DO THE JOB RIGHT.®
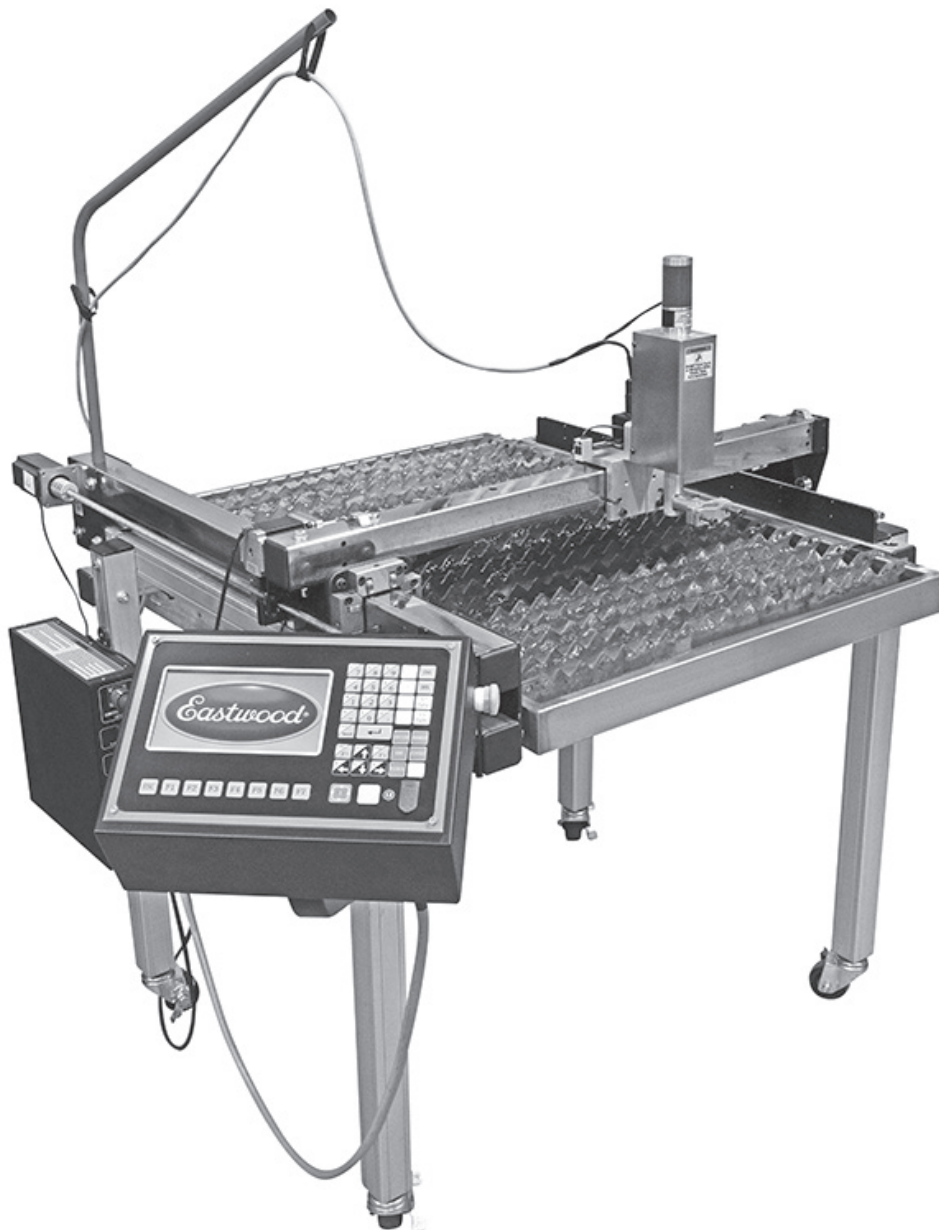
VERSA-CUT
2' X 2' CNC PLASMA TABLE
ASSEMBLY AND OPERATING INSTRUCTIONS

The **EASTWOOD VERSA-CUT 2' X 2' CNC PLASMA TABLE** packs features of a professional CNC Plasma Table in a footprint suited for your home garage. The 24" x 24" cut area is great for custom brackets, sign art, and making generic shapes rapidly. Its lead screw driven design allows ±0.2mm accuracy of movement from the X & Y-axis stepper motors and combines with Automatic Torch Height Control for clean, accurate cuts. The CNC Cut Controller operates fully independent of a PC and enables you to dimension and cut fifty pre-loaded shapes. Additionally, any CAD file post-processed in Autodesk® Fusion 360® can be loaded via USB Drive and modified as needed by the CNC Cut Controller. Limit Switches prevent machine limit collision, and the included Waterbed prevents heat soak, warping, and reduces spark & fume hazards. The CNC Cut Controller with Torch Height Control, Limit Switches, and Waterbed, features frequently unavailable, or only offered at an additional cost by competing units focused on home shop use, are all included with the Eastwood Versa-Cut 2' X 2' CNC Plasma Table.

The optional EASTWOOD VERSA-CUT 40 CNC PLASMA CUTTER (#66725) was specifically designed to connect directly to, and work flawlessly with this Plasma Table. Our Machine Torch (#66723) pairs perfectly for easy mounting to the Plasma Table and enables you to make clean cuts in up to 1/4" thickness material.

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SPECIFICATIONS

Plasma Table Power Requirements:	120±10% VAC, 50/60 Hz, 5A
Plate Capacity:	24" x 36" x 0.25" thick
Weight Capacity	
(Includes workpiece and full Waterbed):	200 lbs. [90kg]
Waterbed Fluid Capacity:	10.4 gal [39.4L]
CNC Torch Travel:	
X-Axis:	24.0" [610mm]
Y-Axis:	24.0" [610mm]
Z-Axis:	1.96" [50mm]
Waterbed Dimensions:	
X-Axis:	27.75" [705mm]
Y-Axis:	40.06" [1018mm]
Z-Axis:	2.17" [55mm]
Overall Assembled Dimensions (W x D x H):	52.5" [1333mm] x 55.0" [1397mm] x 60.5" [1536mm]
Overall Assembled Unit Weight:	158.7 lbs. [72kg]
Movement Accuracy:	±0.2mm
Cutting Accuracy:	±0.5mm

INCLUDES

COMPONENTS, HARDWARE/ACCESSORIES

(1) Cut Controller Box with Hardware installed **[A]**

(2) Control Box Mounting Brackets **[B]**

(1) Torch Height Motor Assembly with Mounting Bracket installed **[C]**

(1) Control Box with Hardware installed **[D]**

(1) Control Panel Mount Arm **[E]**

(1) X-Axis Support Roller Assembly **[F]**

(4) Water Tray Lock Brackets **[G]**

(1) Plasma Cutter Control Cable **[H]**

(1) Power Cable **[J]**

(1) Torch Height Motor and X-Axis Limit Switch Cable **[K]**

(1) Control Panel Cable **[L]**

(1) Cable Guide Arm **[M]**

(1) Replacement Lead Screw Bushing **[N]**

(2) Replacement Bearings **[O]**

(1) X-Axis Limit Switch Assembly **[P]**

(1) Gantry Mount Plate, Front, Outer **[R]**

(1) Gantry Mount Plate, Rear, Outer **[S]**

(2) Gantry Mount Plate, Inner **[T]**

(19) Water Tray Slats **[U]**

(1) Water Tray **[V]**

(1) Y-Axis Lead Screw Assembly **[W]**

(1) Table Frame Tube, Right with Hardware installed **[X]**

(1) Table Frame Tube, Left **[Y]**

(2) Table Frame Tubes, Center **[Z]**

(1) Y-Axis Gantry Tube **[AA]**

(1) X-Axis Support Bracket with Hardware installed **[BB]**

(1) X-Axis Support Guide Rod Assembly **[CC]**

(1) X-Axis Gantry Assembly **[DD]**

(1) Leg with Locking Caster with Control Box Mounting Hardware installed **[EE]**

(3) Legs with Locking Caster **[FF]**

(1) Y-Axis Stepper Motor Assembly **[GG]**

(8) M10 x 113 Bolt with Serrated Flange Nut, Two Sleeves **[HH]**

(4) M10 x 75 Bolt with Nut, Washer, Sleeve **[JJ]**

(8) M10 x 75 Bolt with Nut, Two Washers **[LL]**
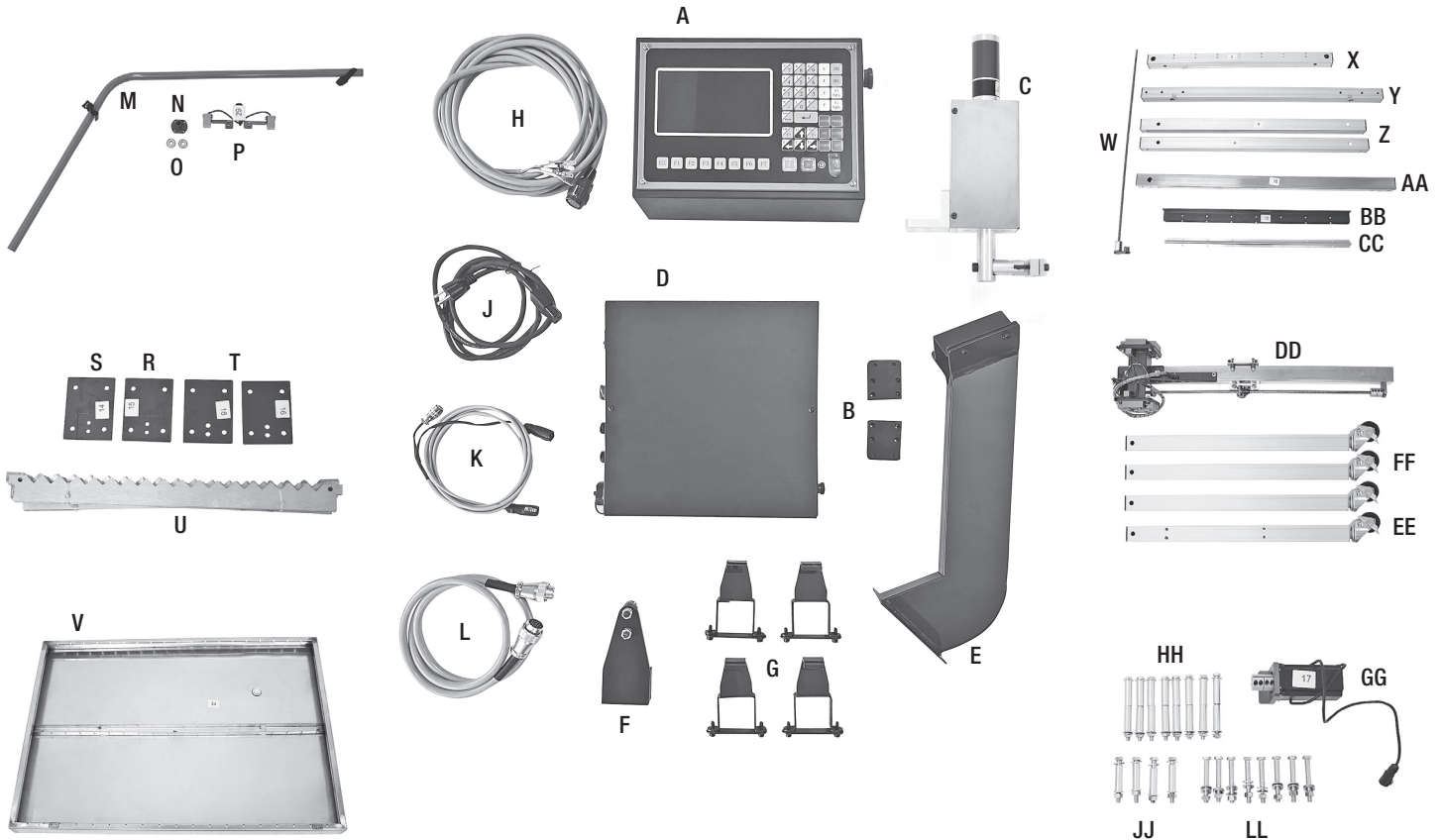
SAFETY INFORMATION

The following explanations are displayed in this manual, on the labeling, and on all other information provided with this product:

⚠ DANGER

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

⚠ NOTICE

NOTICE is used to address practices not related to personal injury.

⚠ READ INSTRUCTIONS

- Thoroughly read and understand these product instructions before using the Eastwood Versa-Cut 2' X 2' CNC Plasma Table.
- Keep these product instructions for future reference.

⚠ DANGER   SPARKS CAN CAUSE FIRE OR EXPLOSION!

- Plasma cutting produces sparks which can be discharged considerable distances at high velocity igniting flammable or explosive vapors and materials. Keep flammables a minimum of 6 feet [1.8m] away from the edge of the Eastwood Versa-Cut 2' X 2' CNC Plasma Table.
- **DO NOT** operate electric arc Plasma Cutter in areas where flammable or explosive vapors are present.
- Always keep a fire extinguisher nearby while plasma cutting.

⚠ WARNING   FIRE HAZARD!

- The heat and sparks of plasma cutting operations can easily start a fire. DO NOT allow the CNC Plasma Table to operate unsupervised.
- Always disconnect the CNC Plasma Table and Plasma Cutter from the electrical power supply before leaving them unattended for long periods of time.
- Pressurized air discharge can eject metal particles, dirt and debris at high velocity. Always wear ANSI approved eye protection when operating the Plasma Table.

⚠ WARNING   ELECTROMAGNETIC FIELDS CAN BE A HEALTH HAZARD!

- The electromagnetic field that is generated during plasma cutting may interfere with various electrical and electronic devices such as cardiac pacemakers. Anyone using such devices should consult with their physician prior to performing any plasma cutting operations.
- Exposure to the electromagnetic fields generated while plasma cutting may have other health effects which are not known.

⚠ WARNING   ARC RAYS CAN INJURE EYES AND CAUSE BURNS!

- Arc rays produce intense ultraviolet radiation which can burn exposed skin and cause eye damage. Use a shield with the proper filter (a minimum of #5) to protect your eyes from sparks and the rays of the arc when plasma cutting or when observing the plasma arc cutting (see ANSI Z49.1 and Z87.1 for safety standards).
- Use suitable clothing (long pants, long sleeves, closed toe shoes, gloves) made from durable flame-resistant material for skin protection.
- If other persons or pets are in the area of plasma cutting, use welding screens to protect bystanders from sparks and arc rays.

⚠ WARNING   INJURY HAZARD!

- Plasma cutting can generate excessive noise. Wear appropriate hearing protection while operating a plasma cutter.

⚠ CAUTION   INHALATION HAZARD!

- Fumes, vapors and gases released during plasma cutting are hazardous. Do not breathe fumes that are produced by the plasma cutting operation. Make sure work space ventilation is adequate.
- Use an OSHA approved respirator when plasma cutting.
- Use extreme caution when plasma cutting coated materials including but not limited to: cadmium plated, galvanized, lead based paints, powder coat.

⚠ CAUTION   ELECTRICAL SHOCK HAZARD!

- **DO NOT** touch workpiece or Waterbed while operating. Only the control panel may be accessed during operation.
- Improper use of a Plasma Cutter can cause electric shock, injury and death!
- Disconnect Plasma Cutter from power supply before assembly, disassembly or maintenance of the torch and when installing nozzles and electrodes.
- The electrode, workpiece and Waterbed (or ground) circuits are electrically "hot" when the Plasma Cutter is on. Do not allow these "hot" parts to come in contact with bare skin or wet clothing.
- Be sure that the workpiece is properly supported and grounded prior to beginning a plasma cutting operation.
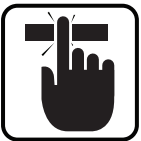
⚠ CAUTION   PINCH AND CRUSH HAZARD!

- The Eastwood Versa-Cut 2' X 2' CNC Plasma Table is a heavy assembly weighing 158.7 lbs. [72kg] and has several large, heavy components which can cause injuries if allowed to drop.
- Obtaining the assistance of a capable helper during assembly is strongly recommended.
- Avoid pinching hands while handling parts and during assembly. The use of thick, well-fitting work gloves is strongly recommended.
- The wearing of approved safety shoes is strongly recommended when uncrating, assembling, and operating the Plasma Table.

⚠ CAUTION   INJURY HAZARD!

- Wear protective work gloves when handling metal. It may be sharp and, when cut, will be extremely hot. Allow sufficient time for cooling before handling.
- Plasma cutting torch and ground leads, and the Plasma Table cables pose a tripping hazard. Secure cables with cable ties where possible, exercise caution when moving around the table, and always make sure you are sure-footed.
- Use on a flat, level, and sturdy surface only. The Plasma Table fully loaded can exceed 357 lbs. [162kg]. **DO NOT** use on sloped surfaces.

⚠ NOTICE

- **DO NOT** lift from the table gantry or gantry mounts. Doing so will result in damage to the table gantry.
- Dispose of Plasma Table fluid and waste only in accordance with your local laws and regulations.

CNC PLASMA CUTTING GLOSSARY OF TERMS

ARC Voltage	Arc Voltage is the voltage of the arc between the electrode and the workpiece being cut. This is used to control the height of the Torch. Higher Arc Voltage means greater height between the Torch and the workpiece. Lower Arc Voltage means a closer gap between the Torch and the workpiece.
CAM	Computer-Aided Machining. Software that takes a drawing file and turns it into a machine path that can be post processed into a G-code file for CNC machine usage is referred to as CAM software.
CCW	Acronym for Counterclockwise when referencing a rotational direction.
CNC	Acronym for Computer Numerical Control, this means that a machine is primarily controlled by a computer.
Cut Controller	Main Control Unit on the CNC Plasma Table. It controls all cutting actions and, on this table, features an integrated Torch Height Controller.
Cut Speed	Horizontal movement speed of the Torch head during cutting. It is important to change according to material thickness.
CW	Acronym for Clockwise when referencing a rotational direction.
Drag Chain	Moving cable sheath attached to the X-axis that guards and guides the Torch cables.
Dross	This is the plasma cutting slag left behind after a cut which builds up on the bottom of the cut. Dross is typically knocked off or ground away if necessary.
Electrode	Component of the Plasma Cutting Torch Head that emits the plasma arc. This wears the fastest when cutting thicker materials.
Gantry	X-axis and Y-axis travel assembly that allows the Torch head to move around the plate. Comprised of the extruded aluminum tracks with stepper motor driven rack and pinion system.
G-code	The Program Code Language that CNC machines understand. Typically, movement commands start with a "G", hence the name G-code. Miscellaneous commands, in the case of the CNC table, these typically relate to Torch control, start with "M".
IHS	Acronym for Initial Height Setting. This parameter is set by the Torch Height Controller and dictates the height of the Plasma Torch above the workpiece when the pierce is initiated.
Kerf	Kerf is the width of the cut left by the Plasma Torch. This is useful for an accurate cut, because if we know how much material the Plasma Torch removes, we can compensate for that in the cut path. This width varies depending on material, cutting amperage, nozzle diameter, consumable wear state, and Torch height.
Lead-In & Lead- Out	Lead-In and Lead-Out is the path that extends before and after the desired cut path, respectively. The plasma arc is unstable when starting and stopping which can leave a rough edge or inaccurate cut. The lead is used to smooth this by starting/ending the cut away from the cut path and smoothly transitioning it in/out while the arc is stable.
Main Cut Screen	The home screen displayed when the CNC table is started up. From here all actions in the Cut Controller are taken.
Nozzle	This component of the Plasma Torch funnels the plasma arc down to an effective size. It wears slightly slower than the electrode.
Pierce	Operation of the Plasma Torch starting a cut in the metal. It must first melt a hole through the sheet which is referred to as the Pierce.
Post Processor	The Post Processor takes a path created in a Computer-Aided Machining software and converts it into the G-code file that the machine understands.
Slats	The metal supports in the Waterbed that the workpiece rests on.
Stepper Motor	This is a type of motor commonly used on CNC machines. It has discrete phase positions, known as steps, that translate into accurate, fully controlled movement. The X-axis is controlled by one Stepper Motor and the Y-axis is controlled by two Stepper Motors on this table.
THC	Acronym for Torch Height Controller. On this Plasma Table it is integrated with the Cut Controller and is capable of automatically controlling Torch height. It will maintain good distance between the workpiece and the Torch.
Torch	The Plasma Cutting Torch Head is often described as "Torch" or "Plasma Torch" for simplification. This is the component that receives the power supplied by the Plasma Cutter and uses it to cut metal. It does this by creating an electric arc and releasing a high pressure air stream which is forced through the nozzle to create a focused jet of plasma. This extremely hot plasma jet conducts to the metal and melts it away upon contact.

ASSEMBLY

Carefully remove all components from the boxes. Verify all components are present and intact as described in the **INCLUDES** section above, then continue to the following assembly instructions.

- Begin assembly of the frame with the following components:
  - Table Frame Tube, Right **[X]**
  - Table Frame Tube, Left **[Y]**
  - Table Frame Tubes, Center **[Z]**
- Layout as shown in **(FIG 1)**. Then utilize the M10 x 75 Bolts with Nut, Washer, Sleeve **[JJ]** to hold it together. Insert the sleeve through the bottom of the frame and fasten the nut on the top, inside the Left and Right Tubes. Only finger tighten the hardware at this stage.
- The Legs have Casters pre-installed. If you do not wish to use them, now is a good time to remove them. The table may be used with or without the casters to suit the user's preference.

FIG. 1

Steel tabs on upper, outer edge

Smaller diameter holes meet (hidden from view)

Hardware on top side

Table Frame Tube, left

Table Frame Tube, right, with hardware installed

Larger diameter holes facing inward on left/right tubes

Table Frame Tube, center

Larger diameter holes facing outward on center tubes
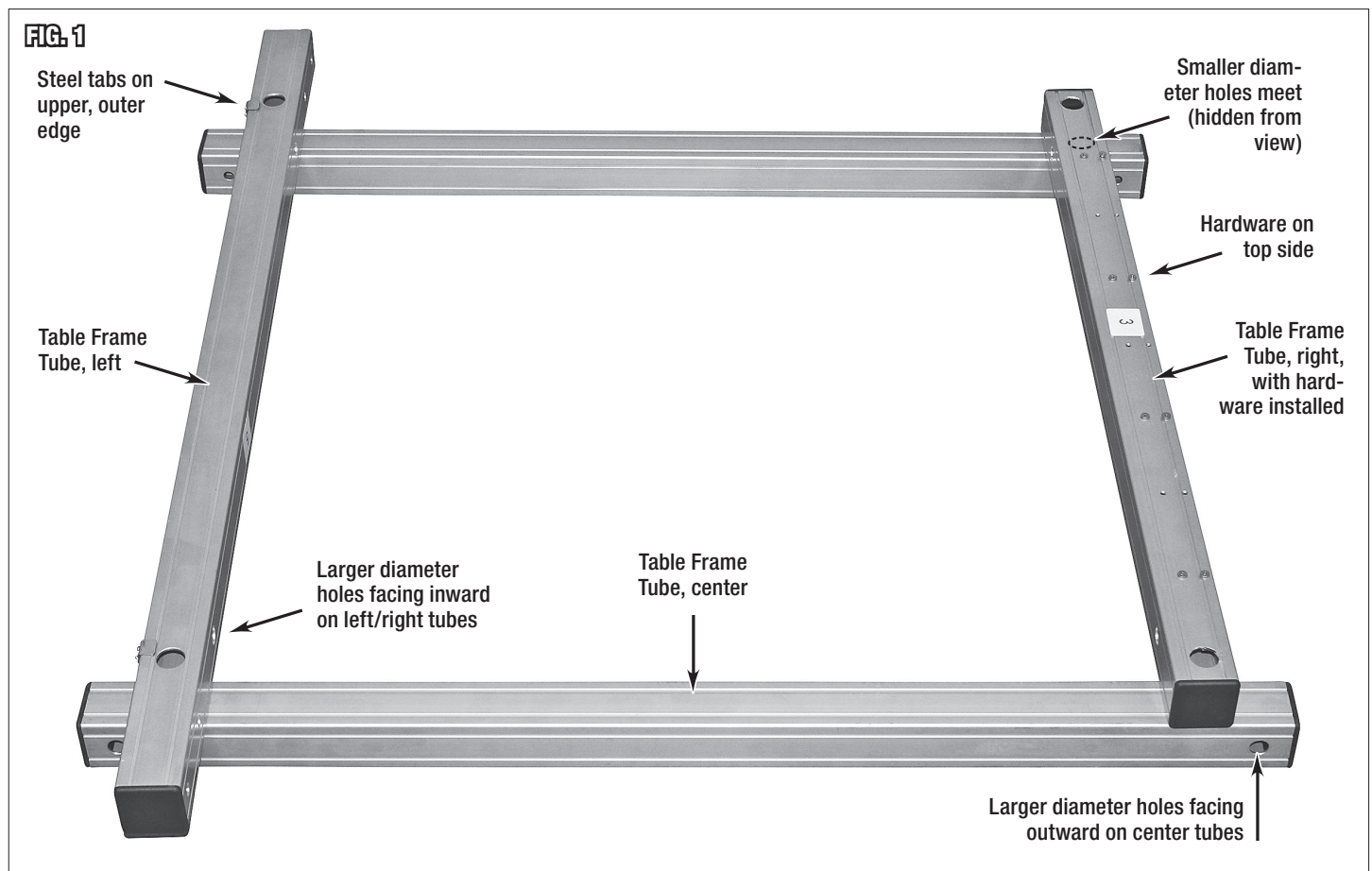
- Install the Leg with Locking Caster with Control Box Mounting Hardware installed **[EE]** to the rear left of the frame and the remaining Legs with Locking Caster **[FF]** as shown in **(FIG 2)**. Use the M10 x 113 Bolts with Serrated Flange Nut, Two Sleeves **[HH]** to fasten them.
- All frame hardware can now be fully tightened.

FIG. 2

Leg with Locking Caster with Control Box Mounting Hardware installed [EE]

Front
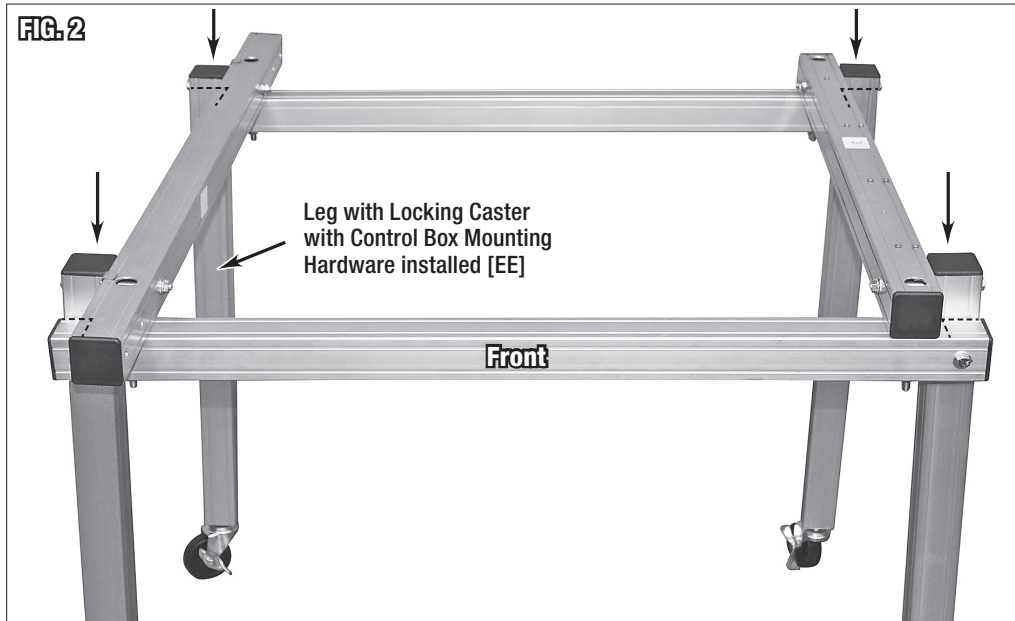
- Remove the pre-installed screws on the top of the Table Frame Tube, Right **[X]**. Place the X-Axis Support Bracket with Hardware installed **[BB]** on the Tube, in the orientation shown in **(FIG 3)**, with the countersunk holes aligned with the hole pattern in the base. Reinstall the screws.
- Remove the pre-installed screws on the Support Bracket and install the X-Axis Support Guide Rod Assembly **[CC] (FIG 3)**.

FIG. 3

Countersunk holes
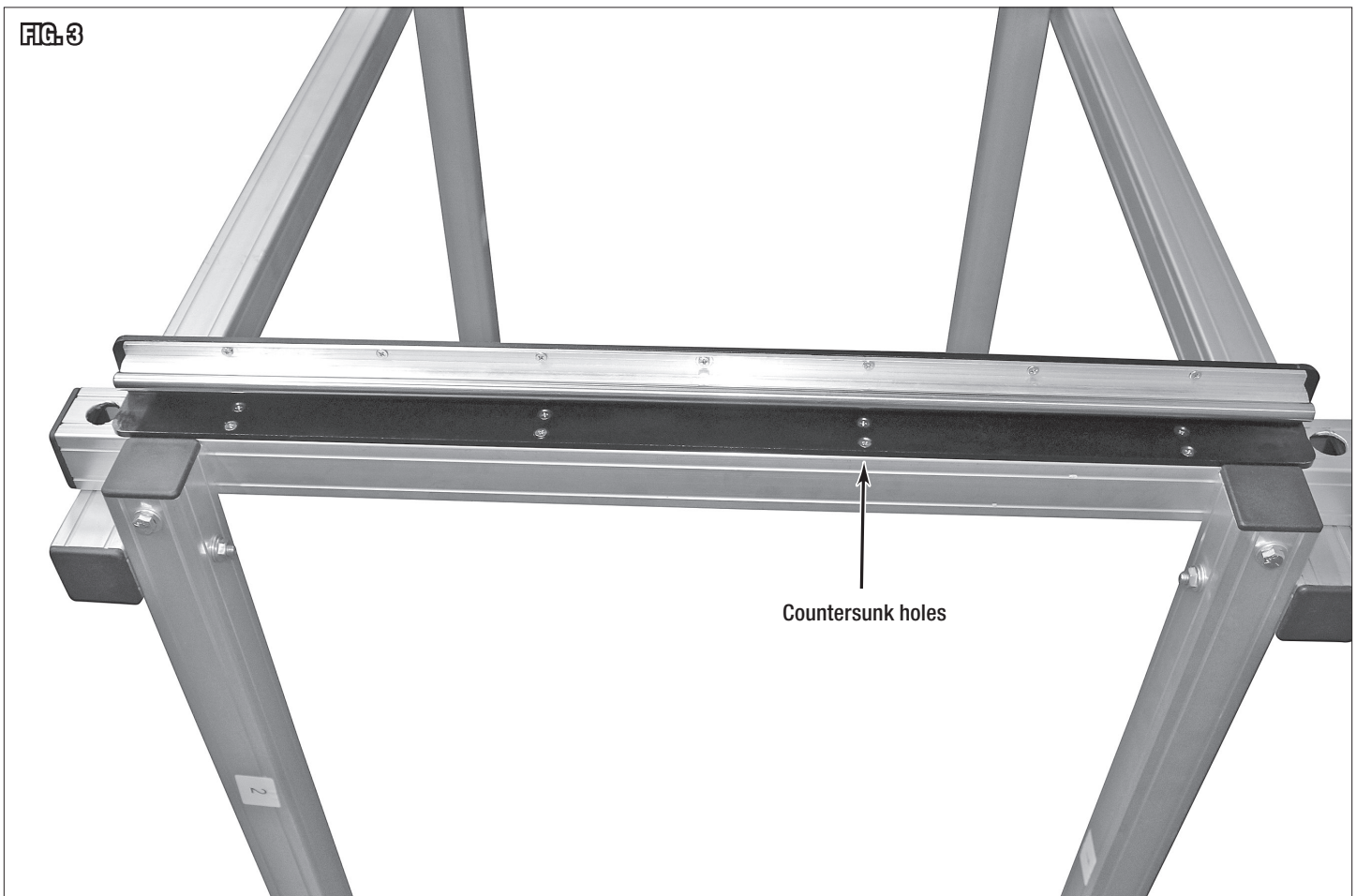
- Gather the following components:
  - Gantry Mount Plate, Front, Outer **[R]**
  - Gantry Mount Plate, Rear, Outer **[S]**
  - Gantry Mount Plate, Inner **[T]**
  - Y-Axis Gantry Tube **[AA]**
  - X-Axis Gantry Assembly **[DD]**
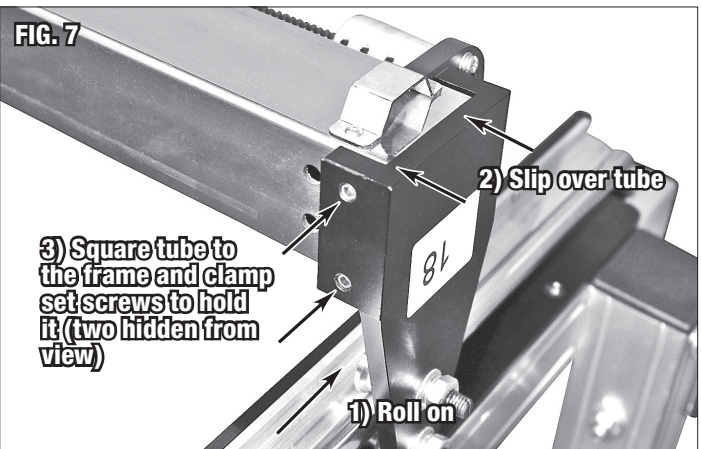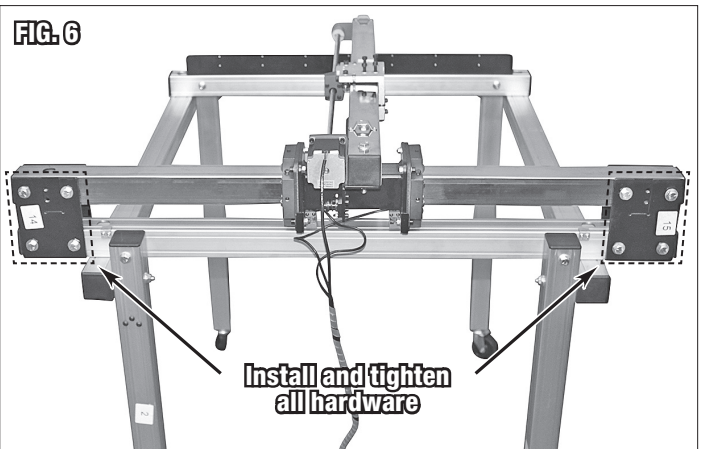 - M10 x 75 Bolt with Nut, Two Washers **[LL]**

> ⚠ **CAUTION**   **INJURY HAZARD!**
> The Eastwood Versa-Cut 2' X 2' CNC Plasma Table has numerous large, unwieldy components that could cause injury or be damaged if they are dropped. Obtaining the assistance of a capable helper during assembly is recommended.

- Install the Gantry Mount Plate, Rear, Outer **[S]** and Gantry Mount Plate, Inner **[T]** to the rear left of the frame with two M10 x 75 Bolt with Nut, Two Washers **[LL]** as shown in **(FIG 4)**.

- Slide the Y-Axis Gantry Tube **[AA]** between the plates and secure it using the same hardware type. Make sure the Ø0.8" through hole is at the rear of the machine.

- With the assistance of capable helper, carefully roll the X-Axis Gantry Assembly **[DD]** onto the tube **(FIG 5)**.

- Install the Gantry Mount Plate, Front, Outer **[R]** and Gantry Mount Plate, Inner **[T]** to the front of the frame with the remaining hardware **(FIG 6)**.

- Roll the X-Axis Support Bracket with Hardware installed **[BB]** onto the X-Axis Support Roller Assembly **[F]**. Hold the X-Axis Gantry Tube square with the frame and clamp the Support Bracket to the end of it with the pre-installed set screws. This prevents the X-Axis tube from drooping **(FIG 7)**.

- Remaining hardware set aside for the Gantry Mount Plates can be installed and all hardware fully tightened.

FIG. 4
Ø0.8" through hole
Machined mounting slot located offset towards front

FIG. 5
1) Roll on
2) Install plates

FIG. 6
Install and tighten all hardware

FIG. 7
2) Slip over tube
3) Square tube to the frame and clamp set screws to hold it (two hidden from view)
1) Roll on
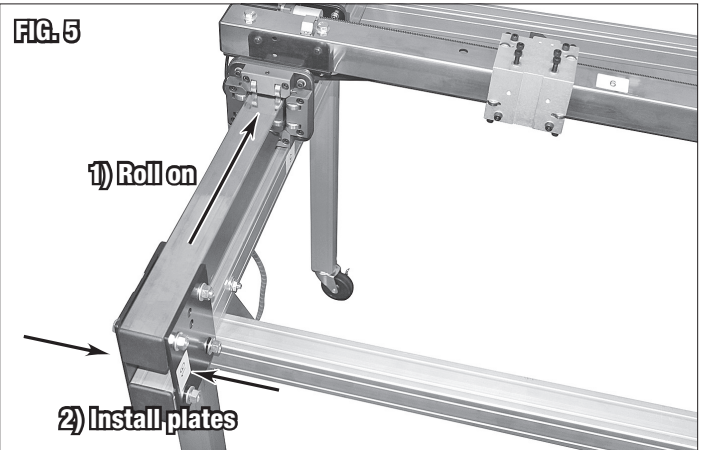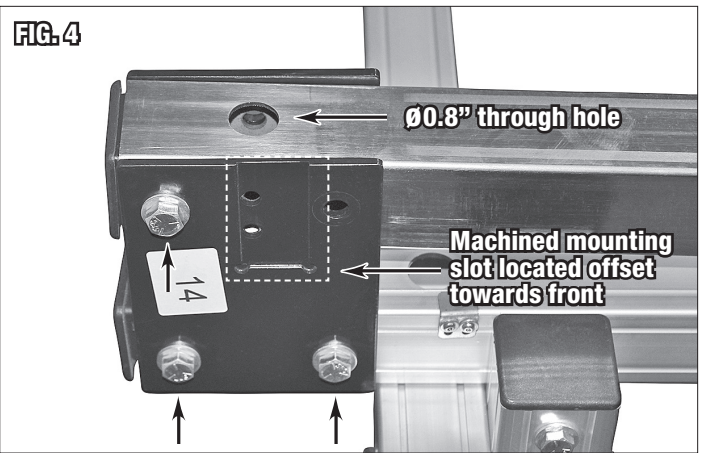
- Thread the Y-Axis Lead Screw Assembly **[W]** through the black bushing on the X-Axis Gantry Assembly and fasten the bearing support to the Gantry Mount Plate, Front, Outer **[R] (FIG 8)** by using the preinstalled hardware, but first remove the end cap on the tube.

- The easiest way to start these screws is with a long hex key, by inserting it through from the inside of the tube and using your other hand to place the screw on the end of the hex key **(FIG 10)**. Once on the hex key you can hold the bearing support in place and carefully pivot the screw into position to thread it in.

- Repeat the process at the opposite end of the Lead Screw with the Y-Axis Stepper Motor Assembly **[GG]**. Make sure the coupler screws are loose so that Lead Screw can slip into the coupler freely, then tighten them once the motor bracket has been fastened **(FIG 9)**.

FIG. 8

Thread though nut

Install screws from inside Tube

FIG. 9

Install screws from inside Tube

Loosen

FIG. 10

Inset hex key through access hole and place screw on end

Install screw
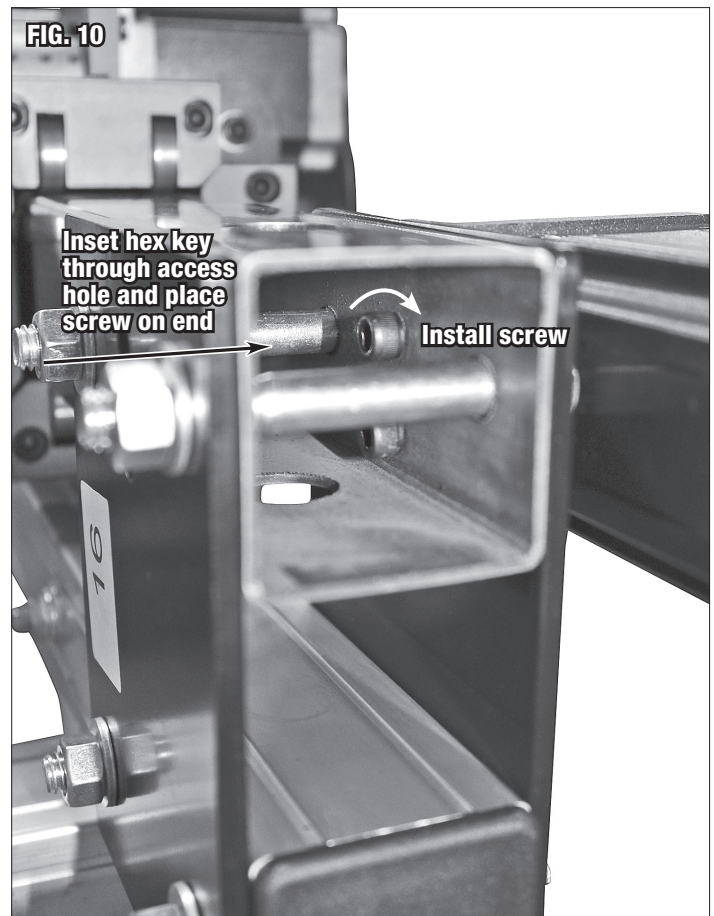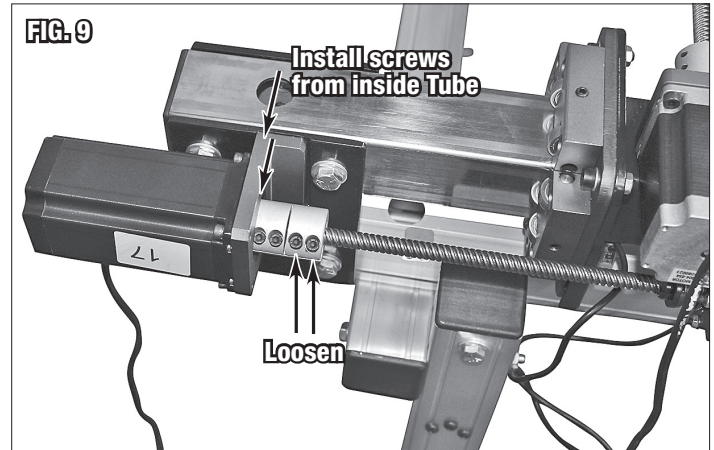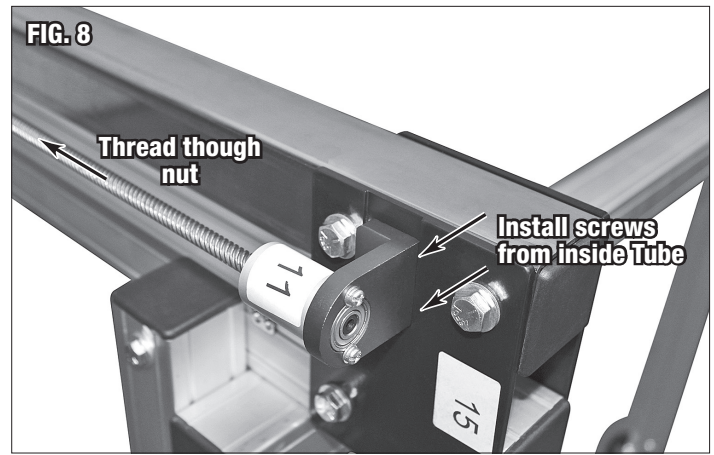
- Install the Torch Height Motor Assembly with Mounting Bracket installed **[C] (FIG 11)** to the X-Axis roller platform along with the X-Axis Limit Switch Assembly **[P]** on top using the pre-installed hardware **(FIG 12)**.

- Clamp the Control Panel Mount Arm **[E]** to the front left Leg using the preinstalled hardware **(FIG 13)**. Then install the Cut Controller Box with Hardware installed **[A]** to the Mount Arm **(FIG 14)**.

FIG. 11

Shorter gap to Torch Height Motor Assembly

FIG. 12

FIG. 13

FIG. 14

Fourth screw hidden from view
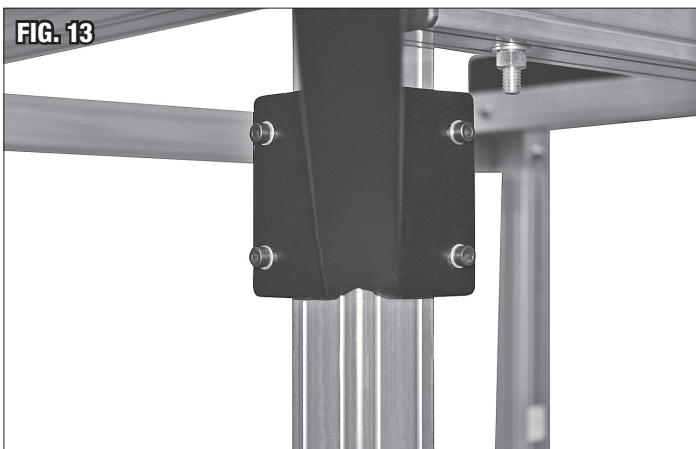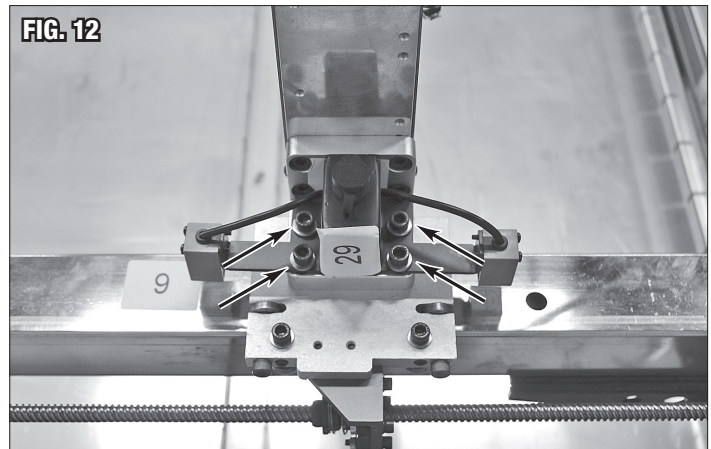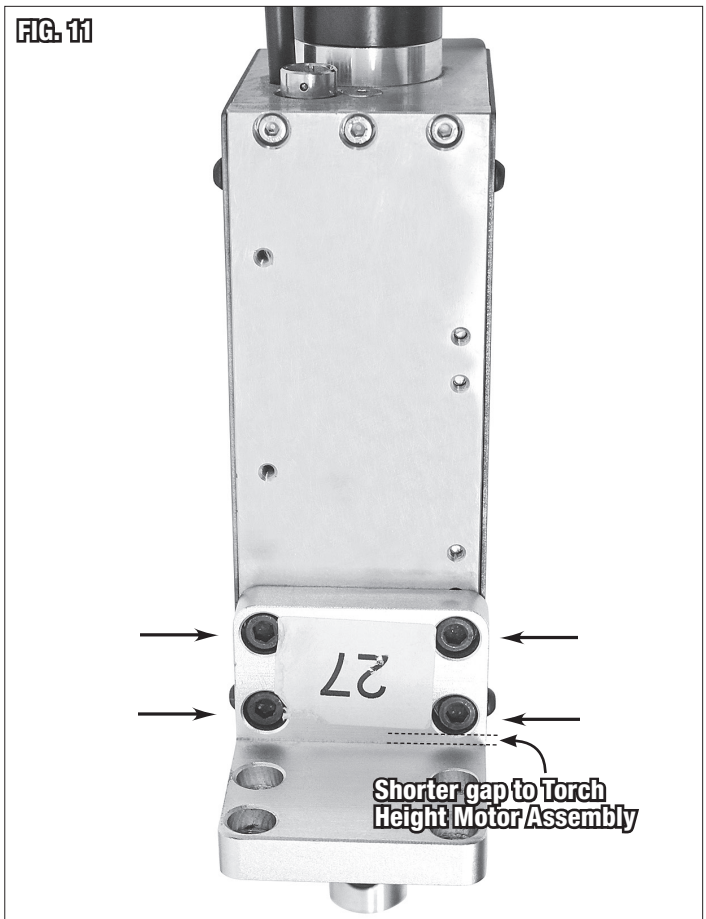
- Fasten the Control Box Mounting Brackets **[B]** to the Control Box with Hardware installed **[D]** using the preinstalled hardware **(FIG 15)**. The assembly can then be fastened to the rear left Leg using the hardware preinstalled on it **(FIG 16)**.

- Insert the Cable Guide Arm **[M]** into the through hole at the rear of the Y-Axis Gantry Tube **(FIG 17)**.

- Slide the Water Tray **[V]** into place. It rests on the center Table Frame Tubes, between the side Tubes. Use the Water Tray Lock Brackets **[G]** to secure it. These Brackets clamp to the Frame Tubes **(FIG 18)** and hook over top of the Water Tray in the locations marked by laser etching **(FIG 19)**.

FIG. 15

Install

FIG. 16

Two additional screws at bottom side not shown

FIG. 17

FIG. 18

FIG. 19

Laser etched mark
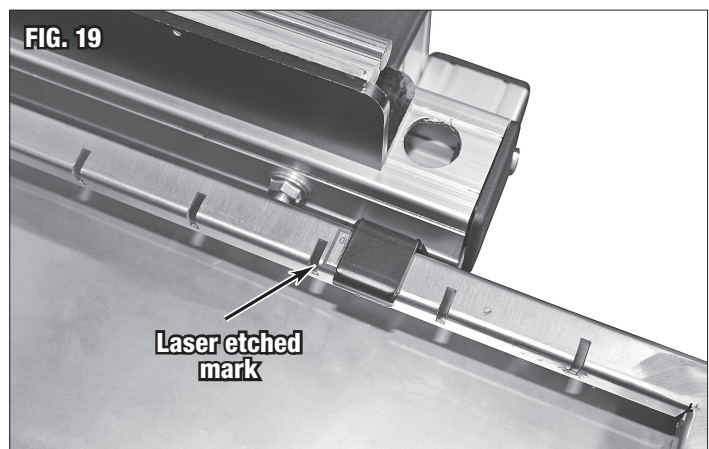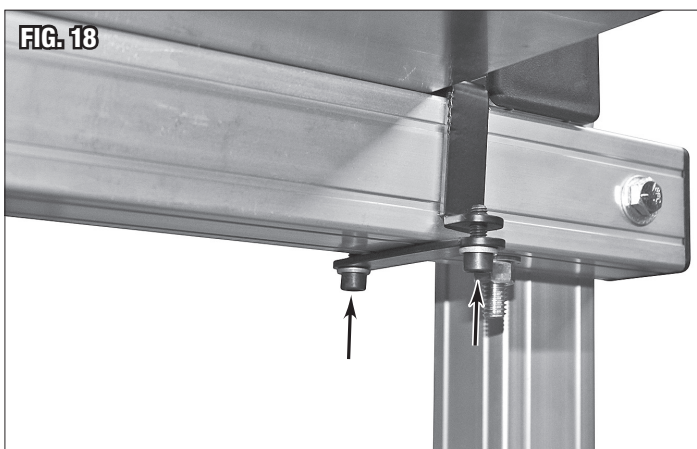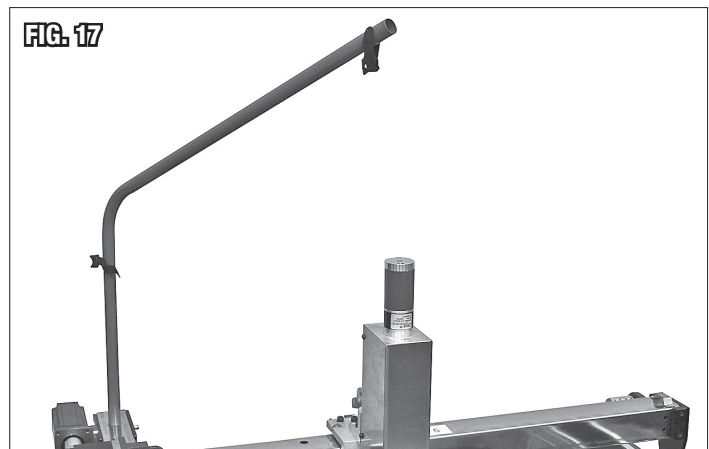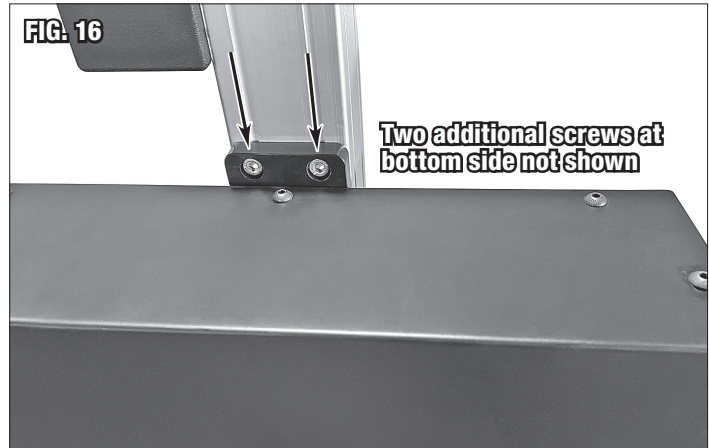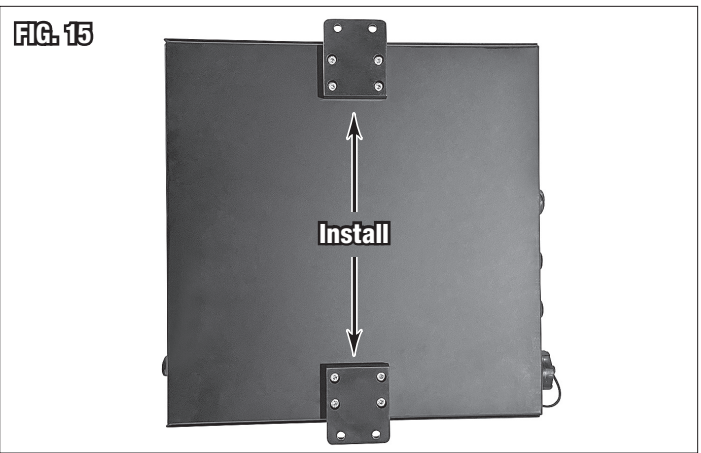
- You may now install all Water Tray Slats **[U]**. These install with a slight curve to better support the workpiece. The easiest method to install them is tab one side in, tilt it down and slot the centers in, then bend and push the opposite side in place. It may be necessary to use a mallet to tap them into their final positions.

- The final step is to route and install all cable connections. The following items are required:
  - Power Cable **[J]**
  - Torch Height Motor and X-Axis Limit Switch Cable **[K]**
  - Control Panel Cable **[L]**

- Install all connections as shown in **(FIG 20)**. Assembly is now complete.

FIG. 20

Control Panel Cable connector

CONTROL SIGNAL INPUT

X-Axis Stepper Motor and Y-Axis Limit Switch connector

Y-AXIS MOTOR

Y-Axis Stepper Motor connector

X-AXIS MOTOR

Plasma Cutter Control Cable connector

Plasma Cutter

Power Cable connector

INPUT:120/220V 10A 50/60HZ

WARNING:For 220V input remove cover and toggle switch on side of power supply

Z-AXIS MOTOR

Torch Height Motor and X-Axis Limit Switch connector

Control Panel Cable connector

Torch Height Motor connector

X-Axis Limit Switch connector

CNC PLASMA TABLE SET-UP

FIG. 21

CONTROL SIGNAL INPUT

Y-AXIS MOTOR

X-AXIS MOTOR

Plasma Cutter Control Cable connector → Plasma Cutter

INPUT: 120/220V
10A 50/60HZ

WARNING:For 220V input
remove cover and toggle switch
on side of power supply

LOCATION

- The Eastwood Versa-Cut 2' X 2' CNC Plasma Table must be located in an indoor area, on a firm, clean, level surface. Having a solid, level concrete floor is ideal. If the table is fully loaded with water and a 2' x 3' x 0.25" steel plate, total machine weight could exceed 357 lbs. [162kg].

- The table should be placed in an area away from flammables, with ample ventilation. A minimum of 6 feet [1.8m] of free space must be maintained around all sides and above the CNC Plasma Table. This is to allow for adequate ventilation and to allow room for a person to access all sides for maintenance purposes. Do not store anything in the immediate vicinity of the table.

> **⚠ WARNING** **FIRE OR EXPLOSION HAZARD!**
> **Keep flammables a minimum of 6 feet [1.8m] from the edge of the Eastwood Versa-Cut 2' X 2' CNC Plasma Table.**

> **⚠ CAUTION**
> **The CNC Plasma Table generates heat, sparks, dust and gas during operation.**

- The temperature environment for proper operation must be between 32°F and 110°F [0°C and 43°C]. The table may not function properly in extreme ambient temperature conditions.

- Plan the location to minimize the transfer time and effort required to load sheet metal.

- The table requires 120±10% VAC, 50/60 Hz, 1 Ph power from a grounded NEMA 5-15R outlet capable of supplying 5A.

CONNECTING THE EASTWOOD VERSA-CUT 40 CNC PLASMA CUTTER

The Eastwood Versa-Cut 2' X 2' CNC Plasma Table is configured to work directly with the Eastwood Versa-Cut 40 CNC Plasma Cutter (#66725, not included). Follow the instruction manual included with the plasma cutter. Once finished, connect the Plasma Table to the Plasma Cutter:

- Insert the Plasma Cutter to CNC Table Cable 10' [3m] 7-Pin connector to the Control Box and lock it **(FIG 21)**.

- The Plasma Table will now be able to trigger the plasma cutter and receive the arc voltage for automatic torch height control.

CONNECTING OTHER MANUFACTURERS' PLASMA CUTTERS

The Eastwood Versa-Cut 2' X 2' CNC Plasma Table may be used with other manufacturers' plasma cutters if they feature blowback (low frequency) start. The following section describes the inputs required by the Plasma Table for control of the plasma cutter. Consult your plasma cutter manufacturer or a licensed electrician on how to connect your plasma cutter to the Plasma Table.

FIG. 22

> ⚠ **CAUTION**   ELECTRIC SHOCK CAN CAUSE INJURY!
> Improper wiring practices can lead to electrical shock or start fires. Wiring should only be performed by a licensed electrician.

> ⚠ **NOTICE**
> • High frequency start machines may damage and degrade the function of the Eastwood Versa-Cut 2' X 2' CNC Plasma Table. Only use plasma cutters which have blowback (low frequency) start.
>
> • Plasma cutter use with a CNC Plasma Table will subject the plasma cutter to extended periods of run time not seen while hand cutting. The increased run time may result in machine overload and reduce the plasma cutter's lifespan if not intended for use with a CNC Plasma Table.
>
> • Utilizing your plasma cutter with the CNC Plasma Table may violate your plasma cutter's warranty terms. If you are concerned about invalidating your warranty, reach out to your plasma cutter's manufacturer for guidance. Eastwood is not responsible for warranty violations or damage incurred to your plasma cutter.

FIG. 23

1:50 input
1:1 input

1:50 mode

1:1 mode

- The included Plasma Cutter Control Cable **[H]** provides the means for connecting a plasma cutter. The two wires labelled **START** must be connected to the trigger connection of the plasma cutter. These wires have no polarity. It is a normally open circuit that closes when the computer wants the plasma cutter to arc.

- For the Torch Height Controller to function, the two wires labelled **ARC+** and **ARC-** need to receive the arc voltage (voltage between the ground and the torch).

- The Torch Height Controller is factory configured to function with a 1:50 divided arc voltage ratio. If necessary, you can reconfigure it to function with a 1:1 undivided arc voltage. Reconfiguring for undivided arc voltage is detailed below:

  - First verify that the CNC Plasma Table is disconnected from power and switched off.

  - Remove the Control Box cover panel by unfastening the screws at the top and bottom of the panel **(FIG 22)**.

  - Switch the motherboard to 1:1 mode **(FIG 23)** with needle nose pliers.

  - Unplug the 1:50 connector, remove the wires from the connector, and insert them into the 1:1 connection port. The 1:1 port is opened by pressing the bottom tabs upward and they clamp on the wires when released **(FIG 23)**. Note that pink is the positive (+) wire and yellow is the negative (-) wire. Correct polarity is important here.

  - Reinstall the Control Box cover panel.

  NOTE: In 1:1 mode the arc voltage input should not travel across a significant resistive load, or the torch height control may not be able to function correctly.

- The wires labelled **0V** and **MOVE** are not required.

- Once wiring has been completed, insert the Plasma Cutter Control Cable **[H]** connector to the Control Box and lock it **(FIG 21)**. The Plasma Table will now be able to control the plasma cutter.
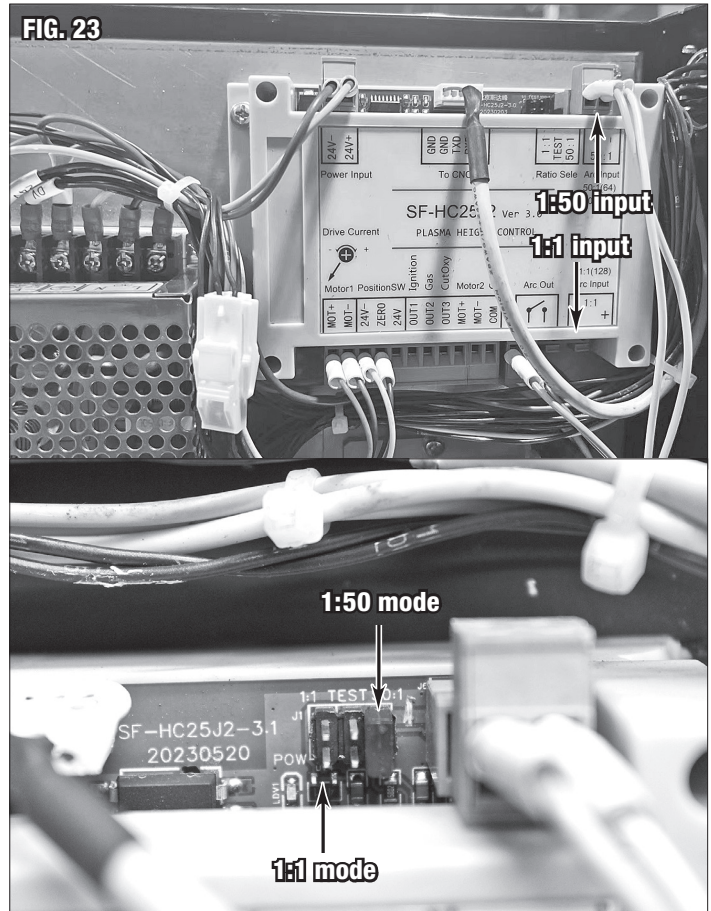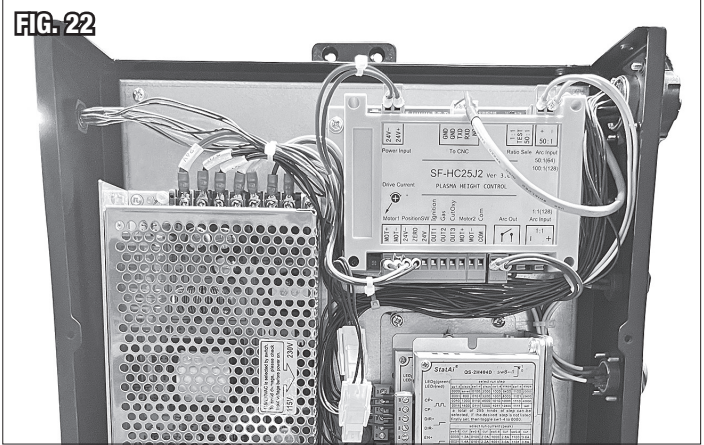
MOUNTING THE PLASMA TORCH

The use of a plasma cutting torch specifically for CNC plasma cutting, commonly referred to as a machine torch, is highly recommended. Our Machine Torch (#66723, not included) is directly compatible with the Eastwood Versa-Cut 40 CNC Plasma Cutter and this Plasma Table.

However, hand torches may also be mounted. Hand torches are not designed for CNC cutting and often have smaller, less durable consumables. They can also be awkward to mount in the torch clamp. Depending on the specific Hand Plasma Torch in question, you may lose several inches of X-Axis (left to right) travel.

The minimum recommended torch cable length is 10' (3m). Shorter cable lengths may require awkward plasma cutter positioning and restrict travel.

- To mount the Plasma Torch, loosen or remove the screws on the torch clamp.
- Connect 120 VAC power to the table. Use the Control Box switch to power the table. Once the Eastwood logo is loaded on the screen press any key to continue.
- Controls are covered in detail later, but if needed, use the arrow keys to jog the torch over a slat or workpiece. Adjust the torch height motor all the way up by holding the S key.
- Install the Plasma Torch such that it has at minimum 3/4" (20mm) clearance over the workpiece **(FIG 24)**. If you find more clearance is required, you may adjust it at any time.
  NOTE: Some hand torches may have an area to clamp on near the nozzle, but on others it may be ideal to clamp on the hand grip area. In that orientation you will lose some left to right travel distance due to the offset of the nozzle from the torch holder centerline.
- Install the mount clamp and fasten the screws in an even fashion until the torch is secured sufficiently so it will not slip in operation.
- Verify the torch has enough downward travel to contact the workpiece by pressing the **S↑** key. It must bottom out on the workpiece to trigger the initial torch height switch for zeroing.

FIG. 24
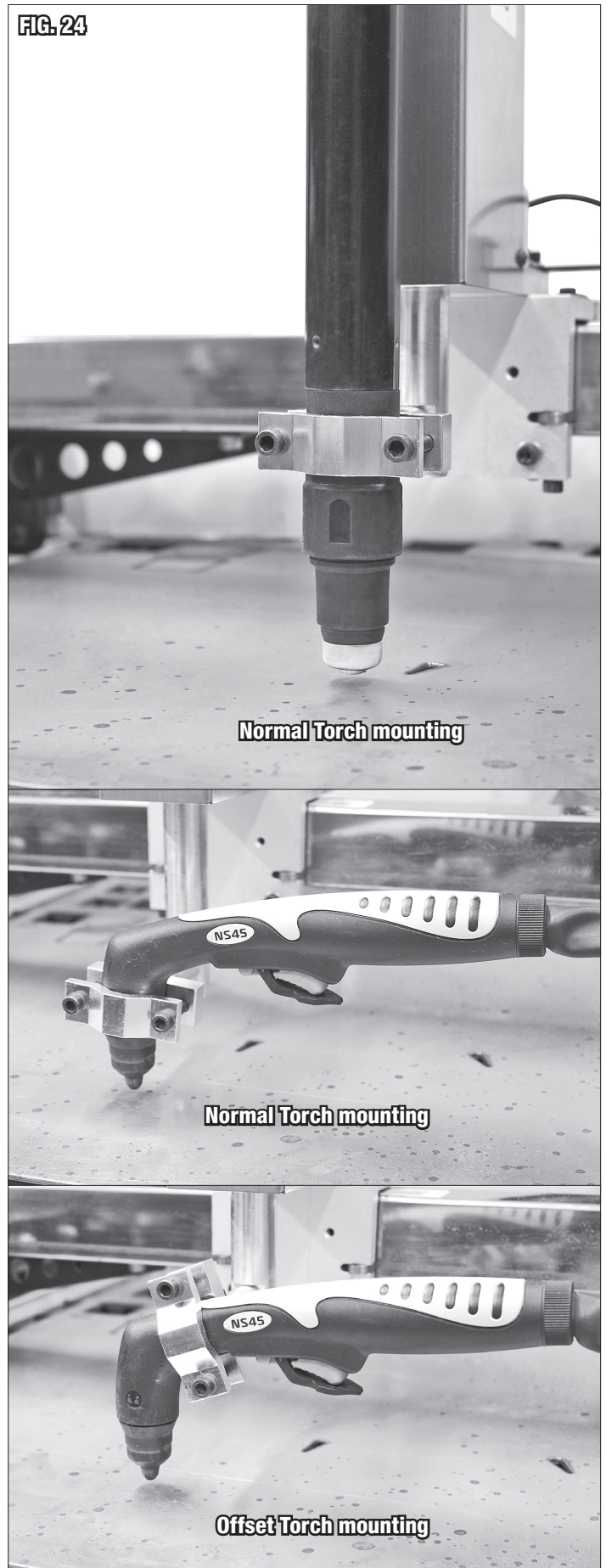
Normal Torch mounting

Normal Torch mounting

Offset Torch mounting

- For best results, with a flat piece of material on the table, verify the torch nozzle is as close to perpendicular (90°) to the workpiece as possible **(FIG 25)**. This will give more consistent, straighter cuts.

FIG. 25

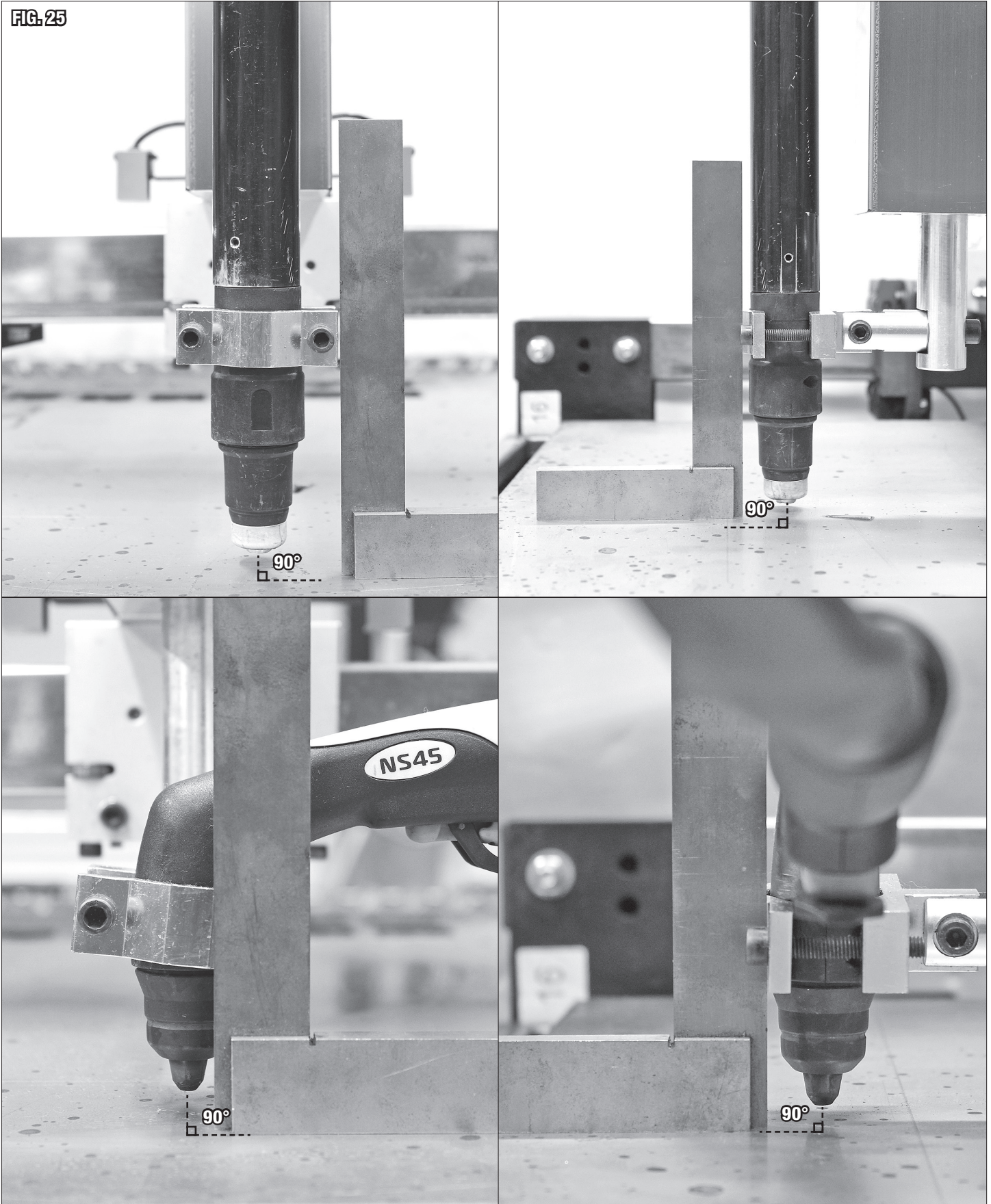Eastwood Technical Assistance: 800.343.9353 >> tech@eastwood.com

- Adjust the angle using the two adjustment bolts, if necessary **(FIG 26)**. You may need to lower the torch to access the rear adjustment screw.
- Route the torch cable along the Cable Guide Arm. Use the straps to hold the cable in place. Allow enough slack that the torch can travel to the furthest extents of the table uninhibited.
- The Plasma Torch is mounted successfully.

WATERBED

The Waterbed is used to reduce workpiece warpage, heat soak, sparks, slag spatter, and dust. Before filling with fluid, verify the table is level and if necessary, shim under the legs or casters to correct.

> ⚠ **CAUTION**   INHALATION HAZARD!
> **DO NOT utilize additives which present inhalation and/or fire hazards when vaporized by the plasma arc. Examples: Anti-freeze, sodium nitrite-based additives.**

> ⚠ **NOTICE**
> **Plasma cutting without coolant can warp the Waterbed and will result in the cut area being extremely hot. Whenever possible cut with coolant to prevent Waterbed damage and reduce burn risk.**

The Waterbed can be filled with tap water; however, it can contain many minerals and impurities which may affect performance. Eastwood strongly recommends adding the Eastwood Plasma Cutting Fluid, #33863 1 Gal. or #33864 5 Gal., to the water in a 5:1 solution to eliminate corrosion and fungal build up. This additive also eliminates risk of explosion when cutting aluminum sheet by preventing the creation of hydrogen. Many other plasma fluid additives are hazardous, toxic, or carcinogenic.

FIG. 26

Front Adjustment Screw   Rear Adjustment Screw

Extensive in-house, R&D research was done to make sure the Eastwood Plasma Cutting Fluid is completely safe for usage and fully effective. For the Waterbed on the Eastwood Versa-Cut 2' X 2' CNC Plasma Table, add 1.7 gallons [6.43 liters] and then fill the rest of the table with water to get the right solution. As the fluid evaporates out over time, it can be topped off with water. The solution concentration will remain effective until approximately 5 gallons [18.92 liters] of water have been added to replace evaporated water. At this point the solution should be replaced. Alternatively, as water evaporates, mixed solution can be added to keep the solution effective. When filling the Waterbed keep in mind that it is most effective when the water level is high.

OPERATION OF THE CNC CUT CONTROLLER

The following sections will sequentially detail each menu and option in the CNC Cut Controller with integrated Torch Height Controller (THC). The THC is capable of automatically adjusting the height of the torch in real time to adapt to height variations in the material. The controller does this by monitoring the arc voltage, which is the voltage of the plasma arc.

Higher arc voltage means the plasma arc is longer, lower arc voltage means it is shorter. With the Eastwood Versa-Cut 40 CNC Plasma Cutter, optimal arc voltage lies between 75-90V typically. If arc voltage is too low the consumables will wear quicker because of slag blowback. If it is too high the cut will have an excessive bevel, or the arc will not be sustainable.

To get an abbreviated version and start cutting go to QUICK GUIDES near the end of this manual for the quick start guides.
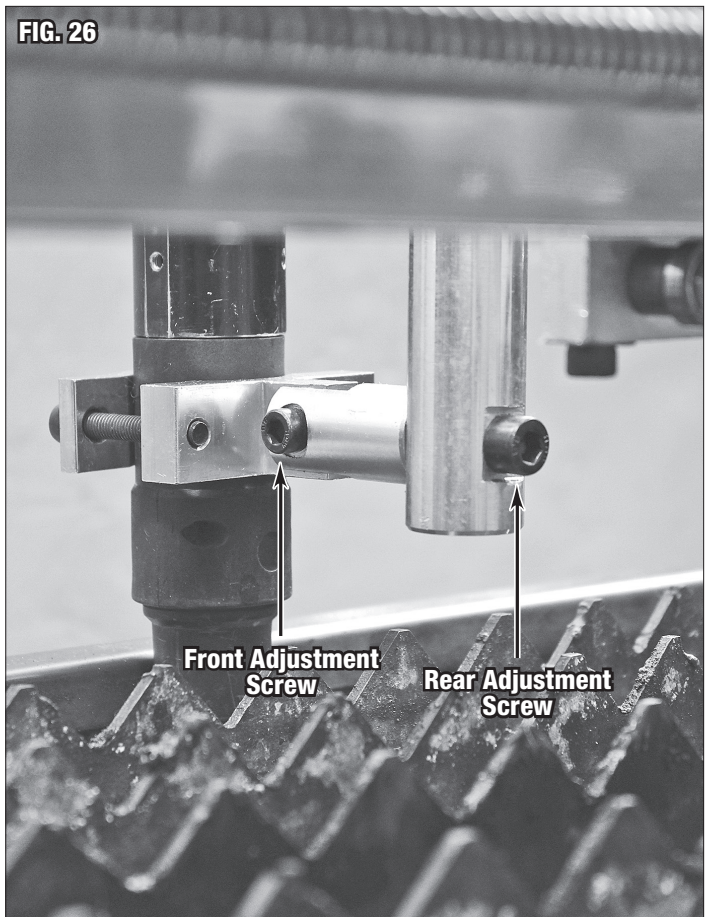
PHYSICAL CONTROLS

The CNC Cut Controller has a color 7" LCD display and 45 keys. The Power Switch and Emergency Stop **(FIG 27)** control power to the Cut Controller. Pressing the Emergency Stop button will immediately cut power, halting cutting and movement operations, until it is rotated clockwise to restore power. The main control clusters for the CNC Cut Controller are highlighted in **(FIG 28)**.

A   LCD screen used to monitor and navigate.
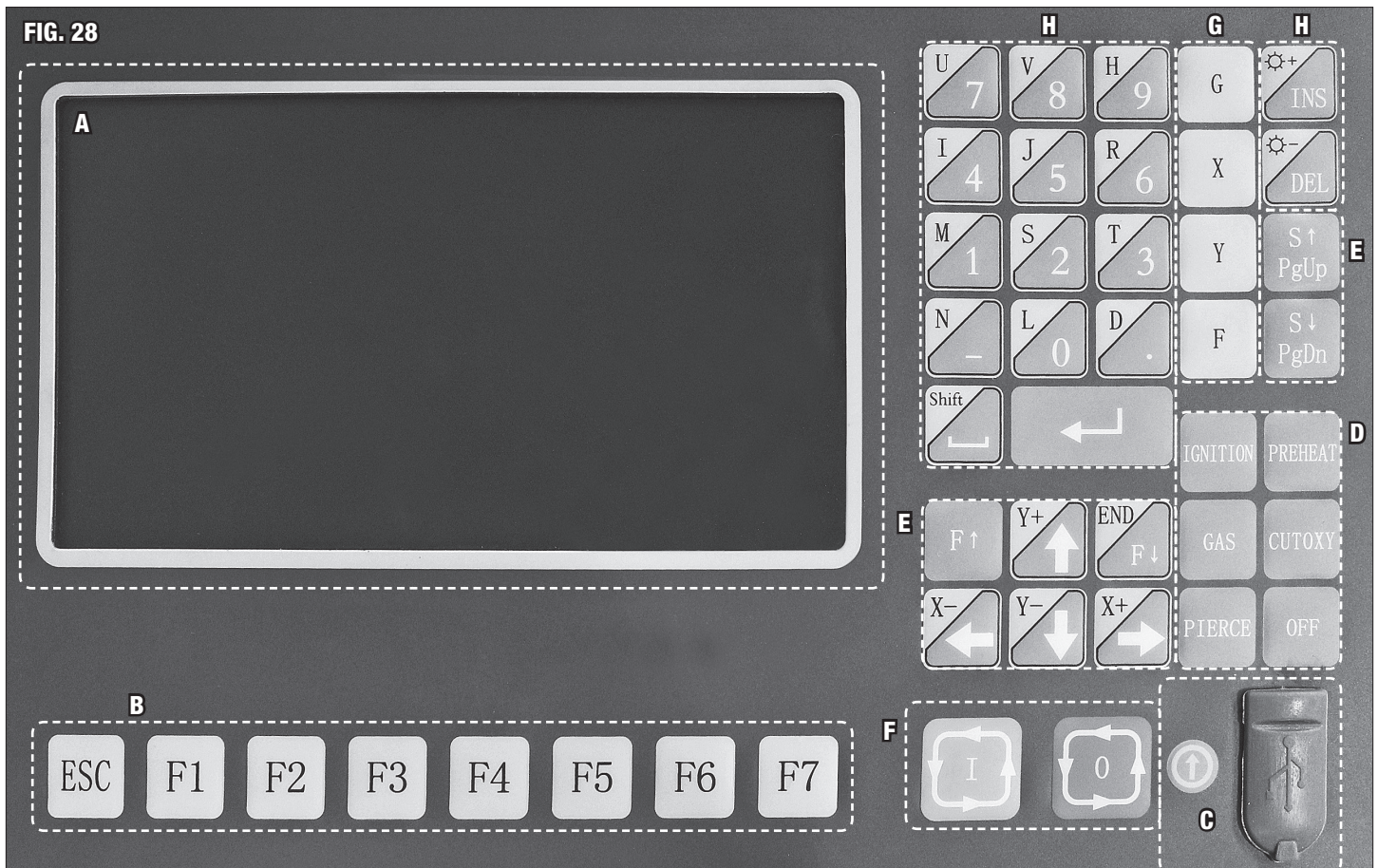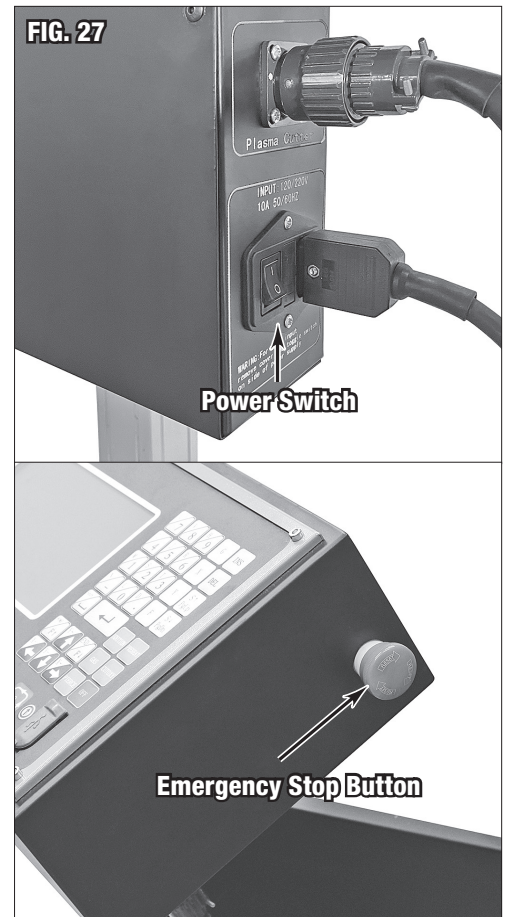
B   Main function keys used for accessing/exiting menus and altering settings quickly. The function of these keys will be shown at the bottom of the LCD screen. Key **F7**, along with ⏎, are commonly used to confirm a change or select continue. **ESC** can be used to exit any screen and pressing it multiple times will get you back to the main screen if needed.

C   USB connection for importing and exporting files via USB drive. The small arrow button to the left of the port is only used for software updates.

D   Manual controls for cutting functions. Since this table is configured as a CNC Plasma Table, only **PIERCE** and **OFF** are used for manual operations.

E   The arrows manually jog the Plasma Torch position and are used in menu navigation. The Torch Height Motor can be triggered manually by the **S↓** and **S↑** keys. Easily alter the torch cutting speed with the **F↓** and **F↑** keys. Single taps will adjust it by one and holding for several seconds will progressively scale by factors of ten.

F   Machine Start/Stop controls. To start a program press **I** followed by ⏎ to confirm. Stop by pressing **0** and resume by pressing **I**. Note, confirmation will not be asked for when starting to resume a cut.

G   This button cluster is used to quick access select settings for altering without having to go into the settings menus.

H   Number and letter keypad is mostly used for setting entry and file naming. **SHIFT** is a modifier key that when pressed toggles the letter/number combo keys to the alternate character. Before each time an alternate character is entered **SHIFT** will need to be pressed again.

FIG. 27

Power Switch

Emergency Stop Button

FIG. 28

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MAIN CUT SCREEN

- Upon powering up the Plasma Table it will take a few seconds to boot up.
  Once the Eastwood logo screen **(FIG 29)** is displayed, press any key to continue.

- The first screen shown is the Main Cut Screen **(FIG 30)**.

⚠ **NOTICE**
> **Return to the Main Cut Screen by pressing ESC as many times as necessary.**

FIG. 29

MAIN CUT SCREEN INTERFACE DESCRIPTION (FIG 30)

[A] Current Torch speed (mm/min).

[B] Current file open.

[C] Counter that shows how many holes (aka pierces) have currently been made and how many there are on the program in total.

[D] Mode specific indicators. Plasma cutting mode shown. Pressing 8 when not cutting will quickly enable/disable the automatic torch height control.

[E] Cut Controller quick reference settings display. Manual speed, cut speed, pierce time, controller mode, kerf, movement mode and steel plate angle.

[F] Torch Height Controller quick reference settings display. Set arc voltage target, IHS set time, THC state, actual arc voltage, and IHS test.

[G] Torch head position with respect to the zero point and THC enable or disable display.

[H] The bottom bar always shows the menu that the function keys will open.

[J] Cut parameters quick access chart. You can input your favorite settings for future reference.

[K] Part preview. The red crosshairs show the zero point and the current torch position. Torch travel will be shown as a red dotted line. The overall part size is shown on the bottom and right sides of the window.

- **G** will cycle through the modes: Plasma **(FIG 30)** and Demo **(FIG 31)**.

- Settings can be quickly changed by pressing their respective quick access key, shown in brackets to the left of the setting. For example, **T** can be used to change the pierce time quickly.

- Navigation within setting windows is often done using the arrow keys and the number pad to enter values.

FIG. 30

FIG. 31

F1 - SHAPE LIBRARY

- Pressing **F1** on the Main Cut Screen takes you to the shape library **(FIG 32)**. Here preloaded shapes can be selected by using the arrow keys.
- Pressing ⏎ or **F6** on the part opens a screen to modify its dimensions. Lead in and lead out are how far away the Torch starts and stops cutting from the actual piece being cut. The machine units are configured to millimeters **(FIG 33)**.
- Good lead in/out helps ensure cut smoothness at the entry and exit points. Generally, as much lead in as possible is better up to approximately 15mm or 0.60in. Lead out is not as critical and can be much lower.
- After the dimensions have been entered press **F7** to open the shape in the main cut screen.
- Some shapes, such as the one shown in **(FIG 34)**, **F1** and **F2** have the option to switch between inside and outside lead cuts. For example, inside would be used to cut out a circle. Whereas outside would be used to cut a hole in a panel.

FIG. 32
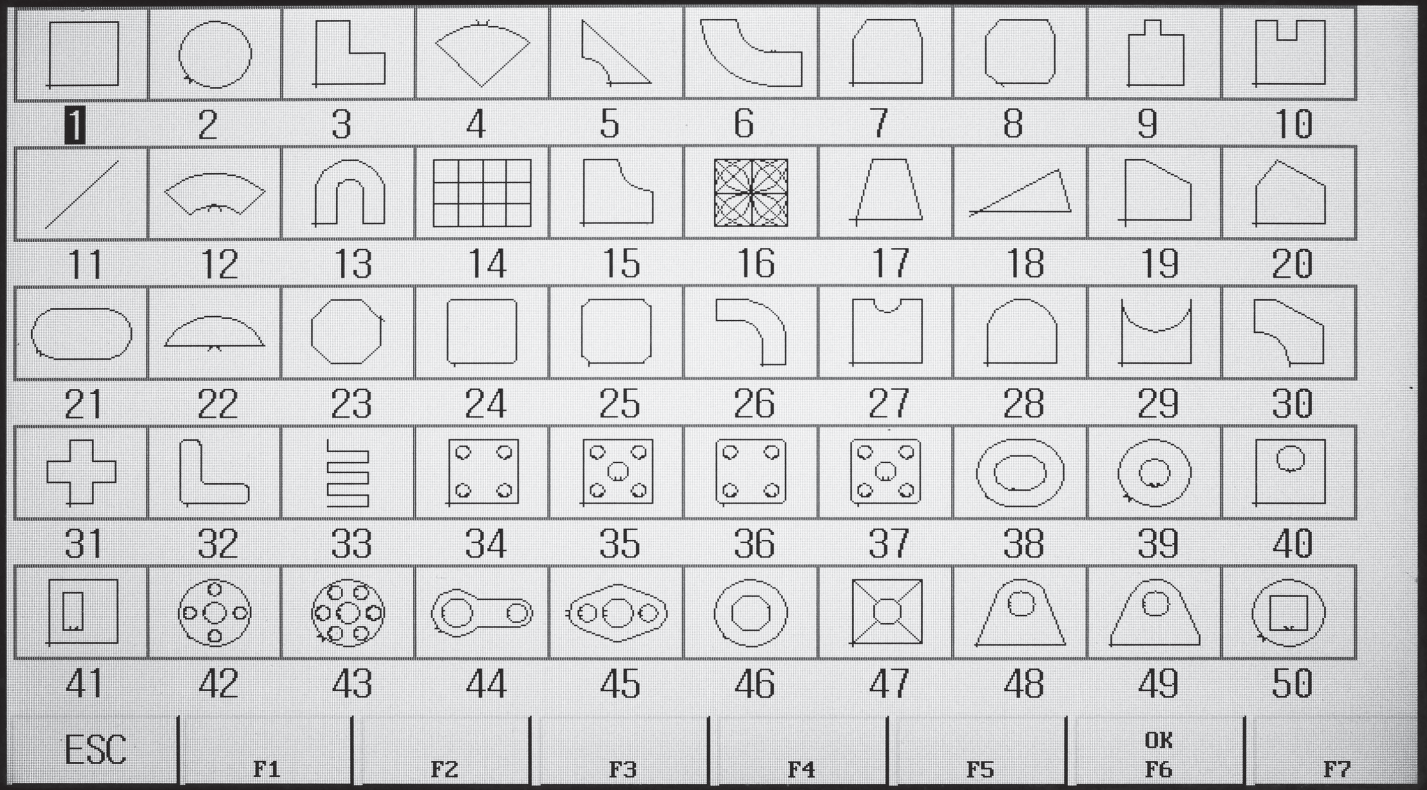
FIG. 33

Size1	100
Size2	100
Size3	20
Size4	20
Size5	10
Size6	15
Lead In	5
Lead Out	5

ESC	Inside F1	F2	F3	F4	F5	F6	OK F7

FIG. 34

Size1	100
Size2	100
Lead In	5
Lead Out	5

ESC	Inside F1	Outside F2	F3	F4	F5	F6	OK F7

F2 - FILES

- **F2** opens the file browser **(FIG 35)** where G-code is stored to the machine, or a USB drive. Files can be searched, edited, deleted, copied, previewed, saved, and renamed here. The maximum USB drive size supported is 16GB, and the <u>USB drive must be formatted to FAT or FAT32 file system.</u>

- Use the arrow keys and ⏎ button to navigate a file directory.

- Pressing ⏎ or **F7** on a G-code file will open it from the USB Drive. Do not remove the USB Drive before you finish using the part because it is not saved to the machine and will not reload correctly.

FIG. 35

Path(CNC): \

Filename	Size
FOUND.000	Folder
2006.TXT	0.338 K
EASTWOOD 12IN SMOOTHED.CNC	19.978 K
EASTWOOD 12IN SQUARE.CNC	19.010 K
EASTWOOD ELITE 16IN.CNC	31.335 K
MOODANDBACK.CNC	80.521 K
TK15.NC	0.355 K
TK00.NC	0.112 K
TK10.NC	0.040 K
TK33.NC	0.438 K
TK01.NC	0.161 K
TK14.NC	0.131 K
TK42.NC	0.784 K
TK02.NC	0.135 K
TK36.NC	0.610 K
TK17.NC	0.108 K

[G] Preview   [F] Search File

| ESC | Files F1 | USB F2 | Edit F3 | Delete F4 | Copy F5 | NewFd F6 | OK F7 |

F3 - PART OPTION

- Pressing **F3** opens the part modification menu **(FIG 36)**. Any changes made in this menu can be quickly reverted with **ESC**.
- **F1** can be used to cycle the cut zero point through bottom left, top left, top right, bottom right, and centered positions.
- **F2** can be used to change the cut angle.
    - **Rotate part** - Allows the user to rotate the orientation of the cut path 360° clockwise or counterclockwise. This is the most common and intuitive option for part rotation.
    - **Rotate steel plate** - This opens to a separate menu where you press **F3** to input the angle of the plate loaded. The result is the same as Rotate part but framed in a different perspective.
- **F3** opens array nesting. The options are outlined below. When nesting parts, the computer will automatically space the "frame" view of each part 10mm apart. In some cases, this may still be too close and you will need to increase the distance further. Press **ESC** to cancel or **F1** to create the array.
    - **Rows** - The number of top to bottom horizontal rows for the array.
    - **Columns** - The number of left to right vertical columns for the array.
    - **Row Distance** - Distance between rows. Defaults to 10mm spacing.
    - **Col Distance** - Distance between columns. Defaults to 10mm spacing.
    - **Alt Order (1/0)** - This setting will alter cutting order of the array. Option "0" will cut the array left to right, bottom to top, and start at the left side of every row. Option "1" will snake through the rows to eliminate travel time for restarting at the left. This cuts down on program run time for large arrays.
    - **Stag Array (1/0**) - Setting to "1" subtracts one part from every other row and staggers the columns for the possibility of tighter nesting with certain shapes, such as circles. "0" is the default and makes a straight array.
- **F4** can be used to change the scale, with 1.00 being the current size of the part. For example, to scale a part up 25%, input 1.25. To reduce size to 63%, input 0.63.
- **F5** is for selecting a specific pierce in the code to start with, this can be helpful when recovering a failed cut or if you want to skip certain features without creating a new G-code file. For example, to skip to the third pierce input "3" and press **F1**. Now the cut will start from the third pierce.
- **F6** is used to view and manually edit the G-code file loaded.
- **F7** Reverts changes to the part or steel plate.
- **X** mirrors the part about the X-Axis, and **Y** mirrors the part about the Y-Axis.
- To save changes and return to the Main Cut Screen press **ESC**.

FIG. 36

F4 - SETUPS

- **F4** opens the machine settings menu where more in-depth options can be accessed.
- Navigate using the arrow keys then use the number pad to enter values.
- **F1 Speed** opens some common settings. Shown in **(FIG 37)**, these settings are relevant to all modes.
  - **Start speed (mm/min)** - Speed at which movement starts. Can be used to slowly ramp up the movement speed over the time defined below in Acc time (S). Useful for thicker materials and making precise manual movements easier.
  - **Acc time (S)** - Time period over which the **Start speed (mm/min)** accelerates to the operating speed and decelerates to zero.
  - **Acceleration (S)** - Changes the speed at which the stepper motors accelerate. This controls how "jumpy" or "sharp" sudden changes direction, such as corners, will be. Small adjustments here make a big difference, 0.3s is a good middle ground.
  - **G00 move speed (mm/min)** - Speed used when the table automatically traverses the torch.
  - **Return origin speed (mm/min)** - This setting is unused in the current table configuration.
  - **Demo/back Speed (mm/min)** - Speed used when running in demo mode or utilizing the **Back** function.
  - **Spd Tran Angle** - This setting is unused in the current table configuration.
  - **Corner Radius (mm)** - This setting is unused in the current table configuration.
  - **Small Arc Limit (mm/min)** - Speed limit when cutting a radius less than the size set below in Limited Speed below Radius (mm). Can improve radius quality by slowing the torch down.
  - **Limited Speed below Radius (mm)** - Any radius equal to or smaller than this setpoint will reduce speed to the limit defined in **Small Arc Limit mm/min)** above.

FIG. 37

Setting	Value	Range
Start speed(mm/min)	2000	(20 < P < 2000)
Acc time(S)	0.50	(0.05 < P < 3.00)
Acceleration(S)	0.30	(0.03 < P < 1.50)
G00 move speed(mm/min)	6000	(20 < P < 50000)
Return origin speed(mm/min)	100	(100 < P < 50000)
Demo/back Speed(mm/min)	1000	(100 < P < 50000)
Spd Tran Angle	20.0	(20.0 < P < 300.0)
Corner Radius(mm)	3.0	(2.0 < P < 1000.0)
Small Arc Limit(mm/min)	1000	(0 < P < 50000)
Limited Speed below Radius(mm)	3.0	(0.0 < P < 1000.0)

ESC	Speed F1	System F2	F3	Plasma F4	Control F5	THC F6	Save F7

- **F2 System** settings can be used to change machine settings such as limits and stepper motor settings **(FIG 38)**.
    - Eastwood does not recommend altering settings in this menu without direction from Eastwood Technical personnel.

FIG. 38

Pulse Equivalent	X:	0.00640000	Y:	0.00640000	(0.00000001 < P < 1.00000000)
Machine Origin Point(mm)	X:	0.0	Y:	0.0	(-3000.0 < P < 30000.0)
Reference Point(mm)	X:	0.0	Y:	0.0	(-3000.0 < P < 30000.0)
Drill Offset(mm)	X:	0.0	Y:	0.0	(-3000.0 < P < 30000.0)
Flame Offset(mm)	X:	0.0	Y:	0.0	(-3000.0 < P < 30000.0)
Plasma Offset(mm)	X:	0.0	Y:	0.0	(-3000.0 < P < 30000.0)
Clearance(mm)	X:	0.00	Y:	0.00	(0.00 < P < 10.00)
Dir-Origin	X:	0	Y:	0	(-1 < P < 1)
Max Limit+(mm)	X:	9000.0	Y:	9000.0	(-31000.0 < P < 31000.0)
Min Limit-(mm)	X:	-9000.0	Y:	-9000.0	(-31000.0 < P < 31000.0)

ESC	Speed F1	System F2	F3	Plasma F4	Control F5	THC F6	Save F7

- Pressing **F3**, then entering "1928" on the key pad will open a pop up window that has the option to swap the machine's units from millimeters and mm/min to inches and inches per minute (IPM). Use the arrows keys and ↵ to select.

- **F4 Plasma** opens the plasma specific settings menu shown in **(FIG 39)**.
  - **Position Check (0/1**) - This option enables or disables running of the initial height program. Leave set to "1" to run the program before cutting so the torch levels itself.
  - **Position Up Time (S)** - This is the Initial Height Setting motor run up-time in seconds. This is also adjustable from the main cut screen with keys 4 and 5.
  - **Torch Up Time (M70)** - The amount of time the torch height motor will run upward at the beginning and end of a cut path. Set to zero or a fraction of a second to save time.
  - **Torch Down Time (M71)** - The amount of additional time the torch will run down before starting a cut path. Set to zero or a fraction of a second to save time.
  - **Watch Arc Enable (0/1)** - Setting to "1" enables monitoring of the plasma arc via arc voltage, used in conjunction with the following two settings below. When set to "0" the table will not stop if arc voltage is undetected.
  - **Arc Start Detect (S)** - Pausing time of arc detection when the cut starts. The table will not pause if it detects the arc is lost in this time period.
  - **Arc Loss Delay (S)** - Arc loss detection delay. If the table detects the arc is lost for longer than the set time, it will pause cutting and display an arc alarm. Normally left at zero.
  - **Pierce Time (S)** - The amount of time after arc start the Plasma Torch will remain stationary in order to pierce the material before moving.
  - **Arc Off Delay Time (S)** - Pauses the table for the set number of seconds after turning off the plasma arc. Can be used to space time between cuts on a part with many holes, if desired. Otherwise set to zero or a fraction of a second to save time.
  - **Time to lock THC (S)** - Time period it will lock the THC after cut start. Helpful for odd starts with large gaps, or on thick material that results in an unstable arc when starting the cut.
  - **Distance to lock THC (mm)** - Distance from the end of the cut segment the THC will be locked.
  - **Speed to lock THC (mm/min)** - If the movement speed during cutting is below this point it will lock the torch height.
  - **Distance to Off arc before end of cutting (mm)** - Distance before the end of cutting that it will turn the plasma arc off.
  - **Distance to Lock THC before end of cutting (mm)** - Distance before the end of cutting that it will lock the torch height.
  - **Use Cylinder THC (0/1)** - This setting is for other types of height controller. Leave set to "0" for this table.

FIG. 39

Setting	Value	Range
Position Check(0/1)	1	(0 < P < 1)
Position Up Time(S)	0.5	(0.0 < P < 29.9)
Torch Up Time(M70)(S)	0.8	(0.0 < P < 100.0)
Torch Down Time(M71)(S)	0.0	(0.0 < P < 100.0)
Watch Arc Enable(0/1)	1	(0 < P < 1)
Arc Start Detect(S)	0.0	(0.0 < P < 120.0)
Arc Loss Delay(S)	0.0	(0.0 < P < 120.0)
Pierce Time(S)	0.5	(0.0 < P < 120.0)
Arc Off Delay Time(S)	0.5	(0.0 < P < 120.0)
Time to lock THC(S)	0.0	(0.0 < P < 90.0)
Distance to lock THC(mm)	0	(0 < P < 1000)
Speed to lock THC(mm/min)	0	(0 < P < 10000)
Distance to Off arc before end of cutting(mm)	0.0	(0.0 < P < 90.0)
Distance to Lock THC before end of cutting(mm)	0.0	(0.0 < P < 100.0)
Use Cylinder THC(0/1)	0	(0 < P < 1)

| ESC | Speed F1 | System F2 | F3 | Plasma F4 | Control F5 | THC F6 | Save F7 |

- **F5** Control has numerous system setting parameters **(FIG 40)**. These are pre-set at the factory.
    - Background color (white 0/blue 1) - Switched between white interface background color (default) and a blue background color.
    - Eastwood does not recommend altering other settings in this menu without direction from Eastwood Technical personnel.

FIG. 40

Setting	Value	Range
Auto Load Next File(0/1)	0	(0 < P < 2)
Laser offset(0/1)	0	(0 < P < 1)
Edge Cutting Enable(0/1)	0	(0 < P < 1)
Forbidden F(0/1)	0	(0 < P < 2)
Calculate Precision(mm)	0.100	(0.010 < P < 0.500)
Remote Controller No-0/wired-1/wireless-2	0	(0 < P < 2)
Clear Coor before cut(0/1)	0	(0 < P < 1)
Return zero after cut(0/1)	0	(0 < P < 2)
Enable limit port(0/1)	1	(0 < P < 1)
Enable Limit coordinate(0/1)	0	(0 < P < 1)
Collide Detect(0/1)	0	(0 < P < 1)
Pause(0)/Torch Up(1) after Collide	1	(0 < P < 1)
Torch Up after pause(0/1)	0	(0 < P < 1)
Background color(white 0/blue 1)	0	(0 < P < 1)
Synchro XZ:0/YZ:1	1	(0 < P < 1)
Confirm Data 0/1	0	(0 < P < 1)

ESC	Speed F1	System F2	F3	Plasma F4	Control F5	THC F6	Save F7

- **F6 THC** contains all Torch Height Controller (THC) specific settings **(FIG 41)**. Some of these may be fine-tuned to better implement the automatic torch height control for your application.
    - **THC Enable (1) / Disable (0)** - Enable (1) or disable (0) the automatic torch height control.
    - **Dead-band voltage (0.1 - 10.0V)** - Adjustment dead zone for the torch height control. If the actual arc voltage differs from the set arc voltage by more than this number, it will automatically adjust the torch height. Typically, 1V works well.
    - **THC arc voltage adjust (1 - 255)** - Arc voltage ratio adjustment calculation number. Do not adjust; adjusting can cause improper function. Default is 64.
    - **Sensitivity (1 - 10)** - Reactivity of the torch height control. Greater numbers will make the torch adjust faster but can also cause a feedback loop where the torch is repeatedly adjusting up and down rapidly. Default is 1.
    - **Manual Up/Down Speed** - Manual adjustment speed of the torch height. Default is 40.
    - **Cutting Up/Down Speed** - Automatic adjustment speed of the torch height. Default is 40.
    - **IHS Speed** - Speed of the torch when it sets the initial height. Keep at 40 for good adjustability range of the start height.
    - **Zero Low Enable(0)/High Enable(1)** - Leave set to (1) to enable the torch height motor.
    - **Limit+ Low Enable(0)/High Enable(1)** - Unused in this table configuration. Leave set to (0).
    - **Limit- Low Enable(0)/High Enable(1)** - Unused in this table configuration. Leave set to (0).
- Remember to press **F7** to save your changes.

FIG. 41

THC Enable(1)/Disable(0)	1	(0 < P < 1)
Dead-band voltage(0.1-10.0V)	1.0	(0.1 < P < 10.0)
THC arc voltage adjust(1-255)	64	(1 < P < 255)
Sensitivity(1-10)	1	(0 < P < 10)
Manual Up/Down Speed	40	(0 < P < 100)
Cutting Up/Down Speed	40	(0 < P < 100)
IHS Speed	40	(0 < P < 100)
Zero Low Enable(0)/High Enable(1)	1	(0 < P < 1)
Limit+ Low Enable(0)/High Enable(1)	0	(0 < P < 1)
Limit- Low Enable(0)/High Enable(1)	0	(0 < P < 1)

THC Version: 2.1

ESC	Speed F1	System F2	F3	Plasma F4	Control F5	THC F6	Save F7

F5 - DIAGNOSE

- <u>**Eastwood does not recommend altering settings in these menus left undescribed without direction from Eastwood Technical personnel.**</u>

- The diagnose menu can be used to monitor inputs and outputs.

- Setting the date and language options are also accessed here using **F4 Sys Set** and entering the password "1928" to access the system settings menu **(FIG 42)**.

- From here, press **F3 Set Time** or **F4 Language**.

⚠ **NOTICE**

Eastwood does not recommend altering settings that we do not explicitly describe in the diagnostics/settings menus as this could cause the machine to become nonfunctional or function erratically. Only change machine settings described in this manual or at direction of Eastwood Technical personnel.

FIG. 42

| ESC | LogoSet F1 | F2 | SetTime F3 | Language F4 | HideMode F5 | F6 | F7 |
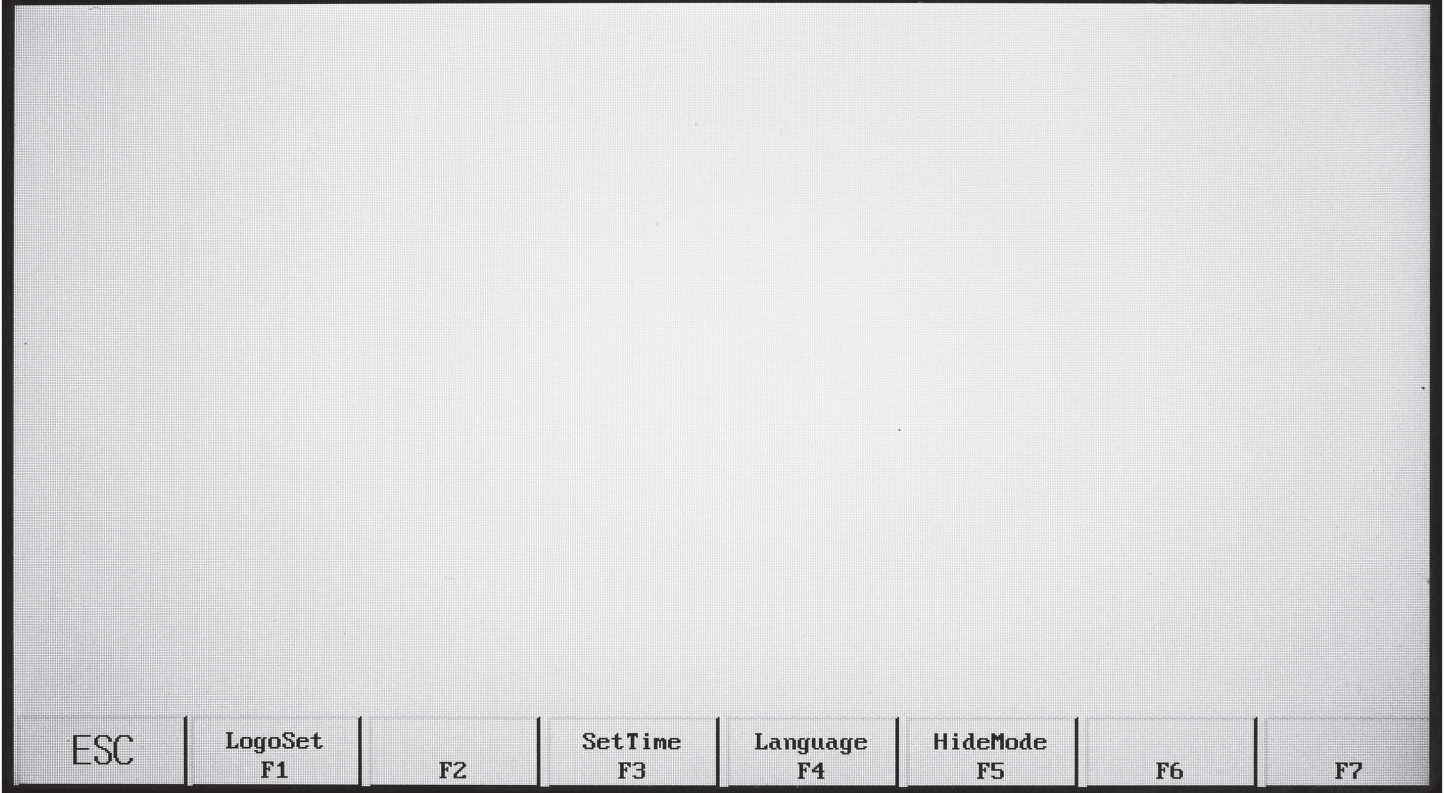
F6 - ZOOM IN

- The zoom function is useful to get a close look at small features. **F4 Zoom Out** and **F5 Zoom In** control the zoom level. **F6 Return** returns to the main cut screen. **F7 Info** shows info about the cut file.

F7 - MANUAL MOVEMENT

- The manual movement menu **(FIG 43)** is useful for cutting manually using the **PIERCE** button, and alignment before making a cut. The options are described below.

- **F1 MDI** Automatically moves the torch by the distance input for the X and Y-Axes.

- **F2 StepMov** switches into step movement mode. This asks you to set a distance and will move the Plasma Torch by that distance in the direction of the arrow key you press. Helpful for precisely aligning with a plate.

- **F3 Zero** can then be used to manually zero the coordinate system so you know you have the alignment you want. The machine also automatically zeroes when a fresh cut is started.

- **F4 Return** Can be used to zero the machine to the current point or zero it to a new point.

- **F5 High Spd** cycles through three predefined speed levels **High Spd, Mid Spd, Low Spd**.

- **F6 Recover** Can recover the torch to a point on your cut file or offset the cut file.

- **F7 Frame** will run the Torch in a rectangular circuit at the min./max. X and Y values of the cut file. Very useful for understanding if you have enough space to cut a complicated part which would take a long time run a demo on.

FIG. 43

Speed: 00000	File: TK00.NC	Current Hole: 0000/0001

TorchUp●   TorchDn●

Pierce●   [8] THC En●

ARCFeed●   IHSDete●

105.0 mm

[X]ManuaSpd:8000   [G]Mode:Plasma

[F]CutSpeed:1200   [N]Set Kerf:0.0

[T]PierTime:0.5   [0]KeepMove:OFF

SteAngle:0.00

[1/2]Set Arc:099   ActuaArc:000

[4/5]IHS Time:0.5   [6]IHS Test

ThcState:

[9]Cut Para

X +00000.000   THC Enable

Y +00000.000

105.0 mm

0> G92 X0 Y0
1> G91

ESC	MDI F1	StepMov F2	Zero F3	Return F4	High Spd F5	Recover F6	Frame F7

MAIN CUT SCREEN DURING CUTTING

(FIG 44) show the screen options displayed while cutting is in progress at different stages of the cut. **(FIG 43)** is supplement to **(FIG 30)**, it highlights displays/options that are changed while cutting is in progress. These are defined on the next page.

(FIG 46) is the prompt window that pops up when you attempt to restart the cut off the cut path. It asks you to select how the torch should return to the stop point.

Only Return simply returns the torch to the last point on the part path, then the Start button can be used to continue the cut.

Cutting Return will ignite the arc at the torch's current location and cut a direct path to the last point on the part path and automatically continue the rest of the program. This can be a great option for restarting a cut because you can effectively create a lead in to reduce roughness where the program was paused. However, in some circumstances there may not be enough space to use this option without damaging another part of the workpiece.

Offset Cutting will move the last point on the part path to the current location of the torch. Essentially, wherever the torch lies it will shift the coordinate system such that the last path point is moved to the current torch location and cutting will continue from there. This option is not as useful as the others unless your plate has physically shifted.

FIG. 44

DESCRIPTION OF MAIN CUT SCREEN DURING CUTTING (FIG 44)

A - Status of THC sensors and programs. Useful to troubleshoot if, for example, the arc is breaking due to height. If the "THC En" indicator is red, it is likely breaking because the torch height is locked due to one of the plasma cutting settings.

- **Torch Up** - Green indicates the torch height motor is adjusting upward.
- **Torch Down** - Green indicates the torch height motor is adjusting downward.
- **Pierce** - Lights up green when the plasma cutter is being triggered on by the computer.
- **THC En** - Lights up green when the automatic torch height control program is running. Red when disabled, which may mean torch height control is fully disabled or locked by a setting.
- **ARCFeed** - Lights up green to indicate arc voltage is being received.
- **IHSDete** - Unused in current configuration.

B - Quick access settings that can be changed when cutting is paused or not running.

- **[X] ManuaSpd** - Press X to alter the speed when moving the torch manually (mm/min).
- **[G] Mode** - Press **G** to quick change between Plasma and Demo modes.
- **[F] CutSpeed** - Pressing **F** will let you set the unmodified speed the torch moves when cutting parts (mm/min).
- **[N] Set Kerf** - Use **N** to input the kerf width (mm) for compensation to improve part accuracy. Kerf width is the width of the material removed by the plasma arc as it cuts. See **CNC PLASMA CUTTING GLOSSARY OF TERMS** and **DETERMINING MACHINE SETTINGS** for additional description and guidelines on kerf.
- **[T] PierTime** - Press **T** to quick access the pierce time setting. Pierce time is the time the torch is stationary at the beginning of the cut to allow the arc to fully pierce the material.
- **[0] KeepMove** - Pressing **0** toggles keep moving mode off/on. For normal movement you must hold the arrow key down to move the torch in a direction. Turning on KeepMove will let you click the direction to move, and it will keep moving the torch in that direction until a limit is hit or you press the key again to stop it.
- **SteAngle** - If using **Rotate steel plate** it will show the angle currently set here. Typically not used.

C - Torch Height Controller specific quick access settings.

- **[1/2] Set Arc** - This is the arc voltage the Torch Height Controller is targeting when cutting and torch height is not locked. Change by pressing **4** and **5**.
- **ActuaArc** - Live display of the actual arc voltage as measured by the CNC table. Will display 0 or 255 if there is no arc voltage or an input error.
- **[4/5] IHS Time** - This is the Initial Height Setting (IHS) in seconds. When a cut is starting it will zero the torch height by touching the material, then it will run the motor up for this amount of time to set the start height. Change with keys **1** and **2**.
- **[6] IHS Test** - Pressing **6** will run the Initial Height Setting program without cutting so you can verify the starting height is correct visually.
- **ThcState** - Displays what the THC is currently doing.

D - This window shows the G-Code live stream on the left side. The top right will show any timer that is running and its' countdown. The bottom right will show what the Cut Controller is currently doing.

E - The part view will be shaded in real time as the cut progresses. Completed sections will be shaded green. Torch travel lines are red dotted. The red crosshairs are the zero point and the current torch location.

MAINTENANCE

- The lead screws, gantry tubes, and roller bearings of the CNC table should be kept clear of debris and dust build up.
- Consumables should be replaced as needed. For best performance replace the Nozzle & Electrode in pairs, but usually the Nozzle life can be stretched longer than that of the Electrode.
- To drain the Waterbed: There is a silicone plug in the drain bolt. This plug is simply pulled out from the top for draining.
- If sheets are frequently being loaded to the table or other equipment is being operated nearby, inspect the wiring harnesses regularly. Damaged wiring could cause degraded or erratic performance and present a fire hazard. Discontinue use immediately and contact Eastwood for replacement harnesses if damaged wiring is noticed.

TROUBLESHOOTING

PROBLEM	CAUSE	CORRECTION
Cut Controller Will Not Power On	No Power	Check 120 VAC, 60Hz, 5 Amp power source and connection to CNC Plasma Table.
	Power supply circuit breaker tripped	Reset circuit breaker.
	Computer malfunction	Contact Eastwood Technical Assistance: techelp@eastwood.com or 800.544.5118.
Plasma Arc Will Not Start	No power	Power supply circuit breaker tripped.
	Workpiece Not Grounded	Verify the plasma cutter ground clamp has good, bare metal contact with the workpiece and is installed to the plasma cutter.
	Power Supply Circuit Breaker Tripped	Reset circuit breaker.
	Plasma Cutter Unit Overloaded	Check for overload indicator. Allow unit to cool. Ensure the duty cycle is not exceeded
	Consumable Failure	Check consumable condition and replace if necessary.
	Torch Height Too High	Lower Arc Voltage and/or Initial Height Setting (IHS).
	Incorrect Mode	Cut Controller must be in Plasma mode.
	Settings Altered Too Far, Making Plasma Cutting Difficult	Reference the **CUT SPEED REFERENCE TABLE** on Page 41 , particularly the cut speed and pierce time, for good baseline settings on your material thickness. Refer to **FIG 37, 38, 39, 41** for safe default settings. If the machine is still not functional contact Eastwood Technical Assistance: help@eastwood.com or 800.343.9353
Plasma Arc Repeatedly Breaks	Gap traversed is too large	Modify pathing so the Torch does not attempt to cross large gaps in the workpiece.
	Workpiece Not Grounded	Verify the plasma cutter ground clamp has good, bare metal contact with the workpiece and is installed to the plasma cutter.
	Arc Start Detect Time Too Low	Increase Arc Start Detect time so there is sufficient time for the height to set and the arc to fire.
	Consumable failure	Check consumable condition and replace if necessary.
	Torch height too high	Lower Arc Voltage and/or Initial Height Setting (IHS).
	Torch height is locked	Check lock indicator **THC En** during the cut. If the Torch height is being locked (red indicator) change the setting that is locking the height (eg. **Time to lock THC (S), Distance to lock THC (mm), Speed to lock THC (mm/min)**) or verify the THC is enabled.
	Settings Altered Too Far, Making Plasma Cutting Difficult	Reference the **CUT SPEED REFERENCE TABLE** on Page 41, particularly the cut speed and pierce time, for good baseline settings on your material thickness. Refer to **FIG 37, 38, 39, 41** for safe default settings. If the machine is still not functional contact Eastwood Technical Assistance: help@eastwood.com or 800.343.9353

TROUBLESHOOTING

PROBLEM	CAUSE	CORRECTION
Poor Cut Quality	Low Supply Air Pressure to Plasma Unit	Make sure your plasma cutter has adequate air pressure flowing to the Torch. Most require 60 psi [4.14 bar] while air is flowing.
	Air Leak at Fittings, Lines, Hose, or Plasma Cutter	Stop plasma unit, locate leak, and perform repair.
	Improper Arc Voltage	Check arc voltage reference table, but for thin gauge metal Torch height should be 0.11-0.19" [2-5mm] above workpiece during cut.
	Consumable Failure	Check consumable condition and replace if necessary. Check that consumables are properly installed. Consumables can touch and cause an air blockage or poor arc in some circumstances. Observe that good air is flowing through the Torch and the arc is a tightly formed vertical beam.
	Improper Amperage	Reference cut setting tables for optimal amperage.
Poor Dimensional Accuracy	Improper Kerf	Before cutting an important piece, run a test piece without any kerf compensation. Measure the kerf by subtracting the measured size from the set size and dividing by two if you measured across two cut faces. Use this calculated kerf as your new kerf setting. Remember, CNC plasma cutting has inconsistencies which make it difficult to get better tolerance than ± 0.02" [0.5mm] consistently. Furthermore, there will always be some positive bevel, the thicker the material the more noticeable the bevel is.
	CNC System is Not Calibrated	Contact Eastwood Technical Assistance: help@eastwood.com or 800.343.9353
Limit Alarm Triggers Randomly	Faulty Computer Setting or Internal Error	Press **F5** to open the Diagnose menu. The status of the limit switches will be shown in the top left. Green dot means they are activated, nothing means they are not active. Utilize a ferrous metal object to trigger the hall effect sensor limit switch. Contact Eastwood Technical Assistance (help@eastwood.com or 800.343.9353) for further troubleshooting and replacement parts.
	Failed Wiring	Check for damaged wiring to the problem sensor.
	Debris Buildup	Check that the sensor is clean from buildup of debris and is not being mistakenly triggered.
USB Drive Not Detected Or Files Load Incorrectly	Incorrect File Type	The table can only load machine Gcode in the form of a ".cnc" text file. Unfortunately, ".dxf", ".pdf", ".dwg", ".jpg", ".png", etc. cannot be loaded directly into the table. You must first load these into AUTODESK® FUSION 360® for machine pathing and G-code creation. See **CREATING AND CUTTING A G-CODE FILE WITH AUTODESK® FUSION 360®** and **CONVERTING AN IMAGE OR .PDF TO .DXF FOR CUTTING** or our CNC plasma YouTube playlist for further guidance: https://www.youtube.com/playlist?list=PL8UO6Tbfghxi7EizoYQ_oYi2SuWb9MaUN
	USB Drive is Too Large	Maximum USB drive size supported is 16GB.
	USB Drive is Not Formatted to the Correct File System	Reformat to FAT or FAT32 file system, this can be done on a Windows PC by right clicking the USB drive in File Explorer and selecting Format.
	USB Drive File System is Corrupted	Reformat the USB drive as described above. USB drive file systems can corrupt over time, especially in usage with the CNC Plasma Table where the drive is frequently connected and disconnected. This usually results in a distorted part or missing segments.

TROUBLESHOOTING

PROBLEM	CAUSE	CORRECTION
Erratic Movement From Stepper Motors	Failing Stepper Motor Driver	Contact Eastwood Technical Assistance (help@eastwood.com or 800.343.9353) for troubleshooting and replacement part.
	Bad Stepper Motor Wiring Connection	Verify all stepper motor wiring is undamaged and connections are secure. Contact Eastwood Technical Assistance (help@eastwood.com or 800.343.9353) for troubleshooting and replacement parts.
Display is Not English	Bad Factory Setting	From the main cut screen, press key **F5** > **F4** > input password "1928" in the popup window and press ↵ > **F4** >use arrow keys to select English and press ↵ . Use **ESC** to exit back.
Table Cutting During Travel or Not Stop-ping After Cut Completion	Plasma Cutter in 4T Mode	Switch plasma cutter to 2T mode. For operating cutting preloaded shapes and custom files from Fusion 360 with Eastwood's post processor the plasma cutter must be in 2T mode. 4T mode will not function correctly and should only be used while hand cutting or if your post processor specifies it.
CNC Table Units in Metric	This CNC Table is Configured to Metric as Default	From the main cut screen press **F4**, followed by **F3**, then enter "1928" on the key pad. This will open a pop up window that has the option to swap the machine's units from millimeters and mm/min to inches and inches per minute (IPM). Use the arrows keys and ↵ to select.

QUICK GUIDES

START CUTTING A LIBRARY SHAPE

- To make sure the table is properly set up, refer to **UNCRATING AND ASSEMBLY** and **CNC PLASMA TABLE SET-UP** before proceeding.
- Verify table and the cutter have power supplied and are switched on. Verify the plasma cutter air pressure regulator is set to 60 psi (0.4MPa) while flowing.
- Verify the workpiece is grounded.
- At the Eastwood logo screen press any key to continue to the main cut screen.
- You are now at the main cut screen. Press key **F1** for the shape library. Use the green arrow keys to change selection and **F6** to select.
- Input desired dimensions. Each dimension is shown on the part below the dimension input area. The units are in millimeters.
- Lead In and Lead Out are used to help smooth the cut where the machine starts and finishes cutting. Generally, at least 5mm should be used. More lead in will make a smoother entry cut with thick materials.
- Press **F7** when finished dimensioning. Press **G** to cycle modes until "Plasma" is shown.
- Before starting the operation, go to the **CUT SPEED REFERENCE TABLE** and make sure your settings will work with the material at hand. If not, alter them by using the **F4** key for settings. **F1**, **F4**, and **F6** keys for Speed, Plasma, and THC settings, respectively. Double clicking **F7** will save settings, and **ESC** will return you to the main cut screen.
- Additionally, check the quick access settings on the main cut screen **(FIG 30)**: **[E]**, **[F]**.
- Now that the machine is set up, to run the operation jog the torch to the desired start location using the arrow keys. Press **F7** for manual movement controls mode and press **F3** to zero. Pressing **F7** will run a frame around the part for a rough idea if you have enough space or not. This is covered in greater detail below in **HOW TO UTILIZE DEMO MODE**.
- If torch path needs to be changed move the torch, zero again, and repeat the frame test.
- When ready to cut, press the green Start button followed by the ⏎ key to initiate the cut. The torch will move to the cut start point, level the torch, and then start the arc.
- The operation can be paused at any time by pressing the red **Stop** button and restarted by pressing the **Start** button.
- If you stop and manually jog the torch when you press **Start** a prompt will list several options for returning the torch to the cut path. Typically, for best cut continuity return only should be used. With the torch returned press Start again to continue cutting. This is described in more detail in the **MAIN CUT SCREEN DURING CUTTING** section of this manual.
- To exit a cut press ESC then ⏎ .

HOW TO UTILIZE DEMO MODE

- There are multiple ways to run part demos on the CNC table: The dedicated Demo Mode, Frame in manual movement, and Demo during cutting.
- The first option is the dedicated Demo Mode. It is accessed on the main cut screen by cycling to it with **G**. This mode simply runs the Torch through the cut path or to a certain point without activating the plasma cutter or Torch Height Controller.
- The other demo method is useful for quick access while cutting. You can stop the cut in progress and press **F2** to run the demo, then stop it and restart cutting.
- The last method is Frame which is accessed through the **F7** manual movement key and pressing **F7** Frame. It will move the Torch around the cut extremes in a rectangular manner. This gives a quick idea if a cut will have any interference with objects, existing cut outs, and table limits. When running the machine, we highly recommended running the Frame function before every cut.

CREATING AND CUTTING A G-CODE FILE WITH AUTODESK® FUSION 360®

- Once the sketch is created, extruding the design in the manner you desire it to be cut out is recommended (extruded distance does not matter). This will make pathing simpler.
- Using the "Change Workspace" drop down menu on the left of the main toolbar, change from the current workspace to the "MANUFACTURE" workspace.
- In the main toolbar switch to the "FABRICATION" tab.
- Select the "2D Profile" tool in the "CUTTING" box. The 2D Profile window will open and default to the "Tool" tab.
- In the "Tool" tab select the desired plasma tool. The "Select Tool" window will open.
  - To create a tool, navigate to the local library in the "Libraries" box (Local -> Library), then press the "Create new tool for waterjet, laser, and plasma cutting." icon in the top right of the window.
  - In the "Cutter" tab switch the type to "Plasma cutter" and verify the unit is Millimeters.
  - Set the kerf width to the desired value. The kerf width is typically 0.50mm - 1.50mm, but for best dimensional accuracy, measure the kerf width yourself.
  - Press OK to finish. Now this tool will always be available for future selection in the local library.
- In the "Geometry" tab, click the face that is to be cut out.
- In the "Passes" tab, Tolerance of the machine path can be adjusted. For best cut quality Sideways Compensation should be set to Left. Compensation Type controls whether the kerf width is to be controlled by the Cutting Control System "In control" or by Fusion 360 "In Computer".
  - For designs with small and/or intricate features allowing Fusion 360 to compensate is highly recommended. The CNC Cut Controller cannot calculate compensation pathing for small, intricate features and will default to zero kerf. If using Fusion 360 to compensate, check that the kerf width in the Cutting Control System is set to zero.
- In the "Linking" tab Lead-In/Lead-Out can be adjusted and cut entry/exit positions can be altered.
- When finished, press the OK button. If no errors appear, the toolpath has been generated.
  - To view the toolpath in motion, select "Simulate" in the "ACTIONS" box. The path the Plasma Torch will take can be manipulated with the control arrows at the bottom center of the window.
- To output the path as G-Code for the Eastwood CNC Plasma Table, select "Post Process" in the "ACTIONS" box. This will generate the G-Code for the selected toolpath(s). Press the Post button and save it to the desired location.
  - If running the Post Process for the first time, download the Eastwood CNC Plasma Table post configuration .cps file from the product webpage (listed below the instruction manual download). Using the "…" button in the Configuration Folder box select the folder the post configuration was downloaded to. Now in the Post Configuration box the Eastwood CNC Plasma Table post configuration can be selected. The default output folder can also be changed below.
- Transfer the file you just saved to a USB flash drive and then plug it into the machine.
- Once the USB stick is inserted, a part can be imported from the Main Cut Screen by pressing **F2** to enter the file menu, then pressing **F2** again to go to USB device.
- The USB stick's files can be navigated using the arrow keys, ⏎ , and, **ESC**.
- When the desired file is selected, press ⏎ to open it.
- Files can be saved to the machine's storage by pressing **F5** on the file when it is selected in the USB menu.

CONVERTING AN IMAGE OR .PDF TO .DXF FOR CUTTING

- To cut an image file or .PDF file, it must be converted to a .DXF file so that Fusion 360 can open it in a manner that a cut path can be created from.
- This is easily done for free from a website such as https://convertio.co/ which can translate a variety of file types to a .DXF drawing.
- When converting an image, if it does not convert the file to a .DXF as desired it may be helpful to use a photo editor to increase the contrast, neutralize colors, or edit certain aspects out. Extraneous line segments can also be removed after the conversion with Fusion 360.
- On convertio.co, choose your file to be converted, then in the drop-down menu to the right of to navigate to CAD > DXF.
- Press the Convert button and download the converted file.
- In Fusion 360 navigate to File > Open or use key combo CTRL + O, then select "Open from my computer…" and find the converted .DXF file.
- From here, follow steps in the previous section **CREATING AND CUTTING A FILE WITH AUTODESK FUSION 360**.

RECOVERING AN INCOMPLETE/FAILED CUT

If for any reason a cut does not complete, the steps below can be taken to rerun a cut segment. These steps can also be used if a setting must be changed before continuing to cut, as some settings cannot be changed during a cut. Note that restarting the cut mid segment is never as smooth as a continuous cut; for best results only stop the machine between cuts.

IF THE INCOMPLETE CUT IS NOTICED BEFORE PROGRAM ENDS
- When you notice the incomplete cut, press the red Stop button. The **F1** button will serve as a back button to run G-code segments in reverse. Pressing it will travel the Torch back to the last cut start point.
- Return to a point prior to the incomplete section and, if you need to, press **F2** to run the torch forward without cutting and stop it where the fail starts. Using **F↓** to slow movement speed can be helpful for precise alignment.
- Press the green **Start** button to restart the cut.

IF THE INCOMPLETE CUT IS NOTICED AFTER PROGRAM FINISHES
- When you notice the incomplete cut after the program has finished, move the Torch back to the start point (0.000, 0.000). Typically, after a program ends the machine will prompt you asking if you would like to automatically return to start. DO NOT re-zero.
- Use **G** to switch to Demo Mode. Now press **Start** and ↵ , a few millimeters before the incomplete section hit the red **Stop** button.
- Use **G** again to switch back to Plasma Mode, and press **Start**.

CHANGING SETTINGS DURING CUTTING
- To alter settings during a cut, the same basic idea is used, but press **F3 GoBack** and ↵ to return the Torch to the zero point of the file and exit. Make the setting changes and do not re-zero the table.
- Now switch to Demo Mode and run up to the point where the program was stopped and switch back to Plasma Mode to then resume cutting.

DETERMINING MACHINE SETTINGS

AMPERAGE - For metals thicker than 0.0625" [1.59mm], 40A output on the optional Eastwood Versa-Cut 40 CNC Plasma Cutter is optimal for max speed and is required for thicker materials. Thinner gauge steels may be cut with lower amperage.

Lower amperage will allow you to reduce heat into the workpiece, therefore minimizing warp. It will also require lower speeds which can make for a smoother cut; the computer may struggle to keep up with high speeds (eg. 3000mm/min) on a complicated file may result in jumpy motion.

CUT SPEED - To get a cut speed, first start with a suitable speed for your material thickness from the **CUT SPEED REFERENCE TABLE**. Depending on a multitude of factors, such as condition of consumables, amperage, and material quality, the speed should then be fine-tuned.

The best speed is the fastest possible with minimal dross on the finished piece. Large, chunky dross means speed is too low and a small, hard dross bead means speed is too fast. When cutting in the optimal speed range, it is typical for a narrow spray of sparks to shoot out over top the sheet and for the plasma spray exiting the bottom to slightly lag behind the torch position. It will leave a shallowly curved line on cut edges.

RADIUS SPEED - Using **Small Arc Limit (mm/min)** and **Limited Speed Below Radius (mm)** to reduce tight radius speed does not have a drastic effect, but generally a slight reduction is optimal for good quality, especially at high cut speeds.

PIERCE TIME - Improper pierce time can cause two things: failure to penetrate, resulting in a spark and slag shower with poor initial cut; or arc failure and sputtering at the beginning of a cut. Thick metal may require nearly a second of pierce time or more, while thin gauge may not require any. See the **CUT SPEED REFERENCE TABLE** for a start point based on material thickness.

Pierce time being too short will mean the plasma arc has not fully penetrated the material before movement starts. This results in slag and sparks being showered across the table, increased consumable wear, and an incomplete cut. Optimal pierce time will allow for full penetration of the material before movement occurs.

When the pierce time is too long the plasma arc will have fully penetrated the material, resulting in a hole beneath the torch. The plasma cutter will have trouble maintaining the arc because there is no material to conduct it. This results in sputtering as it switches between the pilot arc and cutting arc or simply an arc break alarm that pauses the cut.

THC LOCK TIME - Time to lock THC (S) is the time the THC will be locked after starting the cut. On thick material this setting can improve initial stability of the arc, where extreme variations in arc voltage cause unstable automatic torch height control.

ACCELERATION - The jumpiness of the movement is predominately controlled by **Acceleration (S)** time setting. At high speeds increasing it may make movement smoother.

ARC VOLTS - Arc volts is the measured voltage drop across the arc, which is useful for controlling height. The Torch Height Controller (THC) will attempt to keep the arc volts at **Set Arc**; the optimal range will vary slightly depending on the plasma cutter used. For the Eastwood Versa-Cut 40 CNC Plasma Cutter it is between 75-90.

IHS TIME - The Initial Height Setting is defined by seconds of motor run time upwards. Ideally, the initial height is slightly higher than the cutting height. With thick material, good initial height is critical because damage to the consumables can occur from slag being shot back into the Plasma Torch.

KERF - The kerf varies depending on numerous factors, and even varies slightly as the table cuts. However, it is typically close to your Plasma Torch nozzle orifice diameter. To get the most accurate kerf width, measure a cut piece with zero kerf compensation applied and subtract the actual size from the set size. If both sides being measured have been cut, divide by two. Due to the nature of plasma cutting there will almost always be a positive bevel that is most evident on thicker materials. This means, from top to bottom, inside features will slope smaller and outside features will slope larger.

CUT SPEED REFERENCE TABLE

This table provides a starting point when CNC Plasma Cutting. It is directly applicable when using the Eastwood Versa-Cut 40 CNC Plasma Cutter with Machine Torch, but you may find it suitable for other plasma cutters of similar capability. Note that depending on amperage being used, consumable condition, material, and a multitude of other factors you may need to fine tune these parameters for the best cut possible.

Thickness (inch) – [mm]	Amperage (A)	Cut Speed (ipm) - [mm/min]	Pierce Time (sec)	Acc Time (sec)	Arc Volts (V)	IHS Time (sec)
0.0375 (20 gauge) [0.952]	40	135 [3500]	0.1	0.2	76	0.3
0.050 (18 gauge) [1.27]		100 [2500]	0.3	0.2	76	0.3
0.0625 (16 gauge) [1.59]		65 [1700]	0.5	0.2	77	0.3
0.109 (12 gauge) [2.77]		50 [1300]	0.8	0.3	77	0.4
0.125 [3.18]		45 [1200]	0.9	0.3	77	0.4
0.25 [6.35]		35 [1000]	1.2	0.3	79	0.4

NOTES

CNC TABLE REPLACEMENT PARTS

#66728 Water Tray Drain Plug
#66731 Emergency Stop Switch
#66734 Motherboard
#66735 Power Supply Unit
#68253 Water Tray Slat
#68252 Cut Controller Panel and Fascia
#68251 Cut Controller Wiring Harness
#68250 Stepper Motor Driver
#68249 Power Switch
#68248 Torch Height Motor Assembly (Hardware installed)
#68247 X-Axis Stepper Motor with Y-Axis Limit Switches and Wiring Harness
#68246 Y-Axis Stepper Motor with Wiring Harness
#68245 X-Axis Limit Switch Assembly
#68244 Gantry Bearing Block Assembly with Bearings
#68243 X-Axis Lead Screw
#68242 Y-Axis Lead Screw
#68241 Ø3" (75mm) Swivel Locking Caster
#68240 Cut Control Panel Cable
#68239 Power Cable
#68238 X-Axis Limit Switch and Torch Height Motor Cable
#68237 X-Axis Gantry Support Roller Assembly

CUT 40 CNC CONSUMABLES

#66721 Hand Torch Electrode (5 Pack)
#66720 Hand Torch Nozzle (5 Pack)
#66719   Hand Torch Air Diffuser (2 Pack)
#66718 Hand Torch Wire Guide (2 Pack)
#66717 Hand Torch Outer Nozzle (2 Pack)
#66716 Machine Torch Electrode (10 Pack)
#66715 Machine Torch Nozzle (10 Pack)
#66714 Machine Torch Air Diffuser (2 Pack)
#66713 Machine Torch Air Stem (2 Pack)
#66712 Machine Torch Cap (5 Pack)
#66711 Machine Torch Outer Nozzle Pack (2 Pack)

ADDITIONAL ITEMS

R&D MUST-HAVE ACCESSORIES

#66725
Eastwood Versa-Cut 40 CNC Plasma Cutter

#66723
Machine Torch

#33863
Plasma Cutting Fluid (5 Gallon)

PLASMA CUTTING FLUID

#33863	Plasma Cutting Fluid (5 Gallon)
#33864	Plasma Cutting Fluid (1 Gallon)

OPTIONAL ITEMS

#66724	Hand Plasma Torch
#13848	Plasma Cutting Glasses
#55070 / 55071	Leather MIG Welding Gloves (M / L)
#55068 / 55068	Leather TIG Welding Gloves (M / L)
#12762	L, XL, XXL Cotton Welding Jacket
#55065	L, XL, XXL Leather Welding Jacket
#21484	XL View Auto Darkening Welding Helmet
#21483	Large View Auto Darkening Welding Helmet
#31739	25' Long 110V Heavy Duty Welder Extension Cord
#20029	25' Long 220V Heavy Duty Welder Extension Cord
#20285	40' Long 220V Heavy Duty Welder Extension Cord

Visit eastwood.com for complete info and pricing.

If you have any questions about the use of this product, please contact
The Eastwood Technical Assistance Service Department: 800.343.9353 >> email: tech@eastwood.com
PDF version of this manual is available at eastwood.com
The Eastwood Company   263 Shoemaker Road, Pottstown, PA 19464, USA   800.343.9353   eastwood.com

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