CHICAGO ELECTRIC® welding systems

DUAL MIG WELDER

Model 97503

SET UP AND OPERATING INSTRUCTIONS

Diagrams within this manual may not be drawn proportionally.

Due to continuing improvements, actual product may differ slightly from the product described herein.

Distributed exclusively by Harbor Freight Tools®.

3491 Mission Oaks Blvd., Camarillo, CA 93011

Visit our website at: http://www.harborfreight.com

Read this material before using this product. Failure to do so can result in serious injury. SAVE THIS MANUAL.

For technical questions or replacement parts, please call 1-800-444-3353.

CONTENTS

SAVE THIS MANUAL

Keep this manual for the safety warnings and precautions, assembly, operating, inspection, maintenance and cleaning procedures. Write the product's serial number in the back of the manual near the assembly diagram (or month and year of purchase if product has no number). Keep this manual and the receipt in a safe and dry place for future reference.

IMPORTANT SAFETY INFORMATION

In this manual, on the labeling, and all other information provided with this product:

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠DANGER **DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.**

⚠WARNING **WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.**

⚠CAUTION **CAUTION, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.**

NOTICE **NOTICE is used to address practices not related to personal injury.**

CAUTION **CAUTION, without the safety alert symbol, is used to address practices not related to personal injury.**

General Safety Rules

WARNING! Read all instructions Failure to follow all instructions listed below may result in electric shock, fire, and/or serious injury. The term "power tool" in all of the warnings listed below refers to your line-operated (corded) Dual MIG Welder.

SAVE THESE INSTRUCTIONS

1. Work area safety

a. Keep work area clean and well lit. *Cluttered or dark areas invite accidents.*

b. Do not operate power tools in explosive atmospheres, such as in the presence of flammable liquids, gases or dust. *Power tools create sparks which may ignite the dust or fumes.*

c. Keep children and bystanders away while operating a power tool. *Distractions can cause you to lose control.*

2. Electrical safety

a. Avoid body contact with grounded surfaces such as pipes, radiators, ranges and refrigerators. There is an increased risk of electric shock if your body is grounded.

b. Do not expose power tools to rain or wet conditions. Water entering a power tool will increase the risk of electric shock.

c. Do not abuse the cord. Never use the cord for pulling or unplugging the power tool. Keep cord away from heat, oil, sharp edges or moving parts. Damaged or entangled cords increase the risk of electric shock.

d. When operating a power tool outdoors, use an extension cord suitable for outdoor use. Use of a cord suitable for outdoor use reduces the risk of electric shock.

3. Personal safety

a. Stay alert, watch what you are doing and use common sense when operating a power tool. Do not use a power tool while you are tired or under the influence of drugs, alcohol or medication. *A moment of inattention while operating power tools may result in serious personal injury.*

b. Use safety equipment. Always wear eye protection. *Safety equipment such as arc shaded, impact safety full face shield, dust mask or respirator, heavy-duty work gloves, non-skid safety shoes, or hearing protection used for appropriate conditions will reduce personal injuries.*

c. Avoid accidental starting. Ensure the switch is in the off-position before plugging in. *Carrying power tools with your finger on the switch or plugging in power tools that have the switch on invites accidents.*

d. Remove any adjusting key or wrench before turning the power tool on. *A wrench or a key left attached to a rotating part of the power tool may result in personal injury.*

e. Do not overreach. Keep proper footing and balance at all times. *This enables better control of the power tool in unexpected situations.*

4. Power tool use and care

a. Do not force the power tool. Use the correct power tool for your application. *The correct power tool will do the job better and safer at the rate for which it was designed.*

b. Do not use the power tool if the switch does not turn it on and off. *Any power tool that cannot be controlled with the switch is dangerous and must be repaired.*

c. Disconnect the plug from the power source before making any adjustments, changing accessories, or storing power tools. *Such preventive safety measures reduce the risk of starting the power tool accidentally.*

d. Store idle power tools out of the reach of children and do not allow persons unfamiliar with the power tool or these instructions to operate the power tool. *Power tools are dangerous in the hands of untrained users.*

e. Maintain power tools. Check for misalignment or binding of moving parts, breakage of parts and any

other condition that may affect the power tool's operation. If damaged, have the power tool repaired before use. *Many accidents are caused by poorly maintained power tools.*

f. Use the power tool, accessories and tool bits etc., in accordance with these instructions and in the manner intended for the particular type of power tool, taking into account the working conditions and the work to be performed. *Use of the power tool for operations different from those intended could result in a hazardous situation.*

5. Service

a. Have your power tool serviced by a qualified repair person using only identical replacement parts. *This will ensure that the safety of the power tool is maintained*.

Specific Safety Rules

1. Maintain labels and nameplates on the tool. These carry important safety information. If unreadable or missing, contact Harbor Freight Tools for a replacement.

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

3. Avoid eye and body damage. Arc rays and infrared radiation can injure eyes and burn skin. Wear ANSI approved eye and body protection. Do not allow viewing by visitors without proper eye and body protection. Use a Face Shield with arc shaded filter plate.

4. Move flammable and explosive material at least 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.

5. Avoid unintentional starting. Prepare to begin work before turning on the tool.

6. Do not leave the tool unattended when it is plugged into an electrical outlet. Turn off the tool, and unplug it from its electrical outlet before leaving.

7. Use clamps (not included) or other practical ways to secure and support the work piece to a stable platform. Holding the work by hand or against your body is unstable and may lead to loss of control.

8. This product is not a toy. Keep it out of reach of children.

9. Industrial applications must follow OSHA guidelines.

10. People with pacemakers should consult their physician(s) before use. Electromagnetic fields in close proximity to heart pacemaker could cause pacemaker interference or pacemaker failure. In addition, people with pacemakers should:

• Avoid operating alone.
• Do not use with power switch locked on.
• Properly maintain and inspect to avoid electrical shock.
• Any power cord must be properly grounded. Ground Fault Circuit Interrupter (GFCI) should also be implemented – it prevents sustained electrical shock.

11. WARNING: This product, when used for welding, plasma cutting, soldering, or similar applications, produces chemicals known to the State of California to cause cancer and birth defects (or other reproductive harm). (California Health & Safety Code § 25249.5, *et seq.*)

12.  Cylinders can explode when damaged:
- Never weld on a pressurized or a closed cylinder.
- Never lay a welding torch on a cylinder.
- Never allow a welding electrode to touch the cylinder.
- Keep cylinders away from any electrical circuits, including welding circuits.
- Keep protective cap in place over the valve except when the cylinder is in use.
- Use only correct gas shielding equipment designed specifically for the type of welding you will do. Maintain this equipment properly.
- Protect gas cylinders from heat, being struck, physical damage, slag, flames, sparks, and arcs.
- Always use proper procedures to move cylinders.

13.  Prevent eye injury and burns. Wearing and using ANSI-approved personal safety clothing and safety devices reduce the risk for injury.
- Wear ANSI-approved safety eye goggles underneath welding eye protection featuring at least a Number 10 shade lens rating.
- Leather leggings, fire resistant shoes or boots should be worn when using this product. Do not wear pants with cuffs, shirts with open pockets, or any clothing that can catch and hold molten metal or sparks.
- Keep clothing free of grease, oil, solvents, or any flammable substances. Wear dry, insulating gloves and protective clothing.
- Wear an approved head covering to protect the head and neck. Use aprons, cape, sleeves, shoulder covers, and bibs designed and approved for welding and cutting procedures.
- When welding/cutting overhead or in confined spaces, wear flame resistant ear plugs or ear muffs to keep sparks out of ears.

14.  **Prevent accidental fires.** Remove any combustible material from the work area.
- When possible, move the work to a location well away from combustible materials. If relocation is not possible, protect the combustibles

with a cover made of fire resistant material.

- Remove or make safe all combustible materials for a radius of 35 feet (10 meters) around the work area. Use a fire resistant material to cover or block all open doorways, windows, cracks, and other openings.
- Enclose the work area with portable fire resistant screens. Protect combustible walls, ceilings, floors, etc., from sparks and heat with fire resistant covers.
- If working on a metal wall, ceiling, etc., prevent ignition of combustibles on the other side by moving the combustibles to a safe location. If relocation of combustibles is not possible, designate someone to serve as a fire watch, equipped with a fire extinguisher, during the cutting process and for at least one half hour after the cutting is completed.
- Do not weld or cut materials having a combustible coating or combustible internal structure, as in walls or ceilings, without an approved method for eliminating the hazard.
- Do not dispose of hot slag in containers holding combustible materials. Keep a fire extinguisher nearby and know how to use it.
- After spot welding, make a thorough examination for evidence of fire. Be aware that easily-visible smoke or flame may not be present for some time after the fire has started. Do not weld or cut in atmospheres containing dangerously reactive or flammable gases, vapors, liquids, and dust. Provide adequate ventilation in work areas to prevent accumulation of flammable gases, vapors, and dust. Do not apply heat to a container that has held an unknown substance or a combustible material whose contents, when heated, can produce flammable or explosive vapors. Clean and purge containers before applying heat. Vent closed containers, including castings, before preheating, welding, or cutting.

15. Do not touch live electrical parts. Wear dry, insulating gloves. Do not touch electrode or conductor tong with bare hand. Do not wear wet or damaged gloves.

16. Protect yourself from electric shock. Do not use outdoors. Insulate yourself from the work piece and ground. Use nonflammable, dry insulating material if possible, or use dry rubber mats, dry wood or plywood, or other dry insulating material big enough to cover your full area of contact with the work or ground.

17. Ensure that the unit is placed on a stable location before use. If this unit falls while plugged in, severe injury, electric shock, or fire may result.

18. Ground this product. This Welder requires the attachment and use of a UL-listed, 240 volt grounded, 3-prong, electrical Power Cord Plug (not included). Only a qualified electrician should install the Power Cord Plug. Never remove the grounding prong or modify the Power Cord Plug in any

way. Do not use adapter plugs with this product.

19. Avoid overexposure to fumes and gases. Always keep your head out of the fumes. Do not breathe the fumes. Use enough ventilation or exhaust, or both, to keep fumes and gases from your breathing zone and general area.
    - Where ventilation is questionable, have a qualified technician take an air sampling to determine the need for corrective measures. Use mechanical ventilation to improve air quality. If engineering controls are not feasible, use an approved respirator.
    - Follow OSHA guidelines for Permissible Exposure Limits (PEL's) for various fumes and gases.
    - Follow the American Conference of Governmental Industrial Hygienists recommendations for Threshold Limit Values (TLV's) for fumes and gases.
    - Have a recognized specialist in Industrial Hygiene or Environmental Services check the operation and air quality and make recommendations for the specific welding or cutting situation.

⚠WARNING

INHALATION HAZARD:
Welding and Plasma Cutting Produce TOXIC FUMES.

Exposure to welding or cutting exhaust fumes can increase the risk of developing certain cancers, such as cancer of the larynx and lung cancer. Also, some diseases that may be linked to exposure to welding or plasma cutting exhaust fumes are:

- Early onset of Parkinson's Disease
- Heart disease
- Ulcers
- Damage to the reproductive organs
- Inflammation of the small intestine or stomach
- Kidney damage
- Respiratory diseases such as emphysema, bronchitis, or pneumonia

Use natural or forced air ventilation and wear a respirator approved by NIOSH to protect against the fumes produced to reduce the risk of developing the above illnesses.

20. The warnings, precautions, 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.

⚠ SAVE THESE INSTRUCTIONS.

SPECIFICATIONS

Welding Current	30 ~ 120 amps
Duty Cycle	20% at 105 amps; 40% at 75 amps; 90% at 50 amps; 100% at 30 amps
Input Power	230 VAC, 21 amps (Peak) at 60 Hz
Open Circuit Voltage (max)	36 VDC
Thermal Overload Protection with Light	Automatic shutdown and restart after cool down
Wire Size	0.023 to 0.030 inch steel and stainless steel; 0.030 to 0.035 inch flux core and aluminum
Welding Capacity	22 gauge to 3/16" Steel
Wire Spool Size	2 lb. Spool
Weight	62.2 lbs.

UNPACKING

When unpacking, check to make sure that the item is intact and undamaged. If any parts are missing or broken, please call Harbor Freight Tools at the number shown on the cover of this manual as soon as possible.

List of contents

Description	Qty
Dual MIG Welder	1
Wheel	2
Axle	1
0.030" (0.8mm) Welding Tip	1
0.040 (1.0mm) Welding Tip	1
2 Pounds (0.030") Flux Core Wire	1
Hand Held Shaded Face Shield	1
Brush Hammer	1
Welder Tip Close End Wrench	1
24" Strap For Gas Bottle	2

INITIAL SET UP INSTRUCTIONS

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 of the tool to its "OFF" position and unplug the tool from its electrical outlet before assembling or making any adjustments to the tool.

Note: For additional information regarding the parts listed in the following pages, refer to the Assembly Diagram near the end of this manual.

Assembly

1. Slide the Axle (29) through the holes at the rear of the unit.
2. Secure both Wheels (28) to the Axle with the Locking Rings (42).
3. Lift up the Side Panel B (1) to expose the wire spool and Wire Feed Mechanism (10). Pull back on the Feed Tensioner (CC) to free the Feed Tension Arm (DD) and lift it up. Remove Wire Feed Wheel Cover (AA) screws, pull out the cover, and pull out the Wire Feed Wheel (BB). See photo page 10.
4. Note the two parallel grooves (one is wider) on the circumference of the Wire Feed Wheel (BB). On the sides

of the wheel, reference markings 0.6 or 0.8 are stamped. They corresponding with wire sizes: 0.6 = 0.023", and 0.8 = 0.030" and 0.035". The groove facing to the inside of the Wire Feed Mechanism (10) should correspond with the size of wire used. Align the axle key with the slot in the Wire Feed Wheel and slide on the Wire Feed Spool (BB). Replace Wire Feed Wheel Cover (AA), the two screws and tighten. See photo on this page.

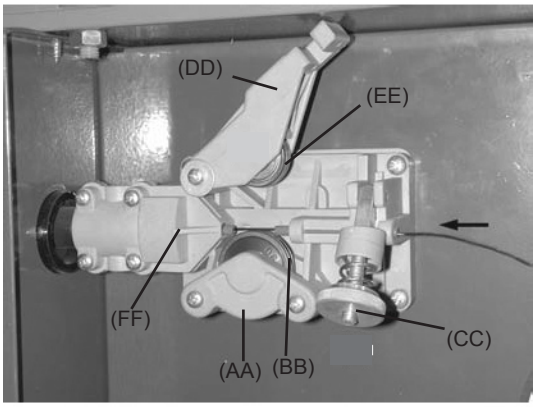
5. Lay the Welding Torch Cable (16) in a straight line, perpendicular to the welder unit, as much as possible. This will prevent the wire from puncturing the Welding Torch Cable (16) when exiting the Wire Feed Housing Throat (FF). See photo on this page.

6. Remove the wing nut and the spool axle nut from the Wire Spool Axle (10). Make sure that the coil spring is inserted onto the Spool Axle, and place a spool with wire over the axle, noting that the wire winding must be in a counterclockwise direction. Replace the Spool Axle Nut (10), the wing nut, and tighten. Verify free rotation of the spool over the axle.

Loading and adjusting the wire tension.

7. **CAUTION:** 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 spring backward and tangle. The end of the wire should be straight and have no burrs.

8. Twist off and pull to remove the Nozzle and unscrew the Contact tip of the Welder.



Wire Feed Mechanism

9. Guide the tip through the feed tube until it protrudes the Wire Feed Wheel opening. Direct and feed at least an inch of wire into the Wire Feed Housing Throat (FF).

10. Close Wire Feed Mechanism (10) over the wire, and adjust Feed Tension Knob (D) until there is a slight resistance on the wire.

11. Remove the nozzle and contact tip of the Welder.

⚠DANGER **The following steps require applying power to the Welder. Do not touch anything with the Torch Handle or Welding Wire or an arc will be ignited. Do not touch the internal components of the unit while it is powered.**

12. Plug the Power Cord into a grounded 230 volt electrical outlet and turn the Welder ON.

13. Point the Torch Handle away from all objects. Squeeze the Trigger Switch

on the Torch Handle until the Welding Wire feeds into the Torch Handle about 2 inches. If necessary, move the Torch Handle slightly in a circular motion to help feed the Welding Wire properly out of the Head Tube.

14. If the Welding Wire does not feed and the Spool is stationary, turn the Welder off and unplug it. Tighten the Tension Adjusting Knob on the Wire Feed Assembly, and rewind the Welding Wire slightly before retrying.

15. Feed the Welding Wire against scrap wood that is 2 to 3 inches away. If the Wire stops instead of bending, turn the Welder OFF and unplug it. Tighten the Tension Adjusting Knob more.

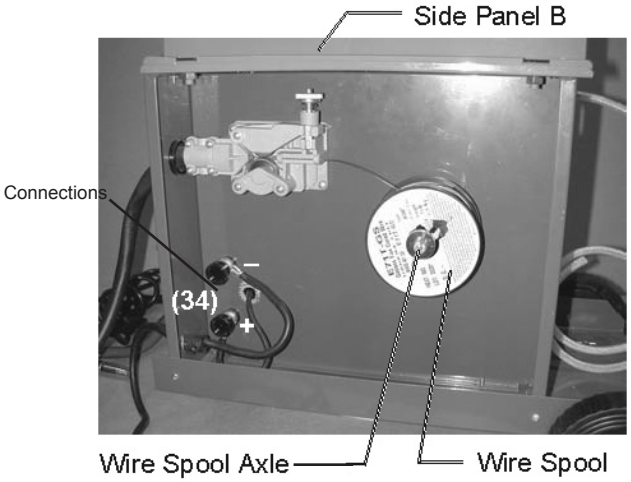
16. Turn the Welder OFF, unplug it, and discharge the electrode to ground. Insert the contact tip onto the Welding Wire and screw it firmly in place. Replace the Nozzle and cut off any excess Welding Wire over 1/2 inch.

17. Check that +/– cables to connection Knobs (34) are correct. See photo this page.

18. When using Non-flux wire and Protective gas, connect Ground cable with clamp to the "-" terminal and the Internal Power cable to "+" terminal. Strap down the Argon / CO2 gas cylinder and connect the hose to the rear of the MIG Welder.

19. When using Flux-core wire (DO NOT USE Protective gas), connect Ground cable with clamp to "+" terminal, and the internal Power cable to "-" terminal.

20. Close the Side Panel B (1).



Installing a gas cylinder

21. Do not use an Argon/Mixed pressure regulator/flow meter with CO2 shielding gas. To use CO2 shielding gas, you must install a CO2 gas pressure regulator/flow meter (neither one included).

22. Thread the provided straps through the slots on the back of the welder. With assistance, set the cylinder onto the shelf at the back of the welder.

23. Secure the cylinder in place with both of the straps.

24. Remove the protective cap from the cylinder. Stand to the side of the cylinder valve, and open the valve slightly to blow dust and dirt from the valve. Close the valve.

25. Make sure the Flow Adjust on the Pressure Regulator/Flow Meter is turned off. Screw the Pressure Regulator/Flow Meter (not included) firmly onto the cylinder valve.

26. Attach the Gas Line to the Pressure Regulator/Flow Meter from the Gas

Inlet located on the Back Panel of the Welder.

27. Adjust the flow rate of the gas by turning the Flow Adjust. The typical flow rate is 10-30 CFH (cubic feet per hour). Check the Welding Wire manufacturer's recommended flow rate.

28. Installation of a line-in, where necessary, and connecting a Twist-lock plug to the Power Cord must be performed by a licensed electrician.

OPERATING INSTRUCTIONS

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.

Tool Set Up

WARNING TO PREVENT SERIOUS INJURY FROM ACCIDENTAL OPERATION:
Turn the switch to its off position before performing any inspection, maintenance, or cleaning procedures.

Work Piece and Work Area Set Up

1. Designate a work area that is clean and well-lit. The work area must not allow access by children or pets to prevent injury and distraction.

2. Route the power cord along a safe route to reach the work area without creating a tripping hazard or exposing the power cord to possible damage. The power cord must reach the work area with enough extra length to allow free movement while working.

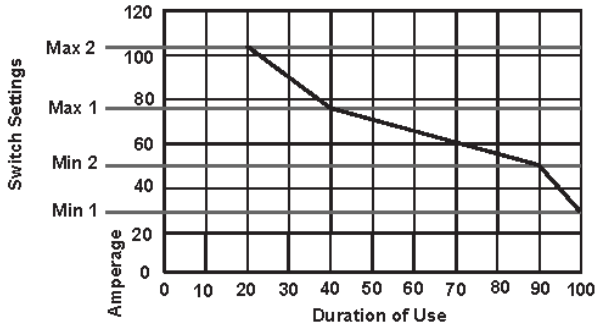
3. Secure loose work pieces using a vise or clamps (not included) to prevent movement while working. The work pieces should be firmly held together and in position while welding. The distance (if any) between the two work pieces must be controlled properly to allow the weld to hold both sides securely while allowing the weld to penetrate fully into the joint.

4. There must not be hazardous objects, such as utility lines or foreign objects, nearby that will present a hazard while working.

5. A barrier, such as a welding curtain or welding shroud should be put up to protect others in the work area and limit the spray of sparks.

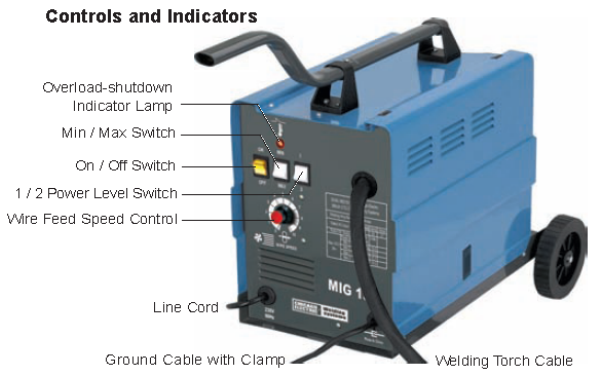
General Operating Instructions

DANGER Protective gear must be worn when using the MIG Welder; ANSI-approved, arc shaded, eye protection, a full face shield, heavy-duty work gloves, a welding apron, respirator, and heavy-duty work clothes without pockets should be worn when using this product. Do not look at the ignited arc without eye protection. Light from the arc can cause permanent damage to the eyes. Light from the arc can burn the skin. Do not breathe arc fumes.



The duty cycle defines the number of minutes, within a 10 minute period, during which a given Welder can safely produce a particular welding current. For example, this Welder, with a 20% duty cycle at 105 Amps (setting Max 2), must be allowed to rest for at least 8 minutes after two minutes of continuous weld at 105 Amps.

- Failure to carefully observe duty cycle limitations can stress a Welder's power generation system, contributing to premature Welder failure.
- This Welder is equipped with an internal thermal protection system to help prevent damage to the unit. When the unit overheats; it automatically shuts down, then returns to service when it cools down.
- Once the unit returns to service, follow a more conservative duty cycle routine to help prevent excess wear to the Welder.



1. Always read and follow wire manufacturer's recommended polarity. If using non-flux core wire, secure the Argon/CO2 gas hose to the rear of the MIG Welder. **(If using flux core wire, protective gas is not required.)**
2. Attach the Ground Cable with Clamp (14) as close as possible to the metal object to be welded.
3. Set the desired current (30~120 amps) for the type of metal being welded with the Temperature Controller. Thin metals use low current and heavy metals use high current.

Set Switch	Amps	Duty Cycle	Volts
Min. / 1	30	100%	15.2
Min. / 2	50	90%	16.5
Max. / 1	75	40%	17.7
Max. / 2	105	20%	19.2

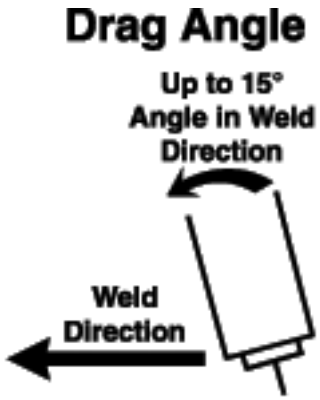
4. Make sure the power switch is off, then plug the MIG Welder Power Cord into a dedicated, 230 VAC, 20 amp line with delayed action type circuit breaker or fuses.
5. While holding the Welding Torch handle, with the electrode wire clear of grounded objects, turn the Power Switch ON.
6. Momentarily press the Welding Torch trigger switch to test the wire feed speed. Adjust the speed by turning the Wire Speed Knob.
7. Hold the Arc Shaded Face Shield over your eyes.
8. Press (and hold) the Torch Trigger Switch and stroke the area to be

welded with the electrode wire to ignite the arc. Never tap the electrode wire into the welding surface to ignite the arc.

9. The Welding Wire should extend no more than 1/2” past the Nozzle of the Welding Torch.

10. The Welding Wire should be directed straight into the joint. This gives an angle of 90 degrees (straight up and down) for groove (end to end) welds, and an angle of 45 degrees for fillet (T-shaped) welds.

11. The end of the Welding Torch should be tilted so that the Welding Wire is angled anywhere in between straight on and 15 degrees in the direction of the weld. The amount of tilt is called the “drag angle”.



12. The wire feeds automatically, and can be changed using the Wire Speed Knob.

13. If too much current is drawn from the MIG Welder, the overload protection will activate, the red overload indicator will light, and the Arc Welder will shut down. If this happens, turn the power Switch OFF and wait about 3 ~ 5 minutes before restarting.

14. When the weld is complete, lift the Welding Torch handle away from any grounded object, remove your Face Shield, and turn the power Switch OFF.

15. Unplug the power cord from the electrical outlet.

16. Read the included weld diagnosis pamphlet for tips and suggestions concerning welding and proper usage.

17. To prevent accidents, turn off the tool and disconnect its power supply after use. Clean, then store the tool indoors out of children’s and unauthorized people’s reach.

Top figures are Voltage Settings.
Bottom number is Wire Speed Setting.

NOTE: The numbers within the spaces are the approximate wire feed/voltage settings recommended* for this wire size and material thickness.

		Material Thickness (Steel)				
		.035”-.047”	.047”-.075”	.075”-.125”	.125”-.157”	.157”-.187”
Wire Size (Flux Core, Mild Steel) Do Not Use Protective Gas	.030”	MIN 1 *1*	MIN 2 *3*	MAX 1 *4*	MAX 1 *6*	MAX 2 6
	.030”	MIN 1 *1*	MIN 2 *2*	MAX 1 *3*	MAX 1 *5*	MAX 2 *5*
Wire Size (Solid Core, Mild Steel) (Use with Protective Gas)	.023”	MIN 2 *4*	MAX 1 *7*	MAX 2 *5*	MAX 2 *8*	
	.030”	MIN 2 *2*	MAX 1 *5*	MAX 1 *6*	MAX 2 *5*	MAX 2 *7*
	.035”	MIN 2 *1*	MAX 1 *2*	MAX 1 *3*	MAX 2 *4*	MAX 2 *5*

MAINTENANCE AND SERVICING

Procedures not specifically explained in this manual must be performed only by a qualified technician.

⚠WARNING TO PREVENT SERIOUS INJURY FROM ACCIDENTAL OPERATION:
Turn the Power Switch of the tool to its "OFF" position and unplug the tool from its electrical outlet before performing any inspection, maintenance, or cleaning procedures.

TO PREVENT SERIOUS INJURY FROM TOOL FAILURE:
Do not use damaged equipment. If abnormal noise or vibration occurs, have the problem corrected before further use.

Cleaning, Maintenance, and Lubrication

1. **BEFORE EACH USE,** inspect the general condition of the tool. Check for loose screws, misalignment or binding of moving parts, cracked or broken parts, damaged electrical wiring, and any other condition that may affect its safe operation.
2. **AFTER USE,** clean external surfaces of the tool with clean cloth.
3. **PERIODICALLY**, open the Access Panel (12) from the unit and, using compressed air, blow out all dust and debris from the interior.
4. **⚠WARNING! If the supply cord of this power tool is damaged, it must be replaced only by a qualified service technician.**

Nozzle Care

1. Turn the Nozzle counterclockwise while pulling to remove.
2. Scrub the interior of the Nozzle clean with a wire brush.
3. Examine the end of the Nozzle. The end should be flat and even. If the end is uneven, chipped, melted, cracked, or otherwise damaged, the Nozzle will adversely effect the weld and should be replaced.
4. Replace the Nozzle after inspecting and cleaning the Contact Tip

Contact Tip Care

1. Make sure the entire Welding Torch is completely cool before proceeding.
2. Remove the Nozzle, as explained above, and the Contact Tip.
3. Scrub the exterior of the Contact Tip clean with a wire brush. Check that the Contact Tip is the proper type for the wire size used.
4. Examine the hole at the end of the Contact Tip for the following problems:
   - Shape: The hole should be an even circle, and should not be oblong or have any bulges in it.
   - Size: The Contact Tip will decrease in efficiency as the center hole

enlarges. A Contact Tip that measures 150% or more the original size* should be replaced. (*.045” or more for .030” Tips; .035” or more for .023 Tips.)

5. If any problems are noted with a Contact Tip, have it replaced.
6. When inspection and maintenance is completed, reinstall the Contact Tip and Nozzle.

Replacing the Welding Torch Liner

1. Switch welder off, disconnect power, and discharge electrode to ground before proceeding.
2. Secure welding wire to the spool, cut it near the spool, and remove it from the torch and cable.
3. Gently twist and slide the Locking Collar off the torch and onto the Protective Sleeve. Slide the Upper Housing forward and off the Lower Housing.
4. Remove the four Screws that hold the Cable Clamp in place. Set aside the Cable Clamp, Screws, and the Liner Sleeve underneath the cable clamp.
5. Lay torch cable out straight to allow the cable to twist within the sleeve.
6. Press in on the Push-lock Coupler and remove the Liner from the gun end.
7. Install a new Liner and Fitting from the gun end with the end without a Fitting first.
8. Attach the Fitting at the end of the Liner to the Push-lock Coupler on the Switch Body.
9. Slide the Liner Sleeve back onto the end of the liner. Reinstall the Cable Clamp and Screws. Trim off the Liner that extends past the Clamp.
10. Make sure that all torch parts lay back into place properly including the Protective Sleeve, Head Tube, and Trigger. See Assembly Diagram. While all parts are properly in place, carefully put the Upper Housing back onto the Lower Housing and slide back to secure. Slide the Locking Collar back onto the Housings and twist to secure.
11. Check the Torch carefully for proper operation.
12. Route the Wire as instructed in the Loading and Adjusting the Wire Tension Section.

TROUBLESHOOTING

⚠DANGER **Important!** Be CERTAIN to shut off the Welder, disconnect it from power, and discharge the torch to ground before adjusting, cleaning, or repairing the unit.

Wire feed motor runs but wire does not feed properly.

Possible Causes and Solutions:

- Insufficient wire feed pressure:
  Increase wire feed pressure.
- Incorrect wire feed roll size:
  Replace with the proper size.
- Damaged torch, cable, or liner assembly:
  Have a qualified technician inspect these parts and replace as necessary.

Wire creates a bird's nest During operation.

Possible Causes and Solutions:

- Excess wire feed pressure:
  Adjust wire feed pressure.
- Incorrect contact tip size:
  Replace with the proper tip for the wire size used.
- Gun end not inserted into drive housing properly:
  Loosen gun securing bolt and push gun end into housing just enough so that it does not touch wire feed mechanism.
- Damaged liner:
  Have a qualified technician inspect and repair/replace as necessary.

Welding arc not stable.

Possible Causes and Solutions:

- Wire not feeding properly:
  See first Troubleshooting section above.
- Incorrect contact tip size:
  Replace with the proper tip for the wire size used.
- Incorrect wire feed speed:
  Adjust wire feed speed to achieve a more stable arc.
- Loose torch cable or ground cable:
  Check to ensure that all connections are tight.
- Damaged torch or loose connection within torch:
  Have a qualified technician inspect and repair/replace as necessary.

Welder does not function when switched on

Possible Causes and Solutions:

- Tripped thermal protection device:
  Shut the welder's switch to off and allow it to cool for at least 20 minutes.
  Reduce duration or frequency of welding periods to help reduce wear on the welder.
  Refer to Duty Cycle section.
- Faulty or improperly connected Switch Body:
  Have a technician check and secure/replace Switch Body.
- Internal fuse blown:
  Have a qualified technician check/ replace.

Weak Arc strength

Possible Cause and Solution:

- Incorrect line voltage:
  Check the line voltage and, if insufficient, have a licensed electrician remedy the situation.

Wire Feeds, but arc does not ignite

Possible Causes and Solutions:

- Improper ground connection:
  Make certain that the work piece is contacted properly by the Ground Clamp and that the work piece is properly cleaned near the ground clamp and the welding location.
- Improperly sized or excessively worn Contact Tip:
  Verify that Contact Tip is the proper size for the welding wire used. Check that the hole in the tip is not deformed, enlarged, or dirty. If needed, replace Contact Tip with proper size and type.

Wire Feeds, but Shielding gas does not Flow

Possible Causes and Solutions:

- Empty Gas Cylinder:
  Check gas cylinder.
- Nozzle Plugged:
  Clean nozzle. If damaged, replace.
- Regulator or cylinder valve closed:
  Make sure both valves are adjusted properly.
- Gas line blocked:
  Check external hose, and hose within Torch cable.
- Gas solenoid broken or not connected properly:
  Have a qualified technician check/ replace.

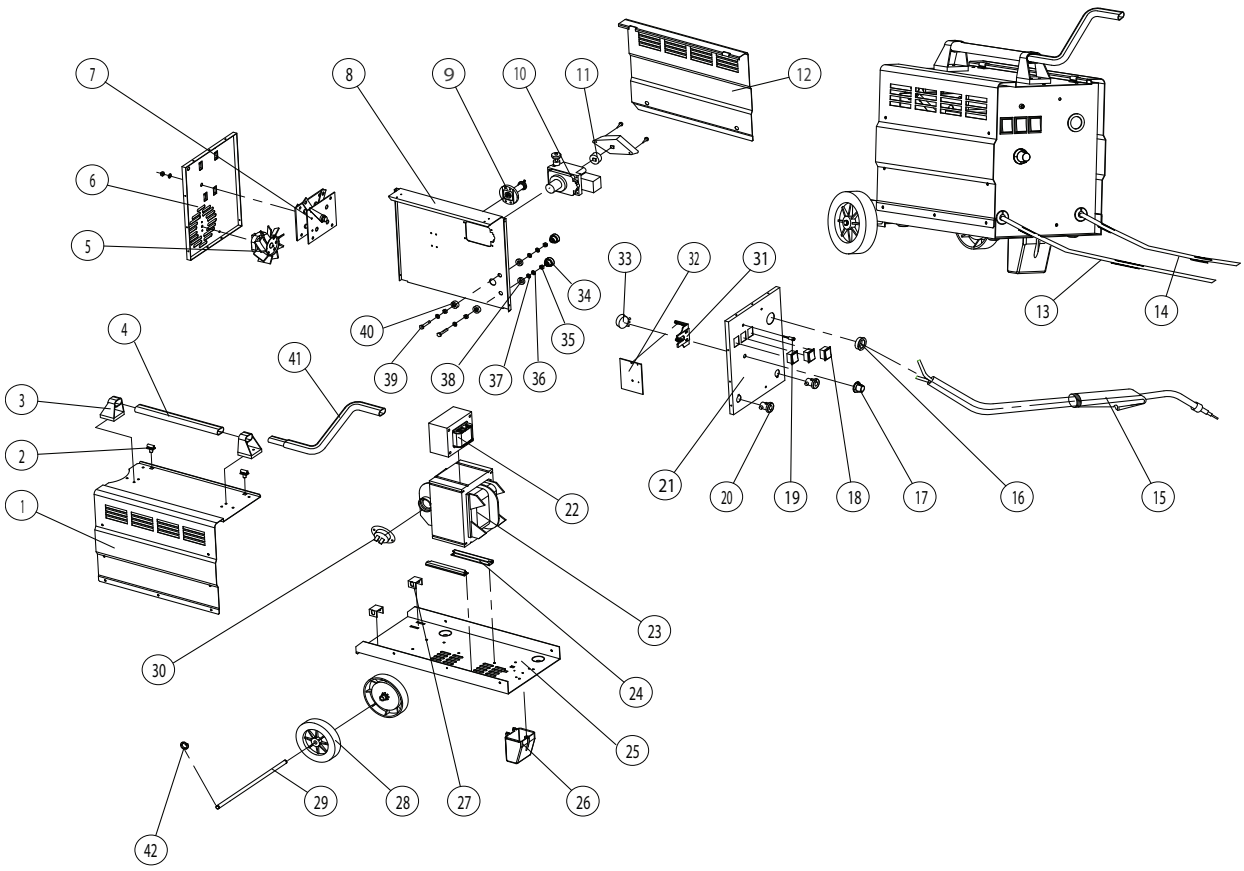
PLEASE READ THE FOLLOWING CAREFULLY

THE MANUFACTURER AND/OR DISTRIBUTOR HAS PROVIDED THE PARTS LIST AND ASSEMBLY DIAGRAM IN THIS MANUAL AS A REFERENCE TOOL ONLY. NEITHER THE MANUFACTURER OR DISTRIBUTOR MAKES ANY REPRESENTATION OR WARRANTY OF ANY KIND TO THE BUYER THAT HE OR SHE IS QUALIFIED TO MAKE ANY REPAIRS TO THE PRODUCT, OR THAT HE OR SHE IS QUALIFIED TO REPLACE ANY PARTS OF THE PRODUCT. IN FACT, THE MANUFACTURER AND/OR DISTRIBUTOR EXPRESSLY STATES THAT ALL REPAIRS AND PARTS REPLACEMENTS SHOULD BE UNDERTAKEN BY CERTIFIED AND LICENSED TECHNICIANS, AND NOT BY THE BUYER. THE BUYER ASSUMES ALL RISK AND LIABILITY ARISING OUT OF HIS OR HER REPAIRS TO THE ORIGINAL PRODUCT OR REPLACEMENT PARTS THERETO, OR ARISING OUT OF HIS OR HER INSTALLATION OF REPLACEMENT PARTS THERETO.

PARTS LIST AND ASSEMBLY DIAGRAM

Part	Description
1	Side Panel B
2	Hinge
3	Handle Socket
4	Straight Handle
5	Fan
6	Back Panel
7	Rectifier Rack
8	Clap Panel
9	Wire Spool Axle
10	Wire Feed Mechanism
11	Wire Feed Wheel
12	Side Panel A
13	Power Cord
14	Ground Cable With Clamp
15	Welding Torch / Cable
16	Cover
17	Wire Speed Knob
18	Switch
19	Overload Light
20	Cable Nib
21	Front Panel

Part	Description
22	Filter Reactor
23	Main Transformer
24	Transformer Carriage
25	Bottom Plate
26	Plastic Foot
27	Axle Bracket
28	Wheel, Plastic
29	Axle
30	Temperature Controller
31	Control Circuit Board Bracket
32	Control Circuit Board
33	Potentiometer
34	Knob
35	Nut, Copper, M6
36	Washer, Spring, 6
37	Washer, Copper, Plain,6
38	Washer, Insulating, 1
39	Screw, Copper, M6X35
40	Washer, Insulating, 2
41	Brace
42	Rings, 8



LIMITED 1 YEAR / 90 DAY WARRANTY

Harbor Freight Tools Co. makes every effort to assure that its products meet high quality and durability standards, and warrants to the original purchaser that for a period of ninety days from date of purchase that the torch, liner, wire feed mechanism (if applicable), welding clamps, electrode holders, cables and accessories packed with the welder are free of defects in materials and workmanship. **This Limited 90 Day/1 Year Warranty shall not apply to consumable parts such as tips, welding wire, and gas nozzles.** Harbor Freight Tools also warrants to the original purchaser, for a period of one year from date of purchase, that the transformer and rectifier are free from defects in materials and workmanship (90 days if used by a professional contractor or if used as rental equipment). This warranty does not apply to damage due directly or indirectly to misuse, abuse, negligence or accidents, repairs or alterations outside our facilities, normal wear and tear, or to lack of maintenance. We shall in no event be liable for death, injuries to persons or property, or for incidental, contingent, special or consequential damages arising from the use of our product. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation of exclusion may not apply to you. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

To take advantage of this warranty, the product or part must be returned to us with transportation charges prepaid. Proof of purchase date and an explanation of the complaint must accompany the merchandise. If our inspection verifies the defect, we will either repair or replace the product at our election or we may elect to refund the purchase price if we cannot readily and quickly provide you with a replacement. We will return repaired products at our expense, but if we determine there is no defect, or that the defect resulted from causes not within the scope of our warranty, then you must bear the cost of returning the product.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

3491 Mission Oaks Blvd. • PO Box 6009 • Camarillo, CA 93011 • (800) 444-3353

Record Product's Serial Number Here:_____

Note: If product has no serial number, record month and year of purchase instead.

Note: Some parts are listed and shown for illustration purposes only, and are not available individually as replacement parts.