

June 1980

FORM: OM-221J

Effective With Serial No. JA417031

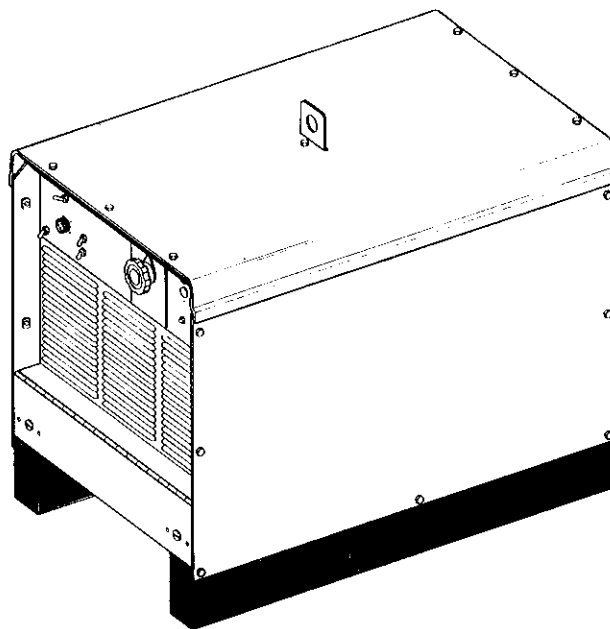
MODEL

Gold Star 300SS

Gold Star 400SS

Gold Star 500SS

Gold Star 600SS



OWNER'S MANUAL



MILLER ELECTRIC MFG. CO.

718 S. BOUNDS ST. P.O. Box 1079
APPLETON, WI 54912 USA

PRINTED IN U.S.A.

LIMITED WARRANTY

EFFECTIVE: JUNE 1, 1979

This 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 hereof, Miller Electric Mfg. Co., Appleton, Wisconsin warrants to its Distributor/Dealer that all new and unused Equipment furnished by Miller is free from defect in workmanship and material as of the time and place of delivery by Miller. No warranty is made by Miller with respect to engines, trade accessories or other items manufactured by others. Such engines, trade accessories and other items are sold subject to the warranties of their respective manufacturers, if any. All engines are warranted by their manufacturer for one year from date of original purchase.

Except as specified below, Miller's warranty does not apply to components having normal useful life of less than one (1) year, such as spot welder tips, relay and contactor points, MILLERMATIC parts that come in contact with the welding wire including nozzles and nozzle insulators where failure does not result from defect in workmanship or material.

Miller shall be required to honor warranty claims on warranted Equipment in the event of failure resulting from a defect within the following periods from the date of delivery of Equipment to the original user:

1. Arc welders, power sources and components . . . 1 year
2. Original main power rectifiers 3 years
(labor - 1 year only)
3. All welding guns and feeder/guns 90 days
4. All other Millermatic Feeders 1 year
5. Replacement or repair parts, exclusive of labor . 60 days
6. Batteries 6 months

provided that Miller is notified in writing within thirty (30) days of the date of such failure.

As a matter of general policy only, Miller may honor claims submitted by the original user within the foregoing periods.

In the case of Miller's breach of warranty or any other duty with respect to the quality of any goods, the exclusive remedies therefore 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. Upon receipt of notice of apparent defect or failure, Miller shall instruct the claimant on the warranty claim procedures to be followed.

ANY EXPRESS WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTY OR REPRESENTATION AS TO PERFORMANCE, AND ANY REMEDY FOR BREACH OF CONTRACT 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 OF FITNESS FOR PARTICULAR PURPOSE, WITH RESPECT TO ANY AND ALL EQUIPMENT FURNISHED BY MILLER IS EXCLUDED AND DISCLAIMED BY MILLER.

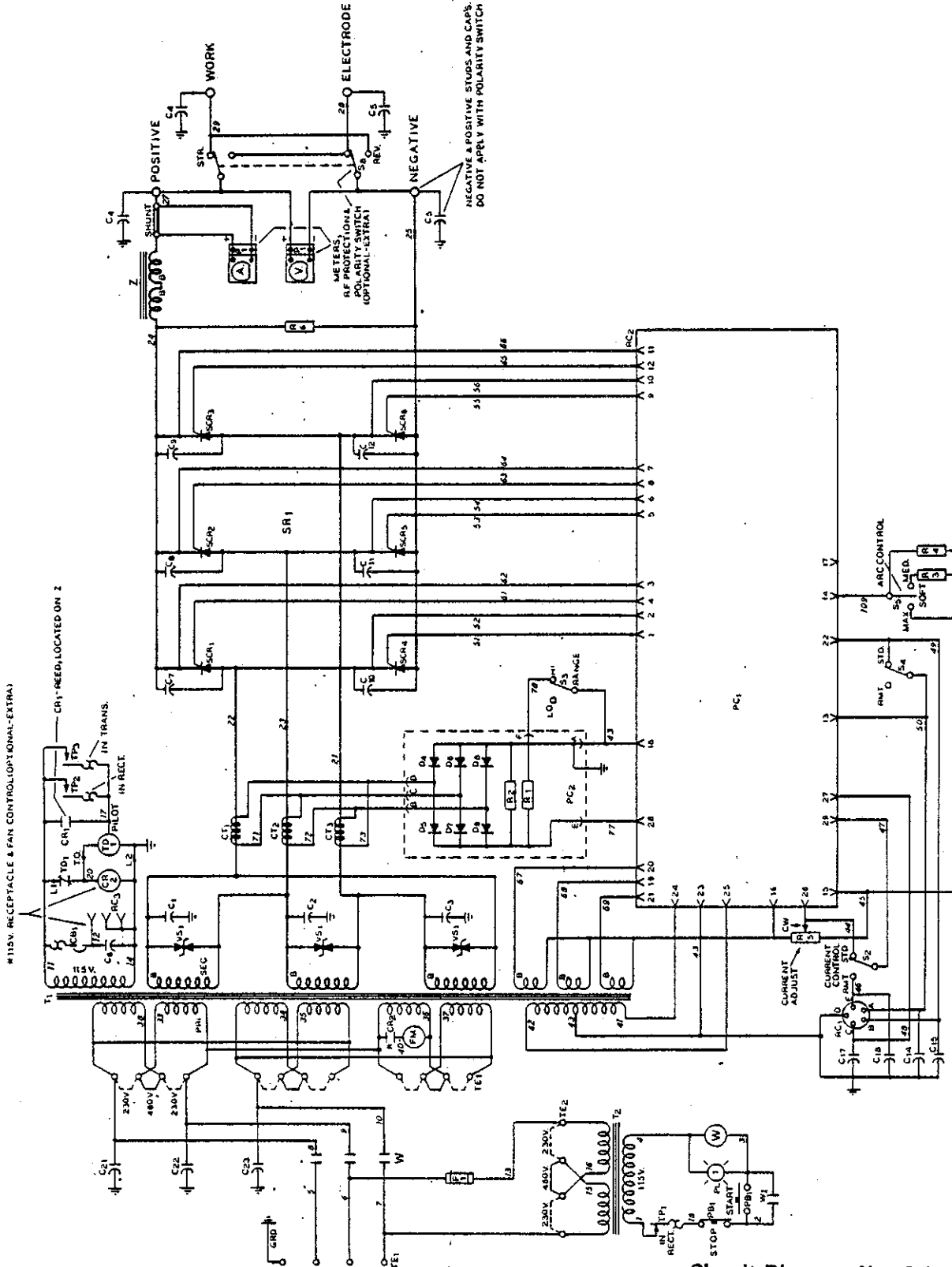
EXCEPT AS EXPRESSLY PROVIDED BY MILLER IN WRITING, MILLER PRODUCTS ARE INTENDED FOR ULTIMATE PURCHASE BY COMMERCIAL/INDUSTRIAL USERS AND FOR OPERATION BY PERSONS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT AND NOT FOR CONSUMERS OR CONSUMER USE. MILLER WARRANTIES DO NOT EXTEND TO, AND NO RESELLER IS AUTHORIZED TO EXTEND MILLER'S WARRANTIES TO, ANY CONSUMER.

ERRATA SHEET

After this manual was printed, refinements in equipment design occurred. This sheet lists exceptions to data appearing later in this manual.

AMENDMENT TO SECTION 7 - TROUBLESHOOTING

Amend Figure 7-2. Circuit Diagram For 500 And 600 Ampere Models



Circuit Diagram No. C-049 058-A

Figure 7-2. Circuit Diagram For 500 And 600 Ampere Models

Item No.	Part No.	Replaced With	Description	Quantity			
				Model			
				300 Amp	400 Amp	500 Amp	600 Amp
76	009 300	+ **072 221	COIL, primary/secondary	2			
77	009 299	**072 220	COIL, primary/secondary	1			
138,							
140-145		045 546	PUSH BUTTON SET, w/cable & housing	1	1		
		072 258	INDICATOR, spring (Eff w/JA435859)		3	3	3

+ Quantity of this item changes to 1 for units with optional fan control and/or duplex receptacle as the right hand coil has 115 volts tertiary winding.

**Replace at Factory or Factory Authorized Service Station.

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

TABLE OF CONTENTS

Section No.	Page No
SECTION 1 – SAFETY RULES FOR OPERATION OF ARC WELDING POWER SOURCE	
1 - 1. Introduction	1
1 - 2. General Precautions	1
1 - 3. Arc Welding	3
1 - 4. Standards Booklet Index	4
SECTION 2 – INTRODUCTION	
2 - 1. General	5
2 - 2. Receiving-Handling	5
2 - 3. Description	5
2 - 4. Safety	5
SECTION 3 – INSTALLATION	
3 - 1. Location	6
3 - 2. Electrical Input Connections	6
3 - 3. Weld Output Connections	7
3 - 4. Remote Current And Contactor Control Connections	8
SECTION 4 – FUNCTION OF CONTROLS	
4 - 1. Power Switch	8
4 - 2. Range Switch	8
4 - 3. Current Adjustment Control	8
4 - 4. Remote Current And Contactor Control Receptacle And Switch	8
4 - 5. Arc Control Switch	9
4 - 6. Pilot Lamp	9
4 - 7. Duty Cycle	9
4 - 8. Volt-Ampere Curves	9
4 - 9. Meters (Optional)	10
4-10. 115 Volts AC Duplex Receptacle (Optional)	10
4-11. Polarity Switch (Optional)	10
4-12. Fan Control (Optional)	10
SECTION 5 – SEQUENCE OF OPERATION	
5 - 1. Shielded Metal-Arc Welding (SMAW)	10
5 - 2. Shutting Down	11
SECTION 6 – MAINTENANCE	
6 - 1. Fan Motor	11
6 - 2. Internal Cleaning	11
6 - 3. Control Circuit Protection	11
6 - 4. Rectifier Protection	11
SECTION 7 – TROUBLESHOOTING	
PARTS LIST	

SECTION 1 - SAFETY RULES FOR OPERATION OF ARC WELDING POWER SOURCE

1-1. INTRODUCTION

We learn by experience. Learning safety through personal experience, like a child touching a hot stove is harmful, wasteful, and unwise. Let the experience of others teach you.

Safe practices developed from experience in the use of welding and cutting are described in this manual. Research, development, and field experience have evolved reliable equipment and safe installation, operation, and servicing practices. Accidents occur when equipment is improperly used or maintained. The reason for the safe practices may not always be given. Some are based on common sense, others may require technical volumes to explain. It is wiser to follow the rules.

Read and understand these safe practices before attempting to install, operate, or service the equipment. Comply with these procedures as applicable to the particular equipment used and their instruction manuals, for personal safety and for the safety of others.

Failure to observe these safe practices may cause serious injury or death. When safety becomes a habit, the equipment can be used with confidence.

These safe practices are divided into two Sections: 1 - General Precautions, common to arc welding and cutting; and 2 - Arc Welding (and Cutting) (only).

Reference standards: Published Standards on safety are also available for additional and more complete procedures than those given in this manual. They are listed in the Standards Index in this manual. ANSI Z49.1 is the most complete.

The National Electrical Code, Occupational Safety and Health Administration, local industrial codes, and local inspection requirements also provide a basis for equipment installation, use, and service.

1-2. GENERAL PRECAUTIONS

A. Burn Prevention

Wear protective clothing - leather (or asbestos) gauntlet gloves, hat, and high safety-toe shoes. Button shirt collar and pocket flaps, and wear cuffless trousers to avoid entry of sparks and slag.

Wear helmet with safety goggles or glasses with side shields underneath, appropriate filter lenses or plates (protected by clear cover glass). This is a **MUST** for welding or cutting, (and chipping) to protect the eyes from radiant energy and flying metal. Replace cover glass when broken, pitted, or spattered. See 1-3A.2.

Avoid oily or greasy clothing. A spark may ignite them.

Hot metal such as electrode stubs and workpieces should never be handled without gloves.

Medical first aid and eye treatment. First aid facilities and a qualified first aid person should be available for each shift unless medical facilities are close by for immediate treatment of flash burns of the eyes and skin burns.

Ear plugs should be worn when working on overhead or in a confined space. A hard hat should be worn when others work overhead.

Flammable hair preparations should not be used by persons intending to weld or cut.

B. Toxic Fume Prevention

Adequate ventilation. Severe discomfort, illness or death can result from fumes, vapors, heat, or oxygen enrichment or depletion that welding (or cutting) may produce. Prevent them with adequate ventilation as described in ANSI Standard Z49.1 listed 1 in Standards index. **NEVER** ventilate with oxygen.

Lead -, cadmium -, zinc -, mercury -, and beryllium -bearing and similar materials, when welded (or cut) may produce

harmful concentrations of toxic fumes. Adequate local exhaust ventilation must be used; or each person in the area as well as the operator must wear an air-supplied respirator. For beryllium, both must be used.

Metals coated with or containing materials that emit toxic fumes should not be heated unless coating is removed from the work surface, the area is well ventilated, or the operator wears an air-supplied respirator.

Work in a confined space only while it is being ventilated and, if necessary, while wearing an air-supplied respirator.

Gas leaks in a confined space should be avoided. Leaked gas in large quantities can change oxygen concentration dangerously. Do not bring gas cylinders into a confined space.

Leaving confined space, shut OFF gas supply at source to prevent possible accumulation of gases in the space if downstream valves have been accidentally opened or left open. Check to be sure that the space is safe before re-entering it.

Vapors from chlorinated solvents can be decomposed by the heat of the arc (or flame) to form PHOSGENE, a highly toxic gas, and other lung and eye irritating products. The ultraviolet (radiant) energy of the arc can also decompose trichloroethylene and perchloroethylene vapors to form phosgene. **DO NOT WELD** or cut where solvent vapors can be drawn into the welding or cutting atmosphere or where the radiant energy can penetrate to atmospheres containing even minute amounts of trichloroethylene or perchloroethylene.

C. Fire and Explosion Prevention

Causes of fire and explosion are: combustibles reached by the arc, flame, flying sparks, hot slag or heated material; misuse of compressed gases and cylinders; and short circuits.

BE AWARE THAT flying sparks or falling slag can pass through cracks, along pipes, through windows or doors, and through wall or floor openings, out of sight of the goggled operator. Sparks and slag can fly 35 feet.

To prevent fires and explosion:

Keep equipment clean and operable, free of oil, grease, and (in electrical parts) of metallic particles that can cause short circuits.

If combustibles are in area, do **NOT** weld or cut. Move the work if practicable, to an area free of combustibles. Avoid paint spray rooms, dip tanks, storage areas, ventilators. If the work cannot be moved, move combustibles at least 35 feet away out of reach of sparks and heat; or protect against ignition with suitable and snug-fitting, fire-resistant covers or shields.

Walls touching combustibles on opposite sides should not be welded on (or cut). Walls, ceilings, and floor near work should be protected by heat-resistant covers or shields.

Fire watcher must be standing by with suitable fire extinguishing equipment during and for some time after welding or cutting if:

- appreciable combustibles (including building construction) are within 35 feet
- appreciable combustibles are further than 35 feet but can be ignited by sparks
- openings (concealed or visible) in floors or walls within 35 feet may expose combustibles to sparks
- combustibles adjacent to walls, ceilings, roofs, or metal partitions can be ignited by radiant or conducted heat.

Hot work permit should be obtained before operation to ensure supervisor's approval that adequate precautions have been taken.

After work is done, check that area is free of sparks, glowing embers, and flames.

An empty container that held combustibles, or that can produce flammable or toxic vapors when heated, must never be welded on or cut, unless container has first been cleaned as described in AWS Standard A6.0, listed 3 in Standards index.

This includes: a thorough steam or caustic cleaning (or a solvent or water washing, depending on the combustible's solubility) followed by purging and inerting with nitrogen or carbon dioxide, and using protective equipment as recommended in A6.0. Waterfilling just below working level may substitute for inerting.

A container with unknown contents should be cleaned (see paragraph above). Do NOT depend on sense of smell or sight to determine if it is safe to weld or cut.

Hollow castings or containers must be vented before welding or cutting. They can explode.

Explosive atmospheres. Never weld or cut where the air may contain flammable dust, gas, or liquid vapors (such as gasoline).

D. Compressed Gas Equipment

Standard precautions. Comply with precautions in this manual, and those detailed in CGA Standard P-1, PRECAUTIONS FOR SAFE HANDLING OF COMPRESSED GASES IN CYLINDERS, listed 6 in Standards index.

1. Pressure Regulators

Regulator relief valve is designed to protect only the regulator from overpressure; it is not intended to protect any downstream equipment. Provide such protection with one or more relief devices.

Never connect a regulator to a cylinder containing gas other than that for which the regulator was designed.

Remove faulty regulator from service immediately for repair (first close cylinder valve). The following symptoms indicate a faulty regulator:

Leaks - if gas leaks externally.

Excessive Creep - if delivery pressure continues to rise with downstream valve closed.

Faulty Gauge - if gauge pointer does not move off stop pin when pressurized, nor returns to stop pin after pressure release.

Repair. Do NOT attempt repair. Send faulty regulators for repair to manufacturer's designated repair center, where special techniques and tools are used by trained personnel.

2. Cylinders

Cylinders must be handled carefully to prevent leaks and damage to their walls, valves, or safety devices:

Avoid electrical circuit contact with cylinders including third rails, electrical wires, or welding circuits. They can produce short circuit arcs that may lead to a serious accident. (See 1-3C.)

ICC or DOT marking must be on each cylinder. It is an assurance of safety when the cylinder is properly handled.

Identifying gas content. Use only cylinders with name of gas marked on them; do not rely on color to identify gas content. Notify supplier if unmarked. NEVER DEFACE or alter name, number, or other markings on a cylinder. It is illegal and hazardous.

Empties: Keep valves closed, replace caps securely; mark MT; keep them separate from FULLS and return promptly.

Prohibited use. Never use a cylinder or its contents for other than its intended use, NEVER as a support or roller.

Locate or secure cylinders so they cannot be knocked over.

Passageways and work areas. Keep cylinders clear of areas where they may be struck.

Transporting cylinders. With a crane, use a secure support such as a platform or cradle. Do NOT lift cylinders off the ground by their valves or caps, or by chains, slings, or magnets.

Do NOT expose cylinders to excessive heat, sparks, slag, and flame, etc. that may cause rupture. Do not allow contents to exceed 130°F. Cool with water spray where such exposure exists.

Protect cylinders particularly valves from bumps, falls, falling objects, and weather. Replace caps securely when moving cylinders.

Stuck valve. Do NOT use a hammer or wrench to open a cylinder valve that can not be opened by hand. Notify your supplier.

Mixing gases. Never try to mix any gases in a cylinder.

Never refill any cylinder.

Cylinder fittings should never be modified or exchanged.

3. Hose

Prohibited use. Never use hose other than that designed for the specified gas. A general hose identification rule is: red for fuel gas, green for oxygen, and black for inert gases.

Use ferrules or clamps designed for the hose (not ordinary wire or other substitute) as a binding to connect hoses to fittings.

No copper tubing splices. Use only standard brass fittings to splice hose.

Avoid long runs to prevent kinks and abuse. Suspend hose off ground to keep it from being run over, stepped on, or otherwise damaged.

Coil excess hose to prevent kinks and tangles.

Protect hose from damage by sharp edges, and by sparks, slag, and open flame.

Examine hose regularly for leaks, wear, and loose connections. Immerse pressured hose in water; bubbles indicate leaks.

Repair leaky or worn hose by cutting area out and splicing (1-2D3). Do NOT use tape.

4. Proper Connections

Clean cylinder valve outlet of impurities that may clog orifices and damage seats before connecting regulator. Except for hydrogen, crack valve momentarily, pointing outlet away from people and sources of ignition. Wipe with a clean lintless cloth.

Match regulator to cylinder. Before connecting, check that the regulator label and cylinder marking agree, and that the regulator inlet and cylinder outlet match. NEVER CONNECT a regulator designed for a particular gas or gases to a cylinder containing any other gas.

Tighten connections. When assembling threaded connections, clean and smooth seats where necessary. Tighten. If connection leaks, disassemble, clean, and retighten using properly fitting wrench.

Adapters. Use a CGA adapter (available from your supplier) between cylinder and regulator, if one is required. Use two wrenches to tighten adapter marked RIGHT and LEFT HAND threads.

Regulator outlet (or hose) connections may be identified by right hand threads for oxygen and left hand threads (with grooved hex on nut or shank) for fuel gas.

5. Pressurizing Steps:

Drain regulator of residual gas through suitable vent before opening cylinder (or manifold valve) by turning adjusting screw in (clockwise). Draining prevents excessive compression heat at high pressure seat by allowing seat to open on pressurization. Leave adjusting screw engaged slightly on single-stage regulators.

Stand to side of regulator while opening cylinder valve.

Open cylinder valve slowly so that regulator pressure increases slowly. When gauge is pressurized (gauge reaches regulator maximum) leave cylinder valve in following position: For oxygen, and inert gases, open fully to seal stem against possible leak. For fuel gas, open to less than one turn to permit quick emergency shutoff.

Use pressure charts (available from your supplier) for safe and efficient, recommended pressure settings on regulators.

Check for leaks on first pressurization and regularly thereafter. Brush with soap solution (capful of Ivory Liquid* or equivalent per gallon of water). Bubbles indicate leak. Clean off soapy water after test; dried soap is combustible.

E. User Responsibilities

Remove leaky or defective equipment from service immediately for repair. See User Responsibility statement in equipment manual.

F. Leaving Equipment Unattended

Close gas supply at source and drain gas.

G. Rope Staging-Support

Rope staging-support should not be used for welding or cutting operation; rope may burn.

1-3. ARC WELDING

Comply with precautions in 1-1, 1-2, and this section. Arc Welding, properly done, is a safe process, but a careless operator invites trouble. The equipment carries high currents at significant voltages. The arc is very bright and hot. Sparks fly, fumes rise, ultraviolet and infrared energy radiates, weldments are hot, and compressed gases may be used. The wise operator avoids unnecessary risks and protects himself and others from accidents. Precautions are described here and in standards referenced in index.

A. Burn Protection

Comply with precautions in 1-2.

The welding arc is intense and visibly bright. Its radiation can damage eyes, penetrate lightweight clothing, reflect from light-colored surfaces, and burn the skin and eyes. Skin burns resemble acute sunburn, those from gas-shielded arcs are more severe and painful. **DON'T GET BURNED; COMPLY WITH PRECAUTIONS.**

1. Protective Clothing

Wear long-sleeve clothing (particularly for gas-shielded arc) in addition to gloves, hat, and shoes (1-2A). As necessary, use additional protective clothing such as leather jacket or sleeves, flame-proof apron, and fire-resistant leggings. Avoid outergarments of untreated cotton.

Bare skin protection. Wear dark, substantial clothing. Button collar to protect chest and neck and button pockets to prevent entry of sparks.

2. Eye and Head Protection

Protect eyes from exposure to arc. **NEVER** look at an electric arc without protection.

Welding helmet or shield containing a filter plate shade no. 12 or denser must be used when welding. Place over face before striking arc.

Protect filter plate with a clear cover plate.

Cracked or broken helmet or shield should **NOT** be worn; radiation can pass through to cause burns.

Cracked, broken, or loose filter plates must be replaced **IMMEDIATELY**. Replace clear cover plate when broken, pitted, or spattered.

Flash goggles with side shields **MUST** be worn under the helmet to give some protection to the eyes should the helmet not be lowered over the face before an arc is struck. Looking at an arc momentarily with unprotected eyes (particularly a high intensity gas-shielded arc) can cause a retinal burn that may leave a permanent dark area in the field of vision.

3. Protection of Nearby Personnel

Enclosed welding area. For production welding, a separate room or enclosed bay is best. In open areas, surround the

operation with low-reflective, non-combustible screens or panels. Allow for free air circulation, particularly at floor level.

Viewing the weld. Provide face shields for all persons who will be looking directly at the weld.

Others working in area. See that all persons are wearing flash goggles.

Before starting to weld, make sure that screen flaps or bay doors are closed.

B. Toxic Fume Prevention

Comply with precautions in 1-2B.

Generator engine exhaust must be vented to the outside air. Carbon monoxide can kill.

C. Fire and Explosion Prevention

Comply with precautions in 1-2C.

Equipment's rated capacity. Do not overload arc welding equipment. It may overheat cables and cause a fire.

Loose cable connections may overheat or flash and cause a fire.

Never strike an arc on a cylinder or other pressure vessel. It creates a brittle area that can cause a violent rupture or lead to such a rupture later under rough handling.

D. Compressed Gas Equipment

Comply with precautions in 1-2D.

E. Shock Prevention

Exposed hot conductors or other bare metal in the welding circuit, or in ungrounded, electrically-HOT equipment can fatally shock a person whose body becomes a conductor. **DO NOT STAND, SIT, LIE, LEAN ON, OR TOUCH** a wet surface when welding, without suitable protection.

To protect against shock:

Keep body and clothing dry. Never work in damp area without adequate insulation against electrical shock. Stay on a dry duckboard, or rubber mat when dampness or sweat can not be avoided. Sweat, sea water, or moisture between body and an electrically HOT part - or grounded metal - reduces the body surface electrical resistance, enabling dangerous and possibly lethal currents to flow through the body.

1. Grounding the Equipment

When installing, connect the frames of each unit such as welding power source, control, work table, and water circulator to the building ground. Conductors must be adequate to carry ground currents safely. Equipment made electrically HOT by stray current may shock, possibly fatally. Do **NOT** GROUND to electrical conduit, or to a pipe carrying ANY gas or a flammable liquid such as oil or fuel.

Three-phase connection. Check phase requirement of equipment before installing. If only 3-phase power is available, connect single-phase equipment to only two wires of the 3-phase line. Do **NOT** connect the equipment ground lead to the third (live) wire, or the equipment will become electrically HOT - a dangerous condition that can shock, possibly fatally.

Before welding, check ground for continuity. Be sure conductors are touching bare metal of equipment frames at connections.

If a line cord with a ground lead is provided with the equipment for connection to a switchbox, connect the ground lead to the grounded switchbox. If a three-prong plug is added for connection to a grounded mating receptacle, the ground lead must be connected to the ground prong only. If the line cord comes with a three-prong plug, connect to a grounded mating receptacle. Never remove the ground prong from a plug, or use a plug with a broken off ground prong.

*Trademark of Proctor & Gamble.

2. Electrode Holders

Fully insulated electrode holders should be used. Do NOT use holders with protruding screws.

3. Connectors

Fully insulated lock-type connectors should be used to join welding cable lengths.

4. Cables

Frequently inspect cables for wear, cracks and damage. IMMEDIATELY REPLACE those with excessively worn or damaged insulation to avoid possibly - lethal shock from bared cable. Cables with damaged areas may be taped to give resistance equivalent to original cable.

Keep cable dry, free of oil and grease, and protected from hot metal and sparks.

5. Terminals And Other Exposed Parts

Terminals and other exposed parts of electrical units should have insulating covers secured before operation.

6. Electrode Wire

Electrode wire becomes electrically HOT when the power switch of gas metal-arc welding equipment is ON and welding gun trigger is pressed. Keep hands and body clear of wire and other HOT parts.

7. Safety Devices

Safety devices such as interlocks and circuit breakers should not be disconnected or shunted out.

Before installation, inspection, or service, of equipment, shut OFF all power and remove line fuses (or lock or red-tag switches) to prevent accidental turning ON of power. Disconnect all cables from welding power source, and pull all 115 volts line-cord plugs.

Do not open power circuit or change polarity while welding. If, in an emergency, it must be disconnected, guard against shock burns, or flash from switch arcing.

Leaving equipment unattended. Always shut OFF and disconnect all power to equipment.

Power disconnect switch must be available near the welding power source.

1-4. STANDARDS BOOKLET INDEX

For more information, refer to the following standards or their latest revisions and comply as applicable:

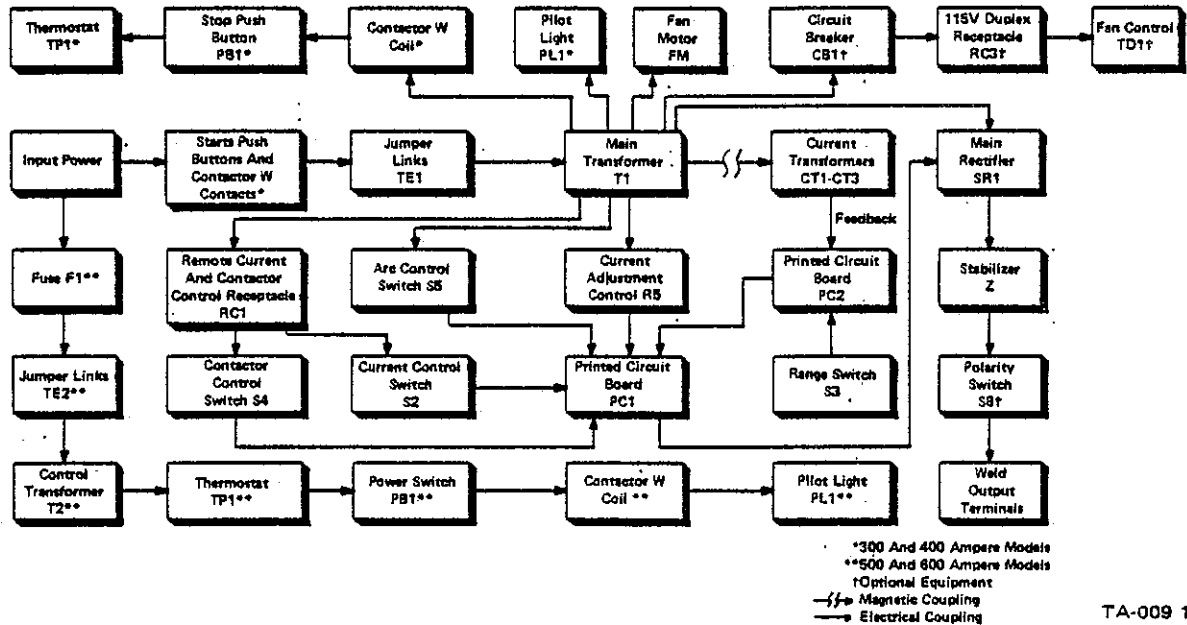
1. ANSI Standard Z49.1, SAFETY IN WELDING AND CUTTING obtainable from the American Welding Society, 2501 NW 7th St., Miami, Fla. 33125.
2. ANSI Standard Z87.1, SAFE PRACTICE FOR OCCUPATION AND EDUCATIONAL EYE AND FACE PROTECTION, obtainable from American National Standards Institute, 1430 Broadway, New York, N.Y. 10018.
3. American Welding Society Standard A6.0, WELDING AND CUTTING CONTAINERS WHICH HAVE HELD COMBUSTIBLES, obtainable same as item 1.
4. NFPA Standard 51, OXYGEN-FUEL GAS SYSTEMS FOR WELDING AND CUTTING, obtainable from the National Fire Protection Association, 470 Atlantic Avenue, Boston, Mass. 02210.
5. NFPA Standard 51B, CUTTING AND WELDING PROCESSES, obtainable same as item 4.
6. CGA Pamphlet P-1, SAFE HANDLING OF COMPRESSED GASES IN CYLINDERS, obtainable from the Compressed Gas Association, 500 Fifth Avenue, New York, N. Y. 10036.
7. OSHA Standard 29 CFR, Part 1910, Subpart Q, WELDING, CUTTING AND BRAZING.

SECTION 2 - INTRODUCTION

Model	Rated Welding Current Amperes 60% Duty Cycle	Welding Current Ranges Amperes	Max. Open-Circuit Voltage	Input At Rated Load Output 60 Hz. Three-Phase						Overall Dimensions (Inches)	Weight (Pounds)	
				Amperes At				kva	kw		Net	Ship
				200(208)V	230V	460V	575V					
300 Ampere	300@ 32 Volts	15-200. 25-385	70	67	58	29	23	23.2	12.9	Height - 30* Width - 22-1/4 Depth - 35-3/4	460	489
400 Ampere	400@ 36 Volts	20-265 25-510	70	87	76	38	30	30	19.8		473	498
500 Ampere	500@ 40 Volts	25-350 25-625	70	113	98	49	39	38.8	25.6		543	568
600 Ampere	600@ 44 Volts	30-415 50-750	70	131	114	57	46	45.6	32.7	Height - 30* Width - 22-1/4 Depth - 40	632	657

*Includes 2-3/4" for lifting eye

Figure 2-1. Specifications



TA-009 132-C

Figure 2-2. Functional Diagram

2-1. GENERAL

This manual has been prepared especially for use in familiarizing personnel with the design, installation, operation, maintenance, and troubleshooting of this equipment. All information presented herein should be given careful consideration to assure optimum performance of this equipment.

2-2. RECEIVING-HANDLING

Prior to installing this equipment, clean all packing material from around the unit and carefully inspect for any damage that may have occurred during shipment. Any claims for loss or damage that may have occurred in transit must be filed by the purchaser with the carrier. A copy of the bill of lading and freight bill will be furnished by the carrier on request if occasion to file claim arises.

When requesting information concerning this equipment, it is essential that Model Description and/or Stock Number and Serial (or Style) Numbers of the equipment be supplied.

2-3. DESCRIPTION

These units are three-phase welding power sources with Solid State control which produce dc welding current. The number in the model designation refers to rated output: the 300SS is rated at 300 amperes. The letters SS in the model designation refer to the Solid State control. These units are to be used in conjunction with the Shielded Metal-Arc Welding (SMAW) process.

2-4. SAFETY

Before the equipment is put into operation, the safety sec-

tion at the front of this manual should be read completely. This will help avoid possible injury due to misuse or improper welding applications.

The following definitions apply to CAUTION, IMPORTANT, and NOTE blocks found throughout this manual:

CAUTION

Under this heading, installation, operating, and maintenance procedures or practices will be found that if not carefully followed may create a hazard to personnel.

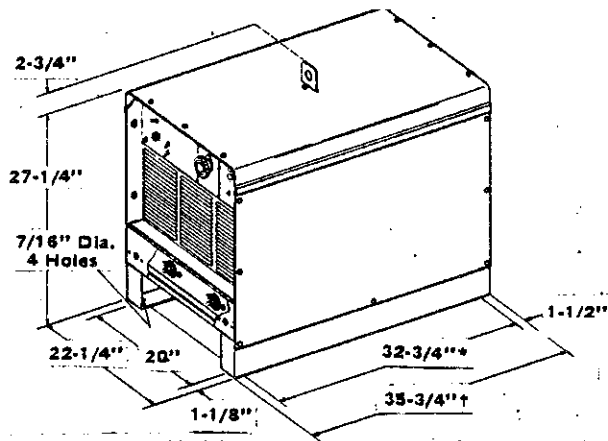
IMPORTANT

Under this heading, installation, operating, and maintenance procedures or practices will be found that if not carefully followed may result in damage to equipment.

NOTE

Under this heading, explanatory statements will be found that need special emphasis to obtain the most efficient operation of the equipment.

SECTION 3 - INSTALLATION



*37" on 600 Ampere Model
†40" on 600 Ampere Model

TC-000 599-B

Figure 3-1. Overall Dimensions and Base Mounting Hole Layout

3-1. LOCATION (Figure 3-1)

A proper installation site should be selected for the welding power source if the unit is to provide dependable service, and remain relatively maintenance free.

A proper installation site permits freedom of air movement into and out of the welding power source, and also least subjects the unit to dust, dirt, moisture, and corrosive vapors. A minimum of 18 inches of unrestricted space must be maintained between the welding power source front and rear panels and the nearest obstruction. Also, the underside of the welding power source must be kept completely free of obstructions. The installation site should also permit easy removal of the welding power source outer enclosure for maintenance functions.

IMPORTANT

Do not place any filtering device over the intake air passages of the welding power source as this would restrict the volume of intake air and thereby subject the welding power source internal components to an overheating condition and subsequent failure. Warranty is void if any type of filtering device is used.

Holes are provided in the welding power source base for mounting purposes. Figure 3-1 gives overall dimensions and the base mounting hole layout.

On most welding power sources a lifting device is provided for moving the unit. However, if a fork lift vehicle is used for lifting the unit, be sure that the lift forks are long enough to extend completely under the base.

IMPORTANT

The use of lift forks too short to extend out of the opposite side of the base will expose internal components to damage should the tips of the lift forks penetrate the bottom of the unit.

3-2. ELECTRICAL INPUT CONNECTIONS

A. Electrical Input Requirements

This welding power source is designed to be operated from a three-phase, 60 Hertz, ac power supply which has a line voltage rating that corresponds with one of the electrical input voltages shown on the nameplate. Consult the local electric utility if there is any question about the type of electrical system available at the installation site or how proper connections to the welding power source are to be made.

B. Input Conductor Connections

NOTE

It is recommended that a line disconnect switch be installed in the input circuit to the welding power source. This would provide a safe and convenient means to completely remove all electrical power from the welding power source whenever it is necessary to perform any internal function on the unit.

CAUTION

Before making electrical input connections to the welding power source, "machinery lockout procedures" should be employed. If the connection is to be made from a line disconnect switch, the switch should be padlocked in the open position. If the connection is made from a fuse box, remove the fuses from the box and padlock the cover in the closed position. If the unit is connected to a circuit breaker, or other disconnecting device without locking facilities, attach a red tag to the device to warn others that the circuit is being worked on.

CAUTION

Connect the input conductors to the welding power source before making connections to the three-phase power supply.

The input conductors should be covered with an insulating material which conforms to local electrical standards. Table 3-1 is provided only as a guide for selecting the proper size input conductors and fuses.

Table 3-1. Input Conductor and Fuse Size

Model	Input Conductor Size - AWG*				Fuse Size in Amperes			
	200(208)V	230V	460V	575V	200V	230V	460V	575V
300 Ampere	6 (8)	6 (8)	10 (12)	10 (14)	100	90	45	35
400 Ampere	4 (8)	4 (8)	8 (10)	10 (10)	125	125	60	45
500 Ampere	2 (8)	3 (8)	6 (8)	8 (8)	175	150	80	60
600 Ampere	1 (8)	2 (8)	6 (8)	8 (10)	200	175	90	80

*Input conductor sizes are based on allowable ampacities of insulated copper conductors, having a temperature rating of 75°C, with not more than three conductors in a raceway or cable. Numbers in () are equipment ground conductor sizes.

Insert the three input conductors plus one ground conductor through the access hole on the rear panel. This hole will accept standard conduit fittings. See Figure 3-2 for hole location and size.

NOTE

It is recommended that a terminal lug of adequate ampere capacity be attached to the ends of the input and ground conductors. The hole diameter in the terminal lug must be of proper size to accommodate the line and ground terminal studs.

Connect the three input conductors to the line terminals on the primary terminal board and connect the ground conductor to the ground terminal. (Refer to the input voltage label for identification of these terminals. See Figure 3-2 for location of this label.) The remaining end of the ground conductor should be connected to a proper ground. Use a grounding method that is acceptable to the local electrical inspection authority.

CAUTION

The ground terminal is connected to the welding power source chassis and is for grounding purposes only. Do not connect a conductor from the ground terminal to any one of the line terminals as this will result in an electrically energized welding power source chassis.

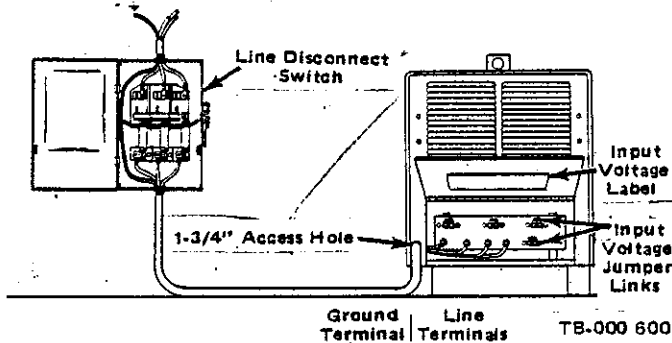


Figure 3-2. Input Conductor Connections

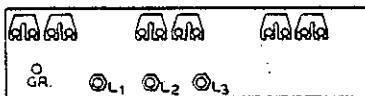
C. Matching The Welding Power Source To The Available Input Voltage

The input voltage jumper links provided on the primary terminal board permit the welding power source to be operated from various line voltages. The various voltages from which this unit may be operated are stated on the nameplate and on the input voltage label. See Figure 3-2 for location of this label. The input voltage jumper links are positioned for the highest of the voltages stated on the nameplate. If the welding power source is to be operated from a line voltage which is lower than the highest voltage for which the unit was designed, the jumper links will have to be moved to the proper positions before operating the unit. Figure 3-3 shows the various positions of the jumper links on the standard welding power sources. If the input voltages on the nameplate differ from those shown in Figure 3-3, the input voltage jumper links must be positioned as shown on the input voltage label.

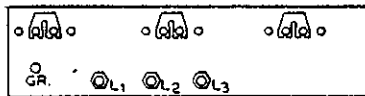
NOTE

If only one jumper link is required on each of the grouped terminals, it is recommended that the unused jumper links be placed across the terminals which are to be used. This will prevent losing the jumper links which are not required for this connection.

230 VOLTS



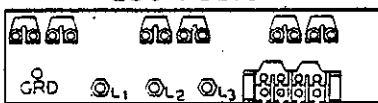
460 VOLTS



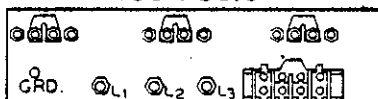
TA-012 130

Input Voltage Jumper Link Arrangement For 300 And 400 Ampere Models

230 VOLTS



460 VOLTS



TA-020 426

Input Voltage Jumper Link Arrangement For 500 And 600 Ampere Models

Figure 3-3. Input Voltage Jumper Link Arrangement

3-3. WELD OUTPUT CONNECTIONS (Figure 4-1)

To obtain the full rated output from this unit, it is necessary to select, install, and maintain proper welding cables. Failure to comply in any of these areas may result in less than satisfactory welding performance.

CAUTION

Ensure that the unit is completely shut down before making any weld output connections.

A. Location

The POSITIVE and NEGATIVE weld output terminals are located on the lower portion of the front panel.

B. Welding Cables

If welding cables were not ordered with this unit, the steps listed should be followed to ensure the best welding performance:

1. It is recommended that the welding cables be kept as short as possible, be placed close together, and be of adequate current carrying capacity. The resistance of the welding cables and connections causes a voltage drop which is added to the voltage of the arc. Excessive cable resistance may result in overloading as well as reducing the maximum current output capability of this unit. Proper operation is to a great extent dependent on the use of welding cables and connections that are in good condition and of adequate size. An insulated electrode holder must be used to ensure the operator's safety.
2. Use Table 3-2 as a guide for selecting correct cable size for the anticipated maximum weld current which will be used. Table 3-2 shows total cable length, which includes the electrode and work cable. Example: If the electrode holder cable is 75 feet long and the work cable is 25 feet long, select the size cable that is recommended for 100 feet at the maximum weld current that is to be used.
3. Do not use damaged or frayed cables.
4. Follow the electrode holder manufacturer's instructions for installing the electrode holder onto the electrode cable.
5. Use correct lugs on the weld cables to connect the work clamp and to connect the cables to the weld output terminals.
6. Ensure that all connections are clean and tight.

If reverse polarity is to be used for the welding operation, connect the electrode holder cable to the POSITIVE output terminal and the work cable to the NEGATIVE output terminal. To obtain straight polarity, connect the electrode holder cable to the NEGATIVE output terminal and the work cable to the POSITIVE output terminal.

Table 3-2. Welding Cable Size

WELDING AMPERES	*TOTAL LENGTH OF CABLE (COPPER) IN WELD CIRCUIT							
	*50	100	150	200	250	300	350	400
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	2	2	1	1/0	2/0	3/0	4/0	4/0
250	1	1	1/0	2/0	3/0	4/0	4/0	2-2/0
300	1/0	1/0	2/0	3/0	4/0	4/0	2-2/0	2-3/0
350	1/0	1/0	3/0	4/0	4/0	2-2/0	2-3/0	2-3/0
400	2/0	2/0	3/0	4/0	2-2/0	2-3/0	3-2/0	2-4/0
500	3/0	3/0	4/0	2-2/0	2-3/0	2-3/0	2-4/0	3-3/0
600	4/0	4/0	2-2/0	2-3/0	3-2/0	2-4/0	3-3/0	3-4/0
700	4/0	4/0	2-3/0	2-4/0	3-3/0	3-4/0	4-4/0	4-4/0
800	2-2/0	2-2/0	2-3/0	2-4/0	3-3/0	3-4/0	4-4/0	4-4/0
900	2-3/0	2-3/0	2-4/0	3-3/0	3-4/0	4-4/0	4-4/0	4-4/0

A-002 624

- NOTE:
- *A. 50 FEET OR LESS.
 - *B. CABLE SIZE IS BASED ON DIRECT CURRENT (DC), 60% DUTY CYCLE AND EITHER A 4 VOLTS OR LESS DROP OR A CURRENT DENSITY OF NOT OVER 300 CIRCULAR MILS PER AMP. *
 - *C. WELD CABLE INSULATION WITH A VOLTAGE RATING TO WITHSTAND THE OPEN-CIRCUIT VOLTAGE (OCV) OF THE WELDING POWER SOURCE MUST BE USED. WHILE MOST WELDING POWER SOURCES HAVE AN OPEN-CIRCUIT VOLTAGE OF LESS THAN 100 VOLTS, SOME WELDING POWER SOURCES OF SPECIAL DESIGN MAY HAVE HIGHER OPEN-CIRCUIT VOLTAGE.

3-4. REMOTE CURRENT AND CONTACTOR CONTROL CONNECTIONS

NOTE

Although the term CONTACTOR is used on the nameplate and throughout this manual, the output is not switched on or off by a physical secondary contactor; rather, the output is controlled by a Silicon Controlled Rectifier (SCR) stack which functions as a contactor.

SECTION 4 - FUNCTION OF CONTROLS

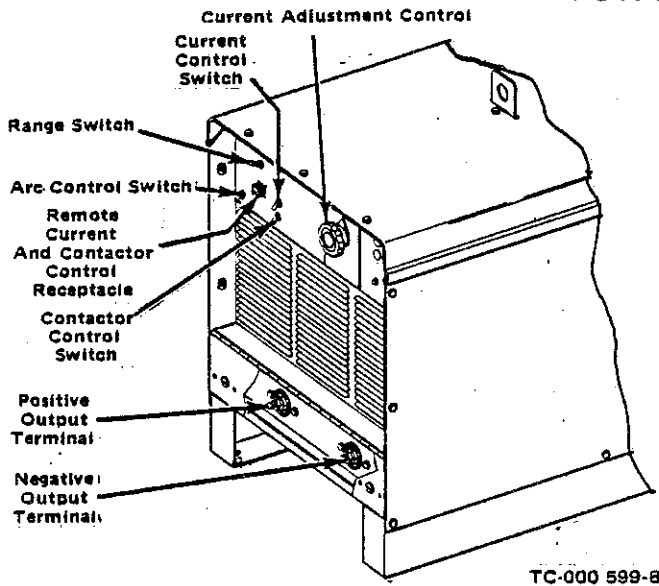


Figure 4-1. Front Panel View

4-1. POWER SWITCH (Figure 4-1)

Depressing the POWER switch ON push button will energize the welding power source and place the unit in a ready-to-weld status. Depressing the POWER switch OFF push button will shut the welding power source down.

CAUTION

Depressing the POWER switch OFF push button does not remove power from all of the welding power source internal circuitry. Completely terminate all electrical power to the welding power source by employing "machinery lockout procedures" before attempting any inspection or work on the inside of the unit. If the welding power source is connected to a disconnect switch, padlock the switch in an open position. If connected to a fuse box, remove the fuses and padlock the cover in the closed position. If the unit is connected to a circuit breaker, or other disconnecting device without locking facilities, attach a red tag to the device to warn others that the circuit is being worked on.

4-2. RANGE SWITCH (Figure 4-1)

The RANGE SWITCH, located on the front panel, provides selection of two coarse output ranges. When the RANGE SWITCH is in the LOW position, ensure that the LOW current scale is used in conjunction with the CURRENT ADJUSTMENT control. When in the HI (high) position, ensure that the HIGH current scale is used in conjunction with the CURRENT ADJUSTMENT control.

4-3. CURRENT ADJUSTMENT CONTROL (Figure 4-1)

The CURRENT ADJUSTMENT control, located on the front panel, provides a means of selecting the exact current desired within the range being used. Rotating the control in a clockwise direction will increase the current output.

The REMOTE CURRENT and CONTACTOR CONTROL receptacle, located on the front panel of the welding power source, provides a junction point for connecting a Remote Contactor and/or a Remote Current Control to the internal circuitry of the welding power source. To connect the Remote Contactor and/or Current Control to the REMOTE CURRENT and CONTACTOR CONTROL receptacle, insert the five-pin plug from the Remote Control fully into the receptacle. Ensure that the plug keyway aligns with the receptacle key. Rotate the plug threaded collar clockwise as far as possible onto the receptacle threaded body to secure the plug in the receptacle.

NOTE

The contacts of the CURRENT ADJUSTMENT control are of the continuous type, thereby making it possible to adjust this control while welding.

4-4. REMOTE CURRENT AND CONTACTOR CONTROL RECEPTACLE AND SWITCH (Figure 4-1)

A. Remote Current Control Receptacle And Switch

If a Remote Current Control is to be used, make connections from the control to the REMOTE CURRENT CONTROL receptacle as instructed in Section 3-4.

When remote control of the current is desired, it is essential that the CURRENT CONTROL switch be placed in the REMOTE position. Likewise, if a Remote Current Control is not to be utilized, the switch must be in the STANDARD position. When in the STANDARD position, only the CURRENT ADJUSTMENT control on the front panel will control the current.

When a Remote Current Control is being used, the control is functioning as a fine current adjustment for the CURRENT ADJUSTMENT control setting on the welding power source. For example: If the CURRENT ADJUSTMENT control on the welding power source is set at the mid-range position, the Remote Current Control will provide (from its min. to max. positions) fine amperage adjustment of one half of the welding power source output for the current range selected. If full adjustment through use of the remote control of the current range selected is desired, the CURRENT ADJUSTMENT control on the welding power source must be set at the maximum position.

B. Remote Contactor Control Receptacle And Switch

The contactor control circuitry in this welding power source enables the operator to remotely control the availability of weld output from the work station.

If a Remote Contactor Control is to be used, make connections to the REMOTE CONTACTOR and CURRENT CONTROL receptacle as instructed in Section 3-4. Place the CONTACTOR switch in the REMOTE position. Depress the ON push button on the welding power source. Weld output will be available whenever the remote contactor control switch is closed.

If a Remote Contactor Control is not to be used, place the CONTACTOR switch in the STANDARD position. When in the STANDARD position, weld output will be available after the ON push button is depressed. Weld output will continue until the OFF push button is depressed.

CAUTION

If the CONTACTOR switch is in the STANDARD position, open-circuit voltage will be present at the output terminals after the ON push button is depressed. Open-circuit voltage will continue to be present until the OFF push button is depressed.

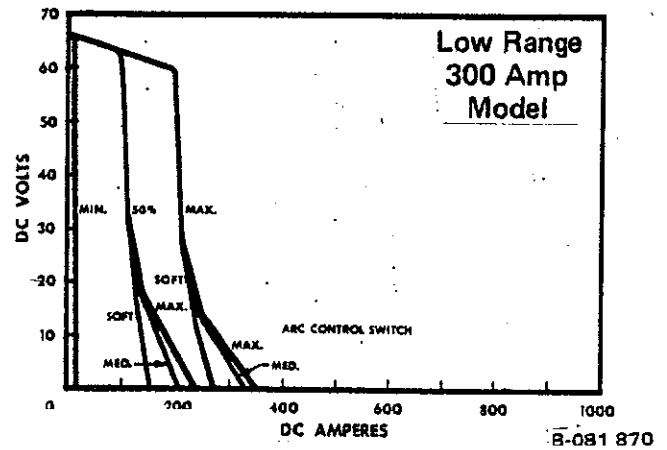
4-5. ARC CONTROL SWITCH (Figure 4-1)

The ARC CONTROL switch provides selection of arc characteristics to suit individual welding conditions.

When the switch is set at MAX. (maximum), current increases rapidly as the short-circuit condition is approached. This provides extra current for arc starting in out of position welding as well as for certain types of electrodes.

When the switch is set at MED. (medium), current increases slightly as the short-circuit condition is approached. This provides a slight increase in current for arc starting which is necessary for certain types of electrodes.

When the switch is set at SOFT, current increases in a linear fashion as the short-circuit condition is approached. This provides current characteristics associated with Gas Tungsten-Arc Welding.



6. PILOT LAMP (Figure 4-1)

The Pilot Lamp, located on the front panel, indicates when the welding power source is in a ready-to-weld state.

7. DUTY CYCLE (Figure 4-2)

The duty cycle of a welding power source is the percentage of a ten minute period that a welding power source can safely be operated at a given output. This welding power source is rated at 60 percent duty cycle. This means that the welding power source can be safely operated at rated load for six minutes out of every ten. During the remaining four minutes, the unit should idle to permit proper cooling. If the welding amperes are decreased, the duty cycle will increase. Figure 4-2 enables the operator to determine the safe output of the welding power source at various duty cycles.

IMPORTANT

Exceeding the indicated duty cycle will cause overheating and thereby damage to the welding power source.

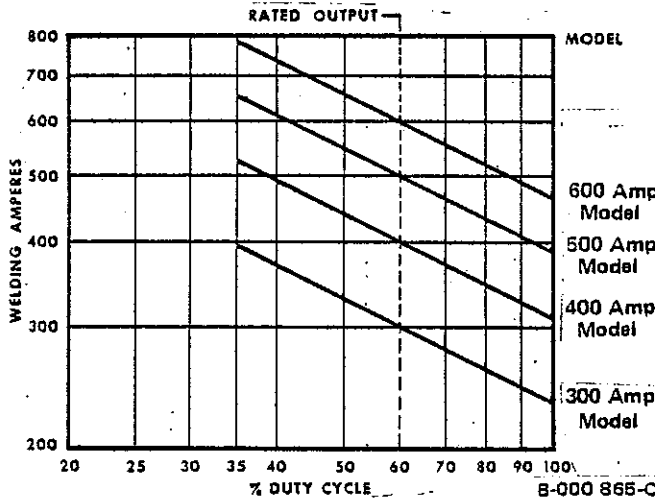
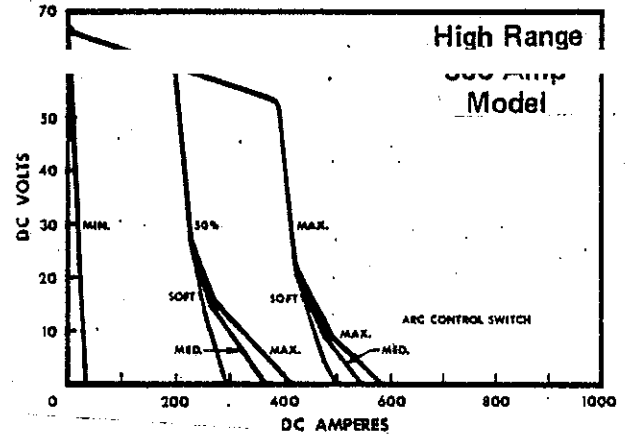
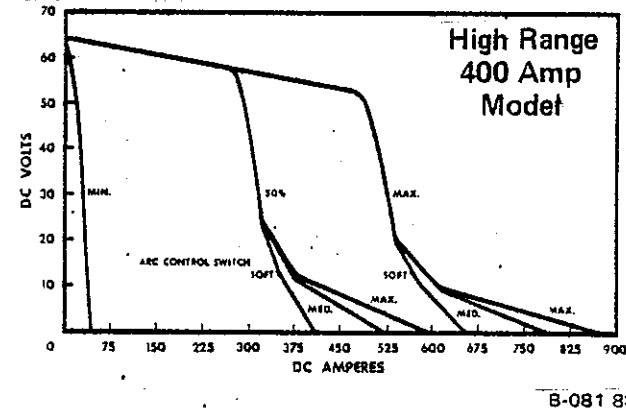
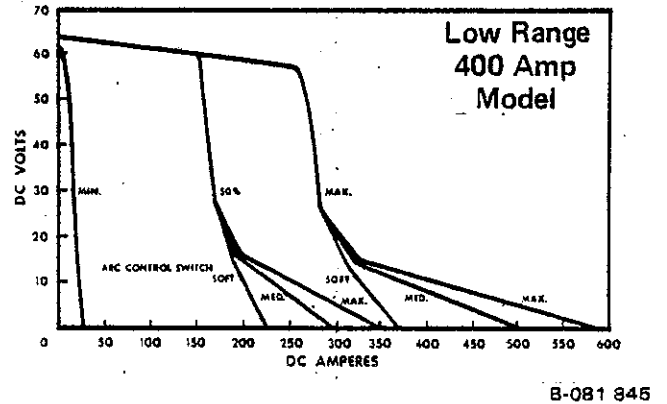
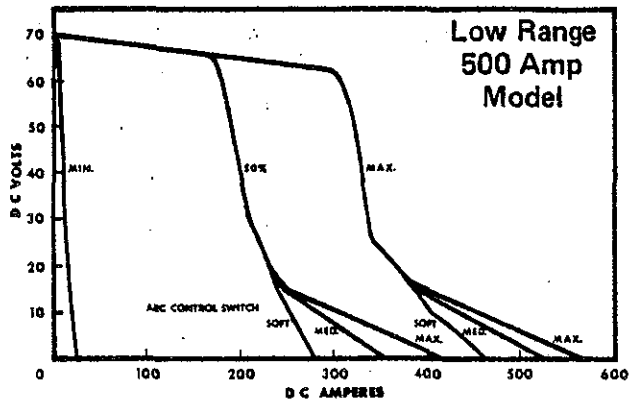


Figure 4-2. Duty Cycle Chart

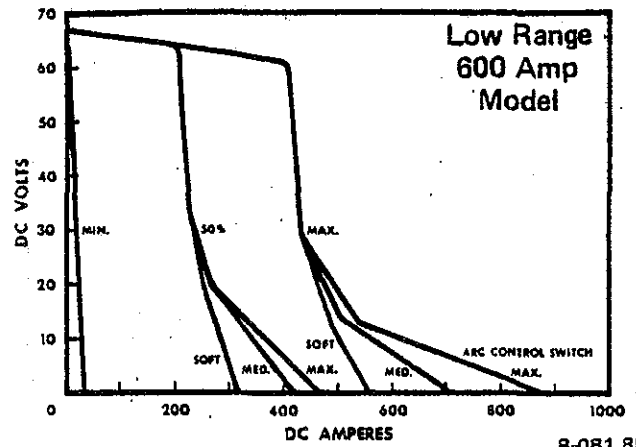


4-8. VOLT-AMPERE CURVES (Figure 4-3)

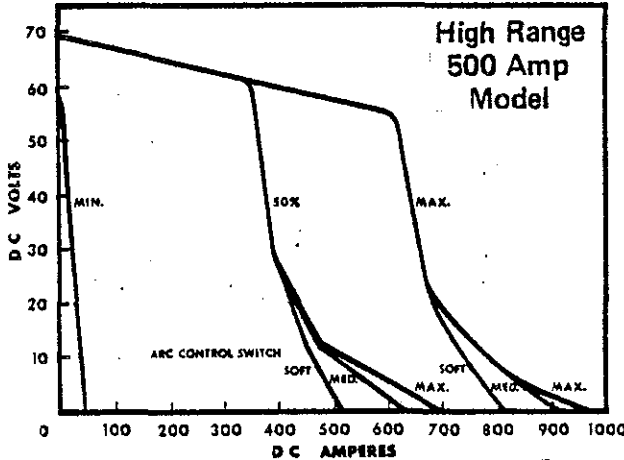
The volt-ampere curves show the output voltage available at any given output current within the limits of the minimum and maximum CURRENT ADJUSTMENT control setting. Load voltage is predetermined to a large degree by arc characteristics. With the use of the volt-ampere curves, it is possible to determine the amperage required for a specific load voltage. With reference to the volt-ampere curves, the curve shows the indicated settings of the CURRENT ADJUSTMENT control only. Curves of other settings will fall between the curves shown,



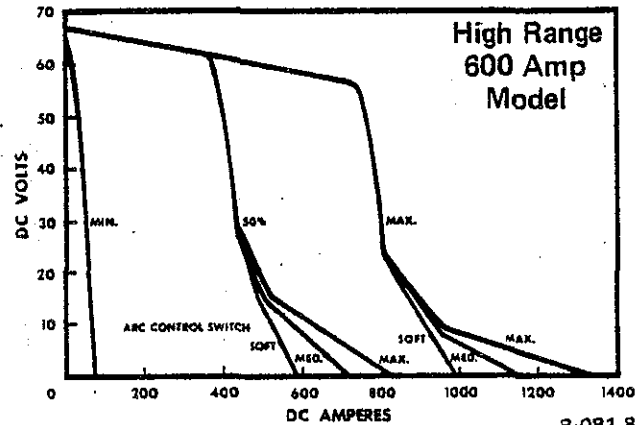
B-081 31



B-081 850



B-081 394



B-081 848

Figure 4-3. Volt-Ampere Curves

4-9. METERS (Optional)

This welding power source can be equipped with meters. These meters monitor the welding operation and serve as an indication of the welding process. They are not intended for exact current or voltage measurements. These meters are internally connected to the welding power source output terminals. The voltmeter will indicate the voltage at the output terminals, but will not necessarily indicate the actual voltage at the welding arc. The ammeter will indicate the current output of the welding power source.

4-10. 115 VOLTS AC DUPLEX RECEPTACLE (Optional)

This welding power source can be equipped with a 115 volts ac duplex receptacle located on the right side of the front panel. Up to 2 kva of 115 volts ac is available at this receptacle for operating accessory equipment. This receptacle is protected from overload by a circuit breaker CB1 located directly below the receptacle on the front panel.

4-11. POLARITY SWITCH (Optional)

To ensure that the weld current output will be in accordance with the labeling of the position on the POLARITY SWITCH, connect the electrode holder cable to the ELECTRODE terminal and the work cable to the WORK terminal.

The POLARITY SWITCH provides a means of selecting either dc STRAIGHT or dc REVERSE polarity without changing the weld output cable connections.

IMPORTANT

Do not change the position of the POLARITY SWITCH while welding or under load, as this causes arcing across the contacts of the switch. This arcing causes the contacts to become pitted and eventually inoperative.

4-12. FAN CONTROL (Optional)

The fan control circuitry consists of a current relay, a five minute fan motor timer, 115 volts fan motor, and two thermostats. The normally open thermostats are located in the main transformer and main rectifier. These thermostats close when the main transformer or main rectifier overheat. Normally the fan will run after arc initiation, when the thermostats close, or before the fan motor timer times out after the arc is extinguished. The fan motor will run initially only if the unit was shut off before the fan motor timer timed out. The 115 volt fan motor replaces the fan motor on the standard model.

SECTION 5 - SEQUENCE OF OPERATION

5-1. SHIELDED METAL-ARC WELDING (SMAW)

1. Make necessary connections as outlined in Section 3.
2. If a Remote Current and/or a Remote Contactor Control are not to be used, place the CURRENT CONTROL and CONTACTOR CONTROL switches in the STANDARD position. If a Remote Current and/or a Remote Contactor Control are to be used, place the CURRENT CONTROL and CONTACTOR CONTROL switches in the REMOTE position.
3. Place the RANGE SWITCH in the desired position.
4. Place the ARC CONTROL switch in the desired position.

5. Rotate the CURRENT ADJUSTMENT control or the Remote Current Control if used, to the desired position.

NOTE

The contacts of the CURRENT ADJUSTMENT control are of the continuous type, thereby making it possible to adjust this control while welding.

6. Insert the proper electrode in the electrode holder.
7. Depress the POWER switch ON push button.

CAUTION

Prior to welding, it is imperative that proper protective clothing (welding coat and gloves) and eye protection (glasses and/or welding helmet) be put on. Failure to comply may result in serious or permanent bodily damage.

8. Commence welding.

5-2. SHUTTING DOWN

1. Cease welding.
2. Allow the welding power source to idle for three minutes with no load applied.
3. Depress the POWER switch OFF push button.

SECTION 6 - MAINTENANCE**CAUTION**

Depressing the POWER switch OFF push button does not remove power from all of the welding power source internal circuitry. Completely terminate all electrical power to the welding power source by employing "machinery lockout procedures" before attempting any inspection or work on the inside of the unit. If the welding power source is connected to a disconnect switch, padlock the switch in an open position. If connected to a fuse box, remove the fuses and padlock the cover in the closed position. If the unit is connected to a circuit breaker, or other disconnecting device without locking facilities, attach a red tag to the device to warn others that the circuit is being worked on.

6-2. INTERNAL CLEANING

Occasional blowing out or vacuuming of the dust and dirt from around the internal components is recommended. This should be done periodically depending upon the location of the unit and the amount of dust and dirt in the atmosphere. The welding power source outer enclosure should be removed and a clean, dry air stream or vacuum suction should be used for this cleaning operation.

6-1. FAN MOTOR

All models are equipped with an exhaust fan and rely on forced draft for adequate cooling. The fan motor is manufactured with lifetime-lubricated sealed ball bearings and no attention should be required.

6-3. CONTROL CIRCUIT PROTECTION (500 And 600⁺ Ampere Models Only)

The entire control circuit of the welding power source is protected by a cartridge type fuse F1. This fuse is located behind the rear panel access door, immediately to the left. Should this fuse open the welding power source would completely shut down.

6-4. RECTIFIER PROTECTION

The main rectifier SR1 in this welding power source is protected by a normally-closed thermostat TP1 wired in series with the contactor W coil circuit. Should overheating of the main rectifier occur, this thermostat would open causing the contactor to drop out thereby suspending all output. If this condition occurs, it will be necessary to allow a cooling down period before operation can be resumed.

SECTION 7 - TROUBLESHOOTING**CAUTION**

Hazardous voltages are present on the internal circuitry of the welding power source as long as power is connected to the unit. Disconnect power before attempting any inspection or work on the inside of the unit. Troubleshooting of internal circuitry should be performed by qualified personnel only.

remedies for some of the troubles that may develop in this welding power source.

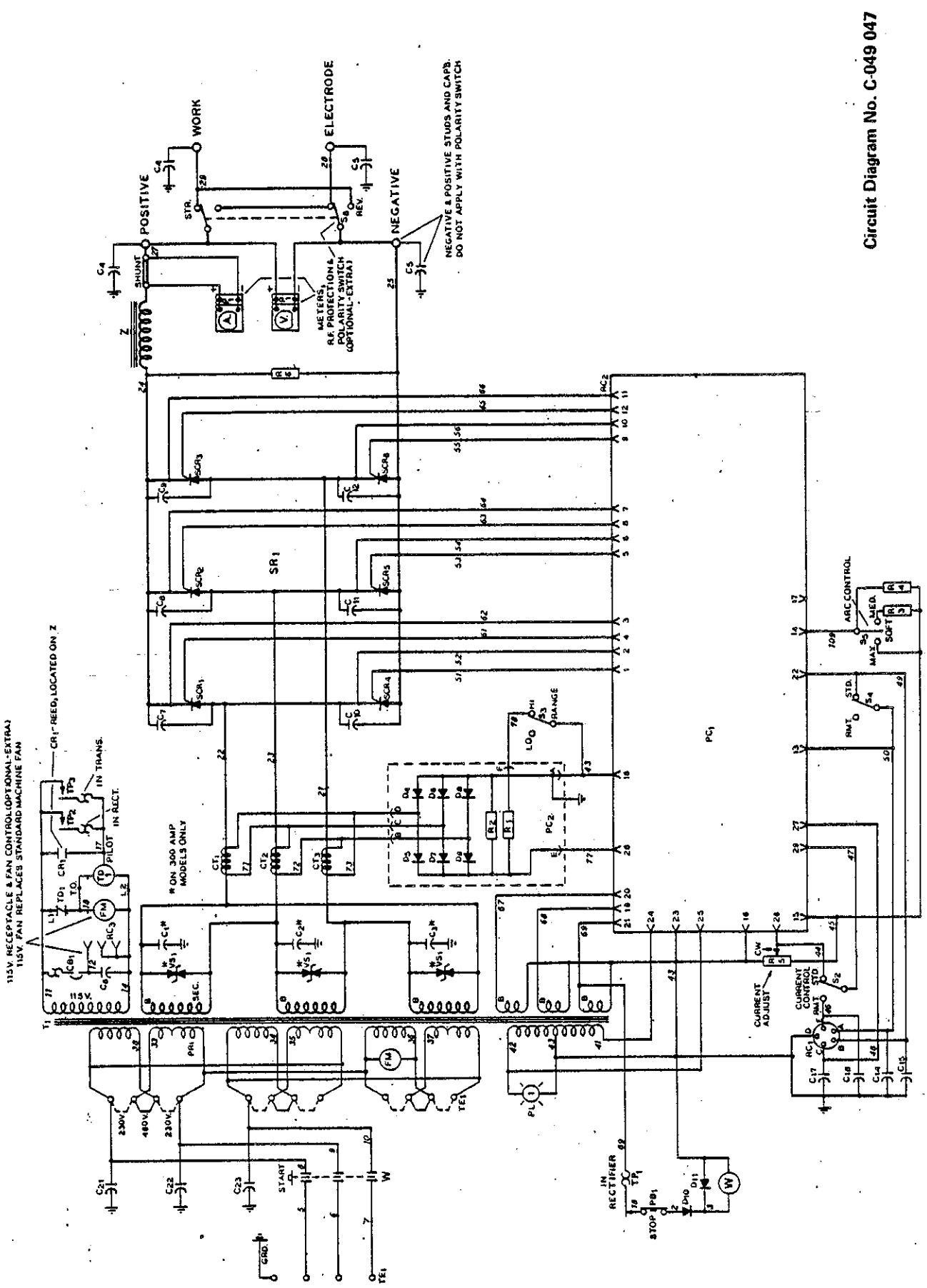
It is assumed that proper installation has been made, according to Section 3 of this manual, and that the welding power source has been functioning properly until this trouble developed.

Use this chart in conjunction with the circuit diagram while performing troubleshooting procedures. If the trouble is not remedied after performing these procedures, the nearest Factory Authorized Service Station should be contacted. In all cases of equipment malfunction, the manufacturer's recommendations should be strictly followed.

The following chart is designed to diagnose and provide

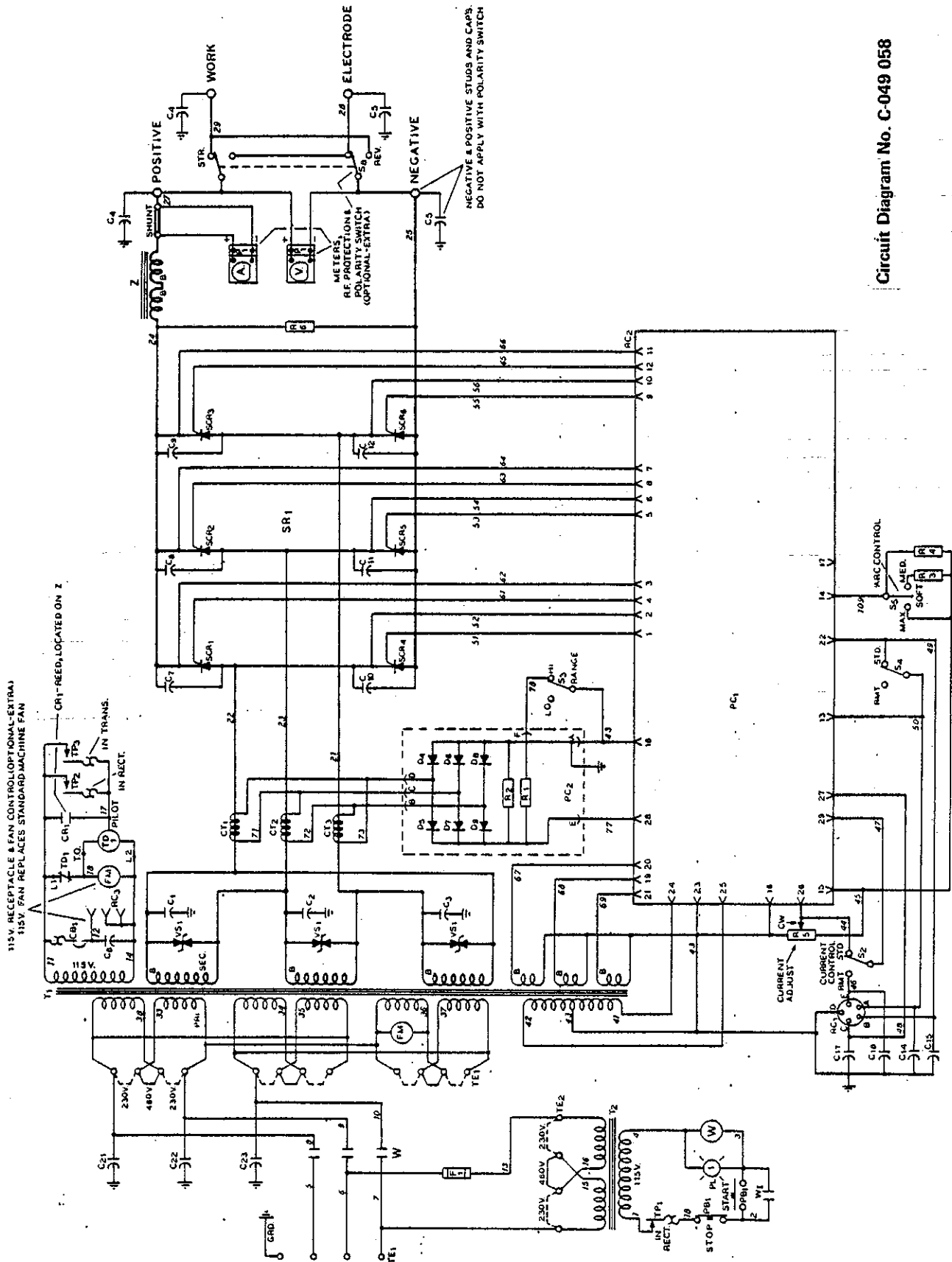
TROUBLE	PROBABLE CAUSE	REMEDY
Completely inoperative.	Open line fuse(s).	Replace open line fuse(s).
	Open control fuse F1.	*Replace open control fuse F1.
	Defective POWER switch.	Replace defective POWER switch.
	Poor and/or improper input connections.	Refer to Section 3-2 for proper input connections.
	Main rectifier SR1 overheating.	Allow the unit to cool down, and see Section 6-4.
Erratic weld output.	Poor and/or improper input and/or secondary connections.	Refer to Section 3-2 and 3-3 for proper input and secondary connections.
	Defective electrode.	Replace electrode.
Low weld output.	Open line fuse.	Replace open line fuse.
	Poor and/or improper input and/or secondary connections.	Refer to Section 3-2 and 3-3 for proper input and secondary connections.
	Low line voltage.	Correct low line voltage.
	Improper use of Remote Current Control in conjunction with CURRENT ADJUSTMENT control.	Refer to Section 4-4 for proper use of Remote Current Control.

*If it becomes necessary to replace any fuse in the welding power source, ensure that a fuse of the proper size is used. Applicable on 500 and 600 ampere models only.



Circuit Diagram No. C-049 047

Figure 7-1. Circuit Diagram For 300 And 400 Ampere Models



Circuit Diagram No. C-049 058

Figure 7-2. Circuit Diagram For 500 And 600 Ampere Models

June 1980

FORM: OM-221

Effective With Serial No. JA417031

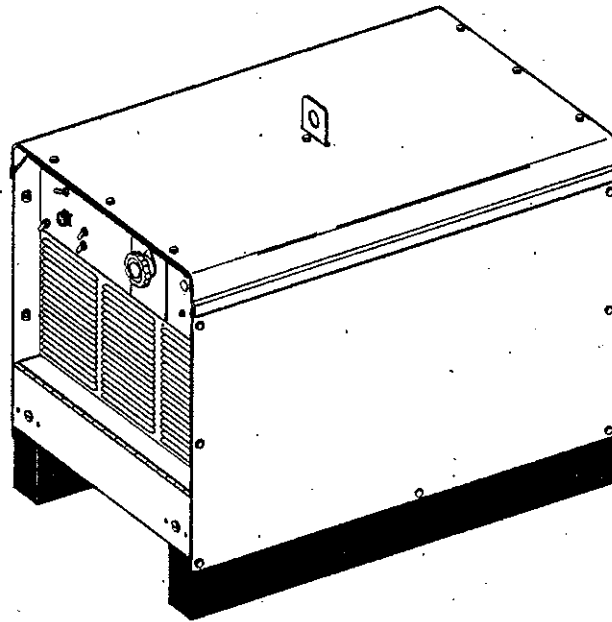
MODEL

Gold Star 300SS

Gold Star 400SS

Gold Star 500SS

Gold Star 600SS



PARTS LIST

Parts For Optional Equipment - See Page 12

Item No.	Dia. Mkgs.	Factory Part No.	Description	Quantity Model			
				300 AMP	400 AMP	500 AMP	600 AMP
Figure A Main Assembly							
1		006 016	PANEL, side	2	2	2	
1		005 195	PANEL, side				2
2		006 017	COVER, top	1	1	1	
2		005 194	COVER, top				1
3		026 627	GASKET, lifting eye - cover	1	1	1	1
4	Z	035 279	STABILIZER	1	1		
4	Z	003 007	STABILIZER			1	
4	Z	005 380	STABILIZER				1
		006 168	BUS BAR, jumper - stabilizer			1	
		006 697	BUS BAR, jumper - stabilizer				1
5		012 638	HOLDER, fuse - cartridge 30 amp 600 volts			1	1
6	F1	*604 259	FUSE, cartridge 3 amp 600 volts			1	1
7		Figure B	PANEL, rear - with components (See Page 3)	1	1	1	1
8	TE1	038 145	TERMINAL ASSEMBLY, primary (See Fig. C Page 3)	1	1		
8	TE1,2	035 398	TERMINAL ASSEMBLY, primary (See Fig. C Page 3)			1	1
9	C21-23	052 830	CAPACITOR ASSEMBLY (consisting of)	1	1	1	1
		032 924	. CAPACITOR, ceramic 0.005 uf 3000 volts dc.	3	3	3	3
10	W	081 015	CONTACTOR, 50 amp 3 pole 120 volts (See Fig. H Page 11) ..	1	1		
10	W	008 552	CONTACTOR, 60 amp 3 pole 600 volts w/interlock			1	
10	W	044 186	CONTACTOR, 3 pole 110-120/208-240 volts (See Fig. H Page 11)				1
		006 158	BRACKET, mounting - contactor.				1

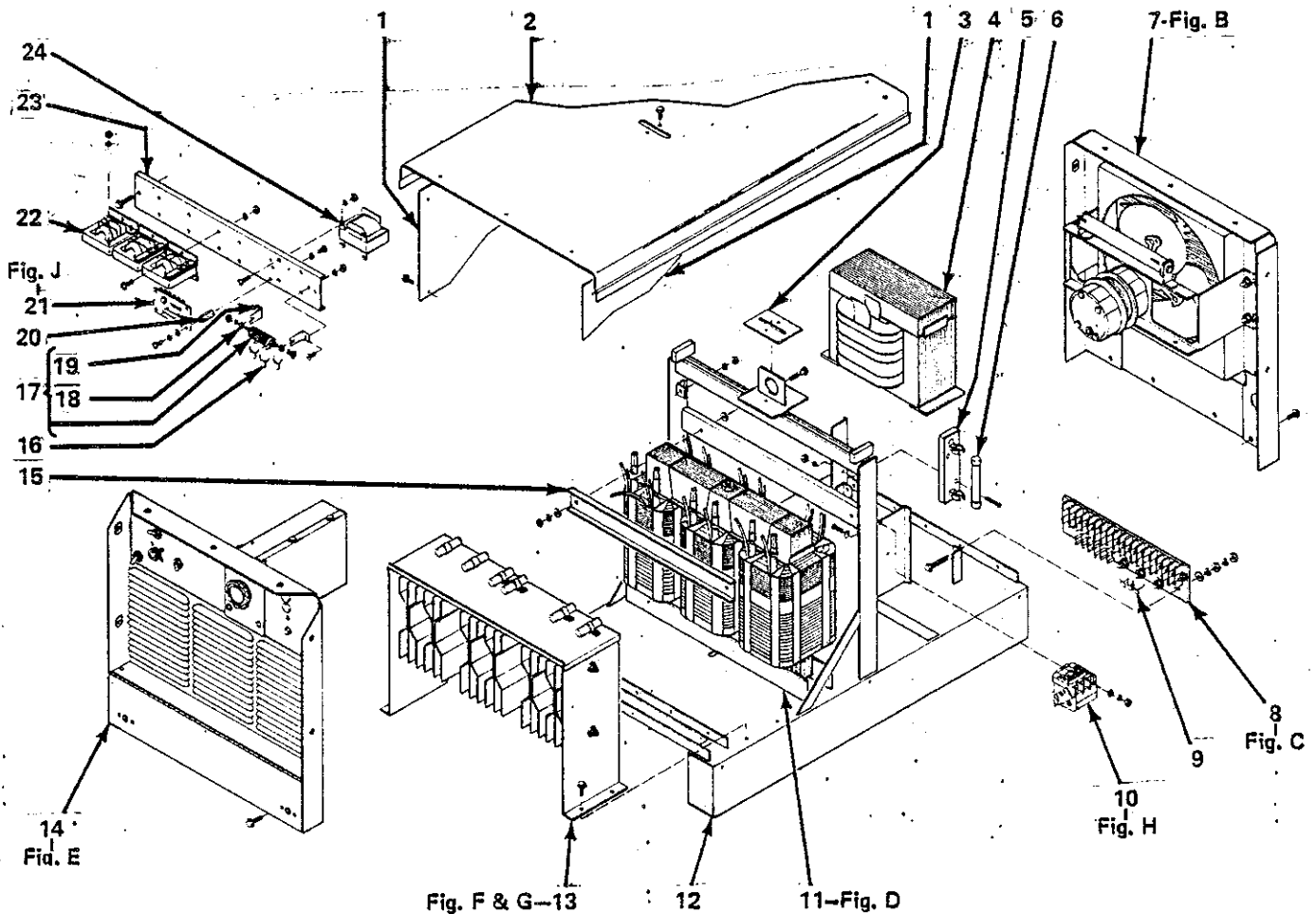


Figure A - Main Assembly

TD-004 991-D

Item No.	Dia. Mkgs.	Factory Part No.	Description	Quantity			
				300 AMP	400 AMP	500 AMP	600 AMP
Figure A Main Assembly (Cont'd.)							
11	T1	See Note	TRANSFORMER, power - main (See Fig. D Page 4)	1			
11	T1	See Note	TRANSFORMER, power - main (See Fig. D Page 4)		1		
11	T1	See Note	TRANSFORMER, power - main (See Fig. D Page 4)			1	
11	T1	See Note	TRANSFORMER, power - main (See Fig. D Page 4)				1
12		048 668	BUS BAR, connecting transformer	1	1		
		048 930	BUS BAR, connecting transformer			1	1
12		006 108	BASE	1	1	1	
12		046 681	BASE		1	1	
12		†009 810	BASE, w/fan control		1	1	
12		046 909	BASE				1
13	SR1	059 601	RECTIFIER, SCR main (See Fig. F Page 10) or	1			
13	SR1	†009 725	RECTIFIER, silicon diode (See Fig. F Page 10) (fan control)	1			
13	SR1	045 107	RECTIFIER, SCR main (See Fig. F Page 10) or		1		
13	SR1	†059 204	RECTIFIER, SCR main (See Fig. F Page 10) (fan control)		1		
13	SR1	045 237	RECTIFIER, SCR main (See Fig. F Page 10) or			1	
13	SR1	†009 210	RECTIFIER, SCR main (See Fig. F Page 10) (fan control)			1	
13	SR1	045 007	RECTIFIER ASSEMBLY, main (See Fig. G Page 10)				1
14		Figure E	PANEL, front - with components (See Page 6)	1	1	1	1
15		023 378	CHANNEL, core - clamping (top of T1)	1	1	1	
		006 156	CLAMP, core				1
16	C1-3	031 670	CAPACITOR, ceramic 0.05 uf 500 volts dc	3		3	3
17	VS1	000 263	THYRECTOR, 104 volts ac 3 amp w/brackets (consisting of)	2		2	2
18		601 242	INSULATOR, washer	2	2	2	2
19		102 363	BRACKET, mounting	2	2	2	2
20		073 756	STAND-OFF, No. 6-32 x 5/8 long	4	4	4	4
21	PC2	053 908	CIRCUIT CARD ASSEMBLY, feedback (See Fig. J Page 11)	1	1	1	1
22	CT1-3	009 830	TRANSFORMER, current 375/1	3			
22	CT1-3	035 454	TRANSFORMER, current 500/1		3		
22	CT1-3	003 008	TRANSFORMER, current 625/1			3	
22	CT1-3	005 379	TRANSFORMER, current 750/1				3
23		003 403	BAFFLE, air - center	1	1	1	1
24	T2	605 856	TRANSFORMER, control 230/460-115			1	1
	D10,11	027 369	DIODE, rectifier 3 amp 600 volts straight polarity	2	2		

Note: When ordering these items be sure to provide the primary voltage and serial number of the unit.

*Recommended Spare Parts.

†Parts For Optional Equipment.

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

Item No.	Dia. Mkgs.	Factory Part No.	Description	Quantity			
				Model			
				300 AMP	400 AMP	500 AMP	600 AMP
Figure B Panel, Rear - With Components (See Fig. A Page 1 Item 7)							
36	FM	032 603	MOTOR, fan 230 volts (consisting of)	1	1		
		024 601	BEARING	2	2		
		†032 641	MOTOR, fan 115 volts (units w/fan control)	1	1		
36	FM	032 605	MOTOR, SP 1/4 hp 230 volts - fan			1	1
37		016 258	CHAMBER, plenum	1	1		
37		003 030	CHAMBER, plenum			1	1
38	R6	039 210	RESISTOR, WW fixed 375 watt 12 ohm	1	1	1	1
39		032 604	BLADE, fan 60 Hz 14 inch 3 wing 19 degree	1	1		
39		605 799	BLADE, fan 60 Hz 14 inch 5 wing 30 degree			1	1
40		018 144	PANEL, rear	1	1	1	1

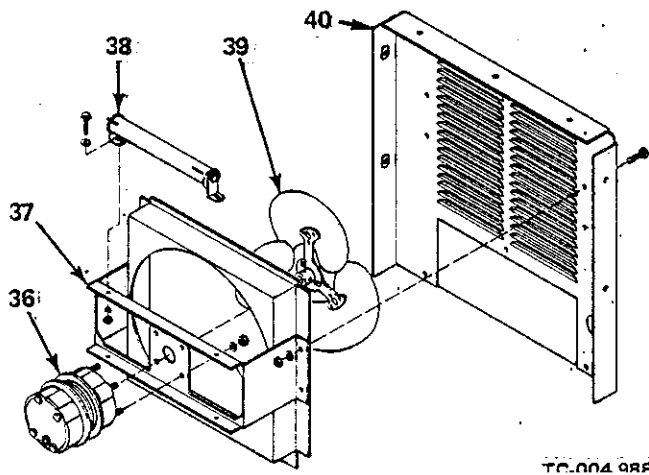


Figure B— Panel, Rear - With Components

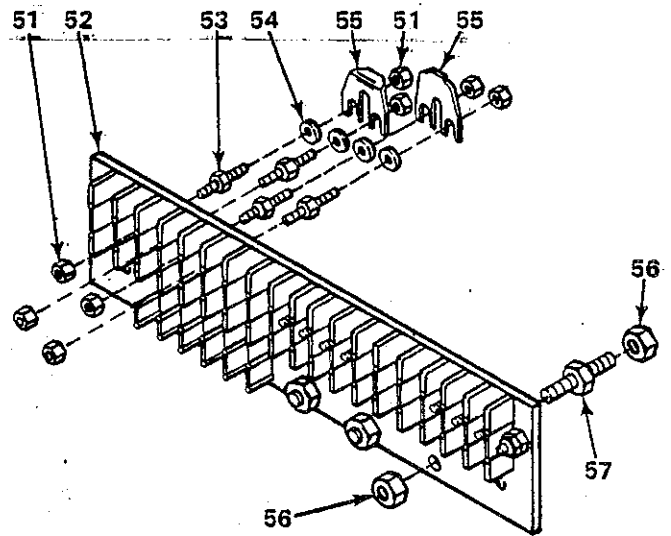


Figure C — Terminal Assembly, Primary

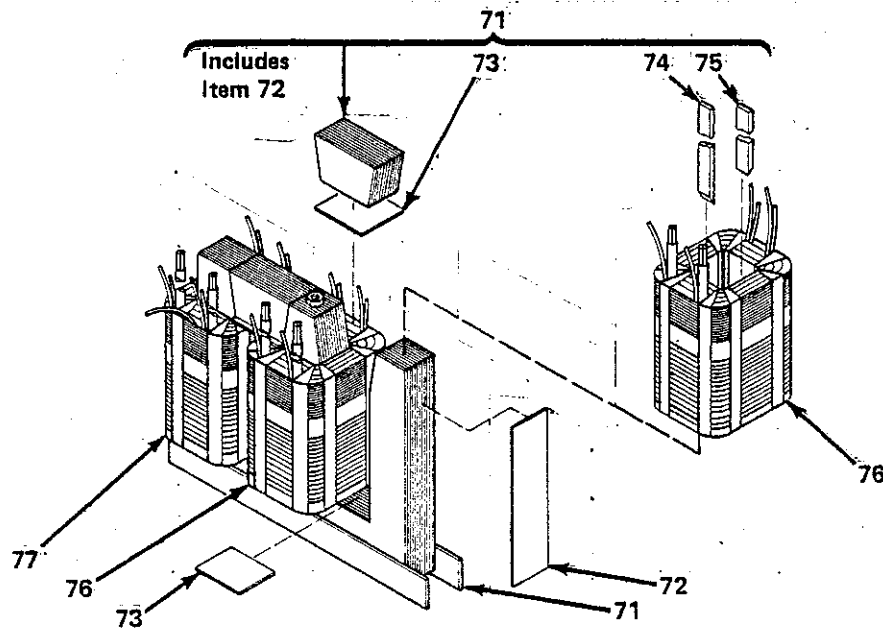
Item No.	Factory Part No.	Description	Quantity	
			300 & 400 AMP	500 & 600 AMP
Figure C Terminal Assembly, Primary (See Fig. A Page 1 Item 8)			038 145	035 398
51	601 835	NUT, brass - hex 10-32	24	32
52	038 058	TERMINAL BOARD	1	1
53	038 887	STUD, brass 10-32 x 1-3/8 with hex collar	12	16
54	010 913	WASHER, flat - brass 3/16 ID x 1/2 OD	12	16
55	038 618	LINK, jumper	6	8
56	601 836	NUT, brass - hex jam 1/4-20	6	6
57	038 888	STUD, brass 1/4-20 x 1-1/2 with hex collar	3	3

†Parts For Optional Equipment.

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

Quantity
Model

Item No.	Factory Part No.	Description	Quantity			
			300 AMP	400 AMP	500 AMP	600 AMP
Figure D Transformer, Power - Main (See Fig. A Page 2 Item 11)						
71	**009 826	TRANSFORMER SUBASSEMBLY (consisting of)	1			
71	**035 349	TRANSFORMER SUBASSEMBLY (consisting of)		1		
71	**002 995	TRANSFORMER SUBASSEMBLY (consisting of)			1	
71	**005 317	TRANSFORMER SUBASSEMBLY (consisting of)				1
72	052 866	. STRIP, glastic 1/16 x 2-1/2	2			
72	039 381	. STRIP, glastic 1/16 x3 x 11		2		
72	002 998	. STRIP, glastic 1/16 x 2-13/16 x 11			2	
72	005 316	. STRIP, glastic 1/16 x 3-13/16 x 11				2
73	009 813	. STRIP, glastic 1/8 x 2-5/8 x 3-11/16	4			
73	039 380	. STRIP, glastic 1/8 x 2-7/8 x 3-11/16		4		
73	002 997	. STRIP, glastic 1/8 x 3-1/4 x 3-11/16			4	
73	005 322	. STRIP, glastic 1/16 x 3-11/16 x 4				4
74	035 026	. WEDGE, phenolic - single bevel 1/2 x 1 x 9-1/2	3			
74	024 002	. WEDGE, phenolic - single bevel 5/16 x 1 x 9-1/2		3	3	
74	035 026	. WEDGE, phenolic - single bevel 1/2 x 1 x 9-1/2				3
75	024 002	. WEDGE, phenolic - single bevel 5/16 x 1 x 9-1/2	3			
75	024 001	. WEDGE, phenolic - single bevel 3/8 x 1 x 9-1/2		3	3	
75	035 026	. WEDGE, phenolic - single bevel 3/8 x 1 x 9-1/2				3
76	+**009 300	COIL, pri/sec - right hand & center	2			
76	†**049 121	COIL, pri/sec W/115 volts winding	1			
76	+**035 382	COIL, pri/sec - right hand & center		2		
76	†**006 029	COIL, pri/sec W/115 volts winding		1		
76	+**000 977	COIL, pri/sec - right hand & center			2	
76	†**004 873	COIL, pri/sec W/115 volts winding			1	
76	+**005 365	COIL, pri/sec - right hand & center				2
76	†**049 123	COIL, pri/sec W/115 volts winding				1
77	**009 299	COIL, pri/sec - left hand	1			
77	**035 381	COIL, pri/sec - left hand		1		
77	**000 976	COIL, pri/sec - left hand			1	
77	**005 364	COIL, pri/sec - left hand				



TS-004 989

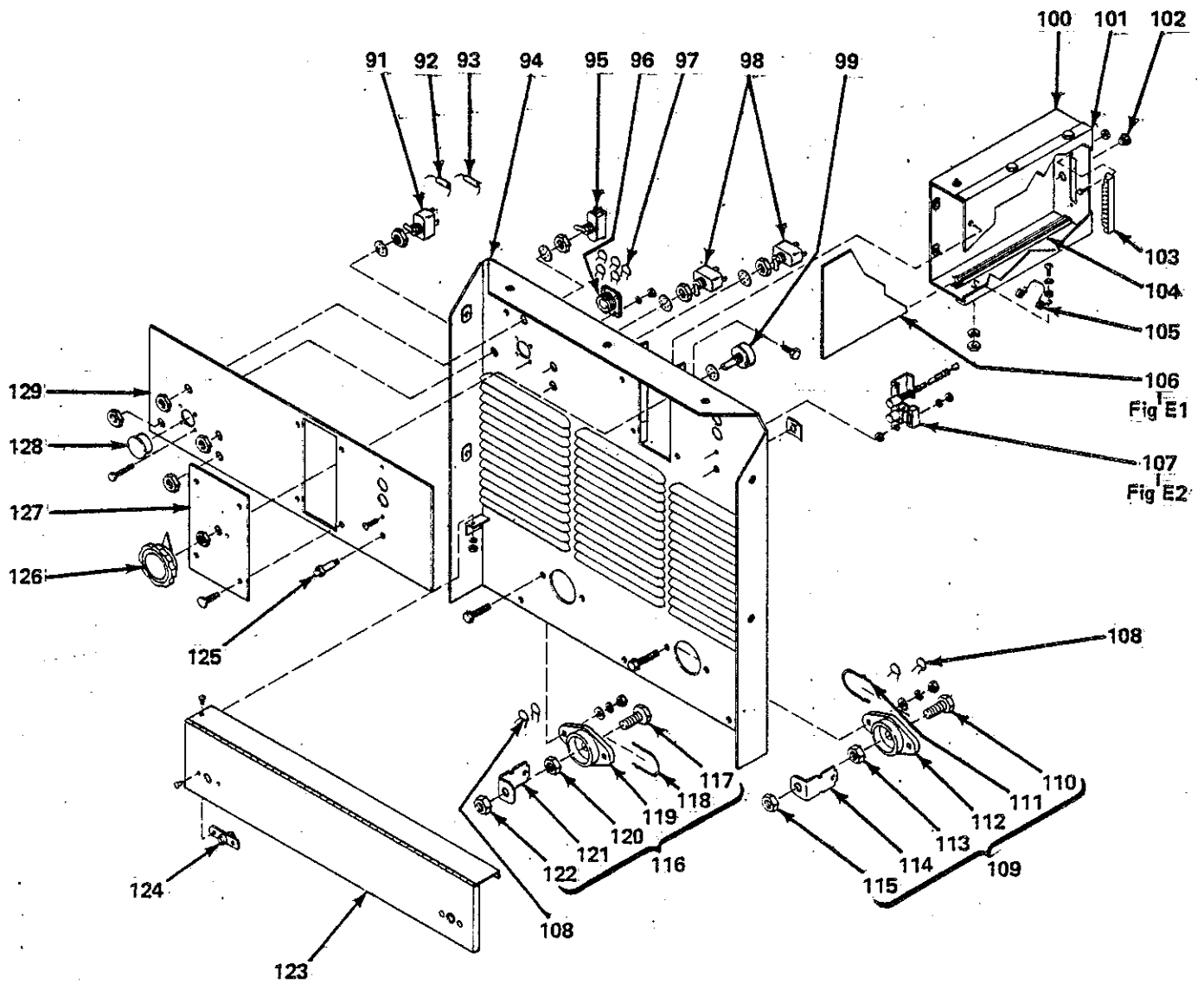
Figure D — Transformer, Power - Main

**Replace at Factory or Factory Authorized Service Station.

†Parts For Optional Equipment.

+Quantity of this item changes to 1 for units with optional fan control and/or duplex receptacle as the right hand coil has 115 volts tertiary winding.

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



TC-004 987-D

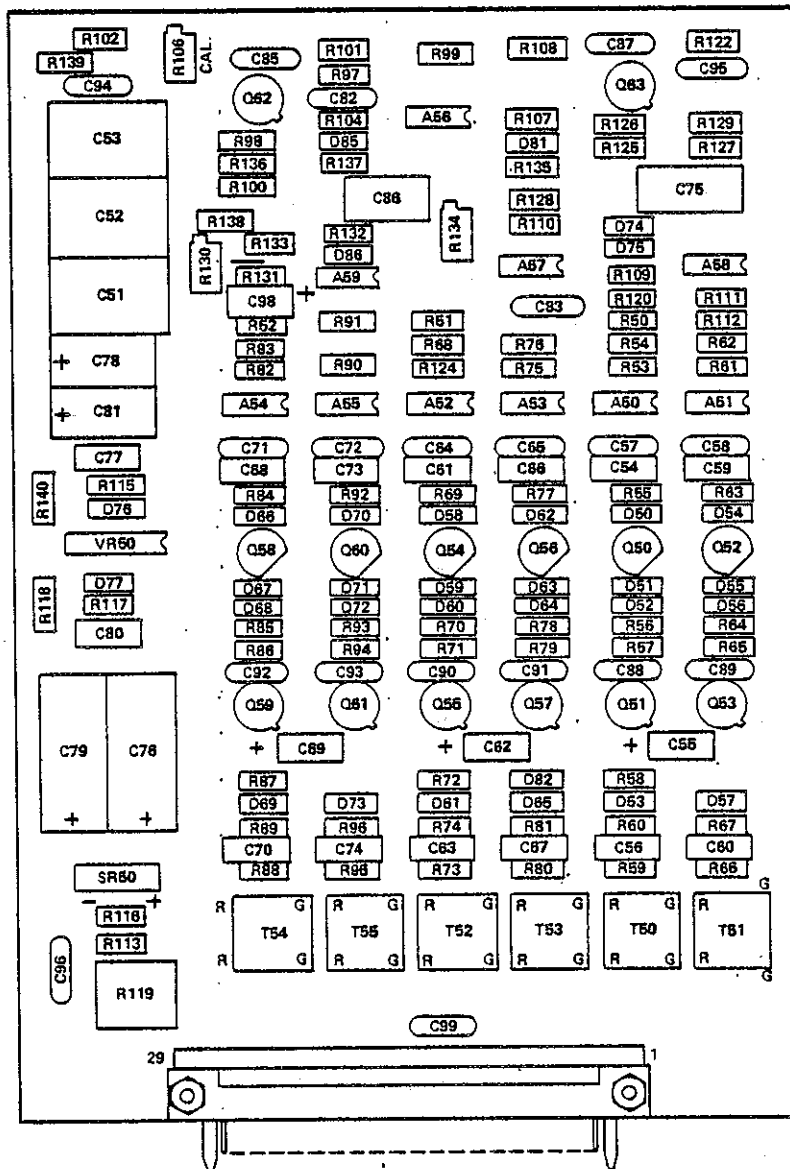
Figure E - Panel, Front - With Components

Item No.	Dia. Mkgs.	Factory Part No.	Description	Quantity Model			
				300 AMP	400 AMP	500 AMP	600 AMP
Figure E Panel, Front - With Components (See Fig. A Page 2 Item 14)							
91	S5	011 610	SWITCH, toggle SPDT 10 amp 125 volts center off	1	1	1	1
92	R3	052 140	RESISTOR, carbon 0.5 watt 330 ohm	1	1	1	1
93	R4	030 853	RESISTOR, carbon 0.5 watt 2200 ohm	1	1	1	1
94		059 880	PANEL, front	1	1		
94		035 355	PANEL, front			1	1
95	S3	053 359	SWITCH, toggle SPST 20 amp 125 volts ac.	1	1	1	
95	S3	011 620	SWITCH, toggle SPST 16 amp 125 volts				1
96	RC1	035 523	RECEPTACLE, amphenol 3102A-16S-8S	1	1	1	1
97	C14-18	031 670	CAPACITOR, ceramic 0.05 uf 500 volts	5	5	5	5
98	S2,4	011 609	SWITCH, toggle SPDT 10 amp 125 volts	2	2	2	2
99	R5	035 897	POTENTIOMETER, carbon 1 turn 2 watt 1000 ohm	1	1	1	1
100		035 283	CONTROL BOX, firing circuit	1	1	1	1
101		035 282	COVER, top - control box	1	1	1	1
102		057 084	BUSHING, snap 1/4 ID 3/8 mounting hole	1	1	1	1
103	RC2	035 815	CONNECTOR, edge (PC1)	1	1	1	1
104		035 506	GUIDE, circuit card 9 inch	2	2	2	2
105		039 349	SPRING, retainer - circuit card	1	1	1	1
106	PC1	047 378	CIRCUIT CARD ASSEMBLY, root pass (See Fig. E1 Page 7)	1			
106	PC1	047 377	CIRCUIT CARD ASSEMBLY, root pass (See Fig. E1 Page 7)		1		
106	PC1	047 376	CIRCUIT CARD ASSEMBLY, root pass (See Fig. E1 Page 7)			1	
106	PC1	047 375	CIRCUIT CARD ASSEMBLY, root pass (See Fig. E1 Page 7)				1
107	PB1	046 746	SWITCH, push button (See Fig. E2 Page 9)	1	1		
107	PB1	011 636	SWITCH, push button 60 amp 100 volts			1	1
108	C4,5	009 063	CAPACITOR, ceramic 0.05 uf 500 volts	2	2	2	2
109	Neg	039 046	TERMINAL, power output - black (consisting of)	1	1	1	1
110		601 976	SCREW, cap - steel hex hd 1/2-13 x 1-1/2	1	1	1	1
111		053 032	CLIP, spring - bus bar	1	1	1	1
112		039 045	TERMINAL BOARD, black	1	1	1	1
113		601 880	NUT, steel - hex jam 1/2-13	1	1	1	1
114		039 044	BUS BAR	1	1	1	1
115		601 879	NUT, steel - hex full 1/2-13	1	1	1	1
116	Pos.	039 047	TERMINAL, power output - red (consisting of)	1	1	1	1
117		601 976	SCREW, cap - steel hex hd 1/2-13 x 1-1/2	1	1	1	1
118		053 032	CLIP, spring - bus bar	1	1	1	1
119		039 049	TERMINAL BOARD, red	1	1	1	1
120		601 880	NUT, steel - hex jam 1/2-13	1	1	1	1
121		039 044	BUS BAR	1	1	1	1
122		601 879	NUT, steel - hex full 1/2-13	1	1	1	1
123		027 408	DOOR, access - front	1	1	1	1
124		605 583	CATCH, spring loaded - access door	2	2	2	2
125	PL1	027 632	BULB, incandescent - slide base 24 volts	1	1		
125	PL1	027 645	LIGHT, indicator - red lens 125 volts ac.			1	1
		027 628	LENS, light - indicator red	1	1		
		027 631	HOUSING, light - indicator	1	1		
126		019 627	KNOB, pointer (R5)	1	1	1	1
127		009 571	PLATE, indicator - amperage (300 amp model)	1			
127		035 286	PLATE, indicator - amperage (400 amp model)		1		
127		003 027	PLATE, indicator - amperage (500 amp model)			1	
127		005 397	PLATE, indicator - amperage (600 amp model)				1
128		039 684	CAP, dust - connector	1	1	1	1
129			NAMEPLATE (order by model and serial numbers)	1	1	1	1

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

This breakdown of parts is for all part numbers listed as Item 106.

Dia. Mkgs.	Factory Part No.	Description	Quantity
Figure E1 Circuit Card Assembly, Root Pass (See Fig. E Page 6 Item 106)			
A50,59	035 845	AMPLIFIER, operational	10
C51-53	035 834	CAPACITOR, metalized film 1.5 uf 100 volts	3
C54,56,59-61,63,66-68,70,73,74	035 833	CAPACITOR, mylar 0.033 uf 100 volts dc	12
C55,62,69	035 835	CAPACITOR, electrolyte 4.7 uf 35 volts	3
C57,58,64,65,71,72,82,87			
94	053 991	CAPACITOR, ceramic 0.05 uf 500 volts	9
C75	038 585	CAPACITOR, mylar 0.22 uf 50 volts	1
C76,79	000 859	CAPACITOR, electrolyte 220 uf 35 volts dc	2
C77,80	035 832	CAPACITOR, mylar 0.0015 uf 100 volts	2
C78,81	031 630	CAPACITOR, electrolyte 20 uf 50 volts dc	2
C83,88-93,85,95,96,99	059 122	CAPACITOR, ceramic 0.01 uf 500 volts	11

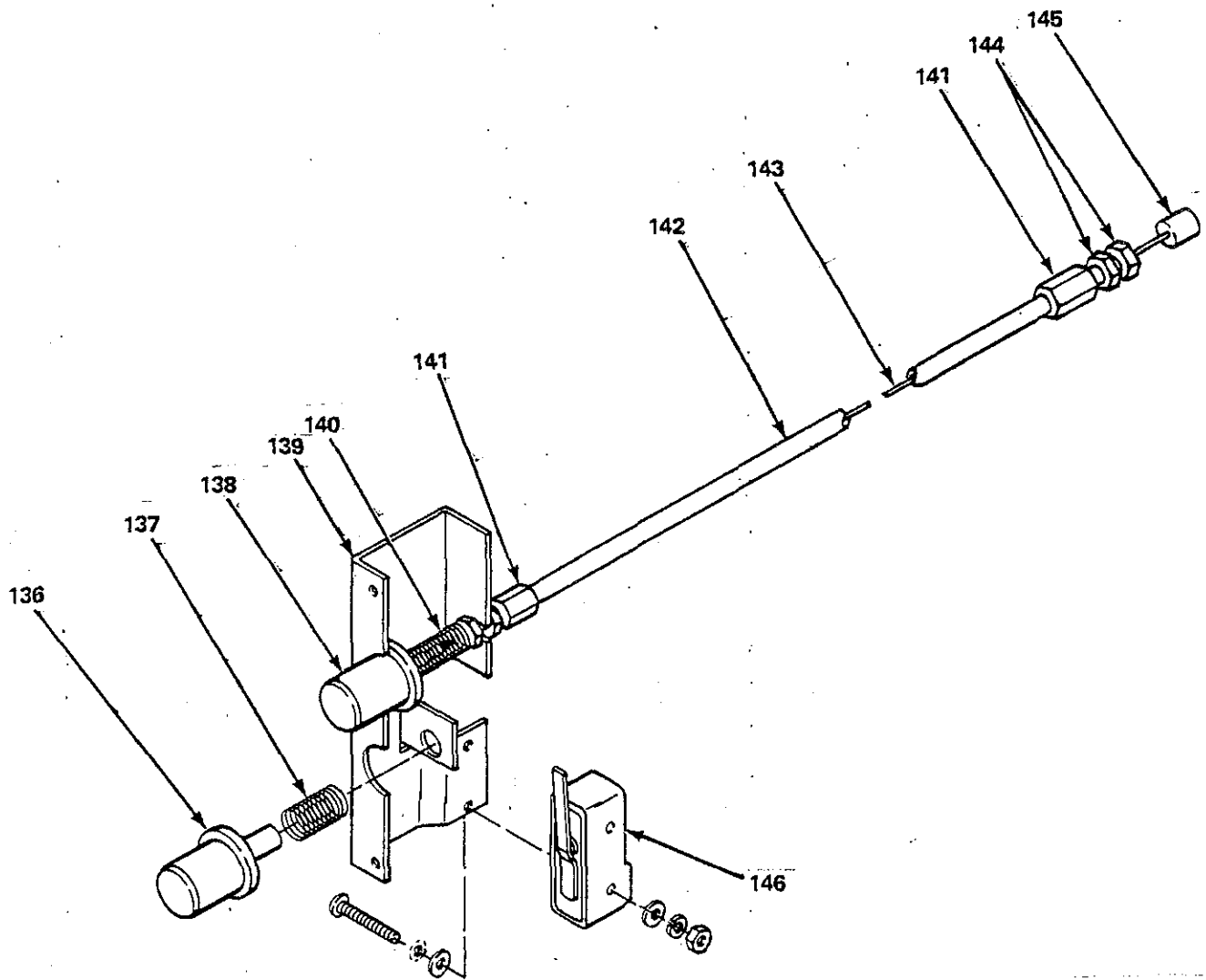


COMPONENTS TO BE REPLACED BY QUALIFIED PERSONNEL ONLY

TS-080 644

Figure E1 - Circuit Card Assembly, Root Pass

Item No.	Factory Part No.	Description	Quantity
			Model 300 & 400 AMP
Figure E2	046 746	Switch, Push Button (See Fig. E Page 6 Item 107)	
136	059 885	BUTTON, push - reset red	1
137	018 606	SPRING, compression	1
138	046 741	BUTTON, push - reset black	1
139	081 008	BRACKET, mounting - switch push button	1
140	080 362	SPRING, compression	1
141	081 006	FITTING, pipe - brass adapter BHD 5/16-18 x No. 12-2	2
142	048 112	CONDUIT, 0.2 OD x 30-1/2	1
143	048 115	WIRE, stainless steel 0.054 dia x 33-3/4	1
144	604 537	NUT, steel - hex full 5/16-18	4
145	046 744	STOP, cable - push button	1
146	027 878	SWITCH, limit - leaf actuating	1



TA-080 214-A

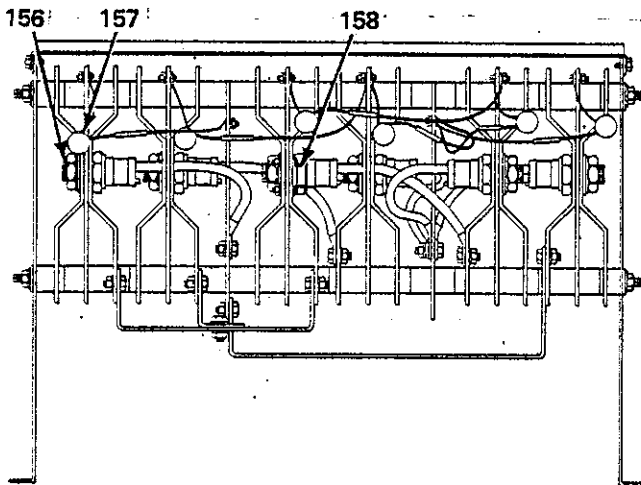
Figure E2 - Switch, Push Button

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

Dia. Mkgs.	Factory Part No.	Description	Quantity
Figure E1		Circuit Card Assembly, Root Pass (See Fig. E Page 6 Item 106)(Cont'd)	
C98	007 742	CAPACITOR, electrolyte 10 uf 35 volts	1
D50-52,54-56, 58-60,62-64, 66-68,70-72, 74,75,81,86	028 351	DIODE, signal 0.020 amp 75 volts straight polarity	22
D53,57,61,65 69,73,76,77, 82,85	026 202	DIODE, rectifier 1 amp 400 volts straight polarity	10
Q50,52,54, 56,58,60	037 277	TRANSISTOR, 200MA 30 volts NPN	6
Q51,53,55,57, 59,61,62	035 842	TRANSISTOR, 6 amp 40 volts PNP	7
Q63	000 088	TRANSISTOR, 800MA 40 volts NPN	1
R50,51,52, 111,112	000 885	RESISTOR, carbon film 0.25 watt 10K ohm	5
R53,54,61,62, 68,75,76,82 83,90,91, 109,124,135	035 884	RESISTOR, carbon film 0.25 watt 100K ohm	14
R55,63,69,77, 84,92,108 126	035 826	RESISTOR, carbon film 0.25 watt 6800 ohm	8
R56,64,70,78, 85,93,100, 129	035 827	RESISTOR, carbon film 0.25 watt 10K ohm	8
R57,65,71,79, 86,94,99	035 825	RESISTOR, carbon film 0.25 watt 1K ohm	7
R58,72,87	035 823	RESISTOR, carbon film 0.25 watt 100 ohm	3
R59,66,73, 80,88,95, R60,67,74, 81,89,96	035 824	RESISTOR, carbon film 0.25 watt 270 ohm	6
R97,101,133	605 919	RESISTOR, carbon 0.25 watt 47 ohm.	6
R98,125,137	035 885	RESISTOR, carbon film 0.25 watt 68K ohm	3
R102	035 887	RESISTOR, carbon film 0.25 watt 3300 ohm.	3
R104	030 024	RESISTOR, carbon 0.5 watt 1000 ohm	1
R106,134	035 829	RESISTOR, carbon film 0.25 watt 1500 ohm	1
R107	035 848	POTENTIOMETER, cermet trimmer 25/T 0.5 watt 10K ohm	2
R110	035 888	RESISTOR, carbon film 0.25 watt 2200 ohm	1
R113,116	039 108	RESISTOR, carbon film 0.25 watt 82K ohm	1
R115,117	030 089	RESISTOR, carbon 0.5 watt 2.7 ohm	2
R118,140	035 822	RESISTOR, carbon film 0.25 watt 10 ohm	2
R119	035 820	RESISTOR, carbon film 0.50 watt 470 ohm	2
R120	030 045	RESISTOR, WW fixed 3.25 watt 100 ohm	1
R122	039 106	RESISTOR, carbon film 0.25 watt 470 ohm	1
R127	076 712	RESISTOR, carbon 0.25 watt 220K ohm.	1
R130	039 329	RESISTOR, carbon film 0.25 watt 2700 ohm.	1
R131,136,139	039 359	POTENTIOMETER, cermet trimmer 25/T 0.5 watt 5000 ohm.	1
R132	039 331	RESISTOR, carbon film 0.25 watt 4700 ohm.	3
R138	039 335	RESISTOR, carbon film 0.25 watt 47K ohm	1
SR50	035 886	RESISTOR, carbon film 0.25 watt 22K ohm	1
T50-55	035 841	RECTIFIER, integrated 1.5 amp 200 volts	1
VR50	035 846	TRANSFORMER, pulse 2 to 1	6
	035 843	REGULATOR, voltage - dual 15 volts 14 pin dip	1
	035 849	CONNECTOR, edge 29 pin	1

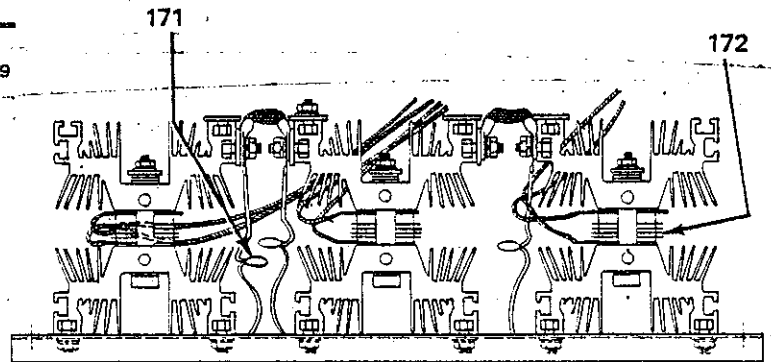
BE SURE TO PROVIDE MODEL AND SERIAL NUMBERS WHEN ORDERING REPLACEMENT PARTS.

Item No.	Dia. Mkgs.	Factory Part No.	Description	Quantity Model			
				300 AMP	400 AMP	500 AMP	
Figure F			Rectifier, Main (See Fig. A Page 2 Item 13)				
				059 601	T009 725	T045 107	T059 204
156	SCR1-6	034 976	THYRISTOR, 175 amp 300 volts	6	6	6	6
156	SCR1-6	046 995	THYRISTOR, 300 amp 300 volts			6	6
156	SCR1-6	004 216	THYRISTOR, 250 amp 300 volts				6
157	C7-12	053 372	CAPACITOR, ceramic 0.01 uf 500 volts dc	6	6	6	6
157	C7-12	048 420	CAPACITOR, ceramic 0.01 uf 500 volts dc			6	6
		048 710	CLAMP, thyristor			3	3
158	TP1	032 810	THERMOSTAT, normally closed	1	1	1	1
158	TP1	012 786	THERMOSTAT, normally closed			1	1
158	TP2	011 308	THERMOSTAT, normally open	1	1		1



TB-049 529

Figure F – Rectifier, Main 300, 400 & 500 Amp Models



TB-005 430-A

Figure G – Rectifier, Main 600 Amp Model

Item No.	Dia. Mkgs.	Factory Part No.	Description	Quantity
Figure G		045 007	Rectifier, Main (See Fig. A Page 2 Item 13)	
171	C7-12	048 420	CAPACITOR, ceramic 0.01 uf 500 volts dc	6
172	SCR1-6	030 287	THYRISTOR, SCR 860 amp 300 volts	6
	TP1	012 786	THERMOSTAT, normally closed	1
		049 416	CLAMP, thyristor	3

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

Item No.	Factory Part No.	Description	Quantity		
			300 & 400 AMP	500 AMP	600 AMP
Figure H		Contactor (See Fig. A Page 1 Item 10)	081 015	032 786	044 186
181	028 982	COIL, contactor 120 volts.	1		
181	035 837	COIL, contactor 115 volts.		1	
181	034 910	COIL, contactor 115/230 volts ac.			1
182	*003 567	KIT, point - contactor	1		
182	*035 836	KIT, point - contactor		3	
182	*044 187	KIT, point - contactor			3
	081 016	BRACKET, mounting - cable contactor.	1		

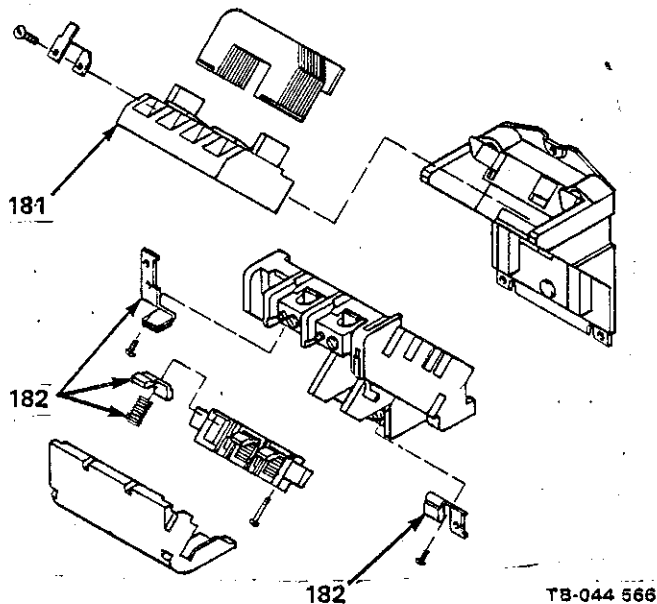
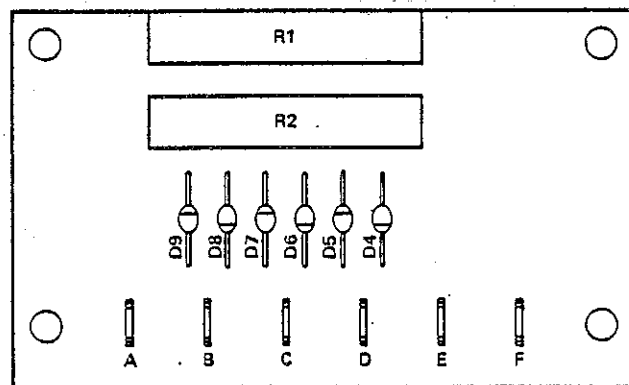


Figure H -- Contactor

COMPONENTS TO BE REPLACED BY QUALIFIED PERSONNEL ONLY



TA-059 161

Figure J -- Circuit Card Assembly, Feedback

Dia. Mkgs.	Factory Part No.	Description	Quantity
Figure J	053-908	Circuit Card Assembly, Feedback (See Fig. A Page 2 Item 21)	
D4-9	026 202	DIODE, rectifier 1 amp 400 volts straight polarity	6
R1,2	007 264	RESISTOR, WW fixed 12 watt 6.6 ohm	2

*Recommended Spare Parts.

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

Parts For Optional Equipment

Dia. Mkgs.	Factory Part No.	Description	Quantity			
			300 AMP	400 AMP	500 AMP	600 AMP
A	025 608	METER, amp dc 0-500 scale	1			
A	025 611	METER, amp dc 0-600 scale		1		
A	025 610	METER, amp dc 0-800 scale			1	1
C6	031 718	CAPACITOR, metalized paper 0.1 x 2 uf, 115 volts	1	1	1	1
CB1	020 278	SWITCH, circuit breaker 15 amp	1	1		
CB1	030 280	CIRCUIT BREAKER, manual reset 10 amp 115 volts ac			1	1
CR1	034 813	SWITCH, reed	1	1		
CR1	034 842	RELAY, reed			1	1
CR2	034 781	RELAY, 2 pole 12 amp			1	1
RC3	604 176	RECEPTACLE, straight - duplex grounded 2P3W	1	1	1	1
S5	011 974	SWITCH, polarity (consisting of)	1	1		
S5	020 292	SWITCH, polarity (consisting of)			1	
S5	053 049	SWITCH, polarity (consisting of)				1
	016 243	BRACKET, mounting - switch	2	2		
	015 900	BRACKET, mounting - switch			1	
	015 899	BRACKET, mounting - switch			1	
	053 044	BRACKET, mounting - switch				2
	103 634	MOUNTING BOARD	1	1		
	038 111	MOUNTING BOARD			1	1
	103 633	BUS BAR, shorting - switch	2	2	2	4
	023 119	BUS BAR, switch				1
	023 120	BUS BAR, switch				1
	011 948	GUIDE, contact - movable switch	2	2	2	2
	021 193	GUIDE, contact			2	2
	038 769	CONTACT BOARD ASSEMBLY, switch	1	1	2	2
	024 694	BEARING, polarity	1	1	1	1
	010 805	HANDLE, switch	1	1	1	1
	019 603	KNOB, ball	1	1	1	1
	020 484	TUBING, steel 5/8 OD x 12 ga wall x 1/4			1	1
	010 086	SPACER, polarity switch			2	2
	011 080	SPACER, contact - switch 1/8 inch				4
	021 932	STRIP, insulation - switch polarity	1	1	1	1
TD1	034 843	TIMER, 5 minute 120 volts 50 cycle	1	1	1	1
	019 515	COVER, dust - timer	1	1	1	1
	020 113	BRACKET, mounting - cover dust	1	1	1	1
TP3	012 622	THERMOSTAT, normally open (located in T1)	1	1	1	1
V	025 604	METER, volts dc 0-100 scale	1	1	1	1
	010 493	BUSHING, snap in 5/8 ID x 7/8 hole	1	1	1	1
	010 859	CLAMP, hose 9/16-1-1/16 clamp dia	1	1	1	1
	103 966	PANEL, front - meter box	1	1	1	1
	103 967	PANEL, rear - meter box	1	1	1	1
	103 965	WRAPPER, meter box	1	1	1	1
	059 090	BAFFLE, air (units w/fan control)	1	1		
	009 845	COVER, dust (units w/fan control)	1	1		

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

