EVERLAST

Power i-MIG 315

Digitally-Controlled, MIG/DC Stick Welder

CC CV

GMAW

SMAW

IGBT

1 ~ PHASE

DV 120/240V

Operator's Manual for the Power i-MIG 315
Safety, Setup and General Use Guide

Rev. 1 0 10531-20

everlastwelders.com

Specifications and Accessories subject to change without notice.

EVERLAST IGBT INVERTER TECHNOLOGY

1-877-755-9353

329 Littlefield Ave. South San Francisco, CA 94080 USA

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Dear Customer,

THANKS! You had a choice, and you bought an Everlast product. We appreciate you as a valued customer and hope that you will enjoy years of use from your welder.

Please go directly to the Everlast website to register your unit and receive your warranty information. Your unit registration is important should any information such as product updates or recalls be issued. It is also important so that we may track your satisfaction with Everlast products and services. If you are unable to register by website, contact Everlast directly through the sales department at the main customer service number in your country. Your unit's warranty will be registered and in full effect. Keep all information regarding your purchase, including date of purchase and receipt. **In the event of a problem with your unit or other issue you must contact technical support before your welder can be a candidate for warranty service and returned. An over-the-phone review/ diagnosis must be performed BEFORE a RMA will be issued or before the unit can be sent in for service.**

Please read the warranty statement published online and other important information found on the Everlast website of the division located in or nearest to your country. This includes the terms of the purchase and warranty procedure. Print it for your records and become familiar of its terms and conditions. Please note that Guns, accessories and torches are covered under a separate, shorter warranty. Please be sure you visit the website and are familiar with all the warranty terms before you call for service.

Everlast offers full technical support, in several different forms. We have online support available through email, and a welding support forum designed for our customers and non-customers to interact with each other. Technical advisors are active on the forum daily. We also divide our support into two divisions: technical and welding performance. Should you have an issue or question concerning your unit, please contact performance/technical support available through the main company headquarters available in your country. This support is free to all Everlast customers. For best service call the appropriate support line and follow up with an email, especially during weekends, holidays or any off hours when you cannot reach a live person. In the event you do not reach a live person, leave a message and your call will normally be returned within 24 hours, except for weekends and holidays. Also, for quick answers to your basic questions, join the company owned forum available through the website. You'll find knowledgeable staff available to answer your questions. You also may find a topic that already addresses your question at http://www.everlastgenerators.com/forums/. Should you need to call or write, always know your model name, purchase date and welder manufacturing inspection date. This will assure the quick and accurate customer service. **REMEMBER: Be as specific and informed as possible. Technical and performance advisors rely upon you to carefully describe the conditions and circumstances of your problem or question. Take notes of any issues as best you can. You may be asked many questions by the advisors to clarify problems or issues that may seem very basic. However, diagnosis procedures MUST be followed to begin the warranty process. Advisors can't assume anything (even with experienced users) and must cover all aspects to properly diagnose the problem. Depending upon your issue, it is advisable to have basic tools handy such as screwdrivers, wrenches, pliers, and even an inexpensive test meter with volt/ohm functions before you call.**

Let us know how we may be of service to you should you have any questions.

Sincerely,

Everlast Customer Service

Serial number: _____
Model number: _____
Date of Purchase_____

Everlast USA:

Everlast consumer satisfaction email: sales@everlastwelders.com
Everlast Website: everlastwelders.com
Everlast Technical Support: tech@everlastwelders.com
Everlast Welding Support: performance@everlastwelders.com Everlast Support
Forum: http://www.everlastgenerators.com/forums/index.php
Main toll free number: 1-877-755 WELD (9353) 9am—5pm PST M-F

FAX: 1-650-588-8817

Everlast Canada:

Everlast consumer satisfaction email: sales@everlastwelders.ca
Everlast Website: everlastwelders.ca
Everlast Technical Support: sales@everlastwelders.ca
Telephone: 905-637-1637 9am-4:30pm EST M-F

Everlast Australia:

Port Macquarie 4/18
Acacia Ave.
Port Macquarie NSW 2444
(02) 6581 23888
After Hours Support
0431 016 416
Sales: sales@everlastwelders.com.au
Support: support@everlsatwelders.com.au

NOTICE:

Product Specifications and features are subject to change without notice. While every attempt has been made to provide the most accurate and current information possible at the time of publication, this manual is intended to be a general guide and not intended to be exhaustive in its content regarding safety, welding, or the operation/maintenance of this unit. Everlast Power Equipment INC. does not guarantee the accuracy, completeness, authority or authenticity of the information contained within this manual. The owner of this product assumes all liability for its use and maintenance. Everlast Power Equipment INC. does not warrant this product or this document for fitness for any particular purpose, for performance/accuracy or for suitability of application. Furthermore, Everlast Power Equipment INC. does not accept liability for injury or damages, consequential or incidental, resulting from the use of this product or resulting from the content found in this document or accept claims by a third party of such liability.

Everlast is committed to providing you with the best possible equipment and service to meet the demanding job requirements that you may have. We want to go beyond delivering a satisfactory product to you. That is the reason we offer free technical and basic welding support to assist you with your needs, should an occasion occur where it is needed. With proper use and care your product should deliver years of trouble free service. *Everlast products are designed and intended for use by professionals and knowledgeable individuals, who have a basic skill set and an elementary knowledge of basic welding and safe welding practices. Untrained users can create unsafe conditions that not only endanger lives, but that also endanger property and the equipment. Keep a printed copy of this manual available and easily accessible for all users and do not let a user operate this equipment without fully reading and studying this manual.*

Safe operation and proper maintenance is your responsibility.

We have compiled this operator's manual, to instruct you in basic safety, operation and maintenance of your Everlast product to give you the best possible operator/owner experience. Welding and related cutting operations require basic experience and common sense. **Exercise extreme caution and care in all activities related to welding or cutting. Your safety, health and even life depends upon it.**

While accidents are never planned, preventing an accident requires careful planning. Stay alert!

Please carefully read this manual before you operate your Everlast unit. This manual, if read in full, can assist the user in obtaining helpful information concerning the safe operation of this unit. Do not operate the unit until you have read this manual and you are thoroughly familiar with the safe operation of the unit. If you feel you need more information please contact Everlast Support. The content of this manual is not meant to be an exhaustive primer on welding. It is written to an audience that, if not professional, will have at least a basic skill set in welding which includes basic knowledge of welding terms and best practices.

The 5 year warranty does not cover improper use, maintenance, accessories or consumables. Accessories are covered by a separate warranty (length varies), which is also listed on our website along with the full terms of the welder warranty. Consumables have no warranty.

Do not attempt to alter or defeat any piece or part of your unit, particularly any safety device. Keep all shields and covers in place during unit operation should an unlikely failure of internal components result in the possible presence of sparks and explosions. If a failure occurs, discontinue further use until malfunctioning parts or accessories have been repaired or replaced by qualified personnel.

Note on High Frequency electromagnetic disturbances:

Certain welding and cutting processes generate High Frequency (HF) waves. These waves may disturb sensitive electronic equipment such as televisions, radios, computers, cell phones, and related equipment. High Frequency may also interfere with fluorescent lights. Consult with a ***licensed*** electrician if disturbance is noted. Sometimes, improper wire routing or poor shielding may be the cause.

WARNING! HF can interfere with pacemakers. See EMF warnings in following safety section for further information. Always consult your physician before entering an area known to have welding or cutting equipment if you have a pacemaker.

These safety precautions are for protection of safety and health. Failure to follow these guidelines may result in serious injury or death. Be careful to read and follow all cautions and warnings. Protect yourself and others.

Welding and cutting processes produce high levels of ultraviolet (UV) radiation that can cause severe skin burn and damage. There are other potential hazards involved with welding such as severe burns and respiratory related illnesses. Therefore observe the following to minimize potential accidents and injury:

Use appropriate safety glasses with wrap around shields while in the work area, even under welding helmets to protect your eyes from flying sparks and debris. When chipping slag or grinding, goggles and face shields may be required.

When welding or cutting, always use an approved shielding device, with the correct shade of filter installed. Always use a welding helmet in good condition. Discard any broken or cracked filters or helmets. Using broken or cracked filters or helmets can cause severe eye injury and burn. Filter shades of no less than shade 5 for cutting and no less than shade 9 for welding are highly recommended. Shades greater than 9 may be required for high amperage welds. Keep filter lenses clean and clear for maximum visibility. It is also advisable to consult with your eye doctor should you wear contacts for corrective vision before you wear them while welding.

Do not allow personnel to watch or observe the welding or cutting operation unless fully protected by a filter screen, protective curtains or equivalent protective equipment. If no protection is available, exclude them from the work area. Even brief exposure to the rays from the welding arc can damage unprotected eyes.

Always wear hearing protection because welding and cutting can be extremely noisy. Ear protection is necessary to prevent hearing loss. Even prolonged low levels of noise has been known to create long term hearing damage. Hearing protection also further protects against hot sparks and debris from entering the ear canal and doing harm.

Always wear personal protective clothing. Flame proof clothing is required at all times. Sparks and hot metal can lodge in pockets, hems and cuffs. Make sure loose clothing is tucked in neatly. Leather aprons and jackets are recommended. Suitable welding jackets and coats may be purchased made from fire proof material from welding supply stores. Discard any burned or frayed clothing. Keep clothing away from oil, grease and flammable liquids.

Leather boots or steel toed leather boots with rubber bottoms are required for adequate foot protection. Canvas, polyester and other man made materials often found in shoes will either burn or melt. Rubber or other non conductive soles are necessary to help protect from electrical shock.

Flame proof and insulated gauntlet or cuffed type gloves are required whether welding or cutting or handling metal. Simple work gloves for the garden or chore work are not sufficient. Gauntlet type welding gloves are available from your local welding supply store.

This welder contains moving parts that can result in injury. Keep hands, fingers, hair, and loose clothing away from the wire feeding mechanisms and fans while unit is switched on and in use. Do not attempt to defeat any safety feature. Always operate unit with guard in place on the wire feeder.

WARNING! Persons with pacemakers should not weld, cut or be in the welding area until they consult with their physician. Some pacemakers are sensitive to EMF radiation and could severely malfunction while welding or while being in the vicinity of someone welding. ***Serious injury or death may occur!***

Welding and plasma cutting processes generate electro-magnetic fields and radiation. While the effects of EMF radiation are not known, it is suspected that there may be some harm from long term exposure to electromagnetic fields. Therefore, certain precautions should be taken to minimize exposure:

- Lay welding leads and lines neatly *away* from the body.
- Never coil cables *around* the body or limbs.
- Secure cables with tape if necessary to keep from the body.
- Keep all cables and leads on the same side the body.
- Never stand between cables or leads.
- Keep as far away from the power source (welder) as possible while welding.
- Never stand between the ground clamp and the torch.
- Keep the ground clamp grounded as close to the weld or cut as possible.

Welding and cutting processes pose certain inhalation risks. Be sure to follow any guidelines from your chosen consumable and electrode suppliers regarding possible need for respiratory equipment while welding or cutting. Always weld with adequate ventilation. Never weld in closed rooms or confined spaces. Fumes and gases released while welding or cutting may be poisonous. Take precautions at all times.
Any burning of the eyes, nose or throat are signs that you need to increase ventilation.
Stop immediately and relocate work if necessary until adequate ventilation is obtained.
Stop work completely and seek medical help if irritation and discomfort persists.

WARNING! Do not weld on galvanized steel, stainless steel, beryllium, titanium, copper, cadmium, lead or zinc without proper respiratory equipment and or ventilation.

WARNING! This product can expose you to chemicals such as lead, which is known to the State of California to cause birth defects, reproductive harm and cancer. Proposition 65 Warning. For more information visit: www.P65Warnings.ca.gov

DANGER! Do not weld or cut around Chlorinated solvents or degreasing areas. Release of Phosgene gas can be deadly. Consider all chemicals to have potential deadly results if welded on or near metal containing residual amounts of chemicals.

Keep all cylinders upright and chained to a wall or appropriate holding pen. Certain regulations regarding high pressure cylinders can be obtained from OSHA or local regulatory agency. Consult also with your welding supply company in your area for further recommendations. The regulatory changes are frequent so keep informed.

All cylinders have a potential explosion hazard. When not in use, keep capped and closed. Store chained so that overturn is not likely. Transporting cylinders incorrectly can lead to an explosion. Do not attempt to adapt regulators to fit cylinders. Do not use faulty regulators. Do not allow cylinders to come into contact with work piece or work. Do not weld or strike arcs on cylinders. Keep cylinders away from direct heat, flame and sparks.

Safety Precautions

WARNING! Electrical shock can kill. Make sure all electrical equipment is properly grounded. Do not use frayed, cut or otherwise damaged cables and leads. Do not stand, lean or rest on ground clamp. Do not stand in water or damp areas while welding or cutting. Keep work surface dry. Do not use welder or plasma cutter in the rain or in extremely humid conditions. Use dry rubber soled shoes and dry gloves when welding or cutting to insulate against electrical shock. Turn machine on or off only with gloved hand. Keep all parts of the body insulated from work, and work tables. Keep away from direct contact with skin against work. If tight or close quarters necessitates standing or resting on work piece, insulate with dry boards and rubber mats designed to insulate the body from direct contact.

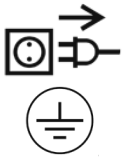
All work cables, leads, and hoses pose trip hazards. Be aware of their location and make sure all personnel in area are advised of their location. Taping or securing cables with appropriate restraints can help reduce trips and falls.

WARNING! Fire and explosions are real risks while welding or cutting. Always keep fire extinguishers close by and additionally a water hose or bucket of sand. Periodically check work area for smoldering embers or smoke. It is a good idea to have someone help watch for possible fires while you are welding. Sparks and hot metal may travel a long distance. They may go into cracks in walls and floors and start a fire that would not be immediately visible. Here are some things you can do to reduce the possibility of fire or explosion:

- Keep all combustible materials including rags and spare clothing away from area.
- Keep all flammable fuels and liquids stored separately from work area.
- Visually inspect work area when job is completed for the slightest traces of smoke or embers.
- If welding or cutting outside, make sure you are in a cleared off area, free from dry tender and debris that might start a forest or grass fire.
- Do not weld on tanks, drums or barrels that are closed, pressurized or anything that held flammable liquid or material.

Metal is hot after welding or cutting! Always use gloves and or tongs when handling hot pieces of metal. Remember to place hot metal on fire-proof surfaces after handling. Serious burns and injury can result if material is improperly handled.

WARNING! Faulty or poorly maintained equipment can cause injury or death. Proper maintenance is your responsibility. Make sure all equipment is properly maintained and serviced by qualified personnel. Do not abuse or misuse equipment. Remove any faulty cords, plugs or electrical equipment from service or access.
Keep all covers in place. A faulty machine may shoot sparks or may have exploding parts. Touching uncovered parts inside machine can cause discharge of high amounts of electricity. **Do not allow employees to operate poorly serviced equipment.** Always check condition of equipment thoroughly before start up.



Disconnect unit from power source before any service attempt is made and for long term storage or electrical storms. **If operating on a generator:** Always switch off and disconnect the unit before shutting the unit down. Never start the generator with the unit switched on or connected. Failure to do so may result in damage to the unit. **This damage is not covered under warranty.** Make sure that any required generator grounding is performed properly and to the manufacturer's recommendations.

Further information can be obtained from The American Welding Society (AWS) that relates directly to safe welding and plasma cutting. Additionally, your local welding supply company may have additional pamphlets available concerning their products. Do not operate machinery until your are comfortable with proper operation and are able to assume inherent risks of cutting or welding.

General Performance Specifications

Power i-MIG 315	
MIG/Stick Amp Range	MIG 30-315A / DC Stick: 10-200A
OCV	70V
MIG Output Type	Standard, non-pulse, with Flux-Cored Capability. Spool gun ready. (Spool gun is optional)
Volt Adjustment Range MIG	15.5-30V (±3V)
MIG Wire Feed Speed	60 to 600 IPM (.5-15 m/min) (No load max 700 IPM)
Input Voltage	240V Single phase (208V is permissible but no lower than 205V)
Welder Type	Digitally controlled, IGBT inverter type with MIG/Flux-Cored, Stick function and Spool Gun capability.
Wire Roll Size and Diameter	.035-.045" (.9mm to 1.2mm) standard. Other wire diameters possible with optional drive rolls. ***Purchase optional drive rolls for extended wire sizes and types..***
Pre/Post Flow Control MIG	Auto
MIG Burn Back Timer Control	0-2 seconds
Inductance/Arc Force Control	0-100%
MIG/Stick Output Type	DC CV/CC
MIG Burn Back Timer	0-2 Seconds
Stick Hot Start Timer	Auto
Stick Hot Start Intensity Control	Auto
Stick E6010 Capability	No, 6011 capable
Power Cable Length	6 ft. (2m)
Accessories	36 Series MIG torch 9.5 ft. (3m), Work clamp with cable 9.5 ft. (3m). 300 A Stick torch with cable (3m), Floating ball type regulator.
Weight	66 lbs. / 30Kg
Dimensions	26"L x 11"W x 16"H(19" with handle) / 660mm L x 280mm W x 407mm H (483mm with handle)
Recommended Generator Minimum	17500W Surge with Clean power output (See detailed information page 11.)
Efficiency	≥80%

Electrical and Performance Specifications

EVERLAST
Power i-MIG 315

MODEL: **Power i-MIG 315**			Serial No.		
1~ f_1/f_2 ⎓			EN/ IEC60974.1		
	⎓		240V; DC: 30-315A; 15.5-29.8V		
		X	35%	60%	100%
S	U_0 V 70V	I2	315A	250A	200A
		U2	29.8V	26.5V	24V
	⎓		DC: 10-200A; 20.4– 28V		
		X	35%	60%	100%
S	U_0 V 70V	I2		200A	160A
		U2		28V	26.4V
1~ 50/60 Hz	U_1 240V		240V $I_{1MAX:}$ 63A I_{1EFF} 38A		
PROTECTION CLASS IP21S	COOLING METHOD: FULL-TIME FANS		INSULATION: F		

IMPORTANT!

Keep this welder at least 18 inches away from all objects for proper cooling. This unit uses multiple fans at different spots within the machine for cooling. For this reason, proper spacing is imperative from all sides. Do not exceed 40° C in environment or duty cycle will be reduced. Regularly inspect and clean the welder and circuitry on a monthly basis with dry compressed air. Remove the covers only after the unit has been turned off and unplugged for 30 minutes to discharge the capacitors and to prevent the possibility of electrocution. Do not grind or direct sparks near the welder to prevent damage to the panel face and internal components. Check fan blades for build up and metal scale/dust and remove carefully. **Failures or damages to the unit due to accumulation of dirt and debris on circuit boards or fan blades are not covered under warranty. Opening your unit up to clean or adjust the unit does not void your warranty, and in fact ensures your unit will perform correctly and will uphold your warranty.**

NOTICE:

This welder conforms to North American electrical standards for 240V single phase welders, including plug type (NEMA 6-50P)and wire gauge. These standards take into consideration duty cycle, Maximum Inrush Amperage and Rated Amperage. When wiring a new electrical service or modifying an existing electrical service for use with this welder, always consult with a local licensed electrician. This unit is intended for use with commercial input power, and ground service. Although this unit may be used in non commercial applications, the user should be aware that the Welder wiring standards are different that typical household and non-commercial wiring standards. Refer to Article 630 of the NEC and to the I_{1MAX} (Inrush Current) and the I_{1EFF} (Effective rated current) listed above when selecting breaker size and the wire gauge to ensure that your installation will conform to national and local electrical codes for welding equipment. Wiring codes for welders differ from wiring codes for household electrical equipment for both plug type, breaker and wire sizing. **Do not attempt to rewire this welder, or make similar unapproved modifications to this welder. To do so will void the warranty. Due to the possible EMF/HF that can be generated with this unit, interference with and disruption of electronics, and electrical equipment may occur if not properly wired and grounded. If interference is caused, have a certified and licensed electrician come out and ground all metal items, directly to earth, including metal wall panels, tables etc, and install a ground rod every 50 ft. The ground bolt on the back of the unit should be used in conjunction to help resolve interference issues. Install an insulated 12 gauge or larger wire connected directly to a separate copper grounding rod driven into the earth and connect it to the grounding bolt on the rear of the unit. Keep Ground paths a short as possible**

General Product and Use Information

NOTICE:

This manual has been compiled to give an overview of operation and is designed to offer information centered around safe, practical use of the welder and its functions. Welding operations are inherently dangerous. Only the operator of this welder can ultimately ensure that safe operating practices are being followed, through the exercise of common sense practices and training**. Do not operate this machine until you have fully read the manual, including the safety section.** If you do not have the skill or knowledge to safely operate this unit and its related functions, do not use this welder until formal training is received*. Always be aware of your surroundings and operating environment and who and what is in that environment. Be on the lookout for fires, and smoldering materials while and after welding!*

GENERAL PRODUCT INFORMATION:

The inverter-based Power i-MIG 315 is a MIG/Stick unit with production welding capability designed for commercial/ industrial use and applications. (Residential or home shop use is ok as long as wiring codes are followed per Article 630 of the NEC) The unit is intentionally basic, for those users who require simplified setup and for use by multiple operators or with operator's with limited experience with MIG or stick welding. It features a self-contained undercarriage and a rear cylinder holder so that gas can be transported with the unit. It has a four roll wire feeder that features four gear driven drive wheels. It can use either 8" or 12" spools of wire. (Adapter required for use with 8" spools). Other than the standard Volt/Amp adjustments, this unit has burn-back control, inductance control, and a spot/stitch timer. Burn-Back is designed to help reduce the need for wire trimming before restarts by providing a momentary arc after the unit stops feeding wire. Typically the lowest setting of .1 to .2 seconds is recommended. The Inductance feature controls puddle wet-in, arc width, and spatter. For steel applications, a typical setting would be between 6.5 to 7.5. For stainless, inductance levels would typically be between 8.5 to 9.5. Aluminum settings of Inductance should be balanced at 4.5-5.5. Gas type or mix type will vary the settings required for best weld characteristics. The Spot timer allows the user to create regular, consistent sized spot, seam or plug welds automatically by timing the arc on time when the trigger is pulled. The stitch feature provides a repeating On/Off cycle of the spot weld function. The arc will continue to cycle on and off as long as the trigger is held. This helps in creating consistent length or size of welds along a seam, if forward travel speed is consistent. The Spot Timer can be used without the stitch timer, providing only a single On/Off cycle. The Stitch Timer cannot be used without the Spot timer. The unit also features an automatic Pre and Post flow time control for the gas. This improves weld quality, allowing a small bit of gas to flow before the wire begins to feed, and for gas to flow for a short time after the weld finishes. This promotes better gas coverage and reduces porosity at the beginning and end of the weld.

GENERATOR REQUIREMENTS AND OPERATION

Although this unit is intended to be primarily used in a shop, and not designed for portability, this unit may be used with generators rated for 17,500 Watts with a Clean Power Output rating. Clean power is defined as 5% or less Total Harmonic Distortion (THD). The manufacturer of the generator must specify that the generator is "clean power" or rate THD to be equal to or less than 5%**. Otherwise, any operation with other types of generators not rated to be "Clean Power Output" will void the warranty.** This is the equivalent quality of power provided by the electric company. This unit should not be used with bank power supplies. **The generator should be properly grounded, according to the generator manufacturer instructions or damage to the machine or injury or death of the operator may occur.**

Never leave the unit on or connected while starting the generator. Never stop the generator while the unit is on or connected. Severe damage will occur. This includes running the generator low on or out of fuel. This damage is not covered under warranty, even if the unit is rated as "clean powered". Always allow the generator to warm up before plugging the unit in and using it. A cold engine may not develop or maintain proper RPM needed to provide stable, clean power even if the unit is rated to be "clean power". Never use economy idle (ECO mode), or auto idle modes.

⚠ WARNING!

- Do not use the welder in damp or wet areas. Perspiration and other forms of water in contact with the body can increase the risk of electrocution.
- Do not use the welder in corrosive environments.
- Always secure the cylinder to the welder with provided chains so that accidental overturn is not likely.

General Product and Use Information

DUTY CYCLE AND ERROR CODES

This MIG/Stick welder features a self-diagnosing feature, which will display an Duty Cycle or Over Current light if a problem occurs. Do not attempt to defeat or ignore any errors that arise.

This unit has a duty cycle rating of 35% @ 315 Amps while welding in MIG. The duty cycle rating for stick is 60% @ 200 Amps. *The duty cycle rating is the amount of time (expressed as a percentage) out of 10 minutes the unit can weld without a rest while operating at a temperature of 40°C. Increases or decreases in temperature, humidity and air flow around the unit can change the stated duty cycle. If temperature is lowered, duty cycle generally increases.*

In MIG mode, the unit is capable of welding 3.5 minutes out of every 10 minutes at the maximum output of 315 Amps. For the balance of the 10 minute period, the unit should be allowed to rest and cool while running. Stick is also rated for a 6 out of 10 minute welding period but at the maximum of 200 Amps output. If the unit's duty cycle has been exceeded, the "Over Temperature" LED will light and welding output will cease. If the unit has over heated and triggered the duty-cycle "Over Temperature" warning, allow the unit to run and cool for 15 minutes. After 15 minutes of cooling while the unit is kept running, cycle the power switch to reset the unit if it has not already reset automatically.

In the event of an Over Current, the welding output will cease the "Over Current" LED will light. In duty cycle and overcurrent events, the wire may continue to feed without welding output. Overcurrent events can be caused by too low of supply voltage, running on undersized extension cords, too large of wire diameter, or internal or external electrical fault. When an overcurrent has occurred, turn the machine off immediately, then check and remedy the fault before cycling the welder back on. **If the error does not clear after cycling the switch, immediately cease operation and call Everlast Technical Support.** When the "Overcurrent Warning" LED lights and will not clear, the overcurrent has likely caused an internal fault. This is usually a result of a poor power supply, a long extension cable, or from running off of a generator that is malfunctioning or not rated for clean power use.

HELPFUL HINT:

Keep the clear protective cover lowered during operation to prevent damage to the panel and controls from sparks and dust. Replace the cover when it becomes scratched or dirty.

Discussion of Welder Features and Operation

SUMMARY OF FEATURES

GMAW Process (MIG) and F-CAW (Flux-Cored)

The digitally controlled components of this welder precisely control wire feeding and arc quality. It also gives real-time feed back about the welding output parameters. The welder is also spool gun (gun optional) ready for economical welding of Stainless and Aluminum wires if needed. It can also be used to weld with Flux Cored and Dual Shield wire (when equipped with optional flux core drive wheels). However, since there is no Dual Shield Power-Set feature, Dual-Shield can only be done in standard MIG mode. The unit is equipped with a heavy duty 36 series MIG gun. ***NOTICE:*** *This unit does not support a Push-Pull gun. It does not have a Pulse-MIG mode.* **Additional drive rolls are optional.**

SMAW (Stick) Process

In stick mode the welder delivers a smooth DC low spatter arc. Professional, high-quality welds are obtainable with E7018, 7014, 309L, 316L, 6011 and many other similar rods that are designed for use with any DC stick welder. This setting also works well with the easier-welding E6011, but is not designed for E6010 use. The Stick mode also features adjustable hot start time and hot start intensity controls which are designed to help reduce sticking during arc starts while simultaneously reducing porosity or inclusions during arc initiation. ***NOTICE:*** *This unit does not provide AC operation in stick mode.*

Burn Back Control (MIG/Flux-Cored)

Burn back control is used to control the length of the wire stick-out after the trigger is released. It helps to prevent the welding wire from sticking in the coalescing weld puddle after the arc is terminated and saves the user from having to trim the wire before restarting the arc. The burn back keeps the arc energized for the time specified by the user after the wire feeder stops feeding. This allows the wire to be trimmed back. For most welding applications, this should be kept between .1 and .5 seconds. To achieve maximum effect, keep the gun held over the weld for a second after welding has stopped.

Pre and Post Flow Control

The auto Pre and Post flow control features are designed to improve weld quality at the beginning and end of the weld where porosity from oxidation can be a problem. This is accomplished by providing additional flow of shielding gas before and after the weld. This control is automatic and is optimized for the amperage used. It cannot be turned off. When using Flux-Core the gas solenoid will continue to cycle and may cause a slight delay in arc starting. This is normal and is not considered a defect or unit problem. If using dual shield, this is not an issue.

MIG Inductance

The MIG inductance control allows the user to customer tailor the arc to suit the position, wire type, and user preference. The Inductance is controlled through the control named "Arc Force". (This control is also used for the stick mode.) This control has been referred to by a number of different names, such as slope and choke. This control adjusts the current rise time once the arc has short circuited against the metal. This determines how fast the wire heats up and burns back until it pinches off a small droplet of metal to be released back into the puddle. The pinching off of the wire happens many times a second. The current rise time is only measured in fractions of a second, but can make a big difference in the arc spatter, puddle fluidity, puddle width and even sound of the weld. For steel, start with a setting of 6.5 to 7.5 for thicker gauges and plate, and 4.5 to 6.5 for thinner gauges. Higher or lower settings may be used depending upon operator preference, but setting the unit too low will result in a narrow, ridged bead, resulting in excess spatter that resembles a stuttering, or improper wire feed. In reality, the burning back is happening too slow and the wire is stubbing into the metal. This is why a high ridge in the center of the weld is observed when Inductance is too low. The sound of the weld will be a high pitched whine. Too much inductance will result in a wide, very wet puddle. This is not a problem as long as burn through doesn't happen, or the tip doesn't over heat. The sound will be lower, and can be quite coarse. Spatter will also once again increase. With that said, try to refrain from using a "5" setting, or a one-size-fits-all setting. Inductance can be used to help smooth out the weld with pure CO2. It is a valuable tool that should be used to improve weld quality and arc performance.

Stick Arc Force

The Arc Force function over time has been identified by a number of names such as "dig" or "arc control". This function serves several purposes. The primary function is to help maintain welding "wattage". Keep in mind that welding involves the use of both Amps and Volts. When multiplied together, you get total wattage (VXA=W). Wattage is really what dictates how the puddle flows and is maintained, and even how the electrode burns. When welding, the height of the electrode and the arc gap created between the end of the electrode control voltage. There is no independent control of this. Amperage can be preset, and controlled with a knob, but voltage is controlled primarily through the length of the arc. This means that the arc length is under constant change, and that "burn-off" of the electrode naturally causes the Voltage to change. The closer the rod is held and the shorter the arc gap that exists, the lower the voltage falls. The fall off of voltage results in a cooler puddle and a slower burn off rate of the electrode. This means that the electrode has a high probability of sticking. With the use of Arc Force, as the voltage falls below the preset threshold of approximately 20V, the unit senses this fall off and automatically compensates by kicking in extra amperage to the weld to help maintain a steady melting of the electrode and a proper puddle. The Arc Force Control allows the user to set how much extra amperage is automatically delivered to the weld puddle when the voltage falls below the 20V threshold. The settings are numbered 0-10, but in reality can be considered 0-100% over the actual amount of set amperage that the machine automatically increases the amperage when voltage falls. Beyond, maintaining a consistently burning rod and puddle, it can be used to help burn in root welds, or burn out defects by simply pushing in on the rod engaging the arc force and automatically increasing the amperage. In the past, with most transformer type stick welders, to increase heat while welding, or to prevent outage of the arc, the operator would purposefully increase the arc length, raising the voltage. This creates issues with porosity by allowing the arc to break or trap air in the puddle. And of course, this will not allow a proper weld "wattage" to be established. Despite protocols calling for certain "amp" settings, this can be somewhat futile as arc length is the "unknown" factor in the field with multiple operators and different skill levels. For those welders used to running machines not equipped with arc force control, some rethinking and retraining of muscle memory may be required to create a proper weld. When more heat is needed, push the rod into the puddle. When less heat is needed, increase the arc length slightly. This also changes the whipping motion used with some rods into a "stepping motion."

General Product and Use Information

MIG/FLUX-CORED WIRE, DRIVE ROLL AND GUN INFORMATION

This unit is designed for multiple types and sizes of MIG and Flux-Cored wire. Recommended wire sizes range from .023" to .045" (.6 to 1.2mm), with the standard equipped 36 series MIG gun. Stock V groove drive roll size supports. 035" and .045" solid/hard wire. Keep in mind that you may need to purchase optional drive rolls and/or another gun or gun liner to fully utilize and weld with all wire types.

NOTICE: No one gun can be used for every combination of wire diameter and type. MIG and Flux-Cored drive rolls must be sized for the diameter of wire. Each drive roll typically supports two wire diameter sizes.

NOTICE: Small diameter (.023"-.030"/.6-8mm) wires and all Aluminum wires should use a short gun which is no longer than 10 ft. (3m) in length, or the wire can jam or feed irregularly. For smaller diameter wires, a smaller gun is recommended. The included gun, will need an optional liner to support .023" and .030" for best feeding and to reduce the chance of "bird's nesting" .035" and .045" wires can be fed in longer length guns.

For small wire diameter sizes, Everlast recommends purchasing either the 15 or 24 series gun to handle the smaller wire and to give greater flexibility when welding more delicate items. See the information below for more information regarding gun and drive roll selection. *Additional drive rolls to match the wire diameter and type are optional items that may be required. If so, they may be purchased from Everlast.*

- Flux-Cored/Dual Shield Wire: Although the standard gun can be used to weld Flux-Cored wire, it's recommended to use an optional flux-cored gun if much flux-cored welding is to be done to prevent nozzle plugging. If using Dual-Shield, the standard gun is sufficient. You must use *serrated*-groove drive rolls if using Flux-Cored or Dual Shield Wire. Its recommended to only use .035" or greater diameter Flux-Cored wires.
- Stainless (INOX) Wire: Standard Gun and V– groove drive rolls should be used. However, using small diameter (i.e. .023"/.6mm) wires will result in problematic feeding without a Polymer liner.
- Steel Wire: Standard Gun and V-groove drive rolls should be used
- Aluminum Wire: There are two options available to weld Aluminum with this welder. The first option: If using the standard gun, an optional ***polymer liner*** can be used to smoothly to feed 50XX series Aluminum wire in guns up to 10 ft. in length. (This means the steel liner must be removed and the new polymer liner reinserted in its place.) U-Groove drive rolls must be used to prevent damage to the wire and the gun liner. The gun cable should be kept relatively straight, without coiling or sharp angles to prevent feeding problems. The minimum wire size recommended for this type of feeding is .035" (.9mm) with up to .062" (1.6mm) possible. 40XX series wire is usually too soft for this type of feeding. The advantage of this method is that larger spools of aluminum wire may be used. Never attempt to feed .023" or .030" Aluminum wire in this fashion. The second option: A spool gun can be used to feed .035" to .045" diameter wire. This limits the spool size to 4", which is typically 1 lb. of Aluminum wire. This is a more expensive, but better option if a longer reach or more convenience is required. Either 40XX or 50XX series Aluminum wire may be fed in this manner. In either case, .023" or .030" Aluminum wire should not be used with this welder or feeding problems will result. **For Spool Gun welding, purchase the optional Parker DSP360 Spool gun from Everlast.**

General Product and Use Information

MIG/FLUX-CORED WIRE, DRIVE ROLL AND GUN INFORMATION

For smooth wire feeding, free of jamming and slipping, the drive rolls must be sized correctly. You must select the proper type and size of drive roll for the size and type of wire used. The size of the wire and the type of drive roll is marked on the side of each drive roll. On this welder, the groove on the same side of the printed size is the groove that corresponds to the marked size. This means that when installed, the size of the groove will always be facing in. You may need to remove the drive roller to verify the correct groove size is being used. *Only the bottom drive rolls need to be changed. The top drive rolls hold pressure and are flat. The top drive rolls are not removeable.*

The type of wire dictates the groove type:

- Steel and Stainless (INOX) wire uses a V-shaped groove milled into the drive roll. This will be signified by a winged "V" stamped on the side of the drive roll, next to the wire diameter marking.
- Aluminum wire uses a U-shaped groove milled into the drive roll. This will be signified by a U mark stamped on the side of the drive roll, next to the wire diameter marking. This cushions the wire, and prevents scoring and damage for easy feeding when using a polymer type gun liner.
- Flux-Cored/Dual Shield wire uses a serrated groove milled into the drive roll. When viewed from the top, the appearance of the groove is similar to a closed zipper, or saw blade. This also has a zig-zag marking on the side of the drive roll next to the wire diameter marking.

These drive rolls may be stamped in metric wire sizes, or in both metric and imperial sizes. To avoid confusion, use the following conversion to select the proper drive roll for you wire diameter:

- .6mm=.023-.025"
- .8mm=.030"
- .9mm=.035"
- 1.0mm=.040"
- 1.2mm= .045"

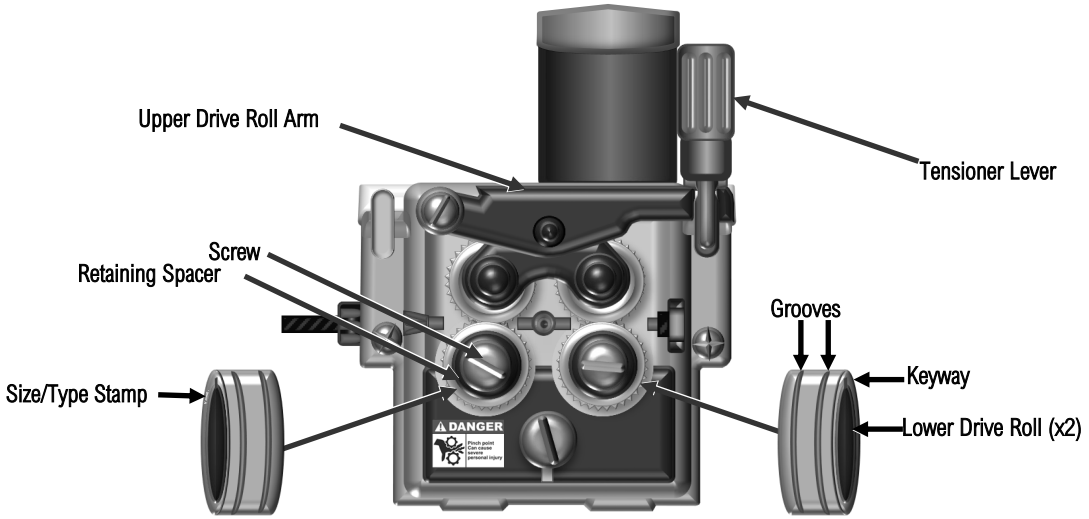
To change or flip the drive rolls:

- Release the tensioner, by flipping the tensioner down and toward you. The upper drive roll arm should raise.
- Remove the slotted screws securing each lower drive roll.
- Pull each retaining spacer.
- Remove the outer ring of the drive roll and flip the drive roll over or replace it, making note of its size.
- The drive roll is actually made of two pieces. Hold the inner assembly of the drive roll on with one finger (to prevent it from slipping off the shaft), while slipping the outer "rim" of the drive roll off with the other hand. *Both inner and outer parts of the assembly have locating keys. The inner assembly does not need to be removed.*

To reinstall the drive rolls:

- Line up drive roll keyway with the locating key on the inner assembly.
- Reassemble in reverse order and tighten each roller.

Make sure both rollers are matched in size. Also make sure the locating keys are in place and have not pushed or slipped out of their grooves during assembly. Lightly coat the inner mating surfaces with light machine oil if necessary to prevent future seizure. Do not lubricate the surfaces of the drive rolls or erratic feeding may result. Please note that the size and type of drive roll is stamped on the side of the drive roll. The size and type is always stamped on the side nearest to the actual groove. This means that, when installed, the stamped size will be turned to the inside, and not visible to view.



General Product and Use Information

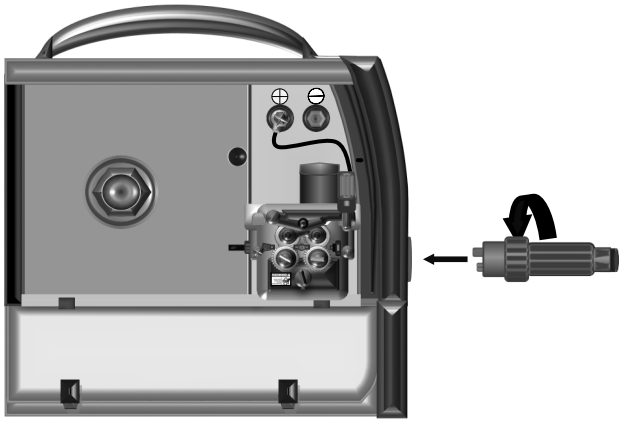
MIG/FLUX-CORED WIRE, DRIVE ROLL AND GUN INFORMATION

The MIG gun has a Euro-style quick connect that is used to connect the gun to the welder. This type of connection is the most common throughout the world and most major MIG gun manufacturers can supply any MIG gun in this type of configuration If you need to change your gun to match other guns in your shop (to keep consumables the same), contact the manufacturer of your preferred gun for a replacement gun with this type of back-end. The Euro-style quick-connect can be rapidly connected and disconnected from the welder without the use of any tools.

To install the MIG Gun:

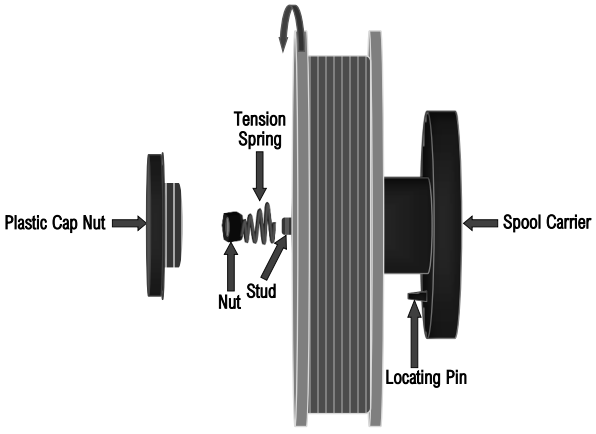
- Align the pins and the wire pick-up on the torch connector with the holes on the feeder receptacle on the welder.
- Fully engage the connector into the receptacle, wiggling slightly to ensure the fittings seat home.
- Using your hand, twist the plastic hand nut on the gun connector clockwise until it is snug.
- Check for side to side play once more by wiggling it.
- Re-tighten if necessary.

The gun supplied with this unit is an air-cooled 36 Series, 340 Amp gun, design. This gun is a common Binzel®-type gun. This is a widely used gun design and offers excellent ergonomics and dependability.



To load the spool of wire:

- Loosen and remove the hand nut on the spool carrier by turning it counter-clockwise.
- Align the locating pin with the hole on the wire spool. *If using an 8" spool slide the adapter on the shaft before sliding the spool on.*
- Slide the spool onto the shaft. Make sure wire is unwinding from the bottom of the spool. This means the spool turns counter-clockwise as it feeds.
- Adjust de-spooling tension by turning tensioner located under the plastic cap nut on the spool carrier.
- Lightly spin the spool. If it free-wheels more than 1/4-1/2 turn, tighten hex nut. If it does not free-wheel at all, loosen tensioner until it free wheels 1/4 -1/2 turn.
- Reinstall the plastic hand nut so the spool is retained securely.
- Locate the end of the wire and clip the bent end of the wire so that it will feed through the wire feed mechanism smoothly. Carefully hold the spool of wire with one hand so the wire will not de-spool. *Proceed to instructions on the next page regarding feeding the wire.*



(Viewed from the Front)

General Product and Use Information

MIG/FLUX-CORED WIRE, DRIVE ROLL AND GUN INFORMATION

1.Install the MIG gun as instructed in "To install the MIG gun (torch)" on the previous page. Loosen the top idler roller tensioner, rotating the black tensioner knob counter-clockwise.

2.Flip the tensioner down, toward you, releasing the carrier arm that holds the top drive rolls.

3.Raise the drive roll arm up. Inspect the drive rolls to make sure that each roller's groove size matches the wire diameter. Also make sure correct type of drive rollers are used. i.e. Flux-Core drive rolls use special serrated rolls. (Top driven rollers do not have grooves and are not to be removed).

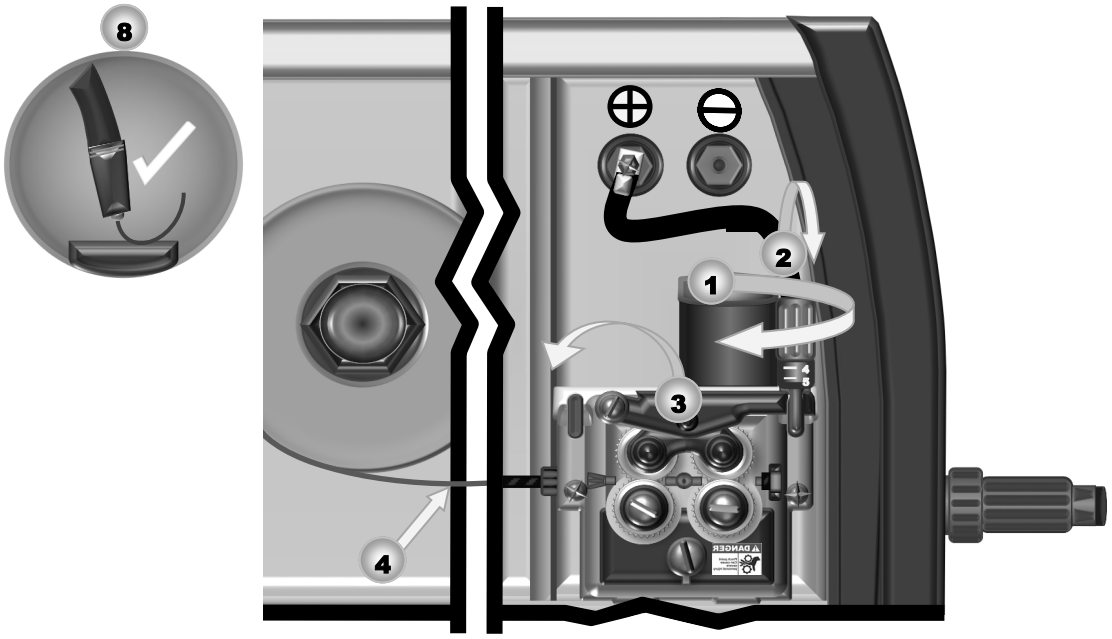
4.Unscrew the plastic retaining cap from the spool carrier. (See Previous page for more information.) Make sure the spool of wire is loaded correctly so that the wire unrolls from the bottom of the spool (counter-clockwise). Thread the wire into the coiled guide and over the grooves in lower drive rolls. Thread the wire through until it threads into the gun section 4"-6".

*5.*Reverse the procedure. Begin by lowering the upper drive rolls into contact with the lower drive rolls, keeping the wire securely held down so that it stays in the inner groove of the drive roll. *If needed, use a screwdriver with a fine blade or small pick to keep wire from moving out of the grooves until step 6 is completed.*

6.Raise drive roll tensioner back into place. Tighten it slightly so the wire will be held and not slip out. Notice markings on tensioner for future reference.

7.Remove the contact tip from the torch. Hold the torch cable and gun as straight as possible, in direct line with the unit so feeding of the wire through the gun liner is smooth and easy. Press the gun trigger to feed wire until the wire exits the end of the torch. Reinstall the contact tip over the wire over the wire and tighten it.

8.To prevent bird nesting or slipping of the wire, adjust the tensioner clockwise until the drive rolls will not slip when the wire comes into contact with a hard surface. The wire will curl up on end while feeding under power. If you over-tension the wire, you will increase the chances of bird nesting of the wire (balling up of the wire or curling of the wire around the drive rolls), so it is best to tighten just until wire stops slipping and is able to curl up. Extra tension can deform the wire and prematurely wear the drive rolls. Slowing of the feeder may result as well. Remember not to test on any metal attached to the work clamp to prevent the wire from arcing while performing this test.



WARNING! ⚠

The wire feeder has moving parts and has pinch points. Keep all guards in place during use or serious injury may occur. Make sure all drive rolls are tight and the wire is properly tensioned. Over tensioning can create jamming and wrapping of the wire around the wire feeder. Keep cover closed while feeding wire.

General Product and Use Information

NOTICE:

The Power i-MIG 315 includes a self-contained undercarriage, which also includes a built-in carrier for the cylinder. This carrier will hold multiple sizes of gas cylinders. However, do not use small cylinders (20 Cu. Ft. or similar sizes) that do not rise above the cylinder yoke, that secures the cylinder with a chain. The yoke should strike the cylinder below the bell shaped area that forms the top of the cylinder. The cylinder should be secured with the included chains dropping through the chain slots on the yoke. It should be as tight as practical, so that play between the yoke and the side of the cylinder is minimized. The gas inlet on the unit is a 5/8" CGA fitting, which is the North American Standard for gas fittings on MIG welders. If using pure CO_2 a regulator specially made for this application must be used.

CONNECTING THE GAS REGULATOR TO THE CYLINDER:

To safely connect the regulator to the cylinder, first make sure the cylinder is properly chained and secured. Then, before connecting the regulator and while standing to the side of the discharge (not in front of the discharge), briefly crack the valve and allow a 1 to 2 second blast of gas to clear any dirt or contamination from the valve seat. Then connect the regulator and screw the fitting clockwise until finger tight and finish tightening with one 1 1/8" wrench. Do not use a pair of pliers or other grip/lock devices. Use a large adjustable wrench if no other wrench is available. Make sure the connection is tight. Slowly open the valve to check the connection for leaks with luke-warm soapy water (or approved leak detector solution) applied to the fittings at the valve.

To connect the hose to the rear of the unit, screw the 5/8" gas fitting into the gas inlet on the rear of the unit, rotating clockwise until finger tight. Then use two (2) 3/4" wrenches to complete the tightening process. One wrench should be placed on the female gas inlet nut and should be held tightly to while the other wrench is used to finish tightening the male fitting. **Always tighten the connection at the welder using one wrench to hold the welder inlet fitting and another wrench to tighten the regulator hose fitting. Using only one wrench may result in damage to the fittings.** Check all fittings and connections for leaks once again. *See illustration next page for proper connection arrangements.*

Do not use thread tape or sealant on threads of the unit, regulator or cylinder. Plugging and sticking of the gas solenoid valves, regulator or torches may occur if thread sealants are used. The compression fittings used will tighten up once proper pressure has been achieved. If the cylinder will not seal, the threads may be worn on the valve. If hoses show sign of leaks, tighten the clamps with a pair of side cutters or end nippers. Gently squeeze the clamp tight until the leak stops or add an additional clamp only if absolutely necessary. If the regulator leaks, remove it from service.

REGULATOR ADJUSTMENT

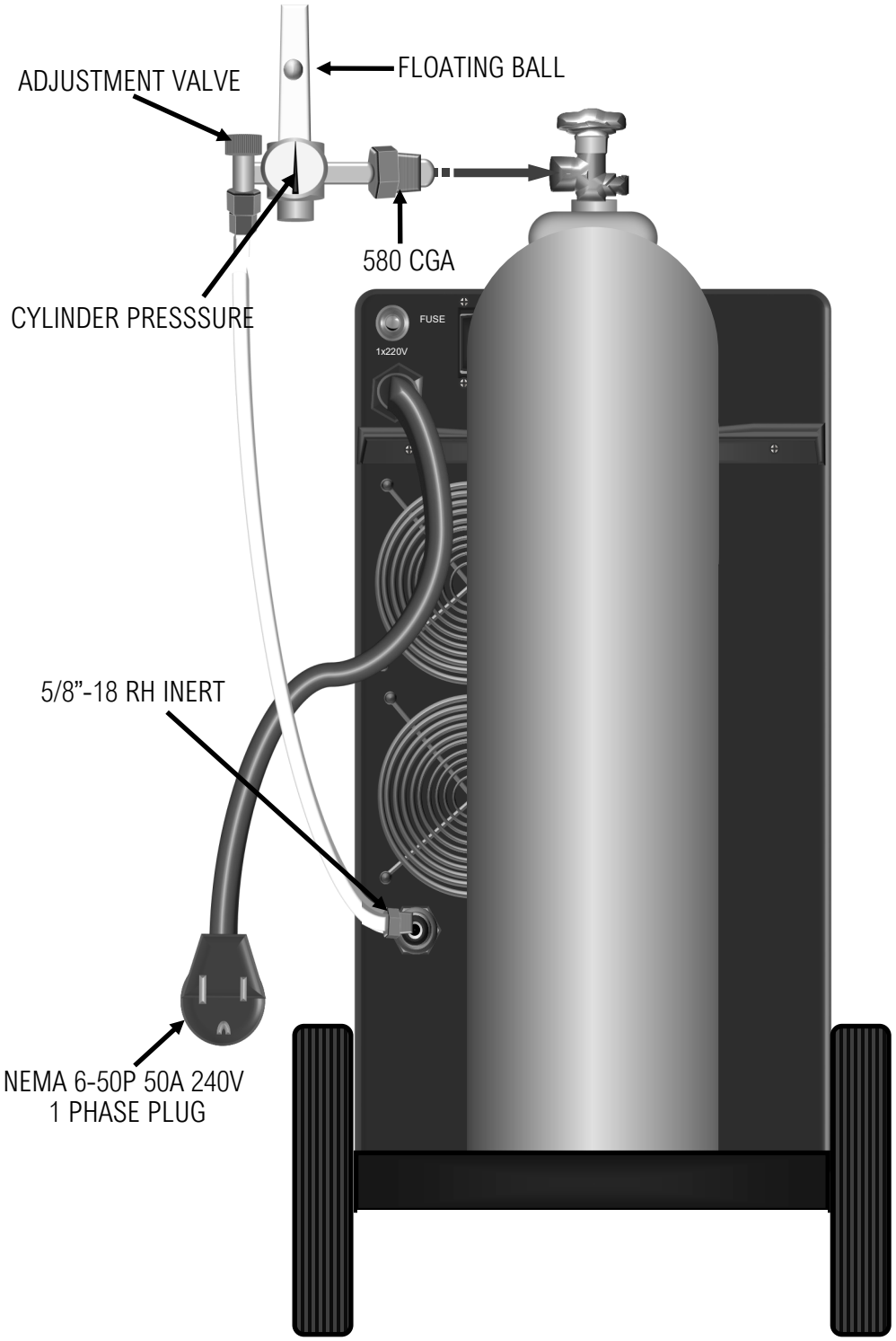
The Ball valve will float briefly once the main cylinder valve is opened and will then settle down and stop floating after 4 to 5 seconds. Fully open the cylinder when in use to prevent valve leaks. If the valve continues to float, you have a leak. Stop and check. To adjust the gas flow rate, the welder must be turned on. First release the tension of the drive spools by flipping down the tension lever. Then, select MIG and squeeze and hold the gun trigger so the gas begins to flow. Adjust the flow rate with the small knob on the down tube on the regulator. Screw the knob counter-clockwise to increase flow. This meter will work with both Argon and Argon/CO_2 mixes. (Not for use with 100% CO_2) The flow rate is calibrated in Cubic Feet per Hour (CFH). (Markets outside of North America may be calibrated in Liters per Minute (LPM)). The pressure gauge only registers the pressure inside of the gas cylinder. Use the clear plastic tube with the floating ball to read flow rate. Use the middle of the ball to read flow rate correctly. As the cylinder looses pressure near the end of its contents, flow rate may need to be readjusted. This is normal.

⚠ WARNING!

Never attempt to repair a damaged regulator yourself. The parts are under pressure. Serious injury or death may occur. Do not open the cylinder valve quickly or damage can occur to the regulator.

General Product and Use Information

Gas and Electrical Connections



NOTICE:

The unit is shipped with a regulator rated for Ar/CO_2 or 100% Argon use only. If using with 100% CO_2, an CO_2 regulator must be used. Gas Cylinders are not included, and shown only for demonstration purposes.

General Product and Use Information

GAS SELECTION

Gas selection for different processes and different metals can be confusing. These guides help you remember which gases should be used. However, for MIG, they are not absolute. The suggested gases for MIG are based upon standard, short-circuit mode and do not take into account the axial spray mode. See below for the stated Gas modes and alternate (permissible) gases that can be used.

- Stainless MIG: Recommended: 98/2 Ar/CO2 , Permissible: Tri-Mix (for short circuit only)
- Steel MIG C25: Recommended: 75/25 Ar/CO2 (for short circuit); Recommended: 90/10, 80/20, 95/5 Ar/CO2 (All gases 80/20 and above are considered to be gases used for axial spray.)
- Steel MIG: C100: Recommended: 100% CO2 (for short circuit); Permissible: No other gas.
- Aluminum MIG: Recommended: 100% Argon; Permissible: No other gas.

⚠WARNING!

Do not leave the regulator on when not the welder is not in use or loss of cylinder contents may occur. Loss of cylinder contents may result in asphyxiation since the shielding gas is heavier than air and does not dissipate quickly. Always have enough ventilation. Do not weld in tight, closed spaces for extended periods of time.

ADJUSTING GAS FLOW RATES:

The gas flow rates for MIG welding are critical for creating a good, contamination and porosity free weld. Too much flow rate will create turbulence and introduce air to the weld. It may seem counter-intuitive, but solving issues with gas coverage by steadily increasing gas flow can create more problems than it solves, and can actually mimic the same issues observed by too little gas flow. In general, ideal gas flow will vary and no one gas flow rate is perfect for every situation. Gas flow rates for MIG are usually 20 to 30% higher when used outside. However, when adjusting gas flow, keep in mind the following variables:

- Joint Design/Type
- Nozzle Size (Larger cups require more gas flow.)
- Metal Type (Aluminum typically requires higher rates.)
- Welding Position (Flat position usually requires less gas flow.)
- Air Circulation Around the Weld Area (A shield such as a piece of plywood may need to be used outdoors)
- Gas Type

The best method for setting gas flow rates involves trial and error by welding, observing the weld and stopping to make quick gas flow adjustments.

To properly set gas flow:

- *Start by setting the gas flow rate to 20 CFH (Cubic Feet Per Hour). This will be an approximate setting.*
- *To obtain the best setting, lower the gas flow rate, 2 CFH at a time. Do this until bubbles and porosity, and extra soot are noticed.*
- *If bubbles and porosity are present at 20CFH, proceed directly to the next step.*
- *Slowly raise the gas flow rate 1CFH at a time until the bubbles and porosity disappear from the weld.*
- *Once the porosity and gas disappear, add another 1 to 2 CFH to allow a buffer zone of gas flow. This will minimize gas wasting and prevent issues caused by too much gas flow. The weld should be bright and shiny if the metal was properly prepped, gun/torch angles were correct etc.*

For Aluminum MIG welding, extra gas flow is required. Start this process around 30 CFH.

CONNECTIONS AND POLARITY

STOP!

IMPORTANT!

Read the information on this page and the following pages carefully. It contains important information on correct polarity that should be used in the welding process. Incorrect polarity is a common cause of many weld-related problems, particularly when changing processes or wire types.

⚠CAUTION!

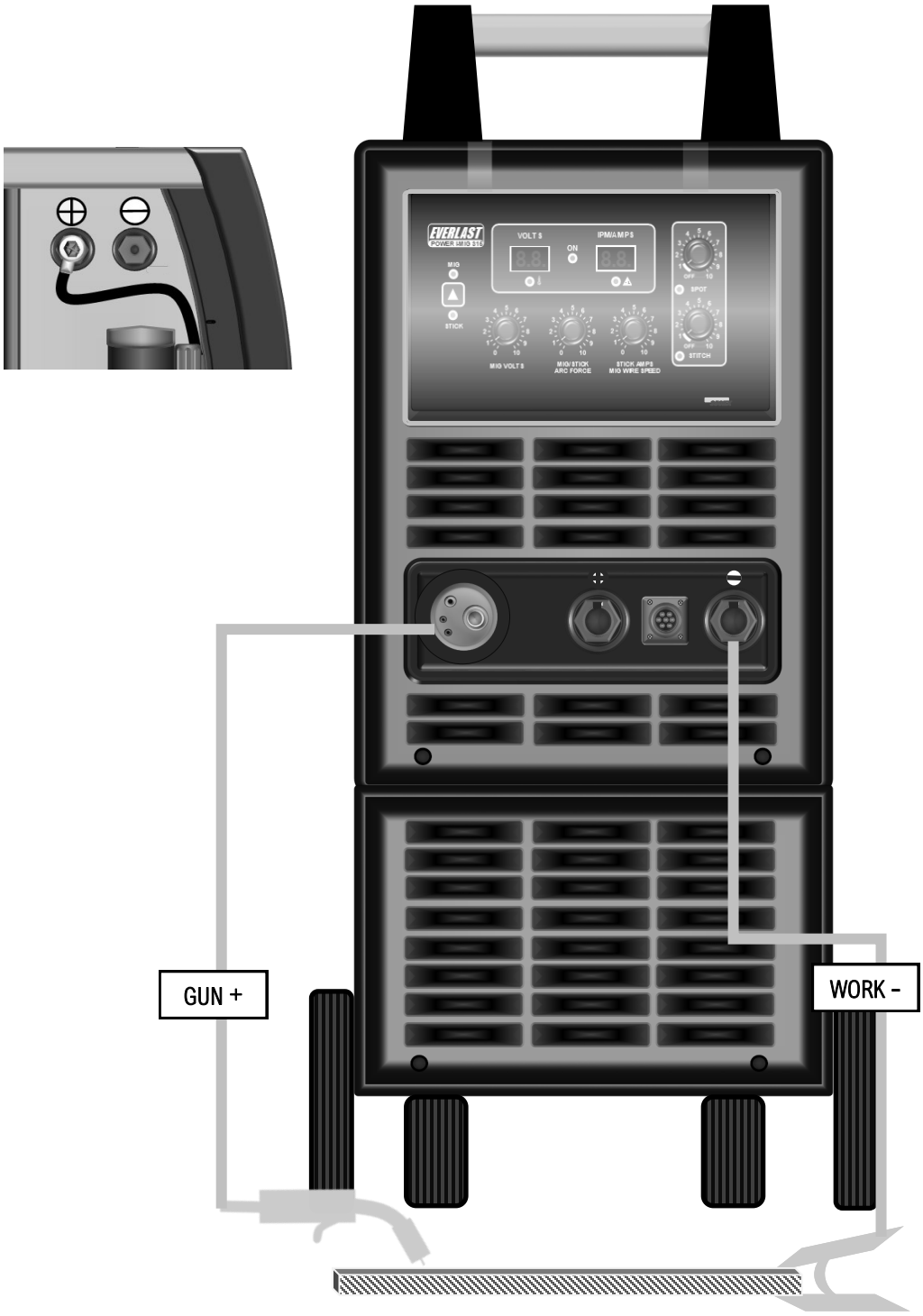
Remove the Stick electrode holder while MIG welding. **These connections remain live and can cause the torches to short out against any metal that comes into direct contact.** The MIG gun may remain connected while welding with the Stick function but the nozzle must be insulated from contact. A small rubber hose or non-conductive tubing may be slid over the tip of the gun to protect it if needed. *Important: Check the polarity before welding, especially if a another process was recently used.*

POLARITY CONNECTIONS		
PROCESS	TORCH POLARITY	WORK POLARITY
MIG (GMAW)	+	-
FLUX CORED (FCAW)	-	+
STICK (SMAW)	+	-

IMPORTANT!

Always connect the work clamp directly to the part being welded. Avoid connecting to table tops or bench legs or indirectly through other items if possible. Loss of power and or poor arc starting may result. This is also a primary cause of a wandering or unstable arc. Keep work leads in good condition.

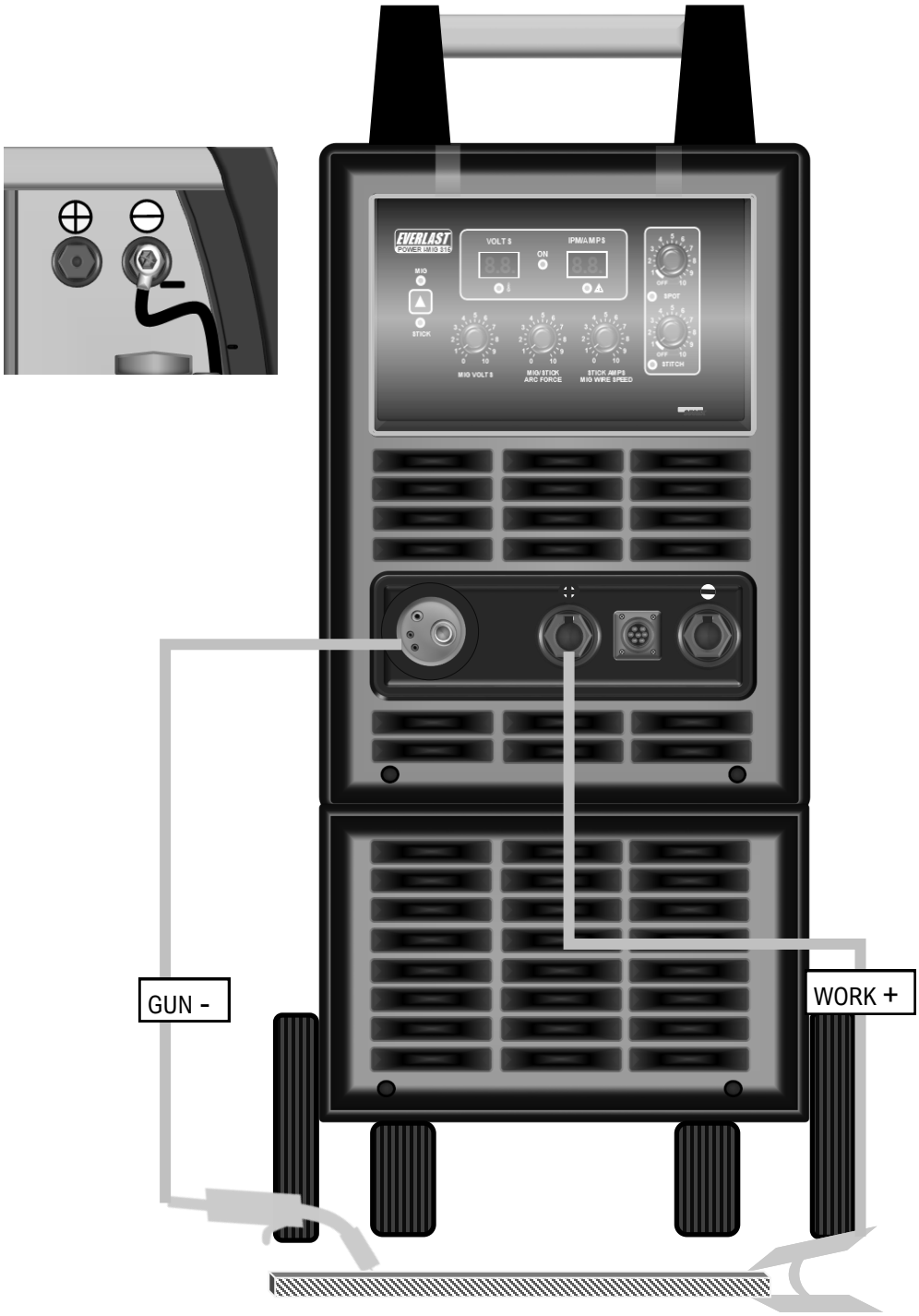
CONNECTIONS AND POLARITY
MIG (GMAW)



NOTICE:

For MIG, the polarity connection for the gun is located under the spool cover. It must be connected to the positive terminal. MIG requires that the gun be positive polarity and the work clamp be negative polarity.

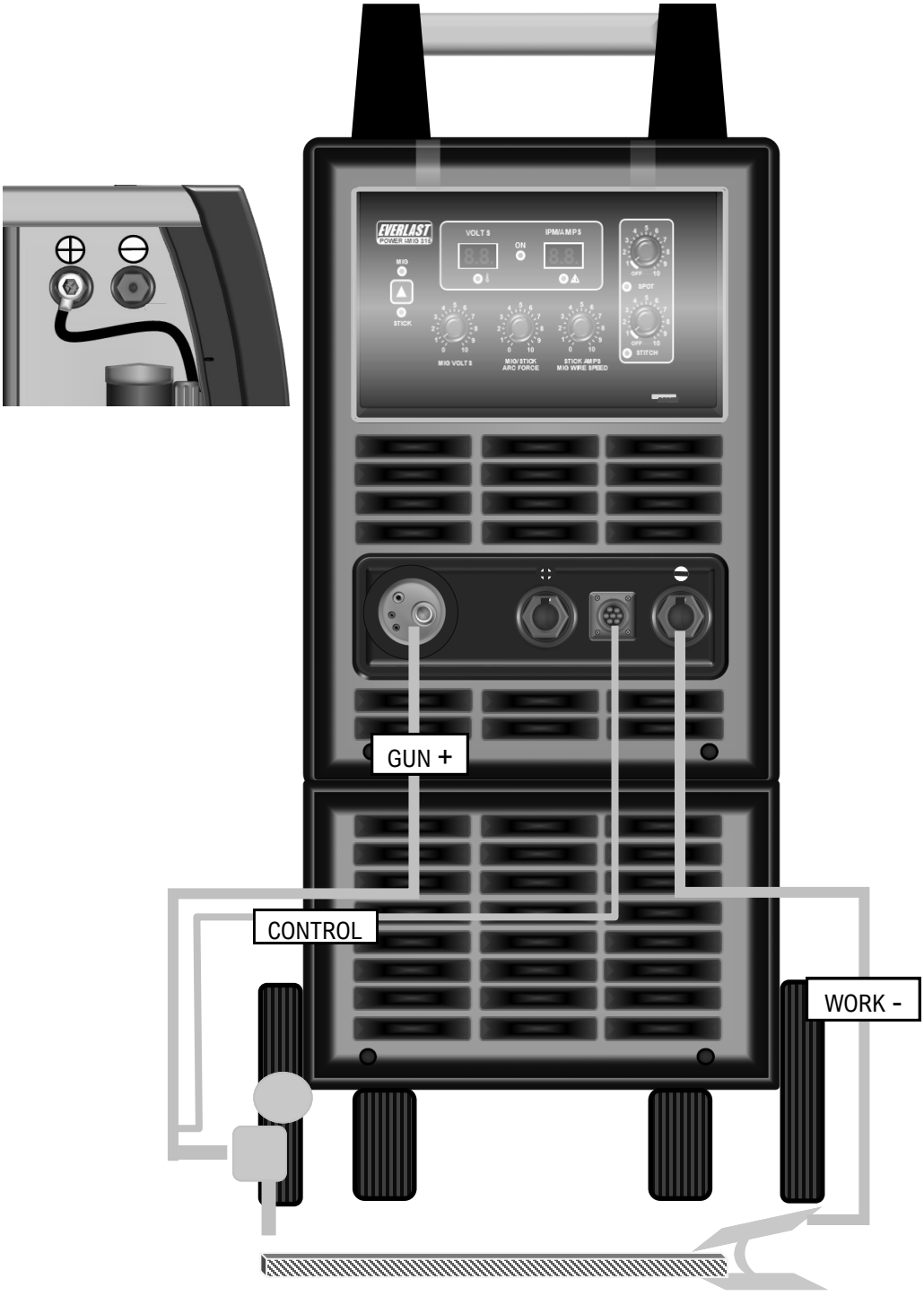
CONNECTIONS AND POLARITY
Flux-Cored (F-CAW)



NOTICE:

For Flux-Cored, the polarity connection for the gun is located under the spool cover. It must be re-located to the negative terminal. Flux-Cored requires that the gun be negative and the work clamp be positive polarity.

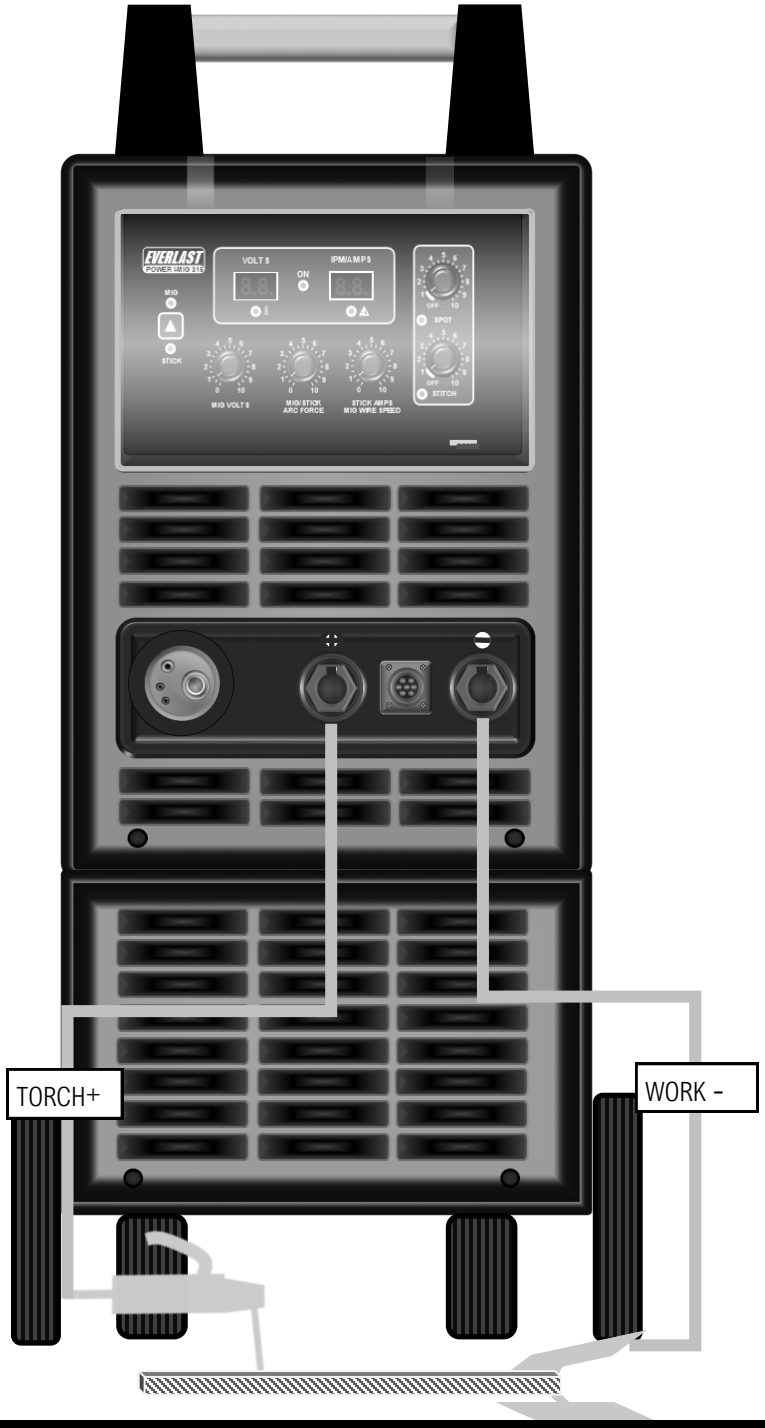
CONNECTIONS AND POLARITY
MIG (GMAW) with Spool Gun



NOTICE:

The polarity connection for the Spool gun is located under the cover. The gun polarity should be positive. If welding Flux-Cored wire with the spool gun, use the negative terminal, and configure for Flux-Cored use.

CONNECTIONS AND POLARITY
Stick (SMAW)



NOTICE:

This is the typical setup for stick welding. Most all welding electrodes use electrode positive as the preferred polarity. Some rods are designated for both polarities. Consult the electrode manufacturer's recommendations for applications of EN or EP. Operation with old or improperly kept welding electrodes will affect performance. If difficulty is encountered welding with a particular class of rod, try changing to another brand.

NOTICE:
The sections on MIG and Flux-Cored adjustment and operation have been combined since setup and adjustment is similar. Where there are exceptions, it will be noted.

MIG/Flux-Cored

UNDERSTANDING MIG FUNCTIONS

TERMS RELATED TO MIG/FLUX-CORED SETUP

Amps. (A) Amps are directly related to wire feed speed in MIG and Flux-Cored operation. The type of wire, the diameter of the Wire and the Wire feed speed govern the amount of current that flows as wire is fed. This is comparable to the rate of "flow" of water. While Amps aren't shown on the panel, WFS controls the Amp output of the unit.

Burn-Back. The Burn-Back setting is the amount of time that the welder keeps the wire energized *after* the drive stops feeding. This reduces the need for trimming the wire by melting the wire back to a length preset by the timer. Ordinarily, the wire Burn-Back Setting should be set for .1 or .2 seconds. Excessive burn back time will result in the wire burning back and even into the tip. To maximize the effectiveness of the Burn-Back function, momentarily hover over the weld after welding has stopped to maintain continuity and allow the Burn-Burn Back to do its job. ***The burn-back timer is located under the door of the unit.***

Inductance. Inductance controls the amount of fluidity of the weld puddle. A fluid puddle is associated with a softer, smoother arc. A flatter weld is the result. A colder puddle, with less wet-in, and lower fluidity often results in a taller, or even "piled-up" appearance to the weld. As Inductance increases, the raspiness of the sound increases, and spatter tends to disappear. With an extreme amount of inductance, though. spatter begins to reappear at the very end of the range. Too low of an Inductance leads to a high pitch whine, and spatter may tends to increase, with a high ridge developing in the center of the weld. However, low inductance levels are good for thin materials, reducing burn-through. Increasing Inductance increases the fluidity, and general heat of the puddle. Often referred to as Welder Slope or Welder Choke, the Inductance controls the current rise time after the arc has shorted out during the short-circuit weld process. As the current rises after a short circuit, the wire begins to burn back to a point where it pinches off and transfers to the puddle. This happens many times a second in reality, in rapid repetition. The Inductance can be tuned for improving arc performance out of position, and on thin materials. It can also be used to compensate for performance issues when using different shielding gases or metal types. The importance of Inductance cannot be overstressed. With older style machines, Inductance was fixed. In fact, many manufacturer's even today choose to fix their inductance at a pre-set level. All machines have some inductance. However, the amount varies by manufacturer. This is what leads some owners to prefer one brand over another as people prefer (without knowing it) a different level of inductance over another. Adjustable inductance ensures that the unit welds equally well with steel as it does with stainless steel, or that it welds similarly with steel and a 75/25 Ar/CO2 mix as it does with a 100% CO2 mix.

Use the following suggested ranges for Inductance settings and fine tune thereafter for preference and application:
MIG C25: 65-75%
MIG 100: 30-50%
MIG Stainless: 80-95%
MIG Aluminum: 50– 70%
Flux-Cored:40-70%

NOTICE: *Setting Inductance to 0 does not turn it off! This only serves to create worse arc performance and unsatisfactory weld behavior. For best results only fine tune Inductance after Volts and Wire Feed Speed have been dialed-in. Extremely high inductance levels may cause starting issues as well.*

WFS (Wire Feed Speed). The wire feed speed is registered in Inches Per Minute (IPM). This is the rate at which the wire is fed into the weld. When combined with the correct voltage, it helps to control penetration. (Penetration is the amount ingress that the molten pool makes into the base metal being welded, and to some extent the profile of the bottom of the molten puddle). Wire Feed speed is also controls Amperage. The faster wire feeds into the puddle, the greater the Amp output. The slower the wire feeds into the puddle, the lower the Amp output. Though WFS controls amperage, it does so indirectly. Amperage in most simple terms is a product of wire type (conductivity of the filler metal), wire diameter, and wire feed speed. If any varies, Amperage will vary. For example, .023" and .045" steel wire will deliver a different amperage per inch of wire fed. It takes about 3.5 inches of .023" of steel wire to deliver 1 amp. For .045", it only takes one inch of wire to deliver the same amp to the weld. So, in steel, to achieve the same equivalent amperage with .023" wire, you'd need approximately 3.5 times the wire speed of .045" wire.

Volts. If electricity is compared to water (as it often is because of their similarities in behavior), Voltage would be the same as pressure. Voltage in MIG is considered constant and is used to control arc length, basic weld bead height/width and wire burn-off rate. The Voltage setting is sometimes referred to as "heat" in the welding field. Having too much Voltage results in undercutting, fast burn off rate of the wire, wire burning back into the tip while welding, and excessive spatter. Too little Voltage results in the wire piling up unmelted, or a high ridge in the center of the weld, incomplete fusion at the toes of the weld, and possibly large pieces of wire flying off while welding. Too little welding Voltage can result in poor arc starts and what feels like the wire stubbing in to the puddle and "pushing" off the weld intermittently.

NOTICE:

This unit operates multiple classes and sizes of electrodes, except E6010. There are basic differences in how a transformer welder and an inverter welder handle stick welding. Inverters, including this one, typically prefer a tighter arc. In fact, the action of the arc force control changes the way a user might weld. Where a long arc is used to add extra heat in a weld with a transformer based Stick welder, the opposite is true with an inverter Stick welder.

The rod should be pushed into the weld to provide more heat. Dragging, or a quick, tight stepping motion usually yields best results, especially in open root welding. The arc force increases automatically increases amperage as the voltage falls when the arc is shortened. This helps prevent snuffing of the arc, or sticking of the rod in the weld. Increasing arc Amperage through the arc force setting offsets the loss of Voltage, which helps maintain welding Wattage (V x A = W). Transformers cannot truly maintain a steady heat input due to the rise and fall of arc Voltage as arc length is changed. Admittedly, this is a far different way of looking at things for those that have not been trained this way. In many ways, engineering call outs for specific amperages are meaningless because wattage is constantly varying with changes in arc voltage with transformer welders. However, with inverters and the newer technology they bring to the industry, wattages can be maintained within a defined range because of the offsetting of Voltage loss by the increase of Amps. If you notice a rise in amperage, or a hotter weld than you'd experience with a transformer, this is largely due to the action of the arc force and not a problem with the welder. Although relatively low arc force is needed for iron-powder and titania fluxed rods (i.e. E7014/E7018/E7014) trying to Zero out (set at 0) the arc force will not force the unit to act like a transformer machine. It will only cause arc quality and stability to deteriorate. For these type rods, start by using 20% (a setting of 2) arc force setting, and adjust from there. For Cellulose fluxed rods, (i.e E6011) start with 60 to 80% arc force setting and increase or decrease as needed.

This may require some retraining and disciplined rod manipulation by some users who have learned older techniques, especially those that use long swinging/flogging motions to whip in and out of the weld puddle. At the very least, it will require an exercise of patience for some users to get used to the new technique.

Longer arcs offer more opportunity for porosity and weld inclusions. The shorter arc techniques used recommended for welding with inverters help eliminate this issue.

STICK

UNDERSTANDING DC STICK FUNCTIONS

TERMS RELATED TO DC STICK FUNCTIONS
Amps. This is the measure of the " flow" of the welder current.
Arc Force Control. In stick mode, as arc length drops, so does voltage due to the manual process design. A weld isn't made with only Amperage, Voltage is also involved. Using the formula of VxA=Watts, the output of a welder and total heat drops if either volts or amps are affected. In reality, wattage is a better measure of heat input into a weld. With arc force, as the arc drops voltage drops below 20 volts due to a short arc length, the loss of voltage is compensated for by injecting additional amperage into the weld. This "force" helps to stabilize the arc and allows the unit to maintain an arc and overall wattage. This can make the puddle feel much smoother or more crisp by removing or adding to arc force action.

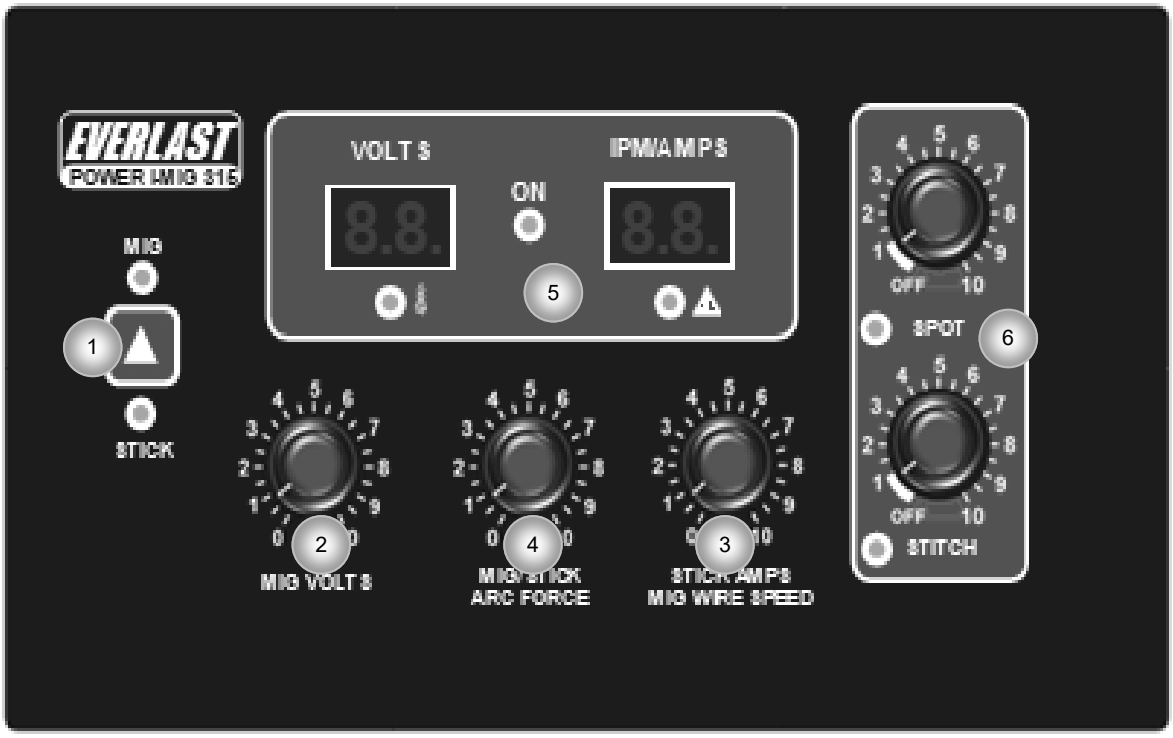
FRONT PANEL POWER I-MIG 315

FRONT PANEL POWER I-MIG 315

FRONT PANEL FEATURES

1. **Control Connector.** This connector serves for use with the spool gun only. The Gun trigger signals the welder to start feeding the wire, and to initiate the arc. This connector should be disconnected in standard MIG and Stick mode for safe operation.
2. **Negative Connector.** The DINSE 35 Style connector is an industry standard sized connector. The polarity of this terminal is always negative. In MIG and Stick Mode this is the location of the work clamp. This will only be reversed for flux-core operation.
3. **Positive Connector.** The DINSE 35 Style connector is an industry standard sized connector. The polarity of the terminal is always positive. This terminal is used as the torch (electrode holder) connection in stick mode. In flux-core, the work clamp will be connected here.
4. **Euro MIG Connector.** The MIG gun and Spool gun connect directly to this fitting. The connection offers quick and secure fitting of the MIG gun or spool gun directly to the unit. To secure the Gun to the fitting, align the small pins and large gas conductor fitting and slide together until it completely seats home. Then, gently screw the outer plastic hand nut on the torch connector clockwise until the fitting is secured. Do not overtighten or use any tool or pliers to further tighten the nut or damage may occur. Hand tight is sufficient.
5. **Clear Plastic Protective Cover.** When the machine is in use, keep this protective cover down to prevent spark damage or UV damage to the panel from intense arc rays. When not in use the panel should remain down as well. The only time the panel should be raised is during

FRONT UPPER PANEL POWER I-MIG 315



FRONT UPPER PANEL POWER I-MIG 315

FRONT UPPER PANEL FEATURES

1. Process Selector. Pressing this button allows you to select the process desired for use.
2. MIG Volt Adjustment. This adjusts the voltage while using in the MIG process. It serves no function in stick mode. In stick mode, voltage is controlled with the arc length.
3. Amps/Wire Speed Adjustment. In MIG, wire speed is also your amperage control. The faster the wire feeds, the higher the amperage will go. Each diameter of wire is able to deliver a certain amount of amperage per inch of wire fed into the weld puddle. So, a larger wire at the same wire feed speed, will deliver more amperage to the weld and a smaller diameter will require more wire speed to deliver the equivalent amperage of a larger wire. To simplify setup, the display will read wire speed in Inches Per Minute (some markets in Meters per minute) during setup and adjustment. However, to provide a meaningful and universal reference, when the arc is struck and welding begins, the unit begins to read in actual Amps output.
4. Arc Force/Inductance Control. This adjustment is used to control the arc behavior and puddle characteristics of the weld. In MIG mode, increasing the value of the Arc Force/Inductance helps to dial out the spatter while simultaneously increasing puddle wet in and fluidity. With 100% CO2 or for use with other wires such as Stainless, the arc force can be adjusted to greatly improve performance. In general, too much will cause the arc to be less smooth on start and the puddle will flatten out too much. Lowering the value narrows the puddle, and can leave a high ridge in the center of the weld. The weld will be poorly wet in and fusion will be poor. Lower arc force settings can be used for thin gauges of metal to help prevent burn through, but too little will cause excess spatter, and unsatisfactory penetration and spatter. For general use with Steel, set the Arc force to 6.5 to 7.5. For 100% CO2, a lower setting than 6.5 may be required to reduce penetration. For Stainless, with a tri-mix gas, an arc force setting of 9 or more may be required for best wet in. With Aluminum, a 5 setting should be a good starting point. Keep in mind these recommendations are based on general observations during use. Each operator may need to fine tune these settings based off of metal thickness, weld position, operator technique and personal preference. For stick, the arc force control serves to act as a “dig” control, or how aggressive the arc penetrates during a short arc situation. Increasing the setting increases the aggressiveness of the arc amp reaction (offset from original set amps) when the arc length is short and the voltage begins to fall. This setting helps sustain an arc, when normally with other types of stick welders, the arc would snuff or the rod would stick. For E70XX series and iron powder rods such as E6013, a setting of 2 to 4 is usually preferred for smooth, easy operation. For 6011 use, increase the arc force to 6 or greater for maximum penetration and arc stability in circumstances where the arc is kept short, use
5. Display and Warning Center. The display area is designed to display chosen settings during adjustment. However, the display will change function, and display dynamically (live) by providing real time amp and volt output readings. In MIG, this display reads in inches per minute during adjustment, but changes to read in Amps output during active welding. The warning lights include Over Current and Over Temperature. Should the over temperature light come on (thermometer symbol), output will usually cease. This is a result of exceeding the duty cycle. If this is the case, continue to allow the unit to remain on and cool without attempting to weld. The fans should continue to circulate air. The unit should automatically reset after 10-15 minutes, when the sensor senses the unit is in the safe threshold. If the unit does not reset after 15 minutes, cycle the machine off and back on. If welding cannot continue after cycling the switch, call Everlast tech support to determine the problem. If the Over Current (Triangle warning symbol) light comes on, turn the unit off immediately, and check for possible faults. If none are found contact Everlast immediately. If the overcurrent comes on, but resets after cycling the unit off and back on without further issue but does so every so often, this may be caused by too long of an arc starting length, or improperly trimmed wire. But if the unit does not clear the code after cycling off and back on, contact Everlast immediately. Do not continue to cycle the switch or attempt to weld.

FRONT UPPER PANEL POWER I-MIG 315

6. Spot and Stitch Timer. The Spot timer allows the user to set a automatic “off” to the arc cycle after the torch switch is pressed and held. This allows the user to make consistently sized spot or plug welds. The timer, when moved off the stop, will be activated. The red light will be on. If you notice that when you weld, or when you are trying to install a new roll, the wire feed suddenly quits, check to make sure the Spot timer is not off the stop. The Stitch timer works with the Spot timer to provide a timed “off” cycle between two spot welds. This means that the stitch timer can be set to provide a constant on/off cycle of the welder, creating both timed spot welds, and timed off cycles between the welds while the trigger is continuously held. This allows regular spacing between each spot weld. The Stitch timer works well when long seams need to be tacked or skip/back welded to control heat. The distance between the spot welds should be fairly regular as long as forward travel speed is consistent. The Stitch timer cannot work independently of the spot timer. But the Spot timer can be used without the Stitch function. However, if the Spot timer and/or Stitch timer are not set to “off” the arc may cycle on momentarily then shut off, depending on how much Spot/Stitch timing is set.

SIDE ACCESS PANEL POWER I-MIG 315

SIDE ACCESS PANEL POWER I-MIG 315

SIDE PANEL FEATURES

1. **Spool Carrier.** The spool carrier is designed to carry full-size spools of wire 12" in diameter, and up to 44 lbs. It can also be used with the supplied adapter to carry 8" diameter spools with the supplied adapter. ***Hint:*** *With some brands of smaller 8" rolls the adapter locating pin may be too long to fit properly. Take a file, or small grinder or saw and take off a small amount of the locating pin until the spool fully seats and the door is able to close without rubbing.*
2. **MIG/Flux-Cored Polarity**. This is where the gun polarity is changed. Work Clamp polarity is changed on the front of the panel. For MIG, the cable should be connected to the positive (+) terminal. For Flux-Cored, the cable should be connected to the negative terminal.
3. **Four Roll Drive Feeder.** The wire feeder features 4 driven rolls. Only the bottom feature removeable rolls. Drive rolls must be matched to the size and type of wire being fed. Order additional drive rolls from Everlast if needed.
4. **Panel Door.** This door should be kept closed while in use to prevent access to moving parts.
5. **Burn Back Control.** This allows the arc to remain activated for a brief period of time after wire feeding stops to help burn the wire back to a desirable length for restarts. This helps to prevent the need to trim the wire before restarting the weld. For most situations, use only .1 to .2 seconds of burn back time. Hold the wire in position briefly after releasing the trigger so the feature can work properly. Too much burn back will cause the wire to burn back into the contact tip, and possibly seize the wire, or melt the tip. Too little burn back may result in the wire sticking in the puddle after the weld is terminated.

REAR PANEL POWER I-MIG 315

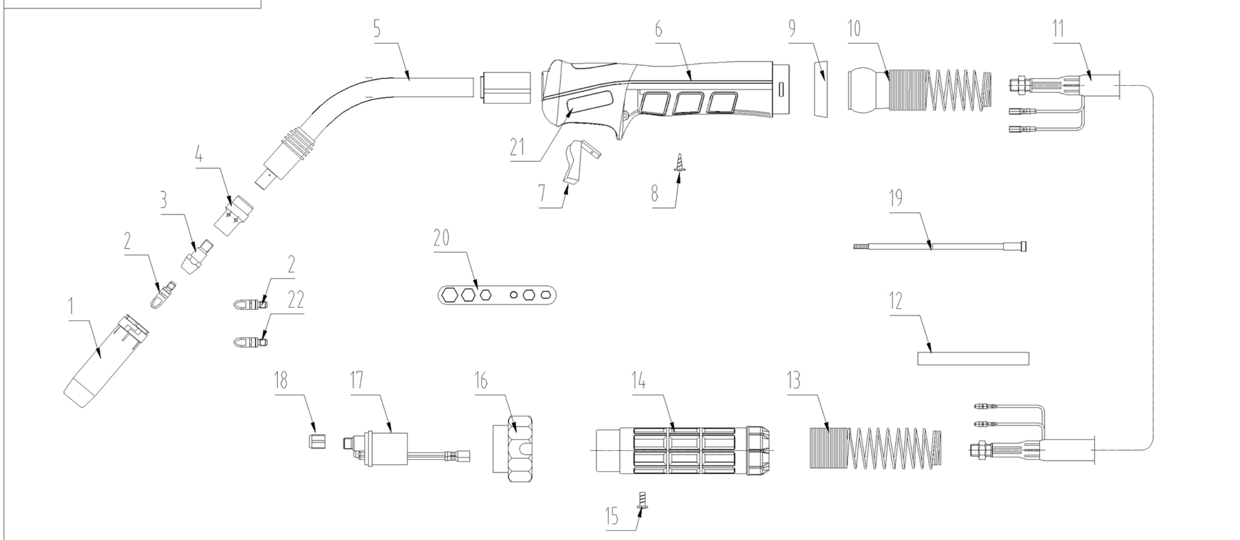
REAR PANEL LIGHTNING POWER I-MIG 315

REAR PANEL FEATURES

1. **Gas Supply.** Connect shielding gas here.
2. **Power Switch**. Turns unit on or off. This is a 2 pole single phase 240V breaker-type switch. If it is switched to the left, this means the unit is switched off. If it is switched to the left, and the unit is plugged into a good power supply, the unit should power up. **Note: When switched off, the unit will continue to run and appear to be switched on for up to 10 seconds as the capacitors discharge. This is normal.** However, If the unit will not switch off for some reason, the switch may be damaged. Turn off the unit at the main circuit breaker, and contact Everlast technical. Do not continue to use.
3. **Power Input Cable and NEMA 6-50P Plug.** The Power i-MIG 315 requires 240 V single phase 50/60 Hz power input. If necessary this unit will operate on 208V input as it is within the 10% voltage allowance. If actual voltage is below 205 volts, the unit may not function correctly. If used on a generator, the generator must labeled as "clean power" and provide less than 5% THD. Consult your generator manufacturer for information regarding the clean power rating on specific units. Everlast does not provide a list of approved generators. Manufacturers rate their units as clean power independently according to industry standards. The plug is the NEMA 6-50P. This is the standard plug for welders operating on 240V in the US and Canada. Other countries will have different configurations.
4. **Fans.** The unit is equipped with a 4 fan system, which offers quieter and more efficient cooling. It must operate free of obstruction to preserve the high duty cycle which it offers. Keep all objects or restrictions at least 12" from all sides of if the unit for proper cooling. If possible allow 18". Allow the unit to rest on the rubber pads/feet mounted on the welder. Do not have the bottom of the unit supported directly on the metal pan so air can circulate around the bottom as well. Do not run in an enclosed space such as a cabinet or work box. Do not grind or weld where sparks are directed toward the rear of the unit or metallic particles will build up on the fan blades and also on interior components. If metal builds up on the fan blades, it can cause the them to vibrate and ultimately fail.
5. **Ground Bolt.** The unit is equipped with an additional grounding point for applications when high frequency or electromagnetic interference becomes an issue with surrounding equipment. Under most conditions, the use of the ground is not required. However, if electronic interference is observed, then this must be used. Additionally, all metal items, including tables, fixtures, racks, and even metal wall panels must be grounded every foot and must be grounded with a separate grounding rod driven into the ground every 50 ft. Consult a local licensed electrician for installation and use of this connection.
6. **Fuse**. If wire feeding stops check the fuse. Replace with spare fuse included in consumable kit. If fuses are used or not available, you may source one locally, as long as the replacement fuse has the same number stamped on the end of the fuse.
7. **Cylinder Bracket and Chain.** The cylinder bracket is designed to capture and hold the shielding gas cylinder. The chain included in the box packaging, should be inserted into the slots on the bracket and wrapped around the cylinder and adjusted so that the chains are securely holding the cylinder. The chain should be captured in the slots designed for holding the chain, and may be alternately twisted to engage the slot as the chain is passed down through it.

36 SERIES MIG TORCH

Expanded View



serial number	drawing number	name	quantity	note
15	IFT0063	SCREW M4X6 UNI 6107	1	
14	IHJ0645	Back Box Hole	1	
13	IFT0897	SPRING FOR CABLE SUPPORT/BLACK	1	
12	IHQ0050	INSULATOR TUBE/¢5 M	0.13m	
11	ICN0670	COAXIAL CABLE 42mmq 3m	1	
10	IZH0864	Joint With Spring	1	
9	IHJ0715	HOUSING FOR HANDLE	1	
8	IFT0874	SCREW D.3x10 UNI9707	3	
7	IHQ0070	TRIGGER RED	1	
6	ICV0757	MIG HANDLE BLUE/INNO/GRIP	1	
5	ICZ0089	Torch Head 36KD	1	
4	ICF0562	White Ceramic Gas Diffuser 36KD	1	
3	ICU0687	Contact Tip Holder 36KD M8 32mm	1	
2	ICU0005-12	Contact Tip 1.2/M8×30	2	
1	ICS0072	Gas Nozzle Φ16 36KD	1	

serial number	drawing number	name	quantity	note
22	ICU0005-10	Contact Tip 1.0/M8×30	1	
21	IFT0167	LABEL ERGO 36KD	1	
20	ICG6000	SPANNER FOR MIG	1	
19	IIC0590	Insulated Steel Liner 1,2-1,6 3.4m Yellow	1	
18	IZT0071	Liner Nut	1	
17	ITB0059	Euro Central Adaptor Body/Spring pins	1	
16	IHJ0070	Gun Plug Nut	1	

marking	Places	Revifed file NO	Signature	date	description	reference number	material	weight(g)	edition
designer			standardization		MIG 36KD Torch 3m With Spring Pins/INNO HANDLE/OLD BACK BOX				A
drafted			craft			page one		one page in total	
proofread			approval		Shanghai Innotec Co.,Ltd	innoTec a step ahead	Tel:021-54883220 Fax:021-54883224 AddBuilding No.8,No.116 Cheyang Road,Chedun Town,Shangjiang		
Audit			date	2016-08-15					

ICT2998-26

range of tolerance			
a<6	6<a<30	30<a<120	a>120
±0.1	±0.2	±0.3	±0.5

NOTICE:

Over time, pressure on the drive rolls causes metal fragments from the filler wire's surface to find its way to the gun cable liner. If the wire guide is not cleaned, it can gradually clog up and causes wire feed malfunctions.

If feeding difficulty is observed, clean the liner in the following manner:

1. Remove the welding gun's gas nozzle, contact tip and contact tip's adapter.
2. With an air nozzle blow compressed air through the wire guide. Wear eye protection!
3. Blow out the wire feed mechanism and reel housing with dry compressed air.
4. Reassemble components. Tighten the contact tip and contact tip's adapter with the spanner included to ensure tightness. Do not overtighten any fittings or stripping of the threads may result.

The MIG torch liner may eventually become worn and will need to be replaced. When welding aluminum with the main gun, a Teflon liner must be used, necessitating a liner change. A spool gun is the preferred method to weld Al, but a polymer liner may be used with guns 10ft and under to weld aluminum. In this case, you will need to change the standard liner intended for steel use to feed directly from the machine.

To change the liner:

1. Remove the securing nut of the liner (#17) which exposes the end of the wire guide.
2. Straighten the gun cable and withdraw the liner from the gun.
3. Carefully push a new wire guide in to the gun. Make sure that the wire guide travels all the way to the contact tip.
4. Make sure the O-ring at the machine-end of the gun is installed
5. Tighten the wire guide in place.
6. Cut the liner 2mm from the mounting nut and file the sharp edge of the liner.
7. Reattach the gun and tighten all parts.
8. Re-thread wire.

MIG OPERATION AND THEORY

General Setup of Amps and Volts.

When MIG welding, the two main adjustments are Voltage and Wire feed speed. The function of voltage in MIG welding is to control the overall width and to a great extent, the height of the weld bead. In other words, voltage controls the bead profile. The wire feed speed directly controls the amps, and in turn amps control penetration. When setting the welder up you will notice that the WFS (Wire Feed Speed) is displayed in Inches Per Minute. For MIG, Amp output is controlled with through control of the wire speed, so one is related to the other. But Amps are not exactly the same thing since wire feed speed, wire diameter, and wire type all figure into the Amp equation. The relationship between wire diameter, wire speed and amps is easily figured with the following approximate industry conversions for steel:

.023": 3.5 x Amps = Inches per minute (IPM)
.025": 3.1 x Amps = Inches per minute (IPM)
.030": 2 x Amps = Inches per minute (IPM)
.035": 1.6 x Amps = Inches per minute (IPM)
.045": 1 x Amps = Inches per Minute (IPM)

To convert wire speed (IPM) into approximate Amps, use the following conversion formula:

.023": IPM ÷ 3.5 = Amps
.025": IPM ÷ 3.1 = Amps
.030": IPM ÷ 2 = Amps
.035": IPM ÷ 1.6 = Amps
.045": IPM ÷ 1 = Amps

Keep in mind these are approximate conversions and do fall off in accuracy as amps are increased into the upper current limits for the given wire diameter.

Even though you will find general recommendations about setting the Amps, Volts and even shielding gas through a variety of free downloadable apps and online calculators, every filler metal manufacturer has its own specific parameters for Volt and Amp settings for each wire diameter and class of wire. The ranges of volt and amp parameters generally varies somewhat from brand to brand, so be sure to read the packaging and/or manufacturer literature to determine what range of settings are recommended. The wire diameter also limits the practical maximum thickness of what can be reasonably welded. The issue with following charts, graphs and calculator recommendations is that most people find them either too hot or too cold. For some people, it may not even close. However, nothing can substitute for watching the arc and listening to the sound of the arc. A crisp, steady sound, frequently referred to as a "Bacon frying sound"" should be heard. The actual frying sound can vary somewhat and may have somewhat of a high pitch whine to it somewhere between the sound of a flying bee and a mosquito. If these sounds are present, look at the arc to see if it is steady, and producing low amounts of spatter. If large amounts of spatter are present, the puddle seems fluid (appears wet) and the wire speed is within the targeted range, decrease volts a little at a time to reduce the spatter. If this does not correct the problem, change the torch angle and torch height. Hold the torch more vertical, with less than a 15 degree deviation from vertical and reduce stick-out of wire to 3/8" or less. If this still does not help, reduce the wire speed. Some spatter is normal, though it should be minimal overall.

The wire can also pop and spatter if the voltage is too low for the wire speed and/or wire diameter. This is mostly observed as flying bits of red-hot but un-melted wire, along with popping as the wire inconsistently stubs into the puddle. This is followed by the wire pushing back against your hand pressure while the wire visibly turns white/red hot before burning off. Too low of voltage will also produce a high piled bead with the toes (edges) of the weld not properly wetting in resulting in poor fusion.

Inductance

The third important variable in setting up the MIG is the Inductance control. This third adjustment can greatly vary the feel of the arc at any given volt and amp setting. It is used to balance the stiffness of the arc against the wetness of the arc. Some professionals refer to the "buttery-ness" of the arc. " Buttery-ness" is arguably somewhat a subjective term. However, it generally refers to how smooth and fluid the arc feels and looks. In fact, the inductance alone can affect how much wire speed or voltage is needed in any given application. It does not typically require altering of the Volts or the Wire Speed settings. However the inductance control can expose poorly selected Volt/Wire Speed parameters by magnifying the effects.

While Everlast uses the term "arc force" on some models as well as inductance on others. The term is the same function in MIG. It is also known in the industry by many different terms. Often it is referred to as inductance, choke or slope. Simply put, the Inductance adjustment controls how long it takes the current to recover and rise to the established welding current to melt the wire after the wire contacts the puddle and the current falls. This process is happening many times a second so it isn't visible to the naked eye. But the overall effect is visible as the wire burn off height is changed and a change in the wetness of the puddle and how easily the molten metal flows in toward the toes of the weld as it melts off. If the unit has sufficient arc force, the edges of the weld will easily wick into the puddle with little or no spatter with little or no manipulation of the torch required. The pitch of the arc will be medium. With too much inductance the puddle may be uncontrollable and the arc will have a throaty, raspy sound. Too little inductance and the puddle will be narrow and possibly have a high ridge in the center. The pitch will be very high and the puddle will seem sluggish and less fluid.

All MIGs have a preset inductance that is inherent in the

MIG OPERATION AND THEORY

machine's design. However, few MIGs have an adjustable inductance. Inductance is part of the personality of a MIG welder. It's one reason that some people prefer the arc of one brand over the other as people develop personal preferences in arc performance. With that in mind, having an adjustable inductance serves several functions:

1) The inductance allows the user to dial the machine to a performance level that the user is accustomed to. This helps if multiple users are present and improves the operator's performance with the welder.
2) The inductance can help improve control and weldability in out-of-position welds (weld positions other than flat) without having to change other parameters.
3) Different shielding gases require different levels of inductance for optimum performance. The inductance improves performance with different gas mixes by being able to adjust the setting to render the best and smoothest possible arc for the shielding gas being used. This is especially helpful when pure CO2 is used when less inductance is used for spatter control.
4) The inductance can improve weldability of thinner metals without having to step down a size in wire. While ultimately there are limits to what any given wire can weld on the lower end of it's range, it does help improve the low amp welding characteristics of the wire diameter.

For the best possible experience welding with Power i-MIG 315 welder, adjust inductance after the wire speed and voltage have been tuned. This will keep the user from constantly having to hunt for the best balance of the other two adjustments. Usually once a particular inductance setting is selected that is suitable to the user, it will work well throughout the range of adjustments and will rarely require readjustment once set to the operator's satisfaction. However, this is not to say that readjusting the inductance from time to time is not beneficial. When the operator must weld out-of-position, readjusting the arc force control can help reduce clogging of the nozzle and even make the puddle more controllable. Welding extremely thin materials such as muffler tubing can also benefit from a lower inductance setting.

Avoid the setting the inductance function at any extreme setting without performing a few test welds first. Few users will find these settings to their liking. Turning the inductance to the minimum setting does not turn the feature off. A suggested starting point would be approximately 6.5-7.5 (65%-75%) with mixed gas on steel. This will usually produce a desirable arc with for most people and will produce minimal spatter. Fine tune the adjustment from there, increasing in half increments to find the best performance.

Burn Back Control.

After the trigger is released on the welder, it's natural for a small extra amount of wire to coast out of the gun. This small amount of extra wire may stick fast in the weld as the molten puddle begins to cool. This will require the operator to break it loose and spend time trimming the wire. Even if the wire does not stick in the puddle, it will often be left sticking too far out from the contact tip for a proper restart. Trimming is usually required with a pair of MIG pliers or wire cutter before restarting the arc. With burn back control, however, the arc can be kept energized long enough to continue supplying power to the wire long enough to burn the wire back to the desired length after the wire stops feeding. The timer control located under the cover sets the length of time the that the arc remains on after the trigger is released.

If the burn back control is set too long it can cause the wire to burn back into the tip itself and welding of the wire to the tip. Begin with setting the unit for around .1 to .2 seconds. If the burn back control is set correctly, it will leave about 1/4"-3/8" wire sticking out beyond the contact tip. If a large ball develops on the end of the wire, reduce the burn back time so that it creates a balance between ball size and stick-out. The Post-Flow will be engaged briefly and helps control balling and prevents oxidation during burn back. This is a unique feature that is not found in many welders with burn back control. Even with the burn back control properly adjusted, due to operator error, an occasional quick trim of the wire may be necessary for best arc starts. When operated in a production setting or in a fabrication shop, the burn back control can save on labor and aggravation.

Starting the Arc and Welding.

Starting the arc is a relatively simple process. Before beginning, the wire should initially be trimmed to between 1/4 to 3/8". Once the wire is trimmed, the gun should be firmly grasped to prevent a phenomenon often referred to as "machine gunning". A light grasp, especially at start, can cause the arc to stutter as the wire pushes back on the gun, lengthening the wire stick-out and creating an irregular start and a porous weld. If the arc stutters too much with a firm grip, lower wire speed, or decrease inductance.

The end of the wire should be positioned just barely above the metal when the trigger is pulled for the cleanest start. This will position the end of the contact tip about 1/2" above the weld. The gun should be in the vertical position, with no more than 5 degrees lean in either side to side direction. Holding the wire too far off from the metal will result in rough starting and too long of wire stick out.

Once the arc has been established, the gun can then either be pushed or pulled in the direction of the weld. In either case, the gun nozzle should be positioned directly over the weld without angling the wire to one side or the other of the weld as already mentioned. The gun should have no more than 15 degrees lean pointed into (push) or pointed away from (pull) the direction of travel. In most cases a push motion is desired. However, a lot of texts offer conflicting information on whether to push or to pull the gun. In reality,

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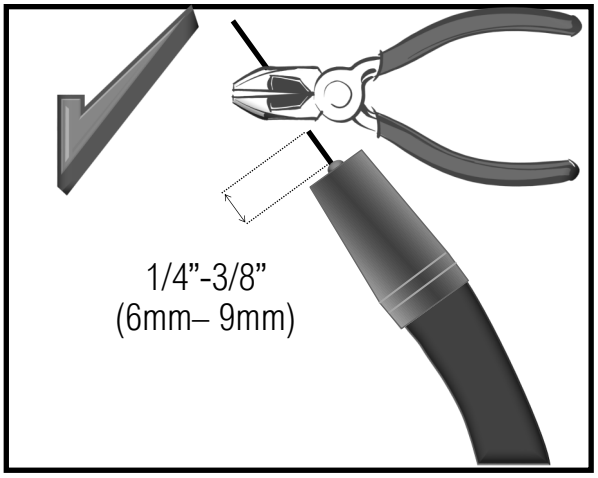
both are correct if used correctly and with each having particular strength and weakness. Either one done with too much gun angle will result in undesirable results. Most modern trained people who are well versed in MIG quickly develop a sense of when to push and when to pull the gun. Even for novices, a sense of when to push and pull the gun comes quickly with a little practice. Pushing can result in shallower penetration but the molten puddle is easier to see and the arc sits easily on the leading edge. It will usually leave a aesthetically pleasing bead. Be careful to prevent the gun from leaning toward or away from the direction of travel too much as spatter will increase and shielding gas flow may become turbulent, creating porosity in the weld. Pulling will result in deeper penetration, but can result in a narrow bead without much side fusion. It also can leave an undesirable humped appearance if not done correctly or if travel is too slow. *Whenever welding with Aluminum, whether with the standard MIG gun or the Spool gun, always push the gun. If using Flux Core, a dragging (Pull) motion is almost always recommended.*

Weaving (oscillating the torch from side to side in one pattern or the other), particularly a MIG bead, is a topic of controversy as much as whether to push or pull the MIG gun. Stringer beads are often best for novice welders. Stringers are simply straight beads that move forward with little or no side to side travel or oscillation. These will offer the soundest welds for a beginner. Stringer welds leave little or no room for contaminates to enter the weld and are the fastest to produce without creating an opportunity for cold lap. Moving too quickly however with a stringer can create undercut which will weaken the weld. The best policy is to move a slow steady speed, making sure the sides of the weld are filled. If undercut is present, it is either from too much voltage or moving before the wire has time to fill the area the arc has melted.

Think of weaving as a method of "sewing" the metal together. If weaving is of interest to you, start with the basic weave pattern. Simple weaves using one variation or the other of a cursive "e" motion are best to begin with. Other weave patterns can be used of course. C's, V'S, U's , Triangles and many more weave patterns can be used depending upon the application. Weaves are employed for a number of reasons. Weaves are often considered to have a more pleasing appearance and can help bridge gaps where fit up is a problem. A weave is also frequently used to manage heat build up. For example: when welding vertically weaves are almost always used to prevent the molten metal from sagging due to the force of gravity. The major drawback of weaving is that it introduces a greater possibility of getting inclusions and other forms of contamination in the weld. Properly done weaving is a valuable tool, but it must be practiced before employing it in any structural or critical application.



Metal Cleaning.

MIG welding requires a well prepped surface to obtain a sound weld. The removal of paint, rust mill scale, or other contaminate such as grease should be done before welding. Stick welding is more forgiving of rust and mill scale, but when MIG welding, contaminates will result in porosity and inclusions in the weld, weakening it. A grinder will usually prep the metal sufficiently to remove oxidation and paint. However, to remove grease a degreaser such as acetone should be used. Do not use any degreaser such a brake cleaner with chlorinated solvents or death or serious injury may occur!

A MIG wire such as ER70S-6 or ER70S-2 includes a sufficient level of deoxidizers such as silicone and copper that are formulated to allow it to handle minor to moderate amounts of rust and mill scale. These deoxidizers will float out most moderate amounts of contaminates out of the weld and will appear in the usual form of glassy like deposits on top of the cooled metal. They are easily brushed off before starting the next pass. They should not be welded over. Any pinholes that appear are a result of trapped gas in the weld and should be ground out before the next pass. It should be noted that some MIG wires such as ER70S-3 have low levels of deoxidizers and must be thoroughly cleaned and ground before welding.

Multiple Pass Welds.

One of the common misunderstandings that people have when beginning to MIG weld is about weld capability. Many mistakenly believe that if the welder has the amperage output to weld something in a single pass, then it is fine to weld it that way. In fact marketing often drives this kind of thought in comparisons and minimum/maximum statements. However, this is a primary way to introduce cold lap and incomplete fusion to the weld. *As a best practice, single pass welds should not exceed 1/4" even with the heaviest wire the welder is capable of handling.* A thick pass may also begin to cool before contaminates and gas pockets have the time to float out to the surface. It's far better to make multiple smaller passes to complete a plate weld for a higher quality result. For best results, this requires that most joints 1/4" and over

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be prepared with a grinder to accept multiple weld passes. The weldment edges should be ground to form a V, U or J shaped groove to create a recess where the welds can be welded one on top of another. Though thicker welds are technically possible, when welding with .035" wire and under, create a bead no thicker than 3/16" in a single pass, no more than 1/8" with .030" wire, and with .025"wire and smaller no more than 3/32 for best results. This will help maintain proper fluidity of the weld and prevent gas from being trapped in the weld and give time for any minor contaminates to float out of the weld. It will also help to maintain reasonable forward travel speeds. Too slow of travel speeds will create excess build up and can tend to create cold lap at the weld toes resulting in poor tie in. One issue created with a weaving technique even if the metal deposited is the correct thickness s that it can slow the forward progress down. If weaving is too wide, one side of the puddle will cool and oxidize before the torch is brought back across to that side. This is a point where porosity and inclusions can be introduced.

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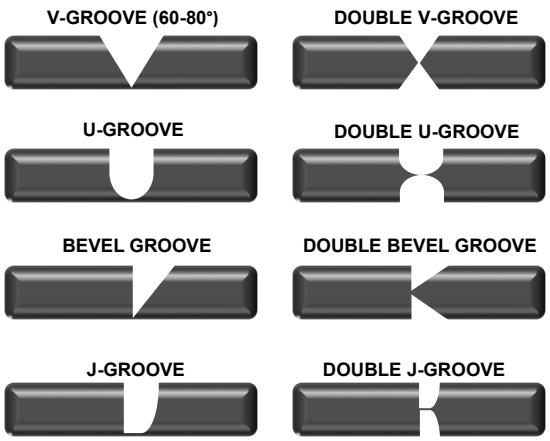
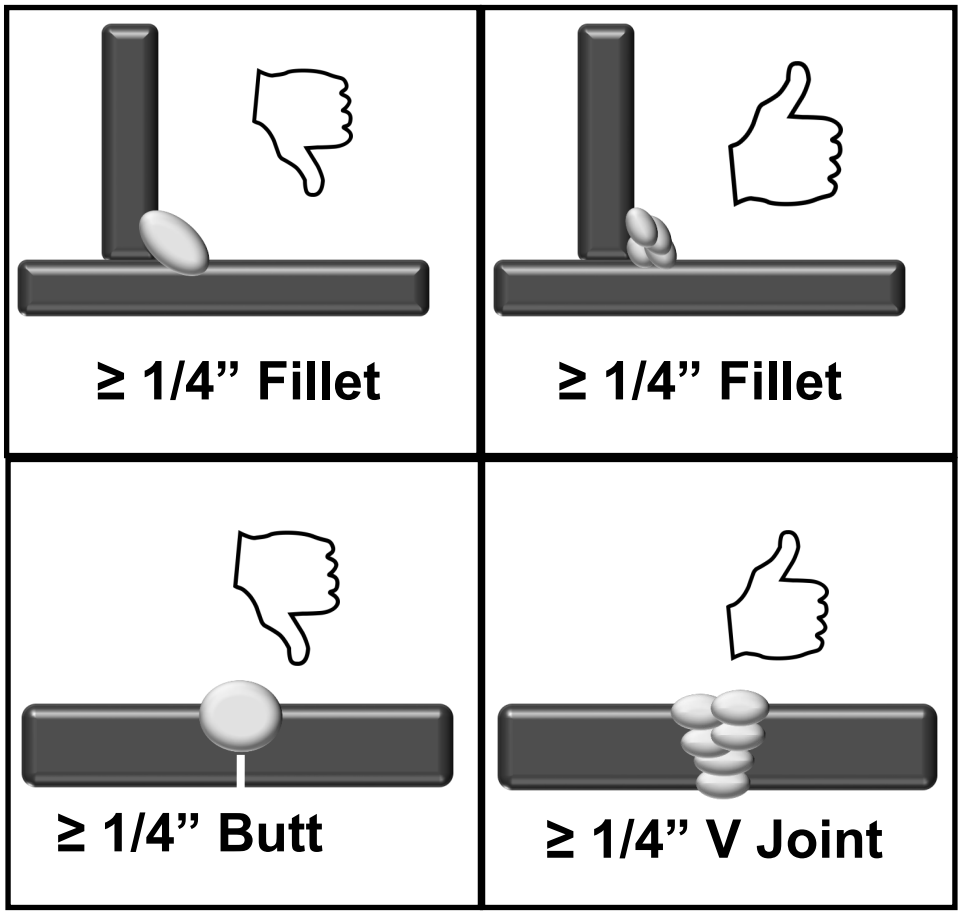


Besides a butt joint and lap joint which are often used for thinner metal gauges, consider using one of these groove joints for best welding results. When grinding or cutting the bevels, especially with a single V-groove, it may be beneficial to leave a small land with a gap between the joint to achieve full penetration. In this case a temporary backer plate can be used to support the bottom of the weld to create the root pass. The root weld will weld the backer to the main plate. This backer can later be ground or cut off. However, in many cases a plain open root can be used as a backer plate adds to the time and labor involved. A knife edge is also acceptable so long as the joint is fully penetrated when the weld is completed. Open root gaps without a backer can range from 1/16" to 1/8" depending upon wire diameter and application.



NOTICE:

When welding material 1/4" and over be careful about trying to put too much metal down in a single pass. Use multiple passes to complete the weld along with any necessary joint preparation especially with wires of smaller diameter. As metal thickness goes up so does the number of required passes. Depending upon the wire diameter and power settings used, a 1/4" joint may only require 1 or 2 passes, but a 3/8" joint in plate metal or pipe will require beveling and 4 to 6 overlapping weld passes including a cap and root pass.

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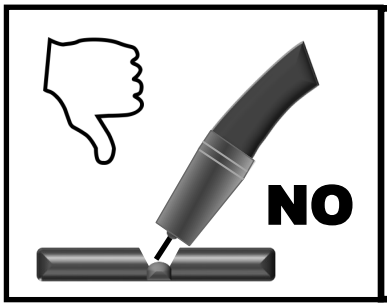
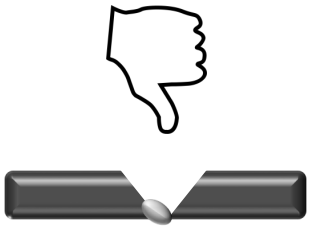
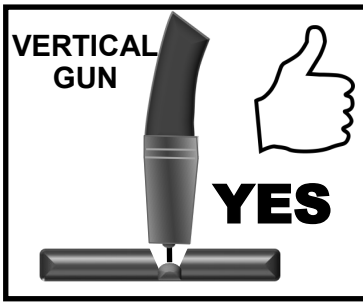
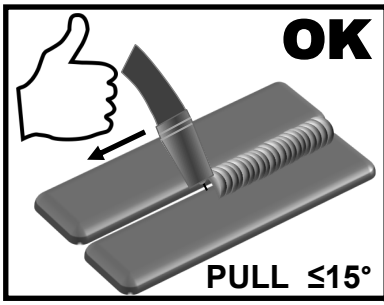


Problem: Gun is not being held vertical from side to side. Wire is not being directed to the center of the puddle. This concentrates heat on one side of the joint and results in poor fusion on the neglected side. It also can create more buildup on one side of the joint than the other.
Correction: Hold the gun so that the angle of the neck stands perpendicular from side to side.

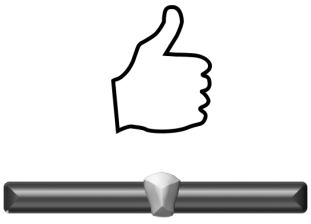


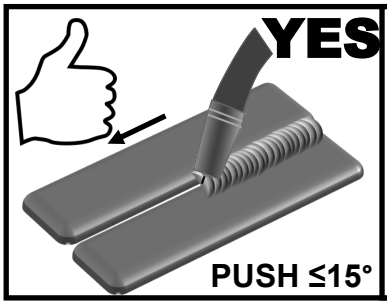


Correct Technique: The gun is held in a near vertical position. A variance of 5 degrees or less is acceptable from side to side. The purpose is to prevent the arc from being concentrated on one side of the weld joint or the other. This balances the heat on both sides of the joint and keeps the bead centered. Don't confuse this with push or pull angle in the travel direction.

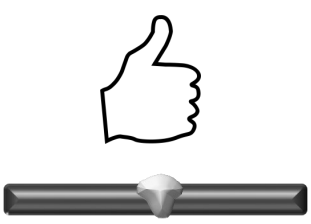


Correct Technique: The gun is angled toward the back of the weld when traveling forward. This angle should not exceed 15 degrees. This provides a narrower but more deeply penetrating weld. Use this method when Flux Core wire is being used. Use this method where the unit may be reaching its maximum welding capacity. Not for use with Aluminum wire.





Correct Technique: The gun can be angled toward the front of the weld when traveling forward. This angle should not exceed 15 degrees. This provides a wider and generally more pleasing weld. However it is shallower penetrating. This method typically allows a much better view of the arc. Use for most types of welding unless deeper penetration must be achieved.



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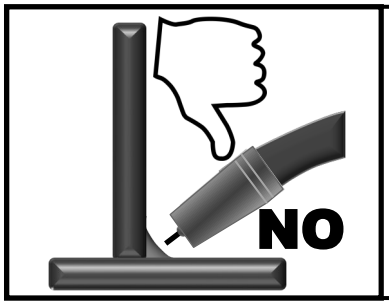
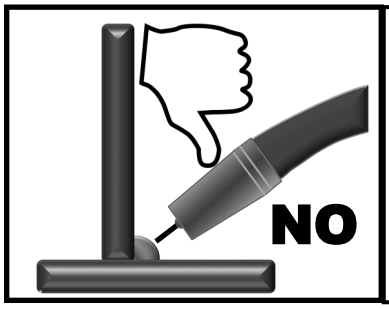
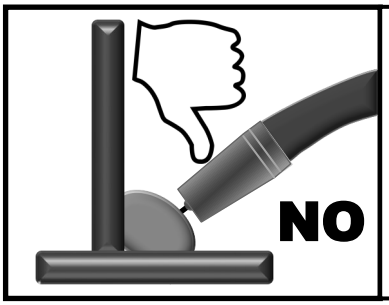


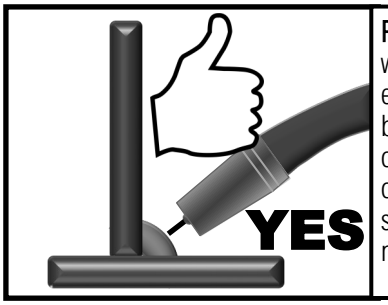
Characteristics: Concave weld, poor filling, possible undercutting resulting in weak weld.
Possible Causes: Voltage too high, not enough wire speed, too short of wire stick out, wrong gun angle.
Remedy: Decrease voltage, use push motion, increase wire speed.



Characteristics: Small Convex weld possibly **with** bulging sides/cold lap and/or an inconsistent arc.
Possible Causes: Not enough Voltage or Amperage. If weld is ropy and thin without bulging at the toes, travel speed is too fast or using a pull technique.
Remedy: Increase voltage and amperage, slow down to fill joint more. Use push technique.



Characteristics: Large convex weld with bulging at toes, weld legs exceed thickness of the metal being welded.
Possible Causes: Not enough voltage, too much wire speed, overfilling due to too slow of forward travel speed, and/or poor weaving technique.
Remedy: Increase voltage, increase forward travel speed, reduce weaving width.



Proper Weld Characteristics: Weld is slightly convex, weld legs (vertical and horizontal width of weld) are equal in length and match the thickness of the metal being welded. No traces of undercutting, Proper tie in of the weld at the toes with no cold lap. Weld is not overfilled or under-filled with no significant amounts of spatter, soot or contaminates around weld. Weld is not oxidized and is bright.

MIG OPERATION AND THEORY

Special Notes Concerning Operation.

1. Shielding Gas Selection for MIG and TIG. While welding aluminum with the Spool gun or MIG gun you must use 100% Argon. You cannot use a mix as you would with steel or stainless. For Steel or Stainless, there are a variety of gases that are used. The type of gas used with Steel or Stainless depends upon whether you are using short-circuit transfer, or spray transfer. In general, the best general gases mixes for welding with Steel are gas mixes that are less than 80% Argon with the balance CO2, or CO2 and O2. A Common mix, usually referred to as a C25 mix, (75% Argon, and 25% CO2) is typically the most economical of the steel gas mixes. 100% CO2 is permissible as well, and is the most economical option for steel welding. However, more spatter and less aesthetic welds will result, requiring more labor during cleanup. For Spray-Transfer, or, gas mixes with greater than 80% Argon content is recommended. Common spray transfer gases for steel are 90/10 Ar/CO2, 95/5 Ar/CO2, 98/2, Ar/CO2 or 98/2 Ar/CO2. Some welding suppliers also suggest Trimixes of Ar/CO2/O2 for spray transfer or pulse spray transfer welding of Steel. For Stainless, there are several recommendations for welding with stainless whether in Short-circuit transfer. But there is mixed consensus on the best gas for use for short-circuit, Axial-Spray transfer. Stainless develops a more sluggish puddle and wet is not as smooth and easy flowing as steel or aluminum. 98/2 Ar/CO2, or 98/2 Ar O2 is often recommended for spray-transfer welding when economy is needed. In fact other less Argon rich blends are sometimes recommended, and it is possible. But when more CO2 is added, the rust resistance of stainless goes down due to the added carbon content. Ideally, there are several Tri-gas mixes out there that are well suited to welding stainless. These include the addition of Helium to the mix as either the primary or secondary component of the mix. The Helium tends to help improve wet-in and fluidity of the puddle, but a higher voltage may be needed to weld if the Helium content is too high. It is also much more expensive. Welds made with Tri-gas mixes tend to hold their rust resistance better. But to reduce the heat that is put into the weld , and reduce warping, there are stainless tri– gas mixes on the market that have a content of approximately 35% or lower Helium. These still are great for preserving rust resistance of the stainless alloys. Wet-in is still excellent and cost is much lower than higher Helium content blends. While welding in any of the TIG modes you must also weld use 100% Argon for any metal type. In some cases, blends of Ar/He may be used for TIG for welding thicker metal thicknesses, but the cost to do so is quite high as He/Argon mixes are expensive by comparison. Do not use more than 25% He in any mix or starting the arc and maintaining a stable arc will be difficult.
2. MIG Welding Aluminum. While welding aluminum with the Spool gun or MIG gun you must use the next size up tip or a special oversize tip for the wire because the heat will cause the aluminum wire to swell and it will either drag or seize in the tip, due to the dissimilar expansion rates of the copper tip and aluminum wire. If you are suffering burn backs while welding Aluminum (and in some cases stainless), change to a larger tip, and reduce burn back time. While welding aluminum with the MIG process, best results are achieved by using a dedicated stainless steel brush to remove the oxide layer and using acetone or aluminum cleaner before welding to remove any residues. Even though aluminum may appear shiny and clean, it still has an oxide layer and a thin layer of oil left over from the manufacturing process. Some soot will appear in most Aluminum MIG welds but if a lot is noticed, you have either contaminated metal, or insufficient gas flow. You can also induce turbulence by having too much of a torch angle. Start with a 90 degree angle and then lean the gun slightly (about 15 degrees) to the “push” position. Welding aluminum is not typically a short circuit process. It is a spray transfer process. Spray transfer is a process that is used to weld many metals, but in Aluminum it must be used to obtain the most sound quality welds.
3. Spool Gun Selection. When using the optional spool gun, the wire speed control is controlled

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on the spool gun. You must purchase a MTS version of the spool gun to operate correctly. You may purchase a compatible spool gun directly from Everlast for your unit. For the best match-up, we recommend the Parker DSP-360.

4. Flux-Core Operation. Flux-Core welding requires the use of serrated drive rollers. These grip the wire and feed it correctly at a steady speed. Flux-Core drive rolls are available for purchase as an optional item. Full time use of Flux-Core filler wire will require the purchase of a flux-core specific gun. Everlast does not supply this type of gun, but many after-market Gun suppliers can supply a Flux -core gun with a Euro-connect fitting and will work. Part-time or occasional Flux-core use with the standard MIG gun is acceptable as long as the nozzle is kept free of spatter.
5. Generator Use. When running this unit on a generator, the manufacturer of the generator must certify it as a having " Clean Power" output. This means the unit produces a truer sine wave and is not a modified sine wave generator and is largely free from harmonic distortion. A clean power generator is usually listed as such, but the manufacturer of the generator should be able to clarify the clean power status of the generator through the technical department of the generator manufacturer. Everlast does not keep a list of approved generators nor does it make endorsements of generators that are listed as clean power output. The generator power requirement for this unit is unit is a surge capacity of 17,500 watts.

STICK OPERATION AND THEORY

STICK ARC STARTING METHODS

1. Make sure the unit is turned on and the boot cycle has finished.
2. Select the Stick Process on the Selector.
3. Make sure the electrode holder is in the Positive connector and the work clamp is in the negative connector.
4. Select the Amp level desired. No voltage adjustment is available. Select Hot Start Time and Hot Start Amps % (Intensity) to improve starting reliability. Use higher amounts of Hot Start %, over 50% with difficult to strike rods, or rods that aren't fresh or out of a sealed metal can.
5. Use the arc force control to select the desired arc characteristics, creating the desired arc characteristic and amp response needed to maintain the arc. Cellulose electrodes may not have the same arc force behavior as other welding electrodes, but each brand and size will weld a little differently. Typically rods such as the E6010 will require a setting 60-80% for best results. The arc force control setting will vary from person to person as well, with different rod angles, positions, and arc lengths all factoring into the arc force control performance. *If you are new to using an inverter welder, there are some aspects that will seem different. One of the main ones is that the arc is better controlled in most situations by "pushing in" when the arc seems to get weak or unstable and the arc force will kick in as the voltage drops.* **If the arc length is too long, the voltage rise will signal the inverter to shut down and will terminate welding output. This is done to limit amp draw on the circuit.** This threshold is shorter than most transformers, and an extremely long arc cannot be maintained. However, with a little practice, the arc will be easy to manage with some adaptation in technique.
6. Strike the arc with either the tapping method or the match strike method. Beginners usually find that the match strike method typically yields the best results.

Tapping

Scratch/Match

HELPFUL HINT:

Pay particular attention to the Arc Force setting as it affects the aggressiveness of the arc and the amp response. Set the Arc force to approximately 30-50% and readjust it from that point to find the optimum setting. Adjust in increments of 5% up or down from there to obtain the best results Usually, an increase in the arc force for cellulose based flux welding rods is helpful. Lowering the Arc force setting is generally desirable for rods iron powder/Titania based flux. Too much arc force will create overheating of the welding rod, and even cause them to flame up. Too little can lead to sticking and arc snuffing. Use the Hot Start features to improve arc starting and cut down on failed arc strikes. Hot Start Amps refers to the % over the set amps that the amps will be boosted during arc striking until the arc is established. Hot Start Intensity controls the amount of time that the Hot Start stays engaged after the arc is struck. Start by setting Hot Start to somewhere between 30% and 50% and set hot start time to .5-1 seconds. Adjust in increments of 5% up or down to obtain best starting results.

When welding, the weld will be slower than MIG speed. One of the most common mistakes for users transitioning from MIG to Stick welding is the travel speed. Allow the metal to fill the puddle as the rod travels forward. Be sure to try to separate the difference between the slag and the molten pool of metal. The slag will coalesce behind the puddle if travel and rod angle is correct. Do not let the slag travel in front of the puddle. Keep the top of the rod inclined to the direction of travel around 10-20 degrees while welding in the flat position (Electrode holder should be in front and inline of the puddle). To begin, simply start the arc, and then drag the rod slowly and carefully along the metal, allowing the rod flux to provide a standoff between the metal filler and the puddle. Be sure to keep feeding the rod steadily downward into the puddle as the rod melts. In the case of E6011, a slight stepping motion in front of the puddle about 1/8"-1/4" in front of the puddle can be used as a key hole opens up in the weld joint, ahead of the puddle. This is also called "whipping" the rod. Do not flip the end of the rod away from the puddle in a arc motion or the arc may terminate while using E6011 or similar cellulosic rods. When experience is gained, numerous manipulation methods may be used with rods such as E7018, 7014, 6013, and 7024. Weave the rod no more than 2.5 times the width of the welding rod. To begin weaving, weave small, tight patterns similar to C's, cursive E's, V's, or even figure 8's.

IMPORTANT!

This unit is designed for operation with Cellulosic electrodes such as E6010 and E 6011. However, to use these rods, the Power-Set mode must be engaged, and the correct rod type and size selected. Improved function of all rods can be obtained through the use of the Power-Set function. In manual mode, rods such as E7014 and E7018 work well, but selecting the Power-Set mode can simplify operation and improve performance. 120V operation will reduce the capability of the E6010 setting however since arc force action is limited and hot start action is reduced.

Section 4 Trouble Shooting

NO.	Trouble		Possible Cause	Solution
1	Unit is switched on, but the power light isn't on		Switch damaged.	Replace.
			Power breaker tripped.	Reset.
2	After welding machine is overheating and the fan does not work		Fan damaged.	Check fan housing and fan. Replace if necessary.
			Fan power connector is loose.	Tighten wires, check for dislodged connectors.
3	When torch switch is pressed, no gas flows		No gas in the gas cylinder.	Replace.
			Gas pipe leaks gas.	Resolve .
			Gas solenoid valve damaged.	Check and clean/replace.
			Torch switch damaged.	Repair or Replace.
			Control board damaged.	Inspect the circuit.
4	Wire-feeder does not work	Wire reel does not turn	Motor damaged, wire loose.	Check and Repair or Replace.
			Control circuit damaged.	Check the board.
		Wire reel turns	The tensioner is loose or wire slips on rollers. Wrong size drive roll. Wire is not mated in drive groove.	Increase tension. Check for proper drive roll size/type. Make sure wire is in groove not riding on top of the drive roller shoulder.
			The drive roller doesn't fit the diameter of weld wire.	Change roller or wire size to match.
			Wire Spool is damaged.	Change out wire spool.
			Gun liner is jammed.	Repair or change it, clear wire from liner/clean liner with compressed air.
			Contact Tip is jammed because of slag or burn back.	Clean or replace. If with Aluminum, increase tip size to next size.
5	No arc, or no output voltage		Work clamp engaged in wrong connect-or.	Change polarity.
			Control circuit damaged.	Check the circuit.
6	Welding stops and warning light is on, Wire continues feeding but no arc is present.		Self-protection has engaged.	Check over-voltage, over-current, over-temperature, lower-voltage and over-temperature. Allow unit to cool if over heated. If an OC, use a shorter wire stick out or smaller diameter wire or reduce power settings with large diameter wires. Check power plug for problems. If easily tripped the Resistor value too low. (Contact Everlast if OC is tripping regularly with normal settings.)
7	Welding Voltage/Current is uncontrolla-ble		Potentiometer damaged.	Repair or Replace it.
			Control board damaged.	Check the circuit.
9	Intermittent Arc/ Wandering arc		Work Clamp is not secure or it is dam-aged. Too windy/breezy.	Check and/or Work Clamp, change position of clamp and attach direct to the work. Move out of wind.
10	Excessive spatter		Voltage too high too high/low arc force/ Too high wire speed. Too much torch angle. Wrong size nozzle	Lower voltage or increase wire speed. Check torch angle for less than 15° push or pull. Change arc force settings to reduce spatter. Change nozzle size.
11	Weld sooty or oxidized looking		Poor metal prep, poor gas flow, too much torch angle, wrong gas type, windy or breezy. Plugged nozzle	Thoroughly clean metal, check gas flow and reposition gun so gas flow is not creating turbulence. Move indoors if necessary. Reposition the welder so its fan will not blow on the weld area. Clean nozzle.
12	Bird nesting of the wire around the drive roll		Jammed gun liner, wire too soft (aluminum), gun hose is kinked or coiled too tightly. Too much tension / pressure on wire feeder .	Reduce wire feed tension so that drive will slip if it encoun-ters too much resistance Check Gun and liner and replace if necessary. Straighten cable.
13	Wire feeds irregularly		Wrong drive roller or wrong size drive roller, too little tension on wire, wire in wrong groove.	Check and match wire size to groove size, increase tension on drive rollers. Check to make sure the wire is not riding on the shoulder of the drive roller.
14	Wire burns back and seizes in tip		Wrong contact Tip size or too much burn back time set.	Match tip size for wire diameter. Reduce burn back time. If using with aluminum, use tip designed for aluminum or use one size larger tip than the wire.
15	Nozzle arcs to work piece welding		Nozzle plugged with spatter	Check/clean nozzle and use a nozzle dip.
16	In Stick mode will not arc		Cables not connected, inverter issue	Check connections.
17	In Stick mode, the rod sticks		Arc force/Hot Start is set too low, arc striking method is poor, wrong polarity, too low of amperage. Wet welding rods or wrong kind.	Check polarity. Check Hot Start settings. Increase arc force control/Hot Start. Change arc striking method. Increase amperage. Use fresh welding rods when possible.