UNITOR

OM-244 324A

2009–04

Processes

TIG (GTAW) Welding

Stick (SMAW) Welding

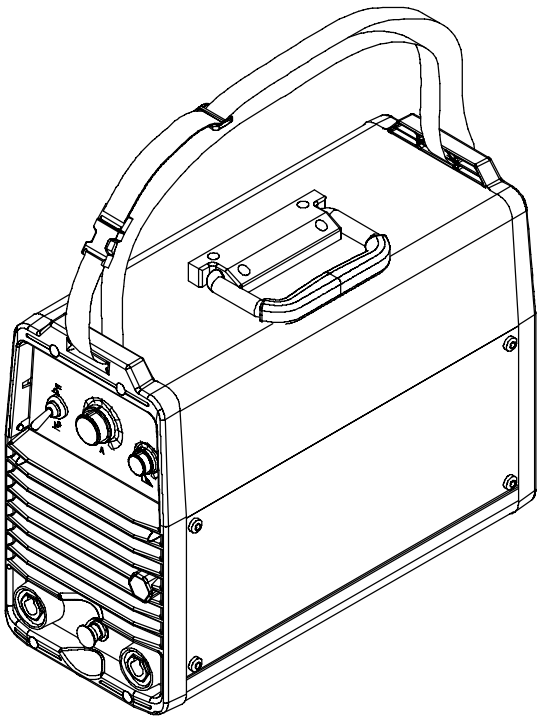
Description

3 Phase DC CC

Arc Welding Power Source

UNITOR UWI 202

CE



OWNER'S MANUAL

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DECLARATION OF CONFORMITY

for European Community (CE marked) products.

ITW Welding Products Italy S.r.l. Via Privata Iseo 6/E, 20098 San Giuliano M.se, (MI) Italy declare that the product(s) identified in this declaration conform to the essential requirements and provisions of the stated Council Directive(s) and Standard(s).

Product/Apparatus Identification:

Product	Stock Number
Unitor UWI 202	029 015 505

Council Directives:

- 2006/95/EC Low Voltage
- 2004/108/EC Electromagnetic Compatibility
- 2006/42/EEC Machinery Directive

Standards:

- IEC 60974-1 Arc Welding Equipment - Welding Power Sources: edition 3, 2005-07.
- IEC 60974-10 Arc Welding Equipment Electromagnetic Compatibility Requirements: edition 2.0, 2007-08

EU Signatory:

Mark Lowther

April 17, 2009

Mark Lowther

European Director, Technology & Product Development.

Date of Declaration

SECTION 1 – SAFETY PRECAUTIONS - READ BEFORE USING

Protect yourself and others from injury — read and follow these precautions.

1-1. Symbol Usage

DANGER! – Indicates a hazardous situation which, if not avoided, will result in death or serious injury. The possible hazards are shown in the adjoining symbols or explained in the text.

Indicates a hazardous situation which, if not avoided, could result in death or serious injury. The possible hazards are shown in the adjoining symbols or explained in the text.

NOTICE *– Indicates statements not related to personal injury.*

☞ *Indicates special instructions.*

This group of symbols means Warning! Watch Out! ELECTRIC SHOCK, MOVING PARTS, and HOT PARTS hazards. Consult symbols and related instructions below for necessary actions to avoid the hazards.

1-2. Arc Welding Hazards

The symbols shown below are used throughout this manual to call attention to and identify possible hazards. When you see the symbol, watch out, and follow the related instructions to avoid the hazard. The safety information given below is only a summary of the more complete safety information found in the Safety Standards listed in Section 1-5. Read and follow all Safety Standards.

Only qualified persons should install, operate, maintain, and repair this unit.

During operation, keep everybody, especially children, away.

ELECTRIC SHOCK can kill.

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

- Do not touch live electrical parts.
- Wear dry, hole-free insulating gloves and body protection.
- Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.
- Do not use AC output in damp areas, if movement is confined, or if there is a danger of falling.
- Use AC output ONLY if required for the welding process.
- If AC output is required, use remote output control if present on unit.
- Additional safety precautions are required when any of the following electrically hazardous conditions are present: 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; or when there is a high risk of unavoidable or accidental contact with the workpiece or ground. For these conditions, use the following equipment in order presented: 1) a semiautomatic DC constant voltage (wire) welder, 2) a DC manual (stick) welder, or 3) an AC welder with reduced open-circuit voltage. In most situations, use of a DC, constant voltage wire welder is recommended. And, do not work alone!
- Disconnect input power or stop engine before installing or servicing this equipment. Lockout/tagout input power according to OSHA 29 CFR 1910.147 (see Safety Standards).
- Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.
- Always verify the supply ground – check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet.
- When making input connections, attach proper grounding conductor first – double-check connections.
- Keep cords dry, free of oil and grease, and protected from hot metal and sparks.
- Frequently inspect input power cord for damage or bare wiring – replace cord immediately if damaged – bare wiring can kill.
- Turn off all equipment when not in use.
- Do not use worn, damaged, undersized, or poorly spliced cables.
- Do not drape cables over your body.
- If earth grounding of the workpiece is required, ground it directly with a separate cable.
- Do not touch electrode if you are in contact with the work, ground, or another electrode from a different machine.
- Do not touch electrode holders connected to two welding machines at the same time since double open-circuit voltage will be present.
- Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain unit according to manual.
- Wear a safety harness if working above floor level.
- Keep all panels and covers securely in place.
- Clamp work cable with good metal-to-metal contact to workpiece or worktable as near the weld as practical.
- Insulate work clamp when not connected to workpiece to prevent contact with any metal object.
- Do not connect more than one electrode or work cable to any single weld output terminal.

SIGNIFICANT DC VOLTAGE exists in inverter-type welding power sources after removal of input power.

- Turn Off inverter, disconnect input power, and discharge input capacitors according to instructions in Maintenance Section before touching any parts.

HOT PARTS can cause severe burns.

- Do not touch hot parts bare handed.
- Allow cooling period before working on gun or torch.
- To handle hot parts, use proper tools and/or wear heavy, insulated welding gloves and clothing to prevent burns.

FUMES AND GASES can be hazardous.

Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

- Keep your head out of the fumes. Do not breathe the fumes.
- If inside, ventilate the area and/or use local forced ventilation at the arc to remove welding fumes and gases.
- If ventilation is poor, wear an approved air-supplied respirator.
- Read and understand the Material Safety Data Sheets (MSDSs) and the manufacturer's instructions for metals, consumables, coatings, cleaners, and degreasers.
- Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watch-person nearby. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.
- Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.
- Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.

ARC RAYS can burn eyes and skin.

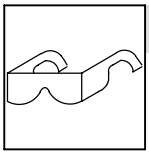
Arc rays from the welding process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Sparks fly off from the weld.

- Wear an approved welding helmet fitted with a proper shade of filter lenses to protect your face and eyes when welding or watching (see ANSI Z49.1 and Z87.1 listed in Safety Standards).
- Wear approved safety glasses with side shields under your helmet.
- Use protective screens or barriers to protect others from flash, glare and sparks; warn others not to watch the arc.
- Wear protective clothing made from durable, flame-resistant material (leather, heavy cotton, or wool) and foot protection.

WELDING can cause fire or explosion.

Welding on closed containers, such as tanks, drums, or pipes, can cause them to blow up. Sparks can fly off from the welding arc. The flying sparks, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode to metal objects can cause sparks, explosion, overheating, or fire. Check and be sure the area is safe before doing any welding.

- Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
- Do not weld where flying sparks can strike flammable material.
- Protect yourself and others from flying sparks and hot metal.
- Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
- Watch for fire, and keep a fire extinguisher nearby.
- Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
- Do not weld on closed containers such as tanks, drums, or pipes, unless they are properly prepared according to AWS F4.1 (see Safety Standards).
- Do not weld where the atmosphere may contain flammable dust, gas, or liquid vapors (such as gasoline).
- Connect work cable to the work as close to the welding area as practical to prevent welding current from traveling long, possibly unknown paths and causing electric shock, sparks, and fire hazards.
- Do not use welder to thaw frozen pipes.
- Remove stick electrode from holder or cut off welding wire at contact tip when not in use.
- Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.
- Remove any combustibles, such as a butane lighter or matches, from your person before doing any welding.
- After completion of work, inspect area to ensure it is free of sparks, glowing embers, and flames.
- Use only correct fuses or circuit breakers. Do not oversize or bypass them.
- Follow requirements in OSHA 1910.252 (a) (2) (iv) and NFPA 51B for hot work and have a fire watcher and extinguisher nearby.



FLYING METAL or DIRT can injure eyes.

- Welding, chipping, wire brushing, and grinding cause sparks and flying metal. As welds cool, they can throw off slag.
- Wear approved safety glasses with side shields even under your welding helmet.

BUILDUP OF GAS can injure or kill.

- Shut off shielding gas supply when not in use.
- Always ventilate confined spaces or use approved air-supplied respirator.

MAGNETIC FIELDS can affect Implanted Medical Devices.

- Wearers of Pacemakers and other Implanted Medical Devices should keep away.
- Implanted Medical Device wearers should consult their doctor and the device manufacturer before going near arc welding, spot welding, gouging, plasma arc cutting, or induction heating operations.

NOISE can damage hearing.

Noise from some processes or equipment can damage hearing.

- Wear approved ear protection if noise level is high.

CYLINDERS can explode if damaged.

Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

- Protect compressed gas cylinders from excessive heat, mechanical shocks, physical damage, slag, open flames, sparks, and arcs.
- Install cylinders in an upright position by securing to a stationary support or cylinder rack to prevent falling or tipping.
- Keep cylinders away from any welding or other electrical circuits.
- Never drape a welding torch over a gas cylinder.
- Never allow a welding electrode to touch any cylinder.
- Never weld on a pressurized cylinder – explosion will result.
- Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
- Turn face away from valve outlet when opening cylinder valve.
- Keep protective cap in place over valve except when cylinder is in use or connected for use.
- Use the right equipment, correct procedures, and sufficient number of persons to lift and move cylinders.
- Read and follow instructions on compressed gas cylinders, associated equipment, and Compressed Gas Association (CGA) publication P-1 listed in Safety Standards.

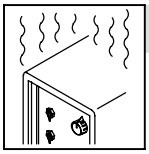
1-3. Additional Symbols For Installation, Operation, And Maintenance

FIRE OR EXPLOSION hazard.

- Do not install or place unit on, over, or near combustible surfaces.
- Do not install unit near flammables.
- Do not overload building wiring – be sure power supply system is properly sized, rated, and protected to handle this unit.

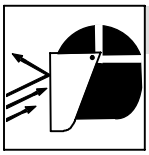
FALLING UNIT can cause injury.

- Use lifting eye to lift unit only, NOT running gear, gas cylinders, or any other accessories.
- Use equipment of adequate capacity to lift and support unit.
- If using lift forks to move unit, be sure forks are long enough to extend beyond opposite side of unit.



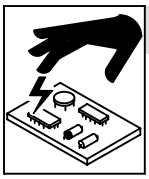
OVERUSE can cause OVERHEATING

- Allow cooling period; follow rated duty cycle.
- Reduce current or reduce duty cycle before starting to weld again.
- Do not block or filter airflow to unit.



FLYING SPARKS can cause injury.

- Wear a face shield to protect eyes and face.
- Shape tungsten electrode only on grinder with proper guards in a safe location wearing proper face, hand, and body protection.
- Sparks can cause fires — keep flammables away.



STATIC (ESD) can damage PC boards.

- Put on grounded wrist strap BEFORE handling boards or parts.
- Use proper static-proof bags and boxes to store, move, or ship PC boards.

MOVING PARTS can cause injury.

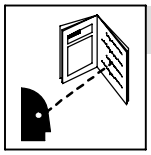
- Keep away from moving parts.
- Keep away from pinch points such as drive rolls.

WELDING WIRE can cause injury.

- Do not press gun trigger until instructed to do so.
- Do not point gun toward any part of the body, other people, or any metal when threading welding wire.

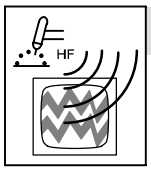
MOVING PARTS can cause injury.

- Keep away from moving parts such as fans.
- Keep all doors, panels, covers, and guards closed and securely in place.
- Have only qualified persons remove doors, panels, covers, or guards for maintenance as necessary.
- Reinstall doors, panels, covers, or guards when maintenance is finished and before reconnecting input power.



READ INSTRUCTIONS.

- Read Owner's Manual before using or servicing unit.
- Use only genuine replacement parts from the manufacturer.



H.F. RADIATION can cause interference.

- High-frequency (H.F.) can interfere with radio navigation, safety services, computers, and communications equipment.
- Have only qualified persons familiar with electronic equipment perform this installation.
- The user is responsible for having a qualified electrician promptly correct any interference problem resulting from the installation.
- If notified by the FCC about interference, stop using the equipment at once.
- Have the installation regularly checked and maintained.
- Keep high-frequency source doors and panels tightly shut, keep spark gaps at correct setting, and use grounding and shielding to minimize the possibility of interference.

ARC WELDING can cause interference.

- Electromagnetic energy can interfere with sensitive electronic equipment such as computers and computer-driven equipment such as robots.
- Be sure all equipment in the welding area is electromagnetically compatible.
- To reduce possible interference, keep weld cables as short as possible, close together, and down low, such as on the floor.
- Locate welding operation 100 meters from any sensitive electronic equipment.
- Be sure this welding machine is installed and grounded according to this manual.
- If interference still occurs, the user must take extra measures such as moving the welding machine, using shielded cables, using line filters, or shielding the work area.

1-4. California Proposition 65 Warnings

Welding or cutting equipment 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 Section 25249.5 et seq.)

Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. Wash hands after handling.

For Gasoline Engines:

Engine exhaust contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

For Diesel Engines:

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

1-5. Principal Safety Standards

Safety in Welding, Cutting, and Allied Processes, ANSI Standard Z49.1, from Global Engineering Documents (phone: 1-877-413-5184, website: www.global.ihs.com).

Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping, American Welding Society Standard AWS F4.1, from Global Engineering Documents (phone: 1-877-413-5184, website: www.global.ihs.com).

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, P.O. Box 9101, Quincy, MA 02269-9101 (phone: 617-770-3000, website: www.nfpa.org and www. sparky.org).

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 4221 Walney Road, 5th Floor, Chantilly, VA 20151 (phone: 703-788-2700, website:www.cganet.com).

Code for Safety in Welding and Cutting, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 5060 Mississauga, Ontario, Canada L4W 5NS (phone: 800-463-6727 or in Toronto 416-747-4044, website: www.csa-international.org).

Safe Practice For Occupational And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 25 West 43rd Street, New York, NY 10036–8002 (phone: 212-642-4900, website: www.ansi.org).

Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, NFPA Standard 51B, from National Fire Protection Association, P.O. Box 9101, Quincy, MA 02269-9101 (phone: 617-770-3000, website: www.nfpa.org.

OSHA, Occupational Safety and Health Standards for General Industry, Title 29, Code of Federal Regulations (CFR), Part 1910, Subpart Q, and Part 1926, Subpart J, from U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 (phone: 1-866-512-1800) (there are 10 Regional Offices—phone for Region 5, Chicago, is 312-353-2220, website: www.osha.gov).

1-6. EMF Information

Considerations About Welding And The Effects Of Low Frequency Electric And Magnetic Fields

Welding current, as it flows through welding cables, will cause electromagnetic fields. There has been and still is some concern about such fields. However, after examining more than 500 studies spanning 17 years of research, a special blue ribbon committee of the National Research Council concluded that: “The body of evidence, in the committee’s judgment, has not demonstrated that exposure to power-frequency electric and magnetic fields is a human-health hazard.” However, studies are still going forth and evidence continues to be examined. Until the final conclusions of the research are reached, you may wish to minimize your exposure to electromagnetic fields when welding or cutting.

To reduce magnetic fields in the workplace, use the following procedures:

1. Keep cables close together by twisting or taping them, or using a cable cover.
2. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around your body.
4. Keep welding power source and cables as far away from operator as practical.
5. Connect work clamp to workpiece as close to the weld as possible.

About Implanted Medical Devices:

Implanted Medical Device wearers should consult their doctor and the device manufacturer before performing or going near arc welding, spot welding, gouging, plasma arc cutting, or induction heating operations. If cleared by your doctor, then following the above procedures is recommended.

SECTION 2 – DEFINITIONS

2-1. Warning Label Definitions

Warning! Watch Out! There are possible hazards as shown by the symbols.

1 Electric shock from welding electrode or wiring can kill.

1.1 Wear dry insulating gloves. Do not touch electrode with bare hand. Do not wear wet or damaged gloves.

1.2 Protect yourself from electric shock by insulating yourself from work and ground.

1.3 Disconnect input plug or power before working on machine.

2 Breathing welding fumes can be hazardous to your health.

2.1 Keep your head out of the fumes.

2.2 Use forced ventilation or local exhaust to remove the fumes.

2.3 Use ventilating fan to remove fumes.

3 Welding sparks can cause explosion or fire.

3.1 Keep flammables away from welding. Do not weld near flammables.

3.2 Welding sparks can cause fires. Have a fire extinguisher nearby, and have a watchperson ready to use it.

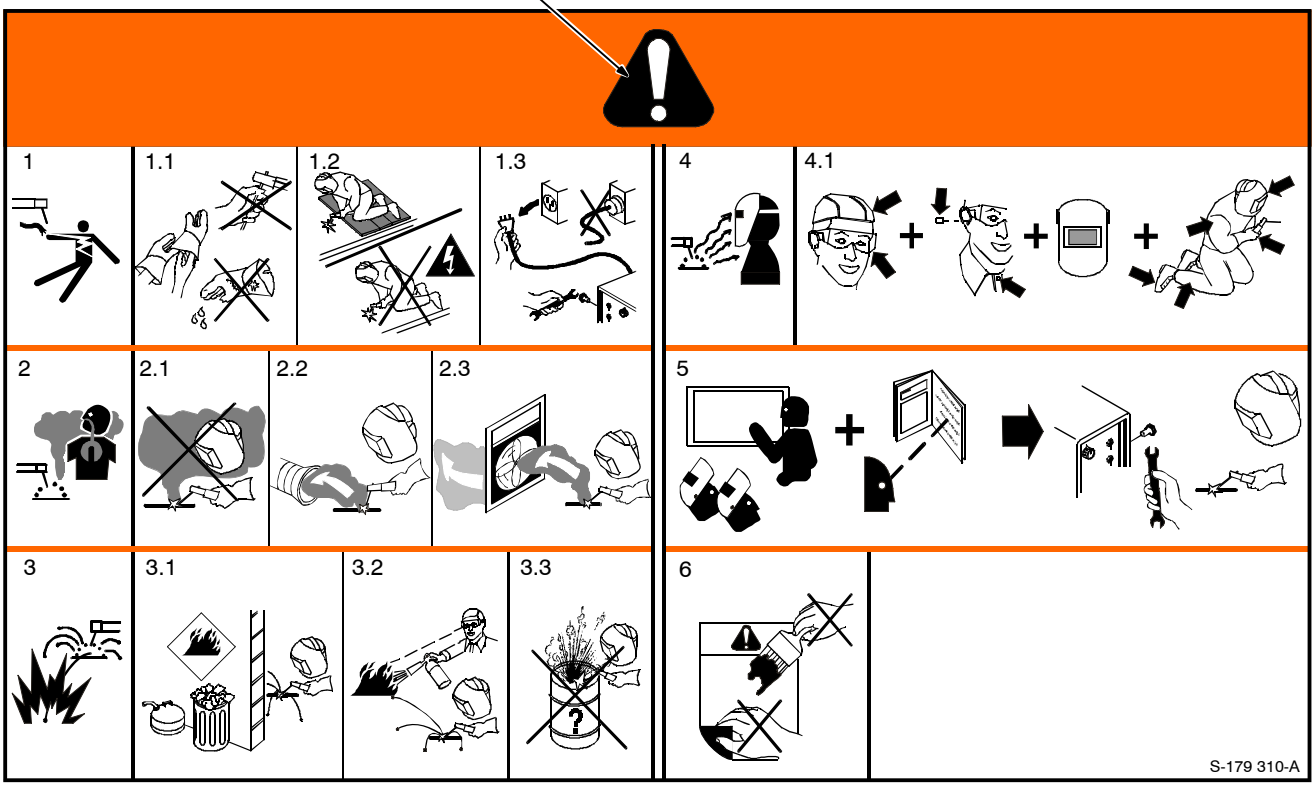
3.3 Do not weld on drums or any closed containers.

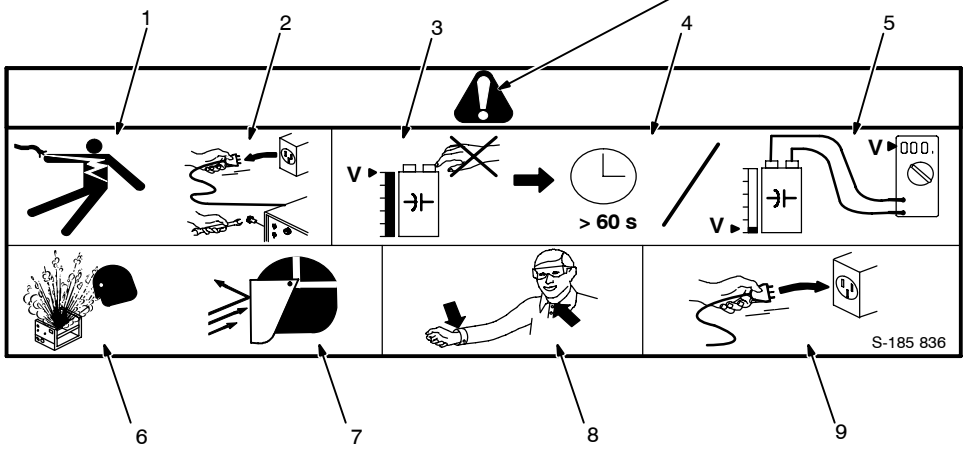
4 Arc rays can burn eyes and injure skin.

4.1 Wear hat and safety glasses. Use ear protection and button shirt collar. Use welding helmet with correct shade of filter. Wear complete body protection.

5 Become trained and read the instructions before working on the machine or welding.

6 Do not remove or paint over (cover) the label.





Warning! Watch Out! There are possible hazards as shown by the symbols.

1 Electric shock from wiring can kill.

2 Disconnect input plug or power before working on machine.

3 Hazardous voltage remains on input capacitors after power is turned off. Do not touch fully charged capacitors.

4 Always wait 60 seconds after power is turned off before working on unit, OR

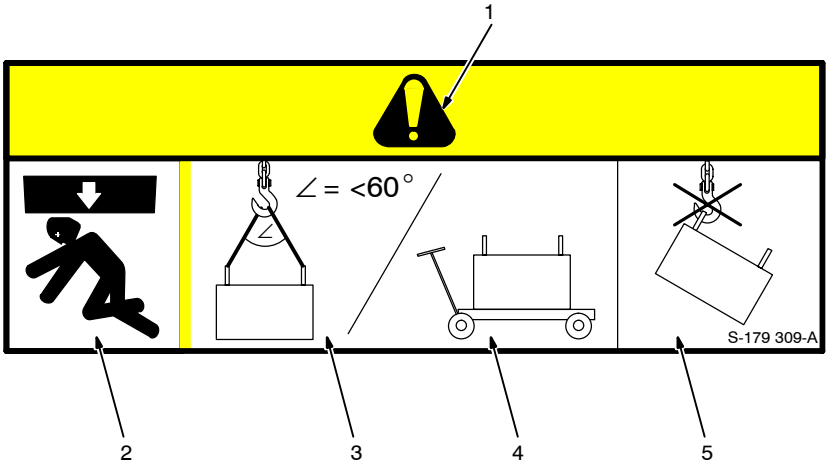
5 Check input capacitor voltage, and be sure it is near 0 before touching any parts.

6 When power is applied failed parts can explode or cause other parts to explode.

7 Flying pieces of parts can cause injury. Always wear a face shield when servicing unit.

8 Always wear long sleeves and button your collar when servicing unit.

9 After taking proper precautions as shown, connect power to unit.



1 Warning! Watch Out! There are possible hazards as shown by the symbols.

2 Falling equipment can cause injury and damage to unit.

3 Always lift and support unit using both handles. Keep angle of lifting device less than 60 degrees.

4 Use a proper cart to move unit.

5 Do not use one handle to lift or support unit.

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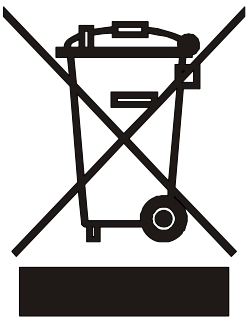
2-2. WEEE Label (For Products Sold Within The EU)



Do not discard product (where applicable) with general waste.

Reuse or recycle Waste Electrical and Electronic Equipment (WEEE) by disposing at a designated collection facility.

Contact your local recycling office or your local distributor for further information.

2-3. Symbols And Definitions

A Amperes	Panel–Local	Gas Tungsten Arc Welding (GTAW)	Shielded Metal Arc Welding (SMAW)
V Volts	Voltage Input	3 Phase Static Frequency Converter-Transformer-Rectifier	
Voltage Output	Circuit Breaker	Remote	Lift-Arc Start (GTAW)
Protective Earth (Ground)	Postflow Timer	Preflow Timer	S Seconds
On	Off	Positive	Negative
Alternating Current	Gas Input	Gas Output	I_2 Rated Welding Current
X Duty Cycle	Direct Current	Line Connection	U_2 Conventional Load Voltage
U_1 Primary Voltage	IP Degree Of Protection	I_{1max} Rated Maximum Supply Current	I_{1eff} Maximum Effective Supply Current
U_0 Rated No Load Voltage (Average)	Pulse Background Amperage	Initial Amperage	Increase/Decrease Of Quantity
Normal Trigger Operation (GTAW)	Two-Step Trigger Operation (GTAW)	Four-Step Trigger Operation (GTAW)	% Percent
Hz Hertz	Recall From Memory	Arc Force (DIG)	HF Impulse Starting (GTAW)
Final Slope	Final Amperage	Pulse Percent On Time	Initial Slope
Contactor Control (Stick)	Pulser On-Off	TIG Weld Amps And Peak Amps While Pulsing	Pulse Frequency
Background Amps	Process	Pulser	Sequence
Output	Adjust	Suitable For Areas Of Increased Shock Hazard	

SECTION 3 – INSTALLATION

3-1. Serial Number And Rating Label Location

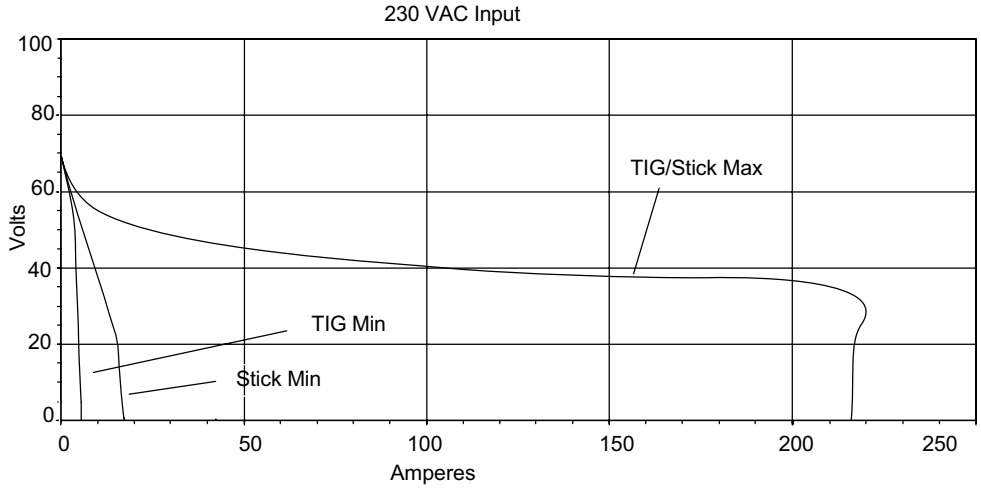
The serial number and rating information for the power source is located on the rear of the machine. Use the rating labels to determine input power requirements and/or rated output. For future reference, write serial number in space provided on back cover of this manual.

3-2. Specifications

Welding Process	Rated Output	Welding Amperage Range	Max. Open-Circuit Voltage (U0)	Amperes Input At Rated Output, 50/60Hz			KVA	KW	Dimensions	Weight
				380	400	440				
Stick	200 A @ 28 VDC, 40% Duty Cycle	5 – 200	68 VDC	13.5	12.8	11.5	8.86	6.51	Length: 17-1/4 in. (438 mm) Width: 7-9/16 in. (192 mm) Height: 13-3/8 in. (333 mm)	28 lb (12.5 Kg)
TIG	200 A @ 18 VDC, 40% Duty Cycle			8.7	8.3	7.5	5.73	4.2		

3-3. Volt-Ampere Curves

Volt-ampere curves show minimum and maximum voltage and amperage output capabilities of welding power source. Curves of other settings fall between curves shown.

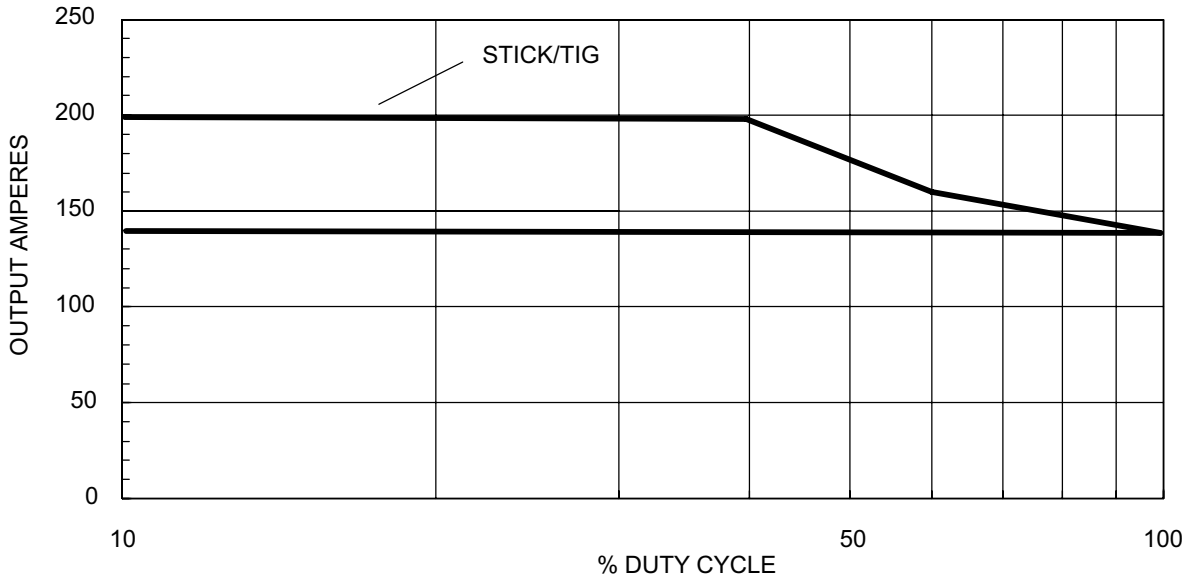


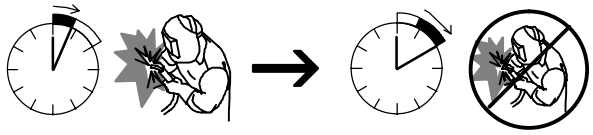
3-4. Duty Cycle And Overheating

Duty Cycle is percentage of 10 minutes that unit can weld at rated load without overheating.

If unit overheats, output stops and cooling fan runs. Wait fifteen minutes for unit to cool. Reduce amperage or voltage, or duty cycle before welding.

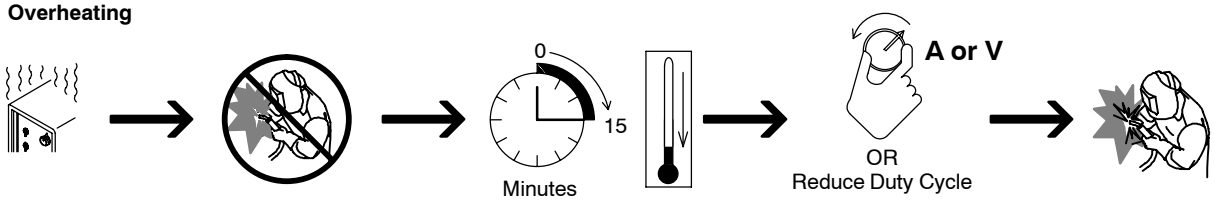
NOTICE *– Exceeding duty cycle can damage unit and void warranty.*





4 Minutes Welding 6 Minutes Resting

Overheating



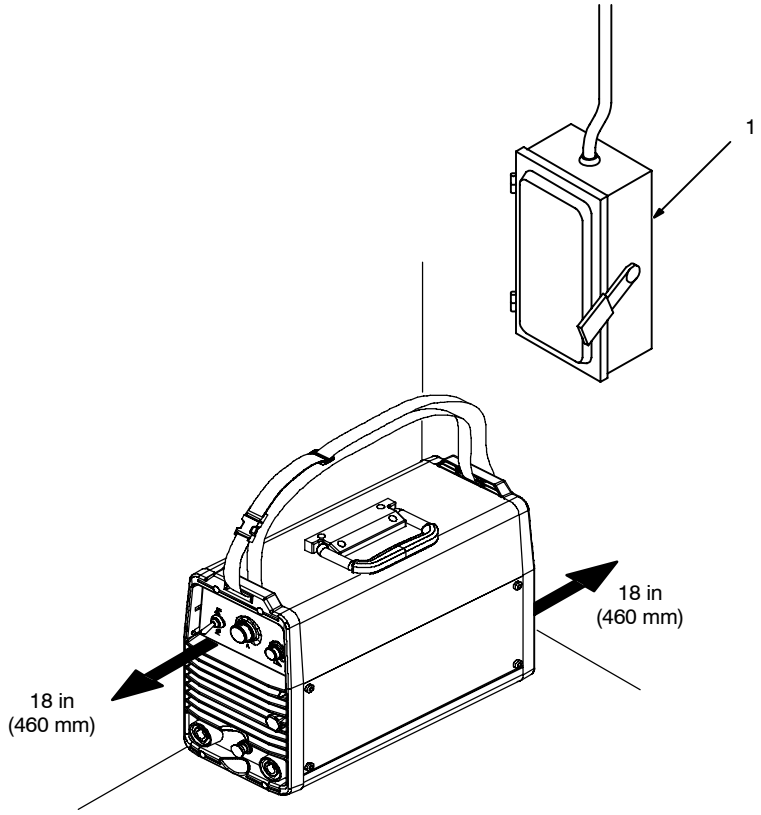
3-5. Selecting A Location

Location And Airflow

1 Line Disconnect Device

Locate unit near correct input power supply.

Special installation may be required where gasoline or volatile liquids are present – see NEC Article 511 or CEC Section 20.



3-6. Weld Output Terminals And Selecting Cable Sizes*

ARC WELDING can cause Electromagnetic Interference.

To reduce possible interference, keep weld cables as short as possible, close together, and down low, such as on the floor. Locate welding operation 100 meters from any sensitive electronic equipment. Be sure this welding machine is installed and grounded according to this manual. If interference still occurs, the user must take extra measures such as moving the welding machine, using shielded cables, using line filters, or shielding the work area.

Weld Output Terminals

Turn off power before connecting to weld output terminals.

Do not use worn, damaged, undersized, or poorly spliced cables.

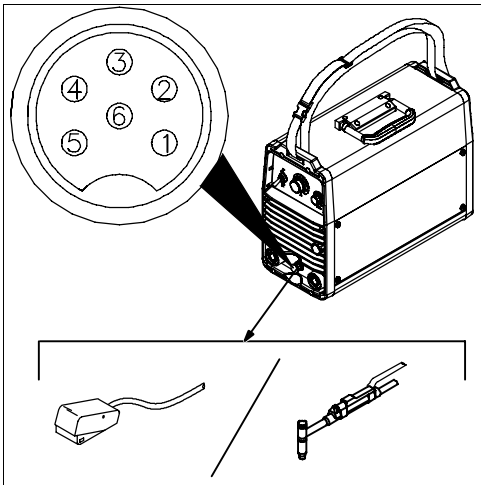
Welding Amperes	Weld Cable Size** and Total Cable (Copper) Length in Weld Circuit Not Exceeding***							
	30 m (100 ft) or Less		45 m (150 ft)	60 m (200 ft)	70 m (250 ft)	90 m (300 ft)	105 m (350 ft)	120 m (400 ft)
	10 – 60% Duty Cycle	60 – 100% Duty Cycle	10 – 100% Duty Cycle					
100	20 (4)	20 (4)	20 (4)	30 (3)	35 (2)	50 (1)	60 (1/0)	60 (1/0)
150	30 (3)	30 (3)	35 (2)	50 (1)	60 (1/0)	70 (2/0)	95 (3/0)	95 (3/0)
200	30 (3)	35 (2)	50 (1)	60 (1/0)	70 (2/0)	95 (3/0)	120 (4/0)	120 (4/0)

* This chart is a general guideline and may not suit all applications. If cable overheats, use next size larger cable.

**Weld cable size is mm^2 based on either a 4 volts or less drop or a current density of at least 300 circular mils per ampere.
( ) = AWG S-0007-F

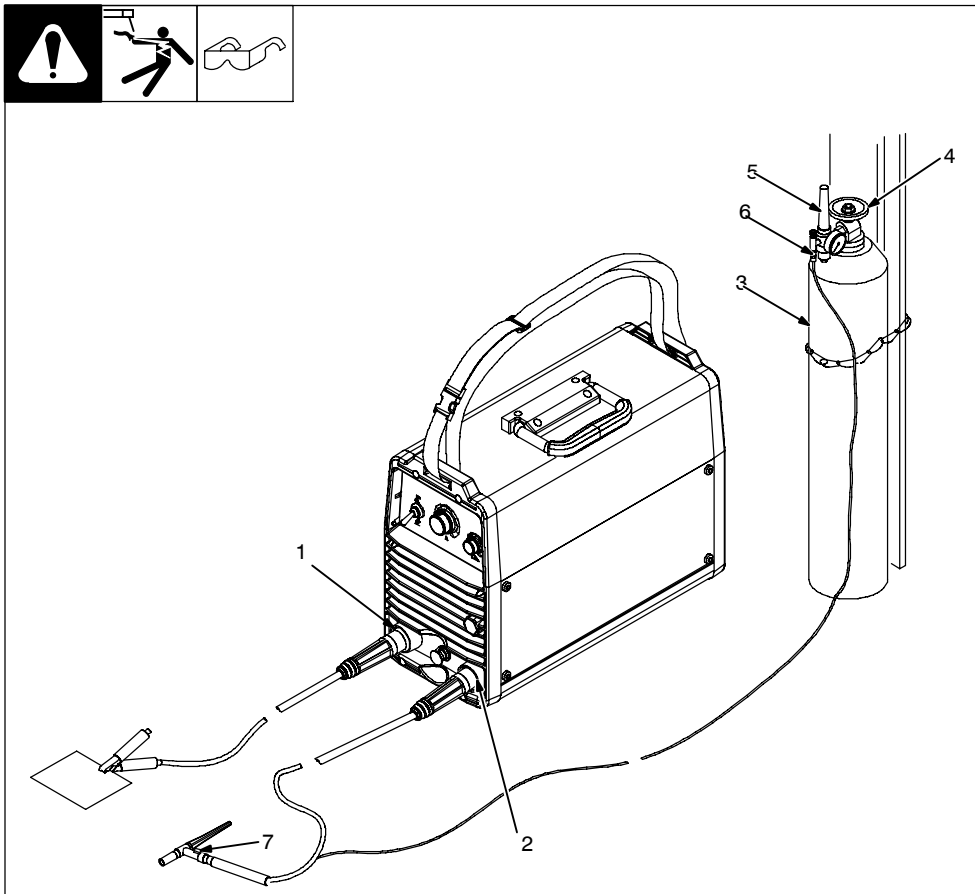
***For distances longer than those shown in this guide, call a factory applications representative at 920-735-4505.

3-7. Remote 6 Receptacle Information



REMOTE 6	Socket*	Socket Information
	1	Not used
	2	Not used
REMOTE OUTPUT CONTROL	3	Output to remote control; +10 volts DC output to remote control.
	4	0 to +10 volts DC input command signal from remote control.
	5	Remote control circuit common.
CHASSIS	6	Chassis common.

3-8. TIG Lift-Arc DCEN (Direct Current Electrode Negative) Connections



Turn off power before making connections.

1 Positive (+) Weld Output Terminal

Connect work lead to positive weld output terminal.

2 Negative (–) Weld Output Terminal

Connect TIG torch to negative weld output terminal.

3 Gas Cylinder

4 Cylinder Valve

Open valve slightly so gas flow blows dirt from valve. Close valve.

5 Regulator/Flowmeter

6 Flow Adjust

Typical flow rate is 15 cubic feet per hour (7.1 liters per minute).

Connect torch gas hose to regulator/flowmeter.

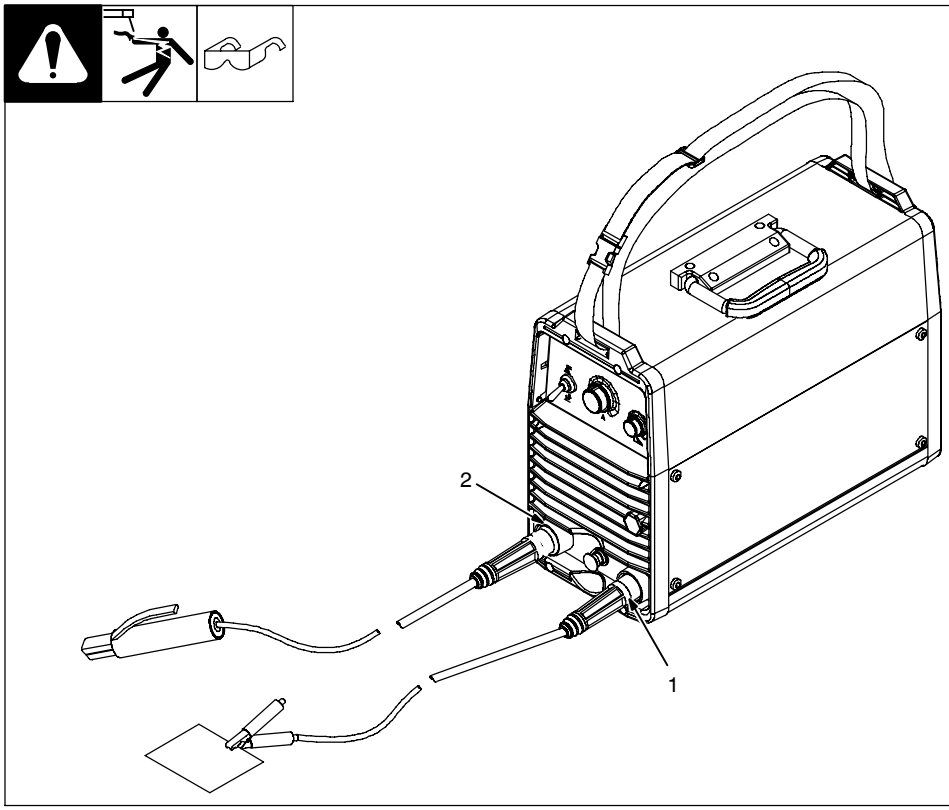
7 Gas Valve

Valve controls gas preflow and postflow. Open valve on torch just before welding.

Tools Needed:

11/16 in., 1-1/8 in. (21 mm)

3-9. Stick DCEP (Direct Current Electrode Positive) Connections



Turn off power before making connections.

1 Negative (–) Weld Output Terminal

Connect work lead to negative weld output terminal.

2 Positive (+) Weld Output Terminal

Connect electrode holder to positive weld output terminal.

3 Remote 14 Receptacle

If desired, connect remote control to Remote 14 receptacle (see Section 3-7).

3-10. Electrical Service Guide

☞ *Actual input voltage cannot exceed -10% of minimum, or +10% of maximum input voltages indicated in table.*

Failure to follow these electrical service guide recommendations could create an electric shock or fire hazard. These recommendations are for a dedicated branch circuit sized for the rated output and duty cycle of the welding power source.

	Three-Phase, 40% Duty Cycle
Input Voltage	380–440 +/– 10%
Input Amperes At Rated Output	13.5–11.5
Max Recommended Standard Fuse Rating In Amperes [1]	
Time Delay [2]	10
Normal Operating [3]	20
Min Input Conductor Size In AWG [4]	13 (2.63 mm^2)
Max Recommended Input Conductor Length In Feet (Meters)	(3.5)
Min Grounding Conductor Size In AWG [4]	13 (2.63 mm^2)

Reference: 2008 National Electrical Code (NEC) (including article 630)

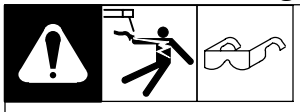
1 If a circuit breaker is used in place of a fuse, choose a circuit breaker with time-current curves comparable to the recommended fuse.

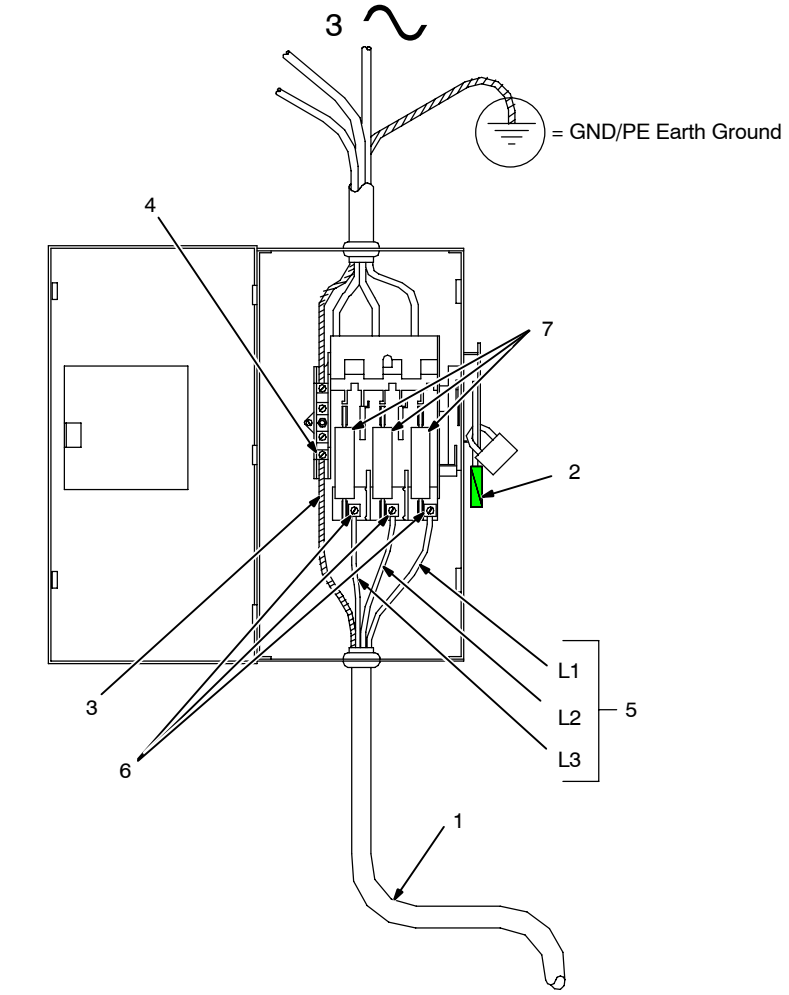
2 “Time-Delay” fuses are UL class “RK5” . See UL 248.

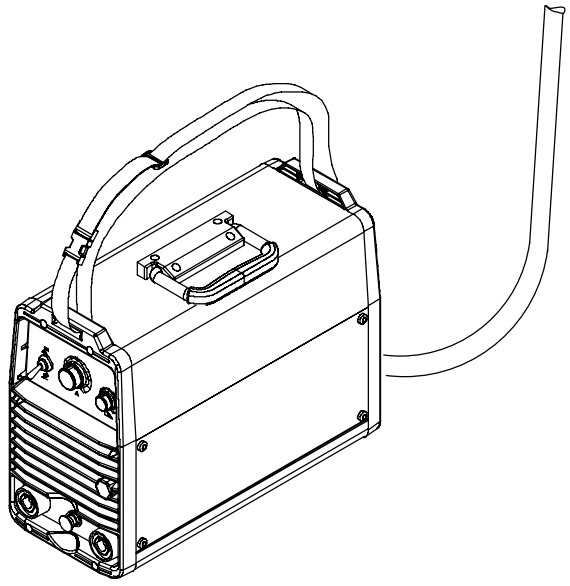
3 “Normal Operating” (general purpose - no intentional delay) fuses are UL class “K5” (up to and including 60 amps), and UL class “H” (65 amps and above).

4 Conductor data in this section specifies conductor size (excluding flexible cord or cable) between the panelboard and the equipment per NEC Table 310.16. If a flexible cord or cable is used, minimum conductor size may increase. See NEC Table 400.5(A) for flexible cord and cable requirements.

3-11. Connecting Input Power







Installation must meet all National and Local Codes – have only qualified persons make this installation.

Disconnect and lockout/tagout input power before connecting input conductors from unit.

Always connect green or green/yellow conductor to supply grounding terminal first, and never to a line terminal.

For Three-Phase Operation

1 Input Power Cord.

2 Disconnect Device (switch shown in the OFF position)

3 Green Or Green/Yellow Grounding Conductor

4 Disconnect Device Grounding Terminal

5 Input Conductors (L1, L2 And L3)

6 Disconnect Device Line Terminals

Connect green or green/yellow grounding conductor to disconnect device grounding terminal first.

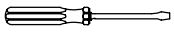
Connect input conductors L1, L2, and L3 to disconnect device line terminals.

7 Over-Current Protection

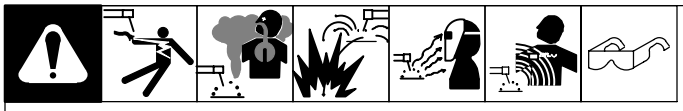
Select type and size of over-current protection using Section 3-10 (fused disconnect switch shown).

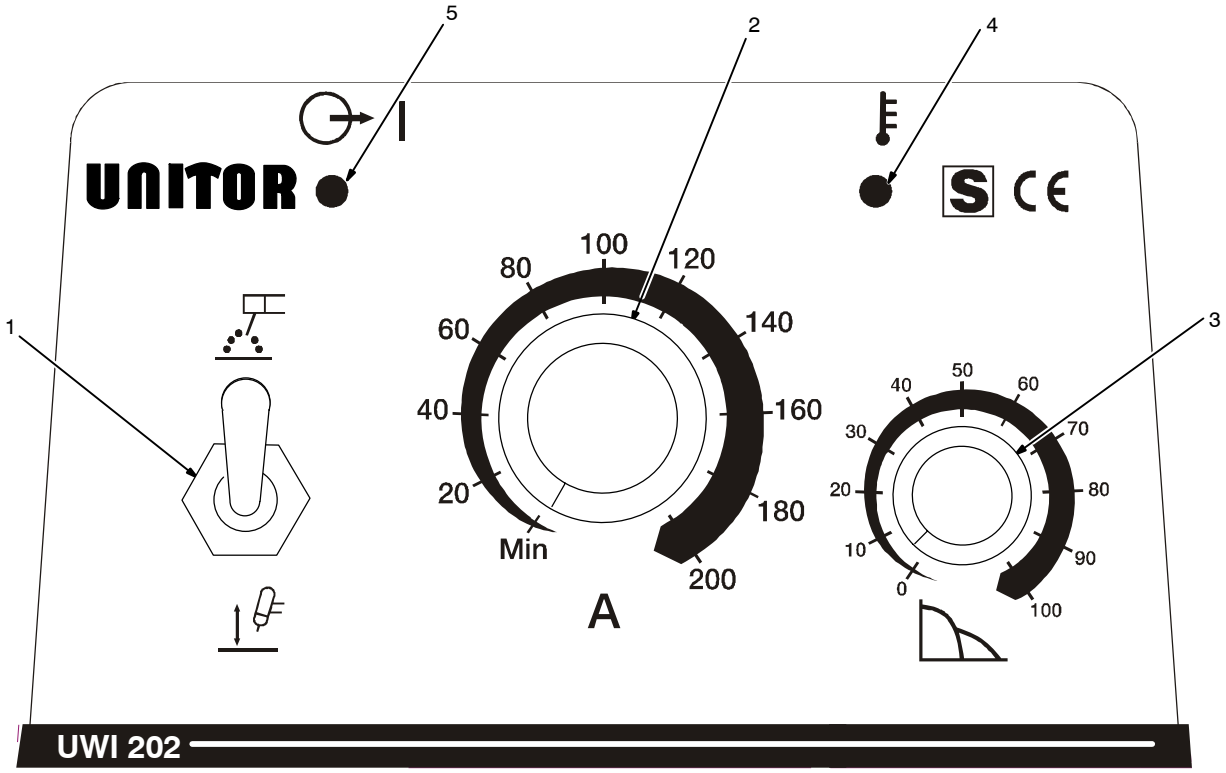
Close and secure door on disconnect device. Remove lockout/tagout device, and place switch in the On position.

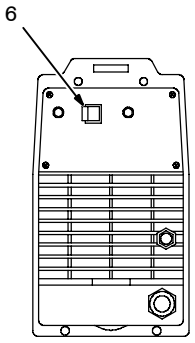
Tools Needed:



4-1. Controls







Green on nameplate indicates a TIG function, Gray indicates a Stick function.

1 Process Controls

See Section 4-2.

2 Amperage Control

See Section 4-5.

3 DIG Control

See Section 4-6.

4 High Temperature Shutdown Light

See Section 3-4.

5 Power On Light

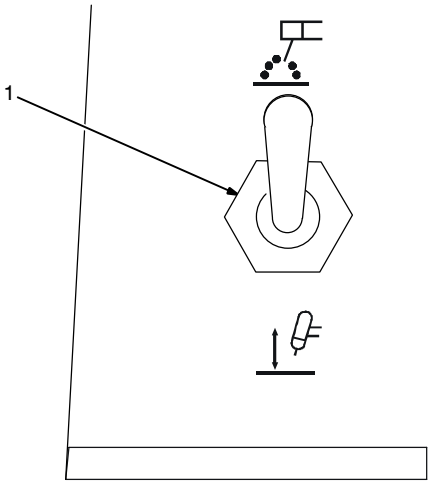
The power on light turns on when power is turned on.

6 Power Switch

Use switch to turn unit and indicator light On/Off.

202 722-A / 802 889

4-2. Process Control



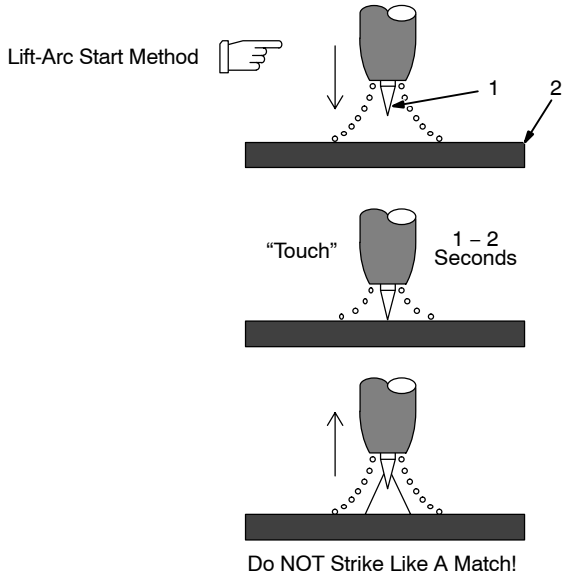
1 Process Control

Use the Process control to select the Stick process (up), or the TIG Lift Arc process (down).

Stick (SMAW) - This is a DCEP (direct current electrode positive) process. Make connections according to Section 3-9.

TIG Lift-Arc™ - This is a DCEN (direct current electrode negative) process in which the electrode must come in contact with the work piece to initiate an arc (see Section 4-3). Make connections according to Section 3-8.

4-3. Lift-Arc Start Procedure



Lift-Arc Start

With Lift-Arc™ selected, start arc as follows:

1 TIG Electrode

2 Workpiece

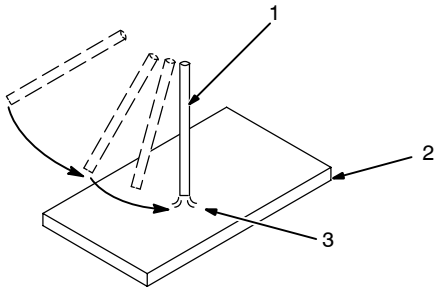
Turn gas on. Touch tungsten electrode to workpiece at weld start point. **Hold electrode to workpiece for 1-2 seconds**, and slowly lift electrode. Arc is formed when electrode is lifted.

Normal open-circuit voltage is not present before tungsten electrode touches workpiece; only a low sensing voltage is present between electrode and workpiece. The solid-state output contactor does not energize until after electrode is touching workpiece. This allows electrode to touch workpiece without overheating, sticking, or getting contaminated.

Application:

Lift-Arc is used for the DCEN GTAW process when HF Start method is not permitted, or to replace the scratch method.

4-4. Stick Start Procedure – Scratch Start Technique



With Stick selected, start arc as follows:

1 Electrode

2 Workpiece

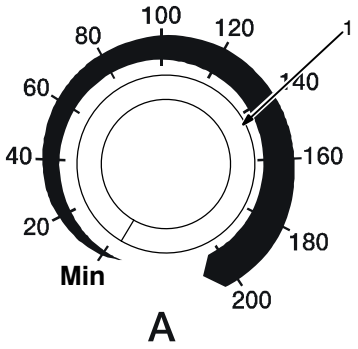
3 Arc

Drag electrode across workpiece like striking a match; lift electrode slightly after touching work. If arc goes out electrode was lifted to high. If electrode sticks to workpiece, use a quick twist to free it.

▲ **For models with stock number 907 220, normal open-circuit voltage (80 volts) is present before electrode touches workpiece.**

For models with stock numbers 907 036 and 907 037, normal open-circuit voltage is not present before electrode touches workpiece; only a low sensing voltage is present between electrode and workpiece.

4-5. Amperage Control

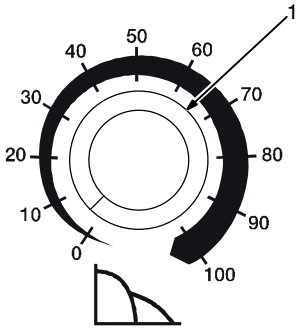


A

1 A (Amperage Control)

Rotate knob clockwise to increase amperage (Min-200 amps).

4-6. DIG Control



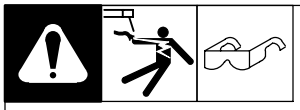
1 DIG Control

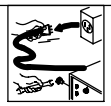
Control increases SMAW short-circuit amperage at low arc voltage. This allows the operator to use a very short arc length without sticking the electrode.

Set control at 0 for normal welding amperage. Turn clockwise to increase short-circuit amperage.

SECTION 5 – MAINTENANCE AND TROUBLESHOOTING

5-1. Routine Maintenance

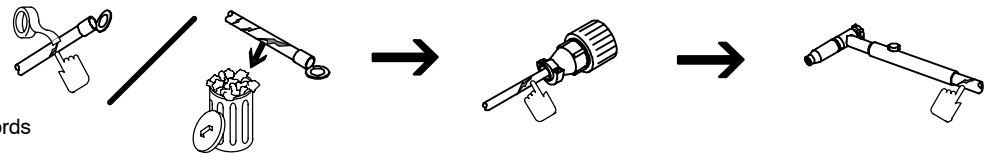
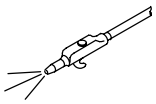




Disconnect power before maintaining.

☞ *Maintain more often during severe conditions.*

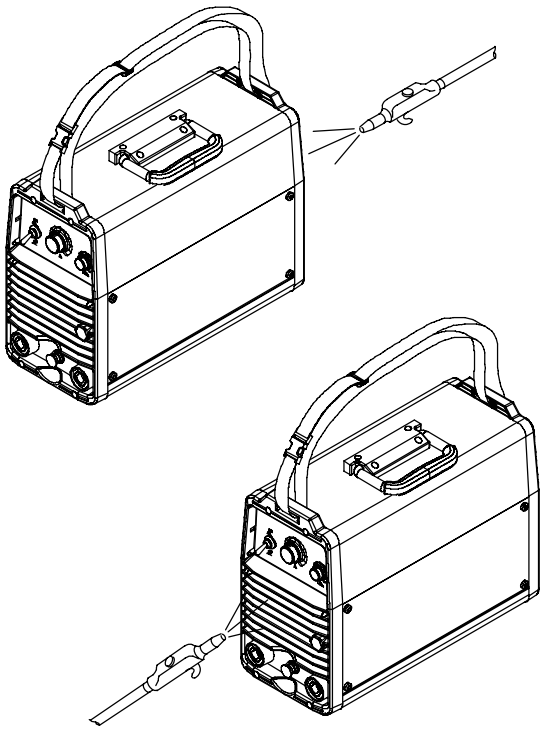
A. Welding Power Source

	✓ = Check ◇ = Change ● = Clean Δ = Repair ☆ = Replace * To be done by Factory Authorized Service Agent			
Every 3 Months	 ✓☆ Labels		 ✓ ☆ Gas Hoses	
Every 3 Months	 ✓Δ ☆Cables And Cords			
Every 6 Months	**Do not remove case when blowing out inside of unit (see Section 5-2) .**  ●:Durning heavy service, clean monthly.			

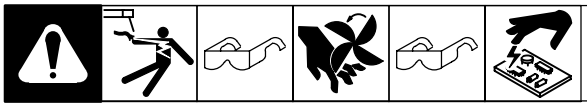
5-2. Blowing Out Inside Of Unit

Do not remove case when blowing out inside of unit.

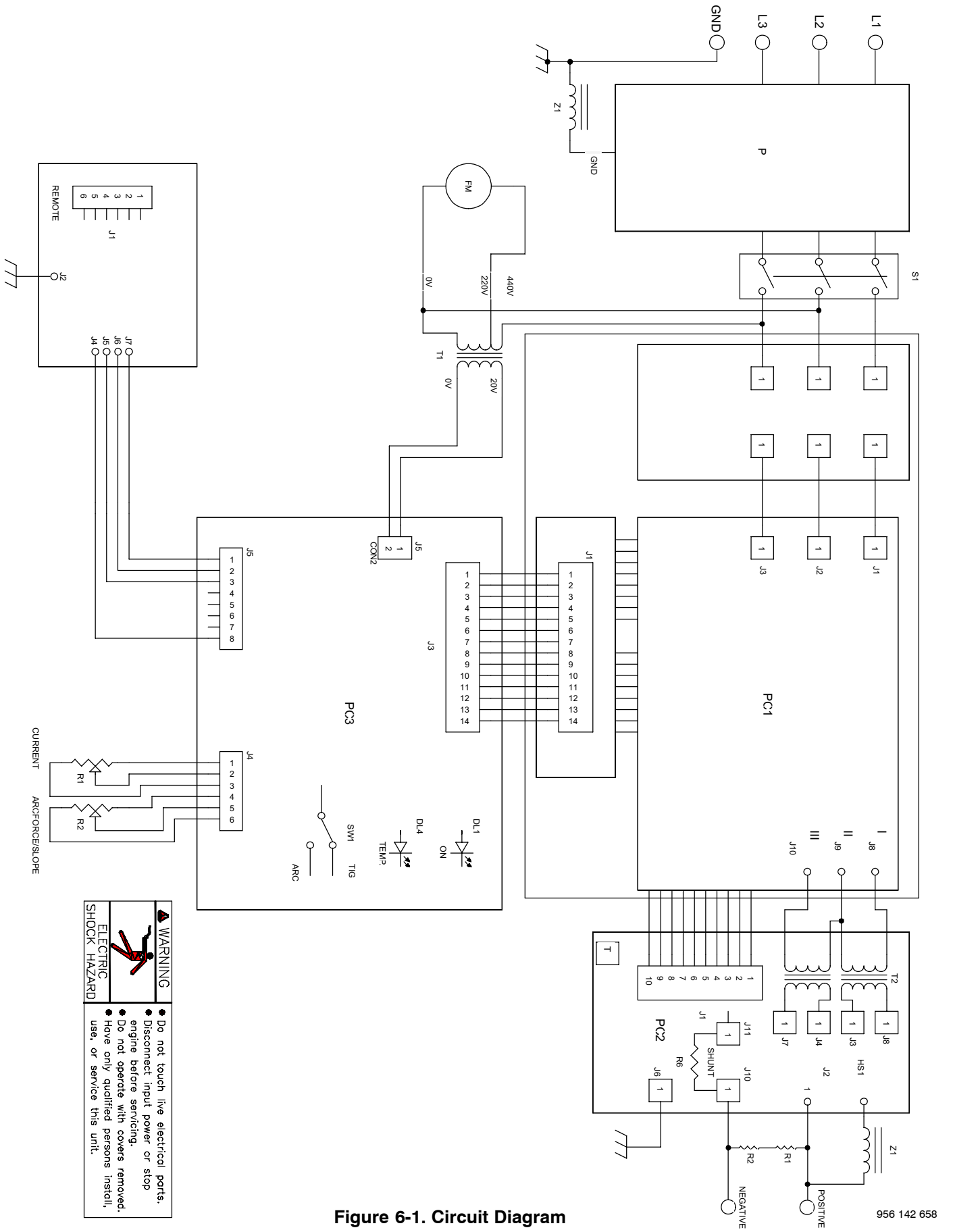
To blow out unit, direct airflow through front and back louvers as shown.



5-3. Troubleshooting



Trouble	Remedy
No weld output; unit completely inoperative.	Place line disconnect switch in On position (see Section 3-11).
	Check and replace line fuse(s), if necessary, or reset circuit breaker (see Section 3-11).
	Check for proper input power connections (see Section 3-11).
No weld output; Output LED on.	Input voltage outside acceptable range of variation (see Section 3-10).
No weld output; Overtemp LED on.	Unit overheated. Allow unit to cool with fan On (see Sections 3-4).
Erratic or improper weld output.	Use proper size and type of weld cable (see Section 3-6).
	Clean and tighten all weld connections (see Section 3-6).
Fan not operating.	Check for and remove anything blocking fan movement.
	Have Factory Authorized Service Agent check fan motor.
Wandering arc	Use proper size tungsten (see Section 7).
	Use properly prepared tungsten (see Section 7).
	Reduce gas flow rate (see Section 3-8).
Tungsten electrode oxidizing and not remaining bright after conclusion of weld.	Shield weld zone from drafts.
	Allow adequate postflow time to shield tungsten while it cools, after welding stops.
	Check and tighten all gas fittings (see Section 3-8).
	Water in torch. Refer to torch manual.



956 142 658

Figure 6-1. Circuit Diagram

SECTION 7 – SELECTING AND PREPARING A TUNGSTEN FOR DC OR AC WELDING WITH INVERTER MACHINES

Whenever possible and practical, use DC weld output instead of AC weld output.

7-1. Selecting Tungsten Electrode (Wear Clean gloves To Prevent Contamination Of Tungsten)

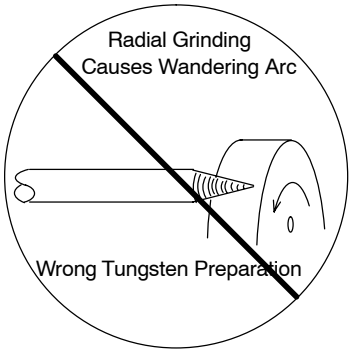
Electrode Diameter	Amperage Range - Gas Type♦ - Polarity	
	(DCEN) – Argon Direct Current Electrode Negative (For Use With Mild Or Stainless Steel)	AC – Argon Balance Control @ 65% Electrode Negative (For Use With Aluminum)
2% Ceria (Orange Band), 1.5% Lanthanum (Gray Band), Or 2% Thorium (Red Band) Alloy Tungstens		
.010" (1 mm)	Up to 25	Up to 20
.020" (1 mm)	15-40	15-35
.040" (1 mm)	25-85	20-80
1/16" (1.6 mm)	50-160	50-150
3/32" (2.4 mm)	135-235	130-250
1/8" (3.2 mm)	250-400	225-360
5/32" (4.0 mm)	400-500	300-450
3/16" (4.8 mm)	500-750	400-500
1/4" (6.4 mm)	750-1000	600-800

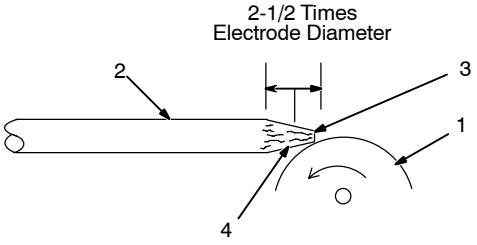
♦ Typical argon shielding gas flow rates are 11 to 35 cfh (cubic feet per hour).

Figures listed are a guide and are a composite of recommendations from American Welding Society (AWS) and electrode manufacturers.

7-2. Preparing Tungsten Electrode For DC Electrode Negative (DCEN) Welding Or AC Welding With Inverter Machines

Grinding the tungsten electrode produces dust and flying sparks which can cause injury and start fires. Use local exhaust (forced ventilation) at the grinder or wear an approved respirator. Read MSDS for safety information. Consider using tungsten containing ceria, lanthana, or yttria instead of thoria. Grinding dust from thoriated electrodes contains low-level radioactive material. Properly dispose of grinder dust in an environmentally safe way. Wear proper face, hand, and body protection. Keep flammables away.





Ideal Tungsten Preparation – Stable Arc

1 Grinding Wheel

Grind end of tungsten on fine grit, hard abrasive wheel before welding. Do not use wheel for other jobs or tungsten can become contaminated causing lower weld quality.

2 Tungsten Electrode

A 2% ceriated tungsten is recommended.

3 Flat

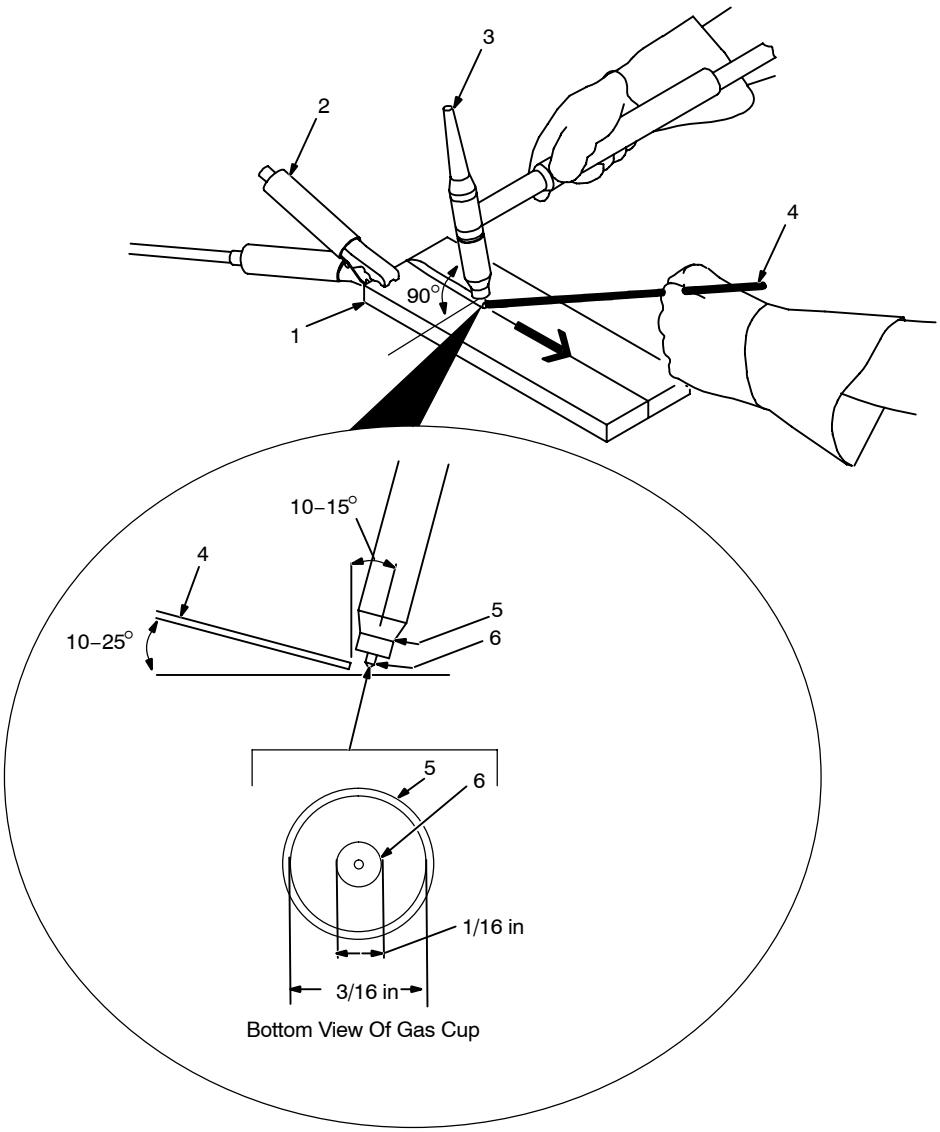
Diameter of this flat determines amperage capacity.

4 Straight Ground

Grind lengthwise, **not radial**.

SECTION 8 – GUIDELINES FOR TIG WELDING (GTAW)

8-1. Positioning The Torch



Bottom View Of Gas Cup

Grinding the tungsten electrode produces dust and flying sparks which can cause injury and start fires. Use local exhaust (forced ventilation) at the grinder or wear an approved respirator. Read MSDS for safety information. Consider using cerium or lanthanum based tungsten instead of thoriated. Thorium dust contains low-level radioactive material. Properly dispose of grinder dust in an environmentally safe way. Wear proper face, hand, and body protection. Keep flammables away.

1 Workpiece

Make sure workpiece is clean before welding.

2 Work Clamp

Place as close to the weld as possible.

3 Torch

4 Filler Rod (If Applicable)

5 Gas Cup

6 Tungsten Electrode

Select and prepare tungsten according to Section 7.

Guidelines:

The inside diameter of the gas cup should be at least three times the tungsten diameter to provide adequate shielding gas coverage. (For example, if tungsten is 1/16 in diameter, gas cup should be a minimum of 3/16 in diameter.

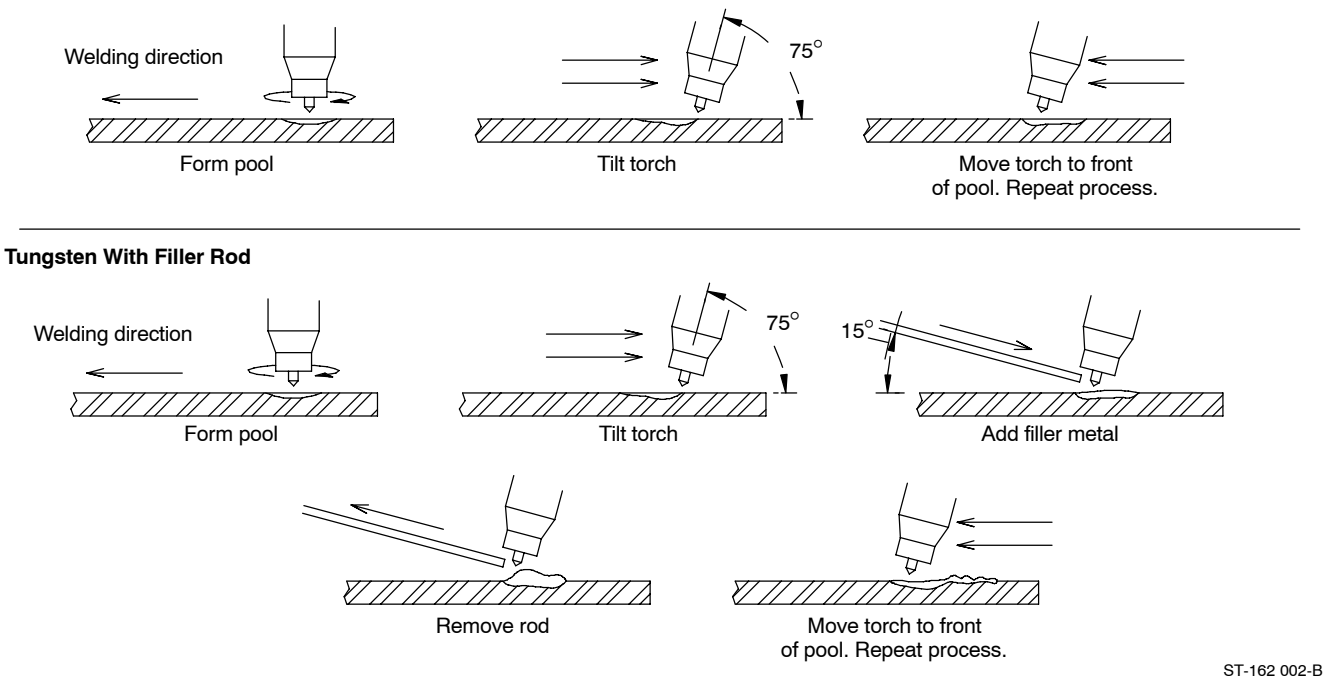
Tungsten extension is the distance the tungsten extends out gas cup of torch.

The tungsten extension should be no greater than the inside diameter of the gas cup.

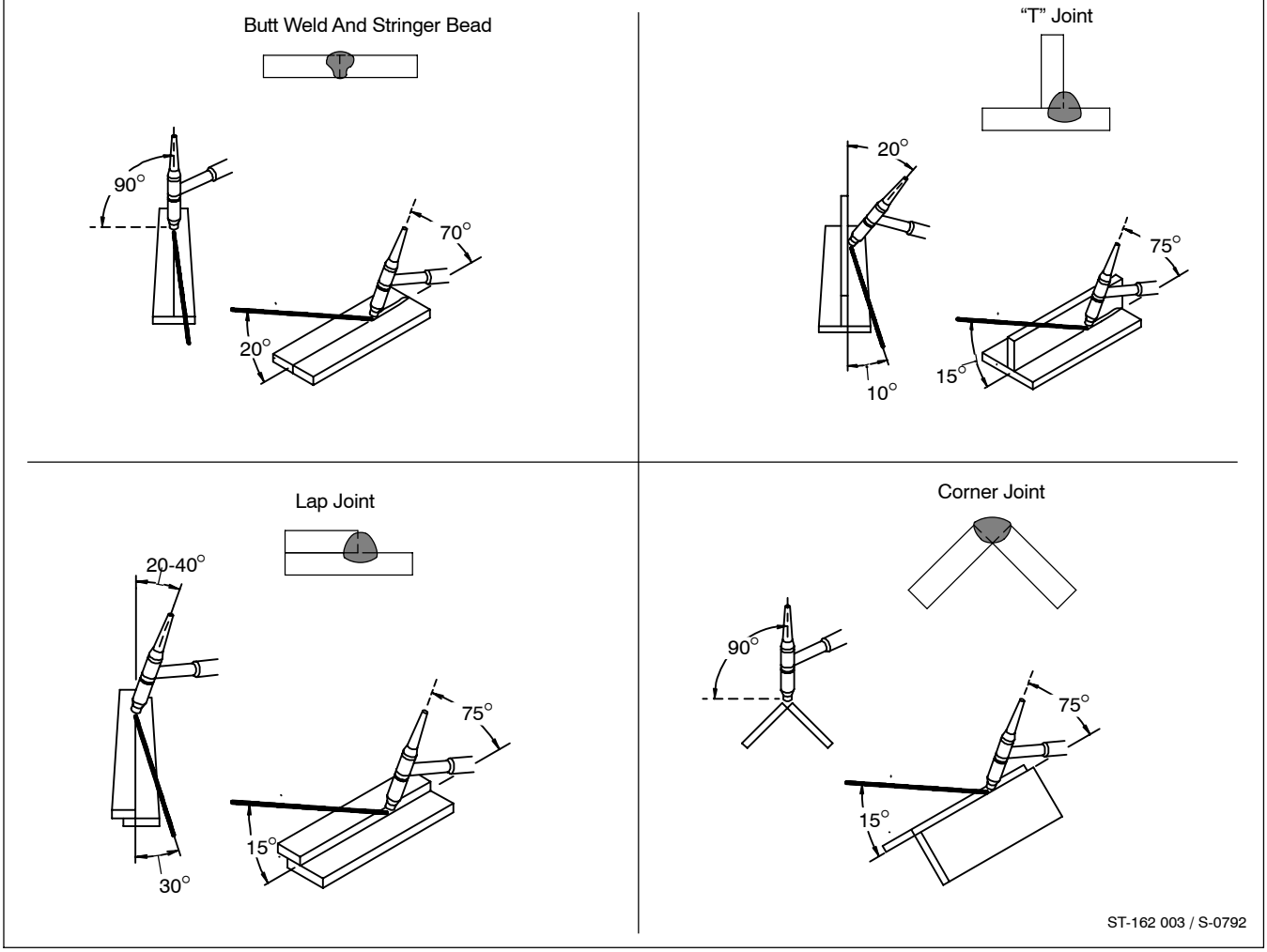
Arc length is the distance from the tungsten to the workpiece.

Ref. ST-161 892

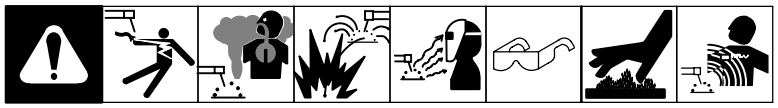
8-2. Torch Movement During Welding



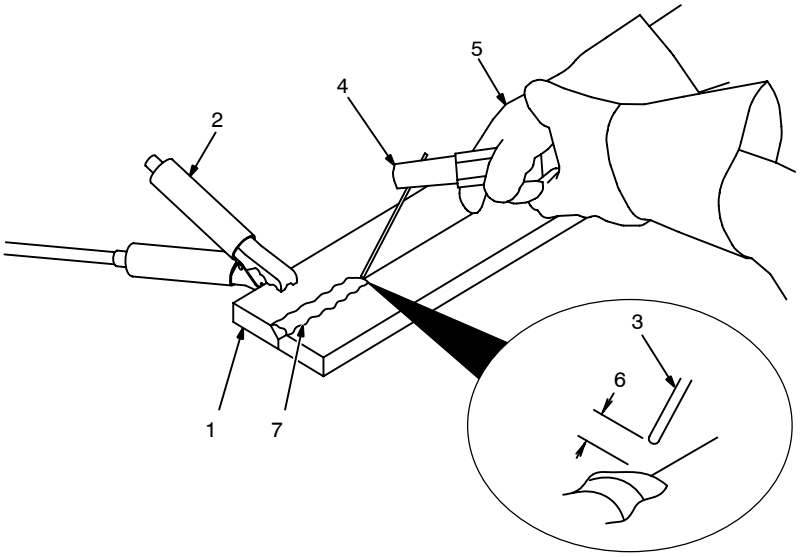
8-3. Positioning Torch Tungsten For Various Weld Joints



SECTION 9 – STICK WELDING (SMAW) GUIDELINES



9-1. Stick Welding Procedure



Weld current starts when electrode touches workpiece.

Weld current can damage electronic parts in vehicles. Disconnect both battery cables before welding on a vehicle. Place work clamp as close to the weld as possible.

1 Workpiece

Make sure workpiece is clean before welding.

2 Work Clamp

3 Electrode

A small diameter electrode requires less current than a large one. Follow electrode manufacturer's instructions when setting weld amperage (see Section 9-2).

4 Insulated Electrode Holder

5 Electrode Holder Position

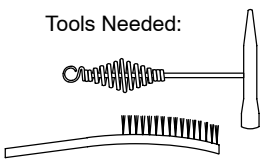
6 Arc Length

Arc length is the distance from the electrode to the workpiece. A short arc with correct amperage will give a sharp, crackling sound.

7 Slag

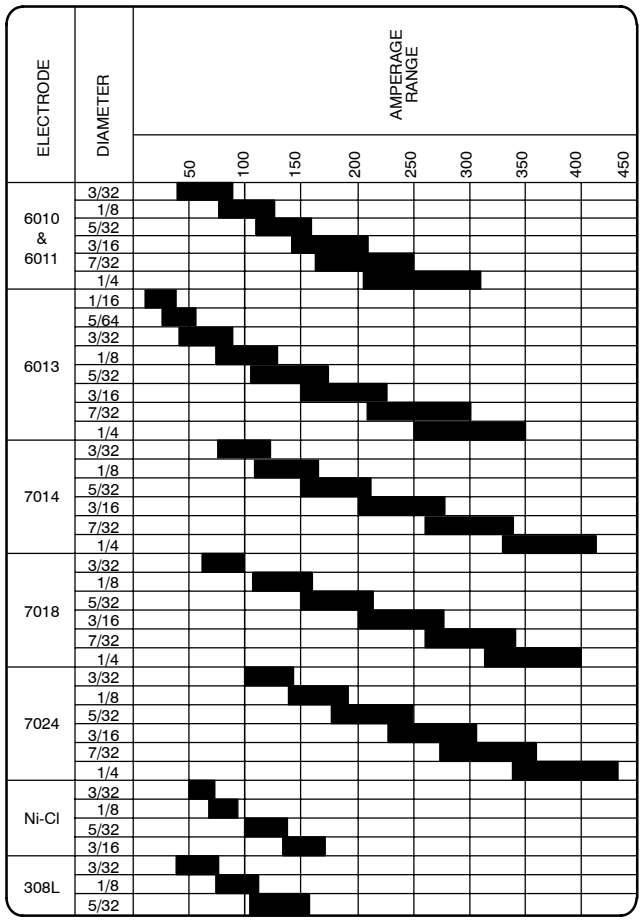
Use a chipping hammer and wire brush to remove slag. Remove slag and check weld bead before making another weld pass.

Tools Needed:



stick 2007–04 – ST-151 593

9-2. Electrode and Amperage Selection Chart

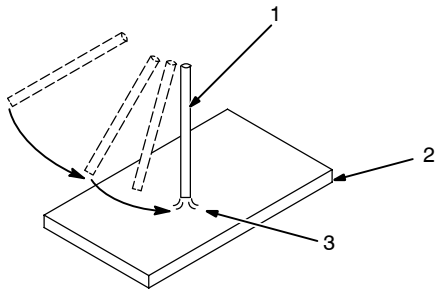


ELECTRODE	DC*	AC	POSITION	PENETRATION	USAGE
6010	EP		ALL	DEEP	MIN. PREP, ROUGH HIGH SPATTER
6011	EP	√	ALL	DEEP	
6013	EP,EN	√	ALL	LOW	GENERAL
7014	EP,EN	√	ALL	MED	SMOOTH, EASY, FAST
7018	EP	√	ALL	LOW	LOW HYDROGEN, STRONG
7024	EP,EN	√	FLAT HORIZ FILLET	LOW	SMOOTH, EASY, FASTER
NI-CL	EP	√	ALL	LOW	CAST IRON
308L	EP	√	ALL	LOW	STAINLESS

*EP = ELECTRODE POSITIVE (REVERSE POLARITY)
EN = ELECTRODE NEGATIVE (STRAIGHT POLARITY)

Ref. S-087 985-A

9-3. Striking an Arc – Scratch Start Technique

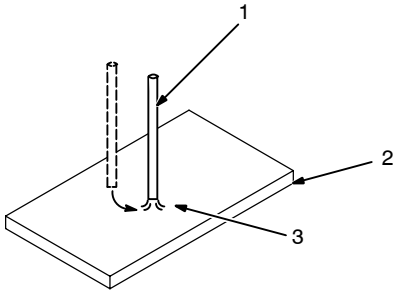


1 Electrode
2 Workpiece
3 Arc

Drag electrode across workpiece like striking a match; lift electrode slightly after touching work. If arc goes out electrode was lifted to high. If electrode sticks to workpiece, use a quick twist to free it.

S-0049

9-4. Striking an Arc – Tapping Technique

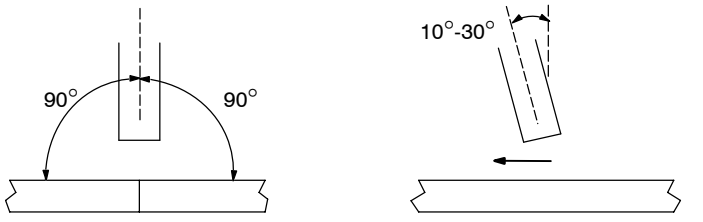


1 Electrode
2 Workpiece
3 Arc

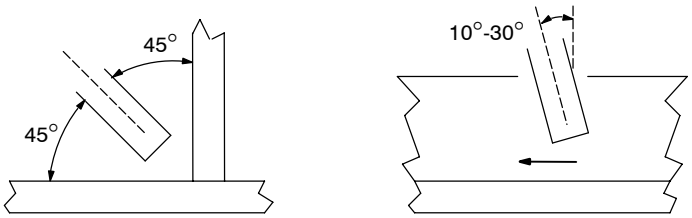
Bring electrode straight down to workpiece; then lift slightly to start arc. If arc goes out, electrode was lifted too high. If electrode sticks to workpiece, use a quick twist to free it.

S-0050

9-5. Positioning Electrode Holder



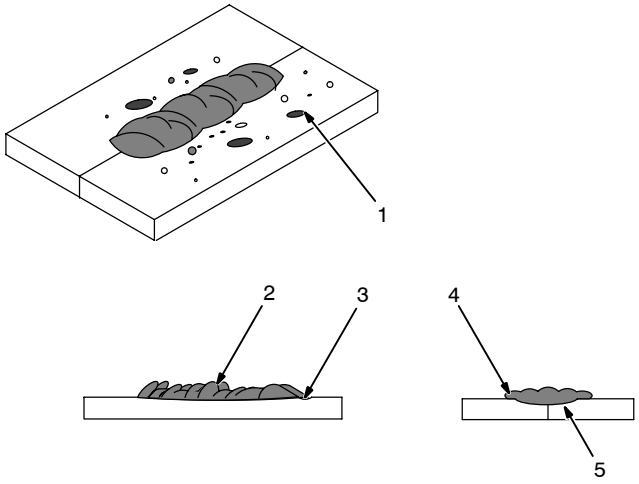
GROOVE WELDS



FILLET WELDS

S-0060

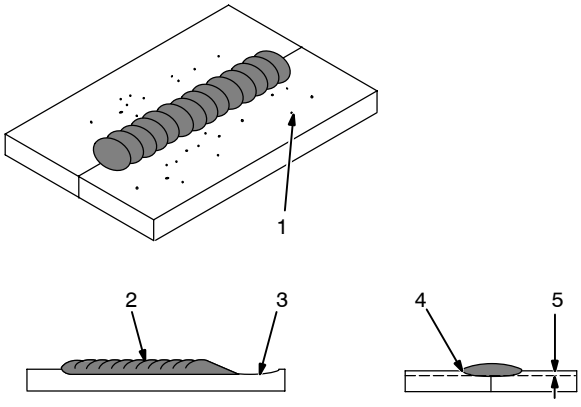
9-6. Poor Weld Bead Characteristics



1 Large Spatter Deposits
2 Rough, Uneven Bead
3 Slight Crater During Welding
4 Bad Overlap
5 Poor Penetration

S-0053-A

9-7. Good Weld Bead Characteristics



1 Fine Spatter
2 Uniform Bead
3 Moderate Crater During Welding

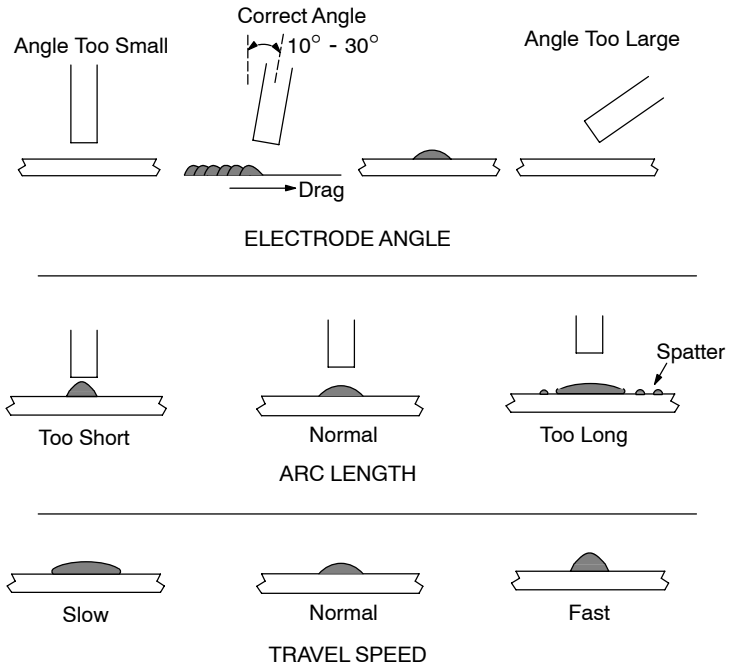
Weld a new bead or layer for each 1/8 in. (3.2 mm) thickness in metals being welded.

4 No Overlap
5 Good Penetration into Base Metal

S-0052-B

9-8. Conditions That Affect Weld Bead Shape

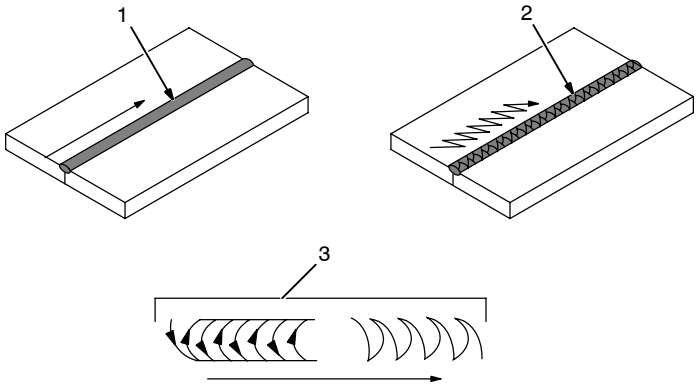
☞ *Weld bead shape is affected by electrode angle, arc length, travel speed, and thickness of base metal.*



S-0061

9-9. Electrode Movement During Welding

☞ *Normally, a single stringer bead is satisfactory for most narrow groove weld joints; however, for wide groove weld joints or bridging across gaps, a weave bead or multiple stringer beads work better.*



1 Stringer Bead – Steady Movement Along Seam

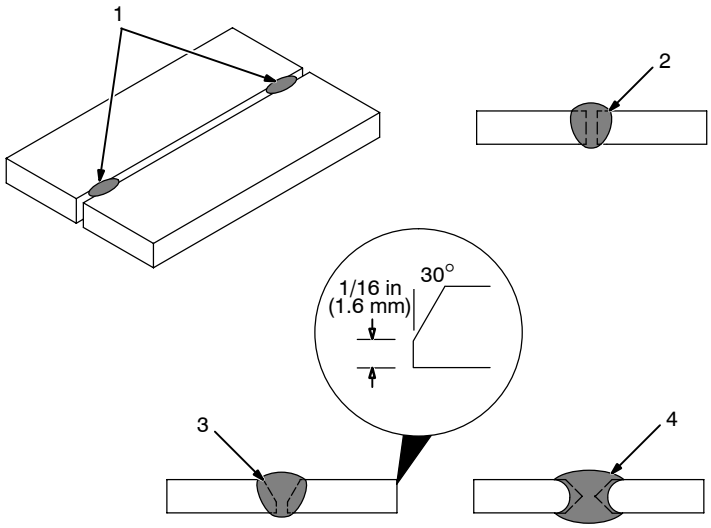
2 Weave Bead – Side to Side Movement Along Seam

3 Weave Patterns

Use weave patterns to cover a wide area in one pass of the electrode. Do not let weave width exceed 2-1/2 times diameter of electrode.

S-0054-A

9-10. Butt Joints



1 Tack Welds

Prevent edges of joint from drawing together ahead of electrode by tack welding the materials in position before final weld.

2 Square Groove Weld

Good for materials up to 3/16 in (5 mm) thick.

3 Single V-Groove Weld

Good for materials 3/16 – 3/4 in (5-19 mm) thick. Cut bevel with oxyacetylene or plasma cutting equipment. Remove scale from material after cutting. A grinder can also be used to prepare bevels.

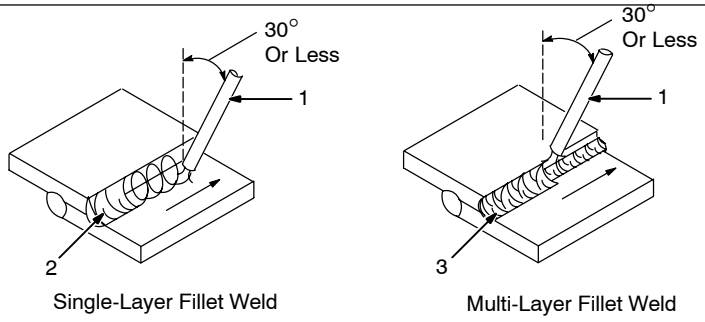
Create 30 degree angle of bevel on materials in V-groove welding.

4 Double V-Groove Weld

Good for materials thicker than 3/16 in (5 mm).

S-0662

9-11. Lap Joint



1 Electrode

2 Single-Layer Fillet Weld

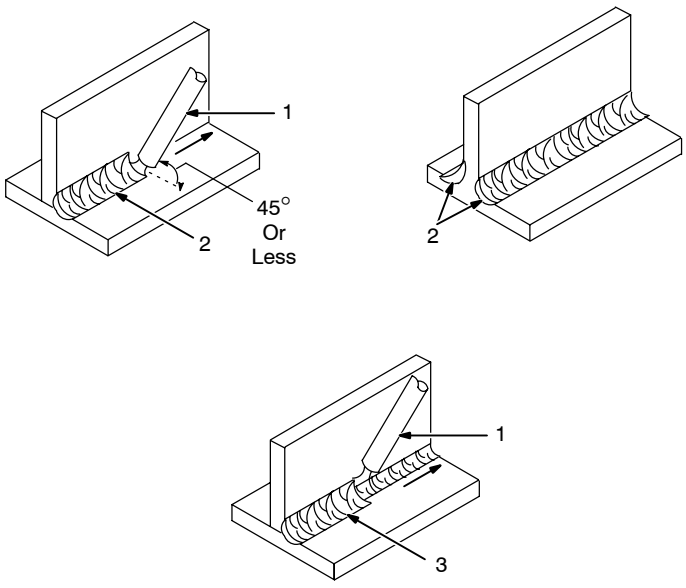
Move electrode in circular motion.

3 Multi-Layer Fillet Weld

Weld a second layer when a heavier fillet is needed. Remove slag before making another weld pass. Weld both sides of joint for maximum strength.

S-0063 / S-0064

9-12. Tee Joint



1 Electrode

2 Fillet Weld

Keep arc short and move at definite rate of speed. Hold electrode as shown to provide fusion into the corner. Square edge of the weld surface.

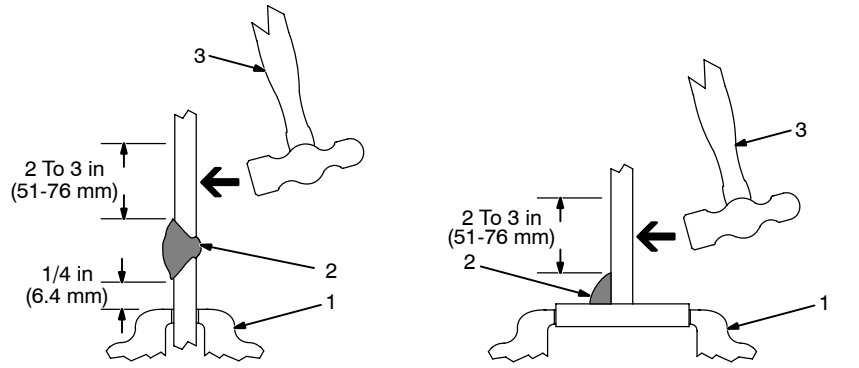
For maximum strength weld both sides of upright section.

3 Multi-Layer Deposits

Weld a second layer when a heavier fillet is needed. Use any of the weaving patterns shown in Section 9-9. Remove slag before making another weld pass.

S-0060 / S-0058-A / S-0061

9-13. Weld Test

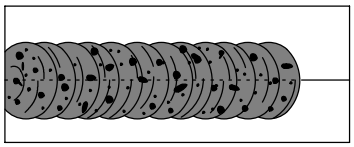


1 Vise
2 Weld Joint
3 Hammer

Strike weld joint in direction shown. A good weld bends over but does not break.

S-0057-B

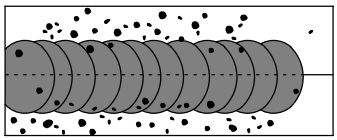
9-14. Troubleshooting – Porosity



Porosity – small cavities or holes resulting from gas pockets in weld metal.

Possible Causes	Corrective Actions
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.

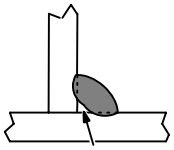
9-15. Troubleshooting – Excessive Spatter

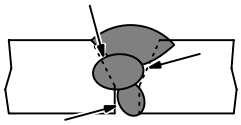


Excessive Spatter – scattering of molten metal particles that cool to solid form near weld bead.

Possible Causes	Corrective Actions
Amperage too high for electrode.	Decrease amperage or select larger electrode.
Arc length too long or voltage too high.	Reduce arc length or voltage.

9-16. Troubleshooting – Incomplete Fusion

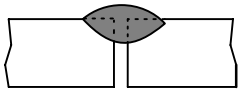




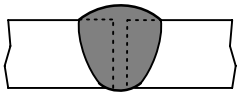
Incomplete Fusion – failure of weld metal to fuse completely with base metal or a preceeding weld bead.

Possible Causes	Corrective Actions
Insufficient heat input.	Increase amperage. Select larger electrode and increase amperage.
Improper welding technique.	Place stringer bead in proper location(s) at joint during welding.
	Adjust work angle or widen groove to access bottom 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 work surface before welding.

9-17. Troubleshooting – Lack Of Penetration



Lack of Penetration

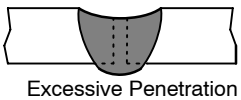


Good Penetration

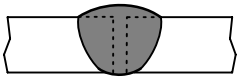
Lack Of Penetration – shallow fusion between weld metal and base metal.

Possible Causes	Corrective Actions
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.

9-18. Troubleshooting – Excessive Penetration



Excessive Penetration

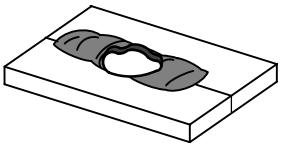


Good Penetration

Excessive Penetration – weld metal melting through base metal and hanging underneath weld.

Possible Causes	Corrective Actions
Excessive heat input.	Select lower amperage. Use smaller electrode.
	Increase and/or maintain steady travel speed.

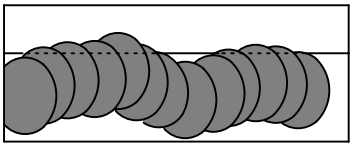
9-19. Troubleshooting – Burn-Through



Burn-Through – weld metal melting completely through base metal resulting in holes where no metal remains.

Possible Causes	Corrective Actions
Excessive heat input.	Select lower amperage. Use smaller electrode.
	Increase and/or maintain steady travel speed.

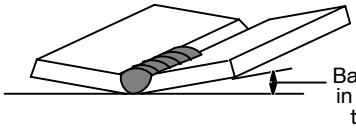
9-20. Troubleshooting – Waviness Of Bead



Waviness Of Bead – weld metal that is not parallel and does not cover joint formed by base metal.

Possible Causes	Corrective Actions
Unsteady hand.	Use two hands. Practice technique.

9-21. Troubleshooting – Distortion



Distortion – contraction of weld metal during welding that forces base metal to move.

Possible Causes	Corrective Actions
Excessive heat input.	Use restraint (clamp) to hold base metal in position.
	Make tack welds along joint before starting welding operation.
	Select lower amperage for electrode.
	Increase travel speed.
	Weld in small segments and allow cooling between welds.

SECTION 10 – PARTS LIST

☞ *Hardware is common and not available unless listed.*

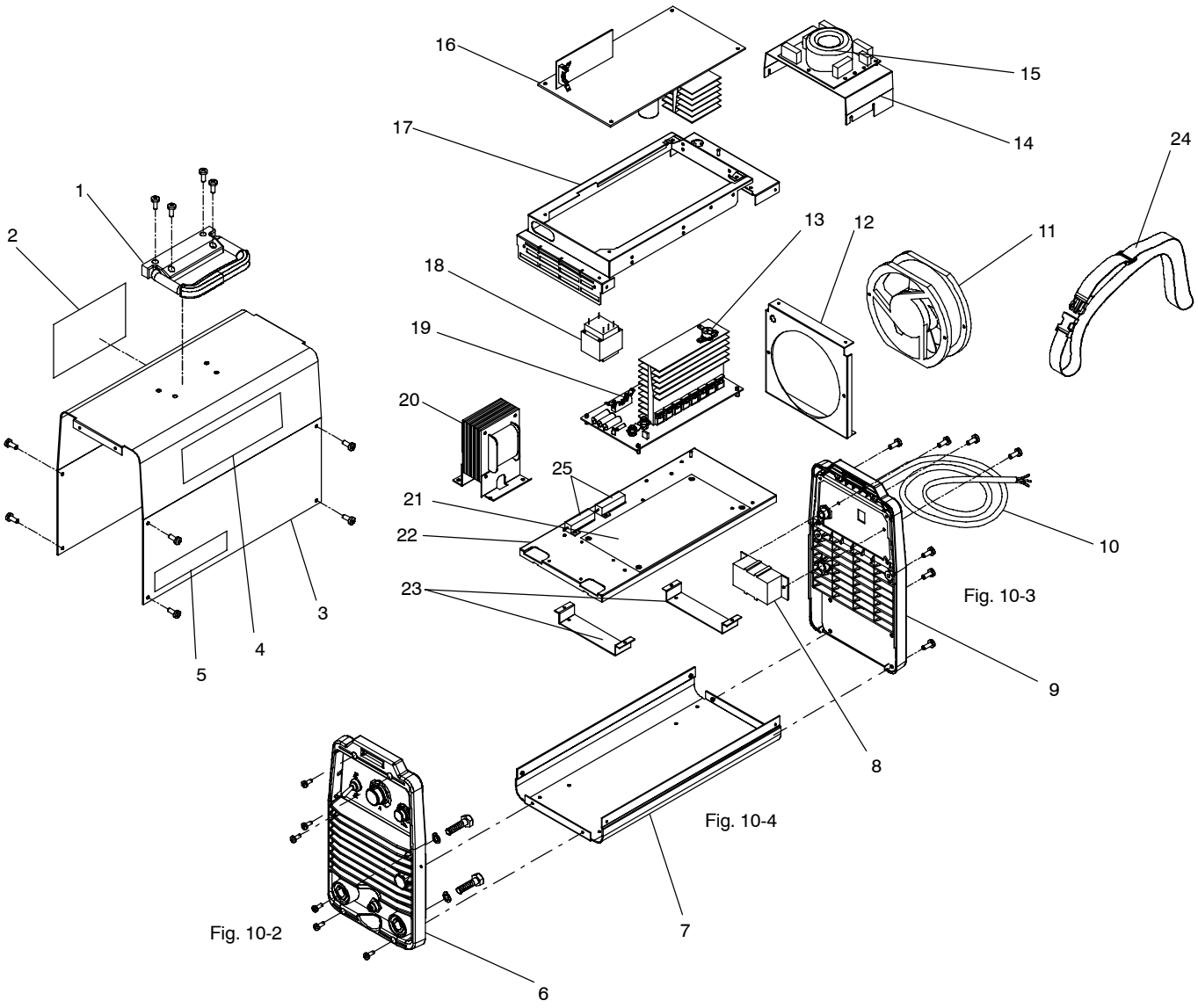


Figure 10-1. Main Assembly

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 10-1. Main Assembly

1		208015	Handle	1
2		207233	Label, Gen. Precautionary	1
3		+156121038	Wrapper	1
4		V56142107	Label, Unitor	1
5		185836	Label, Caution Electrical Hazard	1
6		Fig 10-2	Panel, Front w/Components	1
7		Fig 10-4	Base, Assembly w/Components	1
8	S1	128756	Switch, Tgl 3Pst 40A 600 VAC Scr Term Wide Tgl	1
9		Fig 10-3	Panel, Rear w/Components	1
10		57014221	Cable, Primary 4 Core 2.5mm ^{2}	1
11	FM1	56126076	Fan Motor	1
12		156005138	Fan Motor, Support	1
13	TP1	56159027	Thermal Switch	1
14		156005139	Support, Line Input Filter PCB	1
15	PC4	56130021	PC4 Line Filter Board	1
16	PC1	57084137	PC1 Circuit Card Assy, Primary Inverter	1
17		156118055	Support, Inverter PCB	1
18	T1	57059006	Auxiliary Transformer	1
19	PC2	57084138	PC2 Circuit Card Assy, Secondary Inverter	1
20	Z1	57059007	Stabilizer Assy	1
21		756084029	Mylar insulating	1
22		156006061	Intermediate, Panel	1
23		756005028	Support, Intermediate, Panel	2
24		195663	Strap, Shoulder Assy 6 ft	1
25	R1,R2	056059283	Resistor w/Wound 150 Ohm 50 Watt	2

+When ordering a component originally displaying a precautionary label, the label should also be ordered.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts.

Model and serial number required when ordering parts from your local distributor.

☞ *Hardware is common and not available unless listed.*

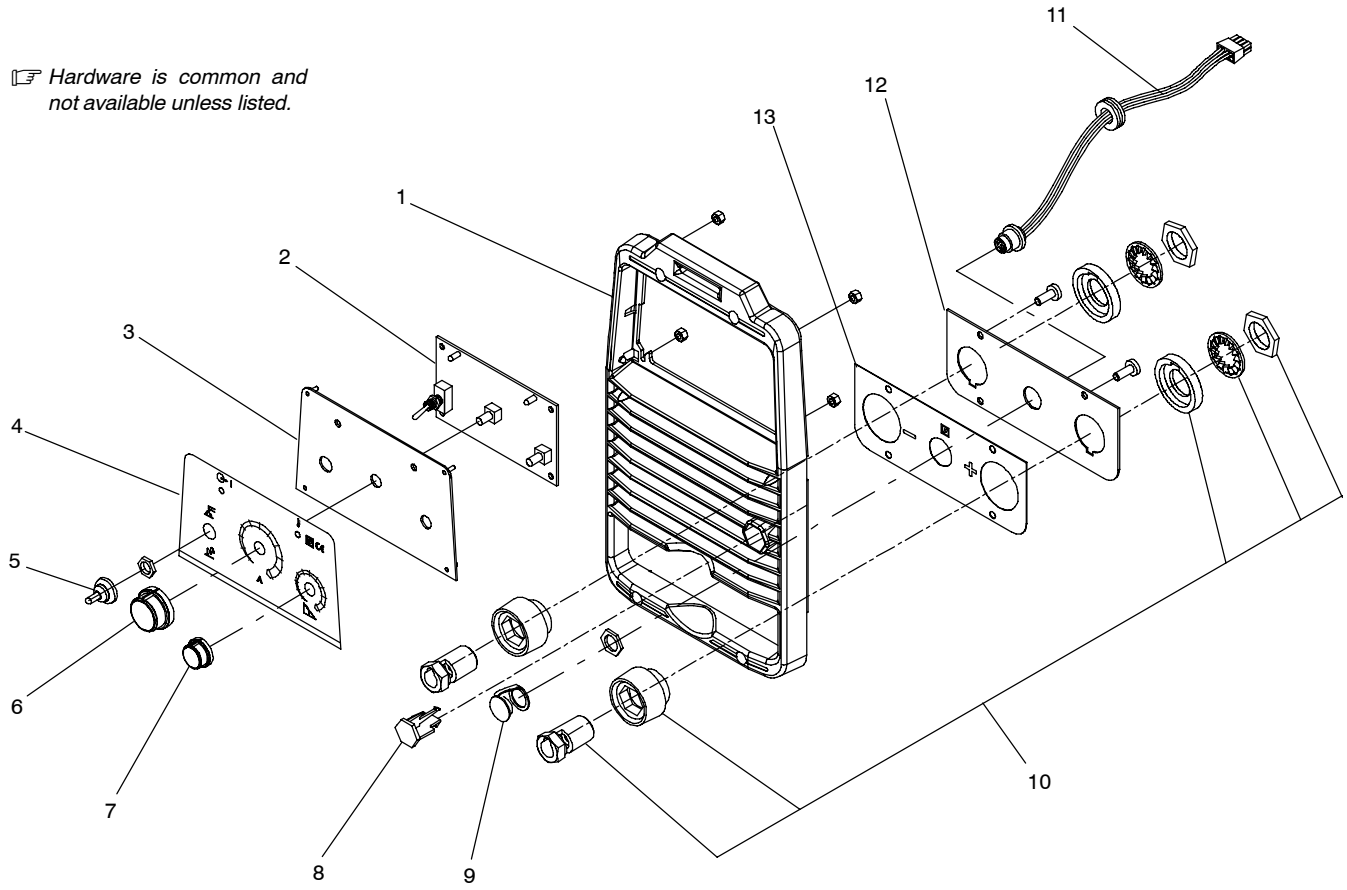


Figure 10-2. Panel, Front w/Components

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
			10-2. Panel, Front w/Components (Figure 10-1 Item 1)	
1		194242	Panel, Front/Rear	1
2	PC3	57084136	PC3 Circuit Card Assy, Interface	1
3		156118054	Panel, Front Upper	1
4		356029206	Nameplate, Unitor UWI 202	1
5		656014013	Cover, Selector Switch	1
6		193919	Knob, Pointer 1.250 Dia X .250 Id	1
7		193920	Knob, Pointer .840 Dia X .250 Id	1
8		207253	Plug, Gas Fitting	1
9	RC1	156007041	Cover 6 Pin receptacle	1
10		56076257	Female Socket, Dinse	1
11		56076258	Female 6 Pin Receptacle , Wiring Harness	1
12		156005137	Panel, Front, Lower	1
13		956142634	Nameplate, Dinse, 6 Pin	1

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

☞ *Hardware is common and not available unless listed.*

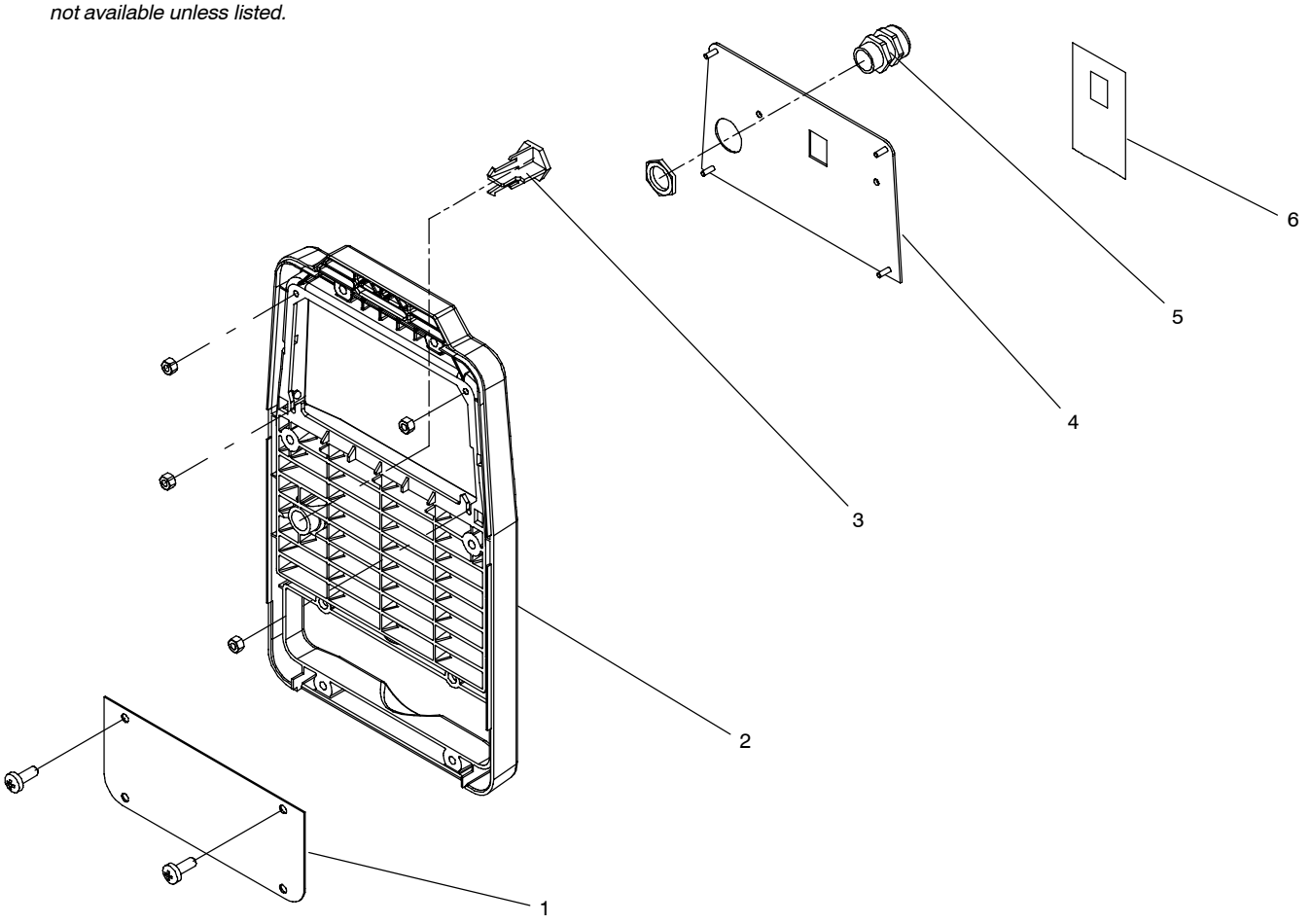


Figure 10-3.Panel, Rear w/Components

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 10-3. Panel, Rear w/Components (Figure 10-1 Item 2)

1		V16118098	Panel, Rear Lower	1
2		194242	Panel, Front/Rear	1
3		207723	Plug, Gas Fitting	1
4		V15024100	Panel, Rear Upper	1
5		656089039	Bushing, Strain Relief	1
6		956142657	Switch, Label	1

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

☞ *Hardware is common and not available unless listed.*

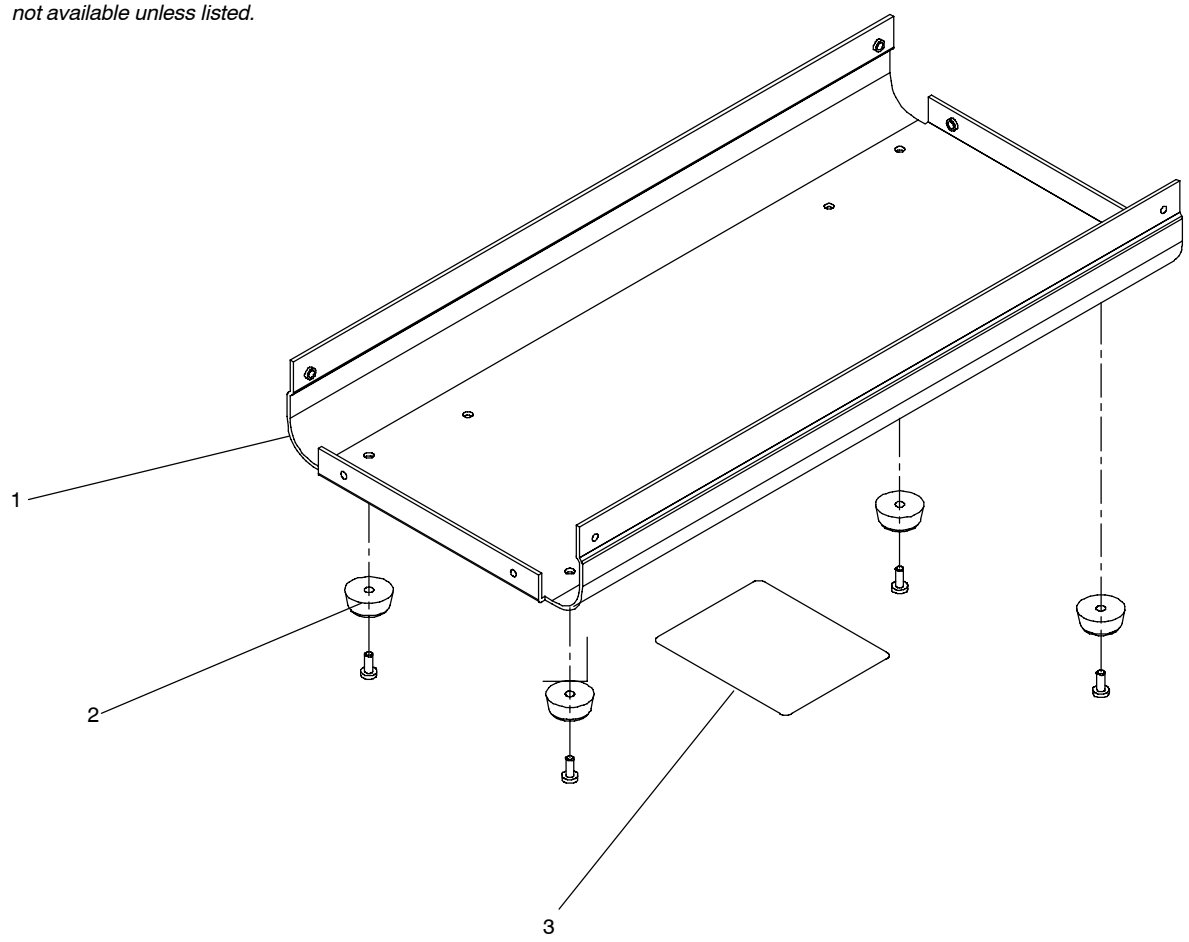


Figure 10-4. Base Assembly

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

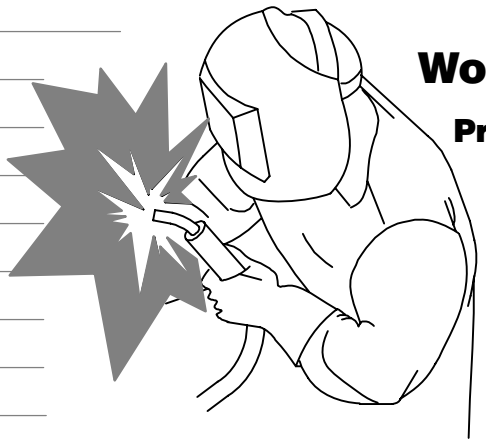
Figure 10-4. Base Assembly
(Figure 10-1 Item 5)

1 . . . . . 156006060 . . . . Base, ... 1
2 . . . . . V56110090 . . . . Mount, Nprn 4
3 . . . . . 956142631 . . . . Rating Plate 1

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

Notes

Notes



Work like a Pro!

Pros weld and cut safely. Read the safety rules at the beginning of this manual.

Notes

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