

MCT520

**5-IN-1 WELDER&CUTTER (MIG, FLUX
CORE, HF TIG, STICK, PLASMA CUTTING)**



OPERATOR'S MANUAL

YESWELDER®

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SAFETY

THANK YOU FOR SELECTING A QUALITY PRODUCT BY YESWELDER.

PLEASE EXAMINE THE PACKING BOX AND EQUIPMENT FOR DAMAGE IMMEDIATELY

When this equipment is shipped, the title passes to the purchaser upon receipt by the carrier. Consequently, claims for material damaged in shipment must be filed by the purchaser against the transportation company when the shipment is received.

SAFETY DEPENDS ON YOU

YESWELDER arc welding and cutting equipment are designed and built with safety. However, your overall safety can be increased by proper installation and thoughtful operation on your part. **DO NOT INSTALL, OPERATE OR REPAIR THIS EQUIPMENT WITHOUT READING THIS MANUAL AND THE SAFETY PRECAUTIONS CONTAINED THROUGHOUT.** And most importantly, think before you act and be careful.



WARNING

This statement appears where the information must be followed precisely to avoid serious personal injury or loss of life.



CAUTION

This statement appears where the information must be followed to avoid minor personal injury or damage to this equipment.

KEEP YOUR HEAD OUT OF THE FUMES.

DON'T get too close to the arc. Use corrective lenses if necessary to stay a reasonable distance from the arc.

READ and obey the Safety Data Sheet (SDS) and the warning label on all welding materials containers.

USE ENOUGH VENTILATION or exhaust at the arc, or both, to keep the fumes and gases from your breathing zone and the general area.

IN A LARGE ROOM OR OUTDOORS, natural ventilation may be adequate if you keep your head out of the fumes (See below).

USE NATURAL DRAFTS or fans to keep the fumes away from your face.

If you develop unusual symptoms, see your supervisor. Perhaps the welding atmosphere and ventilation system should be checked.



WEAR CORRECT EYE, EAR & BODY PROTECTION

PROTECT your eyes and face with welding helmet properly fitted and with proper grade of filter plate (See ANSI Z49.1).

PROTECT your body from welding spatter and arc flash with protective clothing including woolen clothing, flame-proof apron and gloves, leather leggings, and high boots.

PROTECT others from spatter, flash, and glare with protective screens or barriers.

IN SOME AREAS, protection from noise may be appropriate.

BE SURE protective equipment is in good condition. Also, wear safety glasses in work area **AT ALL TIMES.**



SPECIAL SITUATIONS

DO NOT WELD OR CUT containers or materials which previously had been in contact with hazardous substances unless they are properly cleaned.

DO NOT WELD OR CUT painted or plated parts unless special precautions with ventilation have been taken. They can release highly toxic fumes or gases.

Additional precautionary measures:

PROTECT compressed gas cylinders from excessive heat, mechanical shocks, and arcs; fasten cylinders so they cannot fall.

BE SURE cylinders are never grounded or part of an electrical circuit.

REMOVE all potential fire hazards from welding area.

ALWAYS HAVE FIRE FIGHTING EQUIPMENT READY FOR IMMEDIATE USE AND KNOW HOW TO USE IT.



SAFETY

WARNING

CALIFORNIA PROPOSITION 65 WARNINGS



WARNING: Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects, or other reproductive harm.

- Always start and operate the engine in a well-ventilated area.
- If in an exposed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

For more information go to
www.P65warnings.ca.gov/diesel

WARNING: This product, when used for welding or cutting, produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code § 25249.5 et seq.)



WARNING: Cancer and Reproductive Harm www.P65warnings.ca.gov

ARC WELDING CAN BE HAZARDOUS. PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY. PACEMAKER WEARERS SHOULD CONSULT WITH THEIR DOCTOR BEFORE OPERATING.

Read and understand the following safety highlights. For additional safety information, it is strongly recommended you download free PDF of Standard ANSI Z49.1 from the American Welding Society.
<https://www.aws.org/library/doclib/AWS-Z49-2021.pdf>

BE SURE THAT ALL INSTALLATION, OPERATION, MAINTENANCE AND REPAIR PROCEDURES ARE PERFORMED ONLY BY QUALIFIED INDIVIDUALS.



FOR ENGINE POWERED EQUIPMENT.

- 1.a. Turn the engine off before troubleshooting and maintenance work unless the maintenance work requires it to be running.
- 1.b. Operate engines in open, well-ventilated areas or vent the engine exhaust fumes outdoors.
- 1.c. Do not add the fuel near an open flame welding arc or when the engine is running. Stop the engine and allow it to cool before refueling to prevent spilled fuel from vaporizing on contact with hot engine parts and igniting. Do not spill fuel when filling tank. If fuel is spilled, wipe it up and do not start engine until fumes have been eliminated.
- 1.d. Keep all equipment safety guards, covers and devices in position and in good repair. Keep hands, hair, clothing and tools away from V-belts, gears, fans and all other moving parts when starting, operating or repairing equipment.
- 1.e. In some cases it may be necessary to remove safety guards to perform required maintenance. Remove guards only when necessary and replace them when the maintenance requiring their removal is complete. Always use the greatest care when working near moving parts.
- 1.f. Do not put your hands near the engine fan. Do not attempt to override the governor or idler by pushing on the throttle control rods while the engine is running.
- 1.g. To prevent accidentally starting gasoline engines while turning the engine or welding generator during maintenance work, disconnect the spark plug wires, distributor cap or magneto wire as appropriate.
- 1.h. To avoid scalding, do not remove the radiator pressure cap when the engine is hot.



SAFETY



ELECTRIC AND MAGNETIC FIELDS MAY BE DANGEROUS.



- 2.a. Electric current flowing through any conductor causes localized Electric and Magnetic Fields (EMF). Welding current creates EMF fields around welding cables and welding machines
- 2.b. EMF fields may interfere with some pacemakers, and welders having a pacemaker should consult their physician before welding.
- 2.c. Exposure to EMF fields in welding may have other health effects which are now not known.
- 2.d. All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:
 - 2.d.1. Route the electrode and work cables together - Secure them with tape when possible.
 - 2.d.2. Never coil the electrode lead around your body.
 - 2.d.3. Do not place your body between the electrode and workcables. If the electrode cable is on your right side, the work cable should also be on your right side.
 - 2.d.4. Connect the work cable to the workpiece as close as possible to the area being welded.
 - 2.d.5. Do not work next to welding power source.



ELECTRIC SHOCK CAN KILL.



- 3.a. 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. Wear dry, hole-free gloves to insulate hands.
- 3.b. Insulate yourself from work and ground using dry insulation. Make certain the insulation is large enough to cover your full area of physical contact with work and ground.

In addition to the normal safety precautions, if welding must be performed under electrically hazardous conditions (in damp locations or while wearing wet clothing; on metal structures such as floors, gratings or scaffolds; when in cramped positions such as sitting, kneeling or lying, if there is a high risk of unavoidable or accidental contact with the workpiece or ground) use the following equipment:

- Semiautomatic DC Constant Voltage (Wire) Welder.
 - DC Manual (Stick) Welder.
 - AC Welder with Reduced Voltage Control.
- 3.c. In semiautomatic or automatic wire welding, the electrode, electrode reel, welding head, nozzle or semiautomatic welding gun are also electrically "hot".
 - 3.d. Always be sure the work cable makes a good electrical connection with the metal being welded. The connection should be as close as possible to the area being welded.
 - 3.e. Ground the work or metal to be welded to a good electrical (earth) ground.
 - 3.f. Maintain the electrode stinger, work clamp, welding cable and welding machine in good, safe operating condition. Replace damaged insulation.
 - 3.g. Never dip the electrode in water for cooling.
 - 3.h. Never simultaneously touch electrically "hot" parts of electrode stingers connected to two welders because voltage between the two can be the total of the open circuit voltage of both welders.
 - 3.i. When working above floor level, use a safety belt to protect yourself from a fall should you get a shock.
 - 3.j. Also see Items 6.c. and 8.



ARC RAYS CAN BURN.



- 4.a. 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. Welding shield and filter lens should conform to ANSI Z87.1 standards.
- 4.b. Use suitable clothing made from durable flame-resistant material to protect your skin and that of your helpers from the arc rays.
- 4.c. Protect other nearby personnel with suitable, non-flammable screening and/or warn them not to watch the arc nor expose themselves to the arc rays or to hot spatter or metal.

SAFETY



FUMES AND GASES CAN BE DANGEROUS.



- 5.a. Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. When welding, keep your head out of the fume. Use enough ventilation and/or exhaust at the arc to keep fumes and gases away from the breathing zone. **When welding hardfacing (see instructions on container or SDS) or on lead or cadmium plated steel and other metals or coatings which produce highly toxic fumes, keep exposure as low as possible and within applicable OSHA PEL and ACGIH TLV limits using local exhaust or mechanical ventilation unless exposure assessments indicate otherwise. In confined spaces or in some circumstances, outdoors, a respirator may also be required. Additional precautions are also required when welding on galvanized steel.**
- 5.b. The operation of welding fume control equipment is affected by various factors including proper use and positioning of the equipment, maintenance of the equipment and the specific welding procedure and application involved. Worker exposure level should be checked upon installation and periodically thereafter to be certain it is within applicable OSHA PEL and ACGIH TLV limits.
- 5.c. Do not weld in locations near chlorinated hydrocarbon vapors coming from degreasing, cleaning or spraying operations. The heat and rays of the arc can react with solvent vapors to form phosgene, a highly toxic gas, and other irritating products.
- 5.d. Shielding gases used for arc welding can displace air and cause injury or death. Always use enough ventilation, especially in confined areas, to insure breathing air is safe.
- 5.e. Read and understand the manufacturer's instructions for this equipment and the consumables to be used, including the Safety Data Sheet (SDS) and follow your employer's safety practices. SDS forms are available from your welding distributor or from the manufacturer.
- 5.f. Also see item 1.b.



WELDING AND CUTTING SPARKS CAN CAUSE FIRE OR EXPLOSION.



- 6.a. Remove fire hazards from the welding area. If this is not possible, cover them to prevent the welding sparks from starting a fire. Remember that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas. Avoid welding near hydraulic lines. Have a fire extinguisher readily available.
- 6.b. Where compressed gases are to be used at the job site, special precautions should be used to prevent hazardous situations. Refer to "Safety in Welding and Cutting" (ANSI Standard Z49.1) and the operating information for the equipment being used.
- 6.c. When not welding, make certain no part of the electrode circuit is touching the work or ground. Accidental contact can cause overheating and create a fire hazard.
- 6.d. Do not heat, cut or weld tanks, drums or containers until the proper steps have been taken to insure that such procedures will not cause flammable or toxic vapors from substances inside. They can cause an explosion even though they have been "cleaned". For information, purchase "Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping That Have Held Hazardous Substances", AWS F4.1 from the American Welding Society (see address above).
- 6.e. Vent hollow castings or containers before heating, cutting or welding. They may explode.
- 6.f. Sparks and spatter are thrown from the welding arc. Wear oil free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes and a cap over your hair. Wear ear plugs when welding out of position or in confined places. Always wear safety glasses with side shields when in a welding area.
- 6.g. Connect the work cable to the work as close to the welding area as practical. Work cables connected to the building framework or other locations away from the welding area increase the possibility of the welding current passing through lifting chains, crane cables or other alternate circuits. This can create fire hazards or overheat lifting chains or cables until they fail.
- 6.h. Also see item 1.c.
- 6.i. Read and follow NFPA 51B "Standard for Fire Prevention During Welding, Cutting and Other Hot Work", available from NFPA, 1 Batterymarch Park, PO box 9101, Quincy, MA 022690-9101.
- 6.j. Do not use a welding power source for pipe thawing.

SAFETY



CYLINDER MAY EXPLODE IF DAMAGED.



- 7.a. Use only compressed gas cylinders containing the correct shielding gas for the process used and properly operating regulators designed for the gas and pressure used. All hoses, fittings, etc. should be suitable for the application and maintained in good condition.
- 7.b. Always keep cylinders in an upright position securely chained to an undercarriage or fixed support.
- 7.c. Cylinders should be located:
 - Away from areas where they may be struck or subjected to physical damage.
 - A safe distance from arc welding or cutting operations and any other source of heat, sparks, or flame.
- 7.d. Never allow the electrode, electrode stinger or any other electrically "hot" parts to touch a cylinder.
- 7.e. Keep your head and face away from the cylinder valve outlet when opening the cylinder valve.
- 7.f. Valve protection caps should always be in place and hand tight except when the cylinder is in use or connected for use.
- 7.g. Read and follow the instructions on compressed gas cylinders, associated equipment, and CGA publication P-1, "Precautions for Safe Handling of Compressed Gases in Cylinders," available from the Compressed Gas Association, 14501 George Carter Way Chantilly, VA 20151.



FOR ELECTRICALLY POWERED EQUIPMENT.



- 8.a. Turn off the power using the disconnect switch at the fuse box before working on the equipment.
- 8.b. Install equipment in accordance with the U.S. National Electrical Code, all local codes and the manufacturer's recommendations.
- 8.c. Ground the equipment following the U.S. National Electrical Code and the manufacturer's recommendations.

SET UP

Technical Specification

Mode	Input Voltage	Input Current	Duty Cycle	Output Current	Output Current Range	Output Voltage Range	Open Circuit Voltage
MIG	110V	I1 max=37A I1 eff=24A	60%	130A	30~130A	15.5~20.5V	60V
			100%	101A	30~101A	15.5~19.05V	
	220V	I1 max=41A I1 eff=30A	60%	200A	30~200A	15.5~24V	
			100%	155A	30~155A	15.5~21.75V	
HF TIG	110V	I1 max=29A I1 eff=20A	60%	130A	15~130A	10.6~15.2V	
			100%	101A	15~101A	10.6~14.04V	
	220V	I1 max=32A I1 eff=22A	60%	200A	15~200A	10.6~18V	
			100%	155A	15~155A	10.6~16.2V	
STICK	110V	I1 max=45A I1 eff=30A	60%	130A	20~130A	20.8~25.2V	280V
			100%	100A	20~101A	20.8~14.04V	
	220V	I1 max=43A I1 eff=28A	60%	200A	20~200A	20.8~28V	
			100%	155A	20~155A	20.8~26.2V	
CUT	110V	I1 max=40A I1 eff=26A	60%	35A	20~35A	88~94V	
			100%	27A	20~27A	88~90.8V	
	220V	I1 max=39A I1 eff=25A	60%	50A	20~50A	88~100V	
			100%	39A	20~39A	88~95.6V	

MIG Welding Installation



DCEP

- Turn off unit and disconnect input power before making connection.
- Connect the MIG Gun into the EURO Connect Socket. Make sure the gun is completely inserted into the brass receptacle, and then turn it clockwise to secure the connection.
- Connect the Wire Drive Polarity lead into the Positive Output Receptacle, and turn it clockwise to tighten.
- Connect the Work Lead into the Negative Output Receptacle, and turn it clockwise to tighten. The work-piece with the work clamp at the other end of the earth cable.
- Connect the supplied gas hose between regulator/flowmeter gas hose connection and gas inlet for MIG/TIG on rear panel of machine.

FLUX-CORE Welding Installation



DCEN

- Turn off unit and disconnect input power before making connection.
- Connect the MIG Gun into the EURO Connect Socket. Make sure the gun is completely inserted into the brass receptacle, and then turn it clockwise to secure the connection.
- Connect the Wire Drive Polarity lead into the Negative Output Receptacle, and turn it clockwise to tighten.
- Connect the Work Lead into the Positive Output Receptacle, and turn it clockwise to tighten. The workpiece with the work clamp at the other end of the earth cable.

STICK Welding Installation



DCEP

- Turn off unit and disconnect input power before making connection.
- Connect the Electrode Holder into the Positive Output Receptacle, and turn it clockwise to tighten.
- Connect the Work Lead into the Negative Output Receptacle, and turn it clockwise to tighten. The work-piece with the work clamp at the other end of the earth cable.

Note: Generally, DCEP connection is recommended for basic electrode, while there is no special requirement for acid electrode.



DCEN

- Connect the Electrode Holder into the Negative Output Receptacle, and turn it clockwise to tighten.
- Connect the Work Lead into the Positive Output Receptacle, and turn it clockwise to tighten. The workpiece with the work clamp at the other end of the earth cable.

TIG Welding Installation



DCEN

- Turn off unit and disconnect input power before making connection.
- Connect the TIG Torch into the Plasma Cutting Torch & TIG Torch Connection, and turn it clockwise to tighten.
- Connect the 5-Pin Plug into the 5-Pin Trigger Receptacle, and turn it clockwise to secure the connection.
- Connect the Work Lead into the Positive Output Receptacle, and turn it clockwise to tighten. The workpiece with the work clamp at the other end of the earth cable.
- Connect the supplied gas hose between regulator/flowmeter gas hose connection and gas inlet for MIG/TIG on rear panel of machine.

Plasma Cutting Installation



- Turn off unit and disconnect input power before making connection.
- Connect the Plasma Cutting Torch into the Plasma Cutting Torch & TIG Torch Connection, and turn it clockwise to tighten.
- Connect the 5-Pin Plug into the 5-Pin Trigger Receptacle, and turn it clockwise to secure the connection.
- Connect the Work Lead into the Work Clamp Receptacle for Plasma Cutting, and turn it clockwise to tighten. The work-piece with the work clamp at the other end of the earth cable.
- Connect the supplied gas hose between air compressor, air filter regulator, and gas inlet for Cutting on rear panel of machine.



1



2

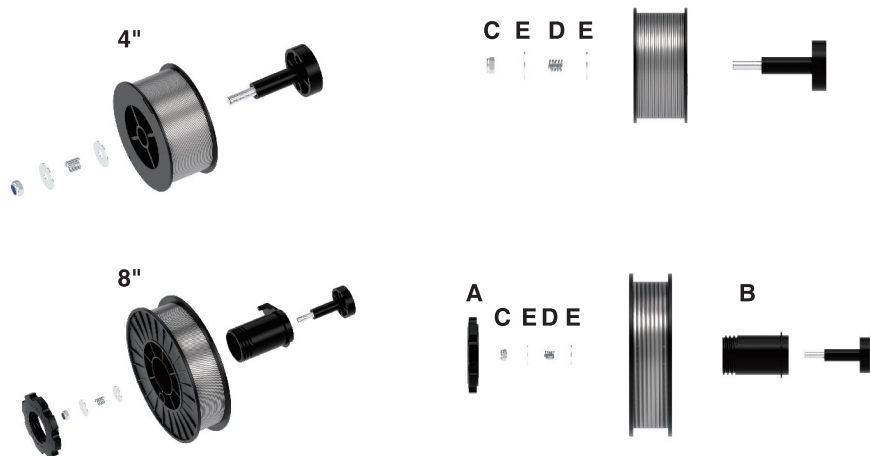


3



4

Welding Wire Installation



Installing 4-Inch Spool (See Figure For Part Identification):

- Turn off unit and disconnect input power before installation.
- Open the side panel.
- Unscrew and remove the wire spool retention cap (A) used for 8-inch spools and store it someplace safe.
- Remove the nut (C), spring (D), and washers (E).
- Remove the spindle adapter for 8-inch spools (B) and store it someplace safe.
- Remove the outer wrapping of the welding wire and then find the leading end of the wire (it goes through a hole in the outer edge of the spool and is bent over the spool edge to prevent the wire from unspooling) but do not unhook it yet.
- Place the spool on the WIRE SPOOL SPINDLE so that the wire unspools from the bottom, and the spool will rotate counterclockwise.
- Place the washers, spring, and nut back.
- Proceed to "Threading Welding Wire" instructions below.

Installing 8-Inch Spool (See Figure For Part Identification):

- Turn off unit and disconnect input power before installation.
- Open the side panel.
- Unscrew and remove the wire spool retention cap (A).

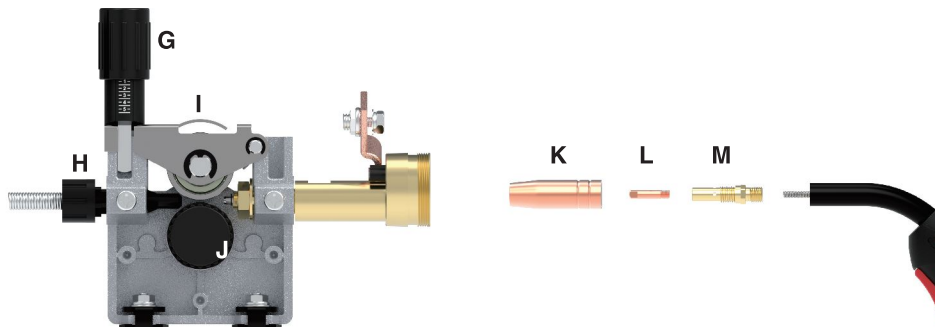
NOTE: If the wire spool retention cap (A) and the spindle adapter for 8-inch spools (B) are not present (machine was last used with a 4-inch spool) put the spindle adapter for 8-inch spools back in place.

- Make sure all of the components used for a 4-inch spool are still in place. They are necessary for 8-inch spools as well (nut (C), spring (D) and washers (E)).
- Remove the outer wrapping of the welding wire and then find the leading end of the wire (it goes through a hole in the outer edge of the spool and is bent over the spool edge to prevent the wire from unspooling) but do not unhook it yet.
- Place the spool on the WIRE SPOOL SPINDLE so that the wire unspools from the bottom, and the spool will rotate counterclockwise.

NOTE: Be sure the alignment pin near the base of the spindle adapter for 8-inch spools is inserted in the corresponding hole on the spool.

- Place the washers, spring, nut and wire spool retention cap back.
- Proceed to "Threading Welding Wire" instructions below.

Threading Welding Wire



- Unhook the wire and hold the wire end and the spool in one hand. Use the other hand to tighten the nut (C) to some extent so that when the spool is released, it does not spin freely and uncoils the wire. Tightening the nut too much may cause inconsistent wire feeding. Leaving it too loose will allow the wire to straighten freely from the spool, leaving a mess of wire in the cabinet.
- While holding the wire in place, use a wire cutter to cut the bent end of the wire so that only a straight end remains.
- Hold the wire end in one hand and release the drive roller pressure arm (I) by pulling the pressure arm adjustment knob (G) toward you. Hold the drive roller pressure arm up off of the drive roller and insert the leading end of the wire into the inlet guide tube (H). Push the wire across the drive roller (J) and into the gun assembly approximately six inches.
- Align the wire up in the inner groove of the drive roller and allow the drive pressure arm to drop onto the drive roller. Pull the pressure arm adjustment knob back over the pressure arm and tighten (turn clockwise) the pressure adjusting knob until the pressure roller applies enough force on the wire to prevent it from slipping out of the drive assembly.

NOTE: Too much pressure will cause wire to feeding problems and may burn out the wire feed motor.

- Let go of the wire.
- Remove the nozzle (K) and contact tip (L) from the end of the gun assembly (M).
- Plug the welder's INPUT POWER CABLE into the AC power source. Press the button Mode to select Manual MIG or Synergic MIG welding mode.
- Press the trigger on the MIG gun or press the button FEED WIRE to feed the wire through the gun assembly. Check if the drive roller is slipping on the wire and increase pressure on the pressure arm adjustment knob if necessary.
- When at least an inch of wire sticks out past the end of the gun, release the trigger or button.
- Slide the contact tip (L) over the wire protruding from the end of the gun (M). Screw the contact tip into the end of the gun and hand tighten securely.
- Install the nozzle (K) on the gun assembly.
- Cut off the excess wire that extends past the end of the nozzle.
- Fine-tune the wire drive pressure with the pressure arm adjustment knob (G).

- a. Turn the pressure adjustment knob clockwise to increase the driving pressure until the wire seems to feed smoothly without slipping.

Note: If TOO MUCH pressure is applied, you will crush the wire and create wire feeding problems. If TOO LITTLE pressure is used, the wire will slip on the drive rolls, and no wire will be fed.

- b. When the driving pressure is set correctly, there should be no slippage between the wire and the drive roller. But if an obstruction occurs along the wire feed path, the wire should slip on the drive roller. You can check it by squeezing the wire between two fingers with moderate force as it comes out of the gun. If this stops the wire from feeding, increase the pressure until the wire feeds through your fingers without issue.
- Double check your spool tension: After feeding the wire and releasing the trigger, the wire coming off the spool should not remain under tension (in a straight line from the spool to the WIRE FEEDER). It should relax a little bit and take on some of the curvature the coiled wire naturally reverts to. It should also not relax so much that the wire begins to loosen on the spool.



INCORRECT



CORRECT



KEEP THE GUN STRAIGHT. WHEN FEEDING A NEW WIRE THROUGH THE LINER, MAKE SURE THE WIRE IS CUT CLEANLY (NO BURRS OR ANGLES) AND THAT AT LEAST 1" FROM THE END IS STRAIGHT (NO CURVES). FAILURE TO FOLLOW THESE INSTRUCTIONS COULD CAUSE DAMAGE TO THE LINER.



WHEN CHECKING THE CORRECT EXIT OF THE WIRE FROM THE GUN DO NOT BRING YOUR FACE NEAR THE GUN. YOU MAY RUN THE RISK OF BEING WOUNDED BY THE OUTGOING WIRE. DO NOT BRING YOUR FINGERS CLOSE TO THE FEEDING MECHANISM WHEN WORKING! THE ROLLS, WHEN MOVING, MAY CRUSH FINGERS. PERIODICALLY CHECK THE ROLLS. REPLACE THEM WHEN THEY ARE WORN AND COMPROMISE THE REGULAR FEEDING OF THE WIRE.

Replacing MIG Gun Graphene Liner for Aluminum Welding

- Ensure the power supply is off and the gun is removed from the feeder before proceeding.
- Remove the nozzle and contact tip by handy spanner (FIG-1).
- Remove the liner retaining nut (FIG-2).
- With the gun straightened, pull the steel liner out of the gun and keep it in safe place (FIG-3).
- Take out the graphene liner (Black) and insert it into the gun from the back end, pushing it all the way through until it exits at the front end. Avoid kinking the liner. Kinking the liner will damage it and require replacement (FIG-4, FIG-5).
- Install the liner retainer and nut onto the back end of the gun (FIG-6).
- Remove the drive roller cap and drive roller (FIG-7).
- Remove the tube holder with screwdriver then rotate inlet guide tube to remove it (FIG-8).
- Remove the black clip on the outlet guide tube and push tube out the front of the machine with a wire (FIG-9, FIG-10).

Note: use a screwdriver against the front of the tube inside the gun connector to better remove the black clip.

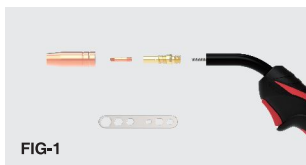
- Cut a same length of liner as the outlet guide tube with wire cutter (FIG-11).

Note: remove any burr that may obstruct wire feed.

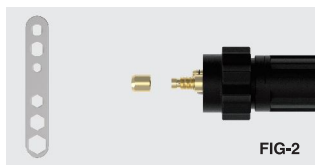
- Put the gun back on the machine and tighten it, the liner will be just very close to the wire feeder roller but without touching (FIG-12).
- Cut another section of liner from the excess graphene liner to the same length as the inlet guide tube and then replace on the tube holder (FIG-13).

Note: remove any burr that may obstruct wire feed.

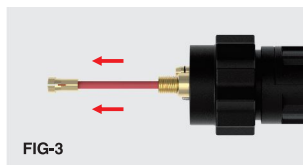
- Place the tube holder back (FIG-14).
- Replace the correct size U-knurled drive roller (FIG-15).
- Install the matched aluminum A+ contact tip and nozzle back into the MIG gun (FIG-16).



Remove the MIG gun consumables.



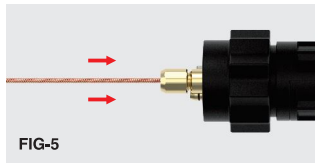
Remove the liner retaining nut.



Pull out and completely remove the liner.



Take out the graphene liner (black).



Insert the new liner into the gun from the back end, pushing it all the way through until it exits at the front end.

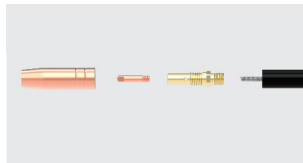
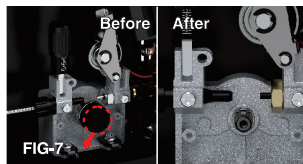
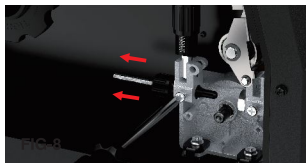


FIG-6

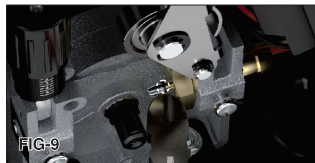
Install the liner retainer and nut onto the back end of the gun.



Remove the drive roller cap and drive roller.

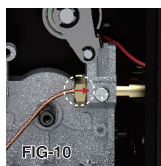
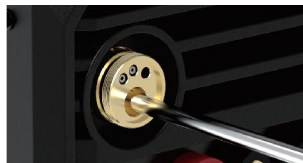


Remove the tube holder with screwdriver then rotate inlet guide tube to remove it.

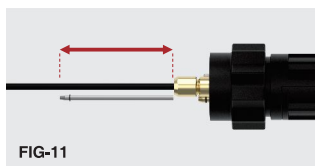


Remove the black clip on the outlet guide tube.

Note: Use a screwdriver against the front of the tube inside the gun connector to better remove the black clip.



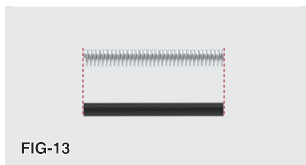
Push the outlet guide tube out the front of the machine with a wire.



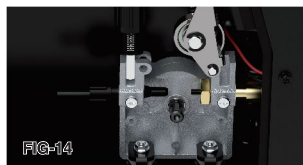
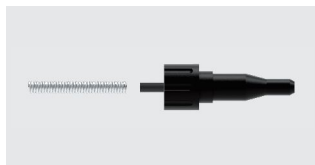
Cut a same length of liner as the outlet guide tube with wire cutter.



Put the gun back on the machine and tighten it.



Cut another section of liner from the excess graphene liner to the same length as the inlet guide tube and then replace on the inlet guide.



Place the tube holder back.

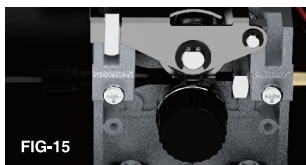


FIG-15

Replace the correct size U-knurled drive roller.

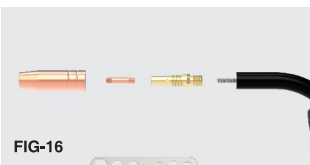


FIG-16

Install the matched aluminum A+ contact tip and nozzle back into the MIG gun.

Installing Spool Gun



- Spool gun with euro connector and 2 Pin-Plug is recommended.
- Install the spool gun into the EURO connect socket, and turn it clockwise to secure the connection.
- **Note: When connecting the gun, be sure to tighten the connection. A loose connection can result in the connector arcing and damaging the machine and gun connector. This damage is not covered under warranty.**
- Connect the 2-Pin Plug into the 5-Pin trigger receptacle with 5Pin-2Pin Converter.
- Connect the wire drive polarity lead into the positive output receptacle, and turn it clockwise to tighten.
- Connect the work lead into the negative output receptacle, and turn it clockwise to tighten. The workpiece with the work clamp at the other end of the earth cable.
- Connect the supplied gas hose between regulator/flowmeter gas hose connection and gas inlet for MIG/TIG on rear panel of machine.
- Set gun selector switch to spool gun inside the wire feeding door.

OPERATION

Controls and Display Panel



1. Welding Mode

Press button **[WELD MODE]** to select the welding mode: TIG/CUT/STICK/SYN MIG/Manual MIG.

2. Welding Data

Press button **[GAS SELECT]** to select the gas corresponding to the welding material: Fe CO₂ 100%/Fe Mix Gas/SS Mix Gas/AL Ar100%/Flux Gasless Press button **[Wire DIA.]** to select diameter of welding wire: .030" 0.8mm/.035" 0.9mm/.045" 1.2mm.

3. Inching Indicator

Press and hold the button **[INCHING]** to feed the wire through the gun assembly.

4. Pre/Post Flow Indicator

Press button **[GAS FLOW]** to select Pre/Post Flow function.

5. 2T/4T Indicator

Press button **[STEPS MODE]** to switch 2T/4T Mode. (Not Available in Stick Mode)

6. Output Voltage/Inductance/Pre/Post Flow Time Display

Display the value of Output Voltage/Pre Flow Time/Post Flow Time.

7. AMP/WFS Display

Display the value of Output Current/WFS.

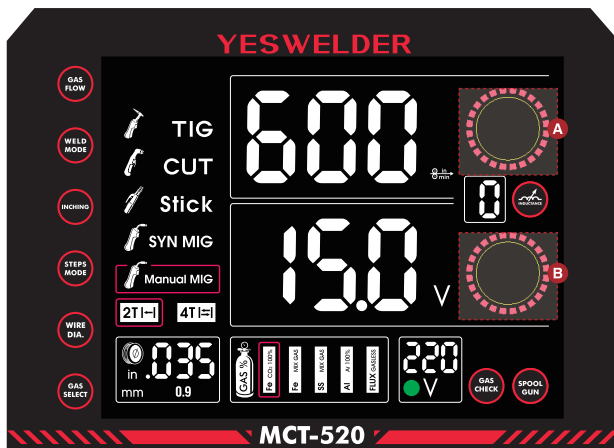
8. Spool Gun



- 9. MIG Gun Connection (Euro Connect)
- 10. Wire Drive Polarity Lead
- 11. 5-Pin Trigger Receptacle for Plasma Cutting Torch/TIG Torch/Spool Gun
- 12. Positive Output Receptacle
- 13. Negative Output Receptacle
- 14. Work Clamp Receptacle for Plasma Cutting
- 15. Plasma Cutting Torch & TIG Torch Connection

- 16. Gas Inlet for MIG/TIG
- 17. Gas Inlet for Cutting
- 18. Power Switch
- 19. Air Filter Installation Location
- 20. Input Power Cable
- 21. Cooling Fan

Manual MIG Set-Up Mode



Note: The indicator lights above are all the functions that can be selected in that mode. The actual machine will not display this way.

- Press button “WELD MODE” to mode selection-Manual MIG.
- Press button “GAS SELECT” to gas selection.
- Press button “WIRE DIA.” to wire selection.
- Press button “STEPS MODE” to 2T/4T selection.

Note: 2T/4T-Normal welding mode (2T) provides weld power only while the trigger switch is depressed. 4T Trigger interlock mode eliminates the need to hold the gun trigger while welding.

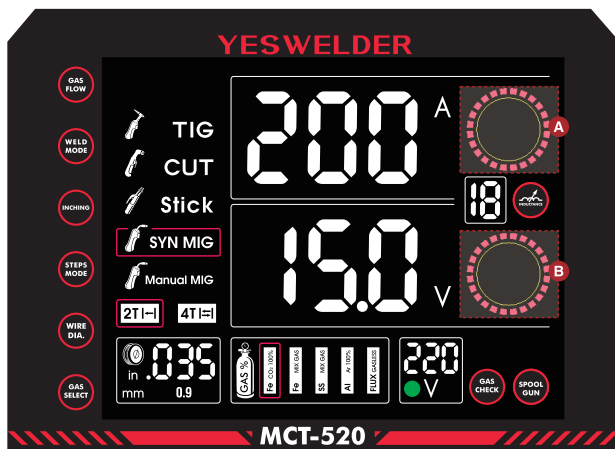
- Rotate the upper knob [A] to WFS adjustment.
- Rotate the lower knob [B] to output voltage adjustment.
- Press and rotate the lower knob [B] to inductance adjustment.

Note: Inductance-Changes the fluidity of the weld puddle. Increasing inductance produces a more fluid, softer arc. Decreasing inductance produces a stiffer arc.

Setting Parameters					
MODE				110V	220V
Manual MIG (2T/4T)	Fe CO ₂ 100%	.030" (0.8mm)	WFS	80~480In/min	80~600In/min
			Output Voltage	10.0~22.0V	10.0~27.5V
			Inductance	0~10	0~10
		.035" (0.9mm)	WFS	80~380In/min	80~600In/min
			Output Voltage	10.0~22.0V	10.0~27.5V
			Inductance	0~10	0~10
	Fe Mix Gas	.030" (0.8mm)	WFS	80~480In/min	80~600In/min
			Output Voltage	10.0~22.0V	10.0~27.5V
			Inductance	0~10	0~10
		.035" (0.9mm)	WFS	80~400In/min	80~600In/min
			Output Voltage	10.0~22.0V	10.0~27.5V
			Inductance	0~10	0~10
	SS Mix Gas	.030" (0.8mm)	WFS	80~480In/min	80~600In/min
			Output Voltage	10.0~22.0V	10.0~27.5V
			Inductance	0~10	0~10
		.035" (0.9mm)	WFS	80~352In/min	80~600In/min
			Output Voltage	10.0~22.0V	10.0~27.5V
			Inductance	0~10	0~10
	AL Ar100%	.035" (0.9mm)	WFS	80~480In/min	80~600In/min
			Output Voltage	10.0~22.0V	10.0~27.5V
			Inductance	0~10	0~10
		.045" (1.2mm)	WFS	80~392In/min	80~600In/min
			Output Voltage	10.0~22.0V	10.0~27.5V
			Inductance	0~10	0~10
	Flux Gasless	.030" (0.8mm)	WFS	80~432In/min	80~600In/min
			Output Voltage	10.0~22.0V	10.0~27.5V
			Inductance	0~10	0~10
		.035" (0.9mm)	WFS	80~388In/min	80~600In/min
			Output Voltage	10.0~22.0V	10.0~27.5V
			Inductance	0~10	0~10

• Note: Please adjust the parameters according to the actual demand.

Synergic MIG Set-Up Mode



Note: The indicator lights above are all the functions that can be selected in that mode. The actual machine will not display this way.

- Press button “**WELD MODE**” to mode selection-Synergic MIG.
- Press button “**GAS SELECT**” to gas selection.
- Press button “**WIRE DIA.**” to wire selection.
- Press button “**STEPS MODE**” to 2T/4T selection.

Note: 2T/4T-Normal welding mode (2T) provides weld power only while the trigger switch is depressed. 4T Trigger interlock mode eliminates the need to hold the gun trigger while welding.

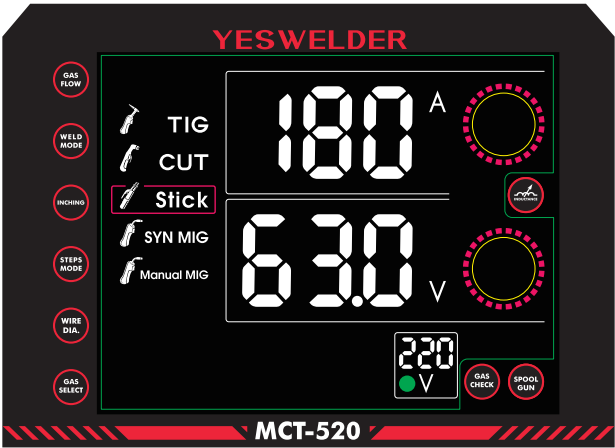
- Rotate **the upper knob [A]** to Amp adjustment.
- Rotate **the lower knob [B]** to output voltage fine adjustment (+3V).
- Press and rotate **the lower knob [B]** to inductance adjustment.

Note: Inductance-Changes the fluidity of the weld puddle. Increasing inductance produces a more fluid, softer arc. Decreasing inductance produces a stiffer arc.

Setting Parameters					
MODE				110V	220V
Synergic MIG (2T/4T)	Fe CO ₂ 100%	.030"/0.8mm	Output Current	30~130A	30~200A
			Voltage Trimming	-3~3V	-3~3V
			Inductance	0~10	0~10
		.035" (0.9mm)	Output Current	60~130A	60~200A
			Voltage Trimming	-3~3V	-3~3V
			Inductance	0~10	0~10
	Fe Mix Gas	.030" (0.8mm)	Output Current	40~130A	40~200A
			Voltage Trimming	-3~3V	-3~3V
			Inductance	0~10	0~10
		.035" (0.9mm)	Output Current	60~130A	60~200A
			Voltage Trimming	-3~3V	-3~3V
			Inductance	0~10	0~10
	SS Mix Gas	.030" (0.8mm)	Output Current	30~130A	30~200A
			Voltage Trimming	-3~3V	-3~3V
			Inductance	0~10	0~10
		.035" (0.9mm)	Output Current	60~130A	60~200A
			Voltage Trimming	-3~3V	-3~3V
			Inductance	0~10	0~10
	AL Ar 100%	.035" (0.9mm)	Output Current	50~130A	50~200A
			Voltage Trimming	-3~3V	-3~3V
			Inductance	0~10	0~10
		.045" (1.2mm)	Output Current	50~130A	50~200A
			Voltage Trimming	-3~3V	-3~3V
			Inductance	0~10	0~10
Flux Gasless	.030" (0.8mm)	Output Current	35~130A	35~200A	
		Voltage Trimming	-3~3V	-3~3V	
		Inductance	0~10	0~10	
	.035" (0.9mm)	Output Current	58~130A	58~200A	
		Voltage Trimming	-3~3V	-3~3V	
		Inductance	0~10	0~10	

• Note: Please adjust the parameters according to the actual demand. The adjustable range of voltage only from 10V to 27.5V.

STICK Set-Up Mode



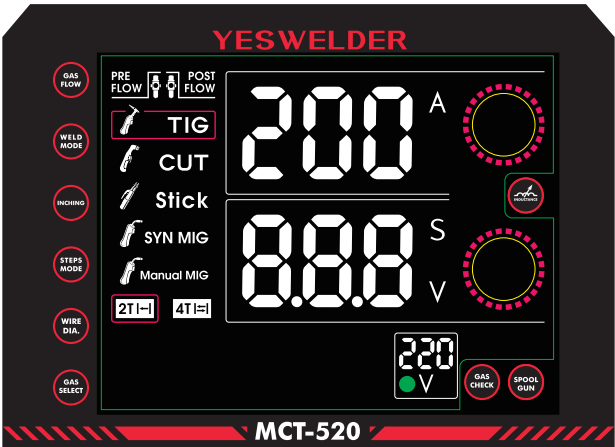
Note: The indicator lights above are all the functions that can be selected in that mode. The actual machine will not display this way.

- Press button “WELD MODE” to mode selection-Stick.
- Rotate the upper knob [A] to Amp adjustment.

Setting Parameters			
MODE		110V	220V
STICK	Output Current	20~130A	20~200A

- Note: Please adjust the parameters according to the actual demand.

TIG Set-Up Mode



Note: The indicator lights above are all the functions that can be selected in that mode. The actual machine will not display this way.

- Press button “WELD MODE” to mode selection-TIG.
- Press button “GAS FLOW” to Pre/Post Flow selection and then rotate the lower knob [B] to time adjustment.
- **Note: Prewflow -** The amount of time that the shielding gas will flow after the trigger is depressed and before the welding arc can start. **Postflow -** The amount of time that the shielding gas will flow after the arc has been shut off.
- Press button “STEPS MODE” to 2T/4T selection.

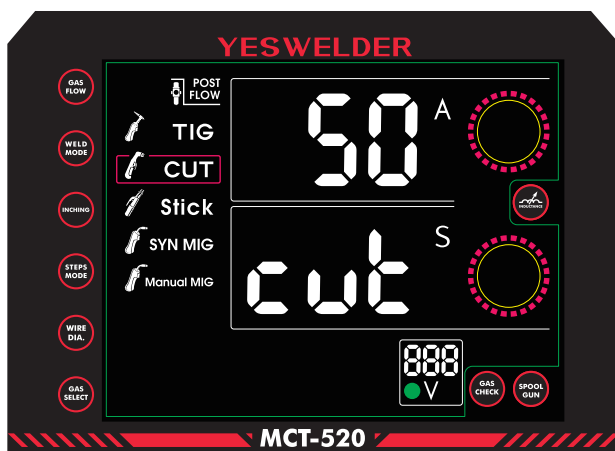
Note: 2T/4T-Normal welding mode (2T) provides weld power only while the trigger switch is depressed. 4T Trigger interlock mode eliminates the need to hold the gun trigger while welding.

- Rotate the upper knob [A] to Amp adjustment.

Setting Parameters			
MODE		110V	220V
TIG (2T/4T)	Output Current	15~130A	15~200A
	Pre Flow	0.2~3.0S	0.2~3.0S
	Post Flow	1.0~15.0S	1.0~15.0S

- **Note:** Please adjust the parameters according to the actual demand.

CUT Set-Up Mode



Note: The indicator lights above are all the functions that can be selected in that mode. The actual machine will not display this way.

- Press button “WELD MODE” to mode selection.
- Press button “GAS FLOW” to Post Flow selection and then rotate the lower knob [B] to time adjustment.

Note: Postflow - The amount of time that the gas will flow after the arc has been shut off.

- Press button “STEPS MODE” to 2T/4T selection.

Note: 2T / 4T-Normal cutting mode (2T) provides cut power only while the trigger switch is depressed. 4T Trigger interlock mode eliminates the need to hold the gun trigger while cutting.

- Rotate the upper knob [A] to Amp adjustment.

Setting Parameters			
MODE		110V	220V
CUT (2T/4T)	Output Current	20~35A	20~50A
	Post Flow	5.0~20.0S	5.0~20.0S

- **Note:** Please adjust the parameters according to the actual demand.

ACCESSORIES



1. MCT520 Welding Machine
2. Work Clamp
3. Electrode Holder
4. MIG Gun with Consumabels
5. TIG Torch with Consumabels
6. Plasma Cutting Torch With Consumabels
7. Gas Hose for MIG/TIG
8. Gas Hose for Plasma Cutting
9. Power Adapter Cord
10. Graphene Liner
11. Drive Rolls (One installed on the machine)
12. Air Filter Regulator
13. 5Pin-2Pin Converter

MAINTENANCE

General Maintenance

This welder has been engineered to need minimal service providing that a few very simple steps are taken to properly maintain it.

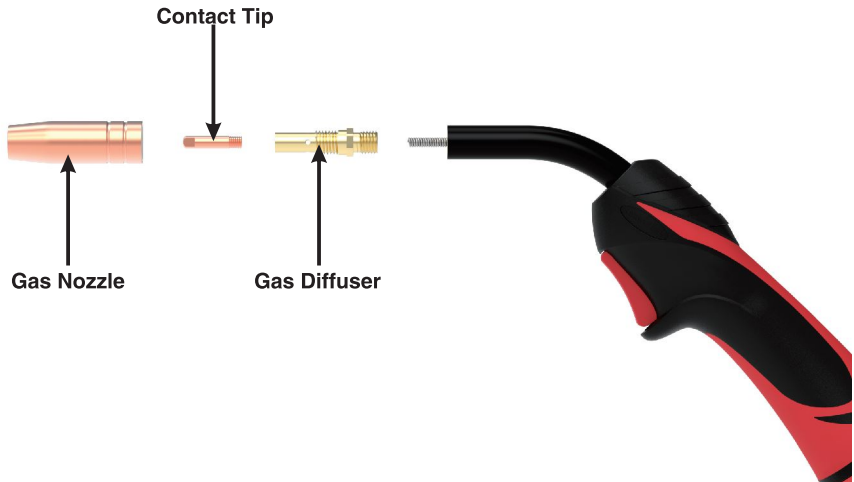
1. Keep the cabinet cover closed at all times unless the wire needs to be changed or the drive pressure needs adjusting.
2. Keep all consumables clean and replace when necessary.
3. Replace **INPUT POWER CABLE**, ground cable, work clamp, or gun assembly when damaged or worn.
4. Avoid directing grinding particles towards the welder. These conductive particles can build up inside the machine and cause severe damage.
5. Periodically clean dust, dirt, grease, etc. from your welder. Every six months or as necessary, remove the side panels from the welder and use compressed air to blow out any dust and dirt that may have accumulated inside the welder.
6. If available, use compressed air to periodically clean the liner, especially when changing wire spools.

⚠ WARNING: DISCONNECT FROM POWER SOURCE WHEN CARRYING OUT THIS OPERATION.

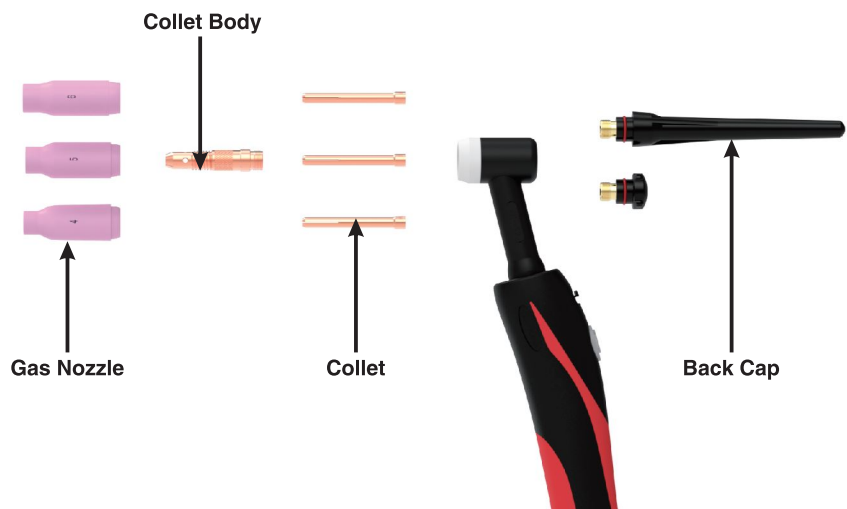
7. The wire feed drive roller will eventually wear during normal use. With the correct pressure, the idler roller must feed the wire without slipping. If the grooves in the wire feed drive roller are worn deep enough that the idler roller and the wire feed drive roller make contact when the wire is in place between them, the wire feed drive roller must be replaced.

⚠ WARNING: ELECTRIC SHOCK CAN KILL! Be aware that the **ON/OFF SWITCH**, when OFF, does not remove power from all internal circuitry in the welder. To reduce the risk of electric shock, always unplug the welder from its AC power source and wait several minutes for electrical energy to discharge before removing side panels.

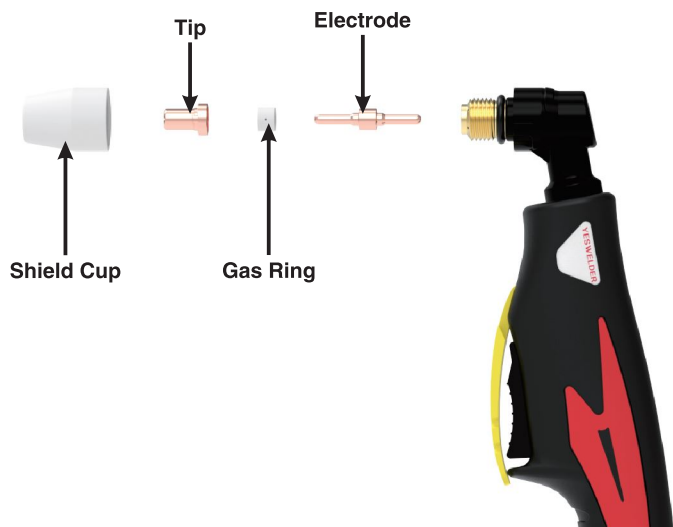
MIG Gun Disassembly



TIG Torch Disassembly



CUT Torch Disassembly



TROUBLESHOOTING

WARNING



The following operation requires sufficient professional knowledge on electric aspect and comprehensive safety knowledge. Operators should be holders of valid qualification certificates which can prove their skills and knowledge. Make sure the input cable of the machine is disconnected from the electricity utility before uncovering the welding machine.

Observe All Safety Guidelines Detailed Throughout This Manual

PROBLEM	POSSIBLE CAUSE	COURSE OF ACTION
	Over Current	Check the input connection.
	Over Heat	1. Thermal protector engaged - Allow welder to cool at least 10 minutes with machine ON. The Error Codes should disappear after the machine has cooled. 2. Insufficient air flow - Check for obstructions blocking airflow and ensure that there are 12 inches of clearance between any obstacles and the vents on all sides of the machine.
	Under Voltage	Check the voltage of your outlet. Call a qualified electrician if needed.
Frequent circuit breaker Trips.	Machine is drawing too much amperage due to use of large size electrode.	Use a smaller electrode.
	Machine is not the only piece of electrical equipment on the circuit.	Make sure the welder is on a dedicated circuit or is the only thing plugged into a circuit.
	Circuit breaker is incorrect/insufficient for use with this machine.	Verify that the circuit breaker for the circuit is a 50A breaker for 110V and 40A for 220V. If it is not, have a qualified electrician install the proper breakers.
All LEDs OFF, No output power, Fan not operating.	No input power.	Connect machine to proper input power source.
		Verify that circuit breaker has not been tripped in your main power panel. Reset if needed.
		Wire loose connection.
	POWER SWITCH is OFF.	Ensure POWER SWITCH (rear) is on the ON position.

MIG Welding Issues

PROBLEM	POSSIBLE CAUSE	COURSE OF ACTION
No arc or wire feed. Fan operates normally (can be heard).	Gun trigger is not being pulled or is not making contact.	Pull the trigger while in contact with the workpiece. The machine does not arc unless the trigger is pulled. Depress the trigger ALL THE WAY until the trigger stops moving into the gun.
	Exceeded duty cycle; thermal protector engaged.	Allow welder to cool at least 10 minutes with machine ON (observe and maintain proper duty cycle). Error Codes should disappear after the machine has cooled.
	Insufficient air flow causing machine to overheat before reaching duty cycle.	Check for obstructions blocking air flow and ensure that there are 12 inches of clearance between any obstacles and the vents on all sides of the machine.
No arc or wire feed. Fan does NOT operate (cannot be heard).	No voltage or incorrect voltage supplied to welder.	Make sure the machine is plugged in. Check the status of your INPUT VOLTAGE INDICATOR. It should be illuminated. Check the voltage of your outlet. If it is 10% more or less than optimal, call a qualified electrician.
	ON/OFF SWITCH is in the OFF position.	Turn the ON/OFF SWITCH to the ON position.
	Circuit breaker has been tripped.	Make sure the circuit breaker has been reset.
Feed motor operates but wire will not feed.	Insufficient feed drive roller pressure.	Adjust drive roller pressure.
	Burr on end of wire.	Re-cut wire so it is square with no burr.
	Liner blocked or damaged.	Clear with compressed air or replace liner.
	Despooler tension too high.	Adjust despooler tension.
Wire feeding works but no arc start	Bad ground or loose ground connection.	Check connection of the ground cable to the work clamp. Tighten cable connection to work clamp if needed. Ensure that the connection between the work clamp and workpiece is good and is on clean, bare (not painted or rusted) metal.
	Trigger not pulled while wire is in contact with workpiece.	Pull the trigger while in contact with the workpiece. The machine does not arc unless the trigger is pulled.
Poor quality welds.	Insufficient gas at weld area.	Ensure workpiece is clean and dry.
	Rusty, painted, oily or greasy workpiece	Check work clamp/workpiece connection and all connections to the machine.
	Poor ground connection or torch/electrode connection.	Check welding parameters and polarity.
	Incorrect settings.	Check welding parameters and polarity.

MIG Welding Issues

PROBLEM	POSSIBLE CAUSE	COURSE OF ACTION
Arc works but not feeding wire.	No pressure on the drive roller; insufficient or excessive pressure on the drive roller.	Adjust the drive pressure.
	Wire spool is empty.	Check if wire is in place and replace if necessary.
Wire is "bird-nesting" at the drive roller or jamming.	Too much pressure on drive roller.	Adjust the drive pressure.
	The contact tip is clogged or damaged. The contact tip size is too small.	Replace contact tip.
	Worn guides or drive roll alignment.	Replace parts.
Low output or non-penetrating weld.	The welding current is too low.	Adjust welding parameters.
	Wrong type or size wire.	Use correct type and size wire.
	Poor ground connection or gun connection.	Reposition clamp and check cable to clamp connection. Check connection of ground cable, gun, and Wire Polarity Drive Lead.
	Wrong size or worn contact tip	Use correct size contact tip with the corresponding wire. Replace contact tip if worn.
	Input power too low.	Have a qualified electrician verify the voltage at your outlet. If the voltage is appropriate, verify that the circuit wiring is sufficient for the circuit breaker size.
	Stick out too long.	Decrease stick out (the amount the wire extends past the contact tip).
Work clamp, ground cable, and/or welding cable get hot.	Bad ground or loose ground connection.	Check the connection of the work clamp and gun to the machine. Check the connection of the MIG Gun. Check connection of the ground cable to the work clamp. Tighten cable connection to work clamp if needed. Ensure the contact between the work clamp and workpiece is good and on a clean, bare metal surface. Make sure the cable is not damaged.
Gun nozzle arcs to work surface.	Spatter or Slag build-up inside nozzle or nozzle is clogged.	Clean or replace nozzle as needed.
Wire burns back to contact tip.	Wire feed speed is set too low for voltage setting being used.	Increase wire feed speed (turn left knob clockwise).
	Stick-out too short.	Increase stick-out (the amount the wire extends past the contact tip).
	Wrong size contact tip.	Use correct size contact tip.
	Contact tip is clogged or damaged.	Replace contact tip.

TIG Welding Issues

PROBLEM	POSSIBLE CAUSE	COURSE OF ACTION
Poor starting.	Poor work clamp connection.	Check and secure work connection.
Black area along weld bead.	Oily or organic contamination on work piece.	Clean work piece.
	Tungsten electrode may be contaminated.	Grind to clean electrode.
	Leaks in gas line or torch connection.	Check connection.
	Gas tank is near empty.	Replace the gas tank.
Unstable Arc.	Contaminated base metal.	Remove materials like paint, grease, oil, and dirt, including mill scale from base metal.
	Tungsten is contaminated.	Remove 25/64" of contaminated tungsten and regrind the tungsten.
	Arc length too long.	Lower torch so that the tungsten is off of the work piece 5/64"-13/64"(2-5mm).
Arc wanders.	Tungsten incorrect or in poor condition.	Check that correct type of tungsten is being used. Remove tungsten 3/4" from the weld end and re-sharpen the tungsten.
	Insufficient gas shielding.	Check and set the gas flow between 20-30CFH flow rate.
	Contaminated gas or leaks in gas line, torch, or connections.	Check gas line & connections.
	Poorly prepared tungsten.	Recommend tungsten grind angles range from 15 to 60 degrees based on the type of metal, joint design and penetration you desire. Standard is 30 degrees.
	Contaminated base metal.	Remove contaminating materials like paint, grease, oil, and dirt, including mill scale from base metal.
	Contaminated/Incorrect filler.	Check the filler wire and remove all grease, oil, or moisture from filler metal.

TIG Welding Issues

PROBLEM	POSSIBLE CAUSE	COURSE OF ACTION
TIG does not initiate an arc.	No gas, incorrect gas flow.	Check the gas is connected and cylinder valve open, check hoses, gas valve and torch are not restricted. Set the gas flow between 20~30CFH flow rate.
	Poor work clamp connection.	Check & secure work clamp.
	Contaminated Tungsten.	Grind to clean Tungsten.
	Loose connection.	Check all connectors and tighten.
	Earth clamp not connected to work.	Connect the work clamp directly to the work piece wherever possible.
Tungsten burning away quickly.	Incorrect Gas/Inadequate gas flow.	Check the gas cylinder contains pure Argon gas and is connected. Set the gas flow between 20~30CFH flow rate.
	Back cap not fitted correctly.	Make sure the torch back cap is fitted so that the o-ring is inside the torch body.
	Incorrect tungsten being used.	Check and change the tungsten type if necessary.
Contaminated tungsten.	Touching tungsten into the weld pool.	Keep tungsten from contacting weld puddle. Raise the torch so that the tungsten is off of the work piece 5/64"~13/64"(2~5mm).
	Touching the filler wire to the tungsten.	Keep the filler wire from touching the tungsten during welding, feed the filler wire into the leading edge of the weld pool in front of the tungsten.
	Tungsten melting into the weld pool.	Check that correct type of tungsten is being used. Too much current for the tungsten size so reduce the amps or change to a larger tungsten.

STICK Welding Issues

PROBLEM	POSSIBLE CAUSE	COURSE OF ACTION
Poor starting.	Poor work clamp connection.	Check and secure work connection
Stick electrode “blasts off” when arc is struck.	Current may be set too high for electrode size.	Adjust current.
Electrode “stick” in weld puddle.	Current may be set too low for electrode size.	Adjust current.
Porosity – small cavities or holes resulting from gas pockets in weld metal.	Arc length too long.	Reduce arc length.
	Damp electrode.	Use dry electrode.
	Workpiece dirty.	Remove all grease, oil, moisture, rust, paint, coatings, slag, and dirt from work surface before welding.
Excessive Spatter – scattering of molten metal particles that cool to solid form near weld bead.	Amperage too high for electrode.	Decrease amperage or select larger electrode.
	Arc length too long or voltage too high.	Reduce arc length or voltage.
Incomplete Fusion – failure of weld metal to fuse completely with base metal or a preceeding weld bead.	Insufficient heat input.	Increase amperage. Select larger electrode and increase amperage.
	Improper welding technique.	Place stringer bead in proper location at joint during welding.
		Momentarily hold arc on groove side walls when using weaving technique.
		Keep arc on leading edge of weld puddle.
	Workpiece dirty.	Remove all grease, oil, moisture, rust, paint, coatings, slag, and dirt from workpiece surface before welding.
Lack Of Penetration – shallow fusion between weld metal and base metal.	Improper joint preparation.	Material too thick. Joint preparation and design must provide access to bottom of groove.
	Improper weld technique.	Keep arc on leading edge of weld puddle.
	Insufficient heat input.	Increase amperage. Select larger electrode and increase amperage.
		Reduce travel speed.
Burn Through – weld metal melting completely through base metal resulting in holes where no metal remains.	Excessive heat input.	Select lower amperage. Use smaller electrode.
		Increase or maintain steady travel speed.

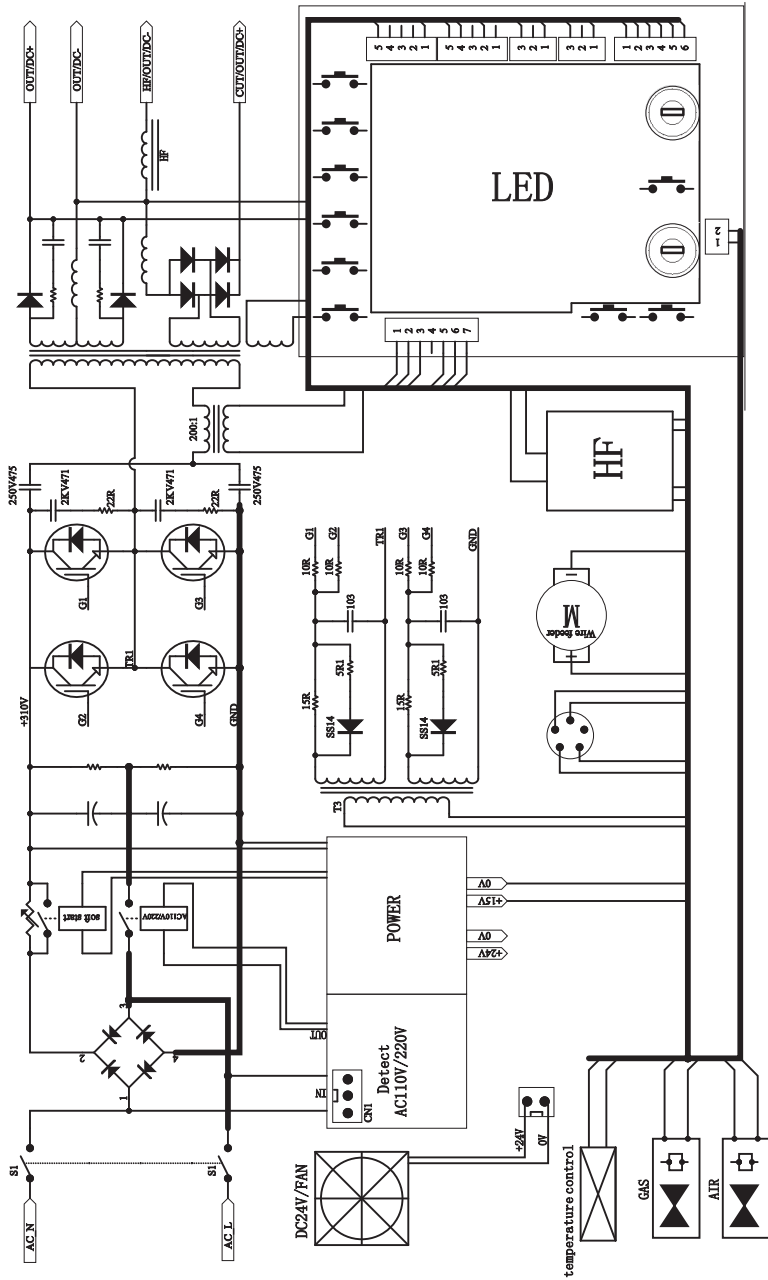
CUT Welding Issues

PROBLEM	POSSIBLE CAUSE	COURSE OF ACTION
The arc does not transfer to the workpiece.	Insufficient work clamp contact with the workpiece.	Clean the area where the work clamp attaches to the workpiece to ensure a good metal to metal connection. Inspect the work clamp and its lead for damage, repair or replace as necessary.
	Improper cutting technique.	1. Brace the cutting hand to steady cutting hand, provides freedom of movement in all directions and helps maintain a constant 1/16" to 1/8" standoff. 2. Place the torch close and start cut from the edge of the metal with a roll 45-to-90 degree roll in case the sparks blow up into the torch.
	Plasma torch may not be in contact with the workpiece.	Be sure to physically drag the cutting nozzle on the workpiece as you cut.
Poor cut quality.	Improper use of Plasma torch.	Review operating instructions.
	Plasma torch parts are worn out.	Examine the consumables for wear and replace worn parts with new consumable parts.
	Moisture or oil in air supply.	Excessive humidity or oil from the compressor may be contaminating the air supply. Install a moisture filter in the air supply line prior to machine.
Insufficient cut penetration.	Cutting speed too fast.	Decrease your torch travel speed.
	Plasma torch is too tilted.	Ensure that Plasma torch head is perpendicular to the workpiece.
	Workpiece is too thick.	Choose thinner workpiece material within the operational limits of the plasma cutting machine.
	Cutting current too low.	Turn current setting up.
		Ensure plasma cutting machine has proper input power.
		If used, eliminate or reduce length of extension cord.
	Plasma torch parts are worn out.	Examine the consumables for wear and replace worn parts with new consumable parts.
	Non-genuine manufacturer's parts.	Use only genuine consumables for optimum performance.
	Insufficient air flow or pressure.	Check for obstructions blocking air flow and ensure that there are 12 inches of clearance between any obstacles and the vents on all sides of the machine.

CUT Welding Issues

PROBLEM	POSSIBLE CAUSE	COURSE OF ACTION
Excessive dress.	Cutting speed too slow (bottom dress).	Increase your torch travel speed.
	Cutting speed too fast (top dress).	Decrease your torch travel speed.
	Cutting current too low.	Ensure plasma cutting machine has proper input power.
		If used, eliminate or reduce length of extension cord.
	Plasma torch parts are worn out.	Examine the consumables for wear and replace worn parts with new consumable parts.
	Non-genuine manufacturer's parts.	Use only genuine consumables for optimum performance.
Excessive wear of the cutting nozzle or electrode.	Air pressure too low.	Inspect air compressor, air lines, and filters for proper operation.
		Inspect consumables for obstructions and proper installation.
	Exceeding plasma cutting machine capability (material too thick).	Choose thinner workpiece material within the operational limits of the plasma cutting machine.
	Moisture or oil in air supply.	Excessive humidity or oil from the compressor may be contaminating the air supply. Install a moisture filter in the air supply line prior to machine.
	Improperly assembled or loose Plasma torch consumables	Check Plasma torch consumables for proper installation.
	Damaged Plasma torch consumable.	Check plasma torch consumables for damage and replace if damaged.
	Non-genuine manufacturer's parts.	Use only genuine consumables for optimum performance.
Tilted cut edge angle (not perpendicular).	Plasma torch position not correct.	Ensure that plasma torch head is perpendicular to the workpiece.
	Workpiece thickness is near the capacity of the machine.	Cut thinner material.
	Asymmetric wear of cutting nozzle hole or wrong assemblage of the plasma torch parts.	Check plasma torch consumables for wear and proper installation.
		Examine the consumables for wear and replace worn parts with new consumable parts.

WIRING DIAGRAM



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