sensor: A sensor able to detect the presence of nearby objects without any physical contact. Often emits an electromagnetic field or a beam of electromagnetic radiation and looks for changes in the field or return signal.

Proximity Sensor Target: Object being sensed by proximity sensor.

Rapid: The maximum speed of each axis. Higher rapid rates decrease machining times.

Rotary Table: A work positioning device that enables the operator to drill or cut workpieces at exact intervals around a fixed axis. On a three-axis rotary table, axes are typically designated A, B, or C depending on which axis the rotary table revolves around.

Rough Cut: A 3D toolpath where the initial cut is designed to remove unwanted material, leaving a rough contour.

Soft Key: A button on a computer keyboard or other electronic device whose function can be changed programmatically.

Soft Limits: Axis limits imposed by the work space boundaries and based on controller settings and the location of home. An "out of soft limits error" implies that there is not enough room to move in a designated direction based on the positioning of the workpiece.

Spindle Speed: Rotational speed of cutting tool measured in Rotations Per Minute (RPM).

Spoilboard: Sacrificial material placed under the workpiece that allows the cutting tool to go past the workpiece to ensure a full, clean cut without damaging the work table. Usually made of MDF.

Stepper Motor: DC motor that moves in precise steps when pulses are received. Has very accurate positioning and speed control.

Surfacing: The process of leveling the surface of a workpiece or spoilboard so it is perpendicular to the spindle.

Tool Changer: A mechanical apparatus used to automatically change cutting tools by program control on CNC machines.

Tool Deflection: When the spindle speed and feed rate exert sufficient force to deflect the cutting tool. Deflection leads to excessive wear and chatter, which can shorten tool life and leave unwanted tooling marks on the material.

Tool Offset: A dimensional value defining the position of the cutting edge(s) of a tool in relation to an established datum.

Tool Setter: A device used to measure tool dimensions and set the zero point (origin) for the Z-axis.

Toolpath: User defined route that the tool follows to machine a workpiece.

Tramming: Process of aligning spindle tooling perpendicular with X- and Y-axis.

Up-Cut Bit: A cutting tool with edges that carve upward on the face of the toolpath. This removes chips from the material, but can pull the material off the bed and splinter the top edge.

Variable Frequency Drive (VFD): Variable frequency drive that controls the speed (RPM) of the spindle. Enables the fine tuning of the spindle during the operation of a toolpath.

Working Envelope: The three-dimensional area that the spindle can travel within while cutting or milling.





MACHINE DATA SHEET

Customer Service #: (570) 546-9663 · To Order Call: (800) 523-4777 · Fax #: (800) 438-5901

MODEL G0403 BENCHTOP CNC ROUTER

Product Dimensions:

Weight 183 lbs.
Width (side-to-side) x Depth (front-to-back) x Height 24 x 36-1/2 x 27 in.
Footprint (Length/Width) 33-1/2 x 16-1/2 in.
Control Box Dimensions 12 x 13 x 5-1/2 in.

Shipping Dimensions:

Type Cardboard Box on Wood Pallet
Content Machine
Weight 221 lbs.
Length x Width x Height 44 x 30 x 35 in.
Must Ship Upright Yes

Electrical:

Power Requirement 110V, Single Phase, 60 Hz
Full-Load Current Rating 1.8A
Full-Load Current Rating (w/Optional Spindle Motor, Coolant Pump, & Rotary Axis Motor) 8.2A
Minimum Circuit Size 15A
Connection Type Cord & Plug
Power Cord Included Yes
Power Cord Length 79 in.
Power Cord Gauge 14 AWG
Plug Included Yes
Included Plug Type 5-15
Switch Type ON/OFF Switch w/Emergency Stop
Inverter (VFD) Type MK100-1S1.5G-DK
Inverter (VFD) Size 2 HP

Motor:

X-Axis Motor

Model 57BHH76-500A-24Bs
Frame Size NEMA 23
Amps 5A
Rated Speed 1500 RPM
Type Stepper
Power Transfer Direct
Step Resolution 5000

Y-Axis Motor

Model 57BHH76-500A-24Bs
Frame Size NEMA 23
Amps 5A
Rated Speed 1500 RPM
Type Stepper
Power Transfer Direct
Step Resolution 5000



Z-Axis Motor

Model..... 57BHH76-500A-24Bs
Frame SizeNEMA 23
Amps5A
Rated Speed1500 RPM
Type..... Stepper
Power Transfer Direct
Step Resolution5000

Spindle Motor (Optional T34438)

Model..... GDZ-80-1.5B
Type..... Induction
Horsepower2 HP
Voltage.....110V
Amps5A
Speed 0 - 24,000 RPM
Number of Speeds Variable
Power Transfer Direct

Coolant Pump (Optional T34438)

Model.....SK-3200
Type..... Induction
Horsepower 75 Watt
Amps0.7A
Rated Speed 3200 L/H

Rotary Axis Motor (Optional T34439)

Model..... 57BHH76-500A-24Bs
Frame SizeNEMA 23
Amps5A
Rated Speed1500 RPM
Type..... Stepper
Power Transfer Direct
Step Resolution5000

Main Specifications:

Axis Information

X-Axis Travel 13 in.
Y-Axis Travel.....25-9/16 in.
Z-Axis Travel7-1/16 in.
XY Rapid Speed.....118 IPM
Z Rapid Speed118 IPM

Construction

Table Aluminum Alloy
BodySteel/Aluminum
Paint Type/Finish..... Powder Coated

Cutting Information

XYZ Work Envelope13 x 25-9/16 x 7-1/16 in.
Max Distance Spindle to Table.....7-1/16 in.
Max Distance Spindle to Table (Gantry Raised)10-1/16 in.
Cutting Accuracy +/-0.004 in.



Table Information

Table Length.....36 in.
Table Width.....15-3/4 in.

Other Related Information

Number of Leveling Feet.....4
Collet Type.....ER11
Controller.....DSP-J2

Other Specifications:

Country of Origin.....China
Warranty.....1 Year
Approximate Assembly & Setup Time.....1 Hour
Serial Number LocationMachine ID Label
ISO 9001 Factory.....Yes

Features:

Ball Screw Drive System w/XY-Axis Linear Guideways & Y-axis Guide Rails
Supports G-Code File Extensions: .tap & .nc
Steel Gantry Supports w/Adjustable Height for Larger Workpieces
Automatic Tool Setter
Anodized Aluminum Table
Trapezoidal Drive Mode
Adjustable Levelling Feet
Secondary Spindle Mount for 65mm Diameter Spindle
Includes ER11 Collet Sizes: 1/16", 1/8", & 1/4"

Recommended Accessories:

2 HP Water-Cooled Spindle Kit (Optional T34438)
4th-Axis Rotary Drive w/Tailstock (Optional T34439)
Laminate Trim Router w/Plunge Base (Optional T27139)



SECTION 1: SAFETY

For Your Own Safety, Read Instruction Manual Before Operating This Machine

The purpose of safety symbols is to attract your attention to possible hazardous conditions. This manual uses a series of symbols and signal words intended to convey the level of importance of the safety messages. The progression of symbols is described below. Remember that safety messages by themselves do not eliminate danger and are not a substitute for proper accident prevention measures. Always use common sense and good judgment.



Indicates an imminently hazardous situation which, if not avoided, **WILL** result in death or serious injury.



Indicates a potentially hazardous situation which, if not avoided, **COULD** result in death or serious injury.



Indicates a potentially hazardous situation which, if not avoided, **MAY** result in minor or moderate injury. It may also be used to alert against unsafe practices.

NOTICE

Alerts the user to useful information about proper operation of the machine to avoid machine damage.

Safety Instructions for Machinery



OWNER'S MANUAL. Read and understand this owner's manual **BEFORE** using machine.

TRAINED OPERATORS ONLY. Untrained operators have a higher risk of being hurt or killed. Only allow trained/supervised people to use this machine. When machine is not being used, disconnect power, remove switch keys, or lock-out machine to prevent unauthorized use—especially around children. Make your workshop kid proof!

DANGEROUS ENVIRONMENTS. Do not use machinery in areas that are wet, cluttered, or have poor lighting. Operating machinery in these areas greatly increases the risk of accidents and injury.

MENTAL ALERTNESS REQUIRED. Full mental alertness is required for safe operation of machinery. Never operate under the influence of drugs or alcohol, when tired, or when distracted.

ELECTRICAL EQUIPMENT INJURY RISKS.

You can be shocked, burned, or killed by touching live electrical components or improperly grounded machinery. To reduce this risk, only allow qualified service personnel to do electrical installation or repair work, and always disconnect power before accessing or exposing electrical equipment.

DISCONNECT POWER FIRST. Always disconnect machine from power supply **BEFORE** making adjustments, changing tooling, or servicing machine. This prevents an injury risk from unintended startup or contact with live electrical components.

EYE PROTECTION. Always wear ANSI-approved safety glasses or a face shield when operating or observing machinery to reduce the risk of eye injury or blindness from flying particles. Everyday eyeglasses are **NOT** approved safety glasses.



WARNING

WEARING PROPER APPAREL. Do not wear loose clothing, gloves, neckties, or jewelry that can become entangled in moving parts. Always tie back or cover long hair. Wear non-slip footwear to reduce risk of slipping and losing control or accidentally contacting cutting tool or moving parts.

HAZARDOUS DUST. Dust created by machinery operations may cause cancer, birth defects, or long-term respiratory damage. Be aware of dust hazards associated with each workpiece material. Always wear a NIOSH-approved respirator to reduce your risk.

HEARING PROTECTION. Always wear hearing protection when operating or observing loud machinery. Extended exposure to this noise without hearing protection can cause permanent hearing loss.

REMOVE ADJUSTING TOOLS. Tools left on machinery can become dangerous projectiles upon startup. Never leave chuck keys, wrenches, or any other tools on machine. Always verify removal before starting!

USE CORRECT TOOL FOR THE JOB. Only use this tool for its intended purpose—do not force it or an attachment to do a job for which it was not designed. Never make unapproved modifications—modifying tool or using it differently than intended may result in malfunction or mechanical failure that can lead to personal injury or death!

AWKWARD POSITIONS. Keep proper footing and balance at all times when operating machine. Do not overreach! Avoid awkward hand positions that make workpiece control difficult or increase the risk of accidental injury.

CHILDREN & BYSTANDERS. Keep children and bystanders at a safe distance from the work area. Stop using machine if they become a distraction.

GUARDS & COVERS. Guards and covers reduce accidental contact with moving parts or flying debris. Make sure they are properly installed, undamaged, and working correctly **BEFORE** operating machine.

FORCING MACHINERY. Do not force machine. It will do the job safer and better at the rate for which it was designed.

NEVER STAND ON MACHINE. Serious injury may occur if machine is tipped or if the cutting tool is unintentionally contacted.

STABLE MACHINE. Unexpected movement during operation greatly increases risk of injury or loss of control. Before starting, verify machine is stable and mobile base (if used) is locked.

USE RECOMMENDED ACCESSORIES. Consult this owner's manual or the manufacturer for recommended accessories. Using improper accessories will increase the risk of serious injury.

UNATTENDED OPERATION. To reduce the risk of accidental injury, turn machine **OFF** and ensure all moving parts completely stop before walking away. Never leave machine running while unattended.

MAINTAIN WITH CARE. Follow all maintenance instructions and lubrication schedules to keep machine in good working condition. A machine that is improperly maintained could malfunction, leading to serious personal injury or death.

DAMAGED PARTS. Regularly inspect machine for damaged, loose, or mis-adjusted parts—or any condition that could affect safe operation. Immediately repair/replace **BEFORE** operating machine. For your own safety, **DO NOT** operate machine with damaged parts!

MAINTAIN POWER CORDS. When disconnecting cord-connected machines from power, grab and pull the plug—**NOT** the cord. Pulling the cord may damage the wires inside. Do not handle cord/plug with wet hands. Avoid cord damage by keeping it away from heated surfaces, high traffic areas, harsh chemicals, and wet/damp locations.

EXPERIENCING DIFFICULTIES. If at any time you experience difficulties performing the intended operation, stop using the machine! Contact our Technical Support at (570) 546-9663.



Additional Safety for CNC Routers

WARNING

You can be seriously injured or killed by getting clothing, jewelry, or long hair entangled with rotating cutter/spindle. You can be severely cut or have fingers amputated from contact with rotating cutters. You can be blinded or struck by broken cutting tools, wood chips, improperly secured workpieces, or adjustment tools thrown from rotating spindle with great force. To reduce risk of serious injury when operating this machine, heed and understand the following:

AVOID CONTACT WITH MOVING PARTS. Never remove guards/covers or reach inside machine during operation or while connected to power. You could be severely injured if you accidentally touch spinning cutting tool or get entangled in moving parts. If a workpiece becomes stuck or debris removal is necessary, turn machine **OFF**, allow spindle and tooling to come to a complete stop, and disconnect power before clearing.

USE CORRECT SPINDLE SPEED. Use proper speeds and feeds for each size and type of cutting tool as recommended by tool manufacturer. This helps avoid injury risk from tool breakage during operation and ensures best cutting results.

INSPECT CUTTING TOOL. Inspect cutting tools for sharpness, chips, or cracks before each use. Replace dull, chipped, or cracked cutting tools immediately. Do not use damaged tools as they are likely to break apart and could hit user with great speed and force.

PROPERLY SECURE TOOLING. Secure tooling so it does not fly out of spindle during operation.

SECURE WORKPIECE TO TABLE. Secure workpiece to table so workpiece cannot unexpectedly move or spin during operation. NEVER hold workpiece by hand during operation.

PROPERLY COLLECT DUST. Only use dust collector to clear chips while spindle is turning. DO NOT clear chips by hand when cleaning. Only use a brush or shop vacuum when spindle/axes are NOT turning or moving.

FIRE HAZARD. To reduce risk of fire, always use proper feeds and speeds for cutting tool and workpiece type. Avoid operations that dwell in one place. Be aware of signs of fire and keep fire extinguisher nearby. Chips and dust collection can disguise embers and smoke. Prepare a fire safety plan and ensure it is practiced by all operators. Never operate machine unattended unless workspace has a lights-out fire prevention system.

DISCONNECT POWER FIRST. To reduce risk of electrocution or injury from unexpected startup, make sure CNC router is turned **OFF**, disconnected from power, and all moving parts are completely stopped before changing cutting tools or performing any inspection, adjustment, or maintenance procedure.

REMOVE SPINDLE TOOLS. Always remove wrenches and other tools used on the spindle immediately after use. This will prevent them from being thrown by the spindle upon startup.

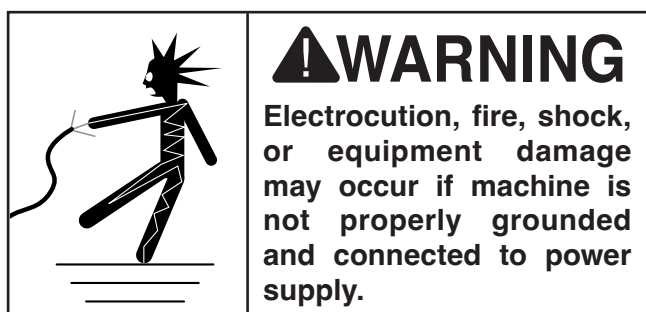
PROPERLY MAINTAIN MACHINE. Keep machine in proper working condition to help ensure that it functions safely and all guards and other components work as intended. Perform routine inspections and all required maintenance. Never operate machine with damaged or worn parts that can break or result in unexpected movement during operation.



SECTION 2: POWER SUPPLY

Availability

Before installing the machine, consider the availability and proximity of the required power supply circuit. If an existing circuit does not meet the requirements for this machine, a new circuit must be installed. To minimize the risk of electrocution, fire, or equipment damage, installation work and electrical wiring must be done by an electrician or qualified service personnel in accordance with all applicable codes and standards.



Full-Load Current Rating

The full-load current rating is the amperage a machine draws at 100% of the rated output power. On machines with multiple motors, this is the amperage drawn by the largest motor or sum of all motors and electrical devices that might operate at one time during normal operations.

Full-Load Current Rating at 110V 1.8 Amps

IMPORTANT: Accessories connected to the Model G0403 will increase full-load current rating of machine! Verify all electrical components connected to machine do not exceed **110V Circuit Requirements**.

The full-load current is not the maximum amount of amps that the machine will draw. If the machine is overloaded, it will draw additional amps beyond the full-load rating.

If the machine is overloaded for a sufficient length of time, damage, overheating, or fire may result—especially if connected to an undersized circuit. To reduce the risk of these hazards, avoid overloading the machine during operation and make sure it is connected to a power supply circuit that meets the specified circuit requirements.

! WARNING

Serious injury could occur if you connect machine to power before completing setup process. **DO NOT** connect to power until instructed later in this manual.

110V Circuit Requirements

This machine is prewired to operate on a power supply circuit that has a verified ground and meets the following requirements:

Nominal Voltage 110V, 115V, 120V
Cycle 60 Hz
Phase Single-Phase
Power Supply Circuit 15 Amps
Plug/Receptacle NEMA 5-15

A power supply circuit includes all electrical equipment between the breaker box or fuse panel in the building and the machine. The power supply circuit used for this machine must be sized to safely handle the full-load current drawn from the machine for an extended period of time. (If this machine is connected to a circuit protected by fuses, use a time delay fuse marked D.)

! CAUTION

For your own safety and protection of property, consult an electrician if you are unsure about wiring practices or electrical codes in your area.

Note: *Circuit requirements in this manual apply to a dedicated circuit—where only one machine will be running on the circuit at a time. If machine will be connected to a shared circuit where multiple machines may be running at the same time, consult an electrician or qualified service personnel to ensure circuit is properly sized for safe operation.*



Grounding & Plug Requirements

This machine **MUST** be grounded. In the event of certain malfunctions or breakdowns, grounding reduces the risk of electric shock by providing a path of least resistance for electric current.

This machine is equipped with a power cord that has an equipment-grounding wire and a grounding plug. Only insert plug into a matching receptacle (outlet) that is properly installed and grounded in accordance with all local codes and ordinances. **DO NOT** modify the provided plug!

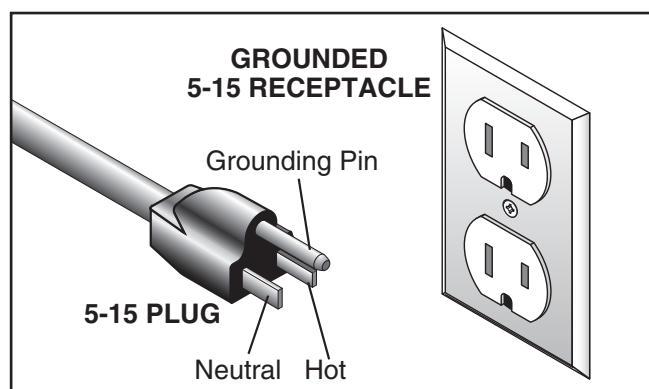
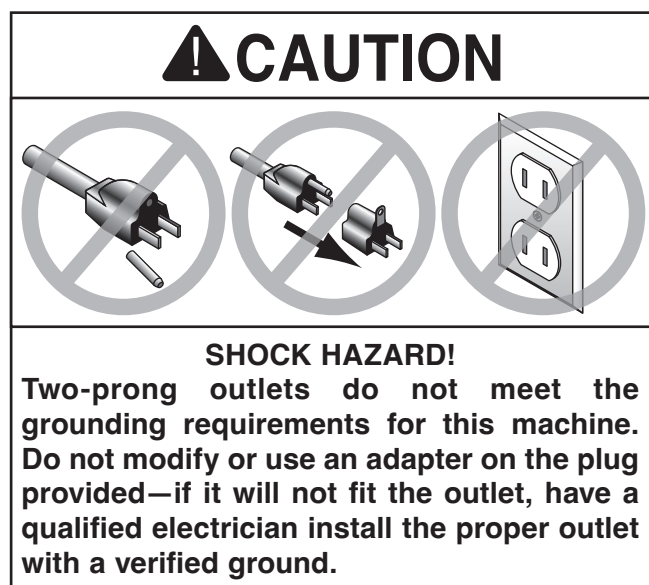


Figure 5. Typical 5-15 plug and receptacle.



Improper connection of the equipment-grounding wire can result in a risk of electric shock. The wire with green insulation (with or without yellow stripes) is the equipment-grounding wire. If repair or replacement of the power cord or plug is necessary, do not connect the equipment-grounding wire to a live (current carrying) terminal.

Check with a qualified electrician or service personnel if you do not understand these grounding requirements, or if you are in doubt about whether the machine is properly grounded. If you ever notice that a cord or plug is damaged or worn, disconnect it from power, and immediately replace it with a new one.

Extension Cords

We do not recommend using an extension cord with this machine. If you must use an extension cord, only use it if absolutely necessary and only on a temporary basis.

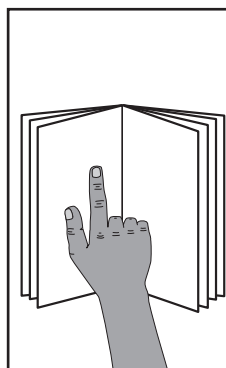
Extension cords cause voltage drop, which can damage electrical components and shorten motor life. Voltage drop increases as the extension cord size gets longer and the gauge size gets smaller (higher gauge numbers indicate smaller sizes).

Any extension cord used with this machine must be in good condition and contain a ground wire and matching plug/receptacle. Additionally, it must meet the following size requirements:

Minimum Gauge Size 16 AWG
Maximum Length (Shorter is Better)..... 50 ft.

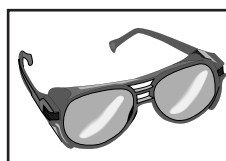


SECTION 3: SETUP



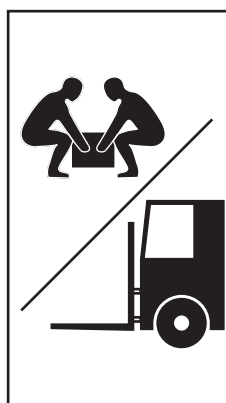
!WARNING

This machine presents serious injury hazards to untrained users. Read through this entire manual to become familiar with the controls and operations before starting the machine!



!WARNING

Wear safety glasses during the entire setup process!



!WARNING

HEAVY LIFT!

Straining or crushing injury may occur from improperly lifting machine or some of its parts. To reduce this risk, get help from other people and use a forklift (or other lifting equipment) rated for weight of this machine.

Needed for Setup

The following items are needed, but not included, for the setup/assembly of this machine.

Description	Qty
• Forklift or Hoist (rated for at least 300 lbs.)	1
• Lifting Straps (rated for at least 300 lbs.)	2
• Additional Person	1
• Safety Glasses (for each person).....	1
• Level	1
• Utility Knife	1
• Spindle Motor	1
• Hex Wrench 6mm.....	1

Unpacking

This machine was carefully packaged for safe transport. When unpacking, separate all enclosed items from packaging materials and inspect them for shipping damage. ***If items are damaged, please call us immediately at (570) 546-9663.***

IMPORTANT: Save all packaging materials until you are completely satisfied with the machine and have resolved any issues between Grizzly or the shipping agent. *You MUST have the original packaging to file a freight claim. It is also extremely helpful if you need to return your machine later.*



Inventory

The following is a list of items shipped with your machine. Before beginning setup, lay these items out and inventory them.

If any non-proprietary parts are missing (e.g. a nut or a washer), we will gladly replace them; or for the sake of expediency, replacements can be obtained at your local hardware store.

NOTICE

If you cannot find an item on this list, carefully check around/inside the machine and packaging materials. Often, these items get lost in packaging materials while unpacking or they are pre-installed at the factory.

Box 1 Inventory (Figure 6)	Qty
A. CNC Router w/Gantry	1
B. Control Box.....	1
C. Toolbox	1
D. Power Cord w/5-15 Plug.....	1
E. ER11 Collets 1/16", 1/8", 1/4".....	1 Ea.
F. USB Flash Drive 32 GB	1
G. Fuse 10A (Spare).....	1
H. Open-End Wrench 13mm.....	1
I. Tool Setter	1
J. Hex Wrench 5mm.....	1
K. Open-Ends Wrench 14/17mm	1

Box 2 Inventory (Figure 7)	Qty
L. DSP Controller	1

Hardware Inventory (Figure 8)	Qty
M. Hold-Down Brackets.....	6
N. Flat Head Screws M6-1 X 60 (P0403126)	12
O. Knobs M6-1 (P0403128).....	6
P. Hex Bolts M6-1 X 70 (P0403125).....	6

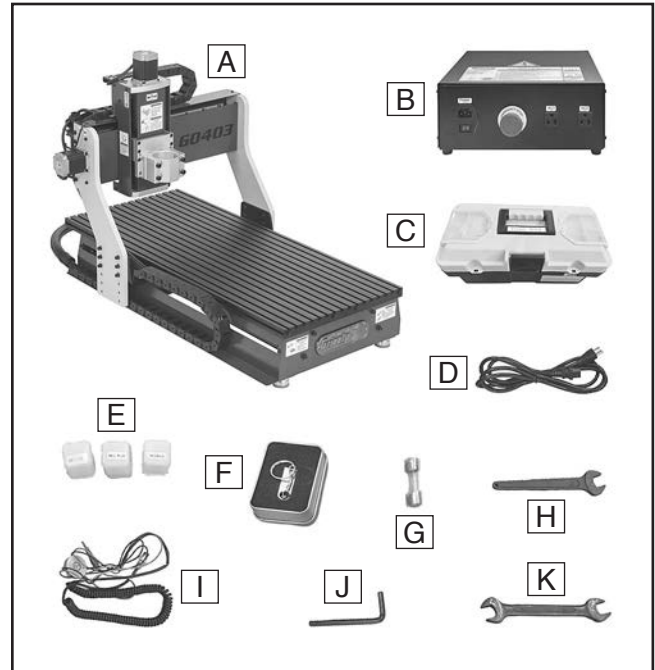


Figure 6. Box 1 inventory.



Figure 7. Box 2 inventory.

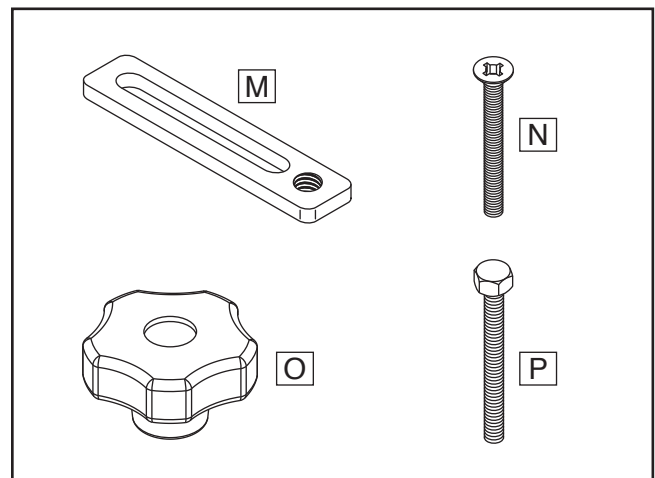


Figure 8. Hardware inventory.



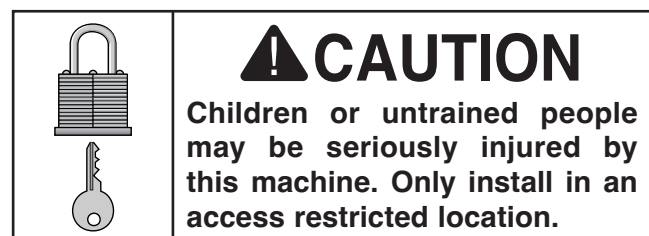
Site Considerations

Weight Load

Refer to the **Machine Data Sheet** for the weight of your machine. Make sure that the surface upon which the machine is placed will bear the weight of the machine, additional equipment that may be installed on the machine, and the heaviest workpiece that will be used. Additionally, consider the weight of the operator and any dynamic loading that may occur when operating the machine.

Space Allocation

Consider the largest size of workpiece that will be processed through this machine and provide enough space around the machine for adequate operator material handling or the installation of auxiliary equipment. With permanent installations, leave enough space around the machine to open or remove doors/covers as required by the maintenance and service described in this manual. **See below for required space allocation.**



Physical Environment

The physical environment where the machine is operated is important for safe operation and longevity of machine components. For best results, operate this machine in a dry environment that is free from excessive moisture, hazardous chemicals, airborne abrasives, or extreme conditions. Extreme conditions for this type of machinery are generally those where the ambient temperature range exceeds 41°–104°F; the relative humidity range exceeds 20%–95% (non-condensing); or the environment is subject to vibration, shocks, or bumps.

Electrical Installation

Place this machine near an existing power source. Make sure all power cords are protected from traffic, material handling, moisture, chemicals, or other hazards. Make sure to leave enough space around machine to disconnect power supply or apply a lockout/tagout device, if required.

Lighting

Lighting around the machine must be adequate enough that operations can be performed safely. Shadows, glare, or strobe effects that may distract or impede the operator must be eliminated.

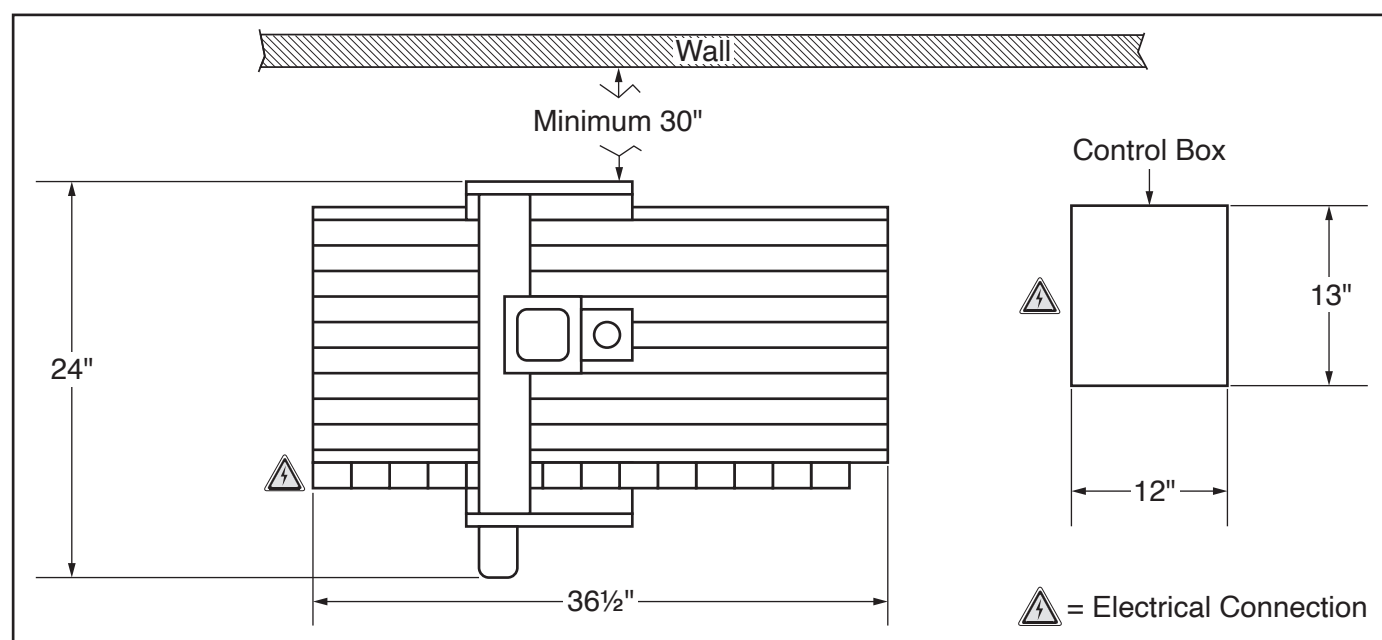
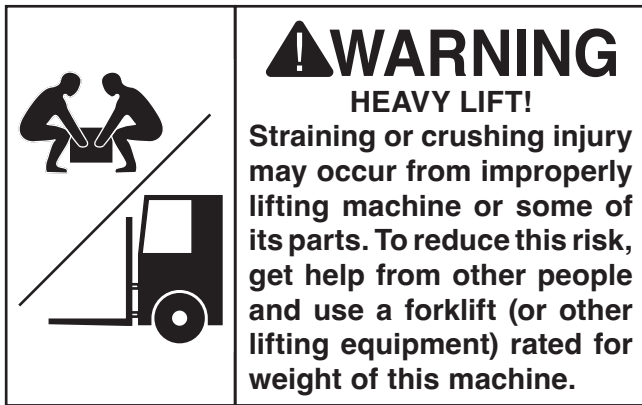


Figure 9. Minimum working clearances.



Lifting & Placing



DO NOT attempt to lift or move this machine without using the proper lifting equipment (such as a forklift or hoist) or the necessary assistance from other people. Each piece of lifting equipment must be rated for **at least 300 lbs.** to support dynamic loads that may be applied while lifting. Refer to **Needed for Setup** on **Page 18** for a complete list of required equipment.

To lift and place machine:

1. Move shipping container to desired machine work area.
2. Remove container top and sides, loose items inside, and plastic covering machine.
3. Remove fasteners securing shipping brackets to gantry (see **Figure 10**).

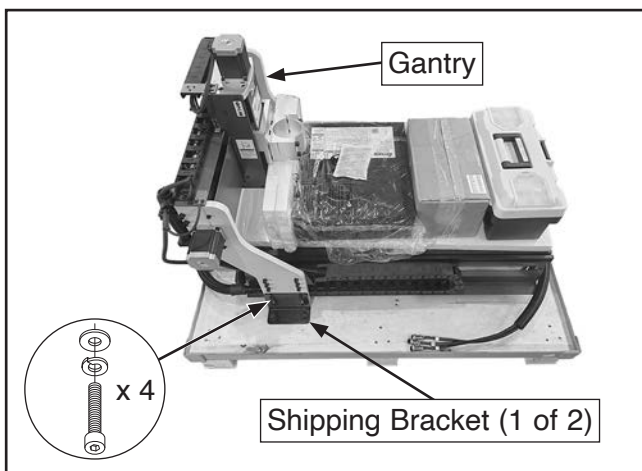


Figure 10. Location of shipping bracket and fasteners.

4. Clear table of shipping foam, toolbox, control box, and DSP controller box, and set aside.

NOTICE

Avoid lifting with the side skirt panels to prevent damage to machine components.

5. Align forklift or lifting straps with machine Y-axis and position forks/straps under machine so they extend under front and rear frame plates (see **Figure 11**). Only lift machine enough to clear pallet, then move pallet out of the way.

IMPORTANT: Position forks or lifting straps so they do not bind on ball screw or guide rails under machine.

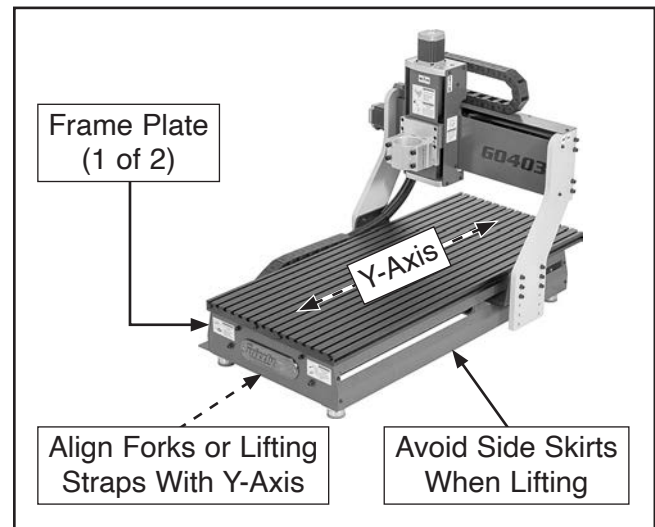


Figure 11. Location of lifting components.

6. Lower machine and remove all lifting equipment from area.



Leveling

NOTICE

For accurate cutting results and to prevent gradual warping of the table and frame, machine **MUST** be leveled from side to side and from front to back on both ends. Check the table and frame 24 hours after installation, two weeks after that, and then annually to make sure they remain level.

Leveling machinery helps precision components remain straight and flat during the lifespan of the machine. Components on a machine that are not level may slowly twist due to the dynamic loads placed on the machine during operation.

To level machine:

1. Place level on table and align to either X- or Y-axis.
2. Lower jam nut and rotate fixed nut on adjustable foot until axis is level (see **Figure 12**). Raise jam nut against foot bracket to secure.

Note: Rotate fixed nut clockwise to raise machine, and counterclockwise to lower.

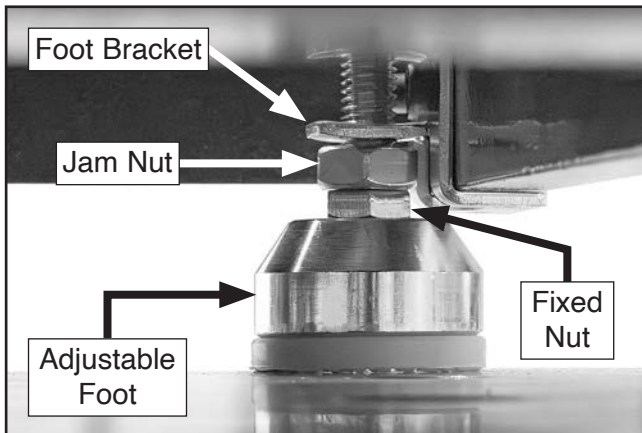


Figure 12. Adjustable foot components (viewed from underneath machine).

3. Rotate level to check remaining axis and repeat **Step 2**.

Assembly

The machine must be fully assembled before it can be operated. Before beginning the assembly process, refer to **Needed for Setup** and gather all listed items.

To assemble machine:

1. Place control box near machine and connect X, Y, and Z-axes stepper motor plugs (see **Figure 13**) to matching receptacles on rear of control box (see **Figure 14**).

NOTICE

To prevent cross-threading plugs, verify key on plug aligns with keyway in receptacle before tightening (see **Figure 13**).

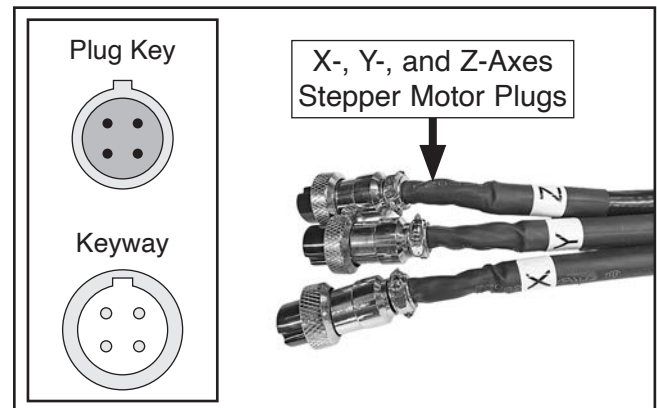


Figure 13. Location of X, Y, and Z-axes stepper motor plugs.

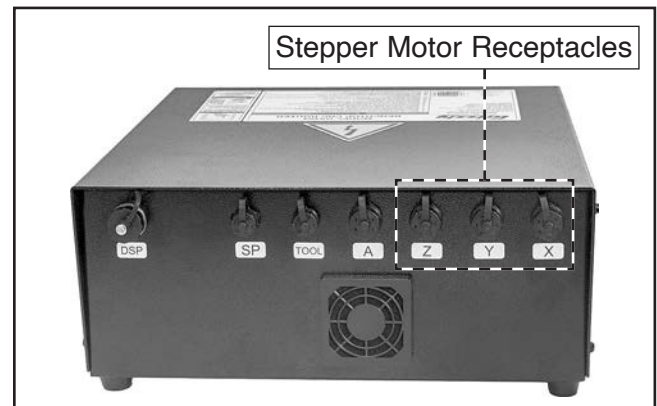


Figure 14. Location of stepper motor receptacles on control box.



2. Turn ON/OFF switch on DSP controller to OFF position, then press Emergency Stop button (see **Figure 15**).



Figure 15. Location of DSP controller power controls.

3. Connect DSP controller plug (see **Figure 16**) to matching receptacle on rear of control box (see **Figure 17**).

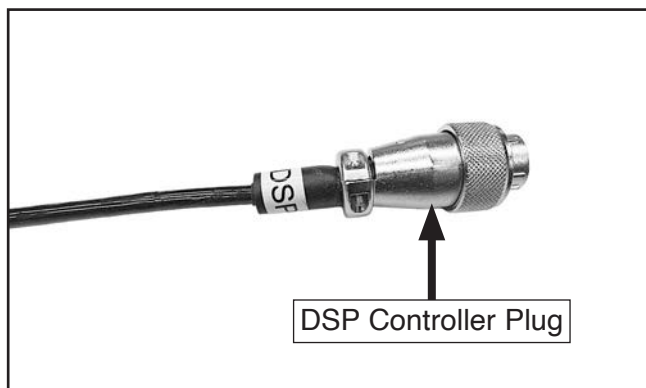


Figure 16. Location of DSP controller plug.

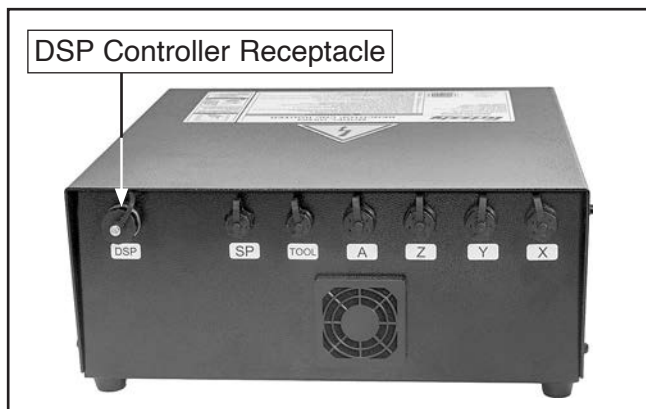


Figure 17. Location of DSP controller receptacle on control box.

4. Connect tool setter plug (see **Figure 18**) to matching receptacle on rear of control box (see **Figure 19**).

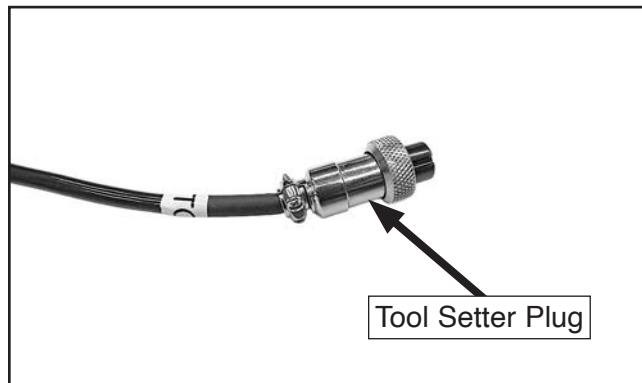


Figure 18. Location of tool setter plug.

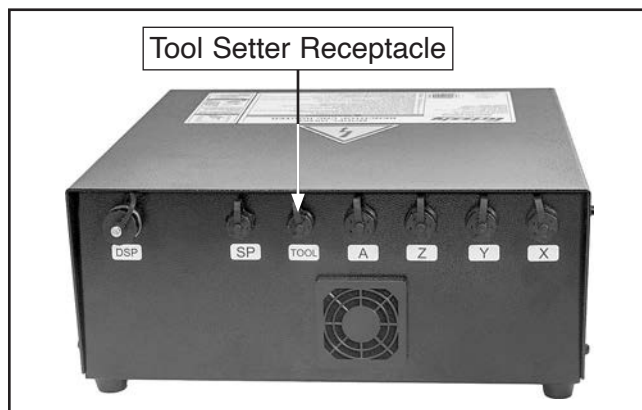


Figure 19. Location of tool setter receptacle on control box.

5. Remove (4) caps screws on spindle motor clamp (see **Figure 20**), then remove clamp.

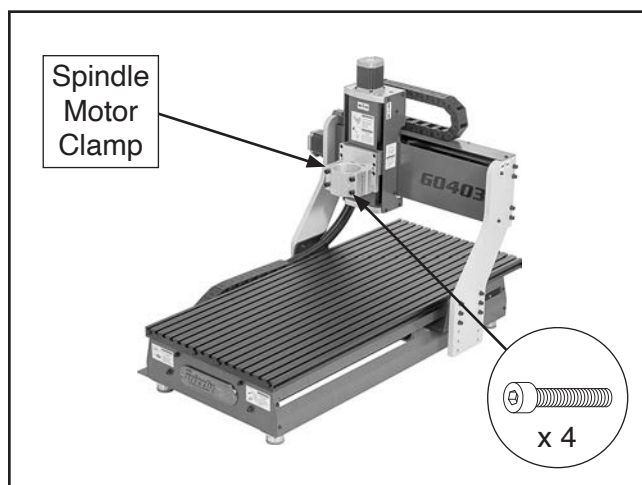


Figure 20. Location of spindle motor clamp.

6. Install spindle motor, then install spindle motor clamp and secure using fasteners removed in **Step 4**.

7. Connect spindle motor plug to matching receptacle on rear of control box shown in **Figure 21**.

IMPORTANT: If using a battery-powered or handheld spindle motor, the spindle motor will operate outside of DSP-J2 control system, and will not feature a connecting plug for interfacing with control box.

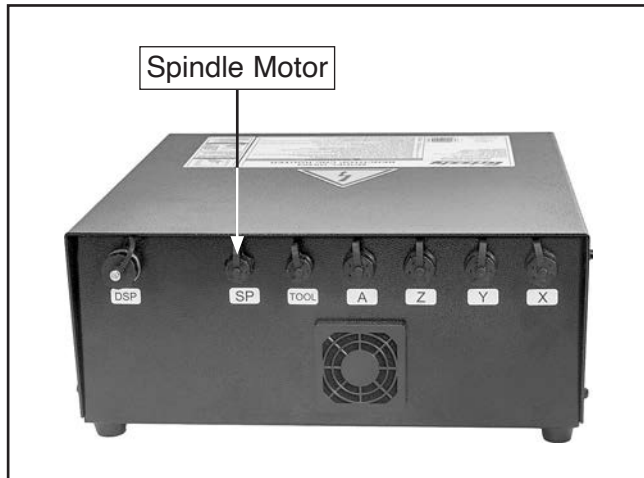


Figure 21. Location of spindle motor receptacle on control box.

NOTICE

Secure any loose cords or tubes from spindle motor as needed to prevent binding or interference with axis movement.

8. Turn main power switch to OFF position, then press EMERGENCY STOP button on front of control box (see **Figure 22**).
9. Connect control box to power by inserting power cord socket into receptacle on control box (see **Figure 22**), then insert power cord plug into matching receptacle.

Note: Auxiliary power connections are available on front of control box for compatible router accessories (see **Figure 22**). Refer to **Accessories** on **Page 43** for router accessories offered by Grizzly Industrial.

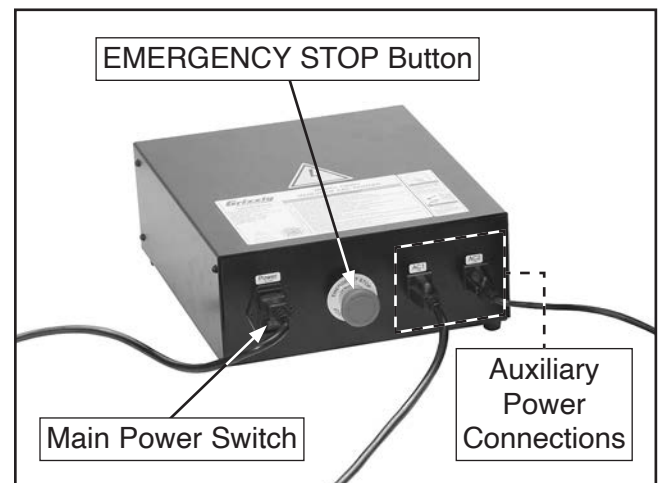


Figure 22. Location of control box power connections.



Test Run

Once assembly is complete, test run the machine to ensure it is properly connected to power and safety components are functioning correctly.

If you find an unusual problem during the test run, immediately stop the machine, disconnect it from power, and fix the problem BEFORE operating the machine again. The **Troubleshooting** table in the **SERVICE** section of this manual can help.

The test run consists of verifying the following:

- 1) the stepper motor for each axis runs correctly,
- 2) the home function operates correctly to synchronize axes,
- 3) the EMERGENCY STOP buttons safety feature functions properly, and
- 4) the spindle motor powers up and runs correctly.

⚠ WARNING

Serious injury or death can result from using this machine BEFORE understanding its controls and related safety information. DO NOT operate, or allow others to operate, machine until the information is understood.

⚠ WARNING

DO NOT start machine until all preceding setup instructions have been performed. Operating an improperly set up machine may result in malfunction or unexpected results that can lead to serious injury, death, or machine/property damage.

To test run machine:

1. Clear all setup tools away from machine.
2. Twist EMERGENCY STOP button on control box clockwise until it springs out (see **Figure 23**). This resets button so machine can start.
3. Twist Emergency Stop button on DSP controller clockwise until it springs out (see **Figure 23**). This resets button so DSP controller will accept commands.



Figure 23. Resetting EMERGENCY STOP button.

4. Move main power switch on control box to ON position.
 5. Move ON/OFF switch on DSP controller to ON position.
- After approximately 10 seconds, DSP controller will finish boot sequence and show coordinate screen (see **Figure 24**).

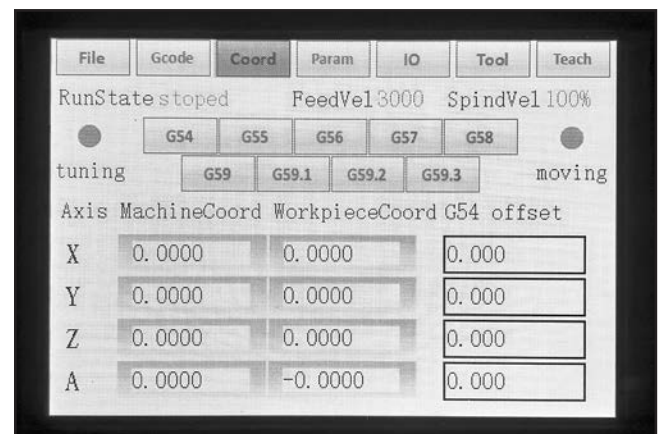


Figure 24. Example of DSP controller coordinate screen.



6. Press "Home" button on DSP controller. A dialog box will open with five soft keys: one for all of the axes, and one for each individual axis (see **Figure 25**).

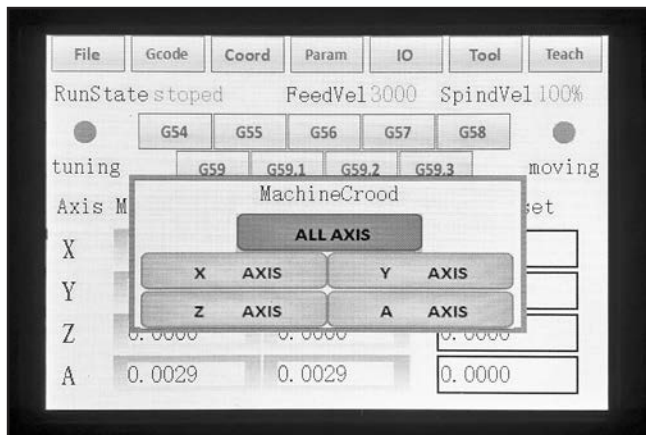


Figure 25. DSP controller home screen.

7. Press "X AXIS" softkey and then press "Enter" button on DSP controller to home axis. Verify X-axis stepper motor operates smoothly and moves to machine zero.

— As axis traverses home, "MachineCoord" column will show the axis coordinate as "0.0000" once zero is established, as shown in **Figure 26**.

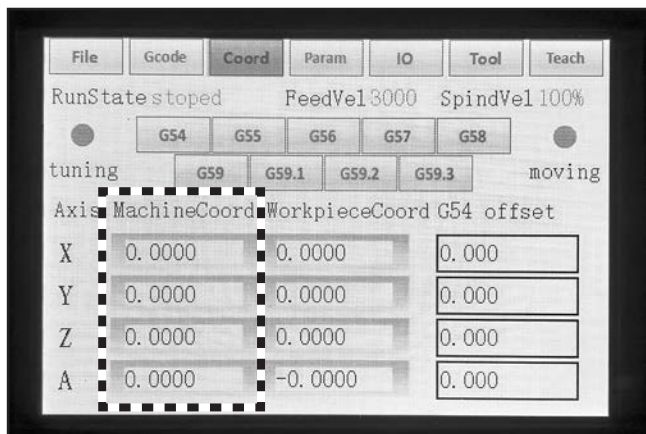


Figure 26. Example of all coordinates at machine zero.

8. Repeat **Steps 6–7** for Y-, and Z-axes.

9. On DSP controller, press Emergency Stop button.

— Machine remains **ON**, but all controller functions cease responding.

10. WITHOUT resetting Emergency Stop button, try to navigate through DSP controller menu. All DSP controls should not respond to input commands.

— If DSP controller *does not* respond to input commands, the safety feature of DSP controller Emergency Stop button is working correctly.

— If DSP controller *does* respond to input commands, immediately turn it **OFF** and disconnect power. Safety feature of DSP controller Emergency Stop button is NOT working properly and must be replaced before further using machine.

11. On DSP controller, twist Emergency Stop button clockwise until it springs out.

12. Press EMERGENCY STOP button on control box to turn control box **OFF**.

13. WITHOUT resetting EMERGENCY STOP button, try to start machine by cycling power with DSP controller ON/OFF switch. DSP controller should not turn **ON**.

— If DSP controller *does not* turn **ON**, safety feature of control box EMERGENCY STOP button is working correctly.

— If DSP controller *does* turn **ON**, immediately turn it **OFF** and disconnect power. Safety feature of control box EMERGENCY STOP button is NOT working properly and must be replaced before further using machine.



Spindle Motor Test Run

The following Test Run procedure references spindle motors connected to the DSP-J2 control system. For battery-powered or handheld spindle motors, refer to the accessory documentation on how to properly test run your spindle motor.

To test run spindle motor:

1. Perform **Steps 1–5 of Test Run on Page 25** to restore power to control box.
2. Rotate axis selection dial (see **Figure 27**) on DSP controller to "Spindle Speed", then rotate jog mode dial to "0.1".

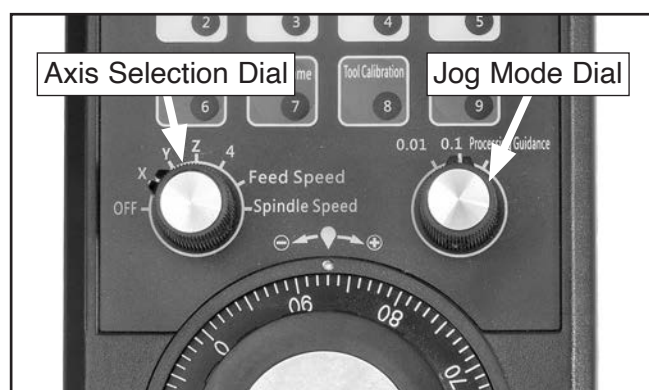


Figure 27. Location of DSP controller axis selection dial and jog mode dial.

3. Use menu navigation keys to navigate to coordinate screen (Coord).
4. Press and hold one of the enable buttons on either side of DSP controller and rotate MPG wheel counterclockwise until SpindVel (Spindle Velocity) value in upper right corner shows 0% (see **Figure 28**).

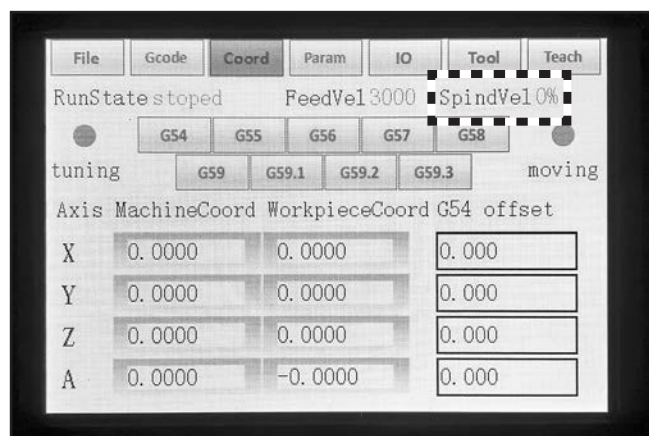


Figure 28. Location of SpindVel status.

5. Press "Spindle ON/OFF" button on DSP controller to turn spindle motor **ON**.
6. Press and hold one of the enable buttons on either side of DSP controller, then slowly rotate MPG wheel clockwise until SpindVel value shows 100% (see **Figure 29**).

— Verify spindle motor starts and runs smoothly without any unusual problems or noises through its full speed range.

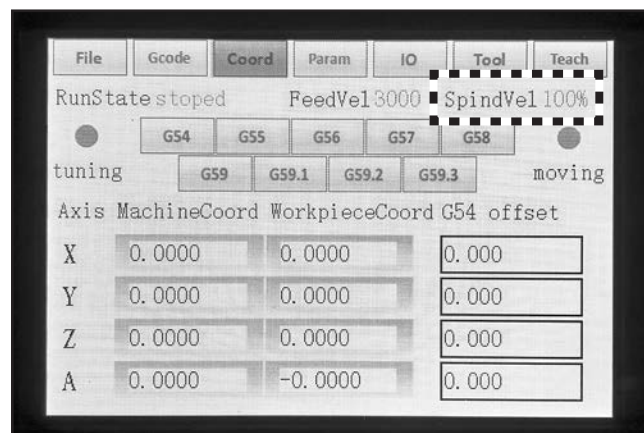


Figure 29. SpindVel status displaying 100%.

7. Press "Spindle ON/OFF" button on DSP controller to turn spindle motor **OFF**.

Congratulations! Test Run is complete.

NOTICE

Your purchase of the Model G0403 includes V-Carve Desktop Software, which you will receive in an e-mail from Grizzly Industrial within 1–2 business days after purchase.

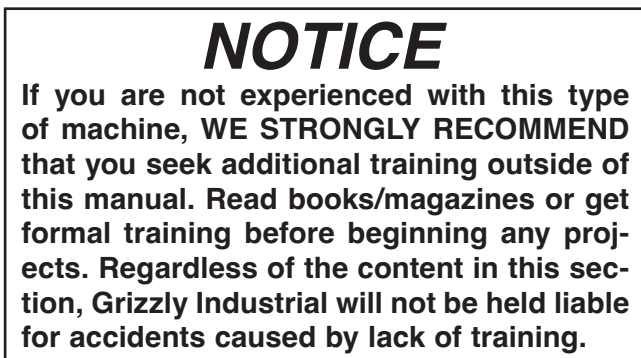
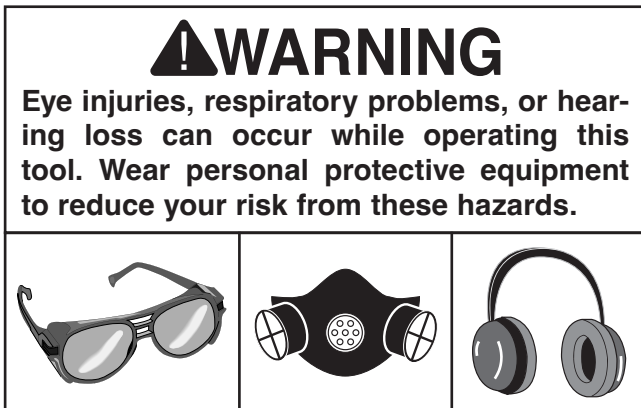


SECTION 4: OPERATIONS

Operation Overview

The purpose of this overview is to provide the novice machine operator with a basic understanding of how the machine is used during operation, so the machine controls/components discussed later in this manual are easier to understand.

Due to the generic nature of this overview, it is **not** intended to be an instructional guide. To learn more about specific operations, read this entire manual, seek additional training from experienced machine operators, and do additional research outside of this manual by reading "how-to" books, trade magazines, or websites.



To complete a typical operation, the operator does the following:

1. Designs/writes program that defines toolpath.
2. Uploads part program to USB flash drive.
3. Examines workpiece to make sure it is suitable for processing.
4. Installs appropriate tool for type of material and operation.
5. If necessary, cuts workpiece with table saw or other machine to fit within working envelope of this machine, or raises gantry height to accommodate tall workpieces.
6. Secures workpiece to table.
7. Turns control box **ON**.
8. Homes all axes to machine zero.
9. Connects USB flash drive to DSP controller.
10. Sets work origin. Uses tool setter to measure tool and set Z-axis relative to workpiece or table, depending on toolpath requirements.
11. Connects dust collection system to spindle, if feasible.
12. Puts on safety glasses, respirator, and hearing protection.
13. Turns dust collection system **ON**, if connected to machine.
14. Runs program. Cutting tool will follow toolpath during operation.
15. When toolpath is complete, cutting tool will return to position defined by program.
16. Turns dust collection system **OFF** if connected, then turns control box **OFF**.



Workpiece Inspection

WARNING

Like all machinery there is potential danger when operating this machine. Accidents are frequently caused by lack of familiarity or failure to pay attention. Use this machine with respect and caution to decrease the risk of operator injury. If normal safety precautions are overlooked or ignored, serious personal injury may occur.

CAUTION

No list of safety guidelines can be complete. Every shop environment is different. Always consider safety first, as it applies to your individual working conditions. Use this and other machinery with caution and respect. Failure to do so could result in serious personal injury, damage to equipment, or poor work results.

Some workpieces are not safe to cut or may first require modification. **Before cutting, inspect all workpieces for the following:**

- **Material Type:** This machine is only intended for cutting natural and man-made wood products, laminated wood products, and plastics. Cutting drywall or cementitious backer board creates extremely fine dust and may reduce the life of the bearings. This machine is NOT designed to cut metal, glass, stone, tile, etc.; cutting these materials with this machine may lead to injury or damage.

- **Foreign Objects:** Nails, staples, dirt, rocks, tramp metal, and other foreign objects are often embedded in wood. While cutting, these objects can become dislodged, break the tool, or cause workpiece kickback—all of which could fly out and strike the operator or bystanders. Always visually inspect workpiece carefully before cutting it. If foreign objects can not be removed, DO NOT cut the workpiece.
- **Large/Loose Knots:** Loose knots can become dislodged during cutting operation. Large knots can cause tool or machine damage. Only use workpieces that do not have large/loose knots or plan ahead to avoid cutting through them.
- **Wet or "Green" Stock:** Cutting wood with a moisture content over 20% causes unnecessary wear on tooling and yields poor results.
- **Excessive Warping:** Workpieces with excessive cupping, bowing, or twisting are dangerous to cut because they are unstable and can come loose or move unexpectedly when being cut. DO NOT cut workpieces with excessive warping!
- **Minor Warping:** Workpieces with slight cupping can be safely supported if cupped side is facing table and workpiece is firmly clamped to table. On the contrary, a workpiece with bowed side facing table will rock during a cut and could cause severe injury.



Choosing Tooling

There are many types of tooling available that can be used for a variety of different processes (see **Figure 30**). Be sure to choose the right one for your application and material. Read all manufacturer instructions before installing and using tools.



Figure 30. Assorted general purpose CNC router bits.

When choosing a tool, consider:

- **Material Type:** Most tools are designed for specific material. Choose a unique bit for plywood, engineered wood products, hardwood, and composite woods to improve overall results. If a general-purpose bit is needed, a two-flute, upcut, spiral bit is a good choice.
- **Application:** Many design features are best cut using specific tools. For example:
 - Use a V-bit for cutting signs and lettering.
 - Use a spoilboard cutter or fly cutter for surfacing a spoilboard or finishing a smooth, flat workpiece, such as a counter top.
 - Use a form bit to cut a profile with a uniform contour, such as an ogee or round over.
 - Use a chipbreaker or rougher for rough cuts and quickly removing a large amount of material when the finish does not matter.
- **Feed and Speed Rates:** Feed rate, spindle speed, and number of flutes on the tool determine chip load. The chip load affects the best diameter bit to use to get the highest quality finish while minimizing wear. Most manufacturers will list the recommended chip load for their tooling.
- **Depth and Width of Cut:** The tool must be long enough to reach the maximum plunge depth of the operation, and small enough to cut the details of the piece. However, shorter, wider bits will deflect less, leading to more accurate cuts, and they are less prone to wear and breakage.
- **Finish:** If a high-quality finish is a priority, use a tool with more flutes. Four-flute tools work well for this in most cases. Do not forget that number of flutes is a component of calculating chip load.
- **Chip Displacement:** Up-cut bits keep the workpiece clear of chips, but on composite materials the upward force of operation will chip and fray the top surface of workpiece. Down-cut bits leave a smooth finish on the top of the workpiece, but pressing chips down creates more heat during the cut, and frays the bottom of the workpiece on through-cuts. Compression bits are fluted to cut up on the bottom, and down on the top, compressing the workpiece during a cutting operation. Compression bits are ideal for cutting materials like plywood and other composites.



Setting Tooling Parameters

The Model G0403 includes a tool parameter file for setting tooling compensation (G41/G42) within a parts program. The file can be modified using a text editor capable of editing and saving .tbl files.

Items Needed	Qty
USB Flash Drive 32 GB (FAT16)	1
Computer w/USB Port	1
Text Editor Software	1

To set tooling parameters:

1. Turn control box and DSP controller **ON** and allow controller to finish boot sequence.
 - After approximately 10 seconds, DSP controller will finish boot sequence and show coordinate screen.
2. Use menu navigation keys to navigate to File screen.
3. Insert USB flash drive into USB port on top of DSP controller (see **Figure 31**).



Figure 31. Location of DSP controller USB port.

4. Navigate to "local" soft key (see **Figure 32**) and press "Enter" button.



Figure 32. Location of local storage in file screen.

5. Navigate to "configs" folder and press "Enter" button, then press "Open" soft key to enter folder (see **Figure 33**).

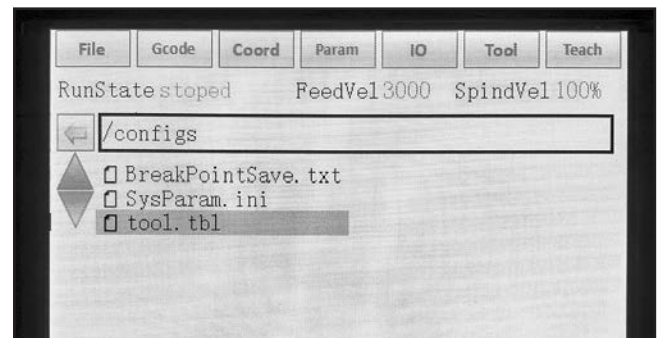


Figure 33. Example of "configs" folder screen.

6. Navigate to **tool.tbl** file and press "Enter" button, then navigate to "Copy" soft key (see **Figure 34**) and press "Enter" button to copy file.

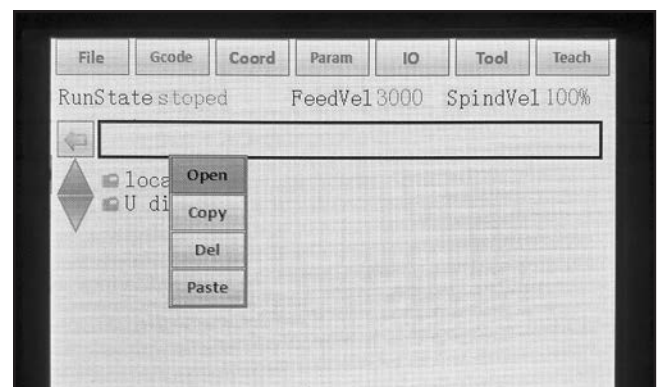


Figure 34. Example of dialog box on file screen.



7. Navigate to  soft key and press "Enter" until you return to file screen (see **Figure 35**).
8. Navigate to "U disk" soft key (see **Figure 35**) and press "Enter" button, then navigate to "Paste" soft key and press "Enter" button to transfer **tool.tbl** file to USB flash drive.

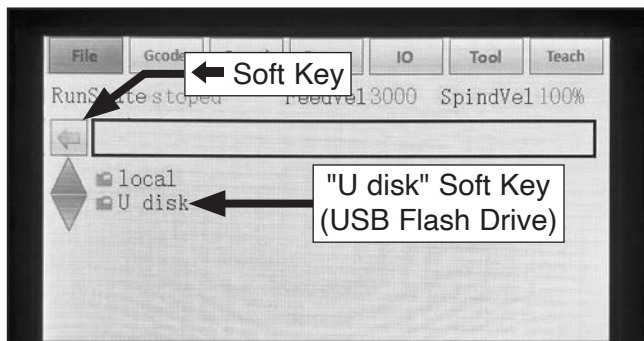


Figure 35. Example of controller file screen.

9. Navigate to  soft key and press "Enter" button until you return to file screen.
10. Remove USB flash drive and insert it into an open USB port on your personal computer, then open **tool.tbl** file with a text editor (see **Figure 36**).

Note: Example dimensions are included in **tool.tbl** file for reference. The example for T1 shows an $\frac{1}{8}$ " end mill bit with a tool width of 0.125", and a tool height of 0.511".

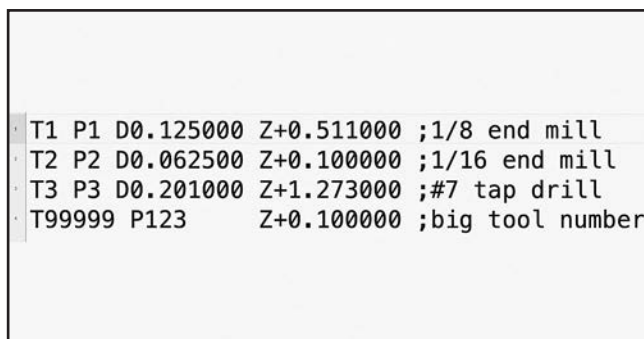


Figure 36. Example of text editor screen.

11. Enter tool compensation values, then save **tool.tbl** file and eject USB flash drive.
12. Insert USB flash drive into USB port on top of DSP controller.

13. Use menu navigation keys to navigate to File screen.
14. Navigate to "U disk" soft key and press "Enter" button, then navigate to "Open" soft key and press "Enter" button to open.
 - All files stored on USB flash drive will be shown in list format.
15. Navigate to desired file and press "Enter" button, then press "Copy" softkey.
16. Navigate to  soft key and press "Enter" button until you return to file screen, then scroll through local storage to "configs" folder and press "Enter" button.
17. Navigate to "Paste" soft key and press "Enter" button to transfer revised **tool.tbl** file to "configs" folder.
18. Navigate to  soft key and press "Enter" until you return to file screen, then load a parts program for processing as instructed in **Processing Part Programs** on **Page 40**.
19. Use menu navigation keys to navigate to Tool screen, then navigate to "ToolParamLoad" soft key and press "Enter" button to load tooling parameters (see **Figure 37**).

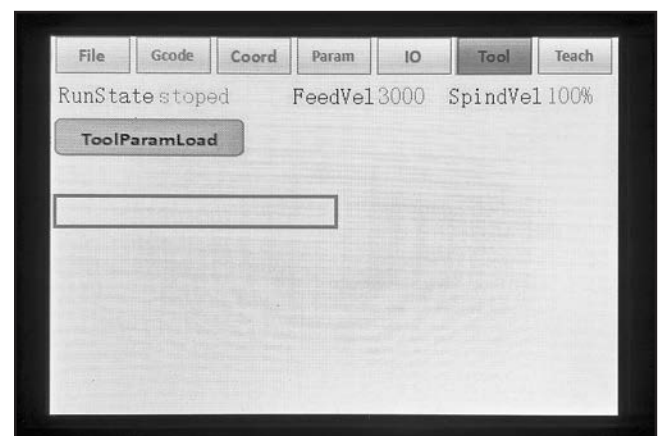
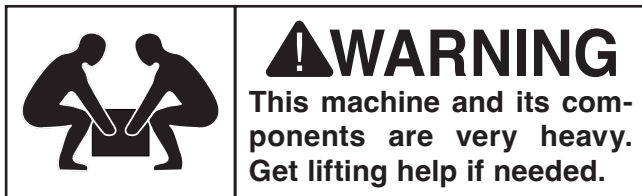


Figure 37. Location of "ToolParamLoad" soft key.

- Tooling parameters are now loaded into parts program file.



Raising Gantry



The gantry on the Model G0403 can be raised to accommodate larger workpieces, increasing the maximum distance from spindle to table to 10¹/₁₆". Z-axis travel distance will remain 7¹/₁₆".

Revised Cutting Information

Max Distance Spindle to Table 10¹/₁₆ in.

Items Needed	Qty
Additional Person	1
Hex Wrenches 5, 6mm.....	1 Ea.
Awls	2
Wood Blocks (4" x 4" Minimum)	2

To raise gantry:

1. DISCONNECT CONTROL BOX FROM POWER!
2. Remove spindle motor (if installed) and all setup tools from machine table.
3. Have an additional person support gantry, then remove (12) cap screws, lock washers, and flat washers securing gantry columns to gantry slide bracket (see **Figure 38**).

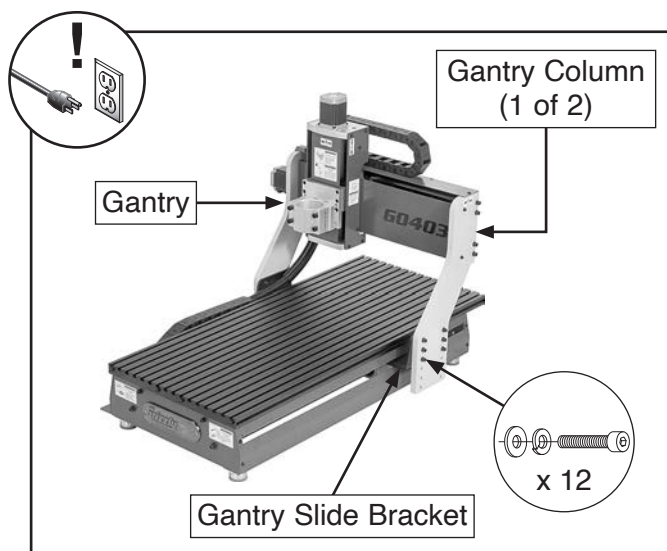


Figure 38. Location of gantry fasteners.

4. Raise gantry and place (2) wood blocks under gantry columns for support during the next step.
5. Raise gantry and install (12) fasteners removed in **Step 3** into lower hole set on gantry columns (see **Figure 39**). Do not fully tighten fasteners at this time.

Note: Use an awl to help align gantry column holes with gantry slide bracket holes. Thread each cap screw lightly so that they may still be adjusted if needed.

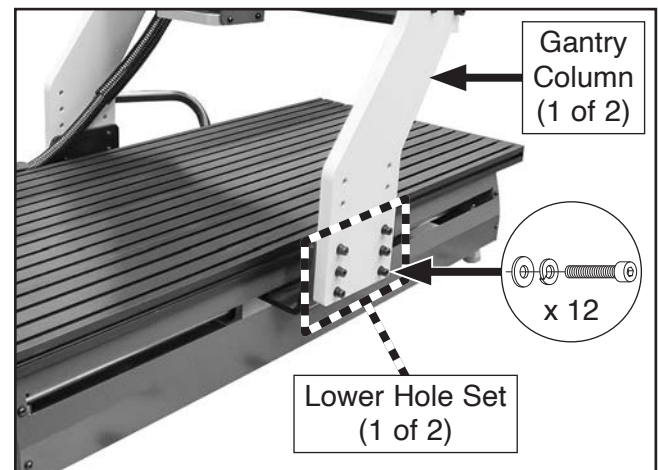


Figure 39. Gantry secured to lower hole set.

6. Fully tighten all fasteners installed in **Step 5** to secure gantry position (see **Figure 40**).

Note: Raise/lower gantry or reposition as needed if cap screws are binding or are difficult to fully tighten.

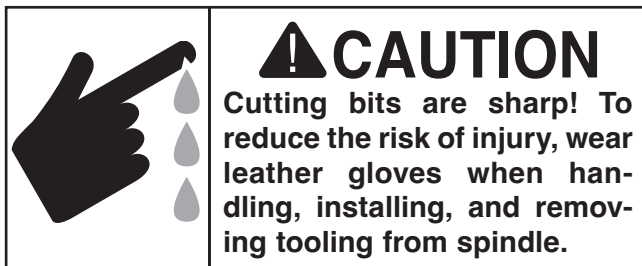


Figure 40. Gantry in raised position.

7. Re-install spindle motor (if removed in **Step 2**) and tram spindle as instructed in **Tramming Spindle** on **Page 50**.



Installing/Removing Tooling



The Model G0403 includes (1) 1/16", 1/8", and 1/4" ER11 collet for securing ER11 tooling.

Items Needed	Qty
Open-Ends Wrench 14/17mm	1
Open-End Wrench 13mm.....	1
Work Gloves	1 Pr.
Clean Shop Rag	As Needed

Installing Tooling

1. DISCONNECT SPINDLE MOTOR FROM POWER!
2. Loosen and remove collet nut on spindle motor (see **Figure 41**), then remove ER11 collet from spindle.

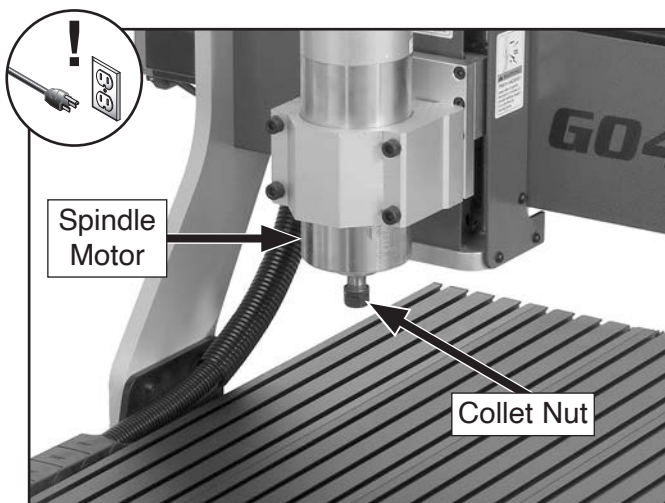


Figure 41. Location of spindle motor tooling components.

3. Insert tooling into ER11 collet and verify entire length of tool shaft will be secured by collet springs.
4. Insert collet in spindle and tighten collet nut to secure tooling (see **Figure 42**).

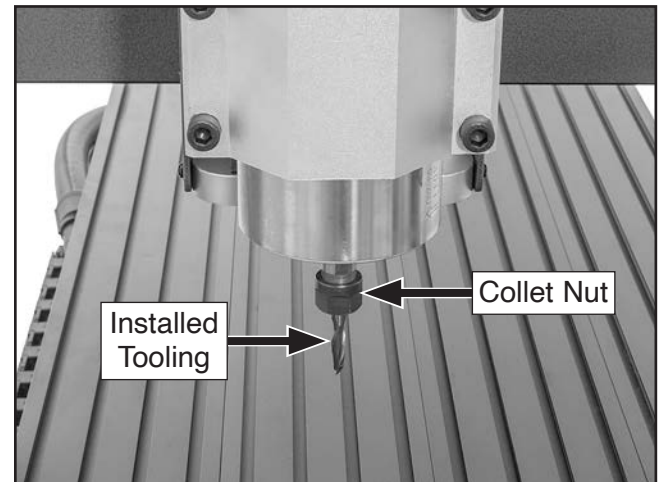


Figure 42. Tooling installed in spindle motor.

Removing Tooling

1. DISCONNECT SPINDLE MOTOR FROM POWER!
2. Place a shop rag under spindle to catch falling cutting tool.
3. Loosen and remove collet nut on spindle motor, then remove ER11 collet and tooling from spindle.



Securing Workpiece on Table

⚠ CAUTION

Unsecured workpieces could be ejected from the table at a high rate of speed. Always secure the workpiece to the table to help prevent injury to operators and bystanders, or damage to the machine.

The Model G0403 comes with a 36" x 15³/₄" table divided by T-slots. Workpieces with a wide range of shapes and sizes can be secured using the hold-down clamps included with the machine.

IMPORTANT: Always use at least (4) hold-down clamps when clamping a workpiece to the table.

Items Needed	Qty
Hold-Down Brackets.....	4
Flat Head Screws M6-1 X 60	4
Hex Bolts M6-1 X 70	4
Knobs M6-1	4
Scrap Wood.....	As Needed

To clamp workpiece to table:

1. Clear dust, wood chips, and tools from table surface and T-slots.
2. Thread (1) M6-1 x 60 flat head screw into hold-down bracket, then insert (1) M6-1 x 70 hex bolt through hold-down bracket and thread on (1) M6-1 knob (see **Figure 43**).

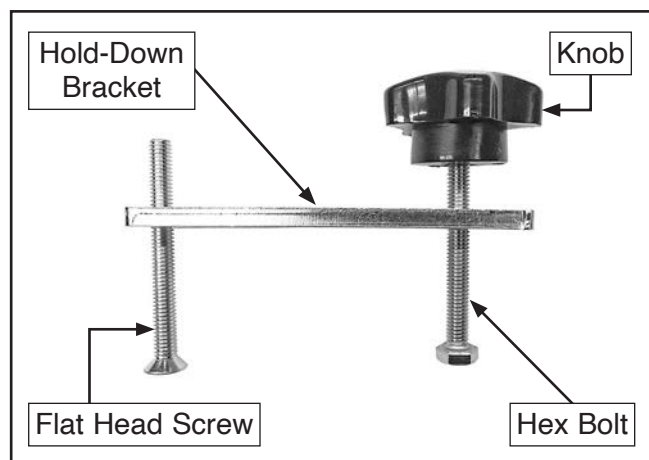


Figure 43. Hold-down clamp components.

3. Repeat **Step 2** for all remaining clamps.
4. Place workpiece on table. Joint or shim if necessary to ensure a flat work surface.
5. Slide hex bolt head into T-slot, then adjust knob so hold-down bracket is above workpiece (see **Figure 44**).

Note: Place scrap wood under head of each screw to prevent damaging table surface.

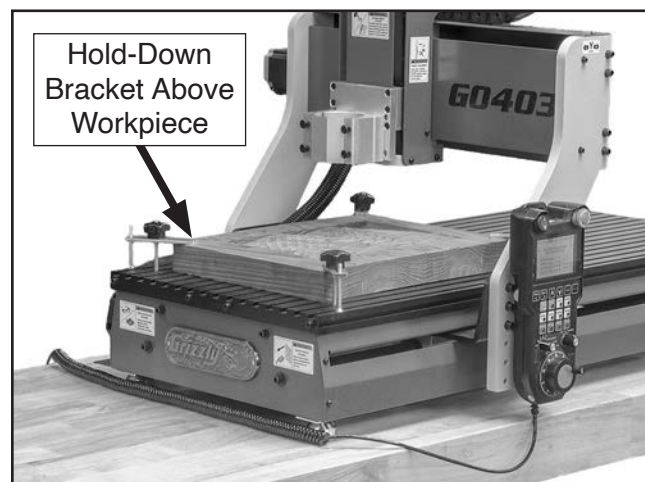


Figure 44. Example of workpiece clamped to table.

6. Position clamps so workpiece is stable and does not rock. Take into consideration axis positions when G-code runs.
7. Tighten knobs until workpiece is secure and flat against table on all four sides/corners.



Using a Spoilboard

NOTICE

Moisture will swell and warp MDF spoilboards. Using a warped spoilboard will result in damaged or inaccurately cut workpieces and could result in damage to the machine. If liquid is spilled on spoilboard, it must be dried and resurfaced, or replaced.

A spoilboard should be used with any operation in which the tool cuts completely through the workpiece. Typically, a spoilboard is made of MDF that has been surfaced perfectly flat. Even a new piece of material should be surfaced before use.

Preparing a Spoilboard

Items Needed	Qty
MDF $\frac{3}{4}$ " (Sized for Table/Workpiece)	1
Sealant (Epoxy/Rubberized Paint)	As Needed

To prepare a spoilboard:

1. Surface both sides of MDF to remove at least 0.5mm of sealant.
2. Seal all four edges of spoilboard using epoxy or rubberized paint.

Note: Spoilboards can be resurfaced and reused until thickness is reduced to approximately $\frac{1}{4}$ " or less.

Securing Spoilboard

Items Needed	Qty
Spoilboard	1
Hold-Down Clamps	4
Double-Sided Tape or Screws	As Needed
Additional Hold-Down Clamps	As Needed

To secure spoilboard:

1. Clamp spoilboard to table using a minimum of (4) hold-down clamps (see **Figure 45**).

Note: See **Securing Workpiece on Table** on **Page 35** for instructions on assembling hold-down clamps.

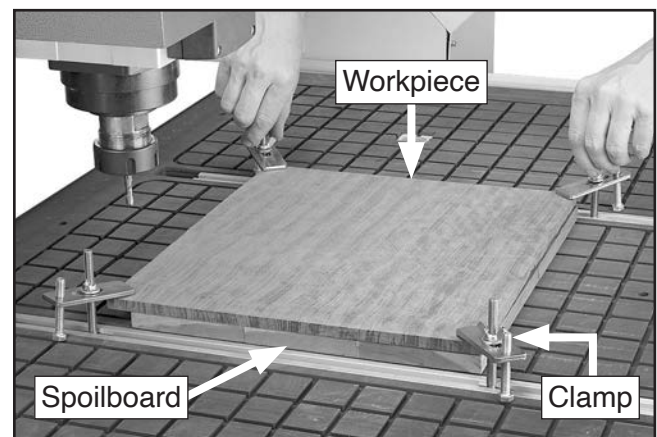


Figure 45. Example of spoilboard and workpiece clamped to CNC router table.

2. Secure workpiece to spoilboard.

IMPORTANT: Depending on workpiece or parts program, it may be necessary to use additional hold-down clamps, double-sided tape, or mount workpiece directly to spoilboard with screws. Always verify workpiece is secure before beginning work operations.



Manually Controlling Axes

Knowing how to manually control axis movement or speed is an essential part of operating the Model G0403. Axes must be positioned manually whenever a work origin is set.

Manual axis control can be performed at two speeds and in two motion modes: Continuous or Offset movement.

NOTICE

Manual axis movement allows movement beyond soft limit proximity switches, which can damage the machine. Always be aware of axis location during manual movement, and be prepared to stop machine if axes move unexpectedly.

Continuous Movement

The Model G0403 uses button controls, axis selection dial, jog mode dial, and MPG wheel on the DSP controller to move axes (see **Figure 46**).

Note: See **DSP Controller** on **Page 5** for all DSP controller button descriptions.

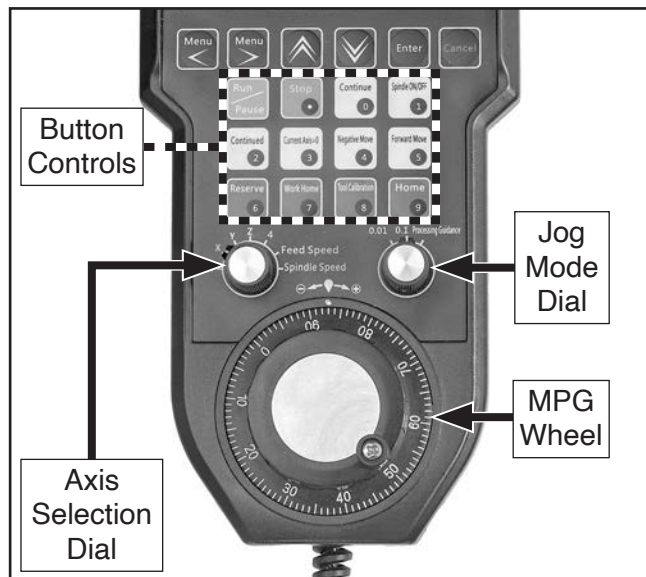


Figure 46. Location of axis movement controls.

Using Dial Controls

1. Turn control box and DSP controller **ON** and allow controller to finish boot sequence.
 - After approximately 10 seconds, DSP controller will finish boot sequence and show coordinate screen.
2. Use menu navigation keys to navigate to coordinate screen (Coord).
3. Rotate axis selection dial on DSP controller to desired axis, then rotate jog mode dial to "0.1" mode setting (see **Figure 46**).

Note: For slower axis traversal, select "0.01" on jog mode dial.

4. Press and hold one of the enable buttons on either side of DSP controller, then rotate MPG wheel (see **Figure 46**) in direction of desired axis movement:
 - Rotate MPG wheel *clockwise* to move axis in *positive* (+) direction.
 - Rotate MPG wheel *counterclockwise* to move axis in *negative* (–) direction.

Using Button Controls

1. Perform **Steps 1–3** of **Using Dial Controls**.
2. Press "Forward Move" or "Negative Move" buttons (see **Figure 46**) to jog selected axis one step in selected direction.
 - "Forward Move" button jogs selected axis in *positive* (+) direction.
 - "Negative Move" button jogs selected axis in *negative* (–) direction.

Note: Hold "Continued" button while pressing either "Forward Move" or "Negative Move" buttons (see **Figure 46**) to move selected axis continuously in selected direction.



Offset Movement

Use the controls on the DSP controller and displayed soft keys to enter an offset value for selected axis. See **DSP Controller Display** on **Page 6** for detailed soft key and menu descriptions.

To enter offset movement:

1. Turn control box and DSP controller **ON** and allow controller to finish boot sequence.
 - After approximately 10 seconds, DSP controller will finish boot sequence and show coordinate screen.
2. Use menu navigation keys to navigate to coordinate screen (Coord).
3. Use menu navigation keys to move cursor over red "moving" soft key (see **Figure 47**), then press "Enter" button.
 - Soft key will change from red to green, signifying that the control is activated.

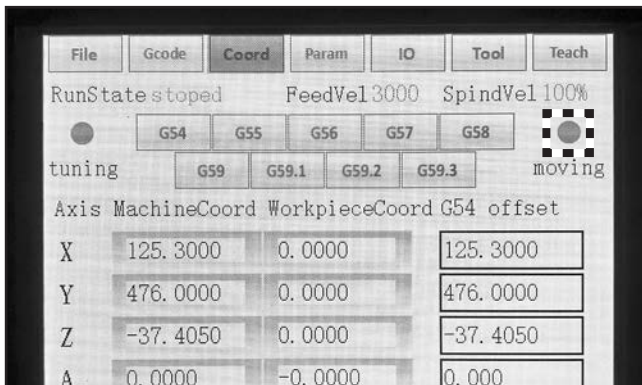


Figure 47. Location of moving button in coordinate screen.

4. Use menu navigation keys to move cursor over desired axis in WorkpieceCoord column (see **Figure 48**), then press "Enter" button.
 - A dialog box will open in center of display.

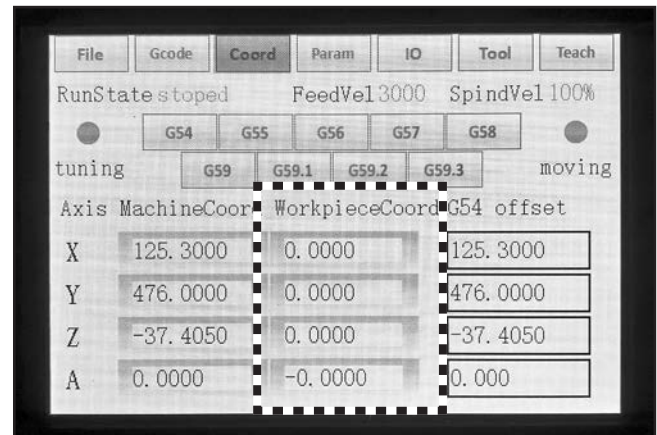


Figure 48. Location of WorkpieceCoord column in coordinate screen.

5. Use numerical input keys to enter desired coordinate offset in inches/millimeters, as shown in **Figure 49**.

Note: Entering a positive number (100) will move axis in the positive direction. Entering a negative number (-100) will move axis in the negative direction.

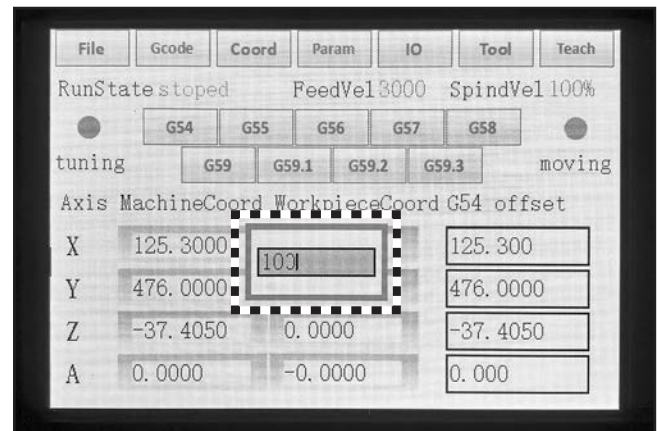


Figure 49. Dialog box opened for inputting coordinates.

6. Press "Enter" button to confirm coordinates.
 - Selected axis will traverse distance entered in dialog box.



Setting Origin

Work origin is the workpiece-specific zero point, the starting point for the toolpath. All axes being used in the parts program need to be zeroed at the work origin before running code.

The Z-axis can be set in relation to either the table surface or the workpiece surface, but it must correspond to what is established in the G-code. If this is not done properly, the tooling may crash into the material or the table, causing damage to the workpiece or the machine.

NOTICE

Set work origin before each unique operation. The work origin of all axes must match the origin of the toolpath established in the G-code. Failure to set the work origin may cause the tooling to crash and damage the workpiece, machine, or tooling.

Setting Work Origin

1. Clamp workpiece to table, install tooling, and load G-code on USB flash drive.
2. Turn control box and DSP controller **ON** and allow controller to finish boot sequence.
 - After approximately 10 seconds, DSP controller will finish boot sequence and show coordinate screen.
3. Manually move cutting tool to X- and Y-axes toolpath origin established in G-code.
4. Manually move cutting tool along Z-axis down to $\frac{1}{8}$ " above workpiece or table surface (as determined by G-code).
5. Place piece of paper between tooling tip and surface. Slowly lower cutting tool while sliding paper until paper cannot move.
6. Rotate axis selection dial on DSP controller to desired axis, then press "CurrentAxis=0" button to set axis origin.
7. Repeat **Step 6** for each remaining axis.
 - Coordinate screen will show "0.0000" for each axis in the "WorkpieceCoord" column (see **Figure 50**).

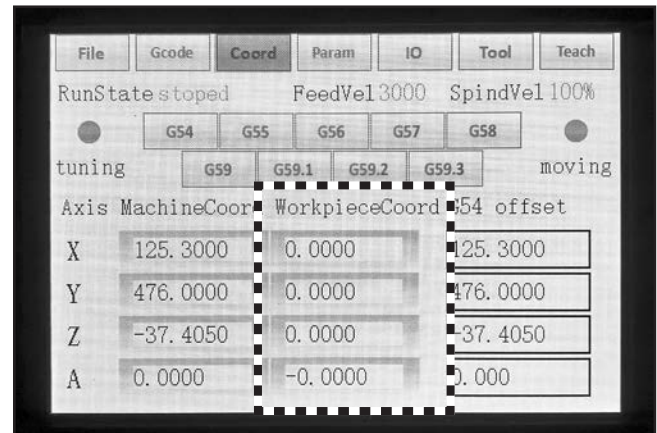


Figure 50. Example of origin set in WorkpieceCoord column.

Setting Z-Axis Origin With Tool Setter

1. Perform **Steps 1–3** of **Setting Work Origin**.
2. Manually move cutting tool along Z-axis down to approximately 1" above workpiece to accommodate tool setter height.
3. Place tool setter on top of workpiece at toolpath origin established in G-code.
4. Connect tool setter test lead to exposed portion of tooling (see **Figure 51**).

Note: Tool setter uses an electrical signal to determine tooling position. Z-axis origin is set at base of tool setter.

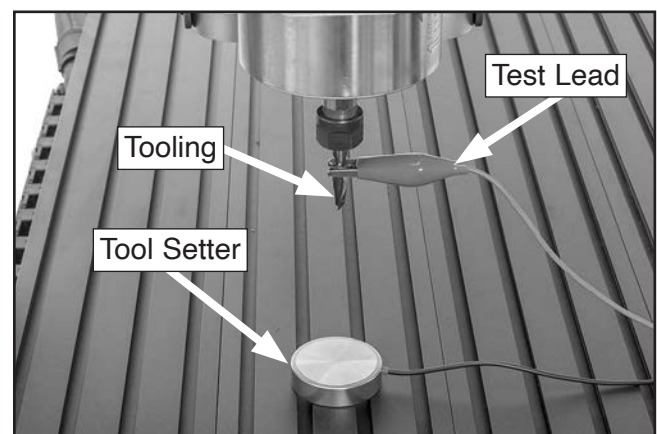


Figure 51. Example of tool setter connected to spindle tooling.



5. Press "Tool Calibration" button on DSP controller to set Z-axis origin.
 - Spindle will lower until tooling touches tool setter, then spindle raises slightly to allow for removing tool setter.
6. Verify Z-axis workpiece coordinates have been zeroed in the coordinate screen (see **Figure 52**).

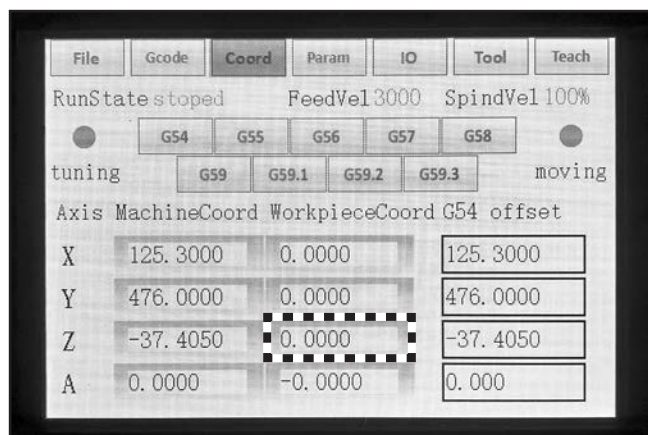


Figure 52. Example of Z-axis origin set in WorkpieceCoord column.

7. Remove tool setter test lead from tooling and tool setter from workpiece, then proceed with operations.

Processing Part Programs

The DSP-J2 control system supports **.tap** and **.nc** part programs created using CAD/CAM software.

CAM software converts a CAD model into G-code, which defines a toolpath for the project, and then formats the G-code into machine-specific syntax via a post-processor.

IMPORTANT: Use CAD/CAM software or a text editor with ANSI character encoding to create/edit part programs on a personal computer. Part programs created using other encoding formats, such as Unicode, may cause unexpected errors when uploaded to the control system.

WARNING

Running a part program from an unknown source may cause unexpected control system operations, which could lead to personal injuries or machine damage. Only use self-created part programs or those from reliable sources.

Items Needed	Qty
USB Flash Drive 32 GB (FAT16)	1

Processing Through USB Drive

The DSP-J2 control system supports processing G-code files directly from a USB flash drive.

To process through USB drive:

1. Turn control box and DSP controller **ON** and allow controller to finish boot sequence.
 - After approximately 10 seconds, DSP controller will finish boot sequence and show coordinate screen.



2. Insert USB flash drive with part program into USB port on top of DSP controller (see **Figure 53**).



Figure 53. USB port on top of DSP controller.

3. Use menu navigation keys to navigate to file screen.
4. Navigate to "U disk" soft key (see **Figure 54**) and press "Enter" button, then navigate to "Open" soft key and press "Enter" button to open.

— All files stored on USB flash drive will be shown in list format.

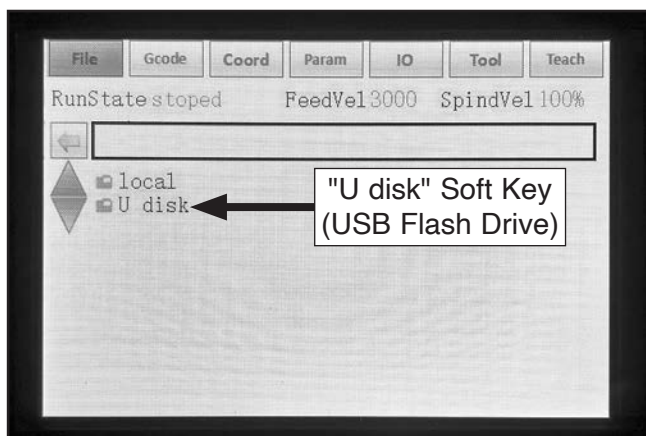


Figure 54. Example of controller file screen.

NOTICE

If using a battery-powered or handheld spindle motor, turn motor **ON** before initiating part program with "Run/Pause" button.

5. Navigate to desired file and press "Run/Pause" button to initiate processing.

— File will be automatically loaded into "Gcode" screen (see **Figure 55**).

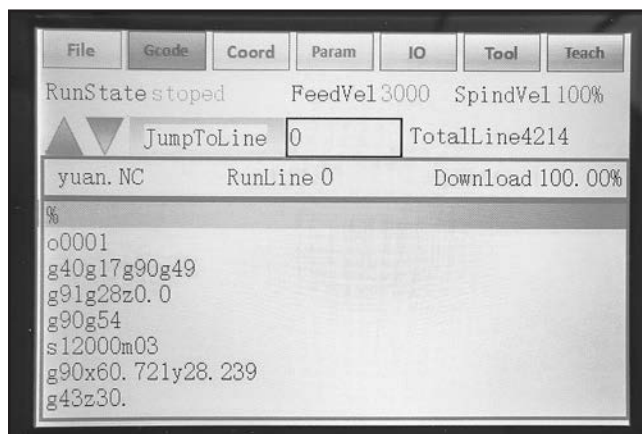


Figure 55. Example of DSP controller Gcode screen.

Processing Through DSP Controller

The DSP-J2 control system supports file transferring for processing G-code files directly from DSP controller memory.

1. Perform **Steps 1–4 of Processing Through USB Drive on Page 40**.
2. Navigate to desired file and press "Enter" button, then navigate to "Copy" softkey (see **Figure 56**) and press "Enter" button.

— File will be loaded into controller memory.

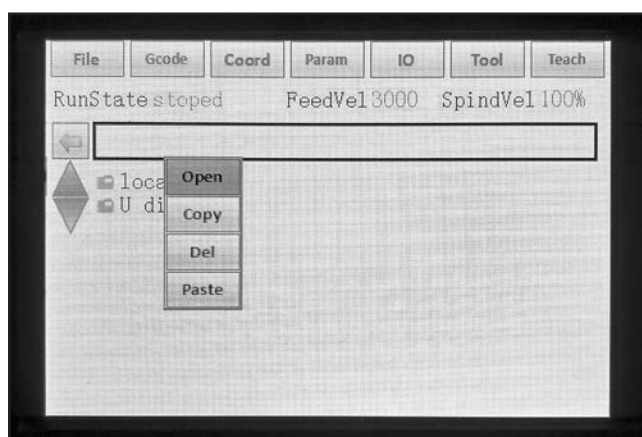


Figure 56. Example of dialog box on file screen.



3. Navigate to **←** soft key and press "Enter" button to return to file screen (see **Figure 57**).
4. Scroll down to "local" soft key (see **Figure 57**) and press "Enter" button.

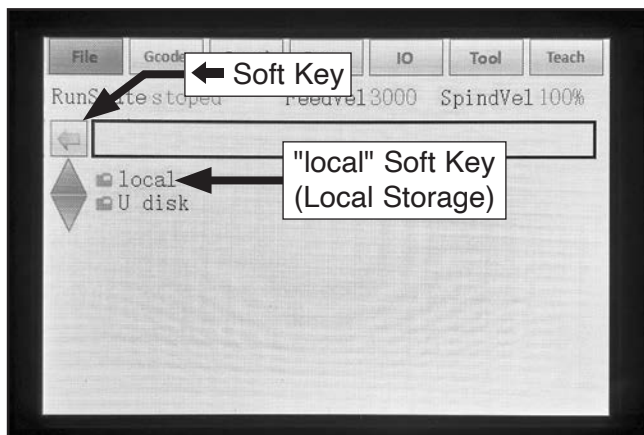


Figure 57. Location of local storage in file screen.

5. Navigate to "Paste" soft key and press "Enter" button to transfer file to local storage.
6. Navigate to "local" soft key and press "Enter" button, then navigate to "Open" soft key and press "Enter" button to enter storage.

NOTICE

If using a battery-powered or handheld spindle motor, turn motor **ON** before initiating part program with "Run/Pause" button.

7. Navigate to desired file and perform one of the following procedures:
 - Press "Run/Pause" button to immediately begin G-code file processing.
 - Press "Enter" button, then press "Open" soft key to load file into "Gcode" screen for future processing.

Setting Breakpoint

In a parts program file, a breakpoint can be used to stop or resume operations. Up to eight breakpoints can be saved to the DSP-J2 controller.

To set a breakpoint:

1. Load G-code file as instructed in **Processing Part Programs** on **Page 40**.
2. Use menu navigation keys to navigate to G-code screen (Gcode).
3. Press "Reserve" button to open breakpoint dialog box (see **Figure 58**).

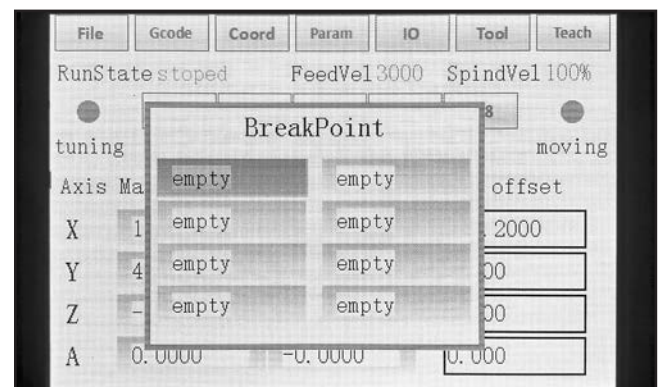


Figure 58. Example of breakpoint dialog box.

4. Press "Enter" button to open breakpoint settings, then input breakpoint save name, G-code line number, and coordinates (see **Figure 59**).

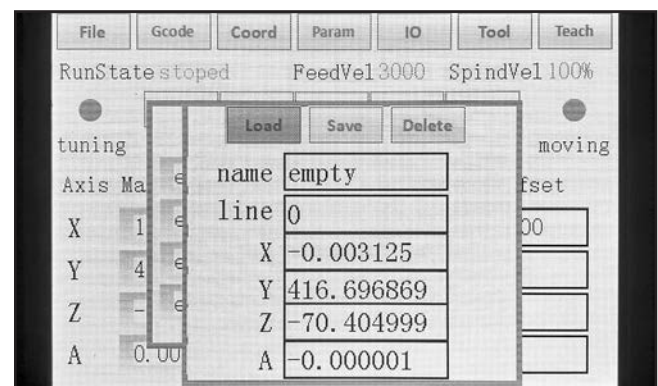


Figure 59. Example of breakpoint settings.

5. Press "Load" soft key to insert breakpoint into currently loaded G-code file, or "Save" soft key to save breakpoint settings.



SECTION 5: ACCESSORIES

!WARNING

Installing unapproved accessories may cause machine to malfunction, resulting in serious personal injury or machine damage. To reduce this risk, only install accessories recommended for this machine by Grizzly.

NOTICE

Refer to our website or latest catalog for additional recommended accessories.

T28101—V-Carve Pro Software

VCarve Pro software provides an intuitive and powerful software solution for cutting parts on a CNC Router. Ideally suited for production environments, this Pro edition allows for unlimited job size, toolpath size, true shape nesting, and job set-up sheets.

The software provides a full set of drawing and editing tools and also imports 2D designs from other programs. For 3D projects, you can rough and finish the model as well as project 2D and 2.5D toolpaths onto a 3D surface.



Figure 60. T28101 V-Carve Pro Software.

Router Bits

C1921—Router Bit Set for Sign Making

These router bits have a long reach, making them excellent for use with sign-making templates. The design allows for smoother cuts and less work for making a stellar looking sign. Forged with a 1/4" shank and 2 3/8" overall length, this set comes with 1/4", 3/8", and 1/2" sizes.



Figure 61. C1921 Router Bit Set for Sign Making.

T30905—1/4" Solid Carbide Upcut Spiral

T30906—1/4" Solid Carbide Downcut Spiral



Figure 62. Assorted CNC router bits.

order online at www.grizzly.com or call 1-800-523-4777



T34438—2 HP Water Cooled Spindle Kit

Transform your G0403 CNC's capabilities with the T34438 2 HP Water-Cooled Spindle Kit, engineered for enhanced power and precision cutting. Specifically designed for serious hobbyists and small workshops, this complete kit replaces your stock router motor to unlock professional-level performance. Includes the following:

- 2 HP Water-Cooled Spindle Motor
- Variable Frequency Drive (VFD)
- Water Pump
- Water Lines
- Water Reservoir
- Flow Meter

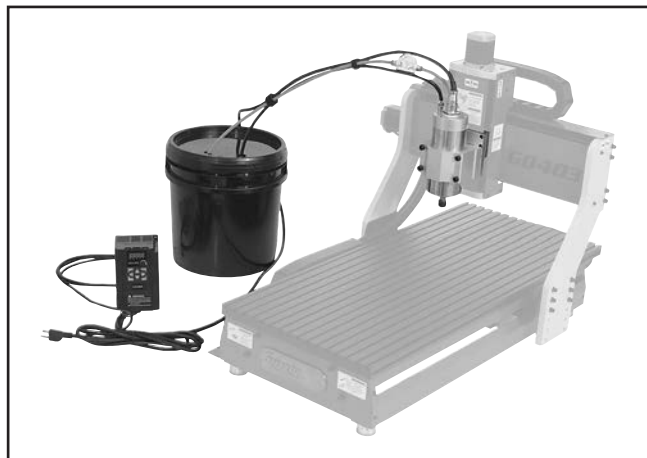


Figure 63. T34438 2 HP Water Cooled Spindle Kit for G0403.

G9649—9" x 12" x 2" Granite Surface Plate

This tool room-grade "B" plate has a bilateral accuracy of plus or minus 0.0001" of total instrument runout.



Figure 64. G9649 Granite Surface Plate.

T34439—4th-Axis Rotary Kit

Expand the G0403's potential with this 4th-Axis Rotary Kit to craft intricate 3D projects with exceptional precision. Carve complex curved surfaces and cylindrical forms up to 4" in diameter with ease. Built with durable, high-quality materials and designed for easy installation. Kit includes a 3-jaw rotary table as well as a tailstock and center.

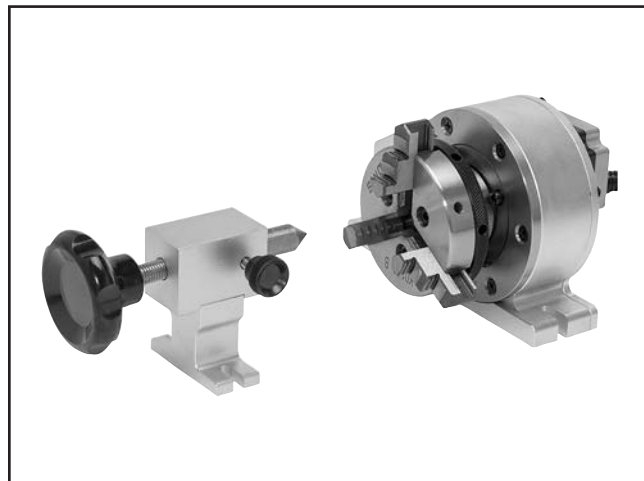


Figure 65. T34439 4th-Axis for G0403.

T27139—Laminate Trim Router w/Plunge Base

Compatible with the Model G0403's 65mm spindle motor clamp, the T27139 Laminate Trim Router is powered by a 1 HP, 6.5A motor with a no-load speed of 10,000–30,000 RPM.

Supports 1/4" collets and includes micro-adjustable guide bearing, fence, fixed base, and collet wrench. Weighs 7 lbs.

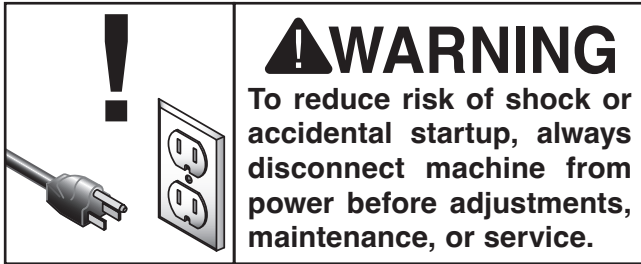


Figure 66. T27139 Laminate Trim Router w/Plunge Base.

order online at www.grizzly.com or call 1-800-523-4777



SECTION 6: MAINTENANCE



Schedule

For optimum performance from this machine, this maintenance schedule must be strictly followed.

Ongoing

To minimize your risk of injury and maintain proper machine operation, shut down the machine immediately if you ever observe any of the items below, and fix the problem before continuing operations:

- Loose mounting bolts.
- Damaged or dull tooling.
- Clogged or dirty collet, collet nut, or spindle collet hole.
- Worn or damaged wires.
- Dust and debris on table.
- Any other unsafe condition.

Daily Maintenance

- Clean/vacuum dust buildup on table and in T-slots.

Weekly Maintenance

- Clean/lubricate guideways, guide rails, and ball screws.
- Inspect spoilboard for defects and flatness.

Monthly Check

- Inspect wiring connections for loose wires.
- Verify fasteners on moving parts are secure.

Annual Maintenance

- Check/level frame and table.

Cleaning & Protecting

Cleaning the Model G0403 is relatively easy. Vacuum excess wood chips and sawdust, and wipe off the remaining dust with a dry cloth.

By design, the linear guideways, rails, and other metal parts on this machine have hardened surfaces that are resistant to corrosion and wear. However, periodically wipe metal parts with light machine oil to extend their life (see **Figure 67**).



Figure 67. T27914 Moly-D Machine and Way Oil.

Lubrication

Lubrication can cause build-up that will bind moving parts, and corrosion can still occur if catalysts are trapped beneath lubricant. Always clean surfaces before applying any form of lubrication.

Items Needed	Qty
Additional Person	1
Hex Wrench 3mm.....	1
Disposable Gloves	1 Pair
Stiff Brushes.....	As Needed
Clean Shop Rags	As Needed
Mineral Spirits.....	As Needed
T27914 or ISO 68 Equivalent	As Needed



Lubricating Ball Screws, Guideways, and Guide Rails

Type..... T27914 or ISO 68 Equivalent
 Amount..... As Needed
 Frequency..... Weekly

To lubricate ball screws, guideways, and guide rails:

1. DISCONNECT CONTROL BOX FROM POWER!
2. Remove (12) cap screws and flat washers securing left and right Z-axis guards on spindle head (see **Figure 68**).
3. Remove (4) cap screws and flat washers securing X-axis guard on gantry, as shown in **Figure 68**.

Note: X-axis guard will rest on spindle motor mount during lubrication and does not need to be fully removed from machine.

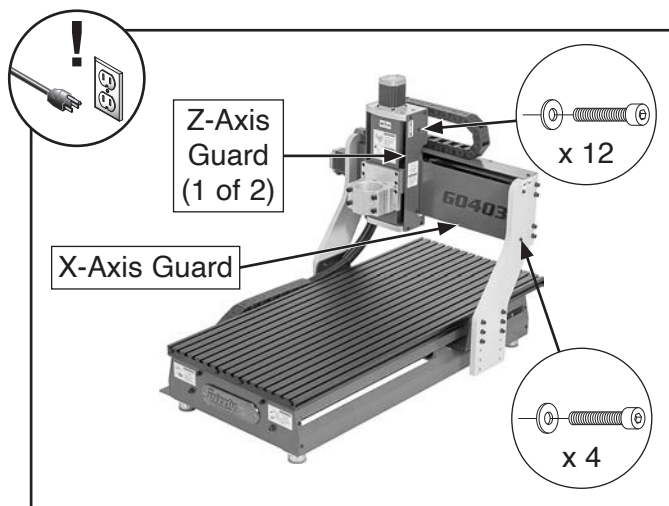


Figure 68. Location of gantry components.

4. Clean X- and Z-axis ball screws and guideways with a brush and mineral spirits to remove grime and old lubrication, as shown in **Figure 69**.
5. Use a clean shop rag to wipe entire length of X- and Z-axis ball screws and guideways with Grizzly T27914 or ISO 68 equivalent lubricant (see **Figure 69**).

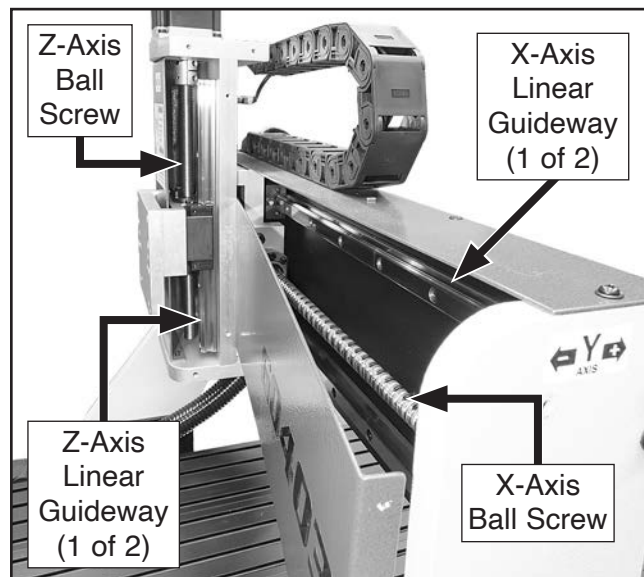


Figure 69. Location of X- and Z-axis ball screws and guideways.

6. With help from an additional person, lift and tilt machine to access Y-axis ball screw and guide rails under table (see **Figure 70**).
7. Clean Y-axis ball screw and guide rails with a brush and mineral spirits to remove grime and old lubrication (see **Figure 70**).
8. Use a clean shop rag to wipe entire length of Y-axis ball screw and guide rails (see **Figure 70**) with Grizzly T27914 or ISO 68 lubricant.

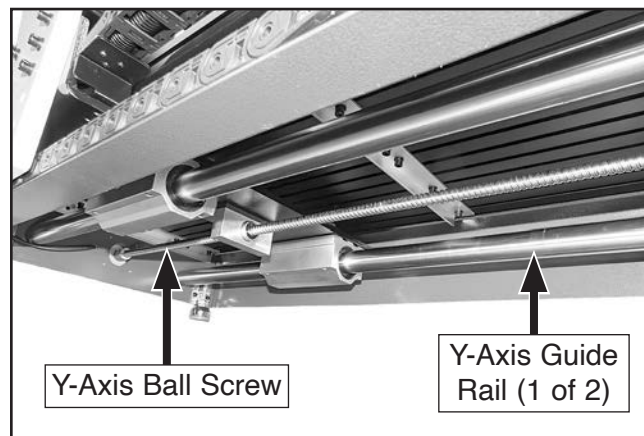


Figure 70. Location of Y-axis ball screw.

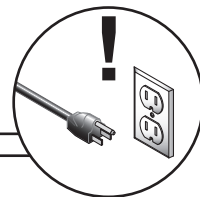
9. Secure X- and Z-axis guards with fasteners removed in **Steps 2–3**.
10. Turn control box **ON** and move spindle and gantry several times over full range of travel to spread lubricant and ensure smooth movement of components.



SECTION 7: SERVICE

Review the troubleshooting procedures in this section if a problem develops with your machine. If you need replacement parts or additional help with a procedure, call our Technical Support. **Note:** *Please gather the serial number and manufacture date of your machine before calling.*

Troubleshooting



Motor & Electrical

Symptom	Possible Cause	Possible Solution
Machine does not start, or power supply breaker immediately trips after startup.	- ON/OFF switch in OFF position. - EMERGENCY STOP button depressed. - Blown fuse. - Incorrect power supply voltage or circuit size. - Power supply circuit breaker tripped or fuse blown. - Wiring broken, damaged, or disconnected.	- Turn ON/OFF switch to ON position. - Rotate EMERGENCY STOP button head to reset. - Replace fuse/ensure no shorts. - Ensure correct power supply voltage and circuit size (Page 16). - Ensure power supply circuit is not overloaded and is free of shorts. Reset circuit breaker or replace fuse. - Fix broken/damaged wires or disconnected/corroded connections (Page 59).
Machine stalls or is underpowered.	- Workpiece material unsuitable for machine. - Dull tool or incorrect tool type for task. - Machine undersized for task. - Axis jammed. - Stepper motor or motor bearings at fault. - One or more axes ball screw(s)/bearing(s) are damaged or binding.	- Only cut wood or plastic/ensure wood moisture is below 20% (Page 29). - Replace/sharpen tool. Use proper tool for operation (Page 30). - Use sharp, proper tooling (Page 30)/reduce feed rate or depth of cut. - DISCONNECT POWER! Move axis by hand to identify/fix cause of jam. - Test wire continuity between stepper motor and stepper driver (Page 59); replace if at fault. - Inspect ball screw(s)/bearing(s) on each axis for damage, corrosion, and debris.
Machine has vibration or noisy operation.	- Motor or component loose. - Incorrect feed rate, spindle speed, or tool type. - Tool or spindle at fault. - Workpiece loose. - Tool chattering. - Machine feet not adjusted properly. - One or more stepper driver(s) have incorrect DIP switch configuration. - One or more stepper driver(s) at fault. - One or more axes ball screw(s)/bearing(s) are damaged or binding.	- Replace damaged or missing bolts/nuts or tighten if loose. - Use appropriate feed rate and spindle speed; use different tool (Page 30). - Replace tool (Page 30); tighten loose spindle; replace defective spindle, collet, or collet nut. - Secure workpiece with clamps (Page 35). - Replace tool (Page 30); index tool to workpiece; use appropriate feed rate and spindle speed. - Adjust feet to stabilize machine (Page 22). - Adjust stepper driver DIP switch configuration (Page 52). - Test wire continuity between stepper motor and stepper driver (Page 59); replace if at fault. - Inspect ball screw(s)/bearing(s) on each axis for damage, corrosion, and debris.



Operation(s)

Symptom	Possible Cause	Possible Solution
Axis will not move after controller receives commands.	1. One axis not moving. 2. All axes not moving.	1. Check connection to stepper motor. Check connection to motion controller. Adjust stepper driver DIP switch configuration (Page 52). 2. Inspect motion controller connections. Adjust stepper driver(s) DIP switch configuration (Page 52).
Axis movement and location not repeatable.	1. Ball screw(s) worn or damaged. 2. Axis motor coupler worn or damaged. 3. Guide rail(s) or guideway(s) worn or damaged.	1. Inspect ball screw; replace if at fault. 2. Inspect axis motor coupler; replace if at fault. 3. Inspect guide rail(s) or guideway(s); replace if at fault.
One or more axes only move in one direction.	1. Motion controller/motor connection loose. 2. Incorrect DIP switch configuration.	1. Inspect wiring connections and ensure all are tight (Page 59). 2. Adjust stepper driver DIP switch configuration (Page 52).
One or more axes will not move.	1. Direction wire and pulse wire in wrong place on motion controller. 2. Stepper motor disconnected.	1. Rewire direction/pulse wiring (Page 59). 2. Reconnect stepper motor.
Inconsistent cutting depth.	1. Loose tooling. 2. Spoilboard not flat. 3. Z-axis ball screw has too much movement. 4. Workpiece loose. 5. CAM/G-code file at fault.	1. Tighten spindle collet (Page 34). 2. Clean/resurface spoilboard (Page 36). 3. Inspect/tighten/replace ball screw. 4. Secure workpiece with clamps (Page 35). 5. Review file and correct errors.
Machine fails to home, or moves beyond soft limits when homing.	1. Incorrect origin setting. 2. Faulty connection. 3. Proximity switch(es) not aligned. 4. Loose proximity switch wire.	1. Verify machine/workpiece origin (Page 39). 2. Inspect/secure connection (Page 59). 3. Inspect/adjust proximity switch alignment. 4. Secure connection (Page 59).
Finished workpiece incorrect size.	1. Incorrect tool. 2. Tooling parameters incorrect. 3. CAD/CAM dimensional or tooling errors.	1. Use correct tool for operation (Page 30). 2. Enter correct tooling parameters (Page 31). 3. Correct CAD/CAM errors as needed.
Spindle moves in opposite direction when homing.	1. Workpiece origin set incorrectly.	1. Input correct origin (Page 39).



Controller Operation(s)

Symptom	Possible Cause	Possible Solution
Controller display shows "out of limits error".	1. Toolpath outside of working envelope. 2. Toolpath too large for working envelope. 3. Origin incorrect in G-code. 4. Incorrect coordinate system in CAD/CAM software.	1. Reset workpiece origin and secure workpiece so toolpath falls within working envelope. 2. Revise toolpath/break up toolpath into multiple sections. 3. Revise toolpath. 4. Set correct coordinates in CAD/CAM software.
Controller not processing correctly.	1. Incompatible G-code file. 2. Incompatible post-processor.	1. Reformat G-code and re-upload to DSP controller (Page 40). 2. Use compatible post-processor. In V-Carve software, select a compatible post processor from the drop-down menu.
Controller display is dim.	1. Power supply disconnected or damaged.	1. Inspect/replace power supply.
Controller display is blank, flickers, or restarts.	1. Faulty DSP controller connection.	1. Inspect/clean plugs and sockets and reconnect.
Controller screen says spindle is ON when spindle is OFF and spindle is OFF when spindle is ON .	1. Wrong connections at motion controller.	1. Correct motion controller wiring (Page 59).
Controller screen says spindle is ON , but spindle is not operating.	1. Spindle speed set to lowest setting (0 RPM). 2. Spindle motor VFD frequency parameters not set correctly.	1. Manually increase spindle speed until spindle is operating (Page 37). 2. Input correct VFD frequency parameters; contact Grizzly Tech Support for assistance.
USB flash drive is not read by controller, or file unable to load.	1. Incorrect file structure or wrong file format. 2. Part program not saved using dedicated CAD/CAM software. 3. DSP controller memory is full. 4. USB flash drive at fault.	1. Use a FAT16 formatted USB flash drive with part programs saved in .tap or .nc format. 2. Save part program using dedicated CAD/CAM software. 3. Delete files from DSP controller memory: Highlight file(s) and press "Enter" button, then press "Delete" soft key to delete file. 4. Replace USB flash drive.



Tramming Spindle

Spindle tramming is the process of aligning spindle tooling perpendicular to the X- and Y-axes. Tram the spindle after a new spindle motor is installed, or when drill holes or pocket walls are no longer cutting true.

Keep in mind that workpiece surfaces may not be exactly parallel with the table. You may choose to tram the spindle to the top surface of the workpiece after it is mounted, rather than tramming the spindle to the table.

Note: For best results, use a dual-indicator tramming tool which can be secured directly in the spindle motor collet (see **Figure 71**). A single-indicator tramming tool can be used as an alternative, but will require rotating the tool periodically while testing.

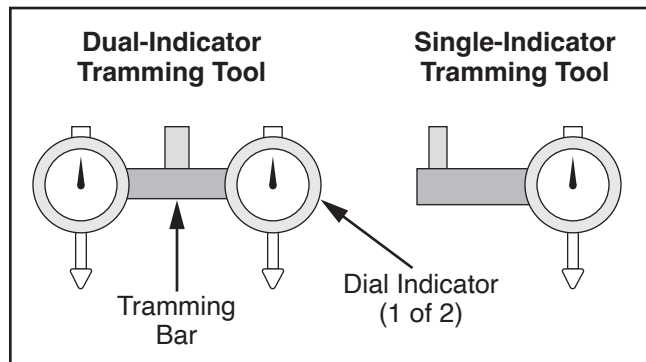


Figure 71. Example of recommended tramming tools.

NOTICE

Tramming on a flat, level surface is vital for accurate measurements. Using a solid, non-flexible test surface (such as granite surface plates, tempered glass panes, or metal sheeting) is highly recommended.

Items Needed

	Qty
Dual-Indicator Tramming Tool (0.001" Resolution)	1
Granite Surface Plate or Equivalent (Page 44) (12" Length)	1
Level	1
Wood Mallet.....	1
Hold-Down Clamps	As Needed
Metal Shims.....	As Needed

To tram spindle:

1. DISCONNECT SPINDLE MOTOR FROM POWER!
2. Verify test surface is flat and level, then place on table and secure with hold-down clamps, as needed.
3. Loosen and remove collet nut on spindle motor, then remove collet from spindle.
4. Insert tramming tool stem into collet, then insert collet in spindle and tighten collet nut to secure (see **Figure 72**).
5. Position tramming tool at center of table and verify tramming tool has been zeroed (see **Figure 72**).

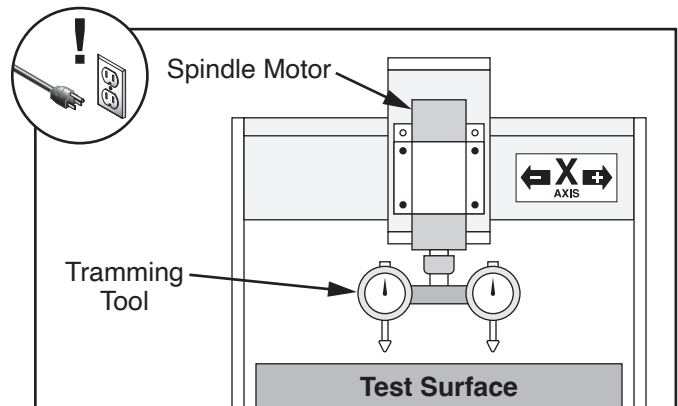


Figure 72. Example of spindle tramming components.

6. Lower tramming tool until dial indicators lightly touch test surface, then make note of measurement shown on indicators (see **Figure 73**).

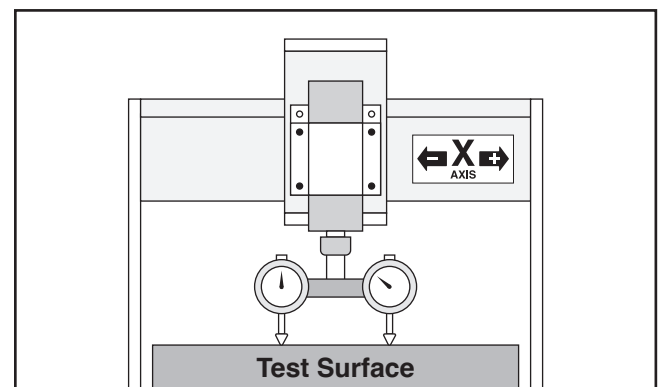


Figure 73. Example of indicators showing different values.



- If both indicators show same value, spindle is perpendicular to X-Axis. Proceed to **Step 7**.
- If indicators show different values, loosen (3) of (4) spindle motor clamp cap screws a $\frac{1}{4}$ turn and gently tap clamp in desired direction of movement until indicators display matching values (see **Figure 74**), then tighten cap screws and proceed to **Step 7**.

Note: If using a single-indicator tramping tool, make note of initial measurement on either side of spindle, then rotate tool 180° to review measurement on opposite side.

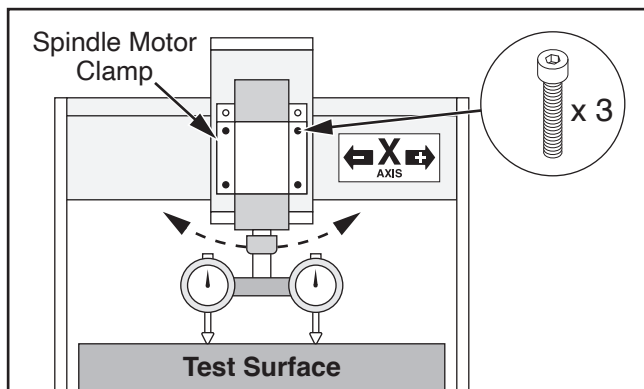


Figure 74. Example of tramping spindle to X-axis.

7. Rotate tramping tool 90° until indicators are oriented along Y-axis (see **Figure 75**).

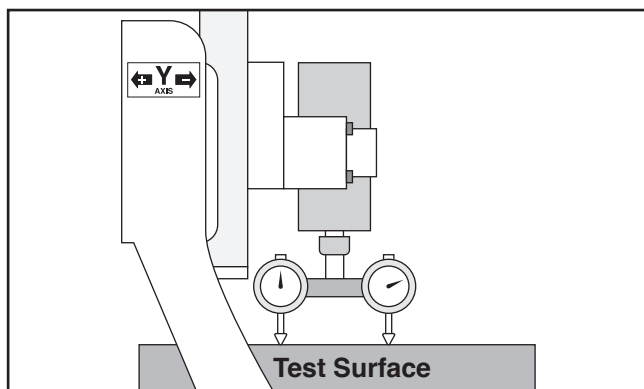


Figure 75. Example of tramping tool rotated 90° to measure Y-axis.

- If both indicators show same value, spindle is perpendicular to Y-axis. Proceed to **Step 8**.
- If indicators show different values, loosen (1) set of upper or lower cap screws on spindle motor clamp a full turn and place shim(s) under clamp in desired direction of movement until indicators display matching values (see **Figure 76**), then tighten cap screws and proceed to **Step 8**.

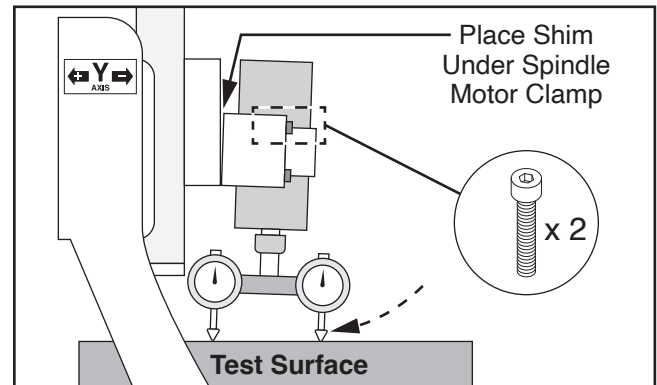


Figure 76. Example of shimming spindle motor clamp with upper cap screw set loosened.

8. Rotate tramping tool 90° until indicators are facing towards front of machine, then repeat **Steps 6–8** to verify tramping adjustments.
 - If tramping tool dial indicators consistently show matching values, no further action is required.
 - If tramping tool dial indicators still show different values after adjustments are made, replace test surface as needed, then repeat **Steps 2–8**.

Setting Stepper Driver DIP Switches

The DIP (Dual In-line Package) switches on the stepper drivers control the step size, current, and speed of the stepper motors. If the DIP switches are not configured properly, erroneous signals will cause the stepper motors to function incorrectly.

Items Needed	Qty
Phillips Head Screwdriver #2	1

To set stepper driver DIP switches:

1. DISCONNECT CONTROL BOX FROM POWER!
2. Remove (8) Phillips head screws and flat washers securing control box cover, then remove cover (see **Figure 77**).

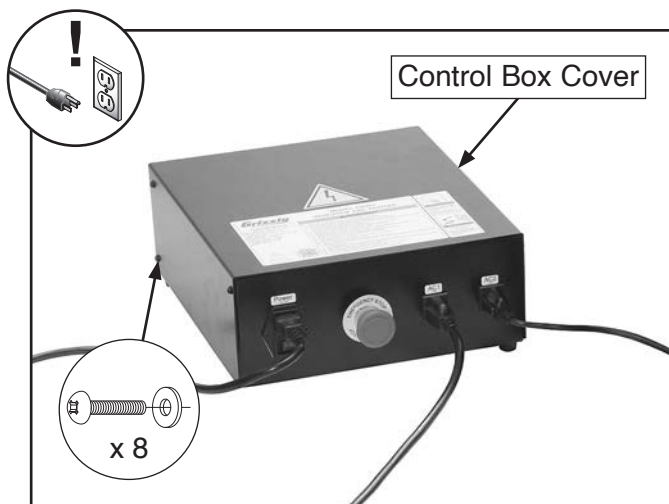


Figure 77. Location of control box cover fasteners.

3. Locate (4) stepper driver DIP switches in control box, as shown in **Figure 78**.

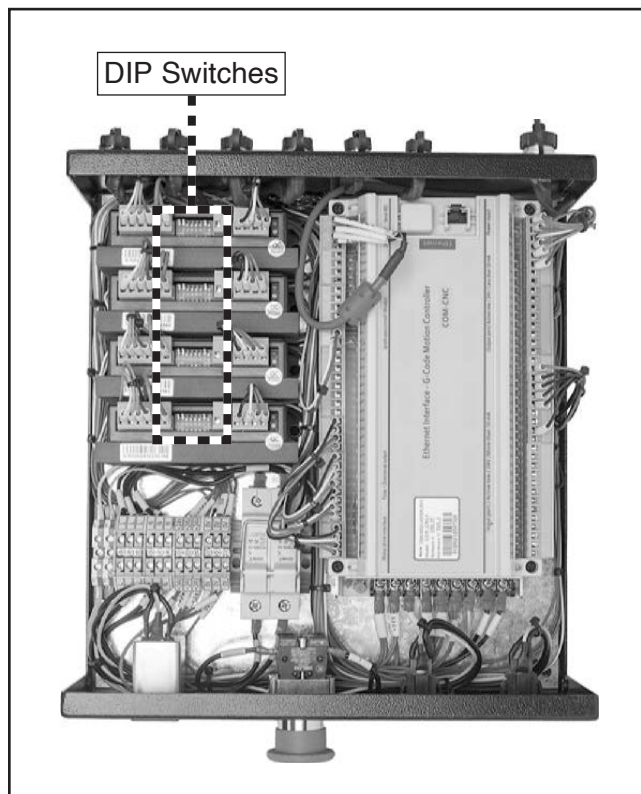


Figure 78. Location of stepper driver DIP switches.

4. Compare stepper drivers DIP switch configuration to diagram in **Figure 79**.
 - If DIP switch *does* match diagram, DIP switch is set correctly.
 - If DIP switch *does not* match diagram, flip rocker switches to match diagram.

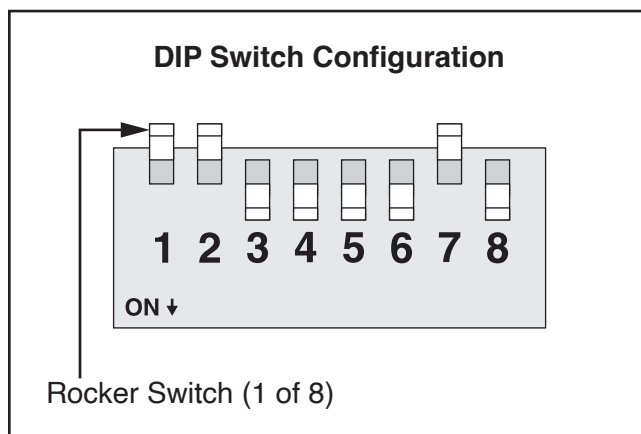


Figure 79. Stepper driver DIP switch configuration.

5. Install control box cover and proceed to **Test Run** on **Page 25** to verify correct machine operation.



Testing Proximity Switches

If the Model G0403 is no longer homing properly, or one or more of the axes is unresponsive, test each proximity switch for proper operation. Refer to **Control Box Wiring** on **Page 59** for wiring and terminal locations.

Items Needed	Qty
Scrap Iron or Steel	1
Multimeter	1
Phillips Head Screwdriver #2	1

To test proximity switches:

1. Turn control box and DSP controller **ON** and allow controller to finish boot sequence.
 - After approximately 10 seconds, DSP controller will finish boot sequence and show coordinate screen.
2. Position all axes near machine center so none of the proximity switches/sensor are actuated (see **Figure 80**).

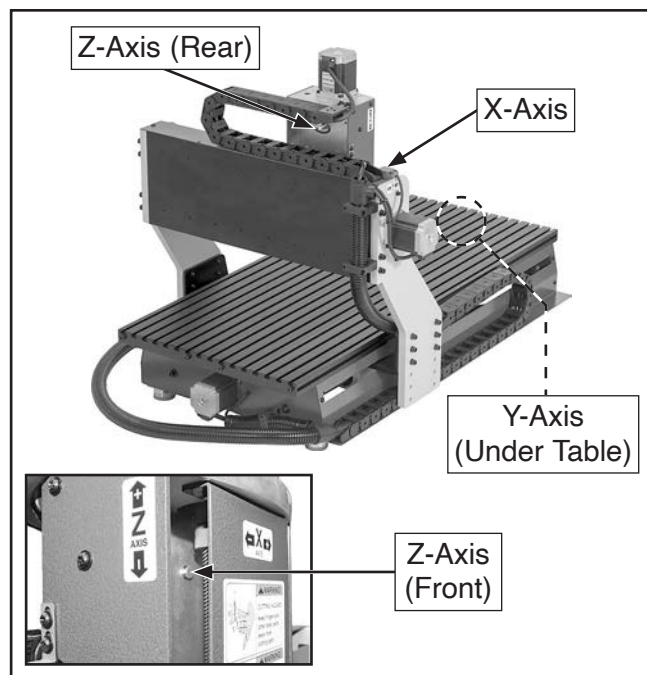


Figure 80. Location of proximity switches/sensor.

3. Use menu navigation keys to navigate to IO screen (see **Figure 81**).

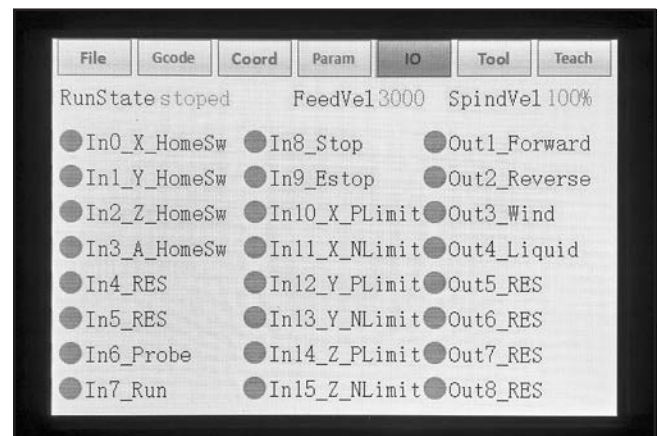


Figure 81. Example of IO screen.

4. Touch X-axis proximity switch target with a scrap piece of iron/steel (see **Figure 82**).

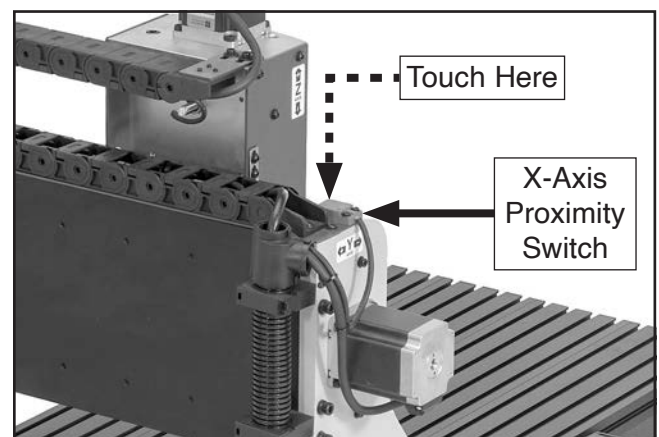


Figure 82. Location of X-axis proximity switch.

5. While touching X-axis proximity switch target, verify red signal icon next to "In0_X_HomeSw" changes to green (see **Figure 83**).

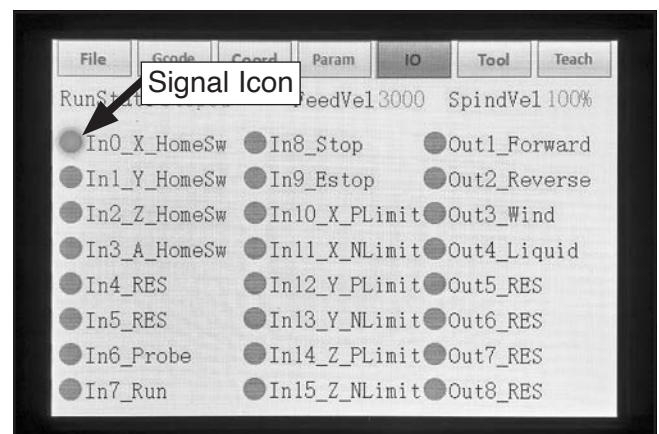


Figure 83. Example of proximity switch signal icon activated.



- If signal icon *does* change to green, proximity switch is working properly. Repeat **Steps 4–5** on Y- and Z-axis switch/sensor. No other testing is required.

- If signal icon *does not* illuminate green, proceed to **Step 6**.

6. DISCONNECT CONTROL BOX FROM POWER!

7. Remove (8) Phillips head screws and flat washers securing control box cover, then remove cover (see **Figure 84**).

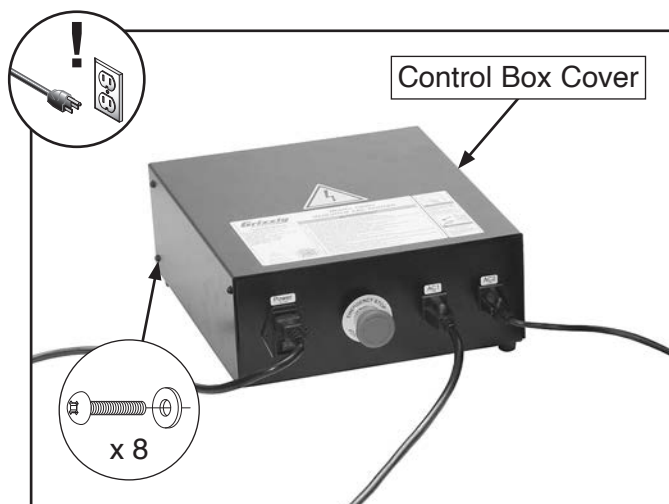


Figure 84. Location of control box cover fasteners.

8. Use a multimeter to check continuity between proximity switch/sensor and motion controller proximity terminals (see **Figure 85**).

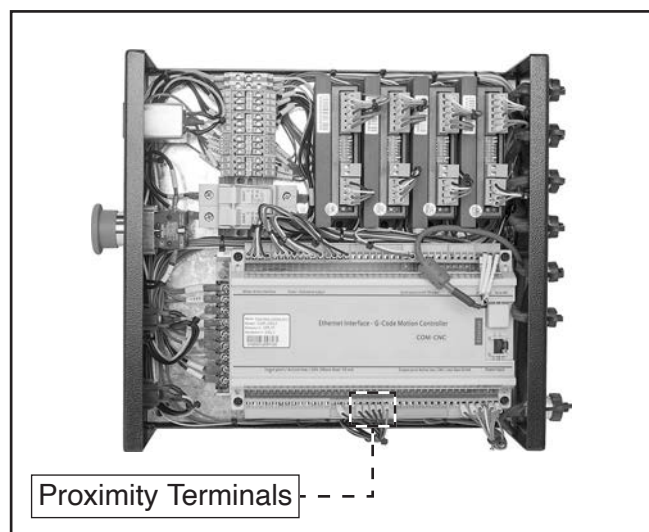


Figure 85. Location of motion controller proximity terminals.

- If continuity *is* confirmed between proximity switch/sensor and motion controller proximity terminals, proceed to **Step 9**.

- If continuity *is not* confirmed between proximity switches/sensor and motion controller proximity terminals, repair wiring as needed, then repeat **Steps 1–8**.

9. Swap faulty axis proximity switch/sensor signal wire on motion controller (see **Figure 86**) with any known good axes signal wire (HL1=X-axis, HL2=Y-axis, HL3=Z-axis).

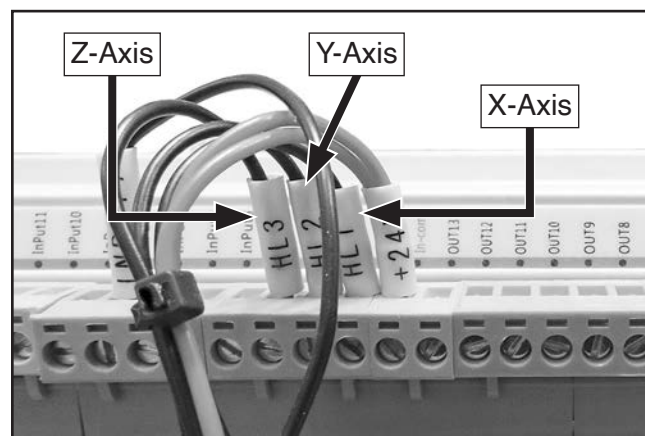


Figure 86. Location of motion controller proximity switch/sensor terminals.

10. Perform **Steps 1–4** and verify test results.

- If signal icon *does* change to green on axis swapped in **Step 9**, replace faulty proximity switch/sensor.

- If signal icon *does not* change to green on axis swapped in **Step 9**, replace motion controller.

11. Return any swapped wires to their original position, then install control box cover and secure with (8) Phillips head screws and flat washers removed in **Step 7**.



Updating DSP-J2 Control System

The motion controller and DSP controller firmware can be updated independently to restore DSP-J2 system functions or enhance existing features.

Items Needed	Qty
USB Flash Drive 32 GB (FAT16)	1

Updating Motion Controller

1. Download the following firmware file from our website at **www.grizzly.com** and transfer it to USB flash drive:

- **XHC-COMCNC-(Version/Date).bin**

2. Turn control box and DSP controller **ON** and allow controller to finish boot sequence.

- After approximately 10 seconds, DSP controller will finish boot sequence and show coordinate screen.

3. Use menu navigation keys to navigate to File screen.
4. Insert USB flash drive with firmware file from **Step 1** into USB port on top of DSP controller (see **Figure 87**).



Figure 87. Location of DSP controller USB port.

5. Navigate to "U disk" soft key (see **Figure 88**) and press "Enter" button, then navigate to "Open" soft key and press "Enter" button to enter USB flash drive.

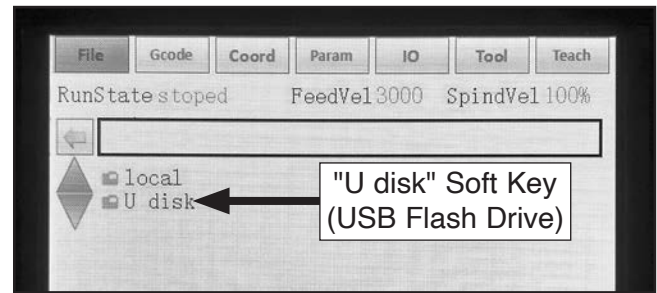


Figure 88. Location of "U disk" soft key.

6. Navigate to **XHC-COMCNC-(Version/Date).bin** file and press "Enter" button, then navigate to "Copy" soft key and press "Enter" button to copy file.
7. Navigate to soft key and press "Enter" until you return to file screen (see **Figure 89**).
8. Navigate to "local" soft key (see **Figure 89**) and press "Enter" button, then navigate to "Open" soft key and press "Enter" button to enter local storage.

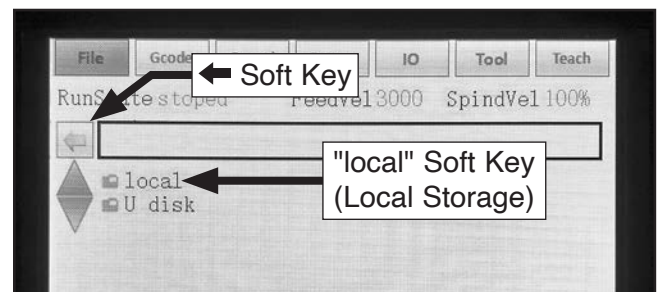


Figure 89. Example of controller File screen.

9. Navigate to "cnc_src" folder and press "Enter" button, then navigate to "Open" soft key and press "Enter" button to enter folder.
10. Navigate to **XHC-COMCNC-(Version/Date).bin** file and press "Enter" button, then navigate to "Delete" soft key and press "Enter" button to delete currently installed file.
11. Navigate to soft key and press "Enter" button to return to previous screen.
12. Navigate to "cnc_src" folder and press "Enter" button, then navigate to "Paste" soft key and press "Enter" button to load updated firmware to local storage.



13. Navigate to Param screen, then scroll down to "cnc_update" soft key (see **Figure 90**) and press "Enter" button.

— Firmware update progress will be shown as a percentage (see **Figure 90**).

NOTICE

Firmware update may take several minutes to complete. Do not disconnect power during the update process or file system corruption may occur.

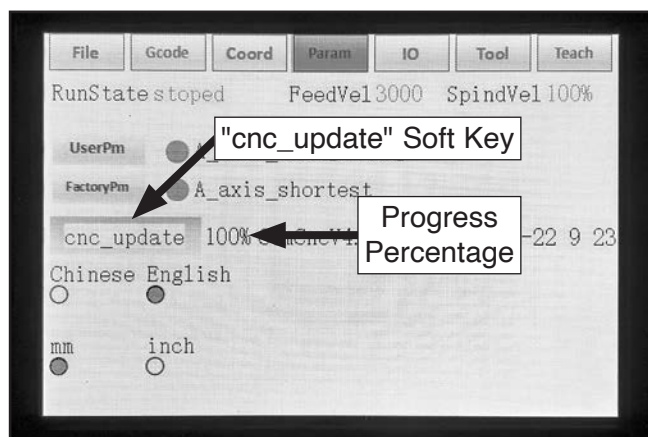


Figure 90. Example of "Param" screen.

14. When firmware update progress has reached 100%, turn DSP controller and control box **OFF**.
15. Proceed to **Test Run** on **Page 25** to verify system integrity with updated firmware.

Updating DSP Controller

1. Download the following firmware file from our website at www.grizzly.com and transfer it to USB flash drive:
 - **XHC-SPJ2-(Version/Date).bin**
2. Perform **Steps 2–5** of **Updating Motion Controller** on **Page 55**.
3. Navigate to **XHC-SPJ2-(Version/Date).bin** file and press "Enter" button, then navigate to "Copy" soft key and press "Enter" button to copy file.
4. Navigate to **←** soft key and press "Enter" button until you return to file screen.

5. Navigate to "local" soft key and press "Enter" button, then navigate to "Open" soft key and press "Enter" button to enter local storage.
6. Navigate to "src" folder and press "Enter" button, then navigate to "Open" soft key and press "Enter" button to enter folder.
7. Navigate to loaded **XHC-SPJ2-(Version/Date).bin** file and press "Enter" button, then navigate to "Delete" soft key and press "Enter" button to delete file.
8. Navigate to **←** soft key and press "Enter" button to return to previous screen.
9. Navigate to "src" folder and press "Enter" button, then navigate to "Paste" soft key and press "Enter" button to load firmware file.
 - File transfer progress will briefly be shown as a progress bar at bottom of screen.
10. Cycle power to DSP controller by turning it **OFF** and then back **ON**.

— Verify file version and date in loading screen matches firmware update file (see **Figure 91**).

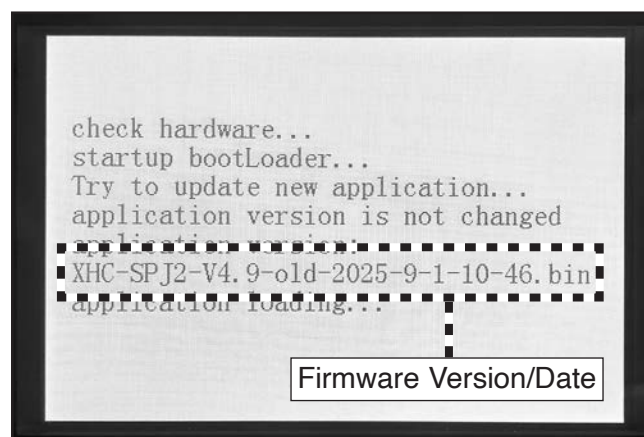


Figure 91. Example of loading screen.

11. Turn DSP controller and control box **OFF**.
12. Proceed to **Test Run** on **Page 25** to verify system integrity with updated firmware.



SECTION 8: WIRING

These pages are current at the time of printing. However, in the spirit of improvement, we may make changes to the electrical systems of future machines. Compare the manufacture date of your machine to the one stated in this manual, and study this section carefully.

If there are differences between your machine and what is shown in this section, call Technical Support at (570) 546-9663 for assistance BEFORE making any changes to the wiring on your machine. An updated wiring diagram may be available. **Note:** Please gather the serial number and manufacture date of your machine before calling. This information can be found on the main machine label.

⚠ WARNING

Wiring Safety Instructions

SHOCK HAZARD. Working on wiring that is connected to a power source is extremely dangerous. Touching electrified parts will result in personal injury including but not limited to severe burns, electrocution, or death. Disconnect the power from the machine before servicing electrical components!

MODIFICATIONS. Modifying the wiring beyond what is shown in the diagram may lead to unpredictable results, including serious injury or fire. This includes the installation of unapproved after-market parts.

WIRE CONNECTIONS. All connections must be tight to prevent wires from loosening during machine operation. Double-check all wires disconnected or connected during any wiring task to ensure tight connections.

CIRCUIT REQUIREMENTS. You MUST follow the requirements at the beginning of this manual when connecting your machine to a power source.

WIRE/COMPONENT DAMAGE. Damaged wires or components increase the risk of serious personal injury, fire, or machine damage. If you notice that any wires or components are damaged while performing a wiring task, replace those wires or components.

MOTOR WIRING. The motor wiring shown in these diagrams is current at the time of printing but may not match your machine. If you find this to be the case, use the wiring diagram inside the motor junction box.

CAPACITORS/INVERTERS. Some capacitors and power inverters store an electrical charge for up to 10 minutes after being disconnected from the power source. To reduce the risk of being shocked, wait at least this long before working on capacitors.

EXPERIENCING DIFFICULTIES. If you are experiencing difficulties understanding the information included in this section, contact our Technical Support at (570) 546-9663.

NOTICE

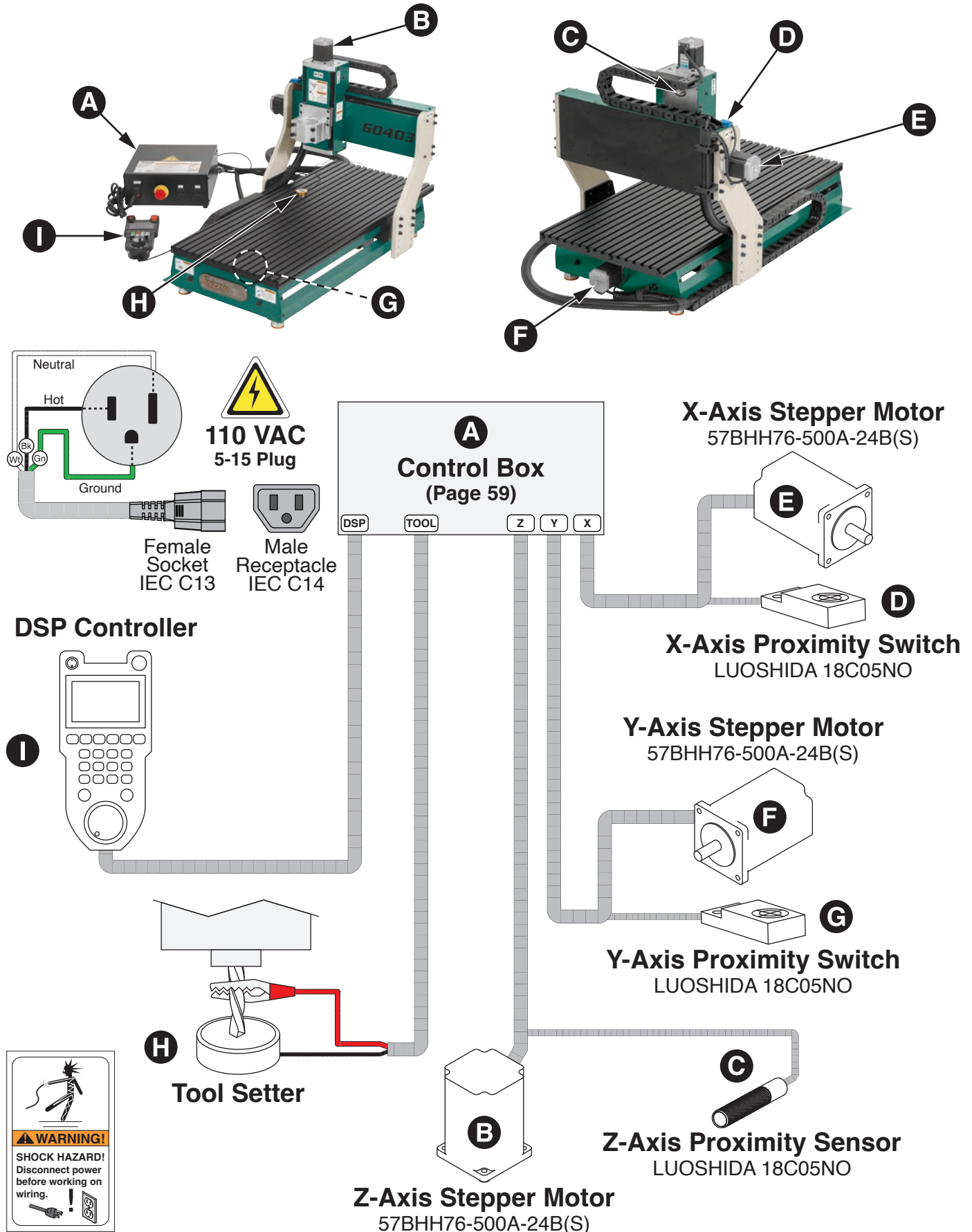
The photos and diagrams included in this section are best viewed in color. You can view these pages in color at www.grizzly.com.

COLOR KEY

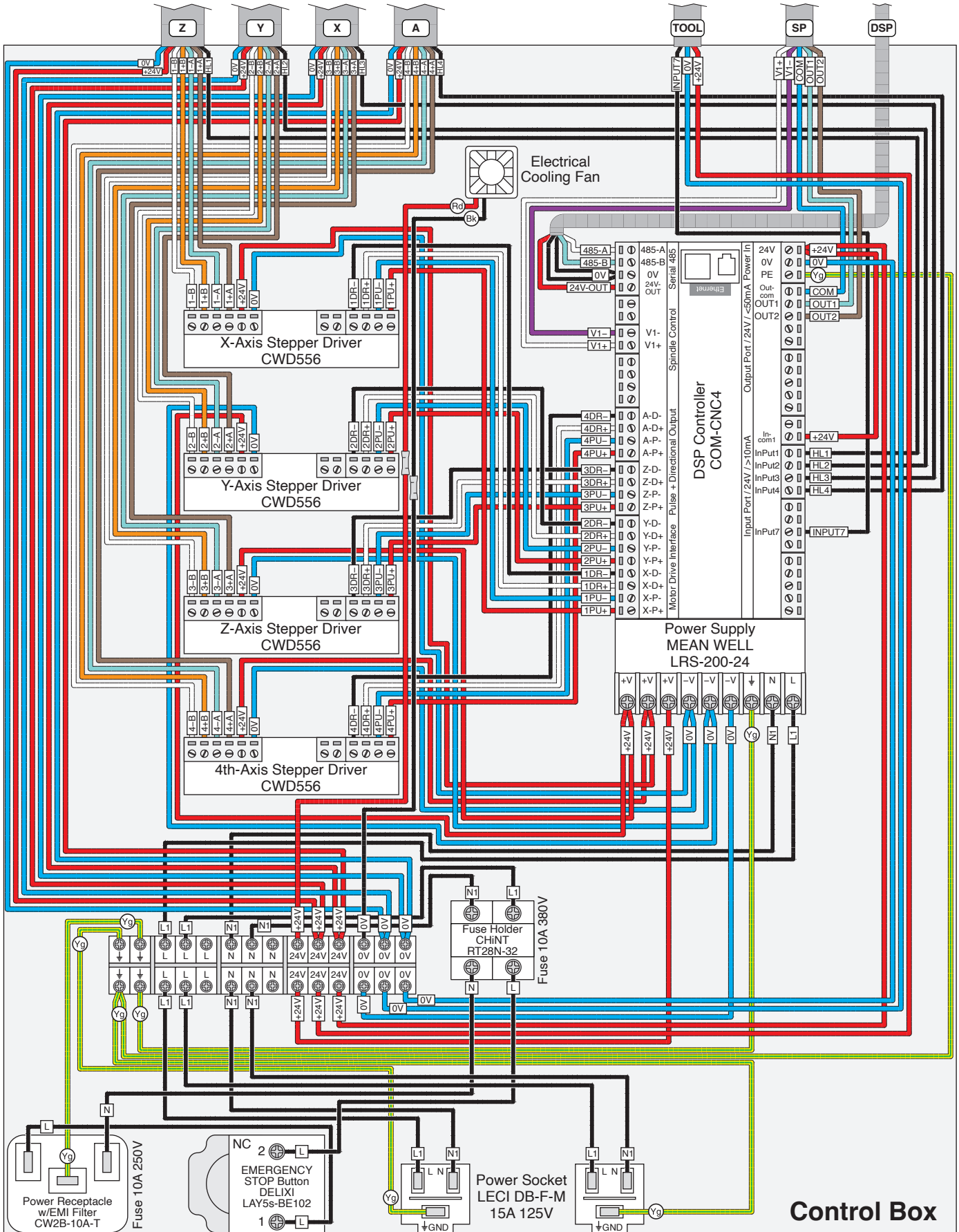
BLACK		BLUE		YELLOW		LIGHT BLUE	
WHITE		BROWN		YELLOW GREEN		BLUE WHITE	
GREEN		GRAY		PURPLE		TURQUOISE	
RED		ORANGE		PINK			



Wiring Overview



Control Box Wiring



Control Box Components

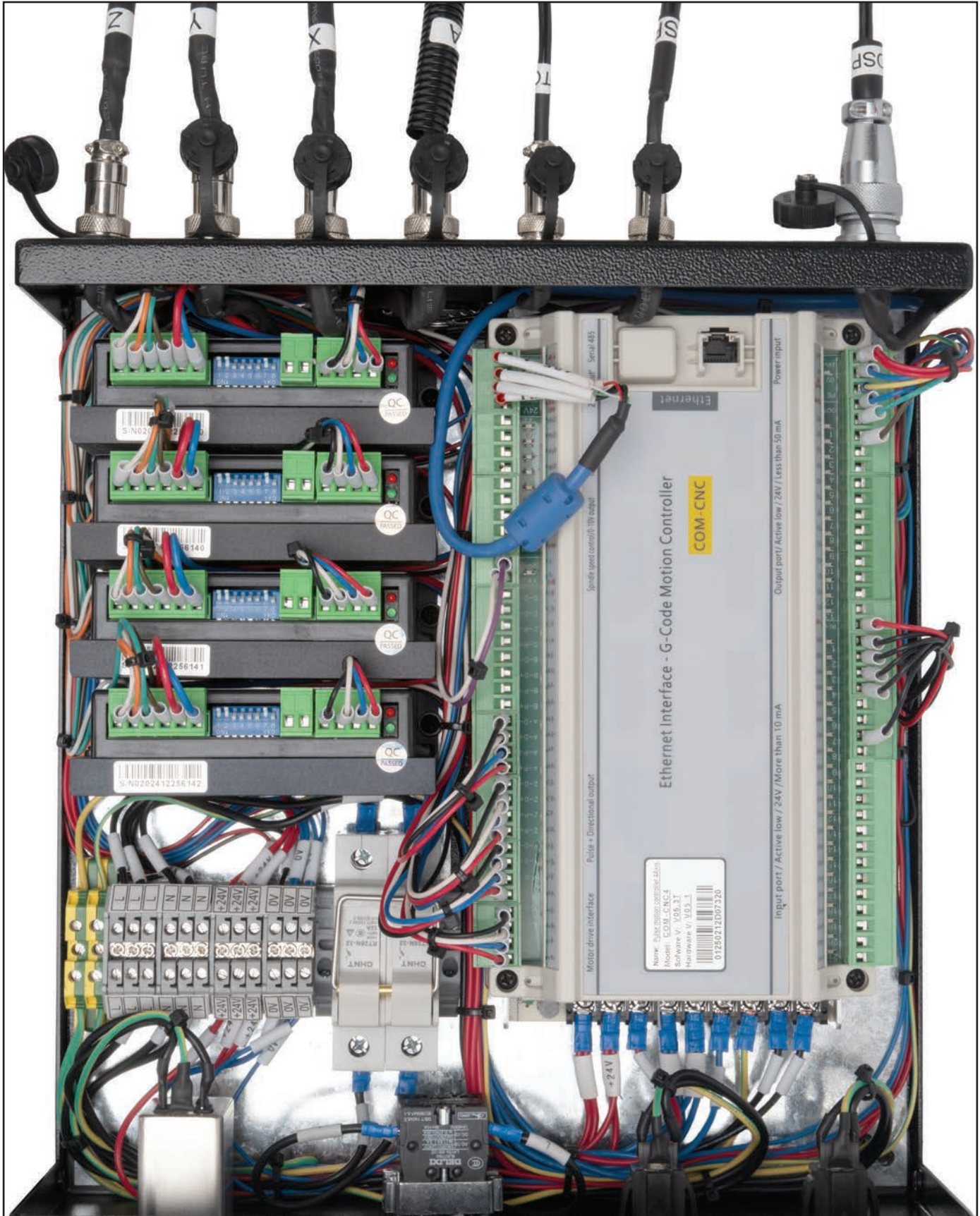
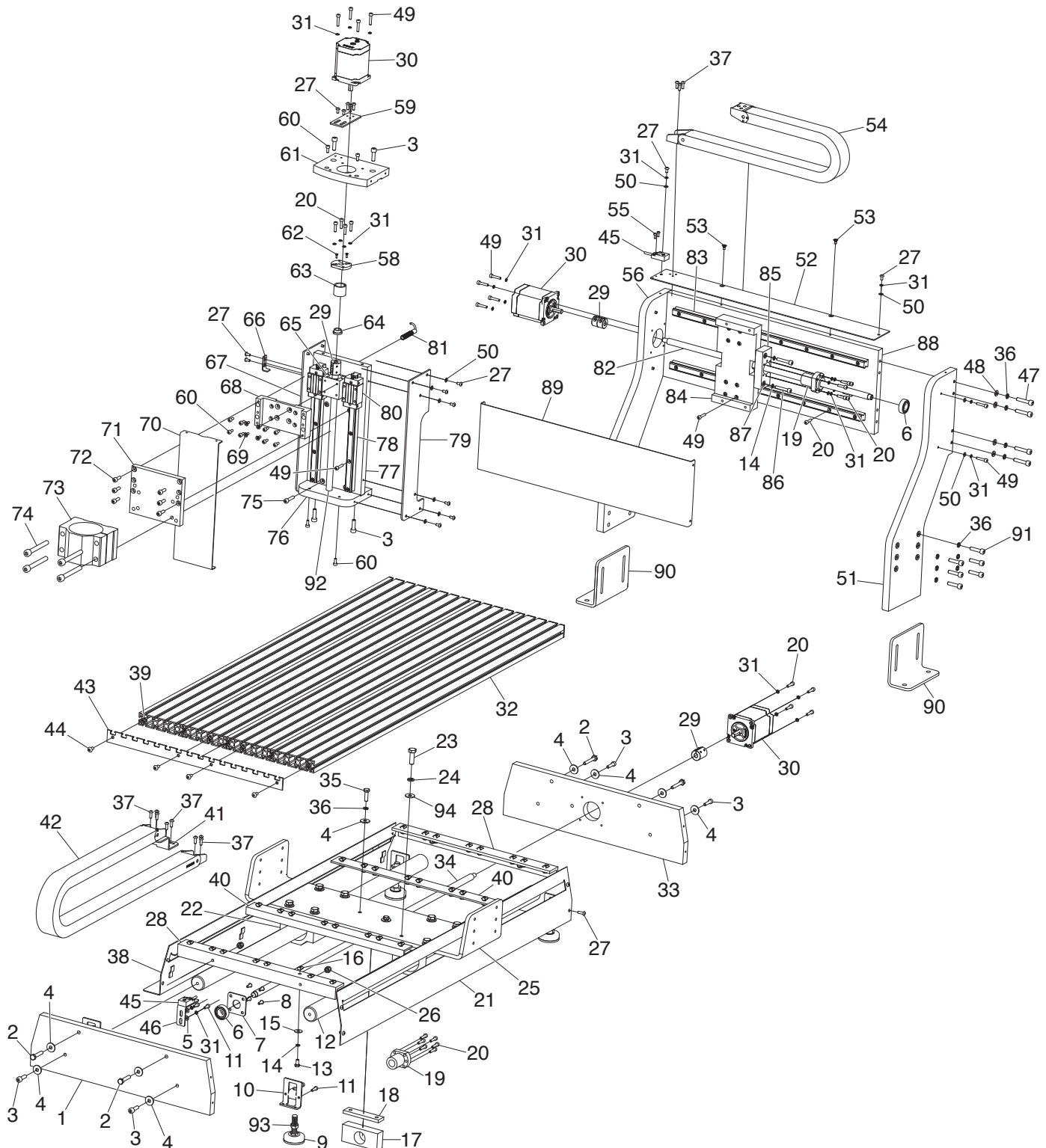


Figure 92. Control box overview.



We do our best to stock replacement parts when possible, but we cannot guarantee that all parts shown are available for purchase. Call **(800) 523-4777** or visit **www.grizzly.com/parts** to check for availability.

Main



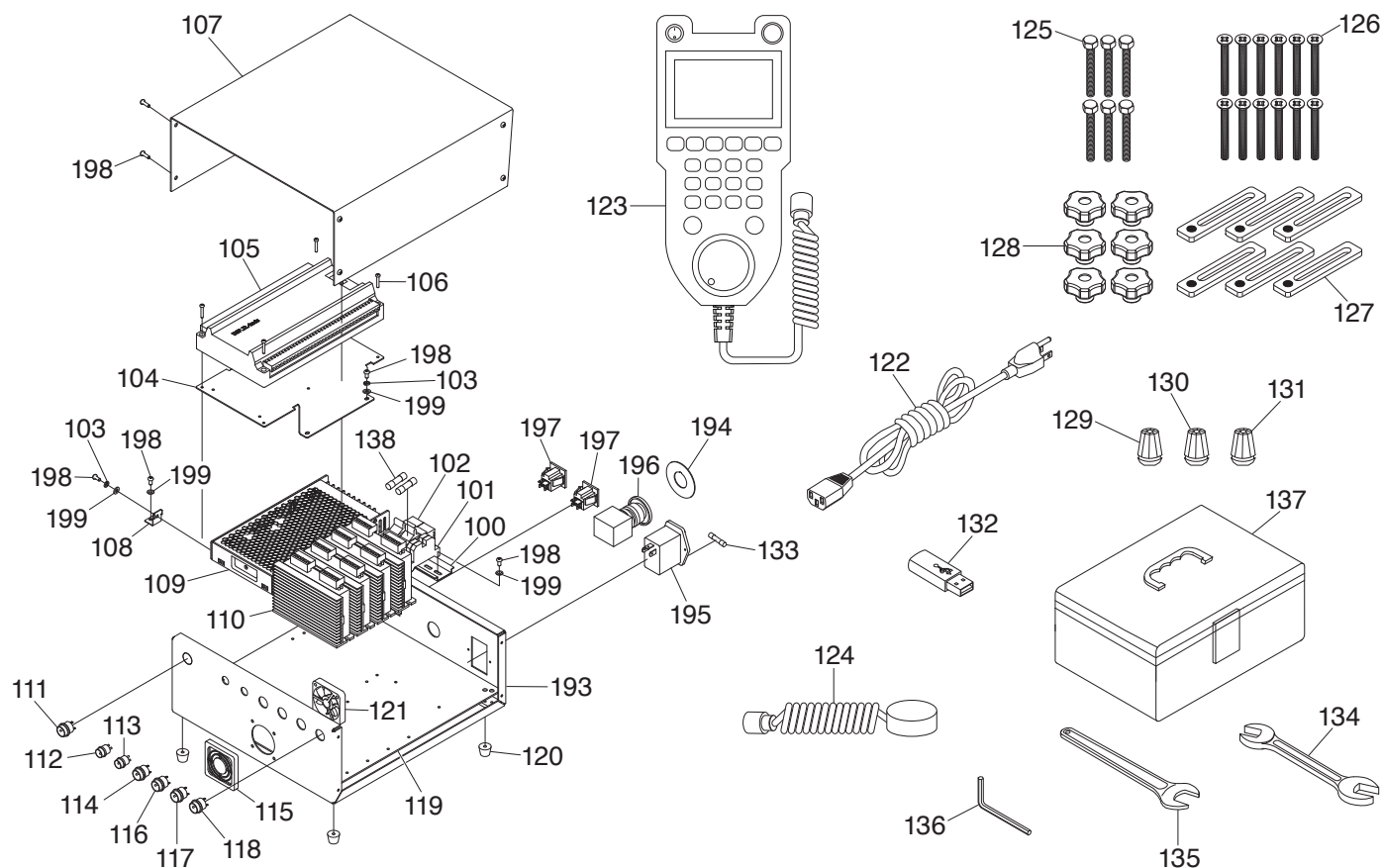
Main Parts List

REF	PART #	DESCRIPTION
1	P0403001	SUPPORT PLATE, FRONT
2	P0403002	HEX BOLT M6-1 X 30
3	P0403003	CAP SCREW M6-1 X 20
4	P0403004	FLAT WASHER 6MM
5	P0403005	FLAT WASHER 4MM
6	P0403006	BALL BEARING 16100-ZZ
7	P0403007	BEARING COVER PLATE
8	P0403008	BUTTON HD CAP SCR M4-.7 X 10
9	P0403009	ADJUSTABLE FOOT M10-1.5 X 50
10	P0403010	FOOT MOUNTING BRACKET
11	P0403011	CAP SCREW M4-.7 X 12
12	P0403012	GUIDE RAIL 30 X 835MM
13	P0403013	HEX BOLT M5-.8 X 10
14	P0403014	LOCK WASHER 5MM
15	P0403015	FLAT WASHER 5MM
16	P0403016	T-SLOT NUT 20, M5-.8
17	P0403017	Y-AXIS NUT SEAT
18	P0403018	Y-AXIS SHIM BLOCK
19	P0403019	FLANGE BALL NUT
20	P0403020	CAP SCREW M4-.7 X 16
21	P0403021	SKIRT PANEL
22	P0403022	LINEAR BALL BEARING SCS30LUU
23	P0403023	HEX BOLT M8-1.25 X 25
24	P0403024	LOCK WASHER 8MM
25	P0403025	GANTRY SLIDE BRACKET
26	P0403026	LOCK NUT M6-1
27	P0403027	BUTTON HD CAP SCR M4-.7 X 8
28	P0403028	FRAME BRACE, OUTBOARD
29	P0403029	MOTOR COUPLER
30	P0403030	STEPPER MOTOR 57BHH76-500A-24B(S)
31	P0403031	LOCK WASHER 4MM
32	P0403032	TABLE 15-3/4" X 36"
33	P0403033	SUPPORT PLATE, REAR
34	P0403034	Y-AXIS BALL SCREW
35	P0403035	HEX BOLT M6-1 X 20
36	P0403036	LOCK WASHER 6MM
37	P0403037	BUTTON HD CAP SCR M4-.7 X 12
38	P0403038	CABLE CARRIER SKIRT PANEL
39	P0403039	THREADED INSERT M5-.8
40	P0403040	FRAME BRACE, INBOARD
41	P0403041	Y-AXIS CABLE CARRIER BRACKET
42	P0403042	Y-AXIS CABLE CARRIER 18 X 28MM
43	P0403043	TABLE END COVER
44	P0403044	BUTTON HD CAP SCR M5-.8 X 10
45	P0403045	PROXIMITY SWITCH LUOSHIDA 18C05NO
46	P0403046	PROXIMITY SWITCH BRACKET
47	P0403047	CAP SCREW M6-1 X 30

REF	PART #	DESCRIPTION
48	P0403048	FLAT WASHER 6MM
49	P0403049	CAP SCREW M4-.7 X 20
50	P0403050	FLAT WASHER 4MM
51	P0403051	GANTRY COLUMN, RIGHT
52	P0403052	GANTRY COVER PLATE
53	P0403053	FLAT HD SCR M4-.7 X 8
54	P0403054	X-AXIS CABLE CARRIER 18 X 28MM
55	P0403055	PHLP HD SCR M3-.5 X 8
56	P0403056	GANTRY COLUMN, LEFT
58	P0403058	BALL NUT FLANGE
59	P0403059	X-AXIS CABLE CARRIER BRACKET
60	P0403060	CAP SCREW M4-.7 X 10
61	P0403061	COVER PLATE, TOP
62	P0403062	FLAT HD SCR M2.5-.45 X 8
63	P0403063	LOCK COLLAR 18 X 23.8 X 20 W/SPRING
64	P0403064	BACKLASH SPRING NUT
65	P0403065	Z-AXIS NUT SEAT
66	P0403066	PROXIMITY ACTIVATION BRACKET
67	P0403067	Z-AXIS GUARD, LEFT
68	P0403068	Z-AXIS SADDLE
69	P0403069	FLAT HD SCR M4-.7 X 10
70	P0403070	Z-AXIS GUARD, FRONT
71	P0403071	SPINDLE CLAMP MOUNT
72	P0403072	CAP SCREW M5-.8 X 16
73	P0403073	SPINDLE MOTOR CLAMP 68MM
74	P0403074	CAP SCREW M8-1.25 X 70
75	P0403075	CAP SCREW M5-.8 X 25
76	P0403076	COVER PLATE, BOTTOM
77	P0403077	Z-AXIS MOUNTING PLATE
78	P0403078	LINEAR GUIDEWAY BOYI HGH15CA 250MM
79	P0403079	Z-AXIS GUARD, RIGHT
80	P0403080	GUIDEWAY CARRIAGE HGH15CA
81	P0403081	PROXIMITY SENSOR DELIXI CDJ10-I1A8BP
82	P0403082	X-AXIS BALL SCREW
83	P0403083	LINEAR GUIDEWAY BOYI HGH15CA 450MM
84	P0403084	X-AXIS SADDLE
85	P0403085	X-AXIS NUT SEAT
86	P0403086	CAP SCREW M5-.8 X 30
87	P0403087	FLAT WASHER 5MM
88	P0403088	GANTRY MOUNTING PLATE
89	P0403089	X-AXIS GUARD
90	P0403090	SHIPPING BRACKET
91	P0403091	CAP SCREW M6-1 X 25
92	P0403092	Z-AXIS BALL SCREW
93	P0403093	HEX NUT M10-1.5
94	P0403094	FLAT WASHER 8MM



Electrical & Accessories



REF PART # DESCRIPTION

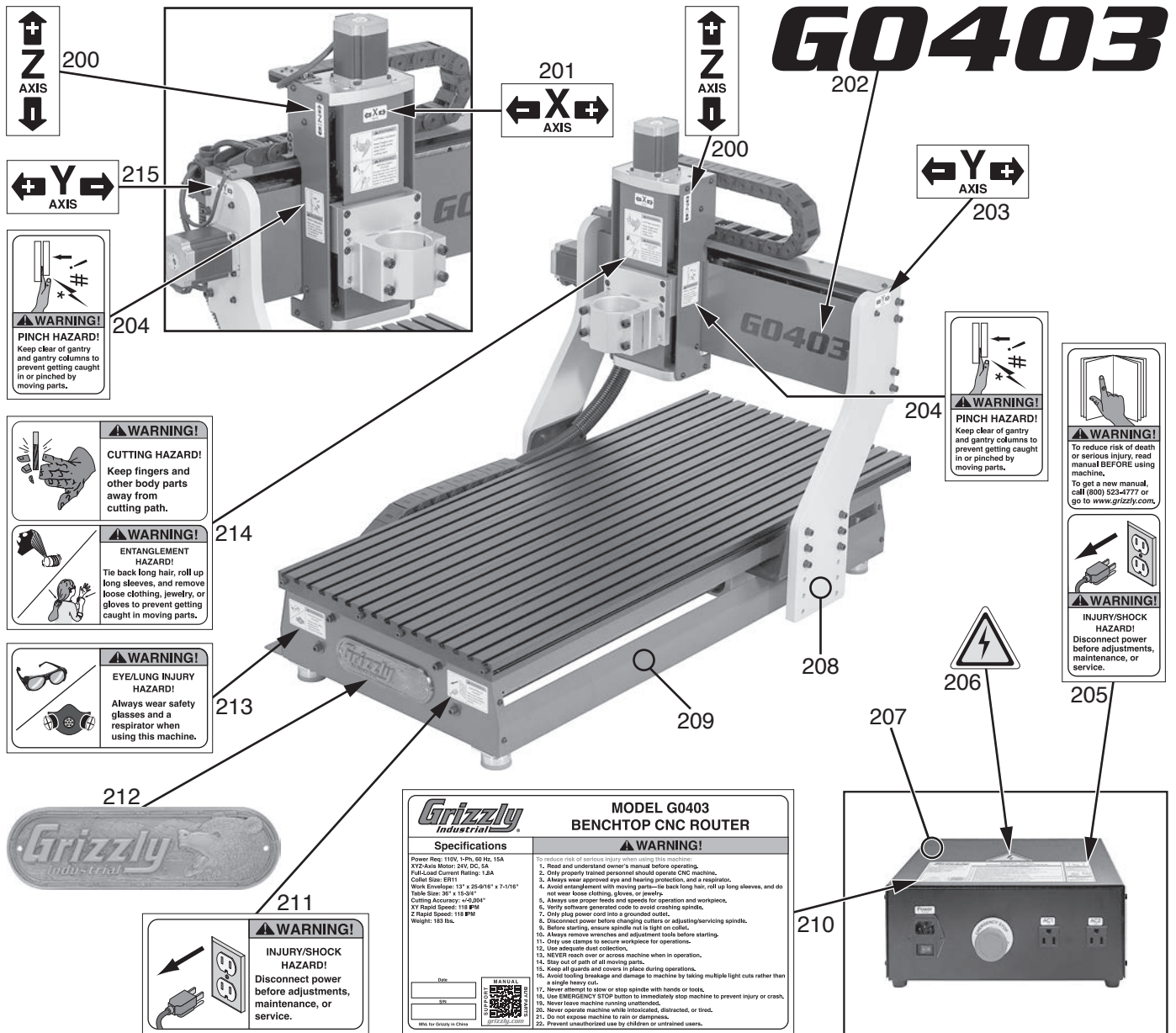
100	P0403100	DIN RAIL TH35-7.5 X 100MM
101	P0403101	GROUND TERMINAL BLOCK JEK2.5/35
102	P0403102	FUSE HOLDER CHINT RT28N-32 32A 380V
103	P0403103	LOCK WASHER 4MM
104	P0403104	CONTROLLER MOUNT
105	P0403105	MOTION CONTROLLER COM-CNC4 WIXHC
106	P0403106	PHLP HD SCR M3-.5 X 18
107	P0403107	CONTROL BOX COVER
108	P0403108	MOUNTING BRACKET
109	P0403109	POWER SUPPLY MEANWELL LRS-200-24
110	P0403110	STEPPER DRIVER JKMOTOR CWD556-A
111	P0403111	CABLE RECEPTACLE 4-PIN, MALE
112	P0403112	CABLE RECEPTACLE 6-PIN, MALE
113	P0403113	CABLE RECEPTACLE 3-PIN, MALE
114	P0403114	CABLE RECEPTACLE 7-PIN, MALE
115	P0403115	ELECTRICAL FAN COVER
116	P0403116	CABLE RECEPTACLE 7-PIN, MALE
117	P0403117	CABLE RECEPTACLE 7-PIN, MALE
118	P0403118	CABLE RECEPTACLE 7-PIN, MALE
119	P0403119	ELECTRICAL BACKING BOARD
120	P0403120	FOOT PAD 16 X 12 X 12, RUBBER
121	P0403121	ELECTRICAL COOLING FAN 50MM
122	P0403122	POWER CORD IEC C13 14G 3W 79" 5-15P

REF PART # DESCRIPTION

123	P0403123	DSP CONTROLLER WIXHC DSP-J2
124	P0403124	TOOL SETTER
125	P0403125	HEX BOLT M6-1 X 70
126	P0403126	FLAT HD SCR M6-1 X 60
127	P0403127	HOLD-DOWN BRACKET
128	P0403128	KNOB M6-1
129	P0403129	COLLET ER11 1/16"
130	P0403130	COLLET ER11 1/8"
131	P0403131	COLLET ER11 1/4"
132	P0403132	USB FLASH DRIVE 32GB
133	P0403133	FUSE 10A 250V 0.18" FAST-ACTING, GLASS
134	P0403134	WRENCH 14 X 17MM OPEN-ENDS
135	P0403135	WRENCH 13MM OPEN-END
136	P0403136	HEX WRENCH 5MM
137	P0403137	TOOL BOX (EMPTY)
138	P0403138	FUSE 10A 380V 0.25" FAST-ACTING, CERAMIC
193	P0403193	CONTROL BOX BASE
194	P0403194	EMERGENCY STOP RING LABEL 22MM
195	P0403195	POWER SWITCH IEC C14 CW2B-10A-T 125/250V
196	P0403196	EMERGENCY STOP BUTTON KEDU LAY7 22MM
197	P0403197	RECEPTACLE FEMALE IECI DB-F-M 15A 125V
198	P0403198	PHLP HD SCR M3-.5 X 8
199	P0403199	FLAT WASHER 4MM



Labels & Cosmetics



REF PART # DESCRIPTION

200	P0403200	Z-AXIS DIRECTION LABEL
201	P0403201	X-AXIS DIRECTION LABEL
202	P0403202	MODEL NUMBER LABEL
203	P0403203	Y-AXIS DIRECTION LABEL
204	P0403204	PINCH HAZARD WARNING LABEL
205	P0403205	COMBO WARNING LABEL
206	P0403206	ELECTRICITY WARNING LABEL
207	P0403207	TOUCH-UP PAINT - GLOSS BLACK

REF PART # DESCRIPTION

208	P0403208	TOUCH-UP PAINT - GRIZZLY BEIGE
209	P0403209	TOUCH-UP PAINT - GRIZZLY GREEN
210	P0403210	MACHINE ID LABEL
211	P0403211	DISCONNECT ELECTRICITY LABEL
212	P0403212	GRIZZLY OBLONG NAMEPLATE-SMALL
213	P0403213	GLASSES/RESPIRATOR WARNING LABEL
214	P0403214	COMBO HAZARD WARNING LABEL
215	P0403215	Y-AXIS INVERTED DIRECTION LABEL

! WARNING

Safety labels help reduce the risk of serious injury caused by machine hazards. If any label comes off or becomes unreadable, the owner of this machine **MUST** replace it in the original location before resuming operations. For replacements, contact (800) 523-4777 or www.grizzly.com.



WARRANTY & RETURNS

Grizzly Industrial, Inc. warrants every product it sells for a period of **1 year** to the original purchaser from the date of purchase. This warranty does not apply to defects due directly or indirectly to misuse, abuse, negligence, accidents, repairs or alterations or lack of maintenance. This is Grizzly's sole written warranty and any and all warranties that may be implied by law, including any merchantability or fitness, for any particular purpose, are hereby limited to the duration of this written warranty. We do not warrant or represent that the merchandise complies with the provisions of any law or acts unless the manufacturer so warrants. In no event shall Grizzly's liability under this warranty exceed the purchase price paid for the product and any legal actions brought against Grizzly shall be tried in the State of Washington, County of Whatcom.

We shall in no event be liable for death, injuries to persons or property or for incidental, contingent, special, or consequential damages arising from the use of our products.

The manufacturers reserve the right to change specifications at any time because they constantly strive to achieve better quality equipment. We make every effort to ensure that our products meet high quality and durability standards and we hope you never need to use this warranty.

In the event you need to use this warranty, contact us by mail or phone and give us all the details. We will then issue you a "Return Number," which must be clearly posted on the outside as well as the inside of the carton. We will not accept any item back without this number. Proof of purchase must accompany the merchandise.

Please feel free to write or call us if you have any questions about the machine or the manual.

Thank you again for your business and continued support. We hope to serve you again soon.

For further information about the warranty, visit <https://www.grizzly.com/forms/warranty> or scan the QR code below to be automatically directed to our warranty page.





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