



DO THE JOB RIGHT.®

Item #74010

TIG 220 AC/DC WELDER

ASSEMBLY AND OPERATING INSTRUCTIONS



The **EASTWOOD TIG 220 AC/DC WELDER** is an evolution of Eastwood's successful TIG 200 AC/DC. This new machine features a similar robust and analog experience, but with additional process controls for professional tuning of the welding experience. AC waveform, balance, frequency, start method, pulsed welding, start and end amperage settings are all adjustable from the front panel. The included WP-17F flex-head TIG welding torch with gas lens kit and Foot Pedal provide versatility for any TIG scenario. Output amperage has been increased for welding material 1/4" thick and beyond, but the overall form factor of the welder has shrunk thanks to the latest in inverter technology. This welder is a dual-voltage machine that can plug into a normal household outlet or unlock full power with a dedicated welder outlet. Enhance your TIG welding capability with this feature-rich TIG machine.

STATEMENT OF LIMITED WARRANTY

The Eastwood Company (hereinafter "Eastwood") warrants to the end user (purchaser) of all new Eastwood-branded tools and chemicals (collectively called the "products") that each will be free of defects in workmanship and material. This warranty is void if the equipment has been subjected to improper installation, improper care or abnormal operations.

WARRANTY PERIOD:

All warranty periods begin on the date of product delivery from Eastwood. Warranty Periods are listed below, along with the products covered during those warranty periods:

3-Year Warranty on Material, Workmanship, and Defects:

- | | | | |
|--------------------------------|---------------------------------|----------------------------|---------------------------------|
| • Eastwood MIG 135 Welder | • Eastwood TIG 200 DC | • Eastwood MIG 175 Welder | • Eastwood TIG 200 AC/DC |
| • Eastwood MIG 250 Welder | • Eastwood MP140i Welder | • Eastwood TIG 200 Digital | • Eastwood MP200i Welder |
| • Eastwood Versa-Cut 20 | • Eastwood Elite MP250i Welder | • Eastwood Versa-Cut 40 | • Eastwood 90A Flux Core Welder |
| • Eastwood Versa-Cut 60 | • Eastwood ARC 80 Stick Welder | • Eastwood Rotisserie | • Eastwood Contour SCT® |
| • Concoours Pro HVLP Paint Gun | • Eastwood TIG 220 AC/DC Welder | | |

Items not covered under this warranty: Consumables, unless deemed defective, are not covered by the 3-year warranty. Abuse, neglect, and lack of maintenance is not covered under this warranty. All other components are covered by the warranty and will be repaired or replaced at the discretion of Eastwood.

2-Year Warranty on Material, Workmanship and Defects:

- | | | | |
|--|--------------------------------------|--------------------------------------|--------------------------------------|
| • Eastwood Air QST-30/60 Scroll Compressor | • Eastwood 80 Gal. 7.5 HP Compressor | • Eastwood 80 Gal. 5 HP Compressor | • Eastwood 60 Gal. 4.7 HP Compressor |
| • Eastwood 60 Gal. 3.7 HP Compressor | • Eastwood Panoramic Welding Helmet | • Eastwood 30 Gal. 1.9 HP Compressor | • Eastwood XL View Welding Helmet |
| • Eastwood Lg View Welding Helmet | • Eastwood Auto Darkening Helmet | • Concoours 2 HVLP Paint Gun | |

Items not covered under this warranty: Consumables, unless deemed defective, are not covered by the 2-year warranty. Abuse, neglect, and lack of maintenance is not covered under this warranty.

1-Year Warranty on Material, Workmanship and Defects:

- | | |
|-------------------------------------|-------------------|
| • Eastwood Tools Not Included Above | • Fairmount Tools |
|-------------------------------------|-------------------|

Items not covered under this warranty: Consumables, unless deemed defective, are not covered by the 1-year warranty. Abuse, neglect, and lack of maintenance is not covered under this warranty.

90-Day Warranty on Material, Workmanship and Defects:

- | | |
|-------------------------------|------------------|
| • Eastwood Paints & Chemicals | • Rockwood Tools |
|-------------------------------|------------------|

Items not covered under this warranty: Consumables, unless deemed defective, are not covered by the 90-day warranty. Abuse, neglect, and lack of maintenance is not covered under this warranty.

Lifetime Warranty on Material, Workmanship and Defects:

- Selected Eastwood Hand Tools carry a Limited Lifetime Warranty

Items not covered under this warranty: Abuse, neglect, and lack of maintenance is not covered under this warranty.

CONDITIONS TO OBTAIN WARRANTY COVERAGE:

- Proof of purchase must be provided for all warranty claims
- Purchaser must first contact Eastwood at 1-800-343-9353 for an RMA Number before Eastwood will accept any warranty returns. Final determination of warranty on welding and cutting equipment will be made by Eastwood.

WARRANTY REPAIR: If Eastwood confirms the existence of a defect covered under this warranty plan, Eastwood will determine whether repair or replacement is the most suitable option to rectify the defect. At Eastwood's request, the purchaser must return, to Eastwood, any products claimed defective under Eastwood's warranty.

FREIGHT COSTS: The purchaser is responsible for shipment to and from Eastwood.

WARRANTY LIMITATIONS:

EASTWOOD WILL NOT ACCEPT RESPONSIBILITY OR LIABILITY FOR REPAIRS UNLESS MADE BY EASTWOOD. EASTWOOD'S LIABILITY UNDER THIS WARRANTY SHALL NOT EXCEED THE COST OF CORRECTING THE DEFECT OF THE EASTWOOD PRODUCT. EASTWOOD WILL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES (SUCH AS LOSS OF BUSINESS, ETC.) CAUSED BY THE DEFECT OR THE TIME INVOLVED TO CORRECT THE DEFECT. THIS WRITTEN WARRANTY IS THE ONLY EXPRESS WARRANTY PROVIDED BY EASTWOOD WITH RESPECT TO ITS PRODUCTS. WARRANTIES IMPLIED BY LAW SUCH AS THE WARRANTY OF MERCHANTABILITY ARE LIMITED TO THE DURATION OF THIS LIMITED WARRANTY FOR THE EQUIPMENT INVOLVED. THIS WARRANTY GIVES THE PURCHASER SPECIFIC LEGAL RIGHTS. THE PURCHASER MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.

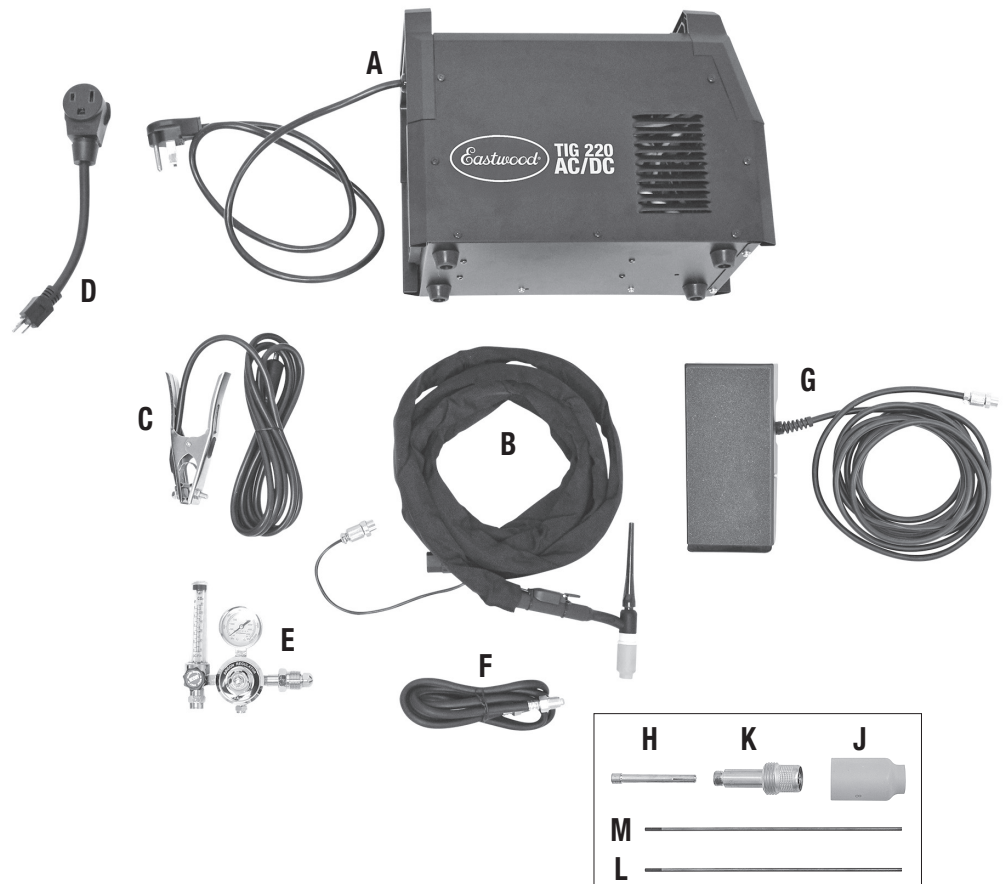
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INCLUDES

- (1) Eastwood TIG 220 AC/DC Welder [A]
- (1) Flex Head TIG Welding Torch and Cable Assembly, 12 ft. [3.65m] with 3/32" Gas Lens Collet Body and Collet, #8 Gas Cup and Long Back Cap pre-installed [B]
- (1) Ground Cable/Clamp Assembly, 9.5 ft. [2.9m] [C]
- (1) Adapter Cord, 8" [0.2m] [D]
- (1) Argon Regulator/Flowmeter [E]
- (1) Shielding Gas Hose, 4.6' [1.4m] [F]
- (1) Foot Pedal with Cable Assembly, 16 ft. [4.85m] [G]
- (1) 1/16" Collet [H]
- (1) Spare #8 Gas Cup [J]
- (1) 1/16" Gas Lens Collet Body [K]
- (1) Tungsten 3/32" x 6", Red [L]
- (1) Tungsten 3/32" x 6", Green [M]



SPECIFICATIONS

POWER SUPPLY

Input Voltage	240 VAC, 50/60Hz, 1 Ph	120 VAC, 50/60Hz, 1 Ph
No Load Voltage	68V	
Rated Input Current: DC TIG (I_{lmax} / I_{leff})	33.2A / 16.6A	35.1A / 17.6A
Rated Input Current: AC TIG (I_{lmax} / I_{leff})	33.2A / 21.0A	35.1A / 22.2A
Rated Input Current: STICK (I_{lmax} / I_{leff})	34.9A / 17.5A	42.5A / 21.3A
Output Current Adjustment: TIG	10A (10.4V) - 220A (18.8V)	10A (10.4V) - 140A (15.6V)
Output Current Adjustment: Stick	20A (20.8V) - 180A (27.2V)	20A (20.8V) - 120A (24.8V)
Rated Duty Cycle: DC TIG	25% @ 220A (18.8V) 60% @ 142A (15.7V) 100% @ 110A (14.4V)	25% @ 140A (15.6V) 60% @ 90A (13.6V) 100% @ 70A (12.8V)
Rated Duty Cycle: AC TIG	40% @ 220A (18.8V) 60% @ 179A (17.2V) 100% @ 139A (15.6V)	40% @ 140A (15.6V) 60% @ 115A (14.6V) 100% @ 89A (13.6V)
Rated Duty Cycle: Stick	25% @ 180A (27.2V) 60% @ 116A (24.6V) 100% @ 90A (23.6V)	25% @ 120A (24.8V) 60% @ 77A (23.1V) 100% @ 60A (22.4V)
Starting Method: TIG	High Frequency	
Power Factor	0.73	
Efficiency	TIG: 71% Stick: 80%	
Pre-Flow Time	0.1 s - 3.0 s	
Post-Flow Time	1 s - 15 s	
Overall Dimensions	16.81" x 8.74" x 13.31" [427 x 222 x 338mm]	
Weight	22.93 lbs. [10.4kg]	

DUTY CYCLE

The rated duty cycle refers to the amount of welding that can be done within an amount of time. It is easiest to look at your welding time in blocks of 10 minutes and the duty cycle being a percentage of that 10 minutes. If welding at 142 amps with a 60% duty cycle, within a 10 minute block of time you can weld for 6 minutes with 4 minutes of cooling for the welder.

If the duty cycle is exceeded, and the built-in breaker is tripped, allow the unit to cool for a minimum of 15 minutes. When a safe temperature has been reached, the welder will automatically enable welding again. To increase the duty cycle, turn down the welder output. Going above 142 amps will yield a lower duty cycle.

OVERLOAD PROTECTION

The Eastwood TIG 220 AC/DC Welder is equipped with overload protection. This will protect the welder if the duty cycle is exceeded. If the duty cycle is exceeded, the welder will cut off the power supply to the welder's outputs, the AMBER overload indicator will illuminate, and the display will show E02 for overheat protection. The fan will still run to cool the unit. Allow the welder to cool for a minimum of 15 minutes or until the error display goes out.

NOTE: The Eastwood TIG 220 AC/DC is equipped with a dynamic cooling fan. The fan will briefly run when the unit is powered up. It will only run when required and it will turn off again when not needed.

SAFETY INFORMATION

IMPORTANT NOTE:

These instructions are intended only to provide the user with some familiarity of the Eastwood TIG 220 AC/DC welder. Electric welding is a highly complex procedure with many variables. If you have no prior experience with electric welding, it is extremely important to seek the advice of someone experienced in electric welding for instruction, enroll in a local technical school welding course or study a comprehensive how-to video and obtain a good quality reference book on electric welding as there is a moderate learning curve necessary before achieving proficiency in welding different metals such as steel, stainless steel and aluminum. It is also strongly recommended that the user adhere to the American Welding Society guidelines, codes, and applications prior to producing welds where safety is affected.

Welding can be dangerous to you and other persons in the work area. Read and understand this instruction manual before using this Eastwood welding machine. Injury or death can occur if safe welding practices are not followed. Safety information is set forth below and throughout this manual. Save these instructions for future reference.

To learn more about welding safety, read OSHA Title 29 CFR 1910, available at www.osha.gov; ANSI Z49.1, "Safety in Welding, Cutting and Allied Processes," available at www.aws.org; and the consumable manufacturer's Safety Data Sheets.

The following explanations are displayed in this manual, on the labeling, and 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.



DANGER ELECTRIC SHOCK CAN CAUSE INJURY OR DEATH!

- Improper use of an electric welder can cause electric shock, injury, and death! Read all precautions described in the welder manual to reduce the possibility of electric shock.
- Disconnect welder from power supply before performing any assembly, disassembly, or maintenance of the welder.
- Always wear dry, protective clothing, leather welding gloves, and insulated footwear. Use suitable clothing made from durable flame-resistant material to protect your skin.
- If other persons or pets are in the area of welding, use welding screens to protect bystanders from sparks.
- Always operate the welder in a clean, dry, well-ventilated area. Do not operate the welder in humid, wet, rainy, or poorly ventilated areas.
- The electrode and work (or ground) circuits are electrically "hot" when the welder is on. Do not allow these "hot" parts to come in contact with bare skin or wet clothing.
- Separate yourself from the welding circuit by using insulating mats to prevent contact from the work surface.
- Be sure that the work piece is properly supported and grounded prior to beginning an electric welding operation.
- Always attach the ground clamp to the piece to be welded and as close to the weld area as possible. This will give the least resistance and best weld.



DANGER WELDING SPARKS CAN CAUSE FIRE OR EXPLOSION!

- Electric welding produces sparks which can be discharged considerable distances at high velocity igniting flammable or exploding vapors and materials.
DO NOT operate electric arc welder in areas where flammable or explosive vapors are present.
DO NOT use near combustible surfaces. Remove all flammable items from the work area where welding sparks can reach (minimum of 35 feet).
- Always keep a fire extinguisher nearby while welding.
- Use welding blankets to protect painted and or flammable surfaces, rubber weather-stripping, dash boards, engines, etc.

SAFETY INFORMATION



⚠ WARNING ELECTROMAGNETIC FIELDS CAN BE A HEALTH HAZARD!

- The electromagnetic field that is generated during arc welding 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 electric welding operations.
- Exposure to the electromagnetic fields generated while welding may have other health effects which are not known.



⚠ WARNING ARC RAYS CAN INJURE EYES AND BURN!

- 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 #11) to protect your eyes from sparks and the rays of the arc when welding or when observing open arc welding (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 welding, use welding screens to protect bystanders from sparks and arc rays.



⚠ WARNING FUMES AND WELDING GASES CAN BE A HEALTH HAZARD!

- Fumes and gases released during welding are hazardous. Do not breathe fumes that are produced by the welding operation.
- Prolonged inhalation of welding fumes above safety exposure limits can injure the lungs and other organs.
- Use enough ventilation and/or exhaust at the arc to keep fumes and gases from your breathing area.
- Use an OSHA approved respirator when welding in confined spaces or where there is inadequate ventilation.
- Never weld coated materials including but not limited to: cadmium plated, galvanized, lead based paints, powder coat.



⚠ WARNING BUILDUP OF GAS CAN INJURE OR KILL!

- Shut off gas supply when not in use.
- Ensure adequate ventilation of the welding area.
- Do not weld in confined areas.
- Always turn your face away from valve outlet when opening cylinder valve.



⚠ WARNING CYLINDERS CAN EXPLODE IF DAMAGED!

- Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. As gas cylinders are a normal component of the welding process, use extra care to handle them carefully.
- Protect compressed gas cylinders from excessive heat, mechanical shocks, physical damage, slag, open flames, sparks, and arcs. Keep away from any welding or other electrical circuits.
- Install cylinders in an upright position by securing to a specifically designed rack, cart, or stationary support to prevent falling or tipping over.
- Never weld on a pressurized cylinder or explosion will occur.
- Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and all related components in good condition.
- Keep protective cap in place over valve except when cylinder is in use.
- Use proper equipment, procedures and have adequate help when moving or lifting cylinders.

SAFETY INFORMATION



⚠ CAUTION HOT METAL AND TOOLS WILL BURN!!

- Electric welding heats metal and tools to temperatures that will cause severe burns!
- Use protective, heat resistant gloves and clothing when using Eastwood or any other welding equipment. Never touch welded work surface, the welding torch gas cup, tungsten, or rod until they have completely cooled.



⚠ CAUTION FLYING METAL CHIPS CAN CAUSE INJURY!

- Grinding and sanding will eject metal chips, dust, debris, and sparks at high velocity. To prevent eye injury wear approved safety glasses.
- Wear an OSHA-approved respirator when grinding or sanding.
- Read all manuals included with specific grinders, sanders or other power tools used before and after the welding process.
- Be aware of all power tool safety warnings.



⚠ NOTICE FIRST AID

- If exposed to excessive fumes move to an area with fresh air. Follow safety information on the welding wire, tungsten electrode, filler rod and stick electrode manufacturers' Safety Data Sheets.
- For other injuries follow basic first aid techniques and call physician or emergency medical personnel.

CONNECTING THE WELDER TO A POWER SOURCE

The Eastwood TIG 220 AC/DC Welder requires a dedicated 240 VAC, 50 AMP, circuit breaker protected outlet. The plug installed on the welder is a NEMA 6-50P and should be used with a NEMA 6-50R receptacle. If unsure about your electrical setup contact a licensed electrician.

As an alternative, by using the included adapter cord, the TIG 220 AC/DC can be used with a 120 VAC, 20 AMP grounded NEMA 5-15R outlet protected by a circuit breaker.

If using an extension cord is required, we recommend using our welder extension cords for optimal performance: Eastwood items #31739 25ft Heavy Duty 110V Extension Cord, #20029 25ft Heavy Duty 220V Extension Cord, and #20285 40ft Heavy Duty 220V Extension Cord.

CONTROL AND DISPLAY PANEL

FRONT UPPER PANEL (FIG 1A)

1. **Digital Display.** The digital display is your primary visual interface with the machine. It shows welding parameters and settings. The four LEDs immediately below the screen indicate the unit of the parameter being adjusted (Hertz, Seconds, Percent, Amps).
2. **Overload Indicator.** Illuminates AMBER when the Duty Cycle has been exceeded, the welder is overloaded or if other abnormalities exist.
3. **VRD Indicator.** Shows whether the Voltage Reducing Device (VRD) is turned on or off for Stick welding. Holding the **Torch Mode Button** until the indicator flashes and then quickly releasing and clicking it again will toggle the VRD on/off.
4. **Foot Pedal Indicator.** Illuminates when the Foot Pedal is connected in TIG mode.
5. **Waveform Button.** Press Button to switch between output modes:
 - **DC:** Direct current is used for welding steels and most metals.
 - **SQU.:** Alternating current square wave is the most commonly used mode for welding aluminum and magnesium. High heat input for enhanced penetration.
 - **SINE:** Sine wave by comparison produces a smoother welding arc with less heat input.
 - **TRI.:** Triangle wave is the final alternating current option. This moves even less heat into the material with a more peaked power delivery that many find preferable on thin aluminum sheet work.
6. **AC Frequency Knob.** Higher frequency creates a more intense and concentrated arc with a smoother weld seam. This is great for working in a tight area or on thin material where you don't want to damage nearby features. A good starting frequency for these qualities is 120Hz. Lower AC frequencies create a wider, hotter weld seam. We recommend starting around 80Hz as a lower baseline to adjust from. Adjustment range 20Hz - 300Hz.
7. **AC Balance Knob.** This adjusts the percentage of time the current is electrode positive. High percentages result in more cleaning effect and a cleaner, smoother weld seam. However, weld penetration will be shallower. Also, the tungsten gets hotter and takes in more contaminants. If you wish to ball the tungsten end, set to 70%. Lower balance settings (25 - 35%) are suggested for most welding situations. If numerous black spots appear in the puddle, try adjusting the balance setting up in 2% increments until the black spots are minimized. Adjustment range 20% - 80%.
8. **Start Current Knob.** This is the amperage the arc will start with. It will ramp up until reaching the **Peak Current** setting over the amount of time set by **Up Slope**. In Stick mode the Hot Start is controlled by this knob. This amperage over the set point when the arc is initiated to aid starts. Adjustment range 0 - 50A, off.
9. **Pre Flow Knob.** Rotate Knob clockwise and counterclockwise to adjust the amount of time gas will flow out before the arc starts. This helps ensure the arc is fully shielded by gas in a steady flow state as it starts which minimizes workpiece contamination, tungsten contamination, and tungsten burnout. Adjustment range 0.1s - 3s.
10. **Up Slope Knob.** The amount of time over which the amperage will ramp to the **Peak Current** setting. To turn this off set to zero and the arc will initiate at the set **Peak Current**.
11. **Peak Current Knob.** Rotate Knob clockwise and counterclockwise to increase and decrease welding amperage, respectively. In Stick mode the Arc Force is controlled by this knob. Also known as force or dig, this allows for a tighter arc to the workpiece without extinguishing. Adjustment range 0 - 100A, off.
12. **Down Slope Knob.** Similar to **Up Slope**, but after releasing the trigger this is the amount of time over which the amperage will ramp down to the **End Current**. Once at the **End Current**, the arc will be ended. Turn to zero for the arc to end immediately at the **Peak Current**.
13. **Post Flow Knob.** Rotate Knob clockwise and counterclockwise to adjust the amount of time gas will flow out after the arc is closed. Like **Pre Flow**, it minimizes workpiece contamination, tungsten contamination, and tungsten burnout. The continuation of gas flow also protects the weld puddle and electrode against oxidization while cooling after welding. Adjustment range 0s - 15s.
14. **End Current Knob.** Amperage the arc will end with after the **Down Slope** is completed.
15. **Pulse Frequency:** The frequency at which the welder will repeat the pulsing cycle. 0.5Hz is a two second cycle time, 1Hz is a one second cycle time, 2Hz is a half second cycle time, and so on. To turn off pulsing, scroll the number down until you see OFF.
16. **Peak On Time.** Percentage of time the welder is outputting the **Peak Current** set point when pulsing between that and the **Base Current**. For example, if at 60%, then 60% of the cycle time will be at the **Peak Current**, and 40% will be at the **Base Current**. With a 1Hz Pulse Frequency 0.6s will be at **Peak Current** and 0.4s will be at **Base Current**.
17. **Base Current.** The alternate amperage setting as a percentage of the **Peak Amps** when using pulse mode.
18. **Pulse Mode Button.** Press Button to switch between **OFF/LOW/HIGH** frequency range pulse welding ranges.
19. **Torch Mode Button.** **2T** is "normal" operation for short welds. Depress trigger and hold to begin arc and it will continue until trigger is released. **4T** is "cruise control" for welding. Depress trigger and hold until the arc is initiated, then release trigger. The arc continues until trigger is pressed again, which terminates the arc. Leave in **2T** mode when the Foot Pedal is being used. **SPOT** automatically produces a brief 0.1 - 20 second timed, ON/OFF "Tack Weld" operation every time the Trigger is depressed. Adjust timer by using the **Down Slope Knob**.
20. **Process Mode Button.** Press to switch between high-frequency (HF) start TIG, lift start TIG or Stick mode.

FIG. 1a



FIG. 1b



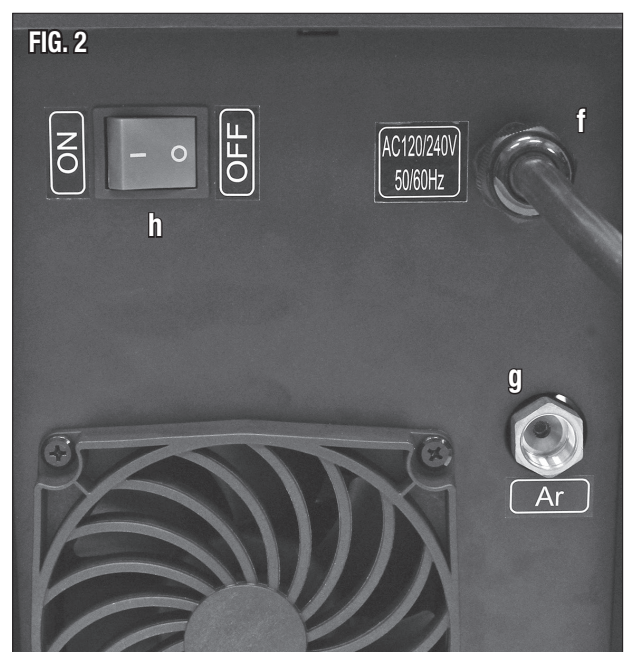
FRONT LOWER PANEL (FIG 1B)

- [a] TIG Torch Connection
- [b] Negative Connection
- [c] TIG Trigger and Foot Pedal Connection
- [d] Positive Connection
- [e] Wireless Foot Pedal Module Connection

REAR PANEL (FIG 2)

- [f] Power Cord
- [g] Shielding Gas Connection
- [h] ON/OFF Switch

FIG. 2



TIG WELDING SET-UP

The Eastwood TIG 220 AC/DC is factory set-up for TIG welding use with a 3/32" tungsten (included, not installed) and 100% argon shielding gas (not included).

The procedure for configuring to Stick welding use is covered further on in this manual.

INSTALLING THE TIG TORCH

- Retrieve the Flex Head TIG Welding Torch **[B]** and thread the power/gas lead onto the TIG Torch Power/Gas Connection **[a]** snugly (**FIG 3**).
- Plug the TIG Trigger Plug into the TIG Trigger and Foot Pedal Connection **[c]** at the Front Panel and fasten the security lock (**FIG 3**).

IMPORTANT NOTE: The connection of the TIG Torch Hose/Wire Cable **[B]** MUST BE fully threaded and snugged onto Gas/Power Connection **[a]** or gas may leak.

INSTALLING THE GROUND CABLE AND CLAMP

- Locate the Ground Cable/Clamp Assembly **[C]** and connect the plug on the brass end to the (+) Positive Connection **[d]**. Align the key of the brass ferrule with the notch of the receptacle at the 12:00 position, insert the plug and twist clockwise ½ turn until it is tight (**FIG 3**).

INSTALLING THE FOOT PEDAL

An alternative to the on/off hand trigger attached to the TIG Torch, the included Foot Pedal **[G]** enables you to trigger the output and vary the amperage in real time. This Foot Pedal works just like a car's throttle pedal: rocking your foot down will gradually increase the amperage output up to the peak amperage setting, and letting off will gradually decrease to minimum output.

Skilled bench welders can make artwork with the Foot Pedal, but beginners may find it overwhelming. Furthermore, it might not always be practical to lug around and spend time positioning the Foot Pedal.

- Unfasten the TIG Trigger Plug security lock and unplug.
- Insert the Foot Pedal Plug. Fasten the security lock (**FIG 4**).
- The Foot Pedal Indicator **[4]** will illuminate to indicate the Foot Pedal is detected.

FIG.3



FIG.4



INSTALLING THE SHIELDING GAS SUPPLY

⚠ WARNING BUILDUP OF GAS CAN INJURE OR KILL!

- Shut off shielding gas supply when not in use.
- Always ventilate confined spaces or use approved air-supplied respirator.
- Always turn your face away from valve outlet when opening cylinder valve.

⚠ WARNING CYLINDERS CAN EXPLODE IF DAMAGED!

- Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. As gas cylinders are a normal component of the welding process, use extra care to handle them carefully.
- Protect compressed gas cylinders from excessive heat, mechanical shocks, physical damage, slag, open flames, sparks, and arcs. Keep away from any welding or other electrical circuits.
- Install cylinders in an upright position by securing to a specifically designed rack, cart, or stationary support to prevent falling or tipping over.
- Never weld on a pressurized cylinder or explosion will occur.
- Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and all related components in good condition.
- Keep protective cap in place over valve, except when cylinder is in use.
- Use proper equipment, procedures and have adequate help when moving or lifting cylinders.
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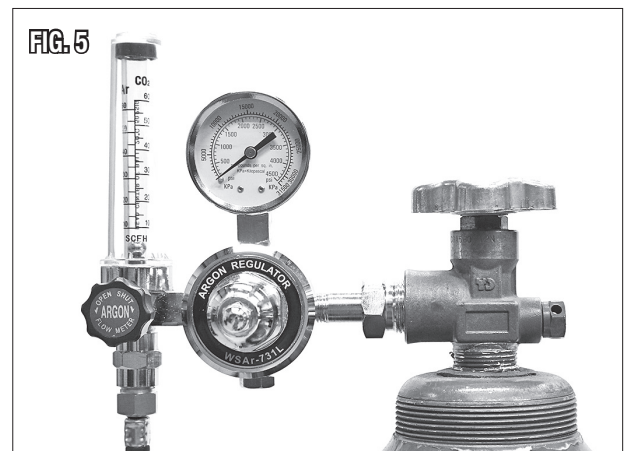
A shielding gas cylinder is NOT INCLUDED with the Eastwood TIG 220 AC/DC but is necessary to TIG weld. It can be bought at most local welding supply stores. 100% argon is recommended for all TIG welding applications.

- Place the Eastwood TIG 220 AC/DC in a secure dedicated area or on a welding cart (not included).
- Secure the shielding gas cylinder to a stationary object or mount to a specifically designed welding cart, equipped to hold one so that the cylinder cannot fall over.
- Remove the cap from the shielding gas cylinder.
- Insert the large male fitting on the Argon Regulator/Flowmeter [E] into the female fitting on the shielding gas cylinder (not included).

⚠ NOTICE

Do not use white thread sealing tape on these connections as it is an inert spherical gas fitting and does not require it. If you have a leak check for burrs or dirt in the threads or on the spherical joints.

- Tighten the fitting with a wrench until snug, do not overtighten (FIG 5).
- Connect either end of the Shielding Gas Hose, 4.6' [1.4m] [F] to the fitting on the Regulator and tighten it until snug (FIG 5).
- Connect the other end of the Shielding Gas Hose to the Shielding Gas Connection [g] on the rear of Eastwood TIG 220 AC/DC and tighten until snug.
- Check the gas lines for leaks by slowly opening the valve on the gas cylinder. When welding, the valve on the cylinder should always be fully open. Close it when finished welding to avoid loss of gas.



TUNGSTEN SELECTION

Before welding, you will need to select a tungsten electrode. There are a variety of different types and sizes available, and they should be selected depending on the material at hand.

- The most popular tungsten types for AC and DC welding are color coded Pink Multi-Mix (Lanthanum, Cerium, Yttrium), Blue (Lanthanum), Grey (Ceriated), Red (Thoriated, included **[L]**), Green (Pure, included **[M]**). Multi-Mix and Lanthanated are some of the best general purpose mixes available, but always research which tungsten may enable the best results for your particular welding situation and material.
- Higher welding currents require a larger tungsten. Generally, a 3/32" tungsten is suitable for most hobbyist jobs. If welding thin gauge steel at double digit amperage often, you may find a 1/16" gives you a better start. Frequent welding around 200A may justify stepping up to a 1/8" tungsten.

TUNGSTEN SHARPENING

The geometry and quality of the tungsten's sharpened point is as important as the size and type. To avoid contamination of the tungsten and ultimately the weld, it is imperative to have a dedicated grinding wheel used for tungsten grinding only. A fine grit standard 6" synthetic stone grinding wheel on a bench top grinder is sufficient, or a dedicated Tungsten Grinder (#33307 Corded or #58878 Cordless) are optionally available.

- Make sure the welder is turned OFF and unplugged.
- Make sure the tungsten and Torch are sufficiently cooled for handling, then loosen and remove the Back Cap. Remove the tungsten from the front of the Torch (Removing from the rear could damage the collet if the tip is distorted). Remove the Collet.

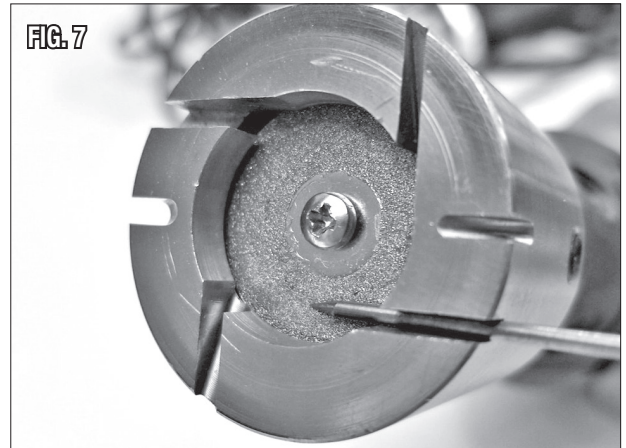
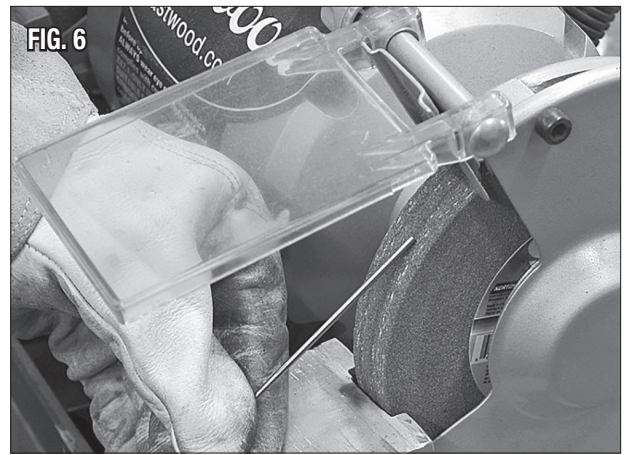
- If the tungsten is used and the end is contaminated, use pliers or a suitable tool to grip the tungsten above the contaminated section and snap off the end of the tungsten.

NOTE: Tungsten is brittle and often splinters if snapped. To avoid splintering, grind a notch in the tungsten before snapping it off or grind fully through.

- Holding the tungsten tangent to the surface of the grinding wheel, rotate the tungsten while exerting light pressure until a point is formed (**FIGS 6 & 7**).
- Point geometry affects arc wander and the "cone" of the welding arc.
 - Longer, pointed tips (shallow angle 5° - 35°) will give the least arc wander, easiest start and generally shallower penetration with a slightly wider weld puddle. Extremely shallow angles may melt off under high amps. 22.5° is one of the most common sharpening angles.
 - Shorter tips (wider angle 40° - 60°) have significantly better longevity with increased penetration, but a narrower weld puddle. It is also more likely to encounter arc wander and might not start as smoothly.
 - Blunt tips (90° - 180°) further exaggerate the effects of a shorter tip. Typically found when welding thick material at high amperage.

TECH TIP: Grinding the point off of a tip (aka blunting or flat spotting it) (**FIG 8**) will typically increase penetration and durability of any given sharpening angle at cost of increased likelihood of arc wander. It may also narrow the weld puddle.

- Replace the tungsten in the TIG Torch.



TIG TORCH DISASSEMBLY (FIG 9)

- Make sure the welder is turned **OFF** and unplugged.
- Remove the Back Cap from the Torch.
- If there is a tungsten installed in the Torch, pull it out from the front of the Torch.
- Slide the Collet out of the Torch rear.
- Unscrew and remove the Gas Cup.
- Unscrew and remove the Collet Body.

TIG TORCH ASSEMBLY (FIG 10)

- Select the Collet Body that matches your tungsten diameter and thread it into the front of the Torch.
- Select a Collet that matches your tungsten diameter. Insert the tungsten into the Collet and put the Collet and tungsten back into the Torch.
- Reinstall the Gas Cup to the Collet Body. The Gas Cup size should be selected according to shielding gas requirements for the material being welded. Generally, aluminum and carbon steel do not require as much shielding effect as stainless steel does. Selection also depends on the joint being welded (large Cups will not fit in tight corners). Smaller Cups are more economical on shielding gas because they need less flow.
- Reinstall the Back Cap to lock the tungsten in place. The general rule of thumb for tungsten "stick out" distance is to not extend further than the inner diameter of the Gas Cup (**FIG 11**). However, this is only a general rule and can vary depending on your particular setup and joint. For example, the pre-installed Gas Lens kit encourages laminar gas flow that will provide shielding effect beyond this rule.

TIG SHIELDING GAS FLOW ADJUSTMENT

Before welding, the gas flow rate needs to be adjusted so that the proper amount of shielding gas is flowing over the weld. If there is too little gas flow, there will be porosity in the resulting welds as well as contamination/discoloration of the tungsten. If there is too much gas flow, this will be a waste of gas and may also result in turbulent flow that negatively affects the weld quality. The included Regulator has 2 indicators on it; the gauge on the right is cylinder pressure while the indicator on the left is the gas flow meter.

- Open the gas cylinder valve all the way.
- After the welder is turned on and set to a TIG mode, the Trigger of the TIG Torch or Foot Pedal will control the internal gas solenoid.
- As the unit is triggered, the gas flow meter ball will rise to a steady reading. The CFH (Cubic Feet per Hour) can be read from the scale. Take the reading at the middle of the ball.
- The general rule of thumb is to set gas flow in cubic feet per hour (CFH) at 1.5 - 2 times the cup number size (e.g. #8 gas cup start with 12 - 16 CFH) while flowing. If the shielding effect is not great enough, adjust up in increments of two until satisfactory.
- Once set, close the valve on the TIG torch to avoid wasting gas.
- When finished welding, the valve on the gas cylinder must be closed.

FIG. 9

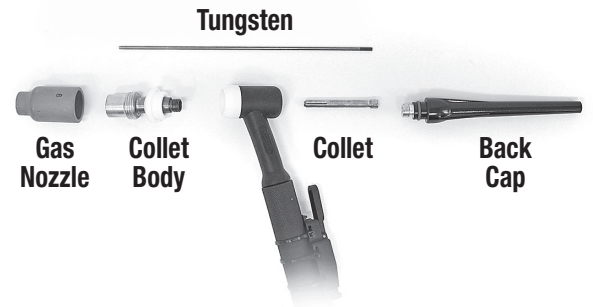
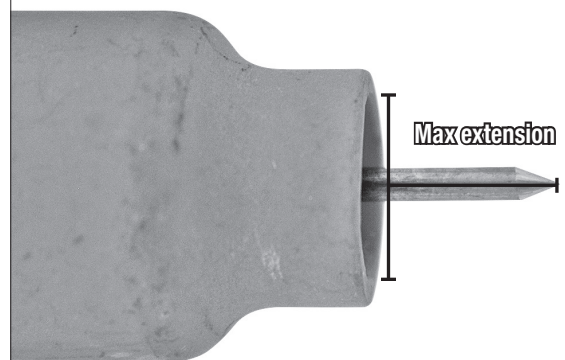


FIG. 10



FIG. 11



FILLER ROD SELECTION

The addition of a filler metal rod to the welding puddle is required for most joints. As with **TUNGSTEN SELECTION**, there are a variety of types and sizes available, and the rod must be suited for the material being welded.

- The most popular common rod for welding mild steel is ER70S-2, stainless steel is ER308L, and aluminum is ER4043. Specialty materials might require a different filler rod and TIG brazing will require a brazing specific silicon bronze rod.
- Generally, higher welding currents will require a larger filler rod. 1/16" or 3/32" diameter rod is suitable for most welding with the TIG 220 AC/DC. If welding thin gauge material at low amps, stainless steel exhaust pipe for example, or a particularly small weld bead is desired, stepping down to 0.045" or thinner can help (in a pinch solid MIG wire can be straightened out and used). If you're maxing the output of this machine on thick plate, you might find stepping up to a 1/8" rod to work better.
- Rod that is too thick for your application will have a greater tendency to "stick" in the welding puddle, it can reduce penetration due to the cooling effect it has on the weld puddle and will result in a larger weld bead. If the rod is too thin you will have to feed it very fast, and the end might melt before even reaching the weld puddle.

TIG WELDING OPERATION

Set the welding parameters described in the previous section to your preference. One rule of thumb for amperage is 1A for every 0.01" of material thickness (e.g. 0.050" start with 50A). If welding dissimilar thicknesses, you might need to split the difference and adjust technique to bias more heat in the thicker piece. Pulsed welding can also allow you to run higher peak amperage with lower base amps to avoid over penetration.

These instructions are intended only to provide the user with some familiarity of the TIG 220 AC/DC. TIG welding is a highly complex procedure with many variables. If you have no experience with TIG welding; it is extremely important to seek the advice of someone experienced in TIG welding for instruction, enroll in a local technical school welding course or study a comprehensive how-to video and obtain a good quality reference book on TIG welding as there is a moderate learning curve necessary before achieving proficiency in TIG welding. Before attempting to use this unit on an actual project or object of value, practice on a similar material as there are many variables present and settings required when TIG welding different metals such as steel, stainless steel, and aluminum. It is also strongly recommended that the user adhere to the American Welding Society guidelines, codes and applications prior to producing welds where safety is affected.

TIG WELDING

⚠ DANGER ELECTRIC SHOCK CAN CAUSE INJURY OR DEATH!

- Disconnect welder from power supply before performing any assembly, disassembly, or maintenance of the welder.
- Always wear dry, protective clothing, leather welding gloves, and insulated footwear. Use suitable clothing made from durable flame-resistant material to protect your skin.
- Always operate the welder in a clean, dry, well-ventilated area. Do not operate the welder in humid, wet, rainy, or poorly ventilated areas.
- The electrode and work (or ground) circuits are electrically "hot" when the welder is on. Do not allow these "hot" parts to come in contact with bare skin or wet clothing.
- Separate yourself from the welding circuit by using insulating mats to prevent contact from the work surface.
- Be sure that the work piece is properly supported and grounded prior to beginning an electric welding operation.
- Always attach the ground clamp to the piece to be welded and as close to the weld area as possible. This will give the least resistance and best weld.

⚠ DANGER WELDING SPARKS CAN CAUSE FIRE OR EXPLOSION!

- Electric welding produces sparks which can be discharged considerable distances at high velocity igniting flammable or exploding vapors and materials.
DO NOT operate electric arc welder in areas where flammable or explosive vapors are present.
DO NOT use near combustible surfaces. Remove all flammable items from the work area where welding sparks can reach (minimum of 35 feet).
- Always keep a fire extinguisher nearby while welding.
- Use welding blankets to protect painted and or flammable surfaces, rubber weather-stripping, dash boards, engines, etc.

⚠ WARNING ELECTROMAGNETIC FIELDS CAN BE A HEALTH HAZARD!

- The electromagnetic field that is generated during arc welding 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 electric welding operations.
- Exposure to the electromagnetic fields generated while welding may have other health effects which are not known.

⚠ WARNING ARC RAYS CAN BURN!

- 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 #11) to protect your eyes from sparks and the rays of the arc when welding or when observing open arc welding (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.

⚠ WARNING FUMES AND WELDING GASES CAN BE A HEALTH HAZARD!

- Fumes and gases released during welding are hazardous. Do not breathe fumes that are produced by the welding operation.
- Prolonged inhalation of welding fumes above safety exposure limits can injure the lungs and other organs.
- Use enough ventilation and/or exhaust at the arc to keep fumes and gases from your breathing area.
- Use an OSHA approved respirator when welding in confined spaces or where there is inadequate ventilation.
- Never weld coated materials including but not limited to: cadmium plated, galvanized, lead based paints, powder coat.

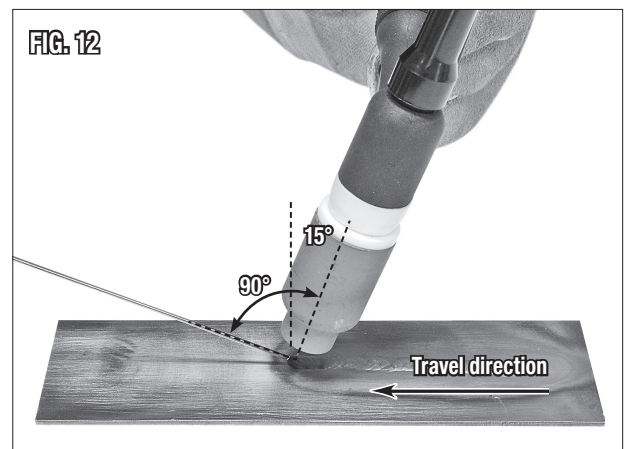
⚠ CAUTION HOT METAL AND TOOLS WILL BURN!

- Electric welding heats metal and tools to temperatures that will cause severe burns!
- Use protective, heat resistant gloves and clothing when using Eastwood or any other welding equipment. Never touch welded work surface, the welding torch gas cup, tungsten, or rod until they have completely cooled.

- Turn the Power Switch at the Rear Panel to the **ON** position.
- Slowly open the gas cylinder valve.

NOTE: Always open valve fully to avoid shielding gas leakage.

- Grounding is very important, place the Ground Cable Clamp on a clean, bare area of your work piece as close to the welding area as possible to minimize the chance of shock. Scrape, wire brush, file or grind a bare area to achieve a good ground to assure safety.
- Use a dedicated stainless steel brush or flap-disc to clean the areas to be welded. To avoid contamination, do not use the brush or flap-disc for any other purpose. Having a set dedicated to a particular material is ideal to minimize contamination.
- Although there is much room for personal style and job specific constraints, a good starting point is to hold the torch perpendicular and centered over the weld joint with a 15° tilt back so the tungsten tip is visible and pointing in the direction of travel (**FIG 12**). When welding, try to keep the distance between the tungsten tip and material equal to the tungsten's diameter. Avoid "dipping" the tungsten tip into the welding puddle because it will be contaminated, necessitating a clean break and sharpen.
- Make sure all your safety gear is in place (welding mask, welding gloves, non-flammable long sleeve apparel) and the area is completely free of flammable material.
- Start the welding arc by triggering the Torch Trigger or Foot Pedal. To stop welding, release the Trigger or Foot Pedal. Keep in mind that after welding you should pause to allow the post-flow shielding gas to protect the tungsten and weld bead as they cool down. Failure to do so will oxidize the tungsten and welded area as they cool, compromising integrity.
- We recommend starting without a filler metal rod and practicing "forming a puddle" in the workpiece a handful of times.
- Once comfortable, move on to "stacking dimes" by "forming a puddle" and moving the torch then pausing in a rhythm to create a series of overlapping puddles. You can do this on a single piece or fusion weld (a weld without using filler material) two pieces together.
- Constantly be aware that TIG welding quickly generates intense heat in the work piece and Torch. Severe burns can quickly occur by contacting hot metal pieces.
- The final challenge is integrating feeding of the filler metal rod. Again, this is a matter of personal preference and dictated by physical constraints, but practice with the rod at a 60° - 90° angle from the tungsten while welding (**FIG 12**). Dab a small amount of rod into the leading edge or center of the puddle when you pause for a dime. Too wide of an angle and you might melt or "blob" the rod end before it makes it to the welding puddle. Too shallow and it can be challenging to get the filler rod to the welding puddle before the arc cone melts it into the puddle which may compromise weld quality. Avoid hitting the tungsten tip with the filler rod because it will be contaminated, necessitating a clean break and sharpen.
- Most welders feed filler by pinching the rod between their thumb and hand, feeding between the index and middle finger. Alternatively, a rod feeding pen (Eastwood #33996) will substitute for some technique.
- When finished, switch the welder **OFF** and close the shielding gas cylinder valve completely.



STICK WELDING SET-UP

⚠ DANGER ELECTRIC SHOCK CAN CAUSE INJURY OR DEATH!

Turn the ON/OFF Switch [g] on the Rear Panel to the OFF position and unplug the welder from the power supply before beginning welder set-up.

POLARITY SELECTION

With an optional electrode holder (Eastwood #20517) the Eastwood Elite TIG 225 LCD can stick weld in both Direct Current Electrode Positive (DCEP) and Direct Current Electrode Negative (DCEN) or Alternating Current (AC). The electrode, or rod, when welding in DCEP is positive and the grounded surface is negative. Generally, DCEP is the most commonly used polarity when stick (aka arc) welding. The electrode when welding in DCEN is negative and the grounded surface is positive. DCEN is typically used for building up heavy deposits of material with less penetration.

ARC (DCEN)

- Connect the Ground Cable/Clamp Assembly, 9.5 ft. [2.9m] [C] to the (+) Positive Connection [d] on the Front Panel of the welder. To connect the plug line up the key on the plug with the keyway on the socket of the welder, insert the plug and twist clockwise until it is tight (FIG 13).
- Connect the Electrode Holder (not included, #20517) to the (-) Negative Connection [b] on the Front Panel of the welder. Connect plug as described above (FIG 13).

ARC (DCEP)

- Connect the Ground Cable/Clamp Assembly, 9.5 ft. [2.9m] [C] to the (-) Negative Connection [b] on the Front Panel of the welder. To connect the plug line up the key on the plug with the keyway on the socket of the welder, insert the plug and twist clockwise until it is tight.
- Connect the Electrode Holder (not included, #20517) to the (+) Positive Connection [d] on the Front Panel of the welder. Connect plug as described above.

FIG 13



ELECTRODE SELECTION

Before beginning welding, you will need to purchase electrodes as these are a consumable item in the arc welding process. There are a variety of different types of rods available and they should be selected depending on the project at hand. The chart below is an overview of some of the most popular electrodes.

Electrode	Polarity	Usage
E6010	DCEP	This electrode works well for welding rusty, dirty, painted, or greasy steels.
E6011	DCEP	This electrode is a general purpose rod used for carbon and galvanized steel. It is recommended for use when deep penetration is necessary.
E6013	DCEP, DCEN	This electrode is a general purpose rod used for welding carbon steel with poor-fitting joints. It is capable of light penetration.
E7014	DCEP, DCEN	This electrode can be used where a high deposition is necessary along with fast travel speed. It is capable of light penetration.
E7018	DCEP	This electrode is best for use with clean, bare steel and is suitable for moderate penetration.

Electrode/Amperage Chart								
Electrode	Diameter		Amperage Range					
	IN	MM	MIN.	50 A	100 A	150 A	200 A	MAX.
6010 & 6011	3/32	2.4						
	1/8	3.2						
	5/32	4.0						
	3/16	4.8						
6013	1/16	1.5						
	5/64	2.0						
	3/32	2.4						
	1/8	3.2						
	5/32	4.0						
	3/16	4.8						
7014	3/32	2.4						
	1/8	3.2						
	5/32	4.0						
7018	3/32	2.4						
	1/8	3.2						
	5/32	4.0						
7024	3/32	2.4						
	1/8	3.2						
	5/32	4.0						
Ni-Cl	3/32	2.4						
	1/8	3.2						
	5/32	4.0						
	3/16	4.8						
308L	3/32	2.4						
	1/8	3.2						
	5/32	4.0						

STICK WELDING OPERATION

Adjust the amperage based on material thickness and the electrode at hand.

STICK WELDING

⚠ DANGER ELECTRIC SHOCK CAN CAUSE INJURY OR DEATH!

- Disconnect welder from power supply before performing any assembly, disassembly, or maintenance of the welder.
- Always wear dry, protective clothing, leather welding gloves, and insulated footwear. Use suitable clothing made from durable flame-resistant material to protect your skin.
- Always operate the welder in a clean, dry, well-ventilated area. Do not operate the welder in humid, wet, rainy, or poorly ventilated areas.
- The electrode and work (or ground) circuits are electrically “hot” when the welder is on. Do not allow these “hot” parts to come in contact with bare skin or wet clothing.
- Separate yourself from the welding circuit by using insulating mats to prevent contact from the work surface.
- Be sure that the work piece is properly supported and grounded prior to beginning an electric welding operation.
- Always attach the ground Clamp to the piece to be welded and as close to the weld area as possible. This will give the least resistance and best weld.

⚠ DANGER WELDING SPARKS CAN CAUSE FIRE OR EXPLOSION!

- Electric welding produces sparks which can be discharged considerable distances at high velocity igniting flammable or exploding vapors and materials.
DO NOT operate electric arc welder in areas where flammable or explosive vapors are present.
DO NOT use near combustible surfaces. Remove all flammable items from the work area where welding sparks can reach (minimum of 35 feet).
- Always keep a fire extinguisher nearby while welding.
- Use welding blankets to protect painted and or flammable surfaces, rubber weather-stripping, dash boards, engines, etc.

⚠ WARNING ELECTROMAGNETIC FIELDS CAN BE A HEALTH HAZARD!

- The electromagnetic field that is generated during arc welding 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 electric welding operations.
- Exposure to the electromagnetic fields generated while welding may have other health effects which are not known.

⚠ WARNING ARC RAYS CAN BURN!

- 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 #11) to protect your eyes from sparks and the rays of the arc when welding or when observing open arc welding (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.

⚠ WARNING FUMES AND WELDING GASES CAN BE A HEALTH HAZARD!

- Fumes and gases released during welding are hazardous. Do not breathe fumes that are produced by the welding operation.
- Prolonged inhalation of welding fumes above safety exposure limits can injure the lungs and other organs.
- Use enough ventilation and/or exhaust at the arc to keep fumes and gases from your breathing area.
- Use an OSHA approved respirator when welding in confined spaces or where there is inadequate ventilation.
- Never weld coated materials including but not limited to: cadmium plated, galvanized, lead based paints, powder coat.

⚠ CAUTION HOT METAL AND TOOLS WILL BURN!

- Electric welding heats metal and tools to temperatures that will cause severe burns!
- Use protective, heat resistant gloves and clothing when using Eastwood or any other welding equipment. Never touch welded work surface, the welding torch gas cup, tungsten, or rod until they have completely cooled.

- Always practice with a scrap piece before welding an actual project piece!
- Connect your ground clamp to the workpiece that is to be welded. Make sure the ground clamp contacts are placed on a clean piece of metal free of paint, grease, rust, oils, etc. It is recommended to place your ground clamp as close to the welding area as possible.
- Assess the general work area and make sure the welding area is also cleaned of any paint grease, rust, oils, etc.
- Wearing protective welding helmet, gloves, long sleeve shirt and pants, closed-toe shoes, insert the electrode into the electrode holder being careful to not allow the electrode to contact the grounded area.
- To start welding an arc must be struck, to do this a similar motion to striking a match will have to be performed with the electrode. Slowly bring the electrode closer to the weld joint and then contact and drag the electrode across the piece to strike the arc. Once the arc has been struck you can continue feeding the electrode into the weld joint.
- While moving along the weld joint the electrode will burn down, while it is burning you will need to continue moving the electrode closer to the joint trying to keep a 1/8" gap between the end of the electrode and the weld joint. The electrode holder must be held so that the electrode is in a downward angle moving in the direction of the weld joint.
- To stop welding simply lift the electrode away from the workpiece. When finished welding remove the electrode from the holder and turn off the welder.

TROUBLESHOOTING

PROBLEM	CAUSE	CORRECTION
Welder Will Not Power Up	Welder Not Plugged Into Proper Power Supply	Check power supply. The Rockwood TIG 180 AC/DC requires a properly grounded, 240 Volt AC, 50 Amp power supply or a properly grounded 120 Volt AC, 20 Amp power supply.
	Facility Power Source Breaker Tripped	Reset breaker.
	Power Switch Not Fully On	Check that Power Switch is fully ON .
	Duty Cycle Exceeded	Allow the welder to cool for a minimum of 15 minutes before attempting to use again.
Digital display shows: E02	Unit Overheated and Went Into Thermal Protection Mode	Allow the Welder to cool for a minimum of 15 minutes or until the error display goes out. If error is still flashing after 15 minutes, restart the welder.
Digital display shows: E04	Welder Temperature Sensor Failure	Restart machine and check if issue persists. Contact Eastwood Technical Assistance at 800-343-9353 or help@eastwood.com.

TIG WELDING TROUBLESHOOTING

PROBLEM	CAUSE	CORRECTION
Arc Will Not Ignite	Incomplete Circuit	Check ground connection. Make sure that the ground is on a freshly cleaned surface and close to the welding area.
	Incorrect or Damaged Tungsten	Consult TUNGSTEN SELECTION or welding handbook and make sure the tungsten is cleaned and well prepared.
	Wrong Polarity	Make sure polarity is set correctly. TIG welding is done with the electrode negative. See TIG WELDING SET-UP .
	High Frequency Start Circuit Malfunction	Restart machine and check if issue persists. Contact Eastwood Technical Assistance at 800-343-9353 or help@eastwood.com.
Arc Wanders and it is Hard to Concentrate Heat in a Specific Area	Poorly Prepped Tungsten	See TUNGSTEN SHARPENING .
	Poor Gas Flow	Adjust the flow rate of the shielding gas (see TIG SHIELDING GAS FLOW ADJUSTMENT). Check for loose fittings where gas could be leaking.
	Contaminated Tungsten	Remove tungsten from torch, cleanly break off contaminated section, and resharpen.
	Incorrect Arc Length	Remove tungsten from torch, cleanly break off contaminated section, and resharpen.
	Incomplete Circuit	Check ground connection. Make sure that the ground is on a freshly cleaned surface and close to the welding area.
	Contaminated Base Metal	Clean base metal to bare, shiny metal making sure to wipe away any oil, debris, coatings, or moisture.
Porosity in Weld Bead	Poor Gas Flow	Check for loose fittings where gas could be leaking. Adjust the flow rate of the shielding gas. The general rule of thumb is to set gas flow in CFH at 1.5 - 2 times the cup number size (e.g. #8 gas cup start with 12 - 16 CFH) while flowing.
	Contaminated Filler Metal	Clean filler metal making sure to wipe away any oil, debris, or moisture.
	Contaminated Base Metal	Clean base metal to bare, shiny metal making sure to wipe away any oil, debris, coatings, or moisture.
	Poor Shielding Gas Coverage	Make sure to be in an area with no wind and with any fans turned off. Wind or fans will blow the shielding gas away from the weld causing porosity.
	Incorrect Tungsten "Stick Out"	The general rule of thumb for tungsten "stick out" distance is to not extend further than the inner diameter of the Gas Cup (FIG 11).

TIG WELDING TROUBLESHOOTING

PROBLEM	CAUSE	CORRECTION
Contamination in Weld Bead	Contaminated Tungsten	Remove tungsten from torch, cleanly break off contaminated section, and resharpen.
	Contaminated Filler Metal	Clean filler metal making sure to wipe away any oil, debris, or moisture.
	Contaminated Base Metal	Clean base metal to bare, shiny metal making sure to remove any oil, debris, coatings, or moisture. If base metal is cold rolled steel, make sure to remove any mill scale.
Melting Tungsten	Poor Gas Flow	Check for loose fittings where gas could be leaking. Adjust the flow rate of the shielding gas. The general rule of thumb is to set gas flow in CFH at 1.5 - 2 times the cup number size (e.g. #8 gas cup start with 12 - 16 CFH) while flowing.
	Wrong Polarity	Make sure polarity is set correctly. TIG welding is done with the electrode negative. See TIG WELDING SET-UP .
	Wrong Tungsten Too Small	Increase tungsten diameter.
	Incorrect Shielding Gas	Only use 100% argon when TIG welding.
Poor Penetration	Low Amperage	Amperage setting is too low for material/thickness. The general rule of thumb for amperage is 1A for every 0.01" of material thickness (e.g. 0.050" start with 50A). If welding dissimilar thicknesses, you might need to split the difference and adjust technique to bias more heat in the thicker piece.
Tungsten Contaminated	Contact of Tungsten with Base Metal or Filler Metal	If tungsten comes in contact with the base material or filler rod, cleanly break off the end and resharpen immediately.
Poor Weld Appearance	Incorrect Positioning	The angle between the filler metal and the torch should be less than 90° otherwise the filler metal may prematurely melt and glob off, causing poor weld quality.
Crater in the End of the Weld Bead	Insufficient Shielding Effect	Keep the torch on the base metal while the post flow shielding gas flows to protect and cool the metal and tungsten.
	Not Enough Filler Material or Heat Saturation	Reduce add more filler at end of weld and "back step" the torch 1/4" - 1/2" to reduce the chances of making a crater.
Weld Bead is Cracking	Too Much Heat in Material	Reduce heat and allow more time between passes.
	Base Metal is Absorbing Too Much Heat	Some metals may require preheat of the base metal (consult welding codes for requirements).
	Incorrect Filler Rod	Use appropriate filler rod type and diameter for the joint being welded.
Material is Warping	Insufficient Clamping	Clamp work piece tightly and weld while clamps are in place.
	Insufficient Tack Welds	Add more tack welds until rigidity and stiffness is developed.
	Too Much Heat in Material	To reduce heat, it is best to spread the welding out around the area. This can be done by using stitch welding techniques, alternating sides, and/or taking your time and allowing the pieces to cool between passes.

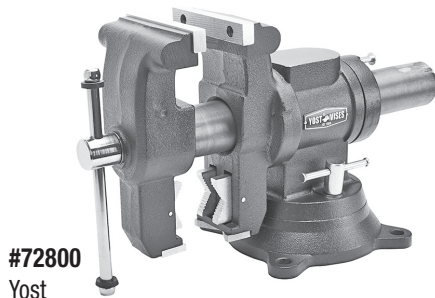
STICK WELDING TROUBLESHOOTING

PROBLEM	CAUSE	CORRECTION
Electrode Sticking	Arc Too Short	While welding, keep the ignited end of the electrode further from the weld joint.
	Current Too Low	Adjust the current on the front of the welder to a higher current setting.
Holes in Weld Bead (Porosity)	Arc Too Long	While welding, keep the ignited end of the electrode closer to the weld joint.
	Moisture in Electrode	Replace electrode with a new one.
Excessive Spatter	Arc Too Long	While welding, keep the ignited end of the electrode closer to the weld joint.
	Current Too High	Adjust the current on the front of the welder to a lower current setting.
Poor Penetration	Poor Joint Preparation	Clean the weld joint of any dirt, grease, paint or other possible contaminants. If the pieces being welded are of a heavy gauge it may be necessary to bevel the edges of the pieces.
	Current Too Low	Adjust the current on the front of the welder to a higher current setting.
	Travel Speed Too Fast	Slow down the travel speed of the electrode while welding.
Digital display shows: E02	Unit Overheated and Went Into Thermal Protection Mode	Allow the Welder to cool for a minimum of 15 minutes or until the error display goes out. If error is still flashing after 15 minutes, restart the welder.

[illegible]

ADDITIONAL ITEMS

R&D MUST-HAVE ACCESSORIES



#72800
Yost
760-DI 6" Swivel Head Rotating Vise



#33996
Eastwood TIG Mate -
TIG Filler Rod Feeder Pen



#98274Z
HotCoat PCS-250®
BenchTop Booth and
Oven Powdercoating Kit

ACCESSORIES

TIG TUNGSTEN & FILLER ROD

#33331 / 33333	1/16" Multi-Mix Tungsten (3 Pack / 10 Pack)
#33332 / 33334	3/32" Multi-Mix Tungsten (3 Pack / 10 Pack)
#33337 / 33340	0.045" ER70S-2 Filler Rod (1lb / 10lb)
#33338 / 33341	1/16" ER70S-2 Filler Rod (1lb / 10lb)
#33339 / 33342	3/32" ER70S-2 Filler Rod (1lb / 10lb)
#33347 / 33349	1/16" ER308L Filler Rod (1lb / 10lb)
#33348 / 33350	3/32" ER308L Filler Rod (1lb / 10lb)
#33343 / 33345	1/16" ER4043 Filler Rod (1lb / 10lb)
#33344 / 33346	3/32" ER4043 Filler Rod (1lb / 10lb)
#33335	1/16" Silicon Bronze Filler Rod 1lb
#33336	3/32" Silicon Bronze Filler Rod 1lb

TIG TORCH CONSUMABLE ITEMS

#13953	Standard TIG Consumables Kit
#20284	#6/8 Gas Lens Components Kit
#20652	#10/12 Gas Lens Components Kit
#20653	TIG Torch #6 "Gas Lens-Style" Gas Cup 10 Pack
#20654	TIG Torch #8 "Gas Lens-Style" Gas Cup 10 Pack
#20655	TIG Torch #10 "Gas Lens-Style" Gas Cup 10 Pack
#12824	3/32" Collet
#12825	Long Back Cap

STICK WELDING ELECTRODES

#19001	E6013 Electrode 1/16in x 14in x 3 lb
#59121	E6013 Electrode 1/16in x 14in x 5 lb
#59120	E6013 Electrode 1/8in x 14in x 10 lb
#59119	E6013 Electrode 1/8in x 14in x 5 lb
#59117	E6013 Electrode 3/32in x 14in x 5 lb
#59114	E6013 Electrode 5/64in x 14in x 5 lb
#59112	E7018 Electrode 1/8in x 14in x 5 lb
#59111	E7018 Electrode 3/16in x 14in x 5 lb
#59110	E7018 Electrode 3/32in x 14in x 10 lb
#59109	E7018 Electrode 3/32in x 14in x 5 lb
#59107	E7018 Electrode 5/32in x 14in x 5 lb

OPTIONAL ITEMS

#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
#12418	Stainless Steel Wire Brush
#33307	TG1800 Tungsten Grinder
#58878	TG2000 Cordless Tungsten Grinder
#20640	10' Long Ground Cable Extension
#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