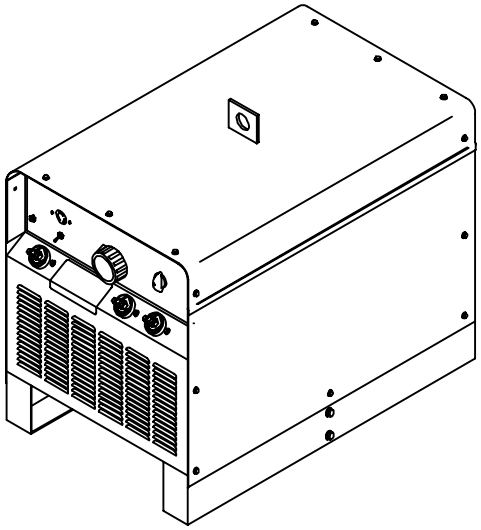
Miller®

June 1998 Form: OM-230M

Effective With Serial No. KJ027 371

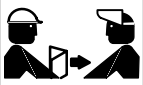
OWNER'S MANUAL



SRH-333 And SRH-444

- CC/DC Welding Power Source
- For SMAW, SAW Welding And CAC-A Cutting And Gouging
- 300 Amperes, 32 Volts DC At 60% Duty Cycle
  400 Amperes, 36 Volts DC At 60% Duty Cycle
- Uses Three-Phase Input Power
- High And Low Range Weld Output Terminals
- Control Circuit Overload Protection
- Remote Amperage Control Receptacle And Switch

- Read and follow these instructions and all safety blocks carefully.
- Have only trained and qualified persons install, operate, or service this unit.
- Call your distributor if you do not understand the directions.



- Give this manual to the operator.

- For help, call your distributor
- or: MILLER Electric Mfg. Co., P.O. Box 1079, Appleton, WI 54912 920-735-4505

From Miller to You

Thank you and *congratulations* on choosing Miller. Now you can get the job done and get it done right. We know you don't have time to do it any other way.

That's why when Niels Miller first started building arc welders in 1929, he made sure his products offered long-lasting value and superior quality. Like you, his customers couldn't afford anything less. Miller products had to be more than the best they could be. They had to be the best you could buy.

Today, the people that build and sell Miller products continue the tradition. They're just as committed to providing equipment and service that meets the high standards of quality and value established in 1929.

This Owner's Manual is designed to help you get the most out of your Miller products. Please take time to read the Safety precautions. They will help you protect yourself against potential hazards on the worksite. We've made installation and operation quick and easy. With Miller you can count on years of reliable service with proper maintenance. And if for some reason the unit needs repair, there's a Troubleshooting section that will help you figure out what the problem is. The parts list will then help you to decide which exact part you may need to fix the problem. Warranty and service information for your particular model are also provided.

ISO 9001 REGISTERED QUALITY SYSTEM

Miller is the first welding equipment manufacturer in the U.S.A. to be registered to the ISO 9001 Quality System Standard.

TRUE BLUE® WARRANTY

Working as hard as you do – every power source from Miller is backed by the most hassle-free warranty in the business.

Miller offers a Technical Manual which provides more detailed service and parts information for your unit. To obtain a Technical Manual, contact your local distributor. Your distributor can also supply you with Welding Process Manuals such as SMAW, GTAW, GMAW, and GMAW-P.

Miller Electric manufactures a full line of welders and welding related equipment. For information on other quality Miller products, contact your local Miller distributor to receive the latest full line catalog or individual catalog sheets. **To locate your nearest distributor or service agency call 1-800-4-A-Miller, or visit us at www.MillerWelds.com on the web.**

Miller® The Power of Blue.

EMF INFORMATION

NOTE ☞

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

The following is a quotation from the General Conclusions Section of the U.S. Congress, Office of Technology Assessment, *Biological Effects of Power Frequency Electric & Magnetic Fields – Background Paper*, OTA-BP-E-53 (Washington, DC: U.S. Government Printing Office, May 1989): ". . . there is now a very large volume of scientific findings based on experiments at the cellular level and from studies with animals and people which clearly establish that low frequency magnetic fields can interact with, and produce changes in, biological systems. While most of this work is of very high quality, the results are complex. Current scientific understanding does not yet allow us to interpret the evidence in a single coherent framework. Even more frustrating, it does not yet allow us to draw definite conclusions about questions of possible risk or to offer clear science-based advice on strategies to minimize or avoid potential risks."

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

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

About Pacemakers:

The above procedures are among those also normally recommended for pacemaker wearers. Consult your doctor for complete information.

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TABLE OF CONTENTS

ARC WELDING SAFETY PRECAUTIONS

⚠ WARNING

ARC WELDING can be hazardous.

PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY. PACEMAKER WEARERS KEEP AWAY UNTIL CONSULTING YOUR DOCTOR.

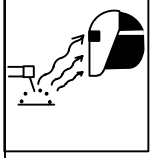
In welding, as in most jobs, exposure to certain hazards occurs. Welding is safe when precautions are taken. The safety information given below is only a summary of the more complete safety information that will be found in the Safety Standards listed on the next page. Read and follow all Safety Standards.

HAVE ALL INSTALLATION, OPERATION, MAINTENANCE, AND REPAIR WORK PERFORMED ONLY BY QUALIFIED PEOPLE.

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.

1. Do not touch live electrical parts.
2. Wear dry, hole-free insulating gloves and body protection.
3. Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.
4. 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).
5. Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.
6. 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.
7. When making input connections, attach proper grounding conductor first – double-check connections.
8. Frequently inspect input power cord for damage or bare wiring – replace cord immediately if damaged – bare wiring can kill.
9. Turn off all equipment when not in use.
10. Do not use worn, damaged, undersized, or poorly spliced cables.
11. Do not drape cables over your body.
12. If earth grounding of the workpiece is required, ground it directly with a separate cable – do not use work clamp or work cable.
13. Do not touch electrode if you are in contact with the work, ground, or another electrode from a different machine.
14. Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain unit according to manual.
15. Wear a safety harness if working above floor level.
16. Keep all panels and covers securely in place.
17. Clamp work cable with good metal-to-metal contact to workpiece or worktable as near the weld as practical.



ARC RAYS can burn eyes and skin; NOISE can damage hearing; FLYING SLAG OR SPARKS can injure eyes.

Arc rays from the welding process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Noise from some processes can damage hearing. Chipping, grinding, and welds cooling throw off pieces of metal or slag.

NOISE

1. Use approved ear plugs or ear muffs if noise level is high.

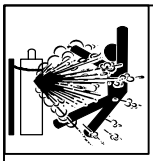
ARC RAYS

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

FUMES AND GASES can be hazardous to your health.

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

1. Keep your head out of the fumes. Do not breathe the fumes.
2. If inside, ventilate the area and/or use exhaust at the arc to remove welding fumes and gases.
3. If ventilation is poor, use an approved air-supplied respirator.
4. Read the Material Safety Data Sheets (MSDSs) and the manufacturer's instruction for metals, consumables, coatings, cleaners, and degreasers.
5. Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watchperson nearby. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.
6. 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.
7. 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 if necessary, while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.



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.

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

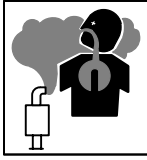
WELDING can cause fire or explosion.

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.

1. Protect yourself and others from flying sparks and hot metal.
2. Do not weld where flying sparks can strike flammable material.
3. Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
4. Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
5. Watch for fire, and keep a fire extinguisher nearby.
6. Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
7. 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).
8. 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 and fire hazards.
9. Do not use welder to thaw frozen pipes.
10. Remove stick electrode from holder or cut off welding wire at contact tip when not in use.
11. Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.
12. Remove any combustibles, such as a butane lighter or matches, from your person before doing any welding.

⚠ WARNING

ENGINES can be hazardous.



ENGINE EXHAUST GASES can kill.

Engines produce harmful exhaust gases.

1. Use equipment outside in open, well-ventilated areas.
2. If used in a closed area, vent engine exhaust outside and away from any building air intakes.

ENGINE FUEL can cause fire or explosion.

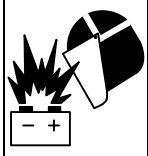
Engine fuel is highly flammable.

1. Stop engine and let it cool off before checking or adding fuel.
2. Do not add fuel while smoking or if unit is near any sparks or open flames.
3. Do not overfill tank – allow room for fuel to expand.
4. Do not spill fuel. If fuel is spilled, clean up before starting engine.

MOVING PARTS can cause injury.

Moving parts, such as fans, rotors, and belts can cut fingers and hands and catch loose clothing.

1. Keep all doors, panels, covers, and guards closed and securely in place.
2. Stop engine before installing or connecting unit.
3. Have only qualified people remove guards or covers for maintenance and troubleshooting as necessary.
4. To prevent accidental starting during servicing, disconnect negative (–) battery cable from battery.
5. Keep hands, hair, loose clothing, and tools away from moving parts.
6. Reinstall panels or guards and close doors when servicing is finished and before starting engine.



SPARKS can cause BATTERY GASES TO EXPLODE; BATTERY ACID can burn eyes and skin.

Batteries contain acid and generate explosive gases.

1. Always wear a face shield when working on a battery.
2. Stop engine before disconnecting or connecting battery cables.
3. Do not allow tools to cause sparks when working on a battery.
4. Do not use welder to charge batteries or jump start vehicles.
5. Observe correct polarity (+ and –) on batteries.

STEAM AND PRESSURIZED HOT COOLANT can burn face, eyes, and skin.

It is best to check coolant level when engine is cold to avoid scalding.

1. If the engine is warm and checking is needed, follow steps 2 and 3.
2. Wear safety glasses and gloves and put a rag over cap.
3. Turn cap slightly and let pressure escape slowly before completely removing cap.

PRINCIPAL SAFETY STANDARDS

Safety in Welding and Cutting, ANSI Standard Z49.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami FL 33126

Safety and Health Standards, OSHA 29 CFR 1910, from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Recommended Safe Practices for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances, American Welding Society Standard AWS F4.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

Code for Safety in Welding and Cutting, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3.

Safe Practices For Occupation And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 1430 Broadway, New York, NY 10018.

Cutting And Welding Processes, NFPA Standard 51B, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

SECTION 1 – SAFETY INFORMATION

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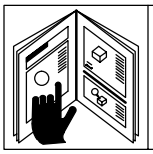
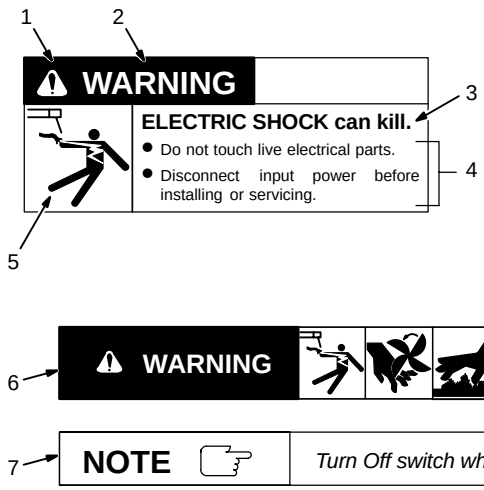


- Read all safety messages throughout this manual.
- Obey all safety messages to avoid injury.
- Learn the meaning of WARNING and CAUTION.



1 Safety Alert Symbol

2 Signal Word

WARNING means possible death or serious injury can happen.

CAUTION means possible minor injury or equipment damage can happen.

3 Statement Of Hazard And Result

4 Safety Instructions To Avoid Hazard

5 Hazard Symbol (If Available)

6 Safety Banner

Read safety blocks for each symbol shown.

7 NOTE

Special instructions for best operation – not related to safety.

Figure 1-1. Safety Information

SECTION 2 – SPECIFICATIONS

Table 2-1. Welding Power Source

Specification	Description	
Type Of Output	Constant Current/Direct Current (CC/DC)	
Welding Processes	Shielded Metal Arc (SMAW) And Submerged Arc (SAW) Welding; Air Carbon Arc Cutting And Gouging (CAC-A)	
Overall Dimensions	See Figure 3-2	
Options	See Rear Cover	
	300 Ampere	**400 Ampere**
Rated Weld Output	300 Amperes, 32 Volts DC At 60% Duty Cycle	400 Amperes, 36 Volts DC At 60% Duty Cycle
Type Of Input Power	Three-Phase, 208, 230, Or 460 Volts AC; 60 Hz	Three-Phase, 208, 230, 460, Or 575 Volts AC; 60 Hz
Input Amperes At Rated Output	64 A At 208 V, 58 A At 230 V, 29 A At 460 V	89 A At 208 V, 80 A At 230 V, 40 A At 460 V, 32 A At 575 V
Input Amperes While Idling	4.8 A At 208 V, 4.3 A At 230 V, 2.15 A At 460 V	5.8 A At 208 V, 5.3 A At 230 V, 2.6 A At 460 V, 2.1 A At 575 V
KVA/KW Used At Rated Output	23.1 kVA/15 kW	31.9 kVA/19.6 kW
KVA/KW Used While Idling	1.7 kVA/0.8 kW	2.1 kVA/0.8 kW
Welding Range In Amperes	A (Low): 30-225; B (High): 40-375	A (Low): 30-280; B (High): 50-500
Max. Open-Circuit Voltage	75 Volts DC	75 Volts DC
Weight	Net: 705 lb (320 kg); Ship: 730 lb (331 kg)	Net: 775 lb (352 kg); Ship: 800 lb (363 kg)

2-1. Volt-Ampere Curves

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

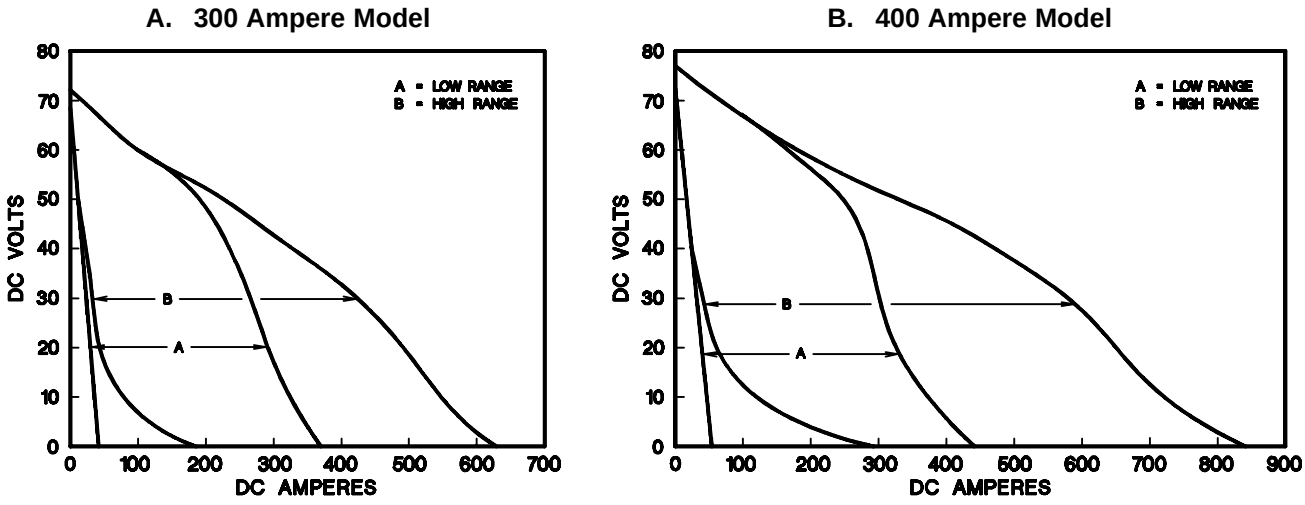


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Figure 2-1. Volt-Ampere Curves

2-2. Duty Cycle

⚠ CAUTION

WELDING LONGER THAN RATED DUTY CYCLE can damage unit and void warranty.

- Do not weld at rated load longer than shown below.

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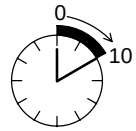
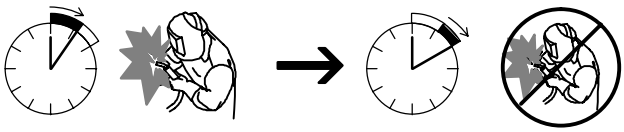


Definition

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

60% Duty Cycle At 300 Amperes For 300 Ampere Models

60% Duty Cycle At 400 Amperes For 400 Ampere Models



6 Minutes Welding — 4 Minutes Resting

Chart

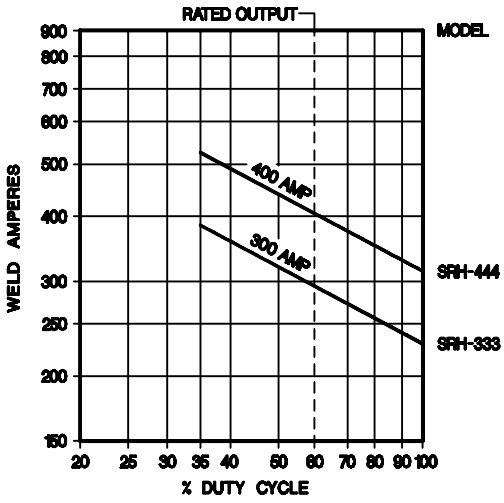


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Figure 2-2. Duty Cycle

SECTION 3 – INSTALLATION

3-1. Selecting A Location And Moving Welding Power Source

⚠ WARNING

ELECTRIC SHOCK can kill.

- Do not touch live electrical parts.
- Disconnect input power conductors from de-energized supply line BEFORE moving welding power source.

FIRE OR EXPLOSION can result from placing unit on, over, or near combustible surfaces.

- Do not locate unit on, over, or near combustible surfaces.
- Do not install unit near flammables.

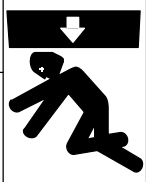
BLOCKED AIRFLOW causes overheating and possible damage to unit.

- Do not block airflow.
- Use only factory-approved filter.

Warranty is void if any unapproved filter is used.

FUMES can be hazardous; LACK OF FRESH AIR AND PROPER VENTILATION can be harmful.

- Do not breathe welding fumes.
- Place unit only where there is a good fresh air supply and proper ventilation.



FALLING EQUIPMENT can cause serious personal injury and equipment damage.

- Use lifting eye to lift unit only, NOT running gear, gas cylinders, or any other accessories.
- Use equipment of adequate capacity to lift the unit.

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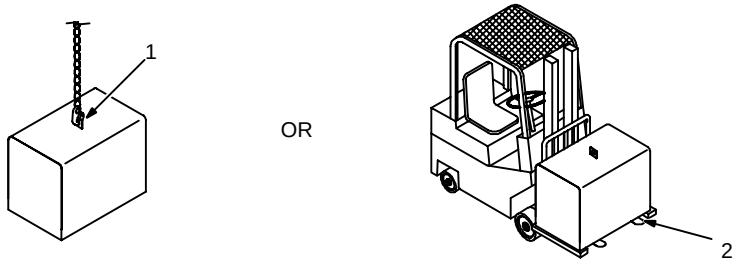
Movement



1 Lifting Eye

2 Lifting Forks

Use lifting eye or lifting forks to move unit.

If using lifting forks, extend forks beyond opposite side of unit.

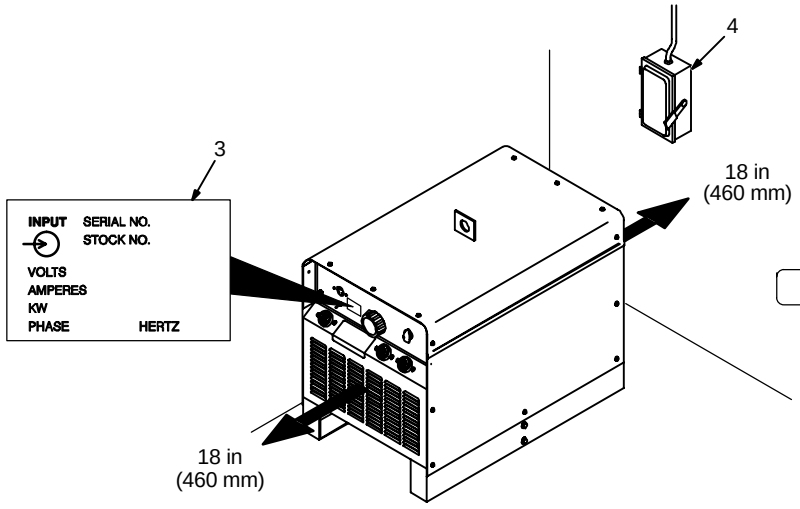
3 Rating Label

Use rating label to determine input power needs.

4 Line Disconnect Device

Locate unit near correct input power supply.

Location And Airflow



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

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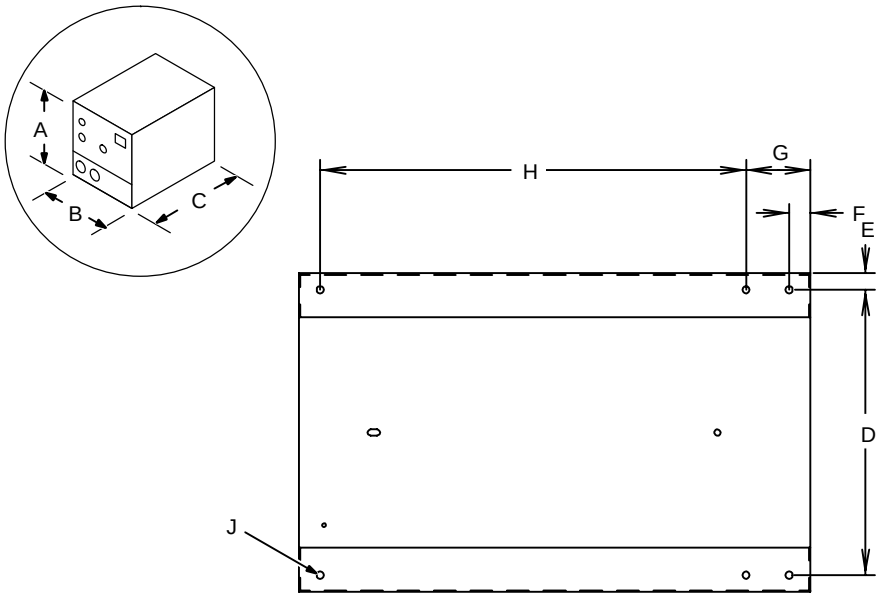
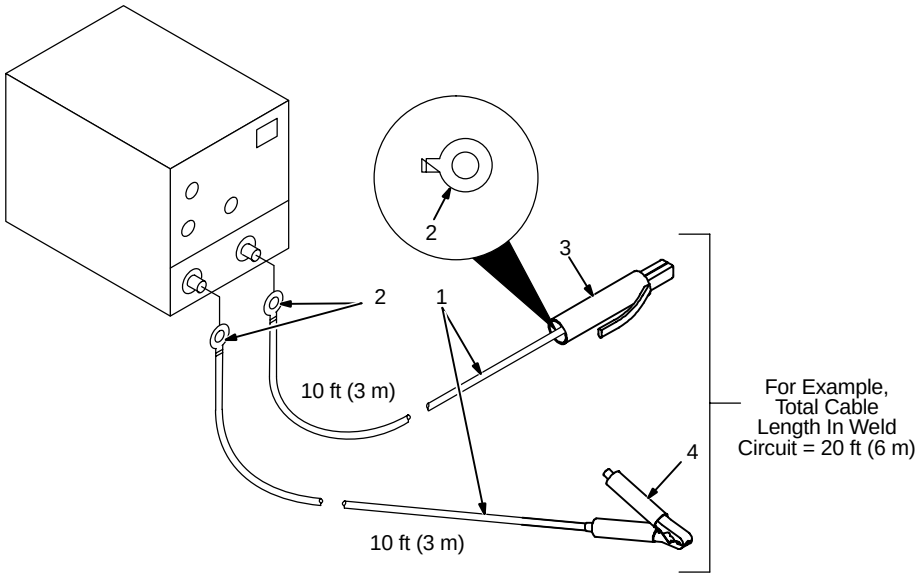
Figure 3-1. Movement And Location Of Welding Power Source



	Inches	Millimeters
A	30-1/4	768
B	22-1/2	571
C	35-3/4	908
D	20	508
E	1-1/4	32
F	1-1/2	38
G	4-1/2	114
H	29-3/4	755
J	1/2 Dia 6 Holes	13 Dia 6 Holes

Figure 3-2. Overall Dimensions And Base Mounting Hole Layout

3-2. Selecting And Preparing Weld Output Cables



1 Weld Output Cable

Determine total cable length in weld circuit and maximum welding amperes. Use Table 3-1 to select proper cable size.

Use shortest cables possible.

Do not use damaged cables.

2 Terminal Lug

Use lugs of proper amperage capacity and hole size for connecting to work clamp, electrode holder, and weld output terminals.

3 Insulated Electrode Holder

Install according to manufacturer's instructions.

4 Work Clamp

Install onto work cable.

Tools Needed:

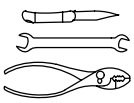


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Figure 3-3. Selecting And Preparing Weld Output Cables

Table 3-1. Weld Cable Size*

Welding Amperes	Total Cable (Copper) Length In Weld Circuit Not Exceeding							
	100 ft (30 m) Or Less		150 ft (45 m)	200 ft (60 m)	250 ft (70 m)	300 ft (90 m)	350 ft (105 m)	400 ft (120 m)
	10 To 60% Duty Cycle	60 Thru 100% Duty Cycle	10 Thru 100% Duty Cycle					
100	4	4	4	3	2	1	1/0	1/0
150	3	3	2	1	1/0	2/0	3/0	3/0
200	3	2	1	1/0	2/0	3/0	4/0	4/0
250	2	1	1/0	2/0	3/0	4/0	2-2/0	2-2/0
300	1	1/0	2/0	3/0	4/0	2-2/0	2-3/0	2-3/0
350	1/0	2/0	3/0	4/0	2-2/0	2-3/0	2-3/0	2-4/0
400	1/0	2/0	3/0	4/0	2-2/0	2-3/0	2-4/0	2-4/0
500	2/0	3/0	4/0	2-2/0	2-3/0	2-4/0	3-3/0	3-3/0
600	3/0	4/0	2-2/0	2-3/0	2-4/0	3-3/0	3-4/0	3-4/0

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

3-3. Connecting To Weld Output Terminals

WARNING

ELECTRIC SHOCK can kill.

- Do not touch live electrical parts.
- Turn Off welding power source, and disconnect input power before making any weld output connections.

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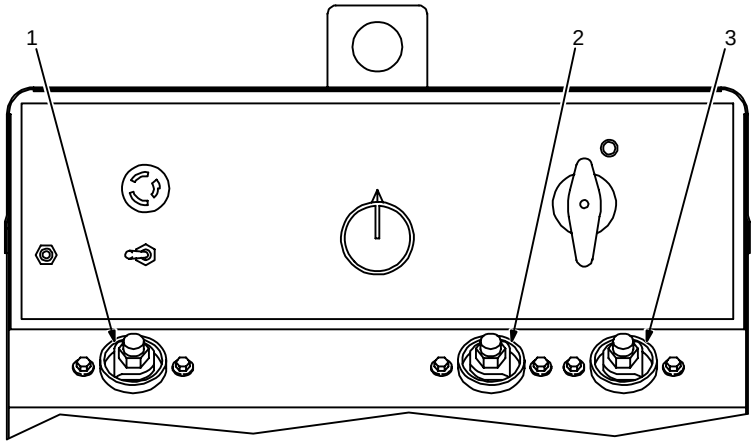


1 Positive (+) Weld Output Terminal

2 A Negative (–) Weld Output Terminal (Low Range)

3 B Negative (–) Weld Output Terminal (High Range)

For DC Electrode Positive (DCEP), connect work cable to negative (–) terminal that supplies desired amperage range. Connect electrode holder cable to positive (+) terminal.

For DC Electrode Negative (DCEN), reverse cable connections.

Use ONLY one negative weld output terminal at a time.

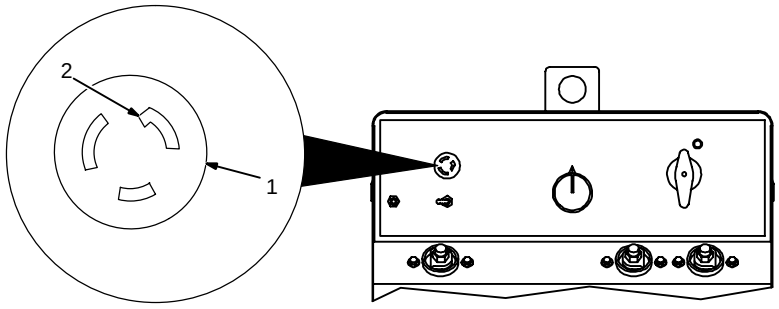
Tools Needed:

3/4 in

Ref. ST-800 040-A

Figure 3-4. Weld Output Connections

3-4. Remote Amperage Control Receptacle



1 Remote Amperage Control Receptacle RC1

2 Keyway

To connect remote amperage control to receptacle, insert plug and turn clockwise until tight.

Ref. ST-800 040-A

Figure 3-5. Remote Amperage Control Receptacle

3-5. Connecting Input Power

⚠ WARNING

ELECTRIC SHOCK can kill.

- Do not touch live electrical parts.
- Turn Off welding power source, and disconnect input power before inspecting or installing.
- Have only qualified persons install unit.
- Installation must meet National Electrical Code and all other codes.

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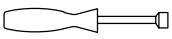
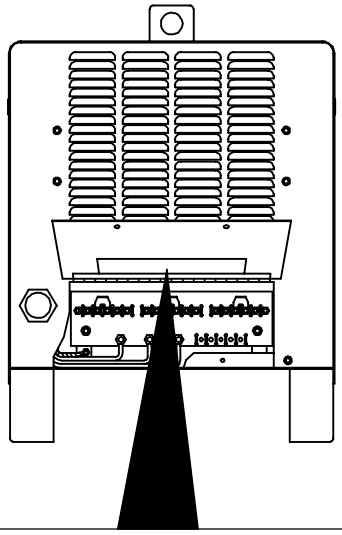
A. Positioning Jumper Links

Tools Needed:



3/8 in



Jumper links allow operation on different input voltages and are factory set for the highest input voltage.

Check input voltage available at site.

Open rear panel access door to check jumper links.

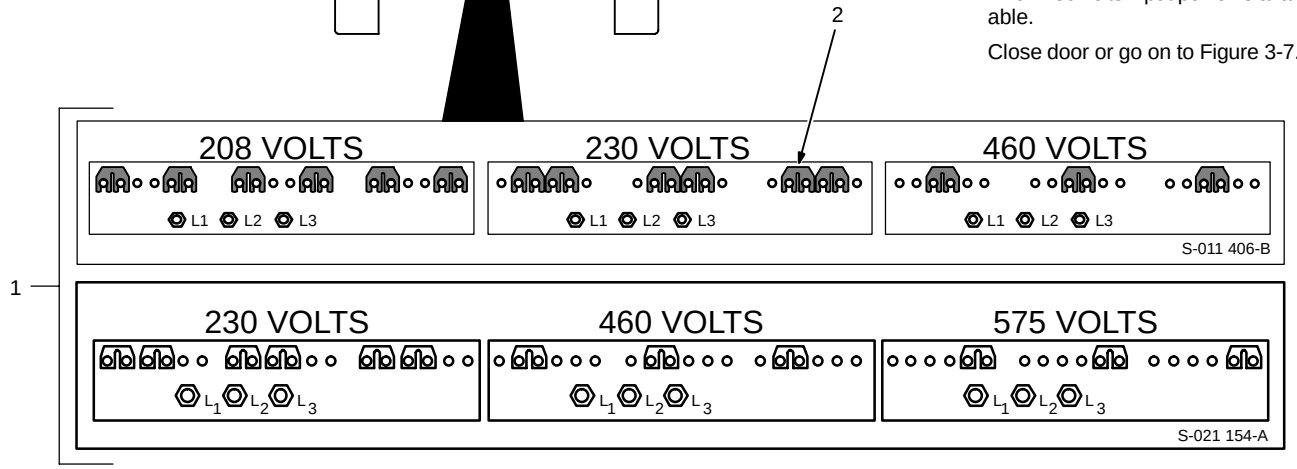
1 Input Voltage Label – Only One Is On Unit

Look at jumper links and compare link position with unit label.

2 Input Voltage Jumper Links

Move links to match input voltage. For example, use 230 volts position when 230 volts input power is available.

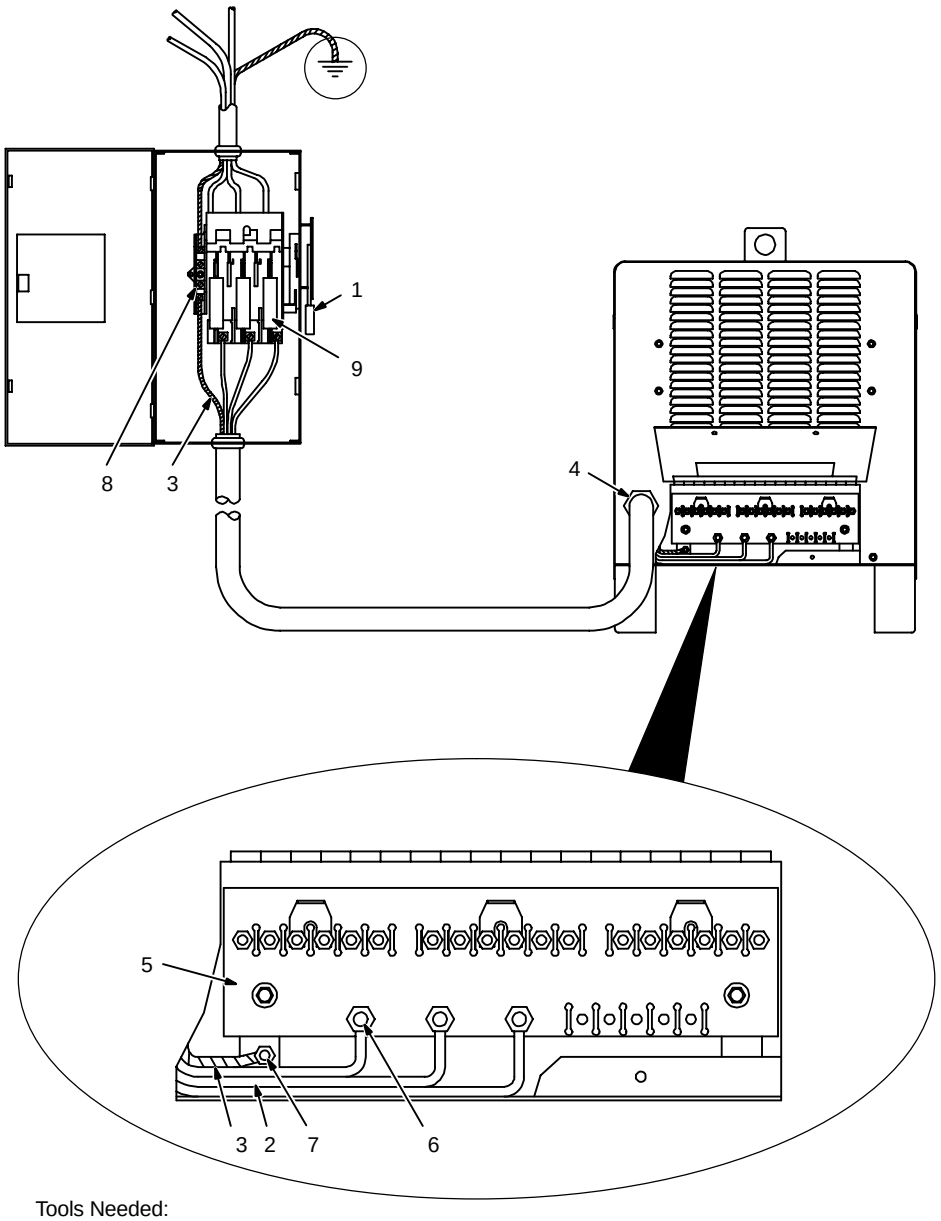
Close door or go on to Figure 3-7.



ssb5.1 2/92 – Ref. ST-800 042

Figure 3-6. Input Voltage Jumper Links Location

B. Connecting Input Power



Have only qualified persons make this installation.

Open rear panel access door.

1 Line Disconnect Device Of Proper Rating

2 Input Conductors

3 Grounding Conductor

Select size and length using Table 3-2. Conductor rating must comply with national, state, and local electrical codes. Use lugs of proper amperage capacity and correct hole size.

4 Strain Relief Connector

Insert conductors through strain relief.

5 Input Terminal Board

6 Line Terminals

7 Welding Power Source Ground Terminal

Connect grounding conductor to ground terminal first. Then connect input conductors to line terminals.

8 Disconnect Device Ground Terminal

Install and connect grounding conductor and input conductors in conduit or equivalent to deenergized line disconnect device.

Connect grounding conductor first, then line input conductors.

Be sure grounding conductor goes to an earth ground.

Close rear panel door.

9 Overcurrent Protection

Select type and size using Table 3-2. Install into deenergized line disconnect device (fused disconnect switch shown).

Tools Needed:

3/8, 7/16, 1/2 in

ssb2.4 1/94 – ST-800 042

Figure 3-7. Input Power Connections

Table 3-2. Electrical Service Guide

	300 Amp			400 Amp			
Input Voltage	208	230	460	208	230	460	575
Input Amperes At Rated Output	64	58	29	89	80	40	32
Max Recommended Standard Fuse Or Circuit Breaker Rating In Amperes	100	90	45	125	125	60	50
Min Input Conductor Size In AWG/Kcmil	8	8	10	4	6	8	10
Max Recommended Input Conductor Length In Feet (Meters)	88 (27)	107 (33)	288 (88)	148 (45)	123 (37)	325 (99)	342 (104)
Min Grounding Conductor Size In AWG/Kcmil	8	8	10	6	6	10	10

Reference: 1993 National Electrical Code (NEC). S-0092J

SECTION 4 – OPERATION

⚠ WARNING

ELECTRIC SHOCK can kill.

- Always wear dry insulating gloves.
- Insulate yourself from work and ground.
- Do not touch live electrical parts.
- Keep all panels and covers securely in place.

FUMES AND GASES can be hazardous to your health.

- Keep your head out of the fumes.
- Ventilate area, or use breathing device.
- Read Material Safety Data Sheets (MSDSs) and manufacturer's instructions for material used.

WELDING can cause fire or explosion.

- Do not weld near flammable material.
- Watch for fire; keep extinguisher nearby.
- Do not locate unit over combustible surfaces.
- Do not weld on closed containers.
- Allow work and equipment to cool before handling.

ARC RAYS can burn eyes and skin; NOISE can damage hearing.

- Wear welding helmet with correct shade of filter.
- Wear correct eye, ear, and body protection.

MOVING PARTS can cause injury.

- Keep away from moving parts.
- Keep all doors, panels, covers, and guards closed and securely in place.

MAGNETIC FIELDS FROM HIGH CURRENTS can affect pacemaker operation.

- Pacemaker wearers keep away.
- Wearers should consult their doctor before going near arc welding, gouging, or spot welding operations.

See Safety Precautions at beginning of manual for basic welding safety information.

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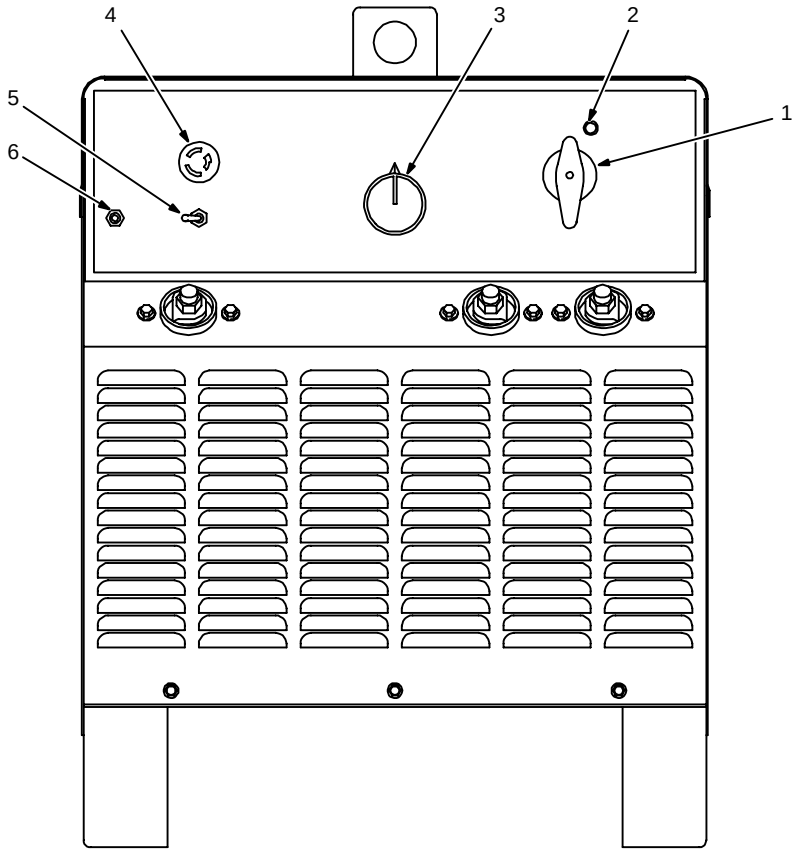
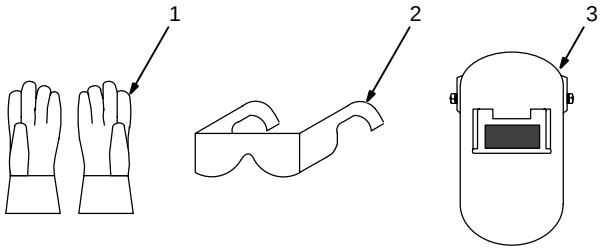


1 Power Switch
2 Pilot Light (Optional)
3 Amperage Adjustment Control
4 Remote Amperage Control Receptacle (See Section 3-4)
5 Remote Amperage Switch
6 Circuit Breaker CB1 (See Section 5-2)

ST-800 040-A

Figure 4-1. Controls



Wear the following while welding:

1 Dry, Insulating Gloves

2 Safety Glasses With Side Shields

3 Welding Helmet With Correct Shade Of Filter (See ANSI Z49.1)

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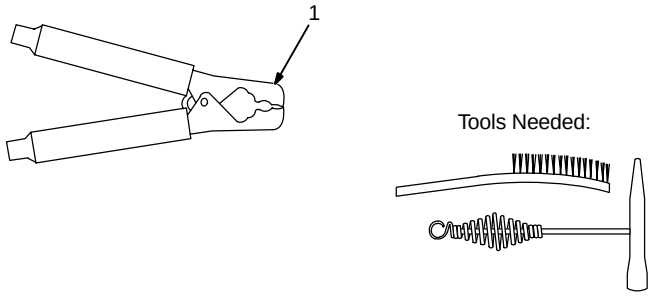
Figure 4-2. Safety Equipment



1 Work Clamp

Connect work clamp to a clean, paint-free location on workpiece, as close to weld area as possible.

Use wire brush or sandpaper to clean metal at weld joint area. Use chipping hammer to remove slag after welding.

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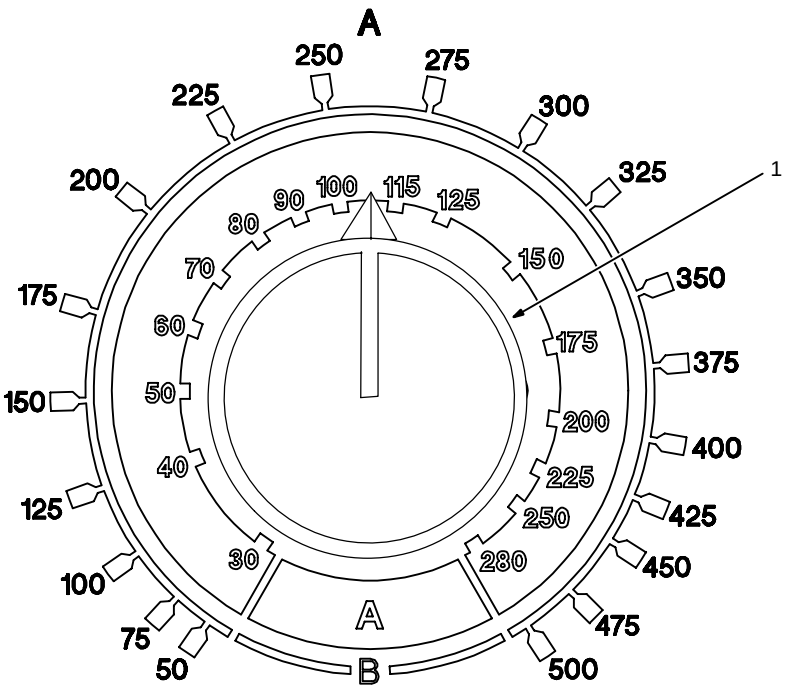
Figure 4-3. Work Clamp



400 Ampere Model Shown

1 Amperage Adjustment Control

Use control to adjust amperage within range for Negative Weld Output terminal (see Section 3-3).

Use A (inner) scale for low amperage range and B (outer) scale for high amperage range.

Ref. ST-174 170

Figure 4-4. Amperage Adjustment Control

⚠ CAUTION

ARCING can damage switch.

- Do not change Remote Amperage switch position while power is on.

Arcing inside switch can damage contacts, causing switch to fail.

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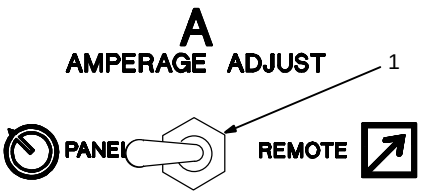


1 Remote Amperage Switch

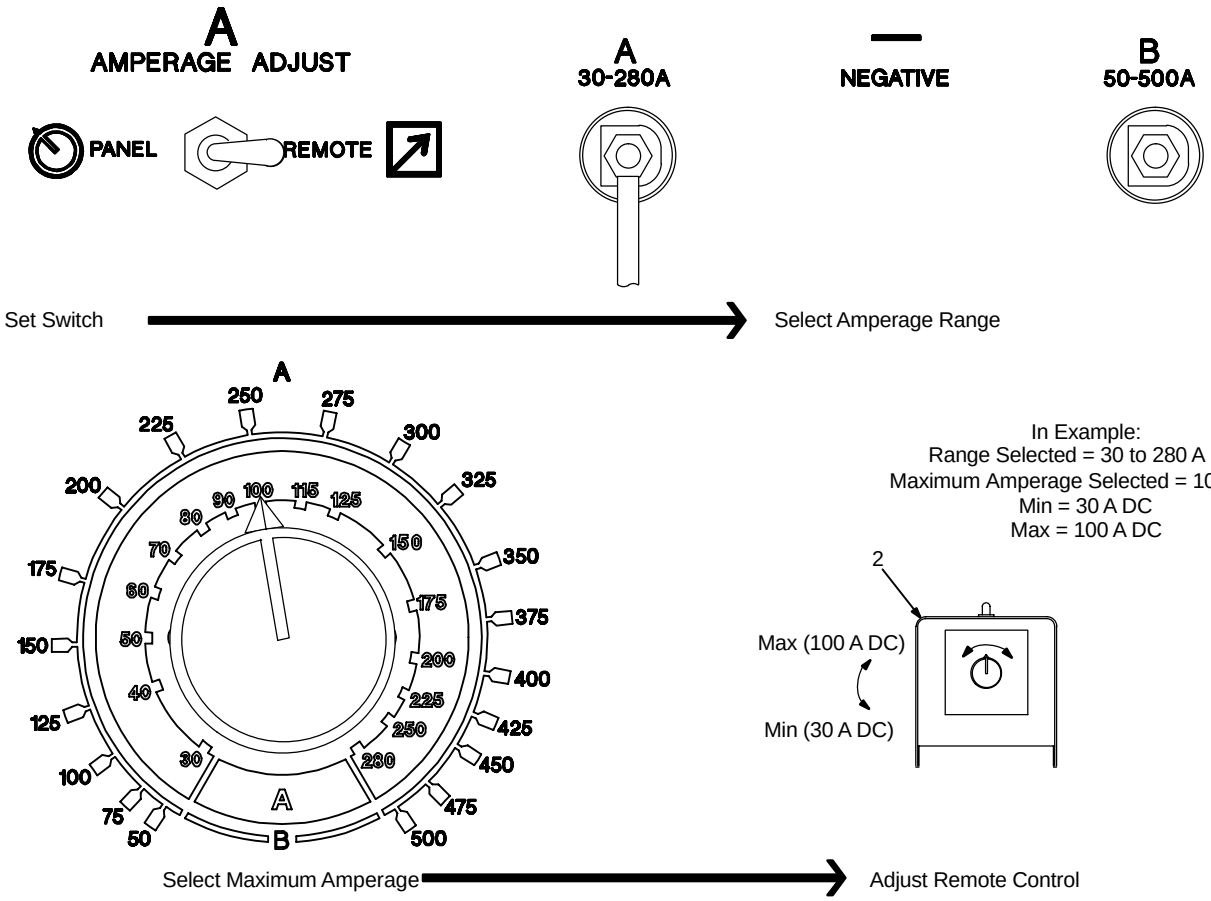
Use switch to select way of controlling amperage adjustment.

For front panel control, place switch in the Off position.

For remote control, place switch in On position (see Section 3-4). See example below.

2 Remote Amperage Control

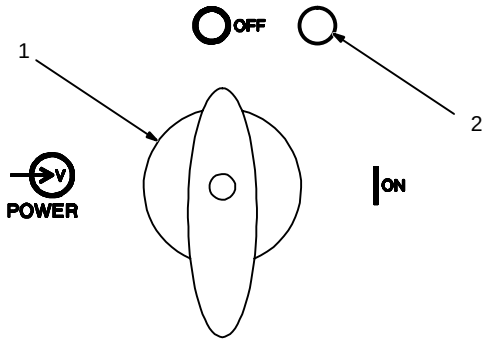
Example: Combination Remote Amperage Control – 400 Ampere Model Shown



In Example:
Range Selected = 30 to 280 A DC
Maximum Amperage Selected = 100 A DC
Min = 30 A DC
Max = 100 A DC

S-0774

Figure 4-5. Remote Amperage Switch



1 Power Switch

2 Pilot Light

Use switch to turn unit and pilot light On and Off.

Figure 4-6. Power Switch And Optional Pilot Light

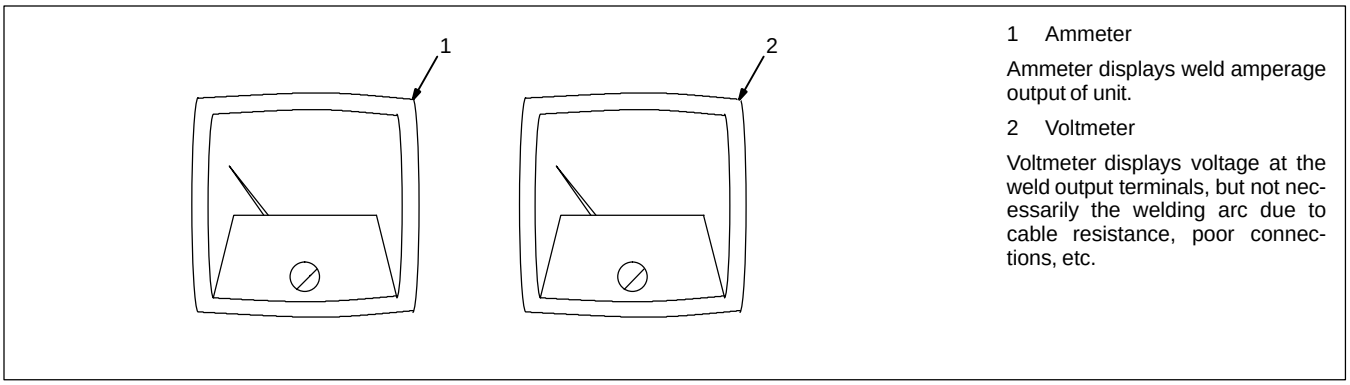


Figure 4-7. Ammeter And Voltmeter (Optional)

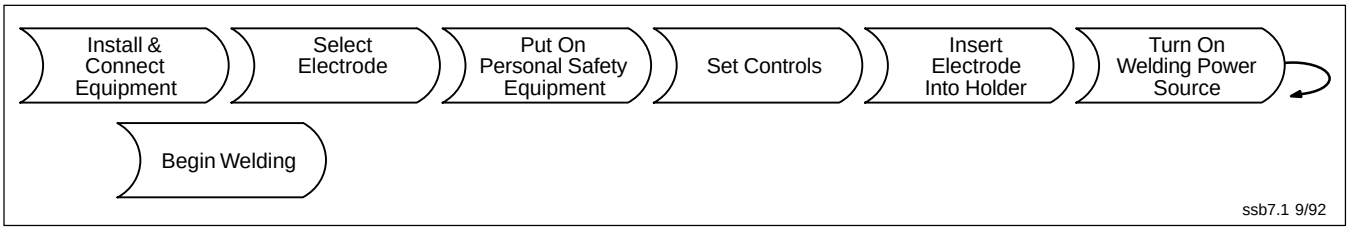


Figure 4-8. Sequence Of Shielded Metal Arc Welding (SMAW)

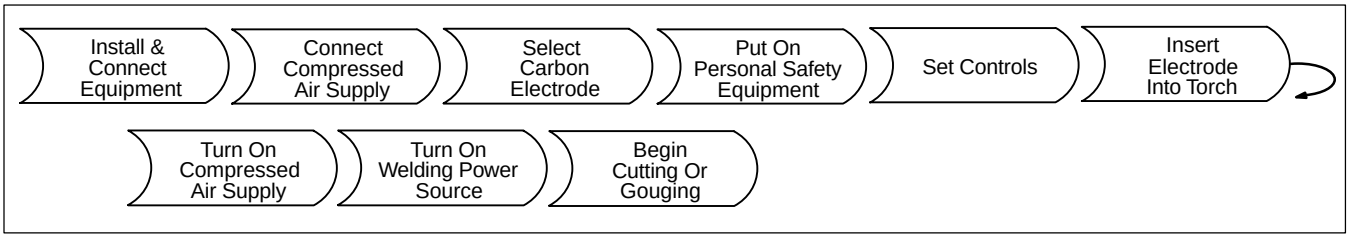


Figure 4-9. Sequence Of Air Carbon Arc Cutting And Gouging (CAC-A)

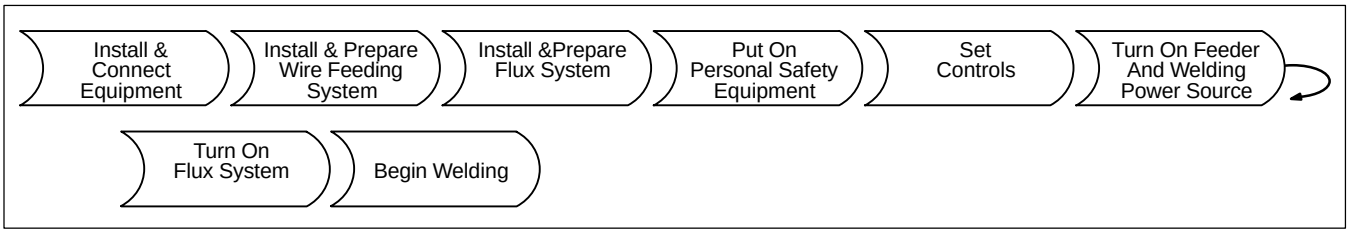


Figure 4-10. Sequence Of Submerged Arc Welding (SAW)

SECTION 5 – MAINTENANCE & TROUBLESHOOTING

⚠ WARNING

ELECTRIC SHOCK can kill.

- Do not touch live electrical parts.
- Turn Off welding power source, and disconnect input power before inspecting, maintaining, or servicing.

HOT PARTS can cause severe burns.

- Allow cooling period before maintaining or servicing.

MOVING PARTS can cause injury.

- Keep away from moving parts.

Maintenance to be performed only by qualified persons.

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5-1. Routine Maintenance

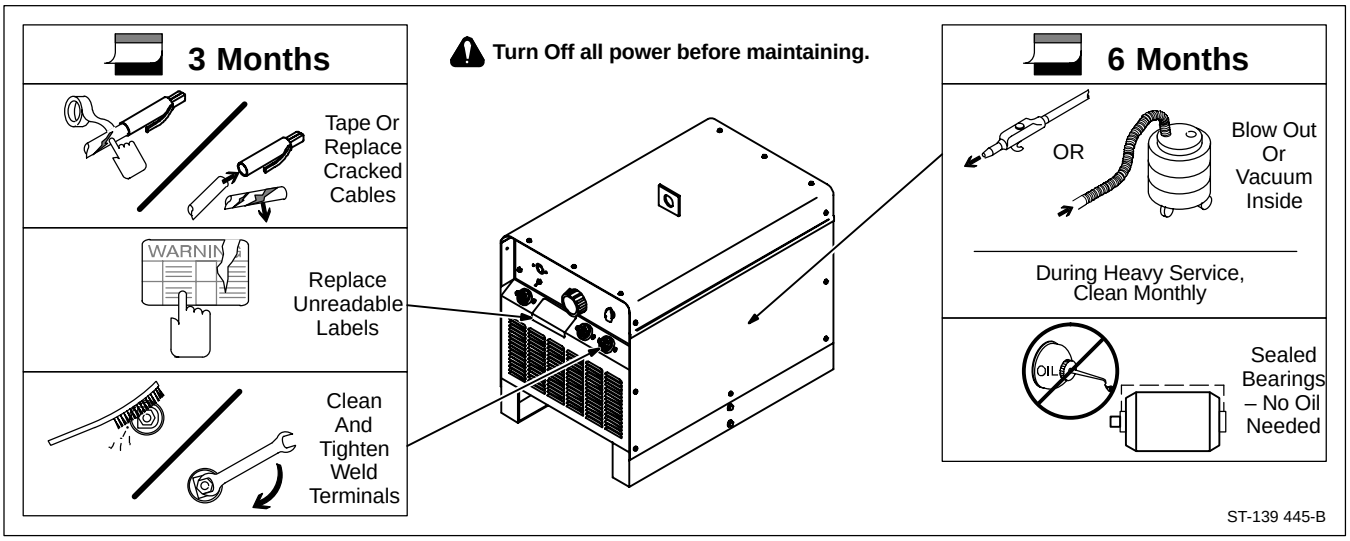
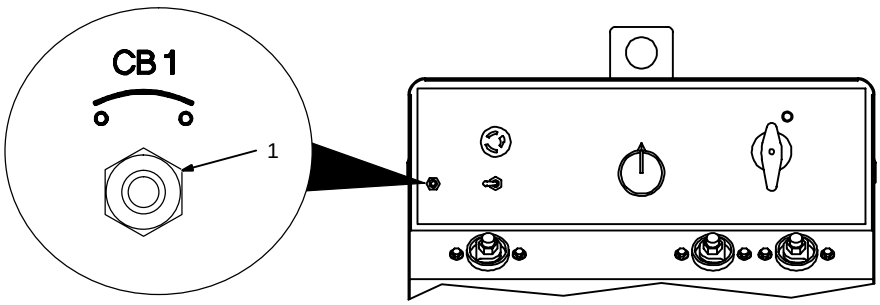


Figure 5-1. Maintenance Schedule

5-2. Overload Protection

⚠ WARNING

READ SAFETY BLOCKS at start of Section 5 before proceeding.



1 Circuit Breaker CB1

CB1 protects the welding power source control circuit from overload. If CB1 opens, weld output drops to the minimum of the range selected.

Press button to reset circuit breaker.

Ref. ST-800 040-A

Figure 5-2. Circuit Breaker CB1

5-3. Troubleshooting

⚠ WARNING

ELECTRIC SHOCK can kill.

- Do not touch live electrical parts.
- Turn Off welding power source, and disconnect input power before inspecting, maintaining, or servicing.

HOT PARTS can cause severe burns.

- Allow cooling period before servicing.

MOVING PARTS can cause injury.

- Keep away from moving parts.

Troubleshooting to be performed only by qualified persons.

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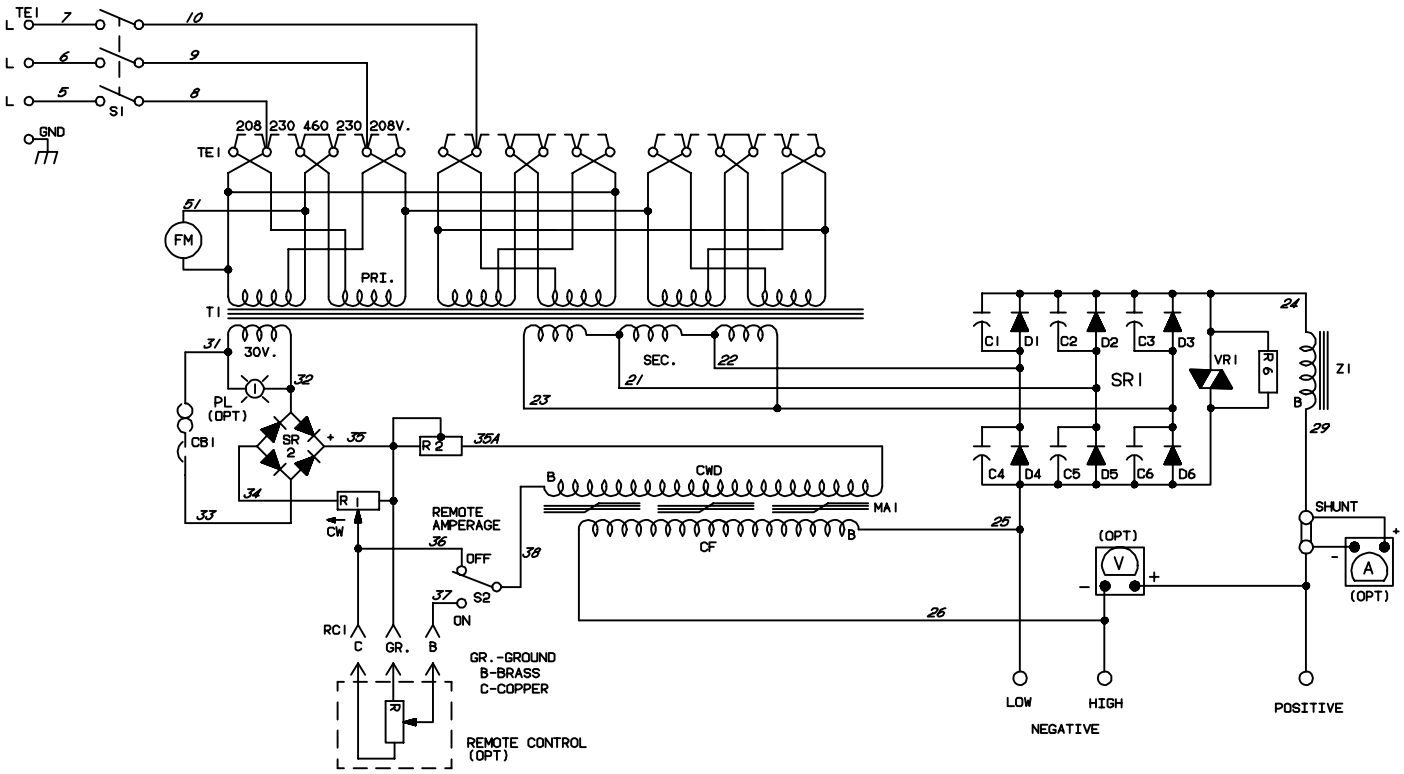
Table 5-1. Welding Trouble

Trouble	Remedy	Section
No weld output; unit completely inoperative.	Place Power switch in the On position.	Figure 4-6
	Place line disconnect switch in the On position.	3-5B
	Check for open line fuse(s), and replace if necessary. Check and reset circuit breakers.	3-5B
	Check for proper input connections.	3-5B
	Check for proper jumper link positions.	3-5A
No weld output; optional pilot light on.	Clean and tighten all weld connections.	3-3
Low or minimum weld output.	Check for proper line voltage.	– –
	Check for open line fuse(s), and replace if necessary. Check and reset circuit breakers.	3-5B
	Clean and tighten all weld connections.	3-3
	Place Remote Amperage switch in the correct position.	Figure 4-5
	Select correct size weld cables according to Table 3-1.	3-2
Low weld amperage; Amperage Adjustment control does not control amperage.	Reset Circuit Breaker CB1, if necessary.	5-2
Maximum weld output.	Have Factory Authorized Service Station/Service Distributor check Amperage Adjustment control.	Figure 4-4
Erratic weld output.	Check for proper input connections.	3-5B
	Clean and tighten weld cable connections.	3-3
	Use proper size and type electrodes.	– –
Excessive line current or line fuses(s) open repeatedly.	Check for proper input connections.	3-5B
	Check for proper jumper link positions.	3-5A
Fan motor inoperative and/or overheating.	Replace fan motor if necessary.	– –
	Check for fan blade obstruction.	– –

SECTION 6 – ELECTRICAL DIAGRAMS



SB-143 314

Figure 6-1. Circuit Diagram For Welding Power Source

NOTES

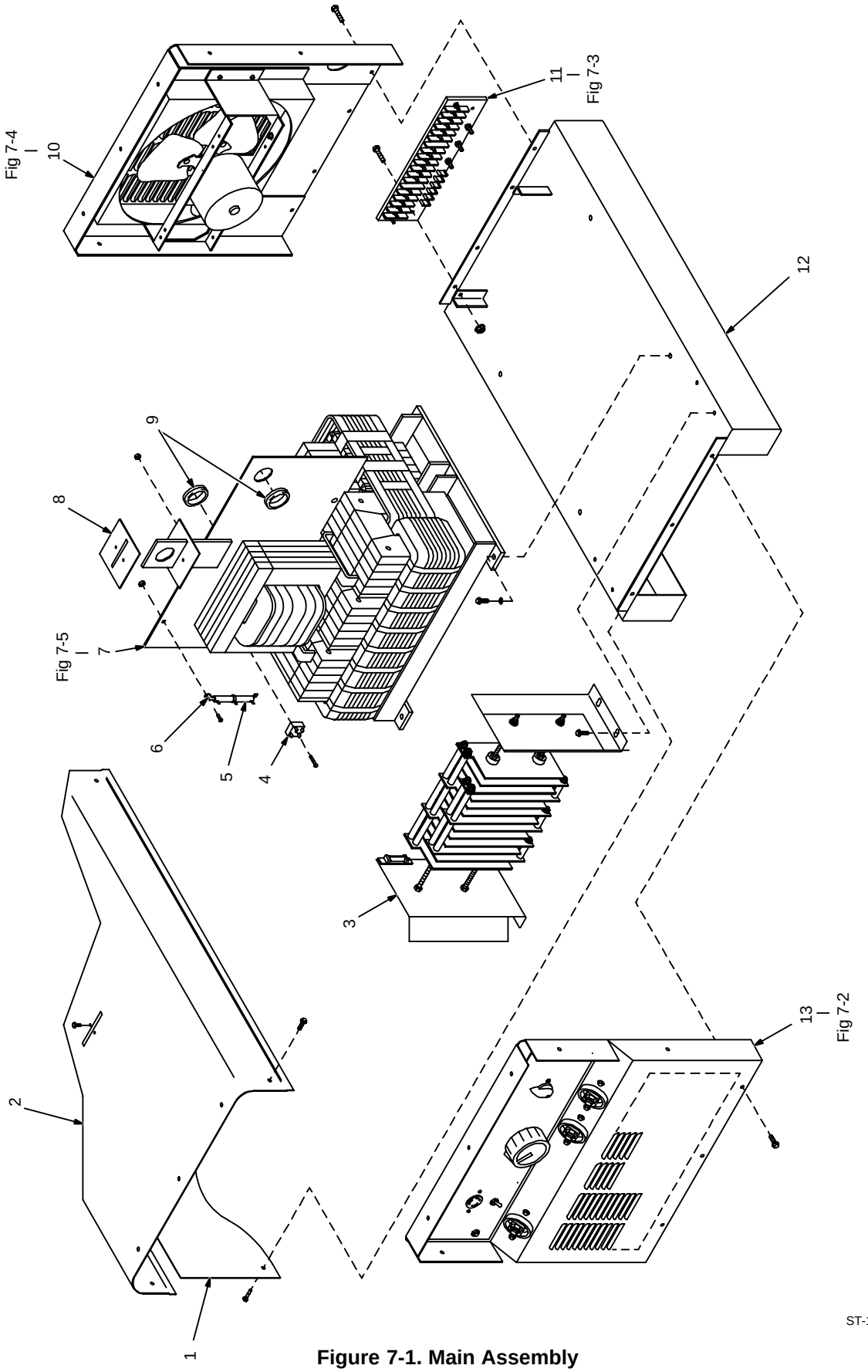


Figure 7-1. Main Assembly

Item No.	Dia. Mkgs.	Part No.	Description	Quantity Model 300 Amp	Quantity Model 400 Amp
			Figure 7-1. Main Assembly		
1		006 016	PANEL, side	2	2
2		006 890	COVER, top	1	1
2		007 110	COVER, top (used w/meters)		1
3	SR1	173 671	RECTIFIER, si diode	1	
3	SR1	173 936	RECTIFIER, si diode		1
4	SR2	035 704	RECTIFIER, integ 40A 800V	1	1
5	R2	071 054	RESISTOR, WW adj 50W 2 ohm	1	1
6		605 741	CLIP, mtg resistor .312 ID core	2	2
7	MA1,T1	Fig 7-5	TRANSFORMER & AMPLIFIER, power main	1	1
8		026 627	GASKET, lifting eye	1	1
9		+116 888	GROMMET, rbr 1.500 ID x 1.750mtg hole	2	2
10		Fig 7-4	PANEL, rear w/components	1	1
11	TE1	038 145	TERMINAL, pri (dual voltage) (Fig 7-3)	1	1
11	TE1	038 138	TERMINAL, pri (triple voltage) (Fig 7-3)	1	1
12		191 758	BASE	1	1
13		Fig 7-2	PANEL, front w/components	1	1
			Parts For Optional Equipment		
		040 670	PILOT LIGHT, (consisting of)	1	1
	PL1	*027 638	BULB, incand slide base 48V	1	1
		027 628	LENS, light ind red clear	1	1
		027 631	HOUSING, light ind slide base 125V	1	1
		041 818	METER KIT, (consisting of)	1	
		041 824	METER KIT, (consisting of)		1
	A	025 608	METER, amp dc 50MV 0-500 scale	1	
	A	025 611	METER, amp dc 50MV 0-600 scale		1
	V	025 604	METER, volt dc 0-100 scale	1	1
		103 966	PANEL, front meter box	1	1
		103 967	PANEL, rear meter box	1	1
		103 965	WRAPPER, meter box	1	1
		010 493	BUSHING, snap-in .625 ID x .875mtg hole	1	1
		010 859	CLAMP, hose .562-1.062clp dia	1	1

+One grommet (center) is included with the Amplifier, Transformer, Stabilizer Assembly.
*Recommended Spare Parts.
BE SURE TO PROVIDE MODEL AND SERIAL NUMBER WHEN ORDERING REPLACEMENT PARTS.

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
			Figure 7-2. Panel, Front w/Components (Fig 7-1 Item 13)	
1		+017 287	PANEL, front	1
		134 327	LABEL, general precautionary	1
2	CB	083 432	CIRCUIT BREAKER, man reset 10A 250VDC	1
3	RC1	039 607	RECEPTACLE, twlk 3P3W 20A 250V	1
		605 797	PLUG, twlk 3P3W 20A 125V Arrow Hart 6312	
4	S2	011 609	SWITCH, tgl SPDT 15A 125VAC	1
5	R1	030 653	RHEOSTAT, WW 150W 15 ohm	1
6	S1	173 417	SWITCH, rotary w/knob	1
7		039 047	TERMINAL, pwr output red (consisting of)	1
7		039 046	TERMINAL, pwr output black (consisting of)	2
8		601 879	NUT, stl hex full fnsh .500-13	1
9		039 044	BUS BAR	1
10		601 880	NUT, stl hex jam .500-13	1
11		039 049	TERMINAL BOARD, red	1
11		039 045	TERMINAL BOARD, black	1
12		601 976	SCREW, cap stl hexhd .500-13 x 1.500	1
13		+	NAMEPLATE, (order by model and serial number)	1
		004 948	LABEL, arc welding can be injurious	1
14		097 926	KNOB, pointer	1

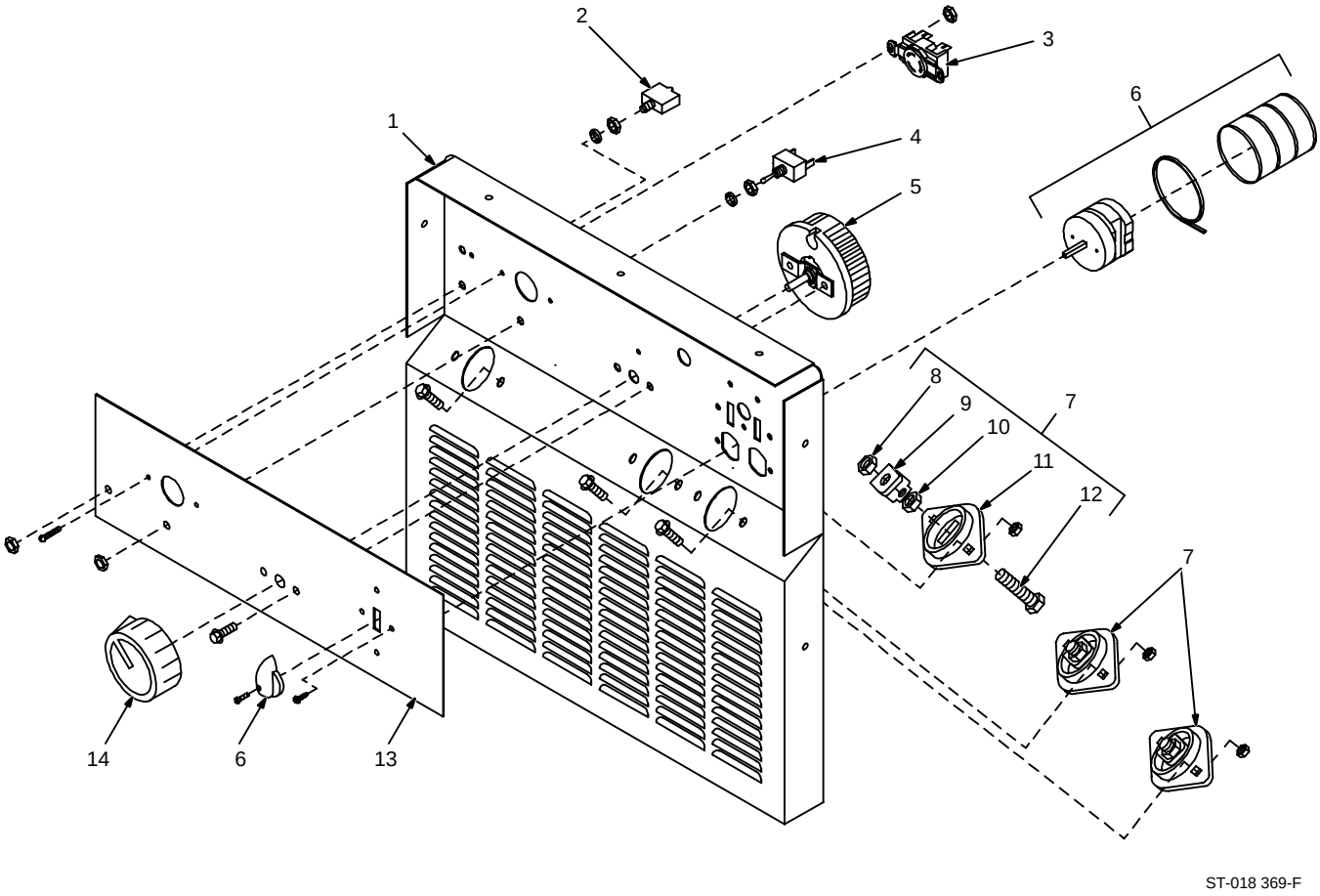


Figure 7-2. Panel, Front w/Components

+When ordering a component originally displaying a precautionary label, the label should also be ordered.
BE SURE TO PROVIDE MODEL AND SERIAL NUMBER WHEN ORDERING REPLACEMENT PARTS.

Item No.	Part No.	Description	Quantity
		Figure 7-3. Terminal, Pri (Fig 7-1 Item 11)	038 145 / 038 138
1	601 835	NUT, brs hex 10-32reg	24 / 36
2	038 058	TERMINAL BOARD, pri	1 / 1
3	038 887	STUD, pri bd brs 10-32 x 1.375	12 / 18
4	010 913	WASHER, flat brs .218 ID x .460 OD x .031thk	12 / 18
5	038 618	LINK, jumper	6 / 6
6	601 836	NUT, brs hex .250-20 jam hvy	6 / 6
7	010 915	WASHER, flat brs .250 ID x .625 OD x .031thk	6 / 6
8	038 888	STUD, pri bd brs .250-20 x 1.500	3 / 3

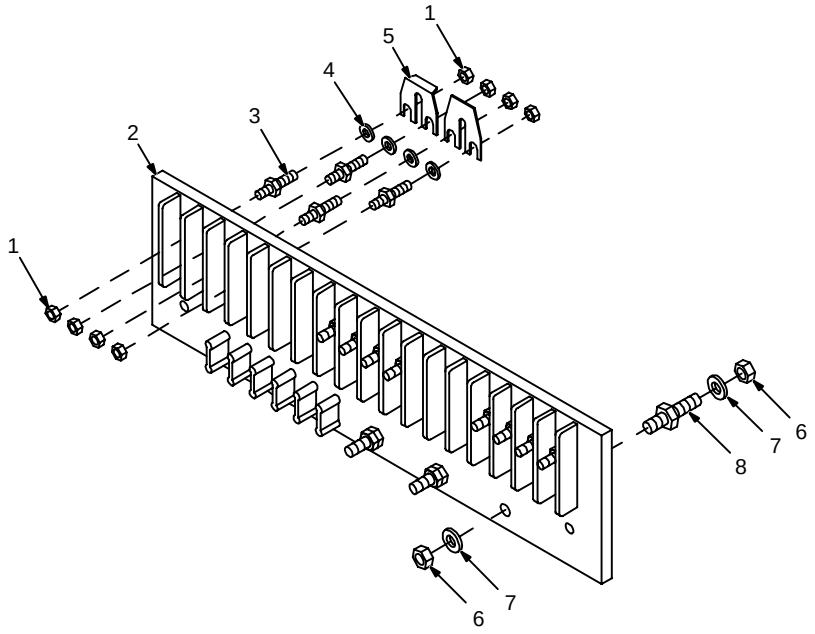


Figure 7-3. Terminal, Pri

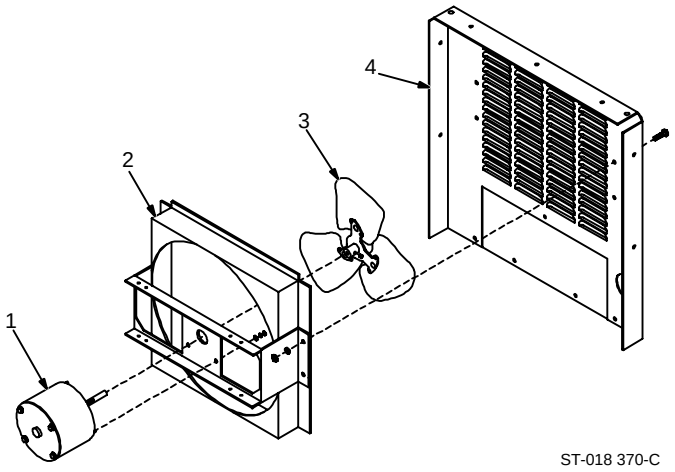


Figure 7-4. Panel, Rear w/Components

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
			Figure 7-4. Panel, Rear w/Components (Fig 7-1 Item 10)	
1	FM	116 190	MOTOR, fan 1/12hp 230V 1550RPM	1
2		131 361	CHAMBER, plenum	1
3		032 604	BLADE, fan 14 in 3 wing 19deg 60Hz or	1
3		032 611	BLADE, fan 14 in 3 wing 25deg 50Hz	1
4		018 144	PANEL, rear	1

BE SURE TO PROVIDE MODEL AND SERIAL NUMBER WHEN ORDERING REPLACEMENT PARTS.

Replace Coils At Factory Or Authorized Service Stations/Service Distributors

Item No.	Dia. Mkgs.	Part No.	Description	Quantity Model 300 Amp	Quantity Model 400 Amp
			Figure 7-5. Transformer & Amplifier, Power Main (Fig 7-1 Item 7) (Listed below as Amplifier)		
.....	MA1,T1	093 896	AMPLIFIER, 208/230/460 (consisting of)	1	
.....	MA1,T1	093 895	AMPLIFIER, 230/460/575 (consisting of)	1	
1	Z	036 126	STABILIZER	1	
2	PR1	093 524	COIL, pri LH 208/230/460	1	
2	PR1	093 522	COIL, pri LH 230/460/575	1	
3	PR1	093 523	COIL, pri center & RH 208/230/460	2	
3	PR1	093 521	COIL, pri center & RH 230/460/575	2	
4	SEC	071 009	COIL, sec	3	
5		018 873	BAFFLE, air	1	
6	CWD	033 652	COIL, control dc	1	
.....	MA1,T1	093 929	AMPLIFIER 208/230/460 (consisting of)		1
.....	MA1,T1	093 930	AMPLIFIER 230/460/575 (consisting of)		1
1	Z	036 127	STABILIZER		1
2	PR1	093 583	COIL, pri LH 208/230/460		1
2	PR1	093 585	COIL, pri LH 230/460/575		1
3	PR1	093 584	COIL, pri center & RH 208/230/460		2
3	PR1	093 586	COIL, pri center & RH 230/460/575		2
4	SEC	033 801	COIL, sec		3
5		018 873	BAFFLE, air		1
6	CWD	033 262	COIL, control dc		1

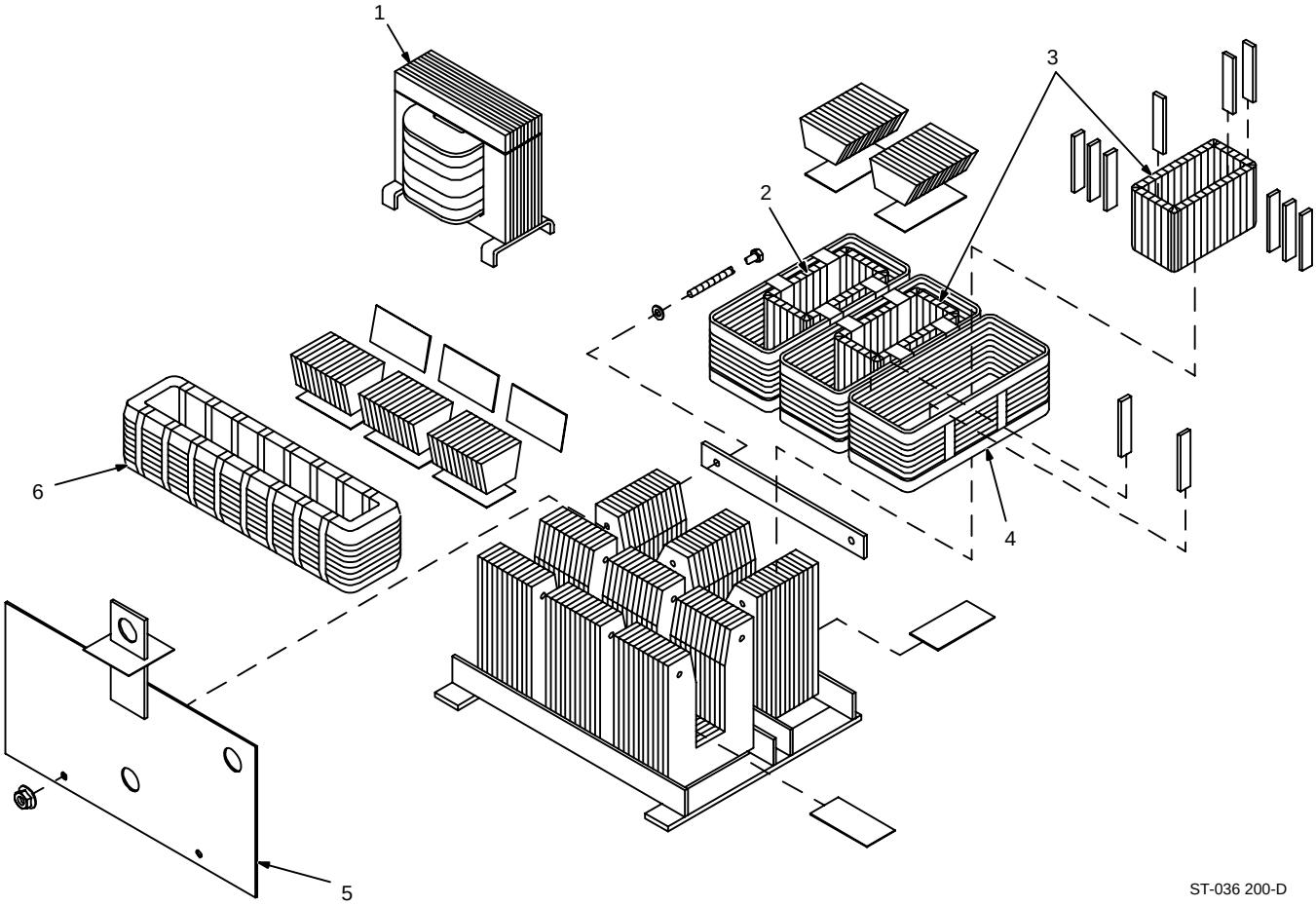


Figure 7-5. Transformer & Amplifier, Power Main

BE SURE TO PROVIDE MODEL AND SERIAL NUMBER WHEN ORDERING REPLACEMENT PARTS.

OPTIONS AND ACCESSORIES

RHC-3 REMOTE CONTROL

(#040 056)

Remote hand amperage control for all Gold Star SRH models. Supplied with a 20 ft. (6 m) cable and plug.

#3-WA

(#040 043)

35 ft (10.6 m) #1/0 electrode cable with electrode holder and lug attached, 30 ft. (9 m) #1/0 ground cable with lugs attached, welding helmet, wire scratch brush. (For Gold Star SRH-333).

#4-WA

(#040 045)

35 ft (10.6 m) #2/0 electrode cable with electrode holder and lug attached, 30 ft. (9 m) #2/0 ground cable with lugs attached, welding helmet, wire scratch brush. (For Gold Star SRH-444).

NO. 20 RUNNING GEAR

(#041 581)

Four 8 in. (203 mm) poly/rubber blend wheels with 30 in. (762 mm) towing handle.

TRUE BLUE® WARRANTY

Effective January 1, 1998
(Equipment with a serial number preface of "KJ" or newer)

This limited warranty supersedes all previous Miller warranties and is exclusive with no other guarantees or warranties expressed or implied.

LIMITED WARRANTY – Subject to the terms and conditions below, Miller Electric Mfg. Co., Appleton, Wisconsin, warrants to its original retail purchaser that new Miller equipment sold after the effective date of this limited warranty is free of defects in material and workmanship at the time it is shipped by Miller. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

Within the warranty periods listed below, Miller will repair or replace any warranted parts or components that fail due to such defects in material or workmanship. Miller must be notified in writing within thirty (30) days of such defect or failure, at which time Miller will provide instructions on the warranty claim procedures to be followed.

Miller shall honor warranty claims on warranted equipment listed below in the event of such a failure within the warranty time periods. All warranty time periods start on the date that the equipment was delivered to the original retail purchaser, or one year after the equipment is sent to a North American distributor or eighteen months after the equipment is sent to an International distributor.

1. 5 Years Parts – 3 Years Labor
   * Original main power rectifiers
   * Inverters (input and output rectifiers only)
2. 3 Years — Parts and Labor
   * Transformer/Rectifier Power Sources
   * Plasma Arc Cutting Power Sources
   * Semi-Automatic and Automatic Wire Feeders
   * Inverter Power Supplies
   * Intellitig
   * Engine Driven Welding Generators
     (NOTE: Engines are warranted separately by the engine manufacturer.)
3. 1 Year — Parts and Labor
   * Motor Driven Guns (w/exception of Spoolmate 185)
   * Process Controllers
   * Positioners and Controllers
   * Automatic Motion Devices
   * Robots
   * IHPS Power Sources
   * Water Coolant Systems
   * HF Units
   * Grids
   * Spot Welders
   * Load Banks
   * SDX Transformers
   * Miller Cyclomatic Equipment
   * Running Gear/Trailers
   * Plasma Cutting Torches (except APT, ZIPCUT & PLAZCUT Models)
   * Deutz Engines (outside North America)
   * Field Options
     (NOTE: Field options are covered under True Blue® for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)
4. 6 Months — Batteries
5. 90 Days — Parts and Labor
   * MIG Guns/TIG Torches
   * APT, ZIPCUT & PLAZCUT Model Plasma Cutting Torches
   * Remote Controls
   * Accessory Kits
   * Replacement Parts (No labor)
   * Spoolmate 185

Miller's True Blue® Limited Warranty shall not apply to:

1. Items furnished by Miller, but manufactured by others, such as engines or trade accessories. These items are covered by the manufacturer's warranty, if any.
2. Consumable components; such as contact tips, cutting nozzles, contactors, brushes, slip rings, relays or parts that fail due to normal wear.
3. Equipment that has been modified by any party other than Miller, or equipment that has been improperly installed, improperly operated or misused based upon industry standards, or equipment which has not had reasonable and necessary maintenance, or equipment which has been used for operation outside of the specifications for the equipment.

MILLER PRODUCTS ARE INTENDED FOR PURCHASE AND USE BY COMMERCIAL/INDUSTRIAL USERS AND PERSONS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT.

In the event of a warranty claim covered by this warranty, the exclusive remedies shall be, at Miller's option: (1) repair; or (2) replacement; or, where authorized in writing by Miller in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized Miller service station; or (4) payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at customer's risk and expense. Miller's option of repair or replacement will be F.O.B., Factory at Appleton, Wisconsin, or F.O.B. at a Miller authorized service facility as determined by Miller. Therefore no compensation or reimbursement for transportation costs of any kind will be allowed.

TO THE EXTENT PERMITTED BY LAW, THE REMEDIES PROVIDED HEREIN ARE THE SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT SHALL MILLER BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOSS OF PROFIT), WHETHER BASED ON CONTRACT, TORT OR ANY OTHER LEGAL THEORY.

ANY EXPRESS WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTY OR REPRESENTATION AS TO PERFORMANCE, AND ANY REMEDY FOR BREACH OF CONTRACT TORT OR ANY OTHER LEGAL THEORY WHICH, BUT FOR THIS PROVISION, MIGHT ARISE BY IMPLICATION, OPERATION OF LAW, CUSTOM OF TRADE OR COURSE OF DEALING, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, WITH RESPECT TO ANY AND ALL EQUIPMENT FURNISHED BY MILLER IS EXCLUDED AND DISCLAIMED BY MILLER.

Some states in the U.S.A. do not allow limitations of how long an implied warranty lasts, or the exclusion of incidental, indirect, special or consequential damages, so the above limitation or exclusion may not apply to you. This warranty provides specific legal rights, and other rights may be available, but may vary from state to state.

In Canada, legislation in some provinces provides for certain additional warranties or remedies other than as stated herein, and to the extent that they may not be waived, the limitations and exclusions set out above may not apply. This Limited Warranty provides specific legal rights, and other rights may be available, but may vary from province to province.

Warranty Questions?

Call
1-800-4-A-
MILLER
for your local
Miller distributor.

Miller®
The Power of Blue.

Owner's Record

Please complete and retain with your personal records.

Model Name Serial/Style Number

Purchase Date (Date which equipment was delivered to original customer.)

Distributor

Address

City

State Zip

For Service

Call 1-800-4-A-Miller or see our website at www.MillerWelds.com to locate a DISTRIBUTOR or SERVICE AGENCY near you.

Always provide Model Name and Serial/Style Number.

Contact your Distributor for:	Welding Supplies and Consumables
	Options and Accessories
	Personal Safety Equipment
	Service and Repair
	Replacement Parts
	Training (Schools, Videos, Books)
	Technical Manuals (Servicing Information and Parts)
	Circuit Diagrams
	Welding Process Handbooks
Contact the Delivering Carrier for:	File a claim for loss or damage during shipment.

For assistance in filing or settling claims, contact your distributor and/or equipment manufacturer's Transportation Department.

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