

Eastwood

DO THE JOB RIGHT.

Item #20358

ARC 80 TIG WELDING KIT

INSTRUCTIONS



The **TIG WELDING KIT** for the Eastwood Arc 80, when used with Argon shielding gas, operates as a full-function TIG welder. Inverter Technology provides the capability of welding thin gauge steel, up to 1/8", with precision and ease.

STATEMENT OF LIMITED WARRANTY

The Eastwood Company (hereinafter "Eastwood") warrants to the end user (purchaser) of all new welding and cutting equipment (collectively called the "products") that it 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 purchase 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 Arc 80 Welder

Items not covered under this warranty: Collets, Collet Bodies, electrodes, nozzles, and ground clamp and cable.
All other components are covered by the warranty and will be repaired or replaced at the discretion of Eastwood.

2 Years:

- All Welding Helmets.

CONDITIONS OF WARRANTY TO OBTAIN WARRANTY COVERAGE:

Purchaser must first contact Eastwood at 1-800-345-1178 for an RMA# before Eastwood will accept any welder 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.

SPECIFICATIONS

Output Amperage Range	Maximum Input Amperage	Input Voltage	Rated Duty Cycle	Tungsten Size	Weight	Overall Dimensions
20-80 Amps DC	20 Amps	120 VAC, 60Hz	20% @ 80 Amps	1/16" to 3/32"	10 lbs. [4.5kg]	12" [304mm] x 9" [229mm] x 5" [127mm]

READ & UNDERSTAND ALL INSTRUCTIONS & PRECAUTIONS BEFORE PROCEEDING

This unit emits a powerful high voltage and extreme heat which can cause severe burns, dismemberment, electrical shock and death. Eastwood shall not be held liable for consequences due to deliberate or unintentional misuse of this product.

SAFETY INFORMATION

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.



⚠ READ INSTRUCTIONS

Thoroughly read and understand this manual before using. Save for future reference.



⚠ DANGER ELECTRIC SHOCK CAN KILL!

- Improper use of an electric welder can cause electric shock, injury and death! Read all precautions described in this manual to reduce the possibility of electric shock.
- Do not touch any electrical components that may be live.
- Separate yourself from the welding circuit by using insulating mats to prevent contact from the work surface.
- The welder power switch is to be in the OFF position and the power supply is to be disconnected when performing any maintenance or consumable changes.
- **Always wear dry, protective clothing and leather welding gloves and insulated footwear.**
- Always operate the welder in a clean, dry, well ventilated area. Do not operate the welder in humid, wet, rainy or poorly ventilated areas.
- Be sure that the work piece is properly supported and grounded prior to beginning an electric welding operation.
- The electrode and work (or ground) circuits are electrically “hot” when the welder is on. Do not touch these “hot” parts with your bare skin or wet clothing.
- **Disconnect from power supply before assembly, disassembly or maintenance of the torch or contact tip or changing wire spools.**
- 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.



⚠ WARNING FUMES & WELDING GASES CAN BE DANGEROUS!

- Do not breathe fumes that are produced by the welding operation. These fumes are dangerous. Keep your head and face out of welding fumes. Do not breathe the welding fumes
- Always work in a properly ventilated area. Wearing an OSHA-approved respirator when welding is recommended!
- Never weld coated materials including but not limited to: cadmium plated, galvanized, lead based paints.
- Refer to the MSDS (Material Safety Data Sheet) for any consumables or materials used during welding for additional safety instructions.



⚠ WARNING WELDING SPARKS CAN CAUSE FIRE OR EXPLOSION!

- Do not operate electric arc welder in areas where flammable or explosive vapors are present.
- Always keep a fire extinguisher nearby while welding.
- Use welding blankets to protect painted surfaces, dash boards, engines, etc.
- Ensure power supply has properly rated wiring to handle power usage.
- Do not use on or near combustible surfaces.
- Remove all flammable items within 35 feet of the welding area.
- Do not weld frozen pipes.



⚠ WARNING ARC RAYS CAN BURN!

- 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 made from durable flame-resistant material to protect your skin. Protect nearby individuals with a non-flammable barrier.
- Wear safety glasses with side shields under your welding helmet
- If other persons are in the area of welding use welding screens to protect bystanders from sparks and arc rays.



⚠ WARNING HOT METAL WILL BURN!

- Electric welding operations cause sparks and heat metal to temperatures that will cause severe burns!
- Use protective gloves and clothing when performing any welding operations. Always wear long pants, long-sleeved shirts and leather welding gloves.
- Make sure that all persons in the welding area are protected from heat, sparks and ultraviolet rays. Use additional face shields and flame resistant barriers as needed.
- Never touch work piece until it has completely cooled.



⚠ WARNING ELECTROMAGNETIC FIELDS MAY BE DANGEROUS!

- 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 electromagnetic fields while welding may have other health effects which are not known.



⚠ WARNING FLYING METAL CHIPS CAN CAUSE INJURY!

- Welding, brushing, hammering, chipping, and grinding can cause flying metal chips and sparks.
- To prevent injury wear approved safety glasses.

DUTY CYCLE

The rated Duty Cycle refers to the amount of welding that can be done within an amount of time. The Eastwood Arc 80 has a Duty Cycle of 20% at 80 Amps. 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 80 Amps with a 20% Duty Cycle, within a 10 Minute block of time you can weld for 2 Minutes with 8 Minutes of cooling for the welder.

If the Duty Cycle is exceeded, the Welder will automatically shut off however the fan will continue running to cool the overheated components.

When a safe temperature has been reached, the Welder will automatically switch the welder output back on.

To increase the Duty Cycle you can turn down the Amperage Output control.

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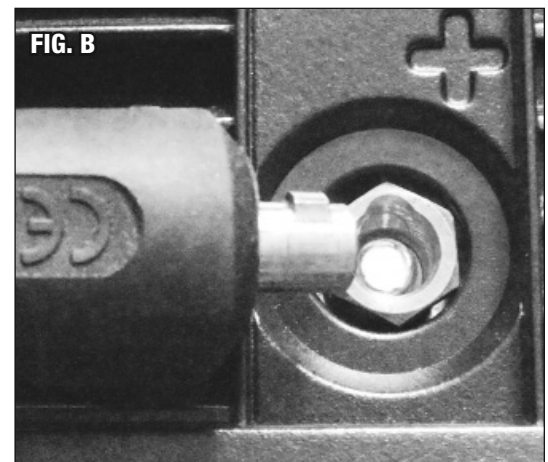
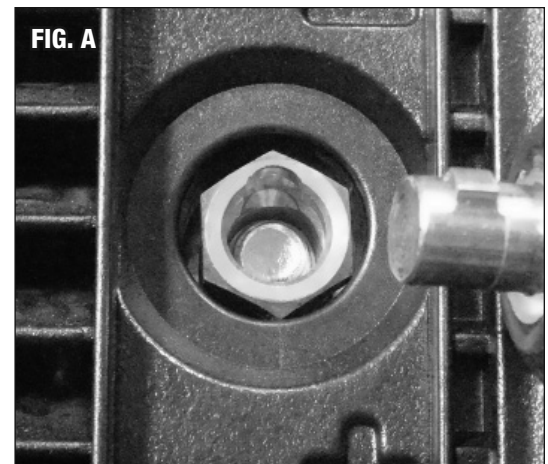
Remove all items from the box. Compare with list below to make sure unit is complete.

- (1) Eastwood TIG Torch with integral zippered sheath encased 10' Power Cable and 14" Shielding Gas line
- (1) Long Black Cap
- (1) Button Back Cap
- (1) Tungsten
- (3) Collets (1/16")
- (3) Shielding Gas Nozzles, (1) #4, (1) # 5 & (1) #6
- (1) Instruction Manual

WELDER SET-UP FOR TIG TORCH KIT

Be sure the power cord is unplugged and the power switch is in the "OFF" position.

1. Insert the Brass Connector of the TIG Torch Cable (Not Included) into the Negative (-) Brass Receptacle on the Front Panel. Note that the Keyed Tab of the Brass Connector fits into the Keyed Slot at the top of the Negative (-) Brass Receptacle (**FIG A**). Seat fully and turn 180 Clockwise to lock in place.
2. Insert the Brass Connector of the Ground Cable into the Positive (+) Brass Receptacle on the Front Panel. Note that the Keyed Tab of the Brass Connector fits into the Keyed Slot at the top of the Positive (+) Brass Receptacle (**FIG B**). Seat fully and turn 180 Clockwise to lock in place.
3. Move the "Stick"/TIG Switch to the left TIG position (**FIG C**).
4. Attach the Ground Clamp to the workpiece as close to the welding area as possible. To ensure good ground, clean the grounded area of any rust, grease, oils or paint.



SHIELDING GAS CONNECTION FOR TIG TORCH KIT

A Shielding Gas Bottle is not included with your Eastwood ARC 80 but is necessary while TIG welding. A Shielding Gas Bottle can be bought at most local Welding Supply Stores. Eastwood recommends the use of 100% Argon shielding gas when TIG welding Steel and Stainless Steel.

After connecting your Shielding Gas Regulator, the gas flow rate needs to be adjusted so that the proper amount of Shielding Gas is flowing over your weld. If there is too little gas flow there will be porosity in your welds as well as excessive spatter, if there is too much gas flow you will be wasting gas and may affect the weld quality.

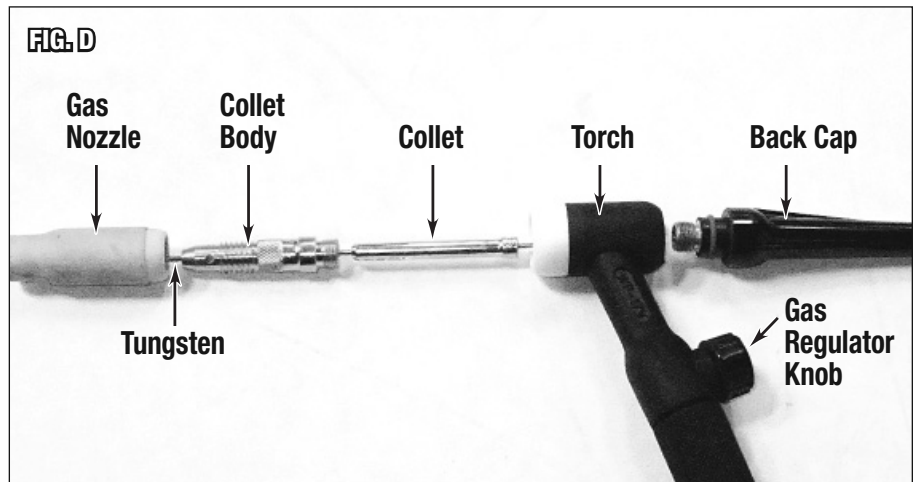
1. Place the Eastwood ARC 80 in its dedicated area or on a welding cart.
2. Secure your Shielding Gas Bottle to a stationary object or mount to your welding cart if it is equipped to hold one so that the cylinder cannot fall over.
3. Remove the cap from the Shielding Gas Bottle.
4. Thread the CGA-580 fitting of the Argon Shielding Gas Inflow Line into the female fitting on the Shielding Gas Bottle.
NOTE: Do not use White Teflon Tape on this connection as it is a tapered thread and does not require it, if you have a leak check for burrs or dirt in the threads. If the leak persists, use gas type sealing tape.
5. Tighten the fitting with a wrench till snug, do not over tighten.

PREPARING TO TIG WELD WITH TIG TORCH KIT

TORCH ASSEMBLY/DISASSEMBLY

Assembly:

1. Select a Collet Body that matches your Tungsten diameter size and thread it into the front of the Torch.
2. Select a Collet that matches your Tungsten diameter size. Insert the Tungsten into the Collet and put the Collet and Tungsten back into the Torch (**FIG D**).
3. The Gas Shielding Nozzle size should be changed according to shielding gas requirements for the material being welded. Thicker materials require more flow. Select the correct Gas Shielding Nozzle and thread it onto the Collet body.
4. Install the Back Cap to lock the Tungsten in place. Always make sure the Tungsten protrudes 1/8" to 1/4" beyond the Gas Shielding Nozzle (**FIG D**).



Disassembly:

1. Make sure the welder is turned OFF and unplugged.
2. Remove the Back Cap from the Torch.
3. If there is a Tungsten installed in the torch pull it out of the front of the Torch.
4. Slide the Collet out of the Torch.
5. Unscrew and remove the Gas Shielding Nozzle.
6. Unscrew and remove the Collet body.

SHARPENING THE TUNGSTEN

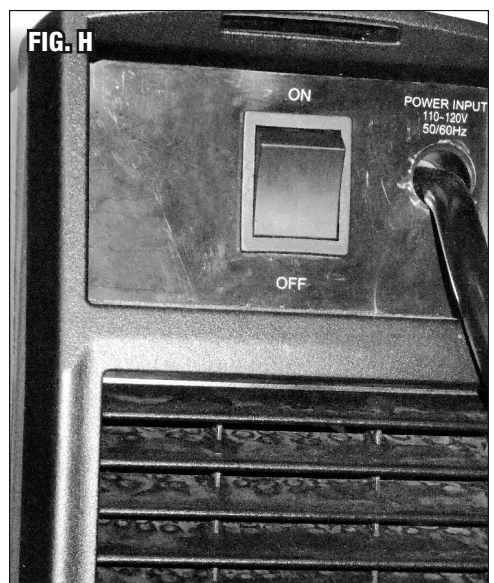
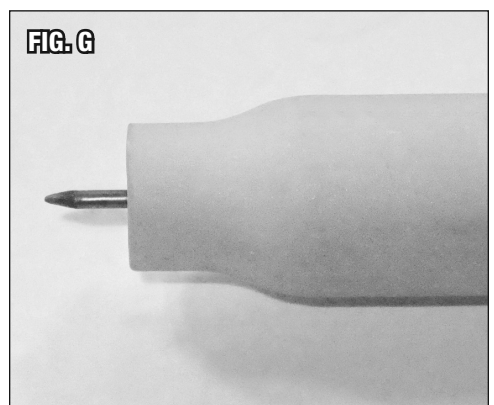
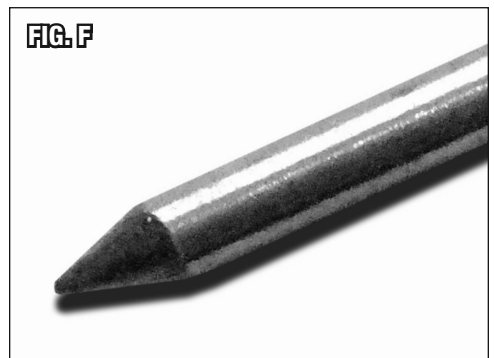
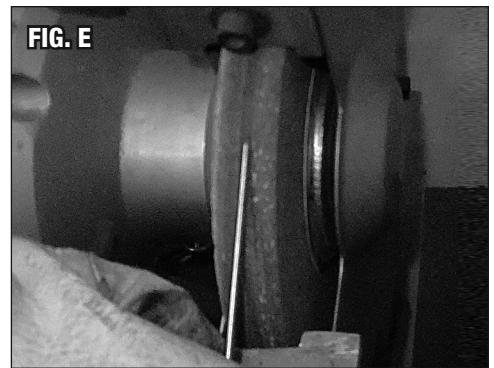
To avoid contamination of the Tungsten and ultimately the weld, it is imperative to have a dedicated grinding wheel used for Tungsten grinding only. A fine grit standard 6" synthetic stone grinding wheel on a bench top grinder is sufficient or specifically designed Tungsten Grinders are available.

1. Shut off the welder.
2. Make sure the Tungsten and Torch are sufficiently cooled for handling then loosen and remove the Back Cap then the Collet (**FIG D**) and remove the Tungsten from the FRONT of the Torch only. (Removing from the rear will damage the Collet).
3. 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.
4. Holding the Tungsten tangent to the surface of the grinding wheel, rotate the Tungsten while exerting light pressure until a suitable point is formed (**FIG E**).
5. The ideal tip will have the length of the conical portion of the sharpened area at 2-1/2 times the Tungsten rod diameter (**FIG F**).
6. Replace the Tungsten in the Collet with the tip extending 1/8"-1/4" beyond the Gas Shielding Nozzle, then re-tighten the Back Cap (**FIG G**).

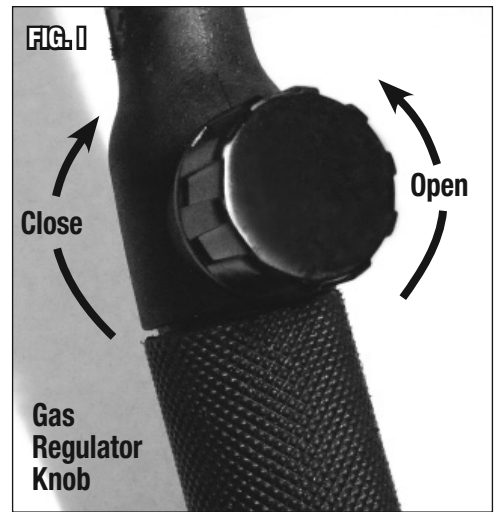
TIG WELDING WITH TIG TORCH KIT

IMPORTANT NOTE: These instructions are intended only to provide the user with some familiarity of the Eastwood ARC 80. 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 DVD 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 and stainless steel. 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.

1. Turn the Power Switch to the ON position (**FIG H**).
2. Slowly open the gas cylinder valve.
NOTE: Always open valve fully to avoid shielding gas leakage.
3. Adjust the gas regulator to 15-20 cfm.
4. 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.
5. Use a dedicated stainless steel brush or flap-disc to clean the areas to be welded. Do not use the brush or flap-disc for any other purpose.



1. 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.
2. Although it is a matter of developing a personal style, a good starting point for best results is achieved by holding the tip at a 45° angle backward and approximately 20° to the right of the weld. Hold the Filler Metal Rod at a 60° angle to the Tungsten Tip. The arc must be Scratch Started, (lightly touch surface to get arc started). Before Scratch Starting, open gas knob on torch (**FIG 1**). Never allow the tungsten tip to touch the weld puddle or material rod, while welding. Doing so will quickly destroy the tip and contaminate the weld. If this happens, remove the Tungsten and regrind the tip. It is best to hold the Tungsten tip 1/8" from the surface.
3. With your Welding Shield and all safety gear in place, practice "Forming a Puddle" with the Tungsten Tip. Once you become familiar with this step, practice the "Dip and Pull" technique with the Filler Metal Rod and Torch. "Dip and Pull" is the practice of forming a puddle, moving the torch while maintaining the puddle and adding filler rod metal to the puddle by "dipping and pulling" as you go; being careful not to allow the Tungsten to contact the puddle or rod.
4. To stop welding, pull the Tip back over the weld approximately 1/2" [13mm] then lift to break the arc. Keep shielding gas flow in place for approximately 10 seconds.
5. Keep in mind that you **MUST** let the shielding gas flow over the weld for approximately 10 seconds. Failure to do so will allow the welded area to oxidize as it cools, compromising the weld integrity.
6. Constantly be aware that TIG welding quickly generates heat in the work piece and torch. Severe burns can quickly occur by contacting hot metal pieces.
7. When done, shut off the Power Switch, close the Regulator in the Torch Handle then close the Shielding Gas Tank valve completely.



TROUBLESHOOTING

PROBLEM	CAUSE	CORRECTION
Arc is Triggered but Will Not Start	Incomplete Circuit	Check Ground connection. Make sure that the ground is on a freshly cleaned surface and close to the welding area. It is suggested to weld towards the ground connection.
	Incorrect Tungsten	Consult chart for proper Tungsten for the base metal being welded. In most cases Thoriated will be used for all steels.
	No Shielding Gas	Make sure the shielding gas cylinder is turned all the way open and set at the correct flow rate.
Arc Wanders and It Is Hard to Concentrate Heat in a Specific Area	Poorly prepped Tungsten	Follow guidelines for prepping Tungsten.
	Poor Gas Flow	Adjust the flow rate of the shielding gas (refer to settings chart). Check for loose fittings where gas could be leaking.
	Contaminated Tungsten	Remove Tungsten from torch and break off contaminated section and re-sharpen.
	Incorrect arc length	Make sure the Tungsten is held 1/8" to 1/4" off the work piece.
	Incomplete circuit	Check Ground connection. Make sure that the ground is on a freshly cleaned surface and close to the welding area. It is suggested to weld towards the ground connection.
	Contaminated base metal	Clean base metal making sure to remove any oil, debris, coatings, or moisture. If base metal is aluminum make sure all of the oxide is removed using either a dedicated stainless brush or flap wheel.
Porosity in Weld Bead	Poor Gas Flow	Adjust the flow rate of the shielding gas. Check for loose fittings where gas could be leaking.
	Contaminated filler metal	Clean filler metal making sure to remove any oil, debris, or moisture.
	Contaminated base metal	Clean base metal making sure to remove any oil, debris, coatings, or moisture.
	Poor Shielding	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 Exposure	Adjust the Tungsten so that 1/8" to 1/4" protrudes from the Collet.
Contamination in Weld Bead	Contaminated Tungsten	Adjust the flow rate of the shielding gas. Check for loose fittings where gas could be leaking.
	Contaminated Filler Metal	Clean filler metal making sure to remove any oil, debris, or moisture.
	Contaminated Base Metal	Clean base 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.

TROUBLESHOOTING

PROBLEM	CAUSE	CORRECTION
Melting Tungsten	Poor Gas Flow	Adjust the flow rate of the shielding gas. Check for loose fittings where gas could be leaking.
	Wrong Size Tungsten	Increase Tungsten diameter. Refer to chart for proper sizing.
	Incorrect Shielding Gas	Only use 100% Argon when TIG Welding.
Poor Penetration	Low Voltage	Voltage setting is too low for material/thickness. Increase as needed.
Tungsten Contaminated	Contact of Tungsten with Base Metal	Keep Tungsten 1/8" to 1/4" from the base metal. If Tungsten comes in contact break off end and resharpen immediately..
Poor Weld Appearance	Incorrect positioning	The angle between the filler metal and the torch must be less than 90° otherwise the filler metal will prematurely melt and glob off causing poor weld appearance.
Crater in the End of the Weld Bead	Insufficient Shielding	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	Reduce current and add more filler at end of weld. It may also be beneficial to back step to ensure no crater will form.
Weld Bead is Cracking	Too much heat in material	Reduce heat and allow more time between passes.
	Base Metal is absorbing too much heat	Preheat base metal (consult welding codes for requirements)
	Incorrect Filler Wire	Use appropriate filler wire 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.

ACCESSORIES

TIG WELDING SUPPLIES:

#12253	ER70S-2 TIG Wire 1/16-36"
#12463	308L Stainless TIG Wire 1/16-36"
#12254	ER70S-2 TIG Wire 3/32-36"
#12464	308L Stainless TIG Wire 3/32-36"
#13953	TIG Consumables Kit
#20284	TIG Gas Lens

WELDING ACCESSORIES:

#19055A	Flap Disc 60 Grit 4.5" Diameter 7/8" Hole
#51139	Copper 3 x 3 Welders Helper Set
#12590	Welding Gloves Large
#50739	Master Welder's Helper Panel Holding Kit
#12589	Welding Gloves Medium
#12762L, XL, XXL	Welding Jacket
#13203	Auto Darken Welding Helmet
#21524	TIG Welding Basics DVD by Ron Covell
#13212	Large View Auto Darken Welding Helmet
#11616	TIG Welder Cart
#19079S	Stainless Steel Brush
#20097	Silicon Carbide Grinding Wheel

If you have any questions about the use of this product, please contact

The Eastwood Technical Assistance Service Department: 800.544.5118 >> email: techelp@eastwood.com
PDF version of this manual is available online >> eastwood.com/20358manual

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