

MIG285 WELDER

ASSEMBLY AND
OPERATING
INSTRUCTIONS

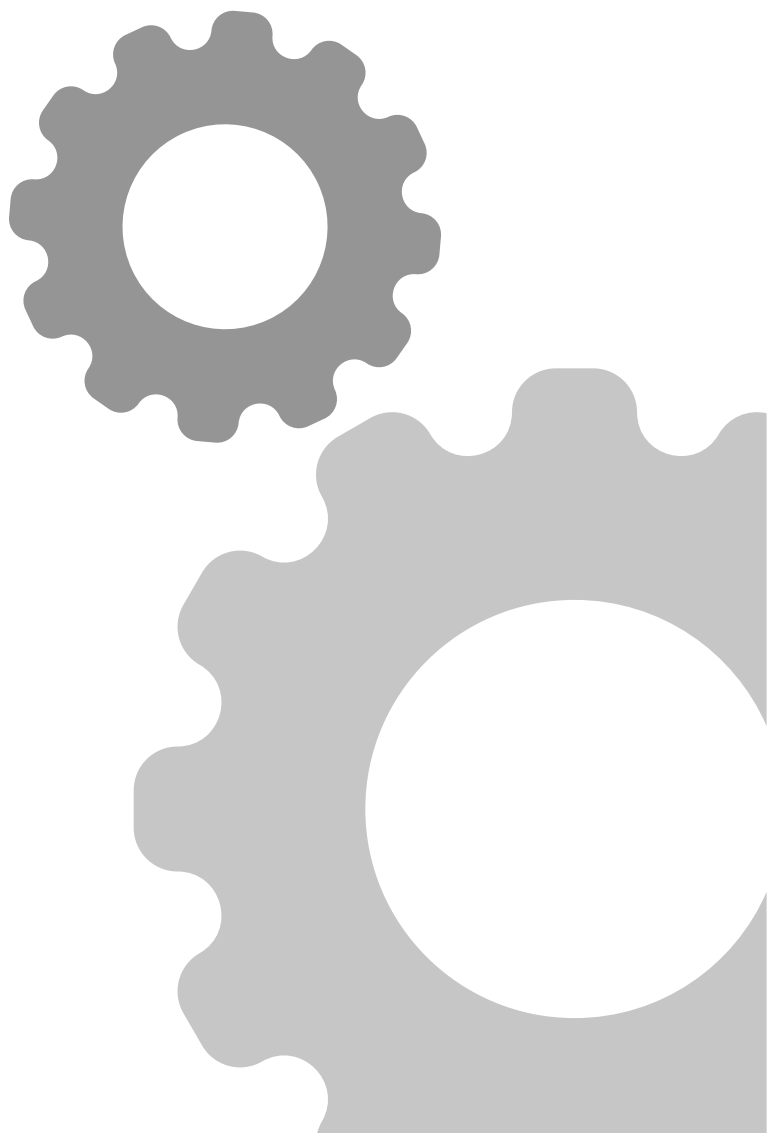
PrimeWeld



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MIG285 MIG WELDER

Save This Manual

You will need the manual for safety warnings and precautions, assembly instructions, operating and maintenance procedures, parts list, and diagram. Keep your invoice with this manual. Write invoice number and date of purchase on the inside of the manual. Keep the manual and invoice in a safe and dry place for future reference.

Operation Manual

Carefully read the operation manual prior to using, installing, and maintaining the electric welding machine for the purpose of preventing damages such as fire, electric shock, and etc. from occurring. Please keep the manual for reference in the future.

SAFETY WARNINGS AND PRECAUTIONS

WARNING: When using welder, basic safety precautions should always be followed to reduce the risk of personal injury and damage to equipment.

Read all instructions before using this welder.

Keep work area clean. Cluttered areas invite injuries.

Observe work area conditions. Do not use machines or power tools in damp or wet locations. Don't expose to rain. Keep work area well lighted. Do not use electrically powered tools in the presence of flammable gases or liquids.

Keep children away. Children must never be allowed in the work area. Do not let them handle machines, tools, or extension cords.

Store idle equipment. When not in use, tools must be stored in a dry location to inhibit rust. Always lock up tools and keep them out of the reach of children.

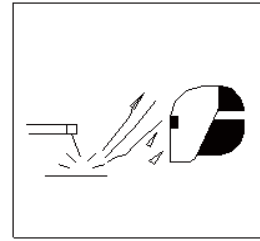
Do not force tool. It will do the job better and more safely at the rate for which it was intended. Do not use inappropriate attachments in an attempt to exceed the tool capacity.

Use the right tool for the job. Do not attempt to force a small tool or attachment to do the work of a larger industrial tool. There are certain applications for which this welder was designed. Do not modify this welder and do not use this welder for a purpose for which it was not intended.

Dress properly. Do not wear loose clothing or jewelry as they can be caught in moving parts. Protective, flame retardant, electrically non-conductive clothes and non-skid footwear are recommended when working. Wear restrictive hair covering to contain long hair.

SAFETY WARNINGS AND PRECAUTIONS

Use eye and ear protection. Always wear an ANSI approved, arc shaded, impact safety face shield(welding helmet). Always use full-face shield when welding. Always wear ANSI approved eyewear under face shield and while in the workplace. Wear a NIOSH approved dust mask or respirator when working around metal, chemical dusts, fumes, and mists.



Do not over reach. Keep proper footing and balance at all times. Do not reach over or across running machines.

Maintain tools with care. Keep tools sharp and clean for better and safer performance. Follow instructions for lubricating and changing accessories. Inspect tool cords periodically and, if damaged, have them repaired by an authorized technician. The handles must be kept clean, dry, and free from oil and grease at all times.

Disconnect power. Unplug tool when not in use.

Remove adjusting keys and wrenches. Check that keys and adjustment wrenches are removed from the welder and work area before plugging in.

Avoid unintentional starting. Be sure the switch is in the off position when not in use and before plugging in. Do not carry any tool with your finger on the trigger whether it is plugged in or not.

Stay alert. Watch what you are doing. Use common sense. Do not operate any tool when tired.

Check for damaged parts. Before using any tool, any part that appears damaged should be carefully checked to determine that it would operate properly and perform its intended function. Check for alignment and binding of moving parts, any broken parts or mounting fixtures, and any other condition that may affect proper operation. Any part that is damaged should be properly repaired or replaced by a qualified technician. Do not use the tool if any switch does not turn on and off properly.

Guard against electric shock. Prevent body contact with grounded surfaces such as pipes, radiators, ranges, and refrigerator enclosures.

SAFETY WARNINGS AND PRECAUTIONS

ARC WELDER SAFETY WARNINGS AND PERCAUTIONS
Warning: This product, when used for welding and similar applications, produces chemicals that cause cancer and birth defects (or other reproductive harm).

Replacement parts and accessories. When servicing, use only identical replacement parts. Use of any other parts will void warranty. Only use accessories intended for use with this welder. Approved accessories are available from **PRIMEWELD**.

Do not operate tool if under the influence of alcohol or drugs. Read warning labels on prescriptions to determine if your judgment or reflexes are impaired while taking drugs. If there is any doubt, do not operate the welder.

Maintenance. For your safety, service and maintenance should be performed regularly by a qualified technician.

Use proper size and type extension cord. If an extension cord is required, it must be of the proper size and type to supply the correct current to the welder without overheating. Otherwise, the extension cord could melt and catch fire or cause electrical damage to the welder. This welder requires use of an extension cord of 30 feet with a wire size rated at 10 AWG. Longer extension cords require larger size wire. If you are using the welder outdoors, use an extension cord rated for outdoor use signified by "WA" on the jacket. Performance of this welder may vary depending on condition in local line voltage. Extension cord usage may also affect welder performance.

WARNING: The warnings, cautions, and instructions discussed in this instruction manual cannot cover all possible conditions and situations that may occur. It must be understood by the operator that common sense and caution are factors which cannot be built into this product but must be supplied by the operator.

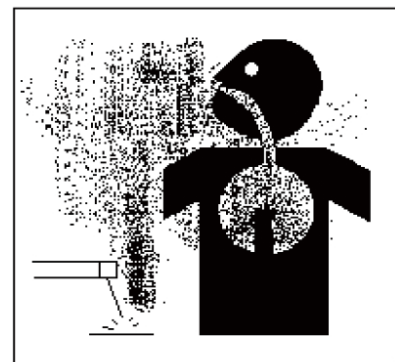
SAFETY WARNINGS AND PRECAUTIONS

Avoid electrical shock. Do not permit electrically live parts, cables, or electrodes to contact skin, clothing, or gloves. Protective clothing should be hole free, dry, and ANSI approved. This unit draws enough current to cause serious injury or death. Before turning the welder on, check the welder gun to be sure that there are no protruding screw heads and that all insulation is secure. Do not weld unless you are insulated from the ground and the work piece.



Avoid breathing fumes or gases. These gases can cause serious health problems. Use an active ventilation system directly above the welding area. Keep your head out of the fumes.

Avoid eye and body damage. Arc rays and infrared radiation can cause injury to the eyes and burn the skin. Wear ANSI approved eye and body protection. Do not allow viewing by visitors without proper eye and body protection.



Know proper arc welding practices. Read and understand the manufacture's instructions as well as your employer's safety practices for arc welding.

Connect only to a code approved power source. Connect only to a grounding power source conforming to the national electrical code and local codes.

Avoid fire and explosion. Remove flammable and explosive material to a minimum of 35 feet from the welding arc to prevent welding sparks or molten metal from starting a fire. Keep a type ABC fire extinguisher within easy reach. Thoroughly clean the object being welded of any paint, grease or other foreign material.

Avoid being burned. Always wear ANSI approved welding gear: eye wear, leather gloves, leather apron and shoes.

ARC WELDING CAN BE HAZARDOUS

WARNING: THIS WELDING MACHINE MUST BE CONNECTED TO A POWER SOURCE IN ACCORDANCE WITH LOCAL ELECTRICAL CODES

SAFETY WARNINGS AND PRECAUTIONS

WARNING: DISCONNECT POWER SOURCE BEFORE DISASSEMBLY OF THE TORCH
WARNING: THE SHIELD NOZZLE MUST BE INSTALLED PRIOR TO OPERATION OF THE TORCH

WARNING: ALL INSTALLATION, MAINTENANCE, REPAIR , OR OPERATION OF THIS EQUIPMENT SHOULD BE PREFORMED BY QUALFIED PERSONS ONLY IN ACCORDANCE WITH NATIONAL, STATE, AND LOCAL CODES. ELECTRIC SHOCK CAN KILL.

Improper use of electric arc welders can cause electric shock, injury, and death! Take all precautions described in this manual to reduce the possibility of electric shock. The MIG285 power switch is to be in the OFF position when installing work cable and gun and when connecting power cord to input power.

Always wear dry, protective clothing and welding gloves and insulated footwear. Always operate the welder in a clean, dry, well-ventilated area. Do not operate the welder in humid, wet, rainy, or poorly ventilated areas.

Be sure that the work piece is properly supported and grounded prior to beginning the electric arc welding operation.

The electrode and work (or ground) circuits are electrically "hot" when the welder is on. Do not touch these "hot" parts with your bare skin or wet clothing.

Ground the work or metal to be welded to a good electrical (earth) ground.

FUMES AND GASES can be dangerous.

Do not breathe fumes that are produced by the arc welding operation. These fumes are dangerous.

Shielding gases used for arc welding can displace air and cause injury or death. Always use enough ventilation.

WELDING SPARKS can cause fire or explosion.

Do not operate electric arc welder in areas with flammable or explosive vapors.

Always keep a fire extinguisher accessible while performing arc-welding operations.



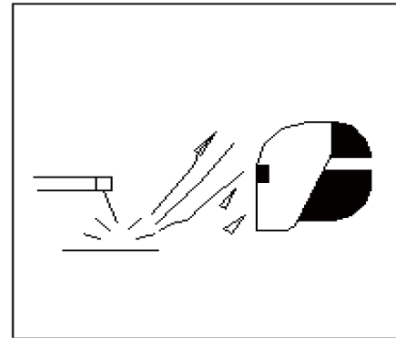
SAFETY WARNINGS AND PRECAUTIONS

ARC RAYS can burn.

Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing open arc welding.

Use suitable clothing made from durable flame resistant material to protect your skin and that of your helpers from the rays.

Protect other nearby personnel with suitable nonflammable screening or warn them not to watch the arc nor expose themselves to the arc rays or to hot spatter or metal.

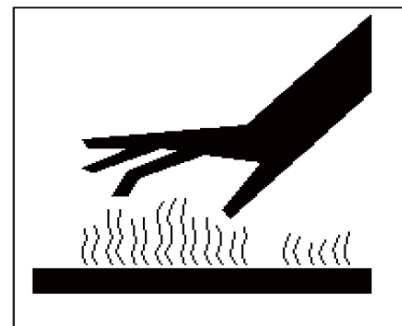


HOT METAL can burn

Electric arc welding operations cause sparks and hot metal to temperatures that can cause severe burns! Use protective gloves and clothing when performing any metal working operations.

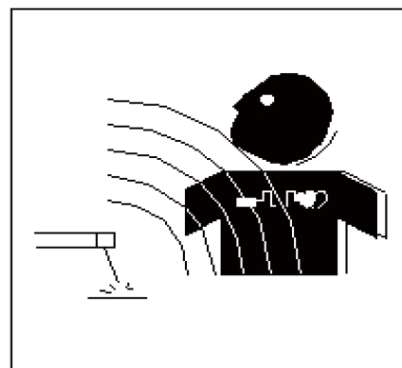
Make sure that all persons in the welding area are protected from heat, sparks and ultraviolet rays. Use a face shields and flame resistant barriers as needed.

Never touch work piece until completely cooled.



ELECTRIC AND MANGETIC FIELDS may be dangerous

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



UNPACKING

Please check to ensure that the following components are included when unpacking (See Figure A-1)

FIGURE A-1



- 1 MIG285 Welder 2 MIG Torch 3 Work Clamp
- 4 Electrode Holder 5 Gas Regulator 6 Gas Hose
- 7 .030"(0.8mm),.045"(1.1mm)Contact Tip 8 Operator's Manual
- 9 Power Adapter 10 .025"-.030" V-groove Drive Roll 2pcs
.035"-.045" Knurled-groove Drive Roll 2pcs
- 11 Hand-hold Welding Reference Lamination Paper 12 Wing Nut

SPECIFICATIONS AND PARAMETERS

Model	MIG285	
Parameters		
Supply voltage (V)	1 phase 120V±15%	1 phase 240V±15%
Frequency (Hz)	50/60	
No-load voltage (V)	68	
Rated Input Current (A)	MIG:34.2 MMA:34.2 TIG:25.3	MIG:57.5 MMA:53.5 TIG:35.7
Output current (A)	MIG:40-120 MMA:20-100 TIG:10-120	MIG:40-285 MMA:20-250 TIG:10-250
Output voltage (V)	MIG:16-20 MMA:20.8-24 TIG:10.4-14.8	MIG:16-28.3 MMA:20.8-30 TIG:10.4-20
Duty cycle (%)	MIG:25% MMA/TIG:30%	
Power factor	≥0.73	
Efficiency (%)	≥80	
Wire speed (in/min)	80-708	
Post flow (s)	1±0.5	
Wire diameter (in)	MIG:.025-.045 Flux-cored:.035-.045	
Appropriate thickness	≥ 22ga.	
Housing protection class	Ip21	
Insulation class	F	
Cooling method	Fan-cooled	
Weight (lb)	57.2	
Dimensions (in)	25.7*11.0*18.1	

NOTE: DUTY CYCLE is a welding equipment specification, which defines the number of minutes, within a given time interval, during which a given welding machine can safely produce a particular welding current. It is usually expressed as a ratio of the uninterrupted no-load duration to the total time(usually 10 minutes).

SETUP



Read the **ENTIRE IMPORTANT SAFETY INFORMATION** section at the beginning of this manual including all text under subheadings therein before set up or use of this product.



WARNING

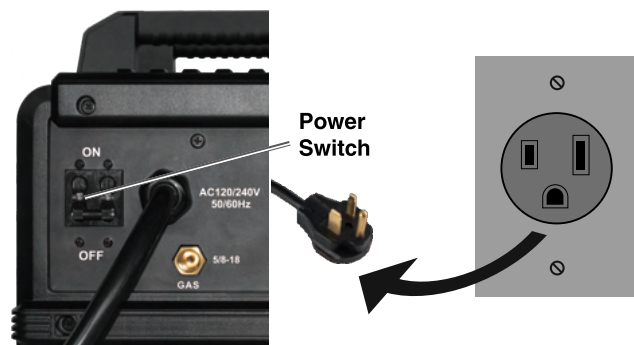
TO PREVENT SERIOUS INJURY FROM ACCIDENTAL OPERATION: Turn the Power Switch off and unplug the welder before setup.

Note: Remove the protective foam and cardboard from the welder before setup.

Wire Spool Installation/ Wire Setup

1

Turn the Power Switch OFF and unplug the welder before proceeding.



2

Pull up on the door latch, then open the door.



SETUP

3 10-12 Pound wire spool installation:

Remove the spool knob.

4 Place the new wire spool over the Adapter and line up pin on Adapter with hole in spool. **To prevent wire feed problems, set the spool so that it will unwind clockwise.**

Notice: If wire spool can spin freely, spool knob is too loose. This will cause the welding wire to unravel and unspool which can cause tangling and feeding problems.

5 Screw the spool knob into the spool adapter.

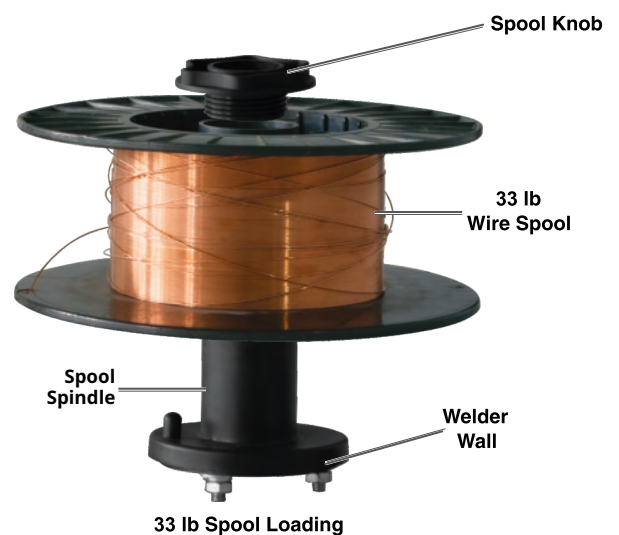
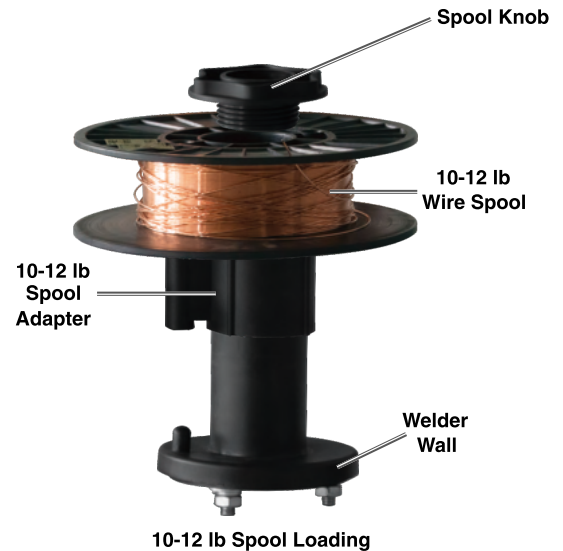
6 33 Pound wire spool installation:

Remove the spool knob.

7 Place the new wire spool over the Spool Spindle as illustrated in the picture. **To prevent wire feed problems, set the spool so that it will unwind clockwise.**

8 Screw the spool knob into the spool spindle.

Notice: If wire spool can spin freely, spool knob is too loose. This will cause the welding wire to unravel and unspool which can cause tangling and feeding problems.



SETUP

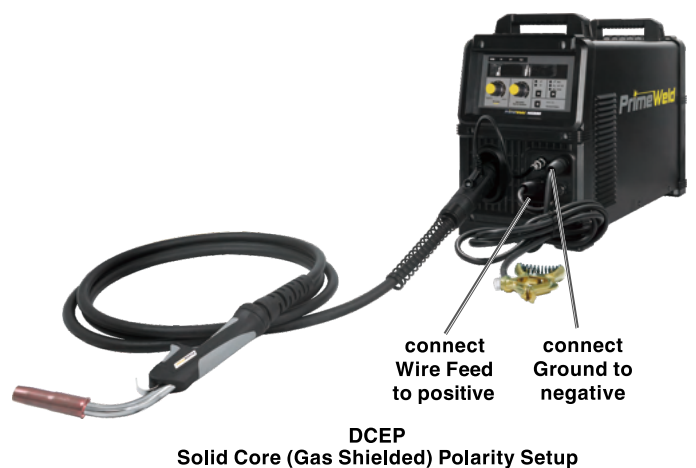
9 DCEN Direct Current Electrode Negative Wire Setup for Flux Cored (gasless) welding:

Connect the Wire Feed Connector to the Negative Terminal on front of the Welder. Connect the Ground Cable to the Positive Terminal on the front of the welder.

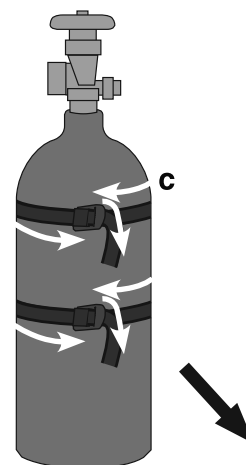


10 DCEP Direct Current Electrode Positive Wire Setup for Solid Core (gas shielded) welding:

- A Connect the Wire Feed Connector to the Positive Terminal on the front of the welder. Connect the Ground Cable to the Negative Terminal on the front of the welder.
- B Determine which type of shielding gas would be appropriate for the welding you will do. Refer to the Welding Guide on the inside of the welder door.



- C With assistance, set the cylinder(not included) onto a cabinet or cart near the Welder and secure the cylinder in place with two straps(not included) to prevent tipping.



SETUP

D Remove the cylinder's cap. Stand to the side of the valve opening, then open the valve briefly to blow dust and dirt from valve opening. Close the cylinder valve.

E Locate the Regulator (included) and close its valve until it is loose, then thread Regulator onto cylinder and wrench tighten connection.

Note: When using C100 shielding gas, connect a CGA 580 adapter (not included) to the inlet connection of the Regulator and wrench tighten. Thread the adapter onto the gas cylinder and wrench tighten.

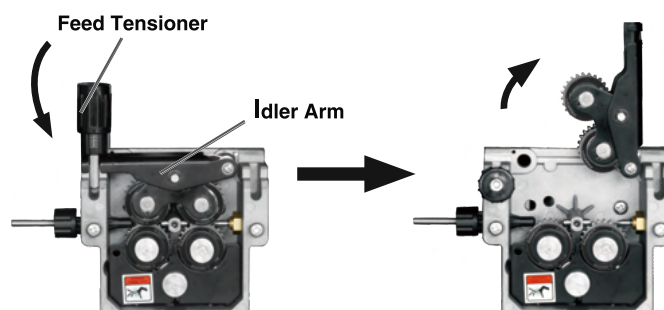
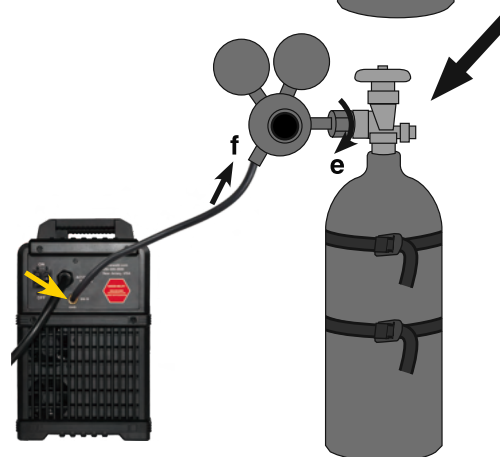
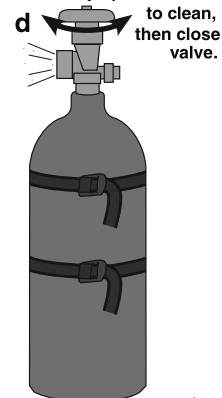
F Attach the Gas Hose (included) to the Regulator's outlet and Welder's gas inlet. Wrench tighten both connections.

11 Turn the Feed Tensioner knob counterclockwise to loosen it enough to pull it down to remove tension. The spring-loaded Idler Arm will move up as shown.

12 Feed Roller Instructions

Check that the Feed Roller is correct for the type of wire being used (solid core or flux-core) and that it is turned to properly match the wire size marked on the Wire Spool:

Briefly open valve to clean, then close valve.

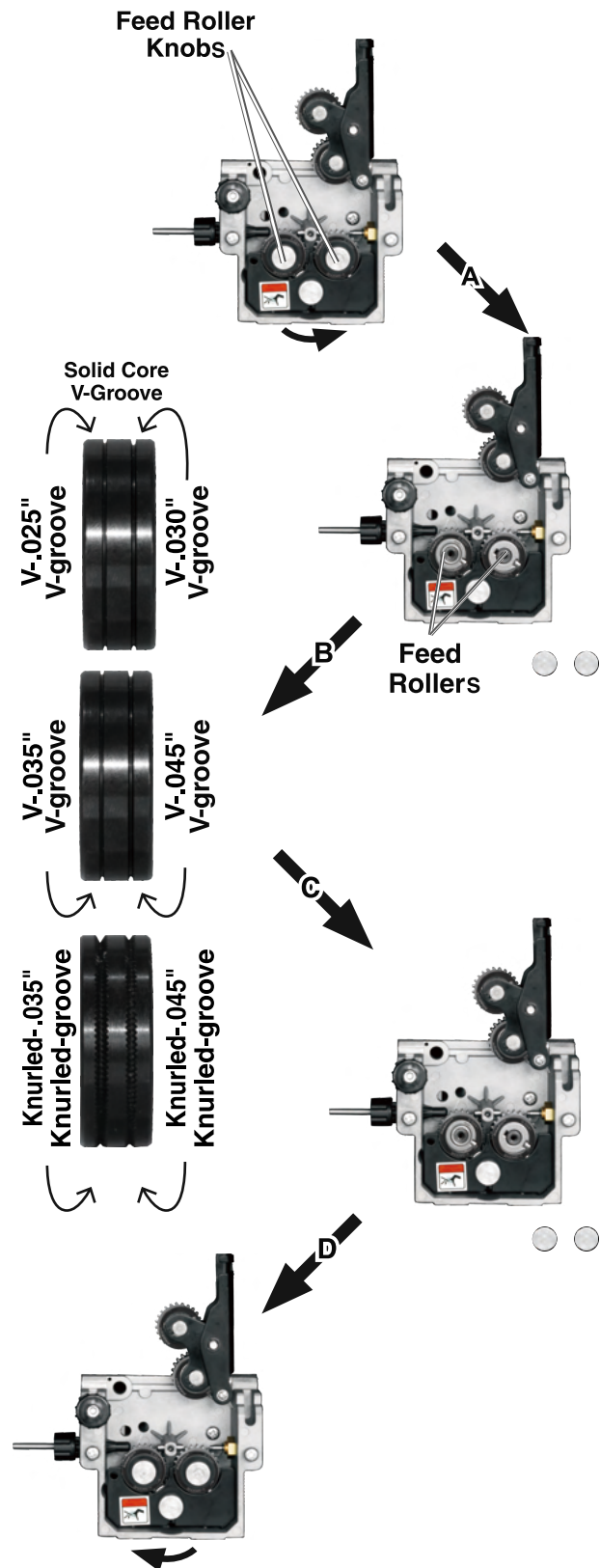


SETUP

- A** Unscrew the Feed Roller Knobs counterclockwise.
- B** Remove the Feed Roller Knobs to expose the Feed Rollers.
- C** Flip or replace the Feed Rollers as needed and confirm that they are the correct Rollers for the type of wire being used and that the number showing is the same as the wire diameter on the Spool.

Note: The knurled groove is used for flux-cored wire. The V-grooves are used for solid/MIG wire.

- D** Screw the Feed Roller Knobs back into place to secure the Feed Rollers.



SETUP

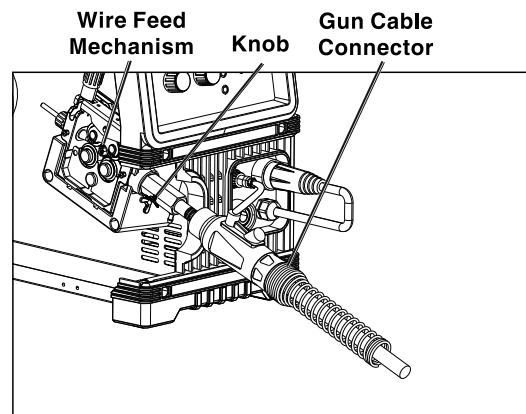
- 13** Loosen the Knob on the Wire Feed mechanism, then insert the Gun Cable Connector through the hole on the Welder front and into the socket on the Wire Feed.

- 14** Ensure that the Gun Cable Connector is full inserted into the socket on the Wire Feed mechanism as shown. **No O-ring should be visible.** Tighten the Knob securely. If Connector is not fully inserted, the gas connection will leak preventing shielding gas from reaching the welding arc.

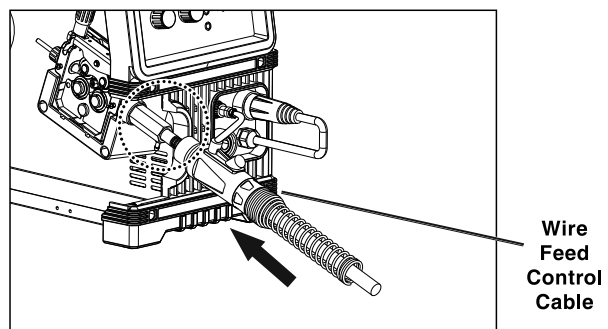
NOTICE: To prevent the damage, do not overtighten the Knob.

- 15** Connect the Wire Feed Control Cable to the Wire Feed Control Socket located on the front of the machine. Press it in until the collar snaps into place. Note that the plug on the Cable fits into socket in one specific orientation only.

To disconnect it, pull the collar back first.



Incorrect-Connector not fully inserted



Correct-Connector fully inserted

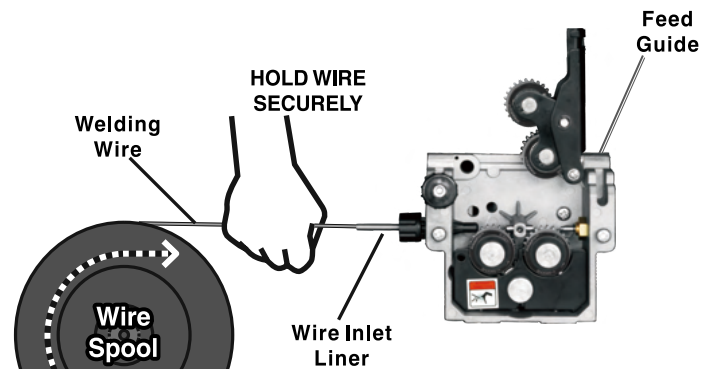
IMPORTANT

Securely hold onto the end of the welding wire and keep tension on it during the following steps. If this is not done, the welding wire will unravel and unspool which can cause tangling and feeding problems.

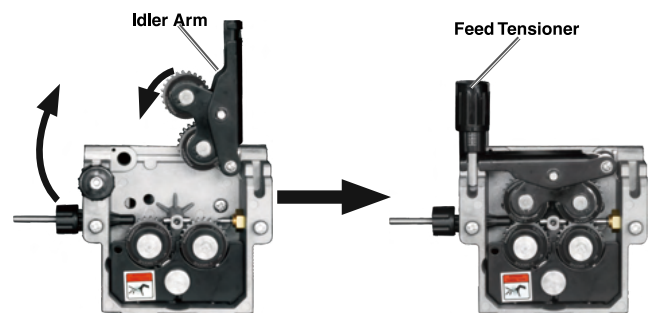
SETUP

- 16** Cut off all bent and crimped wire. The cut end must have no burrs or sharp edges. Cut again if needed.

- 17** Keep tension on the wire and guide at least 12 inches of wire into the Wire Inlet Liner and Feed Guide.



- 18** Make sure the welding wire is resting in the groove of the Feed Roller, then push the wire Idler Arm down, and swing the Feed Tensioner up to latch it across the tip of the arm. After the wire is held by the Tensioner, you may release it.

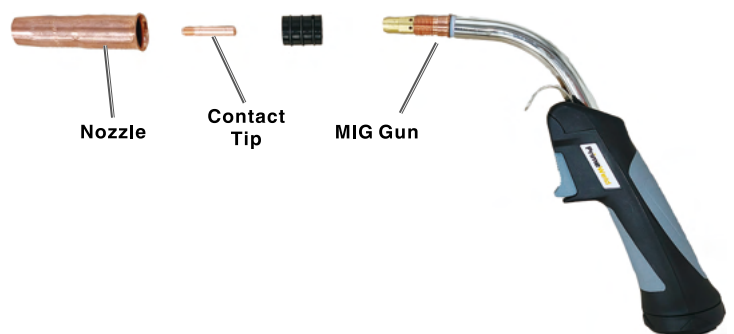


Note: The tension should be 3-5 for solid wire and 2-3 for flux-cored wire. Too much force on flux-cored wire will crush it and may cause feeding issues.

- 19** Pull and twist the Nozzle to remove it.

- 20** Unscrew the Contact Tip counterclockwise and remove.

- 21** Lay the MIG Gun Cable out in a straight line so that the welding wire moves through it easily. Leave the cover open, so that the feed mechanism can be observed.



SETUP

IMPORTANT

Stainless steel wire is less flexible than other welding wire. Therefore, it is more difficult to feed through the liner and gun. It is especially important to keep the gun cable straight while feeding stainless steel wire.



⚠ WARNING

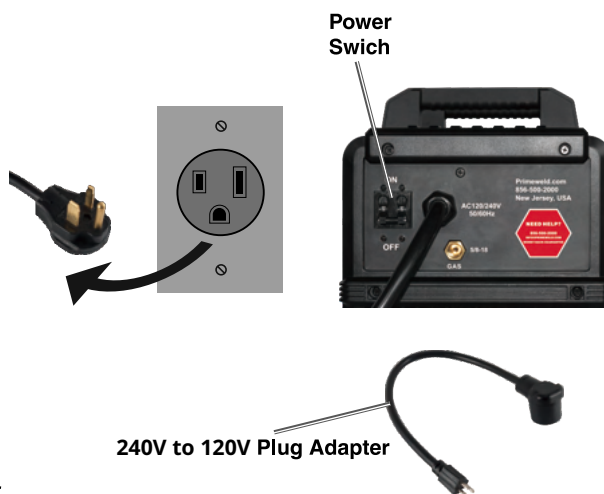
The following steps require applying power to the Welder with the cover open.

To prevent serious injury from fire or electric shock:

1. Do not touch anything, especially not the Ground Clamp, with the Gun or welding wire or an arc will be ignited.
2. Do not touch internal Welder components while it is plugged in.

22

Turn the Power Switch off and do not touch the Gun's Trigger before connecting Power Cord: If using 120VAC, connect the included adapter to the end of the Power Cord. If using 240VAC, do not use the adapter. Plug the Power Cord into a properly grounded and rated receptacle that matches the plug and turn the Power Switch ON.

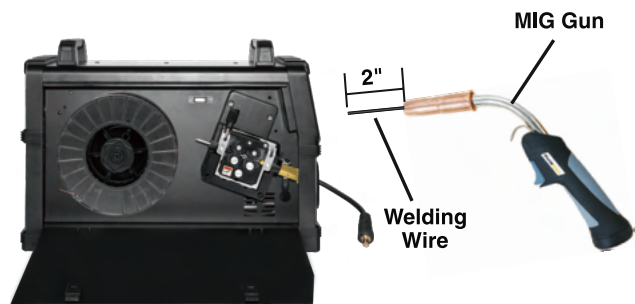


Note: The circuit must be equipped with delayed action-type circuit breaker or fuses.

SETUP

- 23** Point the gun away from all objects. Press and hold the trigger until the wire feeds through the end of the gun two inches.

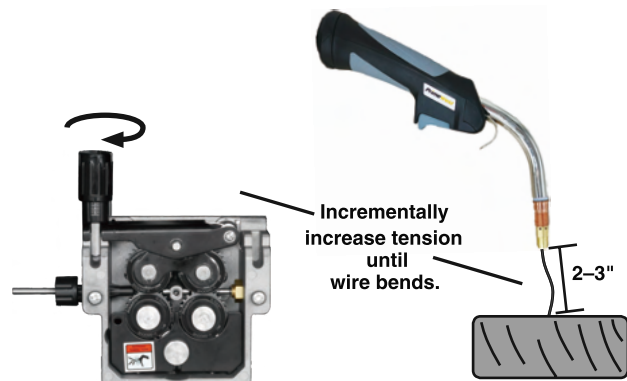
The wire liner may come out with the welding wire. This is normal, just turn off the Welder and push the wire liner back into the gun.



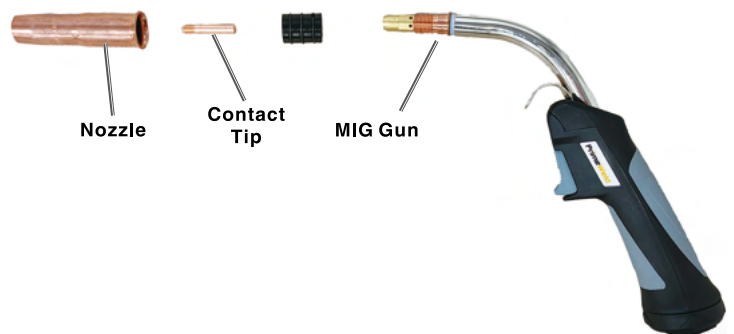
If the wire does not feed properly and the spool is stationary, turn OFF and unplug the welder and slightly tighten the feed tensioner clockwise before retrying.

- 24** To check the wire's drive tension, press and hold trigger to feed the wire against a piece of wood from 2 to 3 inches away.

If the wire stops instead of bending, unplug the Welder, slightly tighten the feed tensioner clockwise, and try again. If the wire bends from the feed pressure, then the tension is set properly.



- 25** Turn OFF the power switch and unplug the power cord from its electrical outlet.



SETUP

- 26** Select a contact tip that is compatible with the welding wire used. Slide the contact tip over the wire and thread it clockwise into the MIG gun. Tighten the contact tip.
- 27** Replace the nozzle and cut the wire off at 1/2" from tip (1/2" stickout).
- 28** Close the door. Make sure door is securely latched.



BASIC WELDING

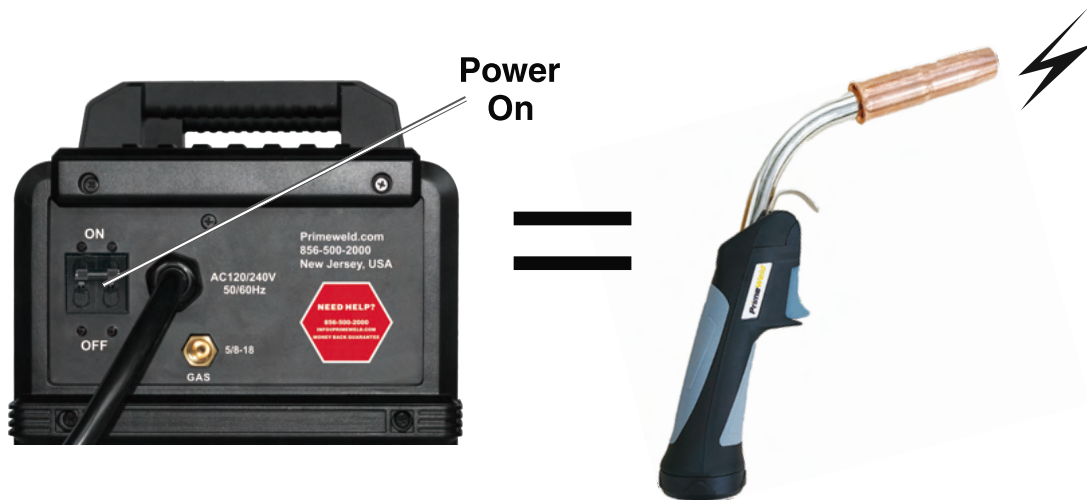
Make practice welds on pieces of scrap to practice technique before welding anything of value.

⚠️ WARNING



**TO PREVENT SERIOUS INJURY,
FIRE, AND BURNS:**

Keep welding tip clear of grounded objects whenever unit is plugged in and turned on.



Practice your welding technique on scrap pieces before welding anything of value.

BASIC WELDING



Read the ENTIRE IMPORTANT SAFETY INFORMATION section at the beginning of this manual including all text under subheadings therein before welding.

⚠️ WARNING

TO PREVENT SERIOUS INJURY:

Protective gear must be worn when using the welder: minimum shade number 10 full face shield (or welding mask), ear protection, welding gloves, sleeves and apron, NIOSH approved respirator, and fire resistant work clothes without pockets.

Light from the arc can cause permanent damage to the eyes and skin. Do not breathe arc fumes.

Flux-cored wire welding is used to weld mild steel and stainless steel without shielding gas.

MIG welding uses solid wire and shielding gas, and is used to weld mild steel and stainless steel. MIG welding can also be used to weld thinner workpieces than flux-cored welding can.

Aluminum welding can be performed with an optional Spool Gun (not included) using aluminum wire and shielding gas. Good welding takes a degree of skill and experience.

Practice a few sample welds on scrap before welding your first project. Additional practice periods are recommended whenever you weld.

Additional practice periods are also recommended whenever you weld:

- a different thickness of material
- a different type of material
- a different type of connection
- using a different process (MIG vs. Flux)



BASIC WELDING

Front Panel Controls



BASIC WELDING

VRD Indicator

A voltage reduction device (VRD) is designed to reduce electric shock hazards present on the output of welding power source when operating in STICK mode. Note that the presence of VRD should not be used as a substitute for the use of appropriate safety practices as indicated in section one of this manual.

Both the green and red indicator lights only operate in STICK mode.

The green VRD ON light illuminates when the VRD is active. Under this condition the open circuit voltage of the unit is limited to below 24V DC thus reducing the potential of serious electric shock (such as when changing electrodes).

The red VRD OFF light illuminates when the VRD is inactive. Under this condition the output voltage of the unit will be at welding potential which in some cases may exceed 24V DC.

Fault Indicator

The yellow fault indicator will be illuminated when any of the faults are detected. All Faults will illuminate the indicator.

Left Multifunctional Data Display

MIG Mode

This digital meter is used to display the pre-set (preview) Wirefeed Speed in Inches Per Minute (IPM) in MIG mode and actual welding amperage of the power source when welding. At times of non-welding, the digital meter will display a pre-set (preview) value of Wirefeed Speed. This value can be adjusted by varying the Left Knob.

STICK and LIFT TIG Modes

The digital meter is used to display the pre-set (preview) amperage in STICK / LIFT TIG modes and actual welding amperage of the power source when welding. At times of non-welding, the amperage meter will display a pre-set (preview) value in both STICK and LIFT TIG modes. This value can be adjusted by varying the Left Knob. When welding, this digital meter will display actual welding amperage in all modes.

At the completion of welding, the digital meter will hold the last recorded amperage value for a period of approximately 7 seconds in all modes. The amperage meter will hold the value until; (1) any of the front panel controls are adjusted in which case the unit will revert to preview mode, (2) welding is recommenced, in which case actual welding amperage will be displayed, or (3) a period of 7 seconds elapses following the completion of welding in which case the unit will return to preview mode.

BASIC WELDING

Right Multifunctional Data Display

MIG Mode

This digital meter is used to display the pre-set (preview) Voltage in MIG mode and actual welding voltage of the power source when welding. At times of non-welding, the digital meter will display a pre-set (preview) value of Voltage. This value can be adjusted by varying the Right Knob.

STICK and LIFT TIG Modes

This digital meter is used to display the Welding Output Terminal Voltage in STICK / LIFT TIG modes during non-welding or welding. This value can not be adjusted by varying the Right Knob.

When welding, this digital meter will display actual welding voltage in all modes. At the completion of welding, the digital meter will hold the last recorded voltage value for a period of approximately 7 seconds in all modes. The voltage meter will hold the value until; (1) any of the front panel controls are adjusted in which case the unit will revert to preview mode, (2) welding is recommenced, in which case actual welding amperage will be displayed, or (3) a period of 7 seconds elapses following the completion of welding in which case the unit will return to preview mode.

2T/4T Selector

Press and release the button to change the selected operating mode of the trigger. The selected mode can be either "2T" (unlatched) or "4T" (latched) operation. The red indicator next to the button will illuminate to identify which mode is selected (2T or 4T). In the 4T mode once the weld has been started you can release the trigger and continue welding until the trigger is activated again or the welding arc is broken to stop the welding arc.

MIG/LIFT TIG /STICK Selector

Press and release this button to change the selected weld process mode from MIG to LIFT TIG to STICK. The weld process will change to the next process in the sequence each time the button is pressed and released. The red indicators next to the button will illuminate to identify MIG or LIFT TIG or STICK process mode.

Advanced Features Selector

Long press the Advanced Features button for 3 seconds to enter or exit from the advanced programming mode. To exit, simply long press the button for 3 seconds again. Any changes made are saved. The advanced programming menu items are described in detail for each welding mode in Advanced Features Details.

BASIC WELDING

Wire feed/Current Adjustment Knob

The Wire feed/current adjusting knob adjusts the amount of welding current delivered by the power source. In STICK and LIFT TIG modes, the amperage control knob directly adjusts the power inverter to deliver the desired level of output current. In MIG mode, the amperage knob adjusts the speed of the wire feed motor (which in turn adjusts the output current by varying the amount of MIG wire delivered to the welding arc). The optimum wire speed required is dependent on the type of welding application. The setup chart on the inside of the wire feed compartment door provides a brief summary of the required output settings for a basic range of MIG welding applications. The value may also be adjusted while a weld is in progress – if this occurs, the left display will briefly switch to show the adjusted value as the knob is turned, and will automatically revert back to showing the weld current measurements when the knob is not being turned.

Volts/Inductance Adjustment Knob

MIG Voltage Control

In this mode the control knob is used to adjust the output voltage of the power source. The welding voltage is increased by turning the knob clockwise or decreased by turning the knob counter-clockwise. The optimum voltage level required is dependent on the type of welding application. The setup chart on the inside of the wire feed compartment door provides a brief summary of the required output settings for a basic range of MIG welding applications. The value may also be adjusted while a weld is in progress – if this occurs, the right display will briefly switch to show the adjusted value as the knob is turned, and will automatically revert back to showing the weld voltage measurements when the knob is not being turned.

Wire Feed Power Cable

This machine has polarity conversion. There is a positive output terminal and a negative output terminal between wire feeder and wire spool. When using solid wire with gas protection, torch socket should be connected to the positive output terminal and ground cable should be connected to the negative output terminal; When using flux-cored wire, the two connected cables should be exchanged.

OPERATION INSTRUCTIONS

Starting Up Display

When the machine power is on, the Multifunctional Data Display will show model name, then machine enter into presetting status, welding modes and parameters can be set. See chart1.



Chart 1: Presetting status

Operation Instruction Under STICK Mode

- 1 When welding stops, press MIG/LIFT TIG/STICK Selector, STICK indicator lights up, machine enter into STICK mode.
- 2 Multifunctional Data Display shows the preset current 20 in Ampere(A). (See Chart 2)



Chart 2: The preset current under STICK mode

- 3 Adjusting Current Knob can change the welding current during welding process and amp will show on the Left Multifunctional Data Display.
- 4 7 seconds after setting the welding parameters, the data will automatically be recorded. Moreover, the panel will display this data when restarting the machine next time if parameters stay unchanged.

OPERATION INSTRUCTIONS

- 5 Hot Start current adjustment: Long press the advanced features selector for 3 seconds to enter into menu mode. Press advanced features selector to choose HOT START function. If choosing the ON function, press the advanced features selector to enter into HOT START TIME setting. Rotate volts knob to choose the time setting. The adjustment range is 0-2S. Press advanced features selector again to enter into HOT START AMP setting. Rotate volts knob to choose the percentage setting. The adjustment range is 0-200%. For example, 50A at 200%=100A. 7 seconds later machine will automatically back to welding current setting interface. (Chart 3, Chart 4, Chart 5, Chart 6, Chart 7 and Chart 8)



Chart 3



Chart 4



Chart 5



Chart 6



Chart 7



Chart 8

OPERATION INSTRUCTIONS

- 6 Arc Force Current Adjustment: Long press advanced features selector for 3 seconds to enter into menu mode. Press advanced features selector to choose arc force function. Rotate volts knob to choose the percentage setting. The adjustment range is OFF-200%. For example, 50A at 200% = 100A. 7 seconds later machine will automatically back to welding current setting interface. (Chart 9 and Chart 10)



Chart 9



Chart 10

- 7 VRD Function Setting: When machine is under STICK mode, press advanced features selector for 3 seconds to enter into menu mode. Press advanced features selector to choose VRD function. Rotate volts knob to turn on or off VRD function. (See Chart 11 and Chart 12)



Chart 11: VRD function turn on



Chart 12: VRD function turn off

OPERATION INSTRUCTIONS

Operation Instruction Under LIFT TIG Mode

- 1 When welding stops, press MIG/LIFT TIG/STICK Selector. LIFT TIG indicator lights up. Machine enter into LIFT TIG mode. LIFT TIG means the tungsten contacts the workpiece first. Then lift up the arc.
- 2 Under LIFT TIG mode(Chart 13).



Chart 13: The preset current under LIFT TIG mode

- 3 Multifunctional Data Display shows the preset current 10 in Ampere(A).
- 4 Adjusting Current Knob can change the welding current during welding process and amp will show on the Left Multifunctional Data Display.
- 5 7 seconds later after setting the welding parameters, the datas will automatically be recorded. Moreover, the panel will display this data when restarting the machine next time if parameters stay unchanged.
- 6 The panel displays as Chart 14 when welding, the preset current is 10A.



Chart 14: Display status when perform welding under LIFT TIG mode

OPERATION INSTRUCTIONS

Operation Instruction Under MIG Mode

- 1 When welding stops, press MIG/LIFT TIG/STICK selector, MIG indicator lights up and the machine enters into MIG mode.(Chart 15)
- 2 Wire check function: Press the MIG torch trigger for 5 seconds to enter into fast wire feeding mode. After 15 seconds if you still pressing the MIG torch trigger, it will stop automatically.



Chart 15: Preset status under MIG mode

- 3 Multifunctional Data Display shows the preset voltage 15.1V in volt(V). 80 I means the preset wire feeding speed in inch/min.
- 4 Under MIG mode, press 2T/4T Selector to set the gun trigger operation to either 2T or 4T mode. 2T (2 touch) mode: 1. Squeeze the trigger to start the welding current. 2. Release trigger to stop the welding current. 4T (4 touch) mode: 1. Squeeze trigger to start welding. 2. Release trigger during welding. 3. Squeeze and release trigger to shut welding current off.
- 5 Adjusting Current Knob during welding can realize the synergic manipulation of welding voltage and feeding speed which display on Multifunctional Data Display Screen.
- 6 7 seconds later after setting the welding parameters, the datas will automatically be recorded. Moreover, the panel will display this data when restarting the machine next time if parameters stay unchanged.

OPERATION INSTRUCTIONS

- 7 The panel displays as Chart 16_1 when welding which means the welding voltage is 19.4V and the current is 110A.
- 8 When welding stops, the Multifunctional Data Display Screen will be locked to show the practical welding current and voltage. After 5 seconds the lock screen will automatically change to welding voltage and wire feed speed setting status. See Chart 16_2.



Chart 16_1



Chart 16_2

- 9 Spool Gun Mode Setting: Choose the Spool Gun / MIG Gun switch to Spool Gun, the Multifunctional Data Display Screen show SPOOL GUN. Rotate volts knob can choose 12V or 24V. When machine is under MIG mode, long press advanced feature selector for 3 seconds to enter into menu mode. Press advanced feature selector to choose Process function. Rotate volts knob to choose ALUM. See Chart 17 and Chart 18.



Chart 17: Under SPOOL GUN 12V mode



Chart 18: Under SPOOL GUN 24V mode

- 10 Welding Arc Voltage Slightly Adjustment: Arc voltage can be slightly adjusted under welding data set mode or welding mode, the adjustment range is -15%~+15%; Rotate volts knob for arc voltage adjustment. See chart 19. Around 7 seconds later after the setting finish, machine will be back to the main menu.

OPERATION INSTRUCTIONS

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Inductance Adjustment: The induction can be slightly be adjusted under welding data set mode or welding mode, the adjustment range is -10%~+10%; press Volts Knob to enter into inductance adjustment mode and rotate the knob to adjust the inductance, see Chart 20. Around 7 seconds after the setting finish machine will be back to the main menu.



Chart 19_1



Chart 19_2

Chart 19: Fine adjustment of welding arc voltage under MIG mode



Chart 20_1



Chart 20_2

Chart 20: Fine adjustment of Inductance under MIG mode

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Synergic adjustment and manual adjustment switch function: Long press the MIG/LIFT TIG/STICK Selector for 3S to enter the synergic adjustment and manual adjustment switch function. Rotate the right knob to select SYN SET ON or OFF.

Select SYN SET ON, it will enter synergic adjustment, rotate the left knob, wire feed speed and voltage synchronous adjustment.

Select SYN SET OFF, it will enter manual adjustment, rotate the left knob to adjust wire feed speed, and rotate the right knob to adjust volts separately. See Chart 21 and Chart 22.

OPERATION INSTRUCTIONS



Chart 21: Synergic set turn on

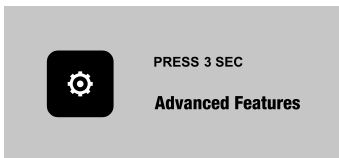


Chart 22: Synergic set turn off

Advanced Features Details



Select the weld process you wish to view Advanced Features for.



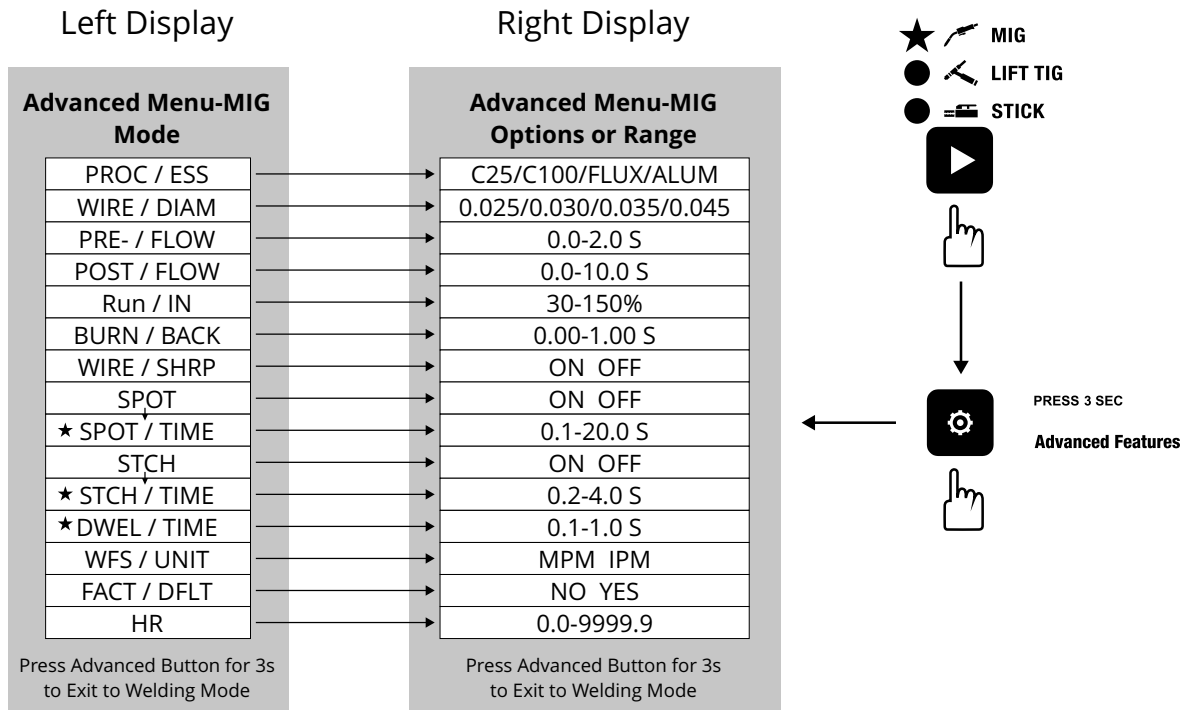
Then long press the Advanced Features button for 3S to enter or exit from the Advanced Features programming function of the welder, then press and release the Advanced Features button to move forward through the list.



To change the value of that parameter, simply turn the right knob to change it. If the setting has been changed from its previous value, the welder will save the new value when the advanced features selector is pressed to view the next parameter or if the user activates a control to cause the welder to exit Advanced Features mode as described earlier.

OPERATION INSTRUCTIONS

MIG/MAG/FLUX Mode Advanced Features Menu map



Advanced Features Selection

Right Knob Selection

NOTE: SPOT TIME and STCH TIME and DWEL/TIME are only active when SPOT or STCH are "ON".

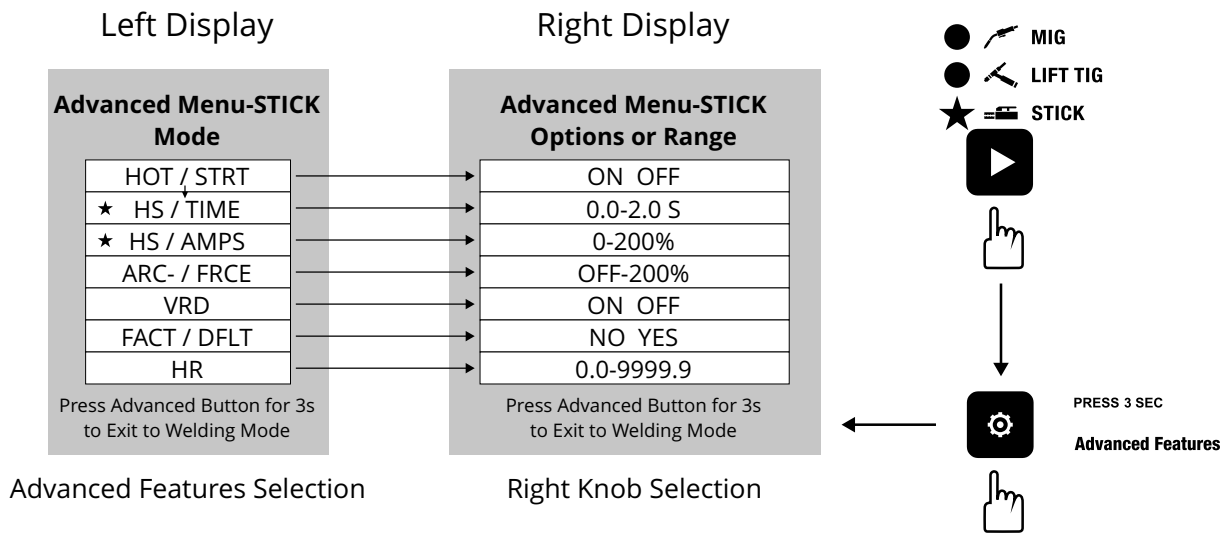
Function	Left Display	Right Display (Factory Default Values)	Limits	Comments
MIG Operator Controls	PROC/ESS	C25	C25/C100/FLUX/ALUM	C25=75%Ar+25%CO2 C100=100%CO2 FLUX=No Gas,Use the cored self-protecting wire. ALUM=100%Ar,Use the aluminum wire. Adjust the parametes by selected Shielding gas.
Wire Diameter	WIRE/DIAM	0.030	0.025/0.030/0.035/0.045	Adjust the parametes by selected wire diameter.
Pre Flow	PRE- /FIOW	0.1	0.0-2.0S	Shielding gas flows for the time specifed before an arc is initiated.
Post Flow	POST/FLOW	1.0	0.0-10.0S	Shielding gas flows for the time specifed after an arc has extinguished.
Run In	RUN/IN	30	30-150%	Wirespeed runs as a percentage of preset wirespeed.

OPERATION INSTRUCTIONS

Function	Left Display	Right Display (Factory Default Values)	Limits	Comments
Burn Back	BURN/BACK	0.10	0.00-1.00S	The time difference between turning the wire feed OFF and the voltage is turned OFF.
Wire Sharp	WIRE/SHRP	ON	ON-OFF	Wire Sharp adds a burst of current at the end of a weld to remove the ball at the end of the wire. This improves the restart of the next weld.
SPOT	SPOT	OFF	OFF-ON	Spot is used to weld two thin plates together at a desired location by melting the top & bottom plates together to form a nugget between them. The weld time is set by the Spot Time.
Spot Time	SPOT/TIME	2.0	0.1-20.0S	Spot Time is the time used for the Spot weld mode.
Stitch	STCH	OFF	OFF-ON	Stitch is used to weld two or more components by stitch or interval weld together. The weld time is set by the Stitch Time and the non weld time is set by the Dwell Time.
Stitch Time	STCH/TIME	2.0S	0.2-4.0S	Stitch Time is the time used for the weld time in Stitch weld mode.
Dwell Time	DWEL/TIME	0.5S	0.1-1.0S	Dwell Time is the time used for the non weld time in Stitch weld mode.
Wire Feed Speed Units	WFS/UNIT	IPM	MPM-IPM	IPM provides preview wirespeed in Inches Per Minute. MPM provides preview wirespeed in Metres Per Minute.
Restore Factory Defaults	FACT/DFLT	NO	NO-YES	Long press advanced features selector for 3 seconds to enter into menu mode, press advance features selector to choose Factory default setting, rotate volts knob to choose yes or no, and press MIG/LIFT TIG/STICKER selector to confirm yes or no. When YES is selected all the user adjustable values in this table (except Arc Hour Accumulated Runtime) are reset to the Factory Default Values.
Arc Hour Accumulated Runtime	HR	0.0	0.0-9999.9	Provides Arc On Hours that the power source has welded. The number displayed is in hours and read only. It will rollover to 0 once 10,000 hours have been reached.

OPERATION INSTRUCTIONS

STICK Mode Advanced Features Menu map



NOTE: HS/TIME and HS/AMPS are only active when HOT/START are “ON”.

Function	Left Display	Right Display (Factory Default Values)	Limits	Comments
Hot Start	HOT/STRT	ON	ON-OFF	Hot Start is used to improve the start characteristics for stick electrodes, e.g. low hydrogen electrodes.
Hot Start Time	HS/TIME	0.5S	0.0-2.0S	Hot Start Time is the time that the Hot Start Amps is applied.
Hot Start Amps	HS/AMPS	140%	0-200%	Hot Start Amps sets the peak start current, e.g. 50A at 200% = 100A.
ARC Force	ARC-/FRCE	75%	OFF-200%	ARC force Amps sets the force current base the welding current, e.g.50A at 200% = 100A
Voltage Reduction Device	VRD	ON	ON-OFF	A VRD is designed to reduce electric shock hazards present on the output of welding power source when operating in STICK mode.
Restore Factory Defaults	FACT/DFLT	NO	NO-YES	Long press advanced features selector for 3 seconds to enter into menu mode, press advance features selector to choose Factory default setting, rotate volts knob to choose yes or no, and press MIG/LIFT TIG/STICKER selector to confirm yes or no. When YES is selected all the user adjustable values in this table (except Arc Hour Accumulated Runtime) are reset to the Factory Default Values.
Arc Hour Accumulated Runtime	HR	0.0	0.0-9999.9	Provides Arc On Hours that the power source has welded. The number displayed is in hours and read only. It will rollover to 0 once 10,000 hours have been reached.

OPERATION INSTRUCTIONS

Wire Feeder Fault Code

Panel display Err-03 and is continuously flashing which means wire feeder fault. Once this fault is solved, the panel will be back to display the reference of the settings before the fault occurred. See Chart 21



Chart 21



Chart 22

Over Output Current Fault Code

Panel display Err-01 and is continuously flashing and machine doesn't work which means an over output current fault. After restarting the machine, the panel will be back to display the reference of the settings before the fault occurred. See Chart 22.

Over Heat Fault Code

Panel display Err-02 and is continuously flashing and machine doesn't work which means over heat protection. When the machine cools down, the panel will be back to display the reference of the settings before the fault occurred. See Chart 23.
Panel display Err-05 and is continuously flashing and machine doesn't work which means temperature sensor damage. Once this fault is solved, the panel will be back to display the reference of the settings before the fault occurred. See Chart 24.



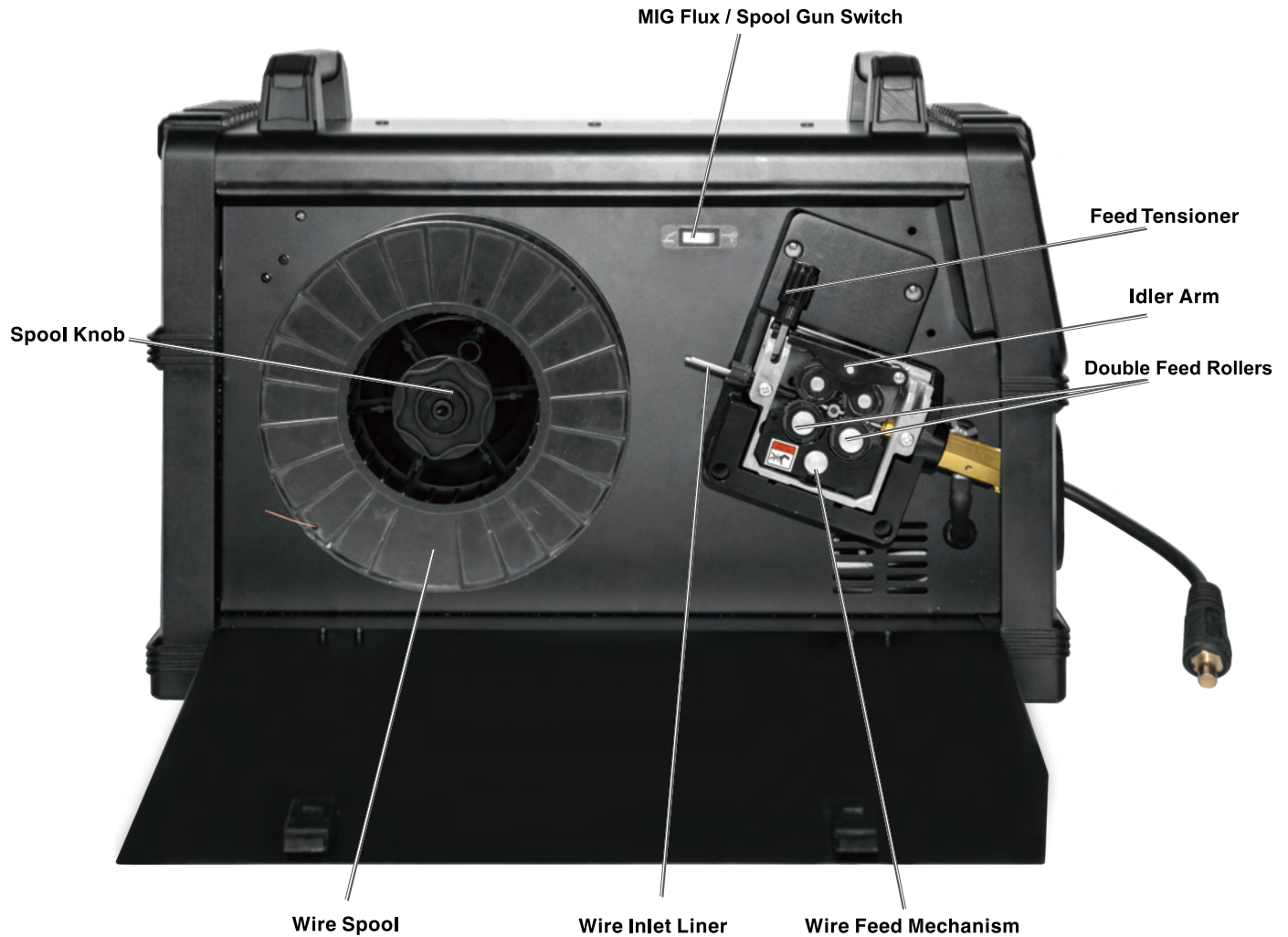
Chart 23



Chart 24

BASIC WELDING

Interior Controls



BASIC WELDING

Back View



Weld Settings

Refer to the Settings Chart on the inside of the Welder door for Flux-Cored and MIG Weld settings. The chart is only intended to show general guidelines for different wire sizes and for different thicknesses of material. The initial settings used at the beginning of a weld may need to be adjusted after stopping and carefully inspecting the weld. Proper welding takes experience.

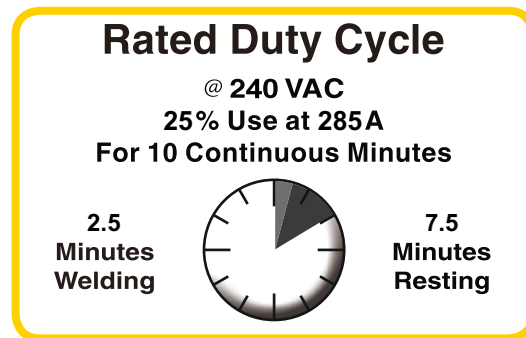
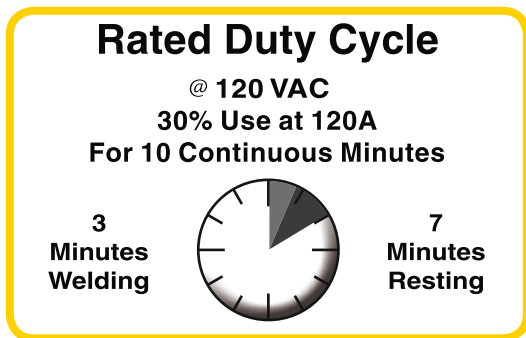
BASIC WELDING

Duty Cycle (Duration of Use)

Avoid damage to the Welder by not welding for more than the prescribed duty cycle time. The Duty Cycle defines the number of minutes, within a 10 minute period, during which a given welder can produce a particular welding current without overheating.

For example, a welder with a 25% duty cycle at 285 A welding current must be allowed to rest for at least 7.5 minutes after every 2.5 minutes of continuous welding.

Failure to carefully observe any duty cycle limitations can easily over-stress a welder's power generation system contributing to premature welder failure.



This Welder has an internal thermal protection system to help prevent this sort of over-stress. When the Welder overheats, it automatically shuts down and multifunctional data display flashes Err-02.

The Welder automatically returns to service after cooling off. Should this occur, rest the MIG Gun on an electrically non-conductive, heat-proof surface, such as a concrete slab, well clear of the ground clamp.

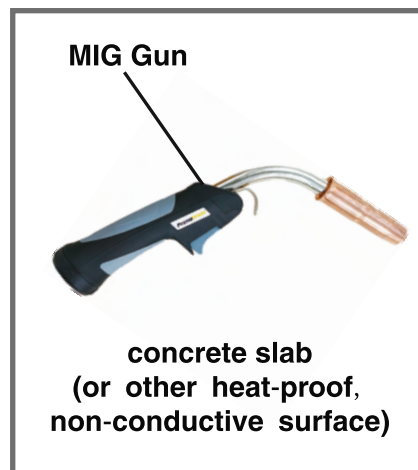
Allow the Welder to cool with the Power Switch on, so that the internal Fan will help cool the Welder.



Power Switch

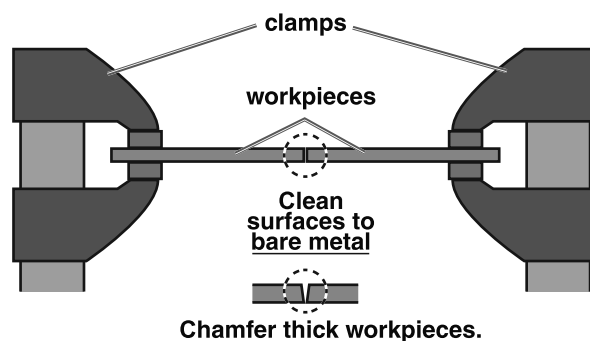
BASIC WELDING

When the multifunctional data display is automatically back to the preset status, and the Welder can be used again, use shorter welding periods and longer rest periods to prevent needless wear.



Setting Up The Weld

- 1** Make practice welds on pieces of scrap the same thickness as your intended workpiece to practice technique before welding anything of value. Clean the weld surfaces thoroughly with a wire brush or angle grinder; there must be no rust, paint, oil, or other materials on the weld surfaces, only bare metal.
- 2** Use clamps (not included) to hold the workpieces in position so that you can concentrate on proper welding technique. The distance (if any) between the two workpieces must be controlled properly to allow the weld to hold both sides securely while allowing the weld to penetrate fully into the joint. The edges of thicker workpieces may need to be chamfered (or beveled) to allow proper weld penetration.



BASIC WELDING

Notice: When welding equipment on a vehicle, disconnect the vehicle battery power from both the positive connection and the ground before welding. This prevents damage to some vehicle electrical systems and electronics due to the high voltage and high frequency bursts common in welding.

- 3 Clamp Ground Cable to bare metal on the workpiece near the weld area, or to metal work bench where the workpiece is clamped.



- 4 Set the Multifunctional Data Adjustment Knob to the desired settings. Refer to the Settings Chart on the inside of the Welder door.

Note: The initial settings may need to be adjusted after stopping and carefully inspecting the weld. Proper welding takes experience.

DANGER! TO PREVENT DEATH FROM ASPHYXIATION:

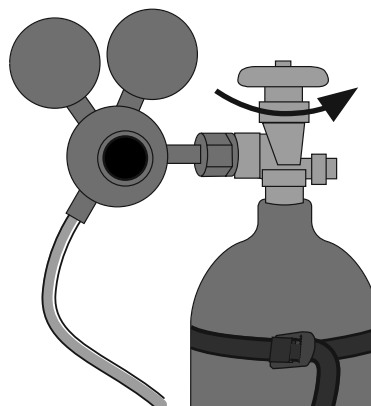
Do not open gas without proper ventilation. Fix gas leaks immediately. Shielding gas can displace air and cause rapid loss of consciousness and death. **Shielding gas without carbon dioxide can be even more hazardous because asphyxiation can start without feeling shortness of breath.**



BASIC WELDING

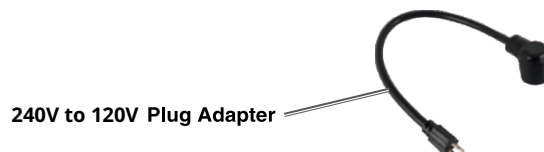
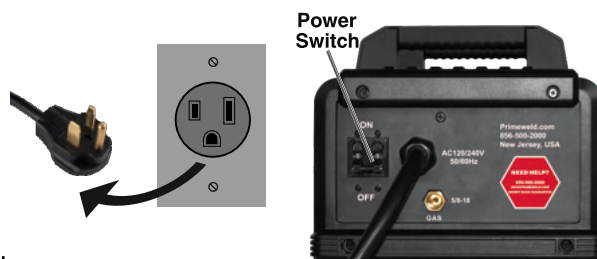
5 Gas shielded, solid-core wire only:

- A: Open gas cylinder valve all the way.
- B: Set Flow Gauge to 20-30 cubic ft per hour(CFH), (10-14L/min).

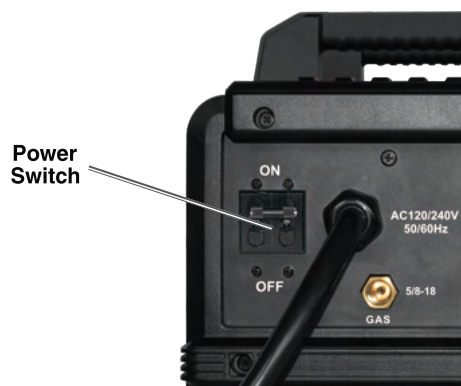


6 Turn the Power Switch off, do not touch the Gun's Trigger, and before connecting Power Cord: If using 120VAC, connect the included adapter to the end of the Power Cord. If using 240VAC, do not use the adapter. Plug the Power Cord into a properly grounded and rated receptacle that matches the plug and turn the Power Switch ON.

Note: The circuit must be equipped with delayed action-type circuit breaker or fuses.



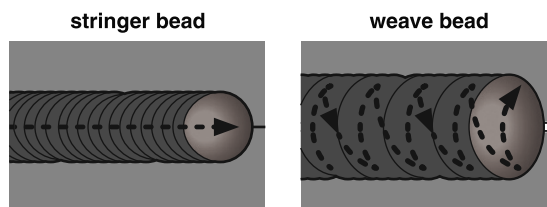
7 Set MIG Gun down on nonconductive, nonflammable surface away from any grounded objects. Turn the Power Switch ON.



BASIC WELDING TECHNIQUE

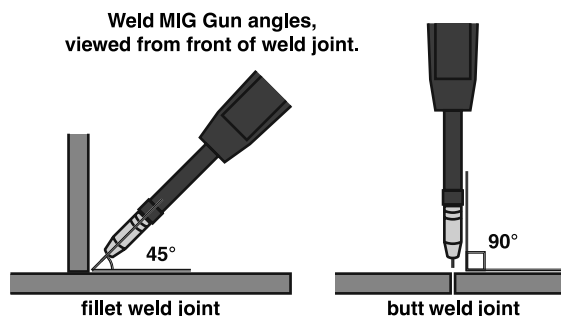
1 Press (and hold) Trigger and contact the area to be welded with electrode wire to ignite arc.

2 For a narrow weld, you can usually draw the wire in a steady straight line. This is called a **stringer bead**.

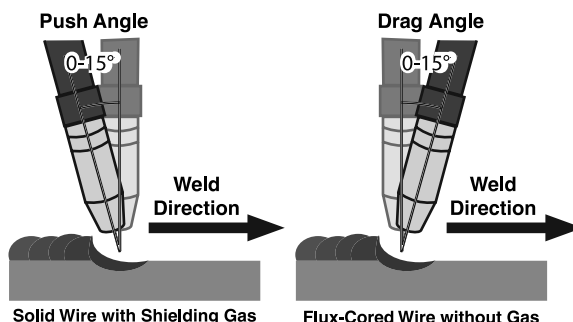


For a wider weld, draw the wire back and forth across the joint. This is called a **weave bead** and takes practice to perform properly.

3 Direct the welding wire straight into the joint. This gives an angle of 90° (straight up and down) for butt (end to end) welds, and an angle of 45° for fillet (T-shaped) welds.



4 For MIG welding using solid wire and shielding gas, the end of the MIG Gun should be tilted so that wire is angled anywhere in-between straight on and 15° away from the direction you are welding. The amount of tilt is called the push angle.



5 When using flux-cored wire without shielding gas, the end of the MIG Gun should be tilted so that wire is angled anywhere in-between straight on and 15° in the direction you are welding. The amount of tilt is called the drag angle.

BASIC WELDING TECHNIQUE

- 6** The Contact Tip should remain within 1/2" of the work surface. This distance is called CTWD - Contact Tip to Work Distance.

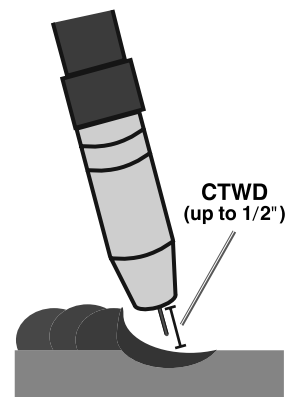
Note: If welder is used too long, the multifunctional data display flashes Err-02 and the unit automatically shuts down. The welder automatically returns to service after cooling off. Should this occur, rest the MIG gun on an electrically nonconductive, heat-proof surface, such as a concrete slab, away from the ground clamp.

Allow the welder to cool with the power Switch on, so that the internal Fan will help cool the welder.

When the multifunctional data display is automatically back to the preset status, and the welder can be used again, use shorter welding periods and longer rest periods to help prevent needless wear.

- 7** After welding the test weld on a piece of scrap for a few seconds, stop and check your progress. Clean, then compare your weld's appearance with the diagrams and descriptions in the **Welding Tips** section starting on the next page. After making any necessary adjustments, continue to weld **while carefully following the DUTY CYCLE guidelines as explained on page 42.**

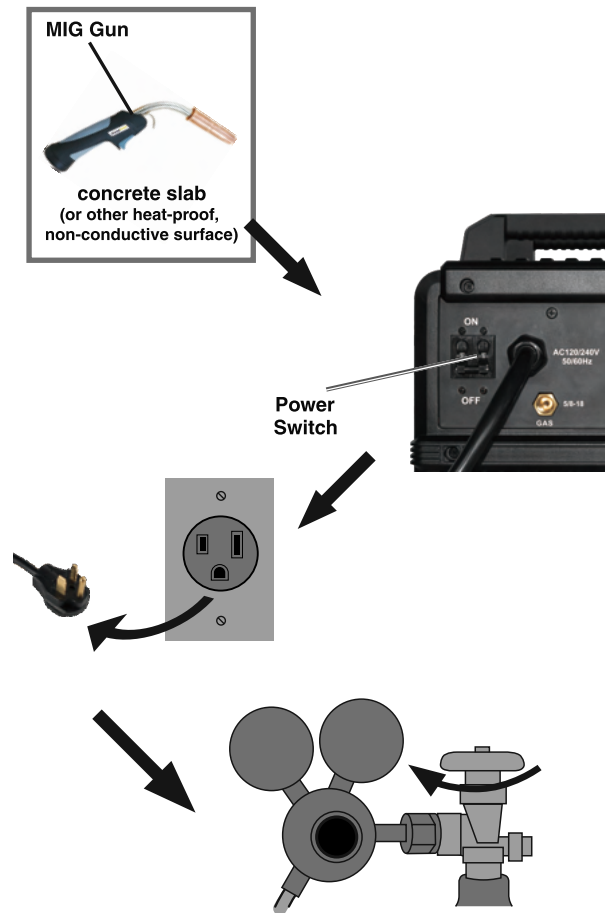
CAUTION! Weld will be hot. Do not touch.



After practice welding for a few seconds, STOP and examine your weld using the guidelines starting on the next page.

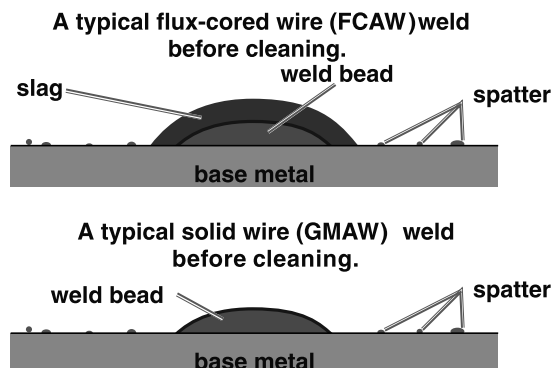
BASIC WELDING TECHNIQUE

- 8** When welding is complete, set the MIG gun down on a heat-proof, electrically non-conductive surface. Turn the Power Switch OFF.
- 9** Allow welder to cool down, then unplug the power cord.
- 10** Remove ground clamp from workpiece or table and disconnect MIG gun.
- 11** Respool wire by clipping wire, removing gas nozzle/contact tip on MIG gun, releasing idler arm on wire feed mechanism, and rotating the wire spool counterclockwise. Be sure to securely hold wire as it is being respooled because the end of wire has a tendency to quickly unravel once it clears the wire feeder.
- 12** **MIG ONLY:** Close shielding gas cylinder valve securely. Remove regulator and replace cap. Disconnect gas hose from welder. Store and secure gas cylinder.



WELDING TIPS

A good way to test welding technique is to examine a weld's appearance after it has cooled and the slag has been removed. Then, better welding can be learned by adjusting your weld technique to remedy any problems found.



Cleaning the Weld

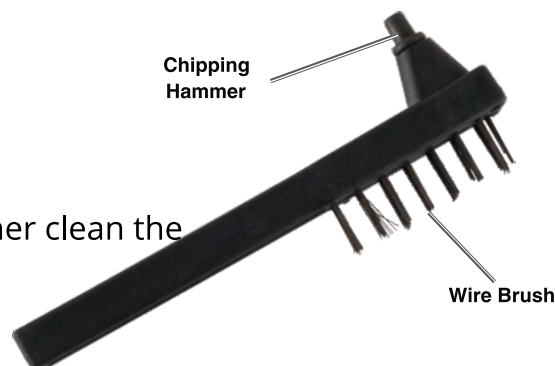
⚠️ WARNING



TO PREVENT SERIOUS INJURY:
Continue to wear ANSI approved safety goggles and protective wear when cleaning a weld.
Sparks or chips may fly when cleaning.

9 A weld from flux-cored wire will be covered by slag. Use a chipping hammer to knock this off.
Be careful not to damage the weld or base material.

10 Use a wire brush(not included) to further clean the weld or use an angle grinder (sold separately) to shape the weld.



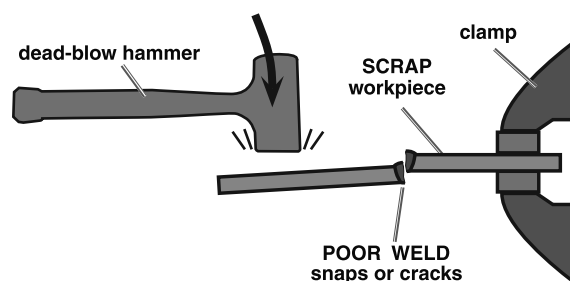
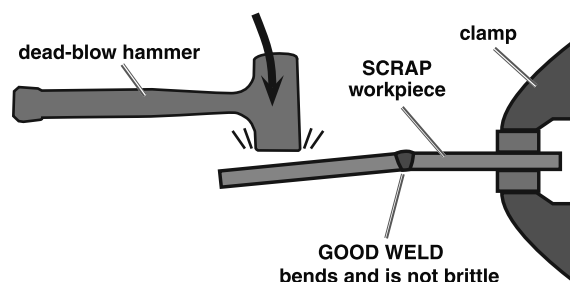
WELDING TIPS

Strike Test

A test weld on a **PIECE OF SCRAP** can be tested by using the following procedure. **WEAR ANSI-APPROVED SAFETY GOGGLES DURING THIS PROCEDURE.**

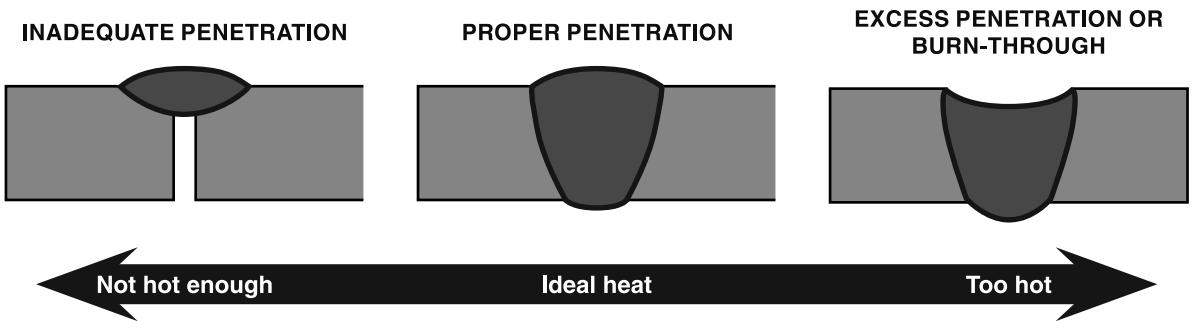
WARNING! This test **WILL** damage the weld it is performed on. This test is **ONLY** an indicator of weld technique and is not intended to test working welds.

- 1** After two scraps have been welded together and the weld has cooled, clamp one scrap in a sturdy vise.
- 2** Stay clear from underneath while you strike the opposite scrap with a heavy hammer, preferably a dead-blow hammer.
- 3** A **GOOD WELD** will deform but not break, as shown on top. A **POOR WELD** will be brittle and snap at the weld, as shown on bottom.



WELD DIAGNOSIS

Workpiece Heat control / Weld penetration



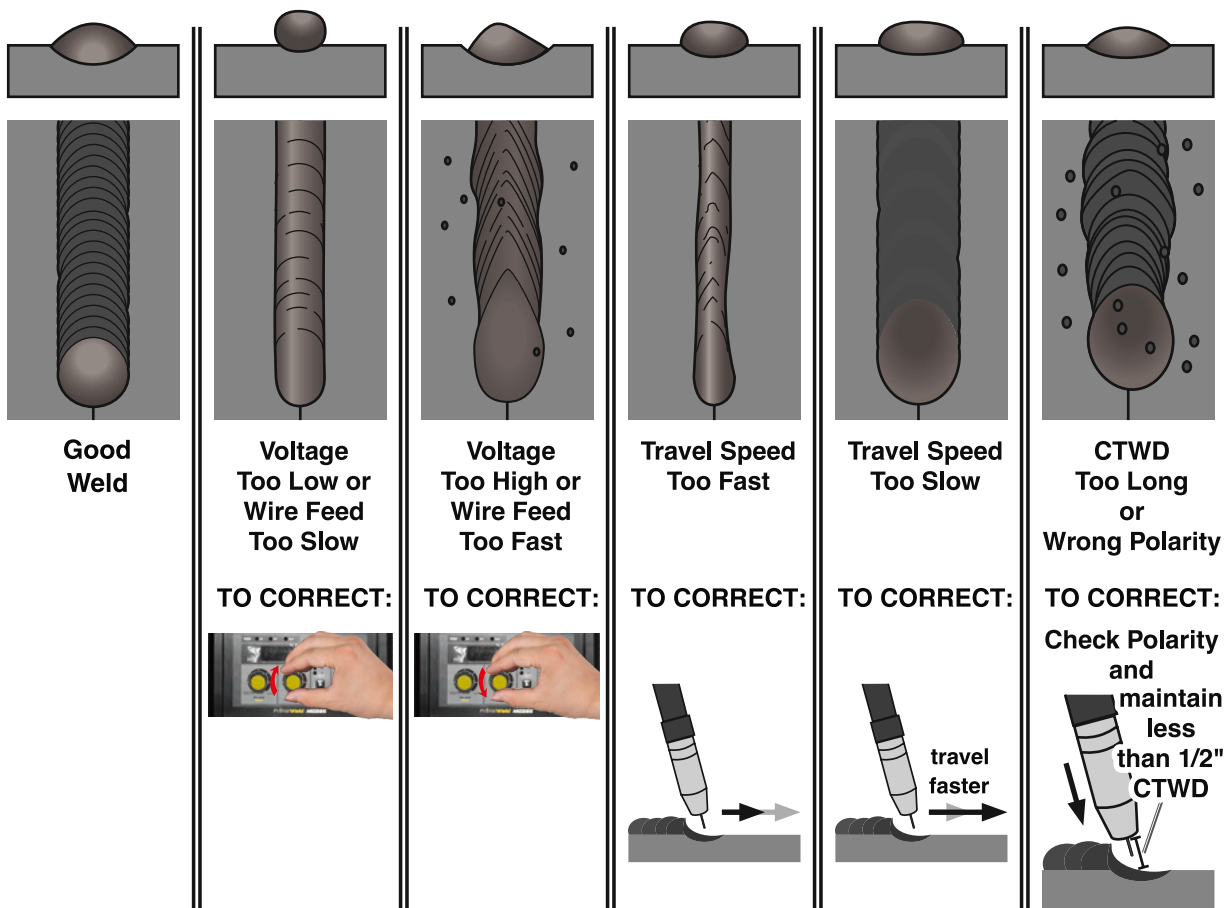
How to increase workpiece heat and increase penetration:
(to weld THICKER workpieces properly)

- a. Increase weld current
- b. Decrease travel speed
- c. Use faster wire feed
- d. Use shorter CTWD

How to reduce workpiece heat and limit penetration:
(to weld THINNER workpieces properly)

- a. Decrease weld current
- b. Increase travel speed
- c. Use slower wire feed
- d. Use longer CTWD

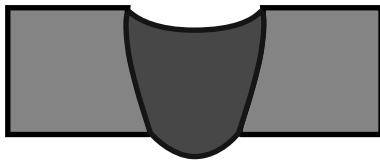
Example Weld Diagrams



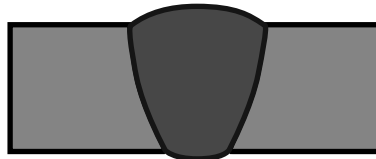
WELD PROBLEMS

Penetration(Workpiece Heat Control)

EXCESS PENETRATION OR BURN-THROUGH
Weld droops on top and underneath, or falls through entirely, making a hole.

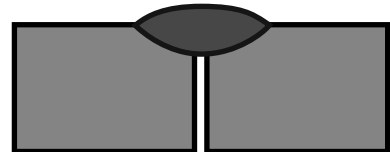


PROPER PENETRATION
Weld is visible underneath and bulges slightly on top.



PROFILE VIEWS

INADEQUATE PENETRATION
Weld does not penetrate the joint fully, just on the surface.



POSSIBLE CAUSES AND SOLUTIONS

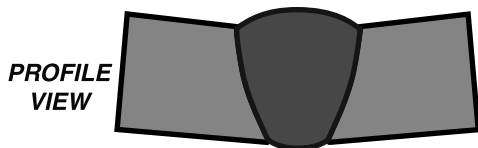
1. **Workpiece overheating:**
Reduce wire feed speed.
Decrease weld current.
2. **Travel speed too slow:**
Increase travel speed and ensure that travelspeed is kept steady.
3. **Excessive material at weld:**
Reduce wire feed speed.

POSSIBLE CAUSES AND SOLUTIONS

1. **Incorrect welding technique:**
Maintain 1/2" or less CTWD.
Keep arc on leading edge of weld puddle. Hold MIG Gun at proper angles.
2. **Insufficient weld heat:**
Reduce travel speed.
Increase weld current.
3. **Workpieces too thick/close:**
Bevel thick workpieces, allow slight gap, and weld in several passes.
4. **Insufficient weld material:**
Increase wire feed speed.

WELD PROBLEMS

Bend at Joint



POSSIBLE CAUSES AND SOLUTIONS

1. **Improper clamping:**
Clamp workpieces securely.
Make tack welds to hold workpieces.
2. **Excessive heat:**
Weld a small portion and allow to cool before proceeding.
Increase travel speed. Reduce wire feed speed.

Coat of Slag Over Weld

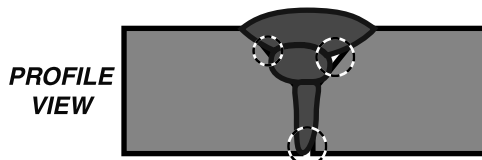


Slag is a necessary part of a flux cored wire weld. It shields the weld from impurities. Clean off the slag with a Chipping Hammer and Wire Brush after welding.

Gas-shielded MIG welds are protected by the shielding gas and do not need slag to protect them.

Weld Not Adhering Properly

Gaps present between weld and previous bead or between weld and workpiece. See areas below.



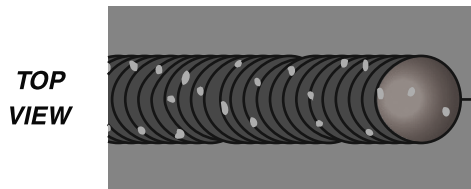
POSSIBLE CAUSES AND SOLUTIONS

1. **Incorrect welding technique:**
Place stringer bead at correct place in joint. Adjust workpiece position or weld angle to permit proper welding to bottom of piece. Pause briefly at sides during weave bead. Keep arc on leading edge of weld puddle. Hold MIG Gun at proper angles.
2. **Insufficient weld material:**
Increase current.
Increase wire feed speed.
3. **Dirty workpiece:**
Clean workpiece down to bare metal.
4. **Insufficient weld material:**
Increase wire feed speed.
5. **Workpiece gap too narrow:**
Widen groove or increase bevel.

WELD PROBLEMS

Porosity

Small cavities or holes in the bead.



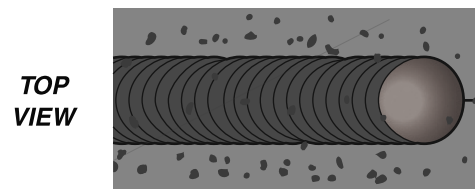
POSSIBLE CAUSES AND SOLUTIONS

1. **Incorrect polarity:**
Check that polarity is set correctly for type of welding.
2. **Insufficient shielding gas (MIG only):**
Increase flow of gas. Clean nozzle. Maintain proper CTWD.
3. **Incorrect shielding gas (MIG only):**
Use shielding gas recommended by wire supplier.
4. **Dirty workpiece or welding wire:**
Clean workpiece down to bare metal. Make certain that wire is clean and free from oil, coatings, and other residues.
5. **Inconsistent travel speed:**
Maintain steady travel speed.
6. **CTWD too long:**
Reduce CTWD.

Excessive Spatter

Fine spatter is normal.

Spatter that is grainy and large is a problem.



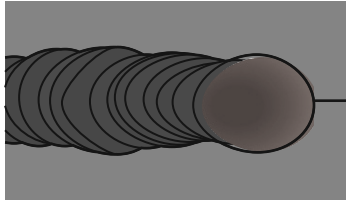
POSSIBLE CAUSES AND SOLUTIONS

1. **Dirty workpiece or welding wire:** Clean workpiece down to bare metal. Make certain that wire is clean and free from oil, coatings, and other residues.
2. **Incorrect polarity:**
Check that polarity is set correctly for type of welding.
3. **Insufficient shielding gas (MIG only):** Increase flow of gas. Clean nozzle. Maintain proper CTWD.
4. **Wire feeding too fast:**
Reduce wire feed speed.
5. **CTWD too long:**
Reduce CTWD.

WELD PROBLEMS

Crooked/Wavy Bead

TOP
VIEW



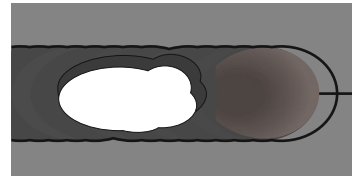
POSSIBLE CAUSES AND SOLUTIONS

1. **Inaccurate welding:**
Use two hands or rest hand on steady surface.
2. **Inconsistent travel speed:**
Maintain steady travel speed.
3. **CTWD too long:**
Reduce CTWD.

Burn-Through

Base material melts away,
leaving a hole in the weld.

TOP
VIEW

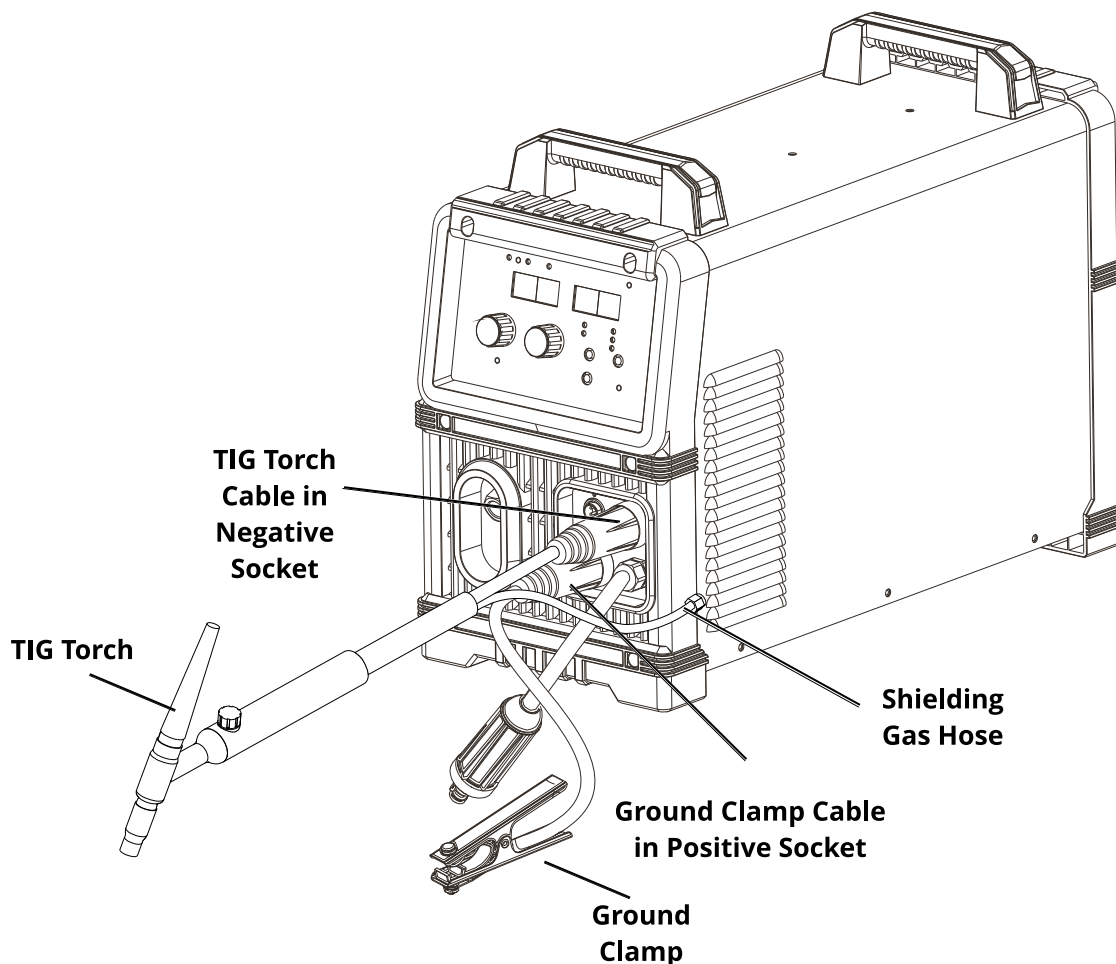


POSSIBLE CAUSES AND SOLUTIONS

1. **Workpiece overheating:**
Reduce current and/or wire feed speed.
2. **Travel speed too slow:**
Increase travel speed and ensure that travel speed is kept steady.
3. **Excessive material at weld:**
Reduce wire feed speed.

LIFT TIG SETUP

Connect cables

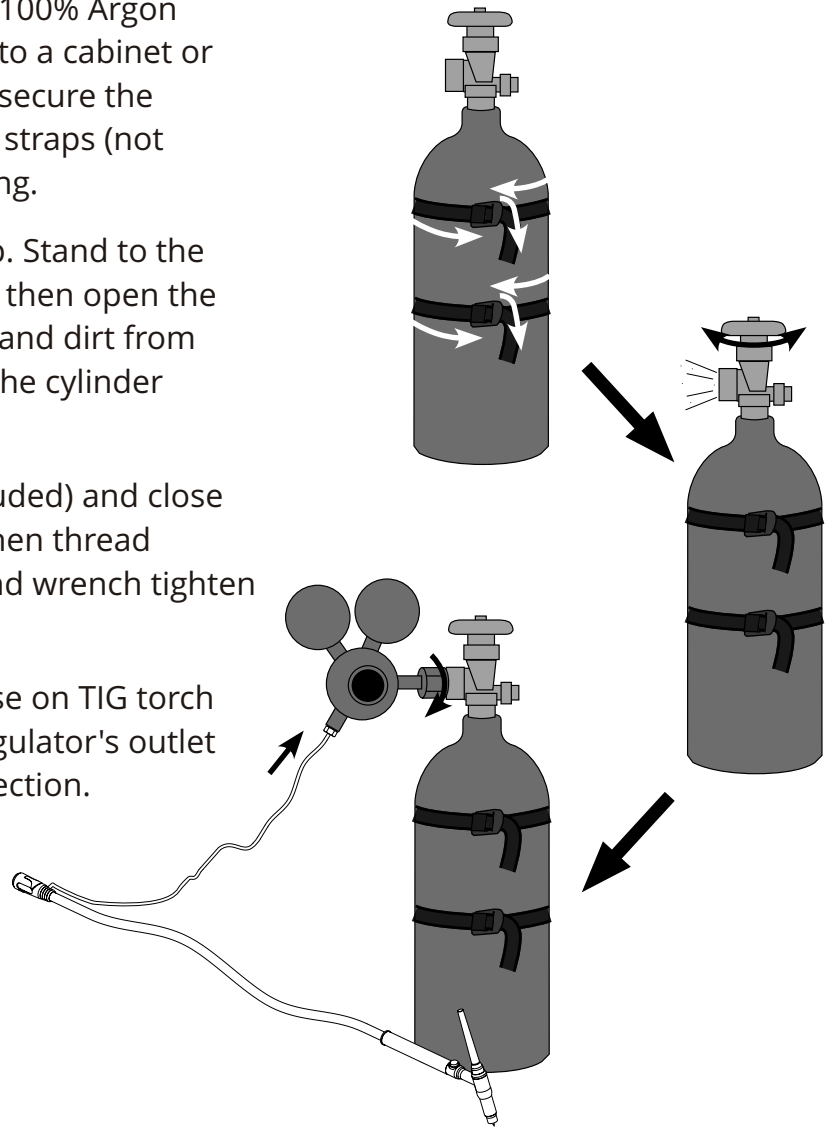


1. Plug Ground Clamp Cable into Positive Socket. Twist clockwise all the way to lock in place.
2. Plug TIG Torch Cable into Negative Socket. Twist clockwise all the way to lock in place.
3. For connecting Shielding Gas Hose, refer to Connect Shielding Gas section on next page.

LIFT TIG SETUP

Connect Shielding Gas

1. With assistance, place an 100% Argon cylinder (not included) onto a cabinet or cart near the Welder and secure the cylinder in place with two straps (not included) to prevent tipping.
2. Remove the cylinder's cap. Stand to the side of the valve opening, then open the valve briefly to blow dust and dirt from the valve opening. Close the cylinder valve.
3. Locate the regulator (included) and close its valve until it is loose, then thread regulator onto cylinder and wrench tighten connection.
4. Connect shielding gas hose on TIG torch cable connector to the regulator's outlet and wrench-tighten connection.



LIFT TIG SETUP

Connect Power Cord

1. Turn the Power Switch off before connecting Power Cord.
2. If using 120VAC, connect the included adapter to the end of the Power Cord. If using 240VAC, do not use the adapter.

Note: The circuit must be equipped with delayed action-type circuit breaker or fuses.



Sharpen Tungsten Electrode

To avoid Electrode contamination, dedicate a fine grit grinding wheel exclusively to Electrode grinding.

WARNING! Some Electrodes may contain materials that are hazardous to breathe. Wear a respirator and ANSI-approved safety goggles when grinding an Electrode.

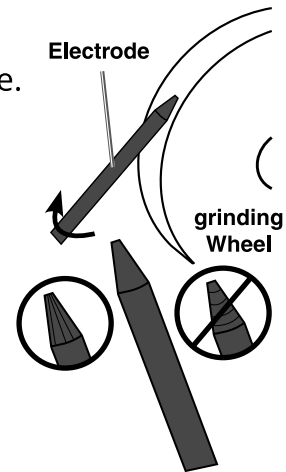
1. Shut off the welder and wait until Electrode and Torch have cooled enough to handle.
2. Remove Back Cap to release Collet's grip on Electrode.
3. Pull Electrode out from front of Torch. (Pulling it from rear will damage Collet and create burrs on Electrode).
4. If Electrode has dulled or been otherwise contaminated, use pliers or a suitable tool to grip the Electrode above the contaminated section and snap off the end of the Electrode.

LIFT TIG SETUP

5. Lightly press Electrode tip against the surface of the grinding wheel at an angle. Rotate Electrode tip until a blunt point is formed.

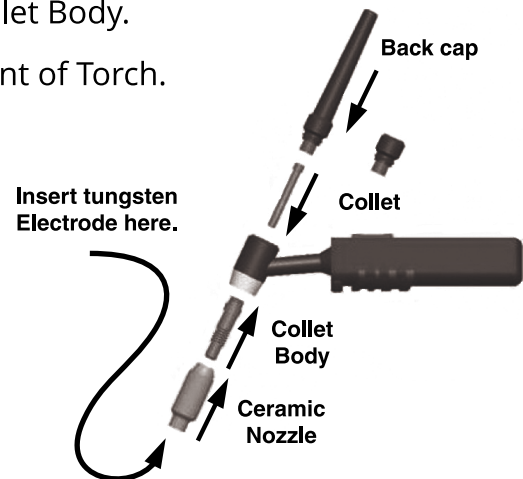
Note: Grinding direction must be parallel to length of Electrode.

6. The conical portion of the ideal tip will be 2-1/2 times as long as the Electrode diameter.
7. Re-insert Electrode into Collet with tip protruding 1/8"-1/4" beyond the Ceramic Nozzle, then re-tighten the Back Cap to secure the Electrode in place.



Connect Power Cord

1. Thread Collet Body into the front of the Torch.
2. Make sure Ceramic Nozzle size is appropriate for application.
3. Thread Ceramic Nozzle onto Collet Body.
4. Insert Collet into back of Torch and into Collet Body.
5. Insert Tungsten Electrode into Collet on front of Torch.
6. Lock Electrode in place with Back Cap. Electrode should protrude 1/8" to 1/4" beyond the Ceramic Nozzle.



INSTALLATION SET-UP FOR SMAW (STICK) WELDING

INSTALLATION SET UP FOR SMAW (STICK) WELDING

- 1 Turn the power source on and select the STICK function with the MIG/LIFT TIG / STICK selector.
- 2 Connection of Output Cables

Two weld output receptacles are available on this welding machine. For Stick welding the electrode holder is connected to the positive receptacle, while the ground lead (work piece) is connected to the negative receptacle, this is known as DC+ polarity. However various electrodes require a different polarity for optimum results and careful attention should be paid to the polarity, refer to the electrode manufacturer's information for the correct polarity.

DC+ Electrode connected to ⊕ output receptacle.

DC- Electrode connected to ⊖ output receptacle.



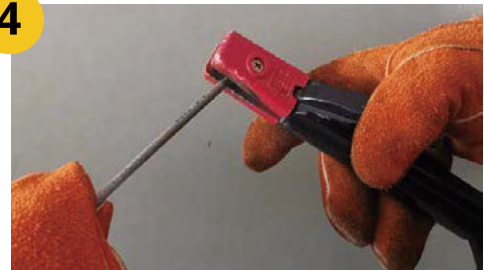
OPERATION FOR SMAW (STICK) WELDING

- 3 Set the welding current relevant to the electrode type and size being used as recommended by the electrode manufacturer.
- 4 Place the electrode into the electrode holder and clamp tight.
- 5 Scratch the electrode against the work piece to create an arc and hold the electrode steady to maintain the arc.
- 6 Hold the electrode slightly above the work piece to maintain the arc while traveling at an even speed to create an even weld deposition.
- 7 To finish the weld, break the arc by quickly snapping the electrode away from the work piece.
- 8 Wait for the weld to cool and carefully chip away the slag to reveal the weld metal underneath.

3



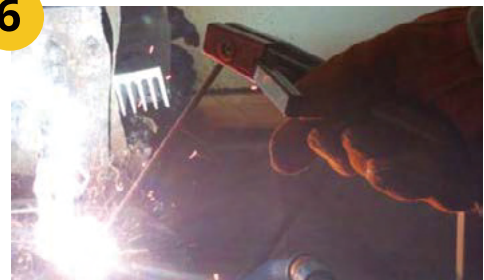
4



5



6



7

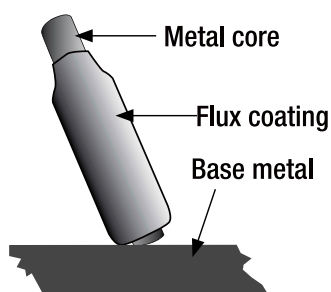
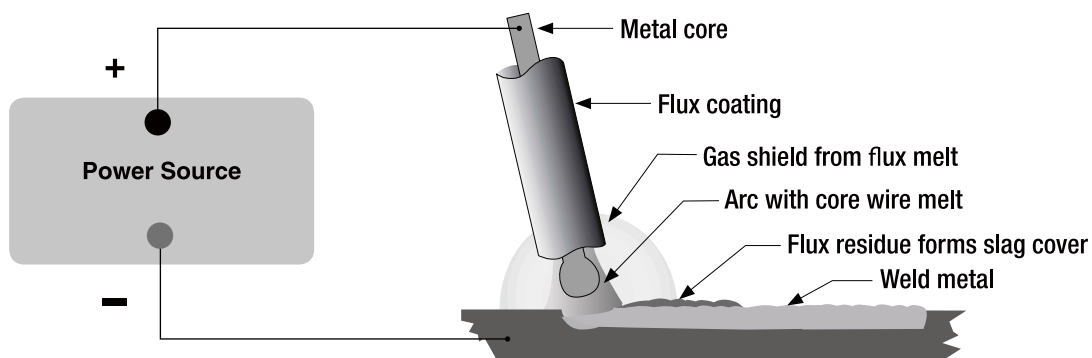


8



SMAW (STICK) WELDING GENERAL DESCRIPTION

One of the most common types of arc welding is shielded metal arc welding (SMAW) or stick welding. An electric current is used to strike an arc between the base material and a consumable electrode rod or 'stick.' The electrode rod is made of a material that is compatible with the base material being welded and is covered with a flux that gives off gaseous vapors that serve as a shielding gas and provides a layer of slag both of which protect the weld area from atmospheric contamination. The electrode core itself acts as filler material. The residue from the flux that forms a slag covering over the weld metal must be chipped away after welding.



The arc is initiated by momentarily touching the electrode to the base metal

The heat of the arc melts the surface of the base metal to form a molten pool at the end of the electrode.

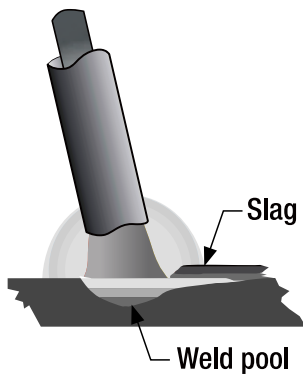
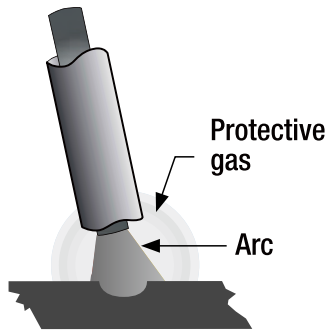
The melted electrode metal is transferred across the arc into the molten pool and becomes the deposited weld metal.

The deposit is covered and protected by a slag which comes from the electrode coating.

The arc and the immediate area are enveloped by an atmosphere of protective gas.

SMAW (stick) electrodes have a solid metal core and a flux coating. These electrodes are identified by the metal core diameter and by a series of letters and numbers. The letters and numbers identify the metal alloy and the intended use of the electrode.

SMAW (STICK) WELDING GENERAL DESCRIPTION



The metal core works as conductor of the current that maintains the arc. The metal core melts and is deposited into the weld pool.

The covering on a shielded metal arc welding electrode is called flux. The flux on the electrode performs many different functions.

These include:

Producing a protective gas around the weld area

Providing fluxing elements and deoxidizers

Creating a protective slag coating over the weld as it cools

Establishing arc characteristics

Adding alloying elements.

Covered electrodes serve many purposes in addition to adding filler metal to the molten pool. These additional functions are provided mainly by the covering on the electrode.

SMAW (STICK) WELDING FUNDAMENTALS

ELECTRODE SELECTION

As a general rule, the selection of an electrode is straight forward, in that it is only a matter of selecting an electrode of similar composition to the parent metal. However, for some metals there is a choice of several electrodes, each of which has particular properties to suit specific classes of work. It is recommended that you consult your welding equipment supplier for the correct selection of electrode.

ELECTRODE SIZE

Average Thickness of Material		Maximum Recommended Electrode Diameter	
0.03 – 0.07 inches	0.75 – 2mm	3/32 inch	2.4mm
0.07 – 0.19 inches	2 – 4.8mm	1/8 inch	3.2mm
0.19 – 0.39 inches	4.8–10mm	5/32 inch	4 mm

ELECTRODE SIZE

The size of the electrode generally depends on the thickness of the section being welded, and the thicker the section the larger the electrode required. The table gives the maximum size of electrodes that may be used for various thicknesses of section based on using a general purpose type 6013 electrode.

WELDING CURRENT (AMPERAGE)

Electrode Size		Current Range
3/32 inch	2.4mm	60–100 amps
1/8 inch	3.2mm	100–160 amps
5/32 inch	4 mm	160–200 amps
1/5 inch	5 mm	200–300 amps

WELDING CURRENT (AMPERAGE)

Correct current selection for a particular job is an important factor in stick welding. With the current set too low, difficulty can be experienced in striking and maintaining a stable arc. The electrode tends to stick to the work, penetration is poor and beads with a distinct rounded profile will be deposited. Too high current is accompanied by overheating of the electrode resulting in undercut and burning through of the base metal and producing excessive spatter. Normal current for a particular job may be considered as the maximum which can be used without burning through the work, over-heating the electrode or producing a rough spattered surface. The table shows current ranges generally recommended for a general purpose type 6013 electrode.

General rule of thumb for down hand welding is to have an arc length no greater than the diameter of the electrode.

SMAW (STICK) WELDING FUNDAMENTALS

ARC LENGTH

To strike the arc, the electrode should be gently scraped on the work until the arc is established. There is a simple rule for the proper arc length: it should be the shortest arc that gives a good surface to the weld. An arc too long reduces penetration, produces spatter, and gives a rough surface finish to the weld. An excessively short arc will cause sticking of the electrode and result in poor quality welds. General rule of thumb for down hand welding is to have an arc length no greater than the diameter of the electrode.

ELECTRODE ANGLE

The angle that the electrode makes with the work is important to ensure a smooth, even transfer of metal. When welding in down hand, fillet, horizontal or overhead the angle of the electrode is generally between 5 and 15 degrees towards the direction of travel. When vertical up welding the angle of the electrode should be between 80 and 90 degrees to the work piece.

TRAVEL SPEED

The electrode should be moved along in the direction of the joint being welded at a speed that will give the size of run required. At the same time, the electrode is fed downwards to keep the correct arc length at all times. Excessive travel speeds lead to poor fusion, lack of penetration, etc., while too slow a rate of travel will frequently lead to arc instability, slag inclusions, and poor mechanical properties.

MATERIAL AND JOINT PREPARATION

The material to be welded should be clean and free of any moisture, paint, oil, grease, mill scale, rust or any other material that will hinder the arc and contaminate the weld material. Joint preparation will depend on the method used, including sawing, punching, shearing, machining, flame cutting and others. In all cases edges should be clean and free of any contaminants. The type of joint will be determined by the chosen application.

Excessive travel speeds lead to poor fusion, lack of penetration, etc., while too slow a rate of travel will frequently lead to arc instability, slag inclusions and poor mechanical properties.

MAINTENANCE

WARNING



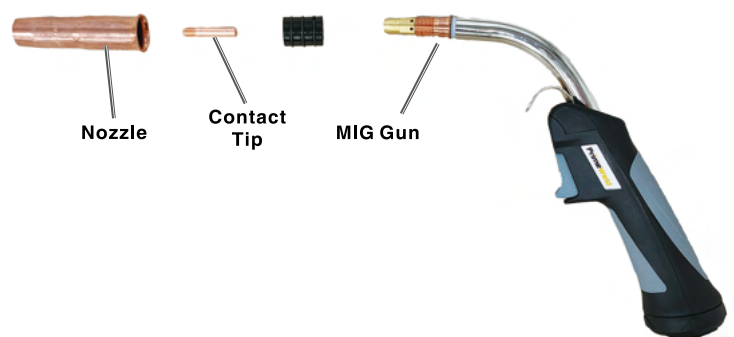
TO PREVENT SERIOUS INJURY, FIRE AND BURNS: Unplug the Welder, rest the MIG Gun on a heat-proof, electrically non-conductive surface, and allow all parts of the Welder to cool thoroughly before service.

1. **BEFORE EACH USE**, inspect the general condition of the Welder. Check for:
 - loose hardware
 - misalignment or binding of moving parts
 - damaged cord / electrical wiring
 - frayed or damaged cables
 - cracked or broken parts
 - any other condition that may affect its safe operation.
2. Periodically, have a qualified technician remove the Rear Panel and use compressed air to blow out all dust from the interior.
3. Store in a clean and dry location.
4. **For optimal weld quality, clean and inspect the contact tip and nozzle before each use, as explained below.**

MAINTENANCE

Nozzle and Contact Tip Inspection and Cleaning

1. Make sure that the entire Mig gun is completely cool and that the power cord is unplugged from the electrical outlet before proceeding.
2. Pull the Nozzle to remove it.
3. Scrub the interior of the Nozzle clean with a wire brush.
4. Examine the end of the Nozzle. The end should be flat and even. If the end is uneven, hipped, melted, cracked, or otherwise damaged, the Nozzle will adversely effect the weld and should be replaced.
5. Unscrew the Contact Tip counterclockwise and slide it off the welding wire to remove.
6. Scrub the outside of the Tip clean with a wire brush. Clean out the inside of the tip with a tip cleaner (sold separately). Check that the Tip is the proper type for the wire size used.
7. Examine the shape of the hole at the end of the Contact Tip. It should be an even circle; it should not be oblong or have any bulges in it.
8. If any problems are noted, replace the Contact Tip. Select a new Tip of the correct size for the welding wire used.
9. Reinstall the Tip and securely reinstall the Nozzle as well.




MAINTENANCE

Troubleshooting

IMPORTANT!

Be CERTAIN to shut off the welder, disconnect it from power, and discharge the MIG Gun to ground before adjusting, cleaning, or repairing the unit.


Problem	Possible Causes	Likely Solutions
Welding arc not stable	<ol style="list-style-type: none"> 1. Insufficient wire feed tension. 2. Incorrect wire feed roller size. 3. Damaged MIG Gun, cable, or liner assembly. 4. Feed Tensioner is too tight. 	<ol style="list-style-type: none"> 1. Increase wire feed tension properly. Follow step 24 on page 20. 2. Flip roller to correct size, follow the Feed Roller instructions on page 15. 3. Have a qualified technician inspect these parts and replace as necessary. 4. Loosen Feed Tensioner so it applies on enough pressure to prevent continued spinning after the Gun Trigger is released.
Wire creates a bird's nest during operation	<ol style="list-style-type: none"> 1. Excess wire feed tension. 2. Incorrect Contacttip size. 3. MIG Gun Cable Connector not fully inserted into Wire Feed mechanism. 4. Damaged liner. 	<ol style="list-style-type: none"> 1. Adjust Wire feed pressure properly Follow step 24 on page 20. 2. Replace with the proper tip for wire used. 3. Insert Gun Cable Connector proper Follow steps 13 and 14 on page 17. 4. Have a qualified technician inspect and repair/replace as necessary.
Wire stops during welding	<ol style="list-style-type: none"> 1. Gun cable is severely bent and Wire Feed mechanism cannot feed wire. 2. Gun liner is Clogged or worn. 3. Gun liner is too small for welding wire being used. 4. Wire is tangled on the spool. 5. Wire is not making contact with Feed Rollers. 6. Feed Roller is not making enough contact with wire or is crushing flux-cored Wire. 	<ol style="list-style-type: none"> 1. Straighten Gun cable. 2. Check gun liner for obstruction. Replace if necessary. 3. Check that gun liner is correct size for wire. 4. Check wire for cross winding or tangled spool. 5. Check Feed Rollers and ensure correct groove for wire diameter is being used. 6. Check Feed Tensioner and ensure it is set proper.
 Follow all safety precautions whenever diagnosing or servicing the equipment.		

MAINTENANCE

Troubleshooting

IMPORTANT!

Be CERTAIN to shut off the welder, disconnect it from power, and discharge the MIG Gun to ground before adjusting, cleaning, or repairing the unit.


Problem	Possible Causes	Likely Solutions
Welding arc not stable	<ol style="list-style-type: none"> 1. Wire not feeding properly. 2. Incorrect Contact Tip or liner size or excessive wear. 3. Incorrect wire feed speed. 4. Loose MIG Gun cable or ground Cable. 5. Damaged MIG Gun or loose connection within Gun. 6. Incorrect polarity for process being run. 7. Gas coverage may be insufficient or too high. 8. Poor connection with workpiece. 	<ol style="list-style-type: none"> 1. See first Troubleshooting section above. 2. Replace with the proper tip or liner size for wire used. 3. Adjust wire feed speed to achieve a more stable arc. 4. Check to ensure that all connections are tight. 5. Have a qualified technician inspect and repair/replace as necessary. 6. Ensure polarity is correct for operation: DCEP for MIG and DCE N for Flux-cored. 7. Ensure gas flow rate is set according to Settings Chart. Make sure MIG Gun Cable Connector is fully inserted into Wire Feed mechanism with no O-rings exposed. 8. Check the ground clamp connection to the workpiece and machine. Ensure the MIG Gun is properly secured.
Weak arc strength	<ol style="list-style-type: none"> 1. Incorrect line voltage. 2. Improper gauge or length of cord. 3. Not enough current. 	<ol style="list-style-type: none"> 1. Check the line voltage and, if insufficient, have a licensed electrician remedy the situation. 2. Do not use an extension cord on this Welder. Use only one of the supplied power cords for this Welder or an identical replacement cord. 3. Switch current to proper setting for metal thickness.
When multifunctional data display screen display normal but machine does not work	<ol style="list-style-type: none"> 1. Faulty or improperly connected Trigger. 2. Machine is in the incorrect mode. 	<ol style="list-style-type: none"> 1. Ensure the gun connection is properly seated on machine. Qualified technician must check and secure/replace Trigger. 2. Ensure MIG/Spool Gun mode is switched to the correct process. Refer to step 9 on page 33.
When multifunctional data display screen does not display when power switch on	<ol style="list-style-type: none"> 1. Unit is not connected to outlet properly. 2. Outlet is unpowered. 3. Circuit supplies insufficient input voltage or amperage. 4. Plug does not have correct rating. 5. Input Power Cord is not seated properly. 	<ol style="list-style-type: none"> 1. Verify the voltage at the outlet and the connection to the outlet. 2. Check circuit breaker/GFCI devices; if any are tripped, determine and remedy cause before resetting. 3. Verify that the circuit is designed to supply the required input voltage and amperage as detailed on the Specifications table. If the Voltage Input/Thermal Overload Indicator is illuminated on machine, check the input voltage to ensure it is within specified range. 4. Make sure installed plug is correct rating. See Specifications on page 11. 5. Ensure the input Power Cord is fully secured.
 Follow all safety precautions whenever diagnosing or servicing the equipment.		

MAINTENANCE

Troubleshooting (continued)

IMPORTANT!

Be CERTAIN to shut off the Welder, disconnect it from power, and discharge the MIG Gun to ground before adjusting, cleaning, or repairing the unit.

Problem	Possible Causes	Likely Solutions
Wire feeds, but arc does not ignite	<ol style="list-style-type: none"> 1. Improper ground connection. 2. Improperly sized Contact Tip. 3. Excessively worn Contact Tip. 4. Dirty Contact Tip. 	<ol style="list-style-type: none"> 1. Make certain that the workpiece is contacted properly by the Ground Clamp and that the workpiece is properly cleaned near the ground clamp and the welding location. 2. Verify that Contact Tip is the proper size for welding wire. If needed, replace Contact Tip with proper size and type. 3. Check that the hole in the tip is not deformed or enlarged. If needed, replace Contact Tip with proper size and type. 4. Properly clean Contact Tip.
Porosity in the weld metal	<ol style="list-style-type: none"> 1. Shielding gas cylinder is empty. 2. Not enough or too much shielding gas. 3. Dirty workpiece. 4. Gun is being used too far away from Workpiece. 5. Polarity is incorrect for the application. 6. Dirty welding wire is introducing contamination into the weld. 	<ol style="list-style-type: none"> 1. Check gas cylinder and replenish as necessary. 2. Check gas regulator to ensure proper flow. 3. Clean workpiece down to bare metal. 4. Check CTWD (contact tip to work distance) for the proper procedure. 5. Check the polarity and ensure it is DCEP for MIG and DCEN for Flux-cored. 6. Make certain that welding wire is clean and free of rust and residues.
 Follow all safety precautions whenever diagnosing or servicing the equipment.		

PARTS LIST AND DIAGRAM

Parts List

Part	Description	Qty
1	Back Plastic Cover	1
2	Right Panel	1
3	Handle	2
4	Panel Protective Cover	1
5	Main Board Support	1
6	Front Panel	1
7	Digital Panel	1
8	Knob	2
9	Front Panel	1
10	Insulated Seat for Control Socket	1
11	4 pin Control Socket	1
12	Quick Socket	2
13	Quick Connector	1
14	Cable Fixtures	1
15	Divider	1
16	Aluminum Connections	1
17	Hall Sensor	1

Part	Description	Qty
18	Torch Copper Connetor Kit	1
19	Wire Feeder	1
20	Reactor	1
21	Wire Feeder Bracket	1
22	MIG/Spool Switch	1
23	Baseboard	1
24	Spool Holder	1
25	Main Control Board	1
26	Hinge	2
27	Door Panel	1
28	Latch	2
29	Fan	2
30	Solenoid Valve	1
31	M27 Cable Fixtures	1
32	Circuit Beaker	1
33	Cable Clip	2
34	PC Board Support Frame	1

