



DO THE JOB RIGHT.®

Item #58015

MIG 90 WELDER

ASSEMBLY AND OPERATING INSTRUCTIONS



The **EASTWOOD MIG 90 WELDER** provides the ability to MIG weld thin gauge sheet metal jobs up to 1/8" steel. Inverter Technology keeps the unit compact and light, while still featuring an integral gas system, independent Wire Speed and Output Voltage adjustment, quick swap polarity, and a dual-groove Drive Roller. Designed for use with Flux Core Wire or Solid Wire with MIG shielding gas (not included).

READ AND UNDERSTAND ALL INSTRUCTIONS AND PRECAUTIONS BEFORE PROCEEDING.

This unit emits a powerful high voltage and extreme heat which can cause severe burns, electrical shock and death.

STATEMENT OF LIMITED WARRANTY

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

WARRANTY PERIOD:

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

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

- | | | | |
|----------------------------|---------------------------------|-------------------------------|--------------------------------|
| • Eastwood MIG 90 Welder | • Eastwood MIG 135 Welder | • Eastwood MIG 140 Welder | • Eastwood TIG 200 DC |
| • Eastwood MIG 175 Welder | • Eastwood TIG 200 AC/DC | • Eastwood MIG 250 Welder | • Eastwood MP140i Welder |
| • Eastwood TIG 200 Digital | • Eastwood MP200i Welder | • Eastwood Versa-Cut 20 | • Eastwood Elite MP250i Welder |
| • Eastwood Versa-Cut 40 | • Eastwood 90A Flux Core Welder | • Eastwood Versa-Cut 60 | • Eastwood ARC 80 Stick Welder |
| • Eastwood Rotisserie | • Eastwood Contour SCT® | • Concours Pro HVLP Paint Gun | |

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

2-Year Warranty on Material, Workmanship and Defects:

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

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

1-Year Warranty on Material, Workmanship and Defects:

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

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

90-Day Warranty on Material, Workmanship and Defects:

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

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

Lifetime Warranty on Material, Workmanship and Defects:

- Selected Eastwood Hand Tools carry a Limited Lifetime Warranty

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

CONDITIONS TO OBTAIN WARRANTY COVERAGE:

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

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

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

WARRANTY LIMITATIONS:

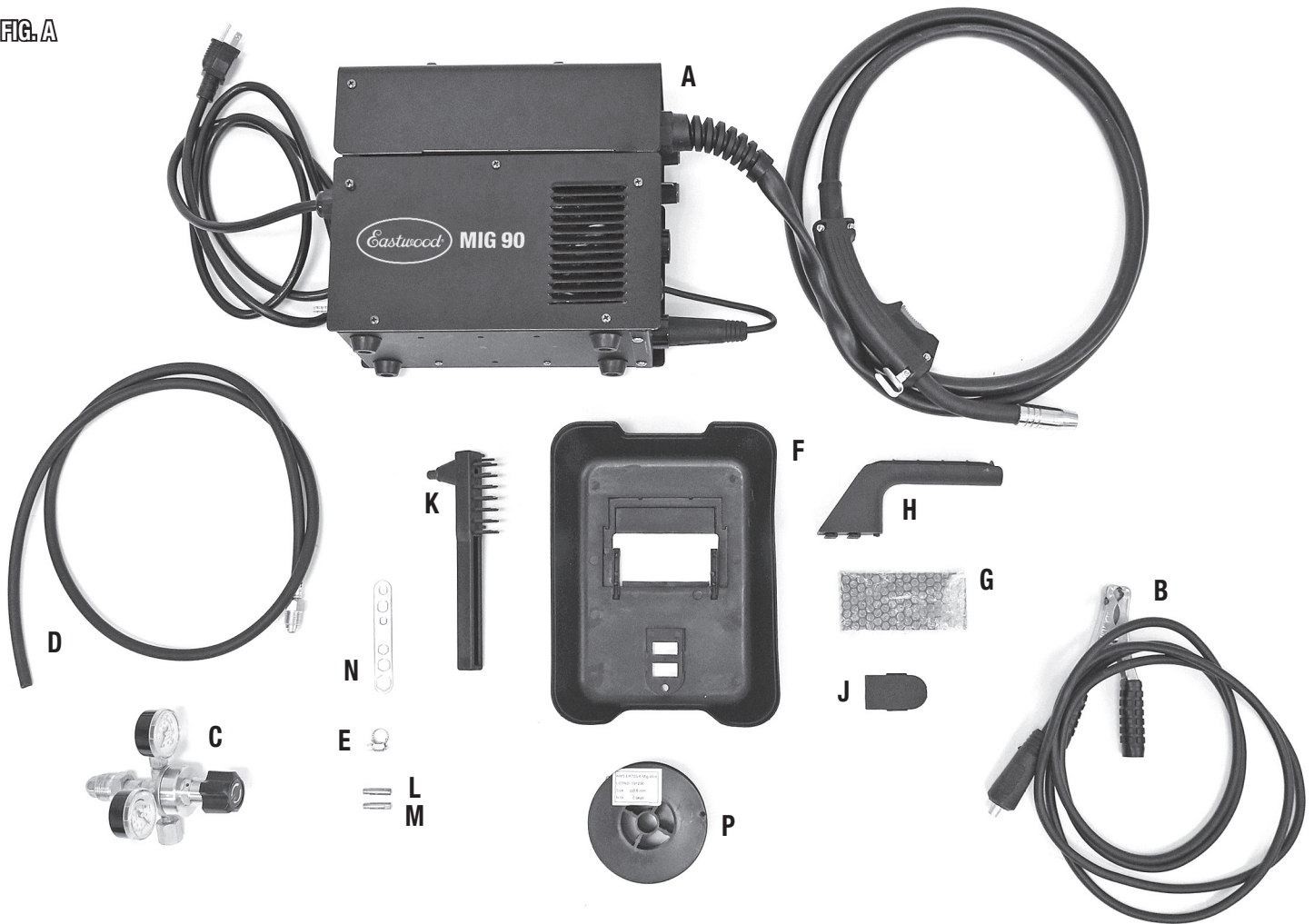
EASTWOOD WILL NOT ACCEPT RESPONSIBILITY OR LIABILITY FOR REPAIRS UNLESS MADE BY EASTWOOD. EASTWOOD'S LIABILITY UNDER THIS WARRANTY SHALL NOT EXCEED THE COST OF CORRECTING THE DEFECT OF THE EASTWOOD PRODUCT. EASTWOOD WILL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES (SUCH AS LOSS OF BUSINESS,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

CONTENTS

COMPONENTS AND ACCESSORIES; FIG A

- (1) MIG 90 Welder with MIG Gun with 8' Cable Assembly and 0.023" Tip Installed [A]
- (1) 8' Ground Cable/Clamp Assembly [B]
- (1) Shielding Gas Regulator [C]
- (1) 4.6' Shielding Gas Hose [D]
- (1) Hose Clamp [E]
- (1) Handheld Welding Face Shield [F]
- (1) Shield Lens [G]
- (1) Shield Handle [H]
- (1) Shield Handle Retaining Plug [J]
- (1) Hammer Brush [K]
- (1) 0.023" Contact Tip [L]
- (1) 0.030" Contact Tip [M]
- (1) Contact Tip Wrench [N]
- (1) 2lb. Spool of 0.023" (0.6mm) Solid Wire [P]

FIG. A



SPECIFICATIONS

Input Voltage	120V±10% VAC, 50/60 Hz, 1 Phase
No Load Voltage	56V
Rated Input Current (I_{max} / I_{eff})	24A / 12A
Output Current Adjustment	30A (15.5V) - 90A (18.5V)
Rated Duty Cycle	25% @ 90 Amps 60% @ 65 Amps 100% @ 50 Amps
Wire Feed Speed	80 - 278 in/min
Maximum Material Thickness	1/8"
Weight	14.52 lbs. [6.58kg]
Dimensions	10.75" x 5.50" x 10.75" [274mm x 140mm x 272mm]

MIG WELDING WIRE CAPACITY

Wire Type	Solid	Stainless	Flux Core
Diameter	0.023"-0.030" [0.6mm-0.8mm]	0.023"-0.030" [0.6mm-0.8mm]	0.030" [0.8mm]

DUTY CYCLE

The rated Duty cycle refers to the amount of welding that can be done within an amount of time. It is easiest to look at your welding time in blocks of 10 Minutes and the Duty Cycle being a percentage of that 10 Minutes. If welding at 65 Amps with a 60% Duty Cycle, within a 10 Minute block of time you can weld for 6 Minutes with 4 Minutes of cooling for the Welder.

If the Duty Cycle is exceeded, and the AMBER Overload Indicator is illuminated, allow the unit to cool for a minimum of 15 minutes. When a safe temperature has been reached, the Welder can be switched back on. To increase the duty cycle, turn down the Voltage Output control. Going above 65 Amps will yield a lower Duty Cycle.

SAFETY INFORMATION

IMPORTANT NOTE: These instructions are intended only to provide the user with some familiarity of the Eastwood MIG 90. Electric welding is a highly complex procedure with many variables. If you have no prior experience with electric welding, it is extremely important to seek the advice of someone experienced in electric welding for instruction, enroll in a local technical school welding course or study a comprehensive how-to video and obtain a good quality reference book on electric welding as there is a moderate learning curve necessary before achieving proficiency in welding different metals such as steel and stainless steel. It is also strongly recommended that the user adhere to the American Welding Society guidelines, codes and applications prior to producing welds where safety is affected.

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

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

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

- ⚠ DANGER** DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.
- ⚠ WARNING** WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.
- ⚠ CAUTION** CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
- ⚠ NOTICE** NOTICE is used to address practices not related to personal injury.



⚠ READ INSTRUCTIONS

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



⚠ DANGER ELECTRIC SHOCK CAN CAUSE INJURY OR DEATH!

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



⚠ DANGER WELDING SPARKS CAN CAUSE FIRE OR EXPLOSION!

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

SAFETY INFORMATION



⚠ WARNING ELECTROMAGNETIC FIELDS CAN BE A HEALTH HAZARD!

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



⚠ WARNING ARC RAYS CAN INJURE EYES AND BURN!

- Arc rays produce intense ultraviolet radiation which can burn exposed skin and cause eye damage. Use a shield with the proper filter (a minimum of #11) to protect your eyes from sparks and the rays of the arc when welding or when observing open arc welding (see ANSI Z49.1 and Z87.1 for safety standards).
- Use suitable clothing (long pants, long sleeves, closed toe shoes, gloves) made from durable flame-resistant material for skin protection.
- If other persons or pets are in the area of welding, use welding screens to protect bystanders from sparks and arc rays.



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

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



⚠ WARNING BUILDUP OF GAS CAN INJURE OR KILL!

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



⚠ WARNING CYLINDERS CAN EXPLODE IF DAMAGED!

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

SAFETY INFORMATION



⚠ CAUTION HOT METAL AND TOOLS WILL BURN!

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



⚠ CAUTION FLYING METAL CHIPS CAN CAUSE INJURY!

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



⚠ NOTICE FIRST AID

- If exposed to excessive fumes move to an area with fresh air. Follow safety information on wire manufacturer's Safety Data Sheet.
- For other injuries follow basic first aid techniques and call physician or emergency medical personnel.

CONNECTING THE WELDER TO A POWER SOURCE

The Eastwood MIG 90 Welder requires a dedicated 120 VAC, 20 AMP grounded outlet protected by a circuit breaker. The plug installed on the Welder is a NEMA 5-15P and should be used with a NEMA 5-15R receptacle. If using an extension cord, use a minimum 12 AWG cord for up to 50 feet. We recommend using our welder extension cord for optimal performance (#31739 25ft Heavy Duty 110V Extension Cord).

CONTROL PANEL AND FEATURES

FRONT UPPER PANEL (FIG 1)

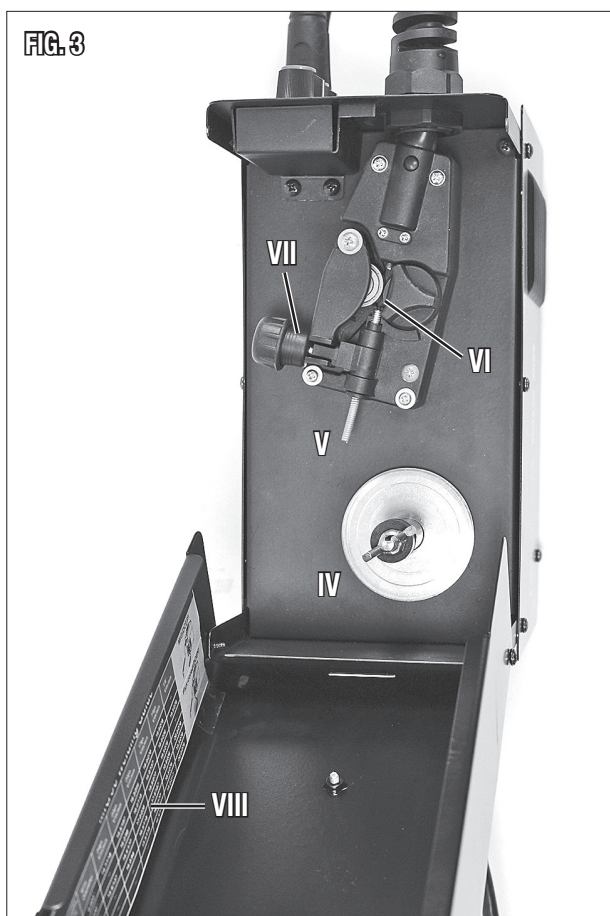
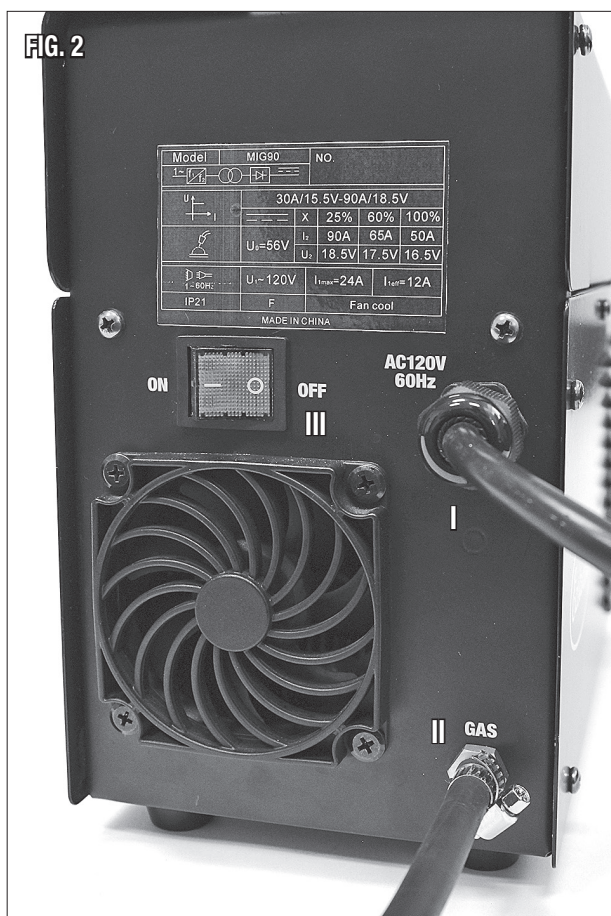
- a. **Wire Speed Control:** 80-278 in/min
- b. **Voltage Control:** 14 to 20V
- c. **Overload Indicator:** Illuminates AMBER when the Duty Cycle has been exceeded, the Welder is overloaded or if other abnormalities exist
- d. **Power ON Indicator:** Illuminates GREEN when the ON/OFF Switch is ON
- e. **MIG Gun Connection (Fixed)**
- f. **Positive Connection**
- g. **Polarity Jumper Lead**
- h. **Negative Connection**

REAR PANEL (FIG 2)

- I. Power Cord
- II. Shielding Gas Connection
- III. ON/OFF Switch

TOP INTERIOR PANEL (FIG 3)

- IV. Wire Feed Spindle
- V. Wire Feed Tube
- VI. Wire Drive Roller
- VII. Wire Tensioner
- VIII. Wire Speed Chart



SET-UP FOR SOLID WIRE WELDING

The Eastwood MIG 90 is factory set-up for MIG Welding use with 0.023" Solid Wire (included) and shielding gas (not included).

This set-up includes the proper polarity (DCEP) and the Drive Roller set for 0.023" (0.6 mm).

The procedure for configuring to Flux Core Wire use is covered further on in this Manual.

ASSEMBLE THE FACE SHIELD

- Slide the #11 Glass Shade [G] Lens under the Retaining Clips at the inside of the Shield [F] (FIG 4).
- Snap the Handle [H] into its receptacle from the back of the shield seating it fully and firmly (FIG 4).
- Press the Handle Retaining Plug [J] into the corresponding shape from the front (FIG 5).

INSTALLING THE GROUND CABLE AND CLAMP

- Locate the 8 ft. Ground Cable/Clamp Assembly [B] and connect the plug on the brass end to the (-) Negative Connection [h]. Align the key of the brass ferrule with the notch of the receptacle at the 12:00 position, insert the plug and twist clockwise 1/2 turn until it is tight (FIG 6).

FIG. 4

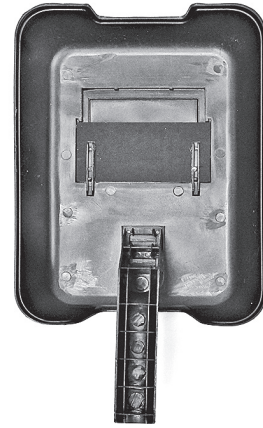


FIG. 5



FIG. 6



INSTALLING THE SHIELDING GAS SUPPLY

NOTE: The following steps cover the installation of the Shielding Gas Regulator, Hose and cylinder (not included).
For flow adjustment, see **SHIELDING GAS FLOW ADJUSTMENT**.

⚠ WARNING BUILDUP OF GAS CAN INJURE OR KILL!

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

⚠ WARNING CYLINDERS CAN EXPLODE IF DAMAGED!

Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. As gas cylinders are a normal component of the welding process, use extra care to handle them carefully.

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

A shielding gas cylinder is **NOT INCLUDED** with the Eastwood MIG 90 but is necessary to weld using Solid Wire. It can be bought at most local Welding Supply Stores. Eastwood recommends the use of 75% Argon / 25% CO₂ for shielding gas when MIG welding steel and Tri-Mix (90% He / 7.5% Ar / 2.5% CO₂) for stainless steel.

- Place the Eastwood MIG 90 in a secure dedicated area or on a welding cart (not included).
- Secure the shielding gas cylinder to a stationary object or mount to a specifically designed welding cart, equipped to hold one so that the cylinder cannot fall over.
- Remove the cap from the shielding gas cylinder.
- Insert the large brass male fitting on the Shielding Gas Regulator **[C]** into the female fitting on the shielding gas cylinder (not included).

⚠ NOTICE

Do not use White Thread Sealing Tape on this connection as it is an inert spherical gas fitting and does not require it. If you have a leak check for burrs or dirt in the threads or on the spherical joint.

- Tighten the fitting with a wrench until snug, do not over tighten.
- Connect the fitting end of the Shielding Gas Hose **[D]** included with the Eastwood MIG 90 to the fitting on the Regulator and wrench tighten until snug.
- Slip the Hose Clamp **[E]** over the other end with no fitting, and then connect it to the barbed fitting on the rear of the Eastwood MIG 90 and tighten the Hose Clamp until snug with a screwdriver (**FIG 2**).
- Check the gas line for leaks by slowly opening the valve on the gas cylinder. When welding, the valve on the cylinder should always be fully open. Close it when done welding to avoid loss of gas.

INSTALLING THE WIRE SPOOL

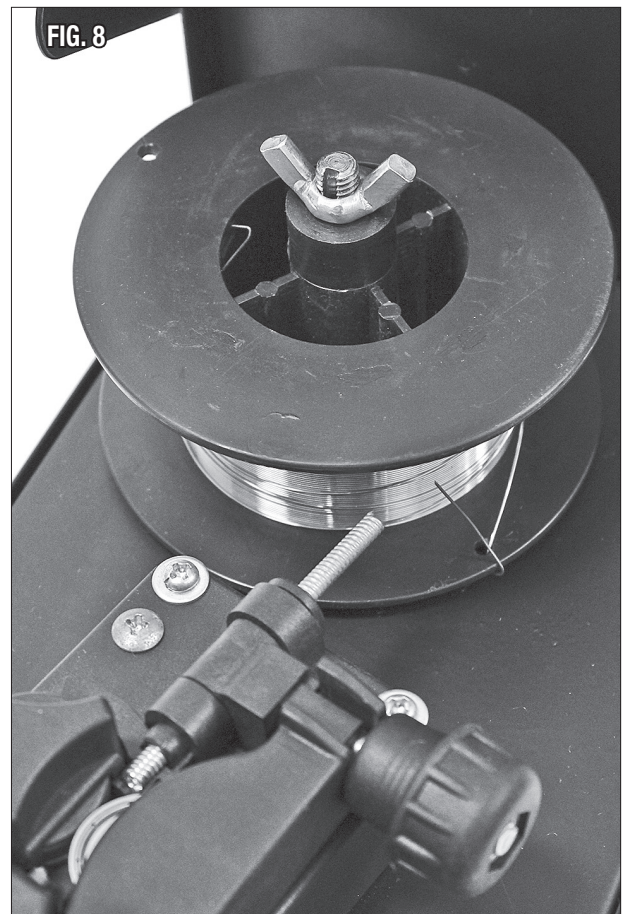
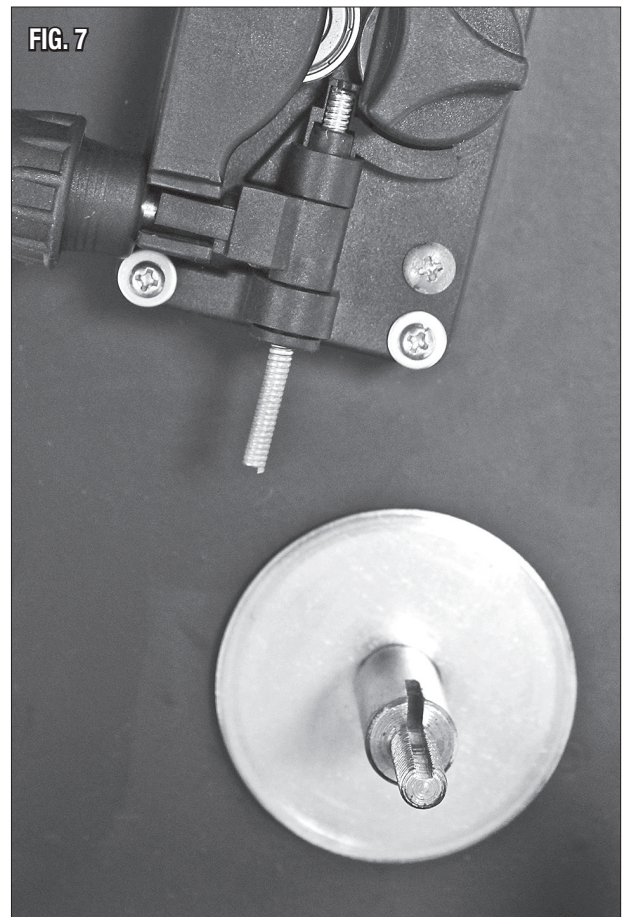
The Eastwood MIG 90 can be used only with a 4" wire spool which fits directly on the Spool Shaft.

TO INSTALL A 4" WIRE SPOOL

- Open the Top Panel of the Welder and remove the Spool Retaining Wingnut and Spacer from the Wire Spool Spindle (**FIG 7**).
- With the wire feed oriented forward and from the topside of the spool, slide the 4" Wire Spool onto the Spindle and reinstall the Spacer and the Spool Retaining Wingnut (**FIG 8**). **DO NOT** unravel wire at this point.

SETTING THE WIRE TENSION ADJUSTER

- To set the tension on the wire, incrementally tighten the Spool Retaining Wingnut at the center of the Spindle until there is a slight resistance to spinning the wire spool on the spindle. If the tension is set too loose the wire spool will freely spin on the shaft and unspool all the wire. If the tension is too tight, the Drive Roller will have difficulty pulling the wire off the spool and some slipping may occur.



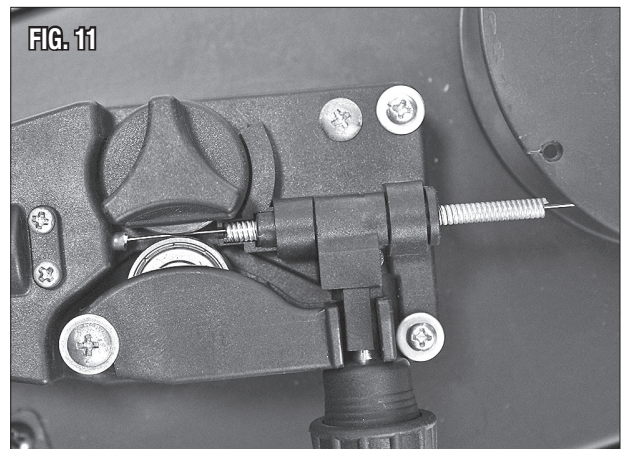
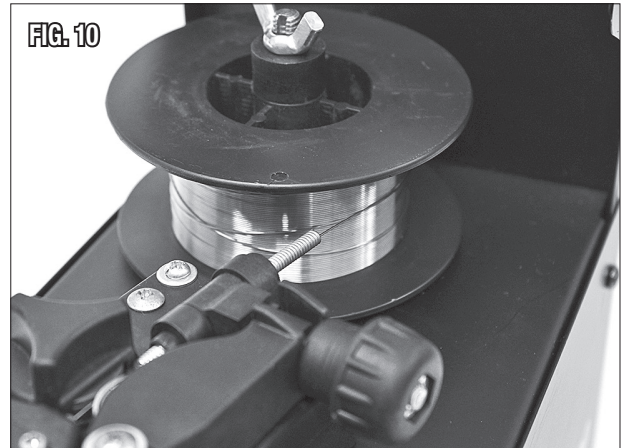
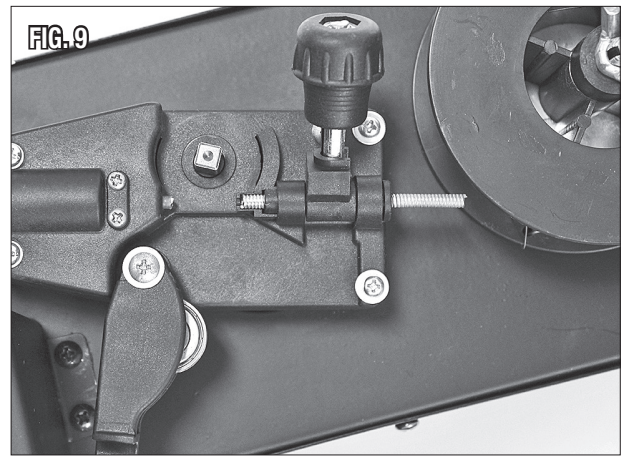
THREADING WELDING WIRE THROUGH THE DRIVE MOTOR TO THE WELDING GUN

This Welder uses wire sizes ranging from 0.023" to 0.030" (0.6mm to 0.8mm). To safely and correctly install the welding wire; follow the procedure in the sequence outlined below:

⚠ DANGER **ELECTRIC SHOCK CAN CAUSE INJURY OR DEATH!**
This procedure requires that the Welder power be switched ON.
DO NOT make contact with the wire when the MIG Gun Trigger is depressed.

1. Turn the Power Switch on the upper rear panel to the **OFF** position and unplug the Welder from the power supply.
2. Using the included Contact Tip Wrench [N], remove the Contact Tip and Nozzle from the end of the MIG Gun.
3. Make sure that the Drive Roller is installed in the proper position in accordance with the wire size being used. See **POSITIONING DRIVE ROLLER FOR WIRE SIZE** for guidance.
4. Flip the Wire Tensioner upward, pivot it up and out of the way, then pivot the Tension Arm out away from the Drive Roller (**FIG 9**).
5. Pull out the welding wire from the Wire Spool carefully.
IMPORTANT NOTE: DO NOT let go of the wire or the entire spool could unravel.
6. Cut off the small piece of the curved segment at the front of the welding wire and straighten the welding wire approximately 3.0" long.
7. Thread the welding wire, feeding from the topside of the spool and forward through the Guide Tube, then over the Wire Drive Roller and into the Wire Feed Hole (**FIG 10**).
8. Replace the Tension Arm and re-latch the Wire Tensioner back into place (**FIG 11**).
9. Connect the Welder to a power supply and turn the ON/OFF Switch at the upper rear panel to the **ON** position. Set the Wire Speed Control to about 212 IPM.
10. With the Gun pointed away from yourself and others, depress the Trigger to begin feeding wire. When not welding, the welder will assume wire is being fed and the Wire Speed potentiometer will be disabled. The welder will automatically start a slow feed, and after a few seconds of the Trigger being held, it will switch to a fast feed to get the wire completely through the Gun faster.
NOTE: The Wire Tensioner may need to be set. To do so:
 - Watch the Drive Roller to see if any slipping is occurring between the Roller and the wire. If so; turn the machine off, unplug it and tighten the Wire Tensioner 1/4 turn and test again.
 - Repeat the above step until wire is feeding smoothly with no binding or slippage.

Once the wire exits the end of the MIG Gun, reinstall the Contact Tip and Nozzle. Cut the wire about 1/4" from the end of the Contact Tip.



SET-UP FOR FLUX CORE WELDING

The Eastwood MIG 90 comes factory set-up to weld with Solid Wire and Shielding Gas. Flux Core does not require shielding gas.

Three changes to the Set-Up need to be made to MIG Weld with Flux Core Wire:

- Reverse polarity from DCEP to DCEN.
- Install Flux Core Wire and correct Contact Tip size.
- Position Drive Roller to accept Flux Core Wire.

CHANGING THE POLARITY TO DCEN FOR WELDING WITH FLUX CORE WIRE

To use a Flux Cored Wire, the position of the Polarity Jumper Lead [g] attached to the front panel must be switched (FIG 12).

⚠ DANGER ELECTRIC SHOCK CAN CAUSE INJURY OR DEATH!
Disconnect Welder from power supply before beginning.

- Disconnect the Polarity Jumper Lead [g] from the (+) Positive Connection [f] by rotating the Rubber Insulator 1/2 turn counter-clockwise and pulling outward.
- Align the key of the brass ferrule with the notch of the receptacle at the 12:00 position, then insert the Polarity Jumper Lead [g] into the (-) Negative Connection [h], seat fully and rotate 1/2 turn clockwise to lock (FIG 12).
- Insert and lock the Ground Clamp Cable into the (+) Positive Connection [f] (FIG 12).

POSITIONING DRIVE ROLLER FOR WIRE SIZE

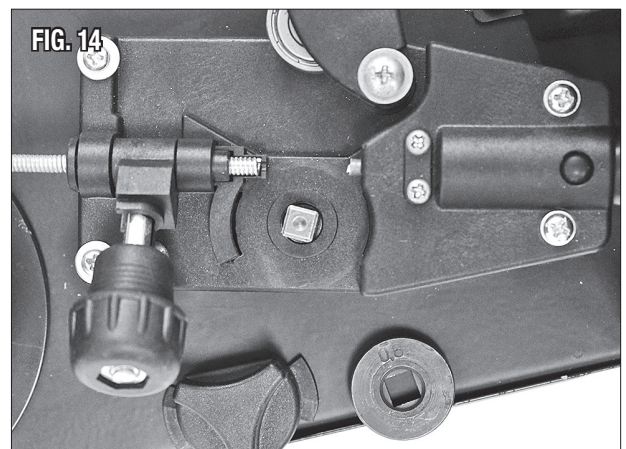
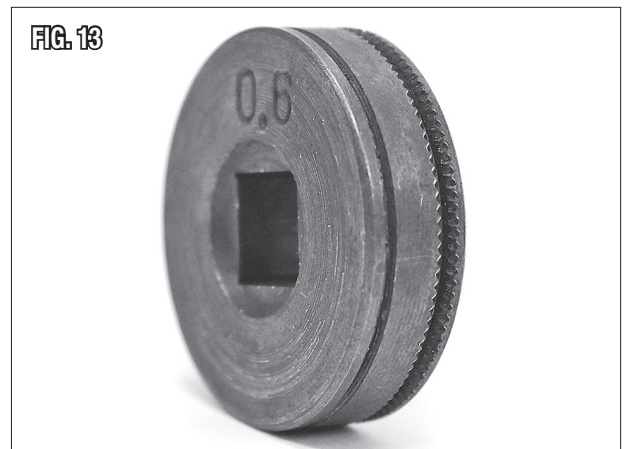
The Eastwood MIG 90 Wire Drive Roller has twin grooves to accommodate both 0.023" [0.6mm] and 0.030" [0.8mm] wire.

The MIG 90 Drive Roller is factory set and up ready to use 0.023" [0.6mm] Solid Wire.

IMPORTANT NOTE: When installed, the stamped marking on the side of the Drive Roller facing up denotes the groove size being used (eg. After the Drive Roller Cover has been removed, the stamping immediately visible on the Drive Roller shows "0.8" indicating it is configured for 0.030" [0.8mm] wire (FIG 13)).

Reverse the Drive Roller position according to the following procedure:

- Open the top door of the Welder to access the Drive Motor compartment.
- Rotate the Pressure Adjuster out of the way, then pivot the Tension Arm away from the Drive Roller (FIG 14).
- Rotate the Drive Roller Cover 90° Counter-Clockwise and remove (FIG 14).
- Remove the Drive Roller and view the wire sizes stamped on each side of the Roller.
- Install the Drive Roller on the square drive in the proper orientation with the chosen wire size stamping facing outward (FIG 13).
- Reinstall the Drive Roller Cover.
- Replace the Tension Arm and re-latch the Pressure Adjuster.



OPERATING THE MIG 90 WELDER

OVERLOAD PROTECTION

The Eastwood MIG 90 Welder is equipped with overload protection. This device will protect the Welder if the duty cycle is exceeded. If the output is exceeded, the AMBER Overload Indicator will illuminate and cut off the power supply to the Drive Motor and MIG Gun although the fan will still run to cool the unit. This protection circuit must be reset manually by switching the unit back on. Before restarting the unit allow the Welder to cool for a minimum of 15 minutes or until the AMBER Overload Indicator goes out.

⚠ DANGER ELECTRIC SHOCK CAN CAUSE INJURY OR DEATH!

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

⚠ DANGER WELDING SPARKS CAN CAUSE FIRE OR EXPLOSION!

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

⚠ WARNING ELECTROMAGNETIC FIELDS CAN BE A HEALTH HAZARD!

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

⚠ WARNING ARC RAYS CAN INJURE EYES AND BURN!

- Arc rays produce intense ultraviolet radiation which can burn exposed skin and cause eye damage. Use a shield with the proper filter (a minimum of #11) to protect your eyes from sparks and the rays of the arc when welding or when observing open arc welding (see ANSI Z49.1 and Z87.1 for safety standards).
- Use suitable clothing (log pants, long sleeves, closed toe shoes, gloves) made from durable flame-resistant material to protect your skin.
- If other persons or pets are in the area of welding, use welding screens to protect bystanders from sparks and arc rays.

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

- Fumes and gases released during welding are hazardous. Do not breathe fumes that are produced by the welding operation. Wear an OSHA-approved respirator when welding.
- Always work in a properly ventilated area.
- Never weld coated materials including but not limited to: cadmium plated, galvanized, lead based paints, powder coat.

⚠ CAUTION HOT METAL AND TOOLS WILL BURN!

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

⚠ CAUTION FLYING METAL CHIPS CAN CAUSE INJURY!

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

SHIELDING GAS FLOW ADJUSTMENT

After connecting the Shielding Gas Regulator, the gas flow rate needs to be adjusted so that the proper amount of shielding gas is flowing over the weld. If there is too little gas flow there will be porosity in the resulting welds as well as excessive spatter.

If there is too much gas flow, this will be wasting gas and may affect the weld quality. The included Regulator has 2 gauges on it; the gauge on the left is Gas Flow while the gauge on the right is Cylinder Pressure.

- Open the shielding gas cylinder valve all the way.
- Adjust the knob on the Shielding Gas Regulator to ~30 CFH.
- After the Welder is turned on (described in following section), the Trigger of the MIG Gun will control the internal gas flow.
- As the MIG Gun is triggered, the Gas Flow Needle will drop to a steady reading. This is the value to be used for measuring gas flow.
- The gas flow should ideally be set to ~20 CFH while flowing. The CFH (Cubic Feet per Hour) scale is the inside scale in red on the Gas Flow Gauge. 20 CFH is the most typical flow rate but it may need to be adjusted in some cases, depending on whether there is a slight breeze or some other instance where additional shielding gas is required to prevent porosity in the weld.
- When finished welding, the valve on the gas cylinder must be closed.

MIG AND FLUX WELDING

The Eastwood MIG 90 can be used to form many different joints and welds all of which will require practice and testing before using on an actual project piece. This following welding process is just a baseline to get started. Welding, as with any skill, requires a learning curve to achieve proficiency. An extended period of “Trial and Error” performed on scrap material is required before welding on an actual project can begin.

- Refer to the ‘Suggested Settings’ chart which is located inside the Top Panel (**FIG 3**) of the Eastwood Welder. From the chart select the baseline starting point for the recommended settings described in the chart.
- Connect the Ground Clamp to the work pieces that are to be welded. Make sure the Ground Clamp contacts are placed on a clean piece of metal free of paint, grease, rust, oils, etc. It is recommended to place your Ground Clamp as close to the weld area as possible.
- Assess the general work area and make sure the welding area is also cleaned of any paint, grease, rust, oils, etc.
- Plug in the Welder and move the Power Switch at the rear panel to the **ON** position.
- Depress the Welding Gun Trigger pointing it away from your body or anyone else then let go of the Trigger and cut the wire back to ~1/4” stick out length.
- Wearing a welding helmet, gloves with long sleeve shirt and pants, put the end of the wire sticking out of the Gun into the joint to be welded.
- Position the MIG Gun so that it is perpendicular to the base metal with ~20° tilt back.
- Depress the Trigger to start the wire feed which starts the arc.
NOTE: A push, perpendicular, or drag technique can be used to weld the pieces together; the type used depends on the type of joint as well as other influential conditions.
 - Once the Trigger is depressed and the arc has started, a molten puddle will form; this puddle is the weld bead and will follow the motion of the MIG Gun.
 - Watching the size of the puddle dictates how the Gun should be moving.
 - If the material burns through, the Gun is either moving too slow or some Wire Speed & Arc Volts setting adjustments must be made.
 - If the base metal is not being penetrated, the Gun is either moving too fast or some Wire Speed & Arc Volts setting adjustments must be made.
- Release the Trigger on the MIG Gun to stop the weld.
- After welding is complete, turn off the Welder and disconnect from power source.

WELDING TECHNIQUES

SHEET METAL WELDING TECHNIQUES

When welding sheet metal a different approach is usually taken to account for how thin the metal is and it's susceptible to warping it is. The technique most often used is called Stitch Welding and this process is described below:

- Clean the metal to be welded of any paint, rust, oil, grease, dirt, or any other contaminants that may be on the surface of the piece.
- Secure the pieces to be welded in place using clamps. Be sure to leave a small gap between the two pieces of sheet metal for the weld to flow into, this will result in a lower bead height which will require minimal finishing.
- Consult the Suggested Settings Chart and set the Voltage and Wire Speed knobs appropriately.
- Get some pieces of scrap metal of the same thickness and verify that the settings will work for the specific weld you will be making.
- Once the settings have been fine-tuned, tack weld your final pieces in place and remove the clamps if they are in the way of the weld.
- The Stitch Welding technique can now be utilized which is basically a series of connected "Tacks". To perform the technique, depress the Trigger for a short period of approximately half a second to lay a tack. Continue to trigger the Gun on and off, making a series of connected tack welds following along the path of the weld joint. Continue the series of tacks for an inch or so and then move to a different section of the weld and perform the process there. It is essential to keep moving around to spread out the heat making sure not to get one section too hot, warping the metal.
- Once the entire weld has been completed allow the metal to cool. If necessary, follow up with a flap disc to grind the weld bead flush.

HEAVIER GAUGE METAL WELDING TECHNIQUES

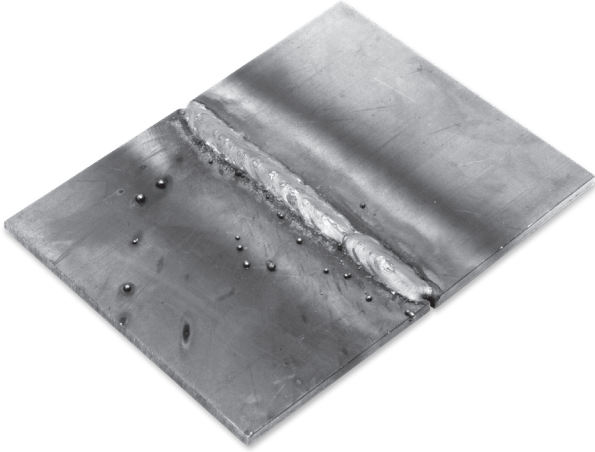
NOTICE

DO NOT attempt to weld material thicker than 1/8".

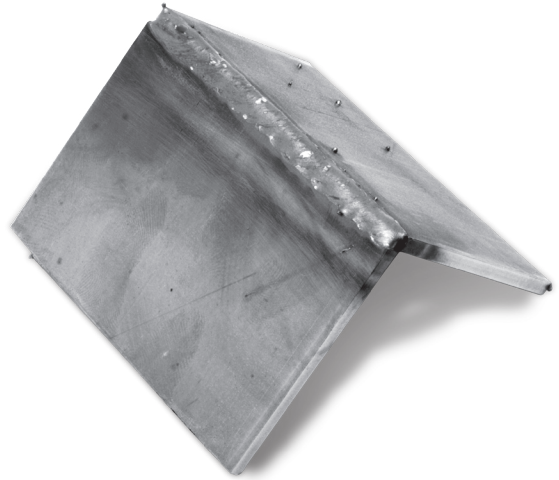
When welding heavier gauge metal, a continuous bead is formed using a 'push' method. This process is described below:

- Clean the metal to be welded of any paint, rust, oil, grease, dirt or any other contaminants that may be on the surface of the piece.
- Secure the pieces to be welded in place using clamps. Be sure to leave a small gap between the two pieces of metal for the weld to flow into, this will result in a lower bead height which will require minimal finishing.
- Consult the Suggested Settings Chart inside the Top Panel and set the Voltage and Wire Speed knobs appropriately.
- Get some pieces of scrap metal of the same thickness and verify that the settings will work for the specific weld you will be making.
- Once the settings have been fine-tuned, tack weld the final pieces in place and remove the clamps if they are in the way of the weld.
- When welding heavy gauge metal there are two basic approaches to creating the weld. The first is a continuous bead with steady Gun movement along the length of the joint. The second type of weld is a Stringer or Weave bead. This is accomplished by moving the MIG Gun in a circular or zig zag pattern. Either of these techniques will create strong welds but in some cases the Stringer or Weave type will create a more aesthetically pleasing weld bead.
- Once the entire weld has been completed, allow the metal to cool. If necessary, follow up with a flap disc to grind the weld bead flush.

TYPES OF WELD JOINTS



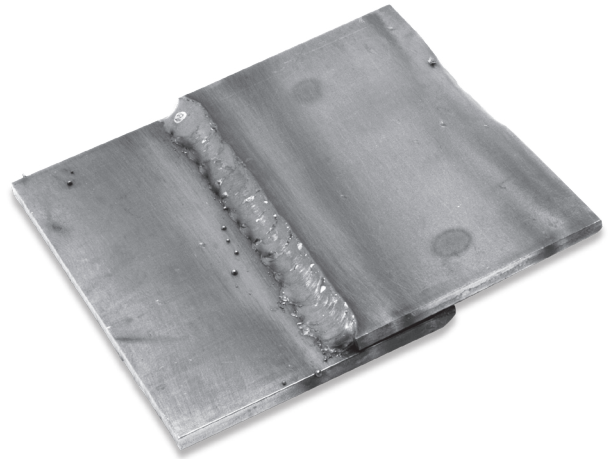
BUTT WELD is a joint between two pieces that are laying in the same direction.



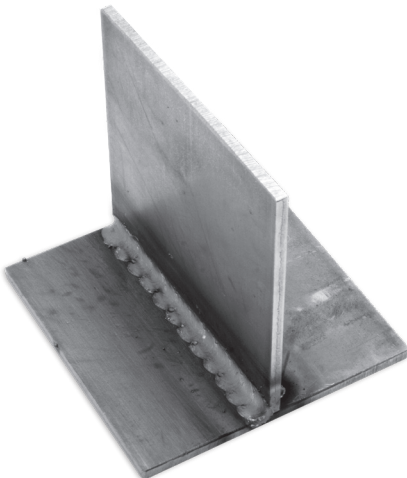
CORNER WELD is a joint between two pieces that meet at or near perpendicular at their edges.



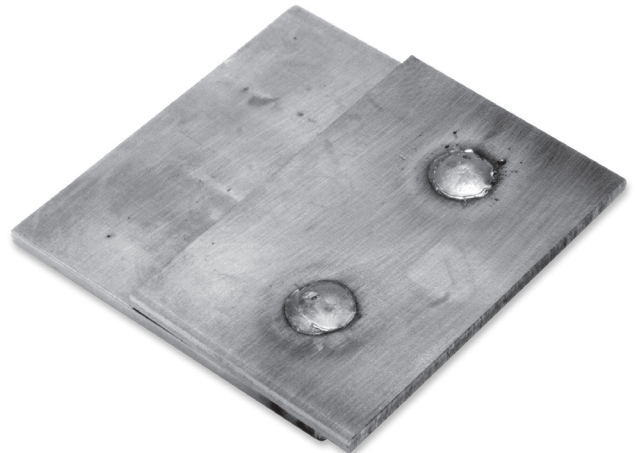
EDGE WELD is a joint between two pieces where the edges are being joined.



LAP WELD is a joint between two overlapping pieces.



TEE WELD is a joint between two pieces where one is perpendicular to the other.



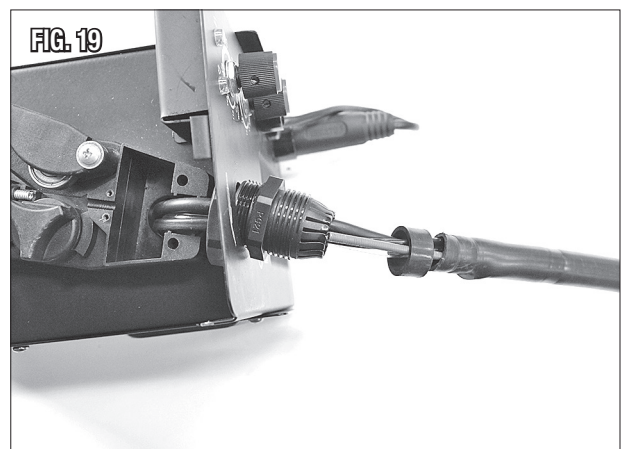
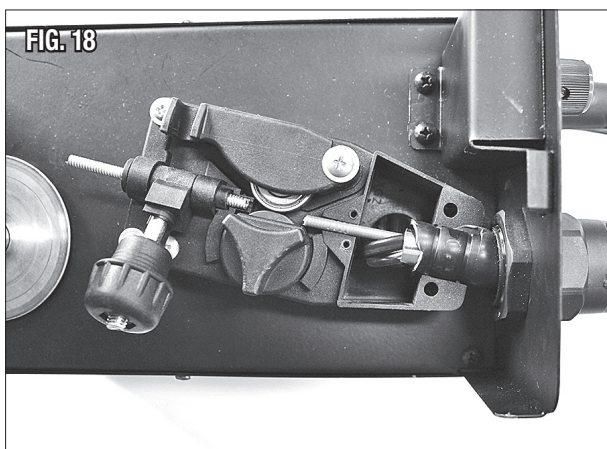
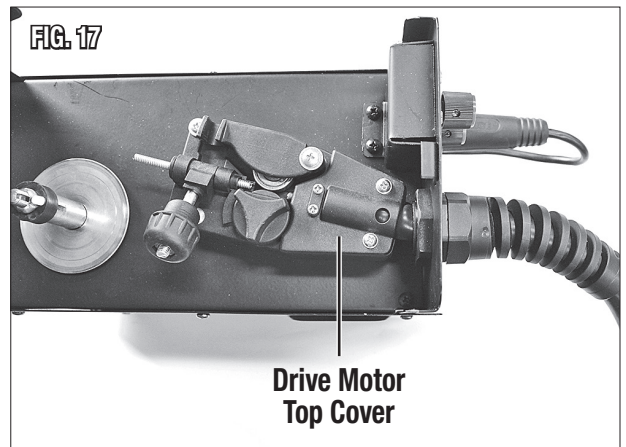
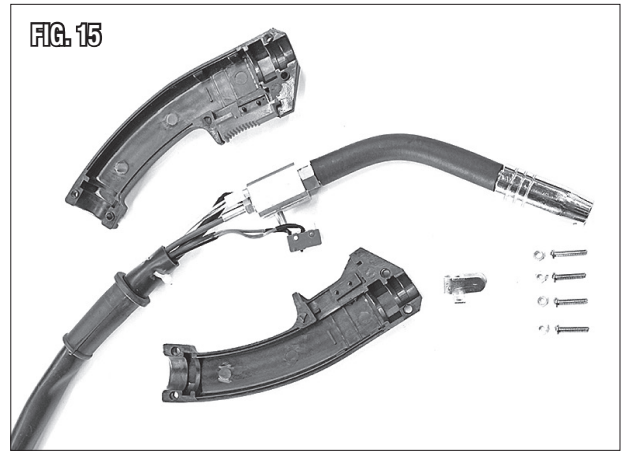
PLUG WELD is a joint which joins two overlapping pieces by filling in a hole punched in the top piece.

MAINTENANCE AND REPAIR

Replacement of the MIG Gun welding wire conduit Liner or MIG Gun assembly may be necessary due to age, damage from heat, or general operation. These can be obtained as replacement parts and installed by the user as follows.

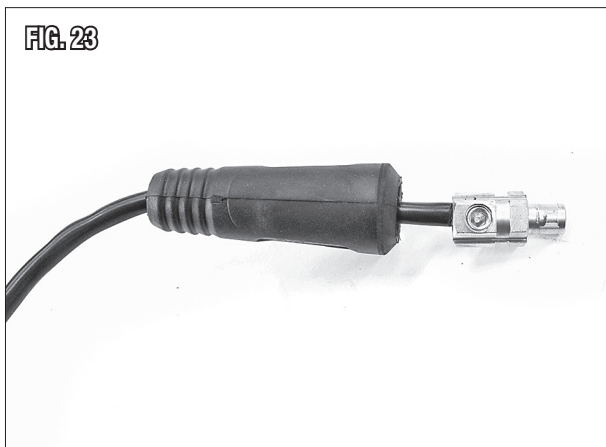
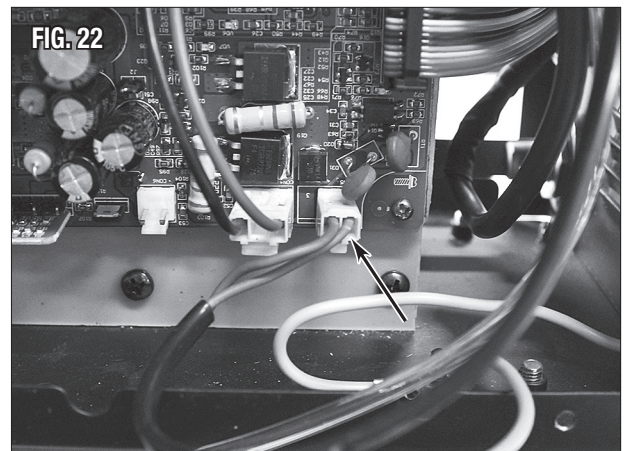
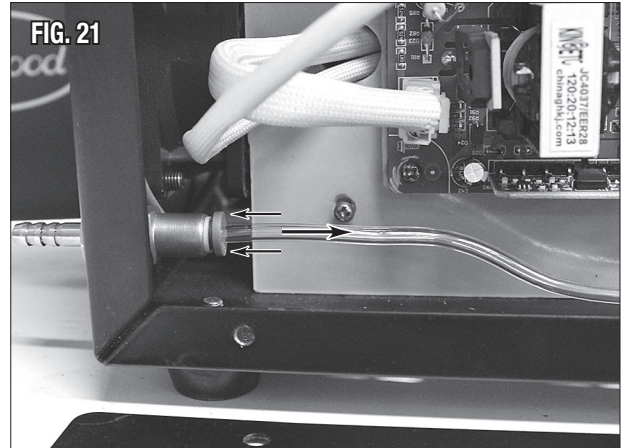
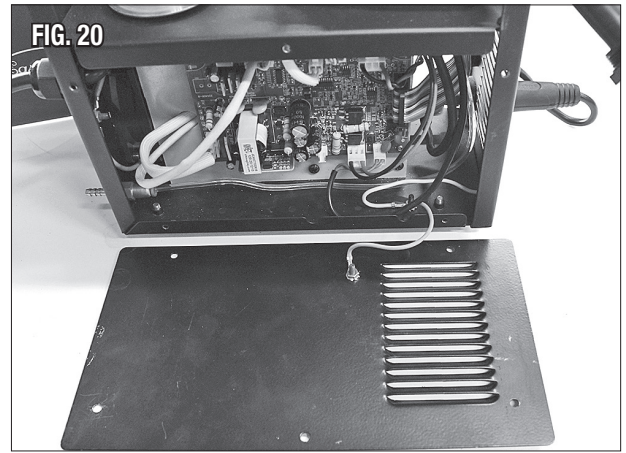
MIG GUN LINER REPLACEMENT

- Before beginning, ensure power is off, the unit is unplugged, and the welding wire has been removed from the Liner.
- Remove the four screws holding the MIG Gun clamshell together, then remove the hook at the top of the Gun. The clamshell can now be split in half to reveal the internals (**FIG 15**). Note that the valve body has a specific orientation so that the MIG Gun Trigger wires can slip in. This will be important for reassembly.
- The brass fitting attached to the end of the Liner must be unfastened from the valve trigger body fully using a 10mm wrench. This end of the Liner is now prepared for removal (**FIG 16**).
- At the Drive Motor, remove the four screws (**FIG 17**) securing the Top Cover to free the Liner (**FIG 18**).
- It may be necessary to disassemble the strain relief and bulkhead coupling to minimize friction for installation of the new Liner (**FIG 19**). Heating lightly may also help to relieve some of the tension the jacket may apply on the internal lines. The Liner should move freely with very little force.
- When removing the Gun Liner, pull it out from the MIG Gun end, while keeping the cable taut straight out of the welder to minimize resistance. With the old Liner fully removed, the replacement can be slipped into the same pathway and pushed through to the other end, exactly as the old one came out.
- Reassemble the MIG Gun in reverse order.



MIG GUN REPLACEMENT

- Before beginning, ensure power is off, the unit is unplugged, and the welding wire has been removed from the MIG Gun.
- For replacement of the full Gun and cable assembly, the Drive Motor Top Cover must be removed using the four screws at the top (**FIG 17**).
- Remove the five left side panel screws so that the internals of the welder can be accessed (**FIG 20**).
- Make sure the welding gas cylinder valve is closed, then simultaneously push in the blue ring on the gas hose fitting to release the gas hose while pulling it out (**FIG 21**).
- Release the latch and pull the MIG Gun Trigger connector off the control board (**FIG 22**).
- Remove the cover of the Polarity Jumper Lead by sliding it back off the fitting (**FIG 23**). This requires significant force. The set screw can now be unscrewed to release the wire (**FIG 24**).
- To remove the bulkhead fitting, while pinching the top and bottom, pull it out (**FIG 24**).
- Now the Gun can be fully removed, and the new assembly installed in the reverse order.



TROUBLESHOOTING

PROBLEM	CAUSE	CORRECTION
Welder Will Not Power Up	Welder Not Plugged Into Proper Power Supply	Check power supply. The MIG 90 requires a properly grounded, 120 Volt AC, 20 Amp power supply.
	Facility Power Source Breaker Tripped	Reset breaker.
	Welder Breaker Tripped	Reset breaker at rear panel.
	Power Switch Not Fully On	Check that Power Switch is fully ON.
	Duty Cycle Exceeded	Allow the Welder to cool for a minimum of 15 minutes or until the AMBER Overload Indicator goes out before attempting to use again.
Wire Will Not Feed	Drive Motor Wire Tension Is insufficient, Allowing Wire Slippage	Tighten Drive Roller Tensioner.
	Duty Cycle Exceeded	Allow the Welder to cool for a minimum of 15 minutes or until the AMBER Overload Indicator goes out before attempting to use again.
Wire Binding Up Ahead of Drive Feed Rolls	Wire Tension Set Too High	Loosen drive roller tension.
Wire Burning Back to Contact Tip	Drive Motor Wire Tension Is insufficient, Allowing Wire Slippage	Tighten Drive Roller Tensioner.
	Wire Speed Setting May Not Be Adequate for Welding Voltage Setting.	Increase Wire Speed or decrease Voltage Setting.
	Wire Stick Out from End of Contact Tip Too Short	Cut wire stick out to 1/4".
Welder Will Not Produce An Arc	Ground Cable Not Attached to Metal Being Welded	Attach Ground Clamp to metal being welded.
	Ground Clamp Attached to a Contaminated or Rusty Work Piece	Prepare a thoroughly cleaned spot for the Ground Clamp.
	Ground Cable Connector Not Fully Secured to Welder Terminal	Check Ground Clamp connection at Welder for tight connection.
	Wrong Ground Clamp from Another Device is Attached to Work Piece	Check that the correct welding ground from Welder being used is attached to the work piece.
	Gun Contact Tip is Excessively Worn	Replace MIG Gun Contact Tip.
Intermittent Welding Arc	Incorrect Input Voltage	Check power supply. The MIG 90 requires a properly grounded, 120 Volt AC, 20 Amp power supply.
	Wrong Size Drive Roller Groove	Check Drive Roller size and install Drive Roller as required to match wire size being run. See DRIVE ROLLER under SET-UP FOR SOLID WIRE WELDING for more details.
	Poor Ground	Prepare a thoroughly cleaned spot for the Ground Clamp.
		Check condition of Ground Clamp and clean clamping surfaces if necessary.
		Check Ground Clamp attachment at Welder for tight connection.
	Wire Slipping in Drive Rollers	Tighten Drive Roller Tensioner.
	Wrong Size or Worn Contact Tip	Replace the Contact Tip for one of correct size or new condition.

TROUBLESHOOTING

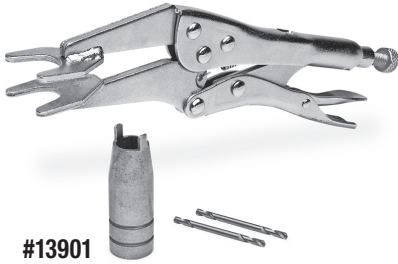
PROBLEM	CAUSE	CORRECTION
Shielding Gas Not Flowing Out of MIG Gun	Shielding Gas Regulator or Gas Cylinder Valve Not Opened Enough	Ensure the gas cylinder valve is fully opened and open the Shielding Gas Regulator knob further to allow more gas flow through.
	Gas Cylinder Empty	Refill welding gas cylinder.
	MIG Gun Gas Hose Disconnected from Fitting	Check the internal connection. See MIG GUN REPLACEMENT.
	Gas Leaking from Hose or Fittings	Tighten fittings and Hose Clamp or replace damaged parts as necessary.
	MIG Gun Clogged with Welding Spatter	Remove the Nozzle and clear it of any blockages. Inspect the exposed Tip and diffuser of the MIG Gun. Clear any visible blockages and debris. If damaged and unable to be cleared, replace the MIG Gun. See MIG GUN REPLACEMENT.
Welder Goes Into Overload, AMBER Overload Indicator Illuminated	Duty Cycle Exceeded	Allow the Welder to cool for a minimum of 15 minutes or until the AMBER Overload Indicator goes out before attempting to use again.
Burn Through	High Voltage and Wire Speed	Adjust Voltage and Wire Speed to a lower setting.
	Slow MIG Gun Travel	Increase your travel speed with the MIG Gun.
Lack of Penetration	Low Voltage and Wire Speed	Adjust Voltage and Wire Speed output to a higher setting.
	Fast MIG Gun Travel	Slow your travel speed of the MIG Gun making sure to pull or drag the molten metal puddle.
	Excessive Wire Protruding	Move the Contact Tip on the MIG Gun closer to the work piece to shorten the length of exposed wire.
	Material Too Thick	The MIG 90 is rated for a maximum thickness of 1/8". Exceeding this will result in poor penetration.
	Poor Material Preparation	If welding heavy gauge metals, it may be necessary to increase the welding gap between the two pieces and also bevel the edges on the weld side of the pieces.
Excessive Penetration	High Voltage and Wire Speed	Adjust Voltage and Wire Speed to a lower setting.
	Slow MIG Gun Travel	Increase your travel speed with the MIG Gun.
Warping	Lack of Tack Welds	Tack weld the pieces in multiple areas to keep the pieces from pulling apart.
	No Clamping	Use welding clamps to secure the pieces in the proper shape.
	Poor Technique	To prevent warping, allow the workpiece to cool after welding small sections at a time. Move your welding areas around by not completing all the welding in one section all at once, rather, welding a small amount in one area and then move to another section area to spread out the heat in the piece.

NOTES

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ADDITIONAL ITEMS

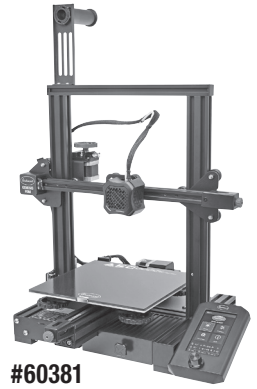
R&D MUST-HAVE ACCESSORIES



#13901
MIG Spot Weld Kit



#21483
Large View Auto Darkening Welding Helmet



#60381
Genesis FDM 3D Printer

Visit eastwood.com for complete info and pricing.

CONSUMABLE ITEMS

- #12211** 0.023" Contact Tips (5 Pack)
- #12224** 0.030" Contact Tips (5 Pack)
- #12210** Nozzle
- #20000** MIG Consumables Kit (2 Nozzles, 20 Contact Tips)

MIG WIRE

- #23022** 0.023" Solid MIG Wire 4" Spool
- #23023** 0.030" Solid MIG Wire 4" Spool
- #23028** 0.030" Flux Core Wire 4" Spool

OPTIONAL ITEMS

- #19015** MIG Welders Pliers
- #55070 / 55071** Leather MIG Welding Gloves (M / L)
- #55068 / 55068** Leather TIG Welding Gloves (M / L)
- #12762** L, XL, XXL Cotton Welding Jacket
- #55065** L, XL, XXL Leather Welding Jacket
- #21484** XL View Auto Darkening Welding Helmet
- #21483** Large View Auto Darkening Welding Helmet
- #20077** Stainless Steel Wire Brush
- #51139** Copper 3 x 3 Welders Helper Set
- #20639** 10' Long Ground Cable Extension
- #31739** 25' Long 110V Heavy Duty Welder Extension Cord

REPLACEMENT PARTS

- #58017** Replacement Gun Liner
- #58172** Replacement Gun

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

The Eastwood Technical Assistance Service Department: 800.343.9353 >> email: tech@eastwood.com

PDF version of this manual is available at eastwood.com

The Eastwood Company 263 Shoemaker Road, Pottstown, PA 19464, USA 800.343.9353 eastwood.com

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