

2 - INTRODUCTION

2.1 SCOPE

This manual provides installation, operation, maintenance information and spare parts list for the 160 Ampere MIG-STICK WELDING SYSTEM.

2.2 USE

The SYSTEM is a completely self-contained unit which can be used for dip-transfer welding of mild steels up to 3/16 inch in thickness as well as stick electrode and TIG welding of various types of materials. DC reverse polarity dip-transfer welding, stick welding with AC and DC, and TIG welding with DC straight polarity and AC are selected by means of the Process Selector Switch. An optional Spot Weld Control Panel permits timed gas-metal arc spot welds.

2.3 DESCRIPTION

The SYSTEM specifications are listed in Table 2 - 1.

TABLE 2 - 1

SPECIFICATIONS

INPUT VOLTAGE	208/230 Single Phase, 60 Hz
RATED INPUT AMPERES STICK ELECTRODE	66/60
RATED INPUT AMPERES DIP TRANSFER	33/30
RATED OUTPUT	
DC DIP TRANSFER	160 Amp @ 22 Volts, 60% Duty Cycle
DC STICK ELECTRODE	160 Amp @ 28 Volts, 35% Duty Cycle
AC STICK ELECTRODE	160 Amp @ 28 Volts, 35% Duty Cycle
DC SP TIG	160 Amp @ 28 Volts, 35% Duty Cycle
AC TIG	160 Amp @ 28 Volts, 20% Duty Cycle
CURRENT RANGE	
DC STICK ELECTRODE & TIG	25-160 Amperes
AC STICK ELECTRODE & TIG	35-200 Amperes

MAXIMUM OPEN CIRCUIT VOLTAGE

DC or AC STICK ELECTRODE & TIG	80
DC DIP-TRANSFER	38
DIMENSIONS:	HEIGHT 30
	WIDTH 15
	DEPTH 29
NET WEIGHT	200 lbs.
SHIPPING WEIGHT	225 lb s.

The SYSTEM consists of a combination Wire Feeder Power Supply housed in one enclosure, and an Air-Cooled Gun. The Gun connects to the Wire Feeder through an opening in the front panel. The Wire Feeder section, consisting of motor, drive rolls, wire guides and spool hub, is accessible through the hinged right top side panel.

The operating controls mounted on the front panel are the Power ON-OFF Switch, Process Selector Switch, Output Hand Crank and Indicator and Dip-Transfer Wire Feed Speed Control. For dip-transfer welding, a control switch lever is provided on the Gun handle.

The work cable with Ground Clamp is permanently connected internally through the front panel and a receptacle is provided on the front panel for the stick electrode cable and TIG holder.

A primary power input cord with a 50 ampere plug conforming to NEMA 6-50 P configuration is provided at the rear of the machine.

An optional Spot Weld Control panel is available for field installation to facilitate a timed Gas-Metal Arc Spot Welding function.

3 - INSTALLATION

3.1 UNPACKING

This Equipment has been packed to prevent damage in transit. Unpack it carefully to prevent accidental damage by tools. After unpacking, examine the equipment for signs of damage, particularly to the front panel controls, and electrical components. Immediately report, in writing, any damage to the Distributor and the freight carrier. All claims for damage should be made to the Freight Carrier.

3.2 LOCATION

Locate the Equipment within 10 feet of the welding operation when used for dip-transfer welding. Keep away from grinding or other operations which produce chips or filings that will be drawn into the Equipment by the cooling fan. Allow at least 18 inches between the back of the Equipment and a wall, or other obstructions. Keep the Shield Gas Cylinder away from heat sources.

A good installation is essential if the Equipment is to provide satisfactory and dependable service.

Preventive maintenance consists of removing the covers from the Equipment and blowing out dust and dirt accumulation. Therefore it is desirable to locate the equipment so that the covers can be removed without difficulty.

3.3 PRIMARY ELECTRICAL INPUT CONNECTIONS

The standard voltage Equipment is designed to operate on 208 or 230 volts, single phase, 60 Hz. power. Special units designed for operation on other primary voltages are available from the factory.

The standard units leave the factory connected for 230 volt operation. To reconnect for 208 volts, see Figure 3-1.

CAUTION

PRIOR TO CHANGING PRIMARY VOLTAGE CONNECTIONS, MAKE SURE THE EQUIPMENT IS COMPLETELY DISCONNECTED FROM THE INCOMING POWER. REMOVE THE PRIMARY INPUT PLUG FROM THE RECEPTACLE.

Remove the left hand side panel from the Equipment. Carefully disconnect the transformer lead tagged 230 from the top outside terminal of the Power Switch. Tape this lead up. Carefully connect the lead tagged 208 to the Power Switch. Make sure all leads are clear of each other, other components, and the case. Replace the left-hand side cover.

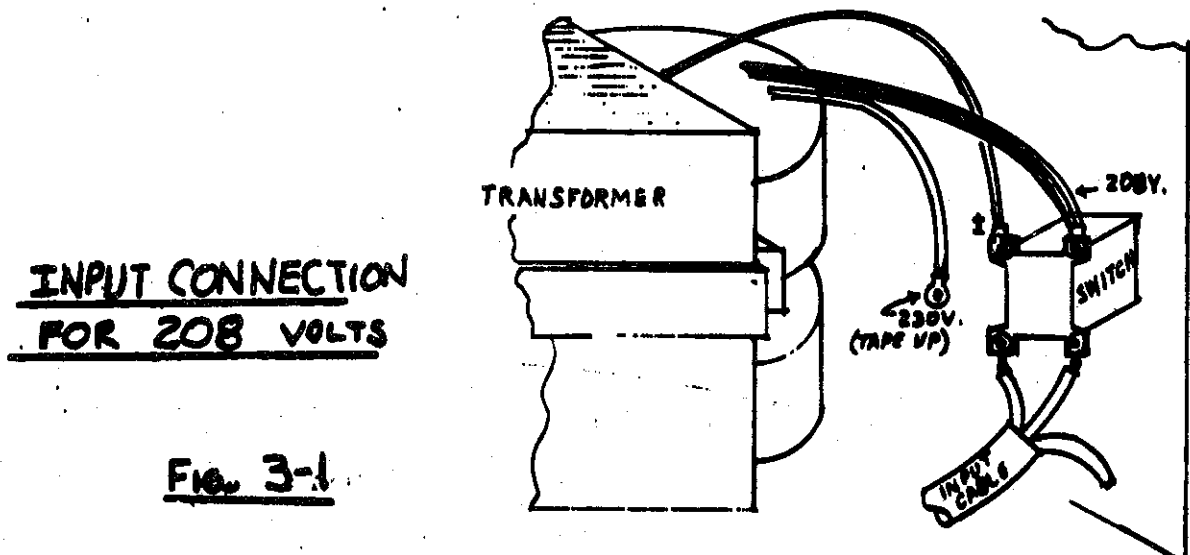


FIG. 3-1

This Equipment requires a single-phase input power supply of adequate capacity. Table 3-1 lists the proper size of input wiring and fusing.

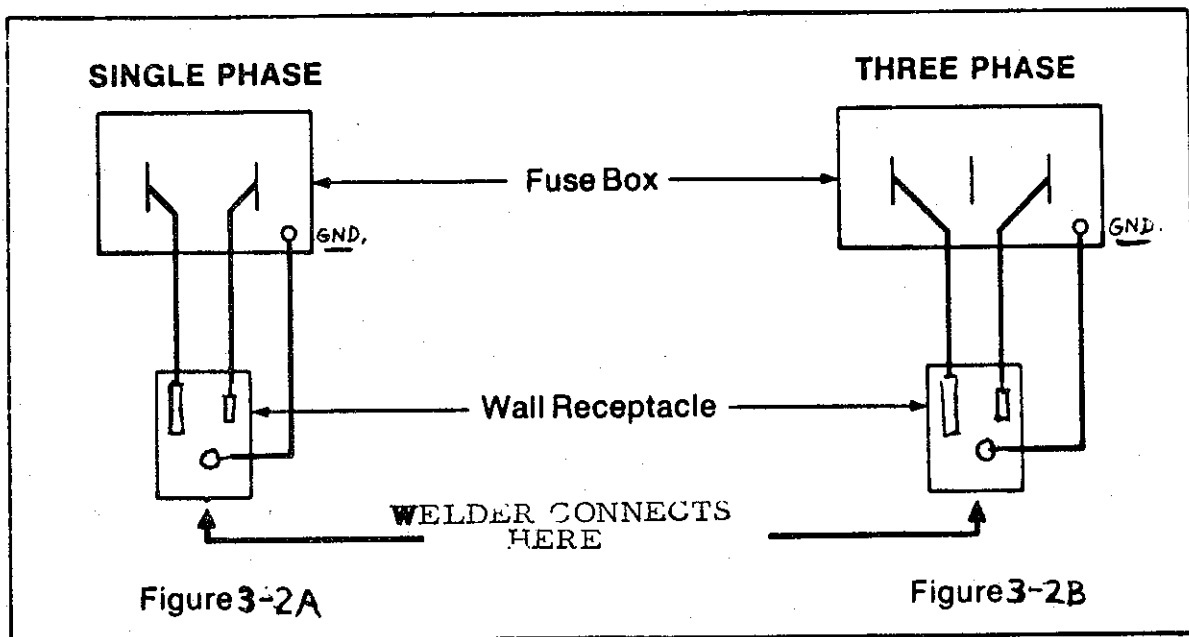
TABLE 3-1
Based on National Electric Code - 1971

<u>PRIMARY INPUT VOLTAGE</u>	<u>GROUND & INPUT WIRE AWG (COPPER)</u>	<u>CIRCUIT BREAKER OR FUSE SIZE</u>
208-230	#8	90

The input power cord is provided with an attachment plug cap. This plug-cap will mate with a 250 volt, 50 ampere receptacle conforming to NEMA 6-50 R configuration. This receptacle is available from local electrical Equipment Suppliers.

The receptacle should be wired to a separately fused disconnect or circuit breaker of the size listed in Table 3-1. This disconnect or breaker can be wired to a single phase supply or to two wires of a three phase supply. A third wire for grounding should also be connected between the disconnect and the receptacle. Figure 3-2A illustrates wiring to a single phase supply and Figure 3-2B illustrates wiring to a three phase supply.

All wiring should conform to local electrical codes and requirements. Consult the local power company about local codes or requirements.



3.4 CONNECTION OF THE WELDING GUN

Feed the machine end of the Gun cable assembly through the opening in the front panel of the Equipment. Fasten the fitting on the end of the conduit to the drive roll stand with the locking nut. Make sure the outlet guide is properly aligned with the drive rolls.

Connect the control wires to the control receptacle and the gas hose to the gas valve.

Bolt the power lead from welder to the cable lug on the Gun with the bolt provided.

3.5 DRIVE ROLLS

The drive roll installed in the Equipment feeds .035 inch and .030 inch diameter hard wire electrode. The unit is set for .035 as it leaves the factory. To change to .030, the drive roll must be reversed on the motor shaft.

IMPORTANT

THE DRIVE ROLL PRESSURE IS SELF-ADJUSTING BY MEANS OF THE LEAF SPRING LATCH AND WAS SET AT THE FACTORY FOR PROPER PRESSURE.

3.6 WELDING WIRE SPOOL

Install a spool of hard wire electrode of the proper diameter, as determined by the contact tip and drive rolls, as follows:

- a. Unscrew the nut from the hub.
- b. Place wire spool on the hub so that the wire unwinds as the spool rotates clockwise. Note that the hub pin must engage the hole in the spool.
- c. Replace the hub nut.

3.7 THREADING WELDING WIRE

Thread welding wire as follows:

- a. Release the spring from the catch and left the pressure roll arm.

CAUTION

BEFORE THREADING WELDING WIRE THROUGH CASING, MAKE SURE CHISEL POINT AND BURRS HAVE BEEN REMOVED FROM WIRE END SO IT CANNOT PUNCTURE CASING OR STICK IN MONO COIL LINER.

- b. Feed the wire from the spool through the inlet guide, across the drive roll groove through the outlet guide, and into the Gun/ cable.
- c. Holding the wire in the groove, lower the pressure roll arm and secure by inserting the spring in the catch. Check that the gears mesh.
- d. Switch the Process Selector to LOW DIP-TRANSFER and turn the POWER SWITCH on. Press the trigger on the welding gun and feed the wire up to the Gun with the Gun cable held straight. Observe that the wire feeds smoothly off the spool and through the drive rolls. It may be necessary to remove the contact tip from the Gun to permit the wire to start through the tip properly.

3.8 CONNECTION OF THE SHIELD GAS SUPPLY

Connect the gas inlet hose to the nipple on the regulator.

3.9 WELDING CABLE CONNECTIONS

Connect the work clamp solidly to the work piece or work table. Clamp on a bare metal area.

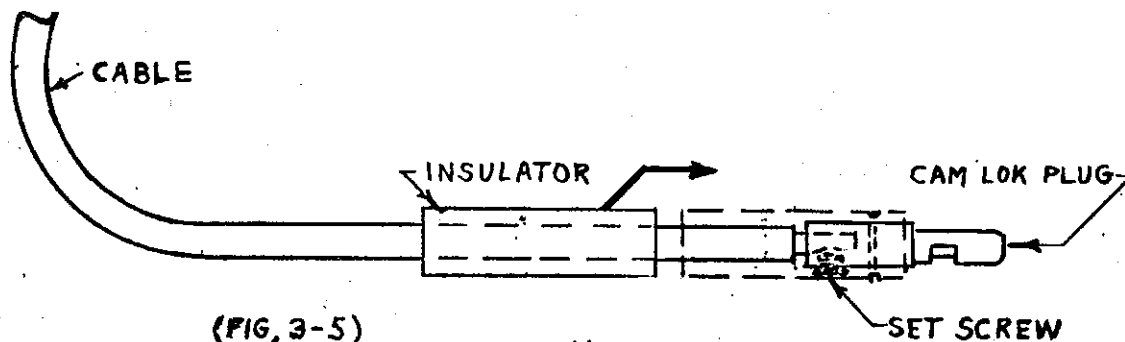
IMPORTANT

A GOOD ELECTRICAL CONNECTION TO THE WORK IS ESSENTIAL TO PROPER WELDING OPERATION.

It is recommended that the welding cables be kept as short as possible and be of adequate current carrying capacity. The resistance of the welding cables and connections cause a voltage drop which is added to the voltage of the arc. Excessive cable resistance may result in a reduction of the maximum usable current output of the Equipment.

The proper operation of this Equipment is to a large extent dependent on the use of welding cables and connections that are in good condition and of adequate size.

The unit is shipped with a connector which should be removed and attached to the Stick electrode holder cable. See Figure 3-5. Use No. 4 welding cable for lengths up to 50 feet. Use No. 3 welding cable for lengths over 50 feet. A special connector is available to be used in conjunction with a TIG holder.



4 OPERATION

CAUTION

REVIEW AND COMPLY WITH ALL SAFETY PRECAUTIONS
IN THE SAFETY SECTION AT THE FRONT OF THIS MANUAL.

4.1 DIP TRANSFER WELDING

- a. Slowly open the valve on the shield gas cylinder.
- b. Set Wire Feed Speed control for the gage of steel to be welded. Set the hand crank so that the indicator shows the proper setting for the gage to be welded.

If steel of two different gage thicknesses is to be welded, determine the average of the two and make the settings accordingly. When welding aim the arc more toward the heavier metal.

IMPORTANT

THE WIRE FEED SPEED CONTROL DIAL AND THE VOLTAGE INDICATOR ARE CALIBRATED FOR WELDING WITH EITHER .035 INCH DIAMETER ELECTRODE WIRE AND AG25 (75% AR+25% CO₂) SHIELDING GAS OR .030 INCH DIAMETER ELECTRODE WIRE AND CO₂ SHIELDING GAS. FOR OTHER ELECTRODE WIRE DIAMETER-SHIELDING GAS COMBINATIONS SEE TABLE 4-1.

Electrode Wire Dia. (in)	Shielding Gas	Wire Feed Speed Control Correction	Hand Crank Indicator Correction
.035	CO ₂	None	Increase approx. one GA setting
		<u>either</u> or	Decrease approx. one GA setting
.030	AG25	Increase approx. one GA setting	None
		<u>either</u> or	None
		None	Decrease approx. one GA setting

TABLE 4 - 1 CONTROL CORRECTIONS

- c. Set the Process Selector to DIP-TRANSFER HIGH or LOW as determined by the gage thickness. If the optional Spot Weld Control is installed make sure the Spot Weld ON-OFF Switch is OFF.
- d. Turn the Power Switch to ON.

CAUTION

WHEN THE POWER SWITCH IS ON AND THE GUN SWITCH LEVER IS DEPRESSED, THE ELECTRODE WIRE BECOMES ELECTRICALLY HOT. DO NOT TOUCH THE WIRE AS IT MAY CAUSE SHOCK. DO NOT ALLOW THE WIRE TO TOUCH A GROUNDED METAL SURFACE AS IT WILL CAUSE AN ARC FLASH.

- e. Position the Gun about 3/8 inch above the work piece. Depress the Gun Switch Lever and weld.
- f. Fine adjustments in welding voltage (arc length) can be made with the hand crank and fine adjustment of the welding current (wire feed speed) can be made with the Wire Feed Speed Control. These adjustments can be made while welding.

IMPORTANT

DO NOT TERMINATE THE ARC BY REMOVING THE GUN FROM THE WELD AREA. RELEASE THE GUN SWITCH LEVER TO STOP WELDING, BEFORE REMOVING THE GUN.

- g. For Spot Welding with the optional Spot Weld Control, install the spot weld nozzle on the Gun and set the Spot Weld ON-OFF switch to ON. Set the Process Selector to DIP-TRANSFER HIGH, and both the Wire Feed Speed Control and output indicator to Spot Weld. Set the Spot Weld Time Control for the desired weld duration.

When spot welding hold the Spot Weld nozzle against the work piece and allow no more than a slight gap, if any, between the materials to be welded.

The Spot Weld Control includes a burn back-delay circuit which has been preset at the factory for optimum time. If field adjustment is necessary, the slide wire resistor on the bottom of the Spot Weld Control panel can be adjusted. Increasing the resistance increases the length of burn back time, and decreasing the resistance shortens the burn back time. If the burn back time is too short, the electrode wire will stick in the weld crater; and if the burn back time is too long, the wire may burn back and fuse in the end of the contact tip.

4.2

STICK ELECTRODE WELDING

- a. Set the Process Selector for the desired stick electrode process: DC Reverse Polarity, DC Straight Polarity, or AC.
- b. Connect the stick electrode holder cable to the stick electrode receptacle.
- c. Set the hand crank so that the Indicator shows the desired stick electrode welding current.
- d. Insert a proper size electrode in the electrode holder.
- e. Turn the Power Switch to ON and weld.

4.3

TIG WELDING

- a. Set the Process Selector for the desired TIG process -- DC Straight Polarity or AC.

NOTE: DCSP TIG welding can be accomplished using touch start or high frequency start. High Frequency must be used for AC TIG welding. Follow instructions in the Arc Stabilizer Instruction Manual.

- b. Connect the TIG holder to the STICK-TIG Electrode receptacle using the special connector.
- c. Set the hand crank so that the Indicator shows the desired TIG welding current.
- d. Use the proper tungsten size from Table 4.2

TABLE 4-2 Guide For Selecting Tungsten Electrode

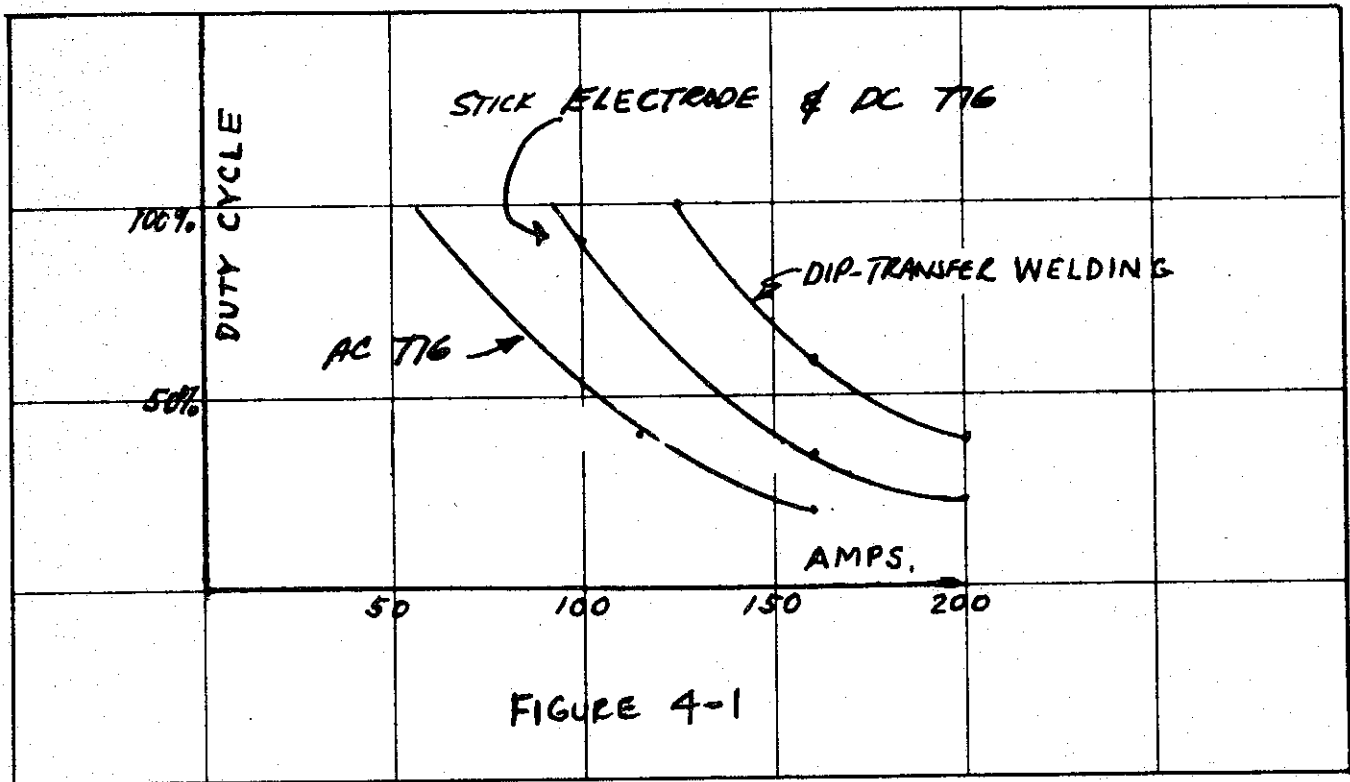
ELECTRODE DIAMETER IN INCHES	PURE TUNGSTEN	1% AND 2% THORIATED TUNGSTEN
	ACHF	DCSP
.010	Up to 15 Amps	Up to 25 Amps
.020	10 to 30 Amps	15 to 40 Amps
.040	20 to 70 Amps	25 to 80 Amps
1/16	50 to 80 Amps	50 to 150 Amps

- e. Connect the Gas Supply.
- f. Turn on power switch and weld.

4.3

DUTY CYCLE

The duty cycle of the Equipment is the percentage of a 10 minute period that it can operate safely at a given output current. This unit is rated at 160 amperes at 22 volts, 60 per cent duty cycle for DIP-TRANSFER welding. This means that the equipment can be safely operated in the dip-transfer mode at 160 amperes for 6 minutes out of every 10. If the welding current is decreased the allowable duty cycle will increase. See Figure 4 - 1.



For AC and DC stick electrode, and DCSP TIG welding this Equipment is rated at 160 amperes at 28 volts at 35 per cent duty cycle. Therefore when used for stick electrode welding at 160 amperes, it can safely be used for 3-1/2 minutes out of every 10. If used at 200 amperes for AC stick electrode it should not be used more than 2 minutes out of every 10.

For AC TIG welding this equipment is rated at 160 amperes at 20% duty cycle. This means that it should not be used for more than 2 minutes out of each 10 minute period if AC TIG welding at 160 amperes. At 100 amperes on AC TIG it can be used for 5 minutes out of every 10.

CAUTION

NEVER OPERATE THIS EQUIPMENT WITH THE COVERS REMOVED. IN ADDITION TO A SAFETY HAZARD, IMPROPER COOLING MAY RESULT IN DAMAGE TO THE TRANSFORMER AND OTHER COMPONENTS. THE WARRANTY IS VOID IF THE EQUIPMENT IS OPERATED WITH COVERS REMOVED.

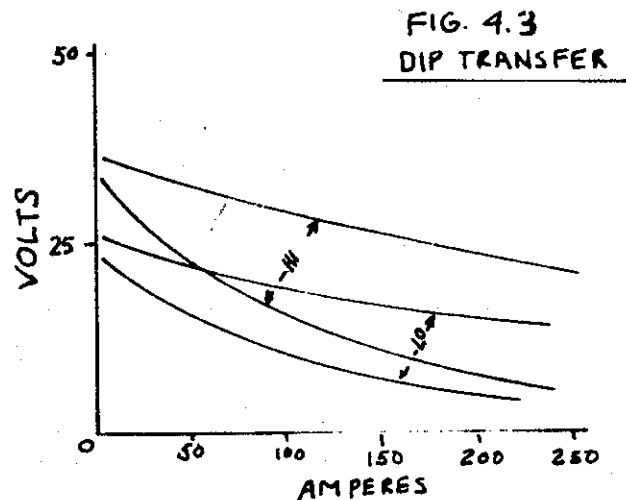
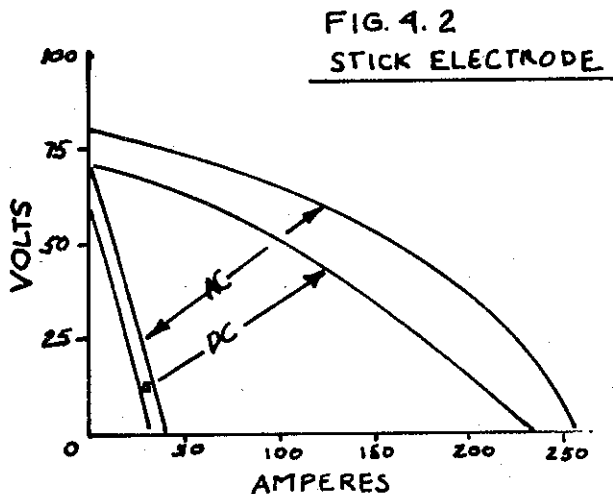
This Equipment is provided with a thermostat in the transformer windings which will open and prevent the contactor from closing if the transformer windings are overheated.

If the thermostat opens, allow the Equipment to idle with the fan running for approximately 15 minutes before attempting to weld again.

4.4 VOLT-AMPERE CURVES (FIGURES 4.2, 4.3)

The volt-ampere curves show the output voltage available at any given output current for the maximum and minimum settings of the output Indicator for the various Process Selector positions. Output voltages between these maximum and minimum curves are available at intermediate settings of the Indicator.

The actual operating point of load voltage and current is determined by type of process, electrode, shield gas, wire feed speed and operator technique.



5 MAINTENANCE

IMPORTANT

THE MAINTENANCE DESCRIBED IN THIS SECTION SHOULD BE UNDERTAKEN ONLY BY A COMPETENT PERSON EXPERIENCED IN MAINTAINING SUCH ELECTRO-MECHANICAL EQUIPMENT. DO NOT ATTEMPT ANY REPAIRS OTHER THAN THOSE GIVEN BELOW. IF FURTHER SERVICE IS REQUIRED, CONTACT THE NEAREST REPRESENTATIVE.

CAUTION

ALWAYS SHUT OFF ALL POWER AND GAS SUPPLIES BEFORE ATTEMPTING INSPECTION OR MAINTENANCE. DISCONNECT THE LINE CORD PLUG FROM RECEPTACLE. DO NOT TOUCH ELECTRICALLY HOT PARTS.

5.1 INSPECTION AND UPKEEP

Inspect and maintain the Equipment as often as required by operating conditions:

Keep Equipment in clean and safe operating condition free of oil, grease, and (in electrical parts) liquid and metallic particles that can cause short circuits. Clean weekly with a low-pressure jet of dry compressed air.

Regularly check cylinder valves, regulators, hoses, and gas connections for leaks with soap solution.

Check for and tighten loose hardware including electrical connections. Loose power connections overheat during welding.

Immediately replace all worn or damaged power cables and connectors. Check for frayed and cracked insulation, particularly in areas where conductors enter equipment.

The electrode wire and all metal parts in contact with it are electrically energized while welding. Inspect these parts periodically for defective insulation and other electrical hazards.

CAUTION

IF UNINSULATED CABLE AND PARTS ARE NOT REPLACED, AN ARC CAUSED BY A BARED CABLE OR PART TOUCHING A GROUNDED SURFACE MAY DAMAGE UNPROTECTED EYES OR START A FIRE. BODY CONTACT WITH A BARED CABLE, CONNECTOR, OR UNCOVERED CONDUCTOR CAN SHOCK, POSSIBLY FATALY.

Keep power cables dry, free of oil and grease, and protected at all times from damage by hot metal and sparks.

Clean dirt and metal particles from drive roll groove weekly; replace roll if badly worn.

Oil the fan motor with a few drops of SAE 20 non-detergent oil every 3 months.

The threaded brass adjusting screw of the transformer should be kept lubricated with lubricant such as Chicago Manufacturing and Distributing Co. Extreme Pressure Lube #3. The plastic strips which are part of the moving iron section of the transformer can be lubricated with Lien Chemical No. 806 Supreme #20.

5.2 TROUBLE SHOOTING

If the equipment does not function properly use the following Trouble Shooting Guides for probable causes and remedies of listed symptoms.

TABLE 5 - 1
TROUBLE SHOOTING GUIDE - GENERAL

<u>WELD CONDITION</u>	<u>POSSIBLE CAUSE</u>	<u>REMEDY</u>
1. No weld or control power	a. Primary input power not available. b. Faulty connection, line cord or power switch. c. Blown fuse .	a. Check for voltage to receptacle and that plug is connected. b. Repair or replace cord or switch as necessary c. Replace fuses.

<u>WELD CONDITION</u>	<u>POSSIBLE CAUSE</u>	<u>REMEDY</u>
2. No welding power	a. Thermostat has opened. b. Shorted diode in main rectifier. c. Open in wiring.	a. Wait 15 minutes with fan running. b. Check diodes and replace if required. c. Check all wiring.
3. Fan does not run	a. See Weld Condition 1. b. Defective fan motor.	a. See Weld Condition 1. b. Replace fan motor.
4. Erratic welding current	a. Poor work piece connection. b. Loose welding connections.	a. Check work piece grounding connection. b. Check all connections
5. Welding output voltage and/or current too low	a. Low line voltage. b. Welding cables too long or too small. c. Loose connection.	a. Use correct voltage. b. Use correct cable size. c. Check all welding cable connections.

TABLE 5-2
TROUBLE SHOOTING GUIDE DC DIP-TRANSFER
CONTINUOUS WELDING

<u>WELD CONDITION</u>	<u>POSSIBLE CAUSE</u>	<u>REMEDY</u>
1 Stringy irregular bead, poor penetration	a. Gun moved too fast. b. Controls are not set properly for metal gage thickness.	a. Move Gun slower along seams. b. Reset controls properly.
2 Bead not centered	a. Nozzle not aligned.	a. Move Gun nozzle parallel to and centered over seam.

<u>WELD CONDITION</u>	<u>POSSIBLE CAUSE</u>	<u>REMEDY</u>
3. Bead too large	a. Gun moved too slowly,	a. Move Gun faster along seam.
4. Unstable arc, excess spatter, weld porous	a. Shield gas flow is too low or stopped, b. Gun nozzle is too far from work, c. Controls not set properly for metal gage thickness,	a. See condition 5, b. Maintain 1/4" wire protusion, hold closer to work, c. Res et controls properly,
5. Shield gas flow low or stopped	a. Cylinder valve closed, b. Cylinder empty, c. Faulty regulator or adaptor, d. Faulty gas solenoid valve.	a. Slowly open valve, b. Replace if gauge so indicates. c. Check flow at outlet replace faulty item. d. Replace solenoid valve.
6 Wire stubs on work while welding	a. Controls not set properly for metal gage thickness,	a. Reset controls properly,
7. Wire burns back into contact tip	a. Contact tip loose, b. Tip too close to work, c. Wire feed slipping, d. Contact tip damaged, e. Drive or pressure roll dirty or worn,	a. Firmly tighten with pliers, b. Maintain 1/4" wire protusion; hold Gun further from work. c. Increase pressure on pressure roll by bending spring. d. Trim back tip 1/16" Max. Replace if still faulty. e. Clean rolls or replace.

TABLE 5 - 3
TROUBLE SHOOTING GUIDE - DC GAS METAL ARC
SPOT WELDING

<u>WELD CONDITION</u>	<u>POSSIBLE CAUSE</u>	<u>REMEDY</u>
1 Poor penetration	a. Weld time too short.	a. Increase weld time control settings.
	b. Gap between metal pieces is too great.	b. Close the gap.
	c. Controls not set properly for spot welding	c. Set control properly See. Para. 4.1.g.
2 Hole burned through one or both metals	a. Weld time too long.	a. Decrease weld time control setting.
	b. Gap between metal pieces is too great.	b. Close the gap.
	c. Metal flange too narrow or weld is too close to edge.	c. Reposition weld or decrease weld time control setting.
	d. Control not set properly for spot welding.	d. Set controls properly. See. Para. 4.1.g.

6 - SPARE AND REPLACEMENT PARTS

6.1 SPARE PARTS

To assure minimum downtime, it is recommended that the spare parts noted by the symbol @ in the Stock No. column of the parts list be kept on hand. The recommended quantity if more than one, is in parenthesis () following the item description.

6.2 PARTS INFORMATION

The following parts lists identifies each part by stock number, description, and quantity used.

6.3 ORDERING INFORMATION

To assure proper operation, use only genuine parts and products with this equipment. To order replacement parts, proceed as follows:

- a. Give the Part Number, description and quantity of each part required.
- b. Give the Part Number, serial number and description of the equipment on which the parts will be used.
- c. Indicate any special shipping instructions.

<u>PARTS LIST - POWER SUPPLY/FEEDER</u>			
<u>PART NO.</u>	<u>DIA.</u> <u>MKG.</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>
27R2286	T1	Transformer Assembly 208/230	1
24R648	S1	Line Switch	1
29R2080		Primary Input Cord	1
11R2272		Fan Motor (230 Volt)	1
11R2273		Fan Blade 10"	1
24G2030	S2	Process Selector Switch	1
18G1881	WC	Welding Contactor Assembly	1
		Contact Set for Contactor - Specify Mfg. on Contactor	
17G1637	SR1	Main Power Rectifier Assembly	1
		Includes:	
17R1634		Silicon Diode (Cathode Stud)	2
17R1635		Silicon (Anode Stud)	2
19R1772	R4	Resistor, 27 Ohm, 2 W	1
4R120A	C2	Capacitor, 4 MFD, 230 V	1
19R1802	R5	Bleeder Resistor, 50 Ohm 50 W	1
4R1233	C3	Capacitor, 10,000 MFD, 50 V	5
27G2005	L1	D C Inductor	1
11R2245	F1	Fuse 6 Amp ABC	1
17R1636	SR2	Wire Feed Rectifier	1
19R1804	R2	Wire Feed Speed Control	1
11R2274	M	Wire Feed Motor	1
36R238		Drive Roll. 035	1

<u>PART NO.</u>		<u>DESCRIPTION</u>	<u>QUANTITY</u>
36R289		Drive Roll .030	1
36R240		Inlet Guide	1
19R1788	R3	Drive Motor Shunt Resistor	1
11R2207		Fuse Holder	1
11R2271		Terminal Strip	1
24G2012	TP	Thermostat	1
22G1878	SOL	Solenoid Valve	1
9R1608		Cam Lok Receptacle	1
		Ground Cable Assembly	1
14R2366		Indicator Strip	1
13R2457		Indicator Spring	1
3G2316		Cabinet Base	1
3G2317		Cabinet Front Panel	1
3G2318		Cabinet Back Panel	1
3G2320		Cabinet Left Side Panel	1
3G2323		Cabinet Right Side Panel Assy.	1
3G2325		Cabinet Wire Feed Shelf Panel Assembly	1

PARTS LIST FOR SPOT TIMER PANEL

<u>PART NO.</u>		<u>DESCRIPTION</u>	<u>QUANTITY</u>
3G2327		Spot Timer Mounting Panel	1
18R1880	TD1	Timer includes Rheostat & Knob	1
24R220	S3	Switch	1
18R1857	K1	Delay Relay	1
4R1231	C1	Capacitor 80 MFD, 115 V	1
19R1803	R1	Adjustable Resistor	1
19R1795	R6	Resistor	1
19R1614	D1	Silicon Diode	1
36R252		Spot Nozzle with Clamp	1

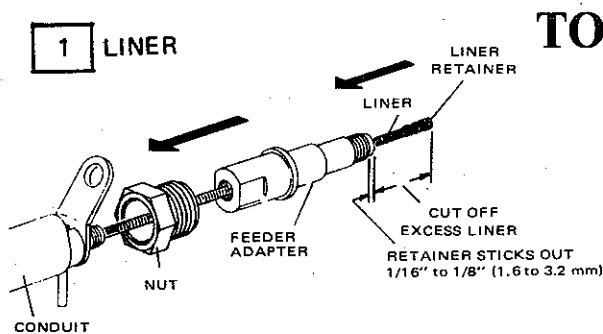
PARTS LIST FOR RUNNING GEAR

<u>PART NO.</u>	<u>DESCRIPTION</u>
13G2463	Handle
13G2464	Bottle Support
7R2063	"S" Hook (2)
13R2332	Chain 22" Long
13G2467	Bottle Tray
13G2468	Caster Mounting Angle
6R1323	Caster (2)
6R1322	Wheel (2)
13G2469	Axle
7R2135	Speed Nut (2)
7R2130	Hub Cap (2)
13G2475	Spacer (2)

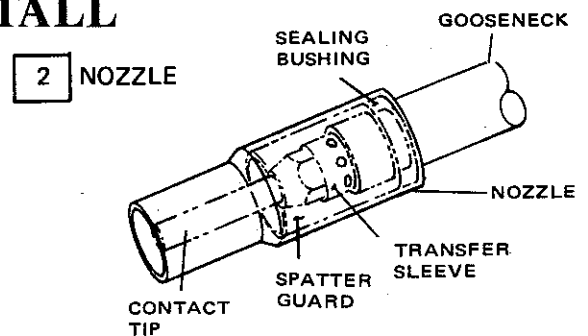
INSTRUCTIONS FOR WELDING GUN USED ON 160 AMPERE MIG-STICK WELDING SYSTEM

SAFETY

1. Before installing, checking, or servicing the Gun, shut OFF all power and gas supplies, and disconnect power source from wire feeder. Pull fuses or lock (or tag) switches.
2. When working in relatively confined spaces where gas supplies are large enough to seriously lower the oxygen content of the atmosphere, provide adequate ventilation at all times and be sure to turn off the valve at the gas supply when shutting down so that the area will be safe to work in or to re-enter.
3. Do not lay the Gun where the trigger can accidentally be pressed. If power is ON, electrode wire becomes electrically HOT and will flash on contact with grounded metal. An arc flash may injure unprotected eyes and may start a fire.
4. To avoid damage to the Gun, do not exceed current rating.



TO INSTALL

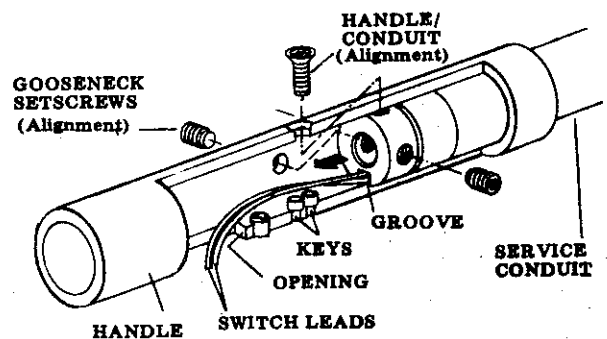


- a. Lay service conduit straight.
- b. Push liner back into nose of gun until flush.
- c. Unscrew retainer from conduit end of liner.
- d. Slip feeder adapter and nut over liner, screw onto conduit end and wrench-tighten.
- e. Screw contact tip into nose of Gun so it butts against liner and tighten with pliers.
- f. Screw retainer on liner until it sticks out 1/16 to 1/8 inch (1.6 to 3.2 mm) from feeder adapter end.
- g. With sharp side cutters, cut liner flush with retainer and remove burr.

OPERATING AND SERVICE

1. CHECK before welding that:
 - a. Tip adapter is wrench tight.
 - b. Contact tip is correct for wire size and screwed tight.
 - c. Spatter guard is in nozzle and nozzle is clean.
 - d. Nozzle is tight on gooseneck. If loose, pry up the 3 prongs on nozzle grip, enough for firm grip.
 - e. Gooseneck metal tube is not exposed; it is electrically HOT when trigger is pressed (see SAFETY section). If insulating sheath is cut or worn, replace it.
2. TO REPLACE PARTS (See exploded parts drawing opposite):
 - a. GOOSENECK — Remove 2 setscrews through holes in handle and with slight twist, pull out gooseneck. To replace, moisten the O-ring on the gooseneck to aid insertion. Insert with slight

- twist, align holes, (see sketch in step c) and replace setscrews.
- b. SWITCH — Remove screws, cover, trigger, switch leads, and switch plate. Spread plate tabs and pop switch out. Snap in replacement switch and



reassemble in reverse order. Check that trigger slants AWAY from handle and that the switch clicks.

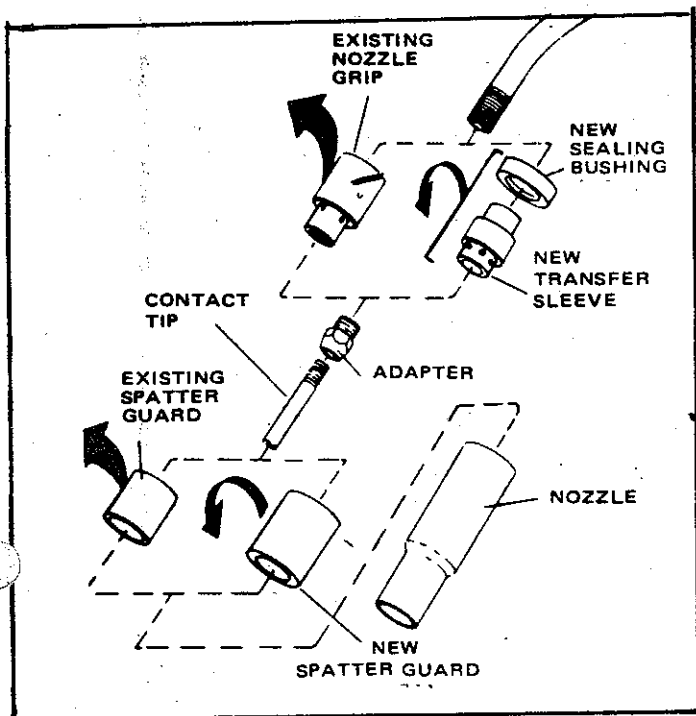
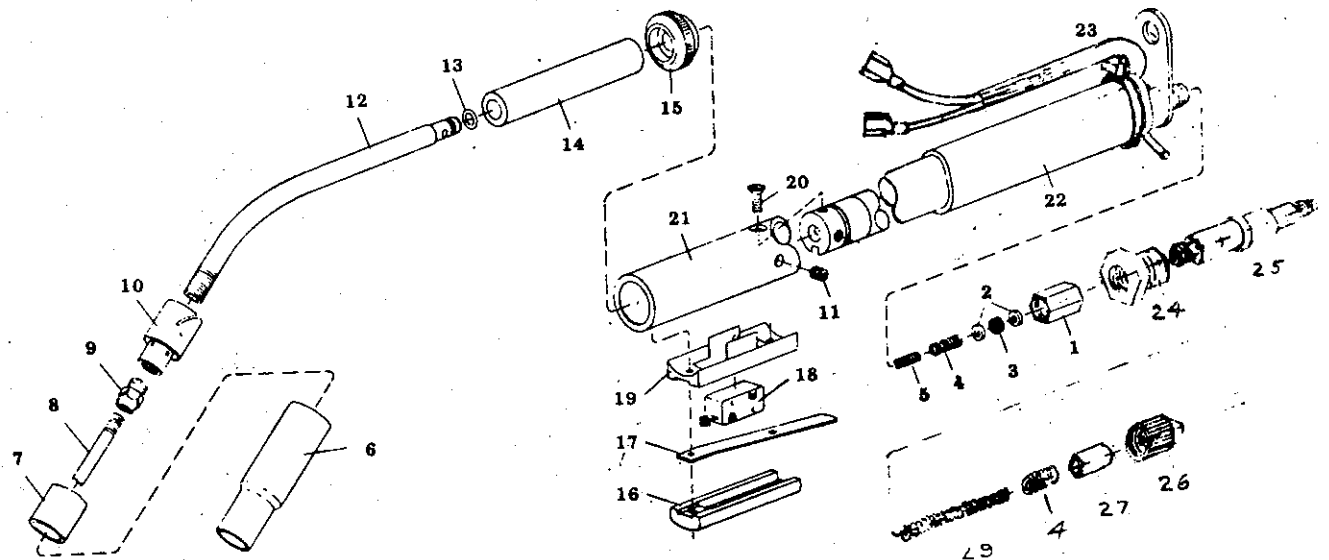
- c. **HANDLE AND CONDUIT** — Remove gooseneck and switch (steps a and b), remove nylon/steel screw from handle and slide service conduit with switch leads straight out of handle. **DO NOT TWIST** (it may damage keys inside handle). Before reassembly, line up the conduit fitting groove with the switch opening in the handle, and check that the switch leads are in the groove (see sketch). Insert conduit in handle without twisting so that the groove straddles the keys. When holes align, reinstall insulated, nylon/steel screw. **CAUTION** — **DO NOT** use other than an insulated screw.

- d. **LINER** — Lay conduit straight (see TO-INSTALL step 1,A).

Remove wiper cap (1,B) and remove old liner from feeder end. Push new liner through feeder end of service conduit until it butts against contact tip (1, D, inset) and complete steps 1,E through G. The felt wiper plug cleans wire of dirt and chips; if worn and ineffective, replace plug.

3. **TO CHANGE SWITCH LOCATION:** Remove 2 setscrews, (step 2, a above) and turn gooseneck 180° (without removing it from handle). Align holes and replace setscrews.
4. **TO EASE SPATTER REMOVAL:** Spray a thin film of anti-spatter compound on contact tip and nozzle. Clean tip and nozzle of accumulated spatter frequently and reapply SPATTER SCAT. **DO NOT** strike nozzle to remove spatter.

PARTS

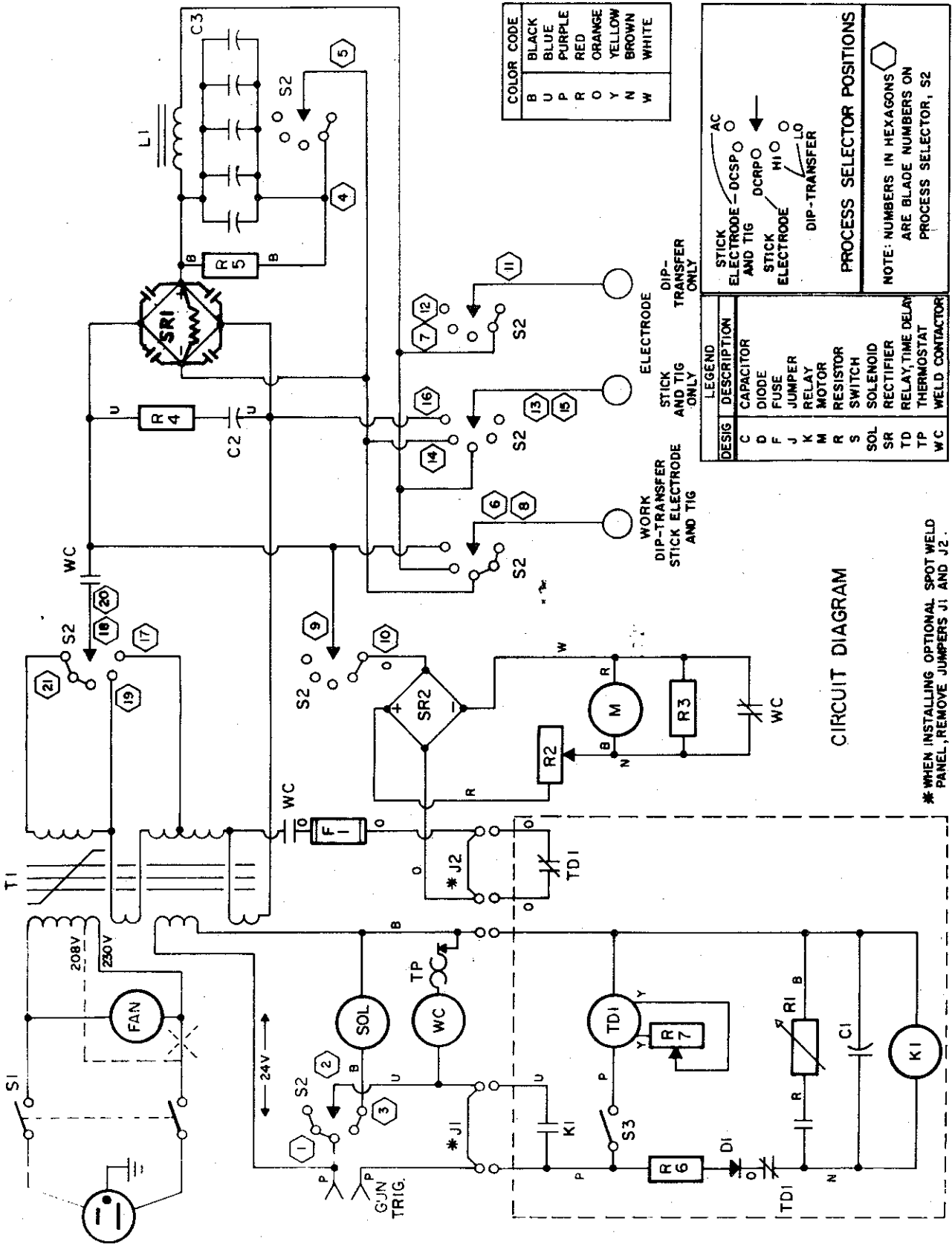


Conversion Of Earlier Model

ITEM	PART NUMBER
NEW SEALING BUSHING	36R326
NEW TRANSFER SLEEVE	36R325
NEW SPATTER GUARD	36R324

GUN PARTS LIST

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	36R303	Wiper Cap
2	8R2330	Fiber Washer
3	36R261	Wiper Plug (Felt)
4	36R264	Retainer (Liner)
5	36R265	Liner
6	36R293	Nozzle 9/16"
7	36R268	Spatter Guard
8	36R282	Contact Tip (.030 - .035")
9	36R270	Adapter
10	36R271	Nozzle Grip
11	7R2142	Set Screw
12	36R272	Gooseneck
13	36R273	"O" Ring
14	36R274	Sheath Gooseneck
15	36R275	Cap
16	36R276	Cover (Trigger)
17	36R277	Trigger Lever
18	24R2035	Switch
19	36R278	Switch Plate
20	7R2144	Screw (Insulated)
21	36R279	Handle
22	36R280	Service Conduit
23	11R2145	Terminal
24	36R246	Retaining Nut
25	36R307	Adapter (Feeder)
26	36R315	Inlet Guide
27	36R286	Sleeve
28		
29	36R312	Adapter Liner
<u>QTY</u>	<u>SPARE PARTS KIT # 36G320 Consisting Of:</u>	
10	36R282	Contact Tips .030 - .035
2	36R293	Nozzle 9/16
1	36R268	Spatter Guard
5	36R261	Wiper Plug (Felt)
1	36R270	Adapter



COLOR CODE	
B	BLACK
U	BLUE
P	PURPLE
R	RED
O	ORANGE
Y	YELLOW
N	BROWN
W	WHITE

DESIG	DESCRIPTION
C	CAPACITOR
D	DIODE
F	FUSE
J	JUMPER
K	RELAY
M	MOTOR
R	RESISTOR
S	SWITCH
SOL	SOLENOID
SR	RECTIFIER
TD	RELAY, TIME DELAY
TP	THERMOSTAT
WC	WELD CONTACTOR

LEGEND	PROCESS SELECTOR POSITIONS
STICK ELECTRODE - DCSP	AC
AND TIG	←
STICK ELECTRODE	HIO
DIP-TRANSFER	LO

CIRCUIT DIAGRAM

* WHEN INSTALLING OPTIONAL SPOT WELD PANEL, REMOVE JUMPERS J1 AND J2.

OPTIONAL SPOT WELD CONTROL PANEL, 31

INSTRUCTIONS FOR INSTALLING SPOT TIMER PANEL

1. Remove 4 screws holding small cover plate at upper right corner of front panel of machine.
2. Remove 2 white jumper leads from terminal block inside machine.
3. Fasten Spot Timer assembly in place of cover plate using same screws just removed.
4. Connect terminal strip from Spot Timer to terminal block, matching lead colors on each.

The Spot Weld Timer Control is now ready to use.

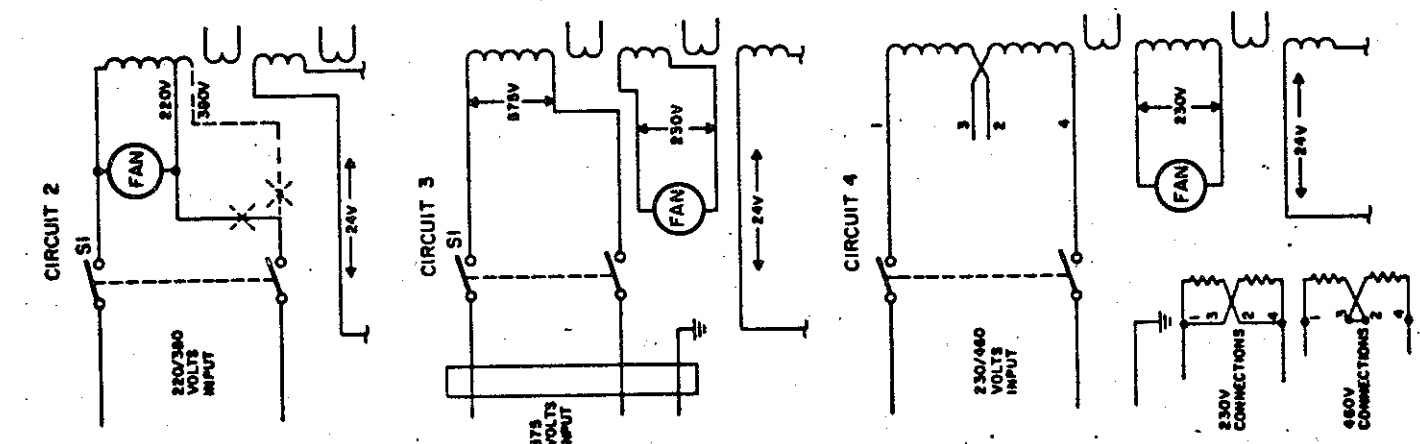
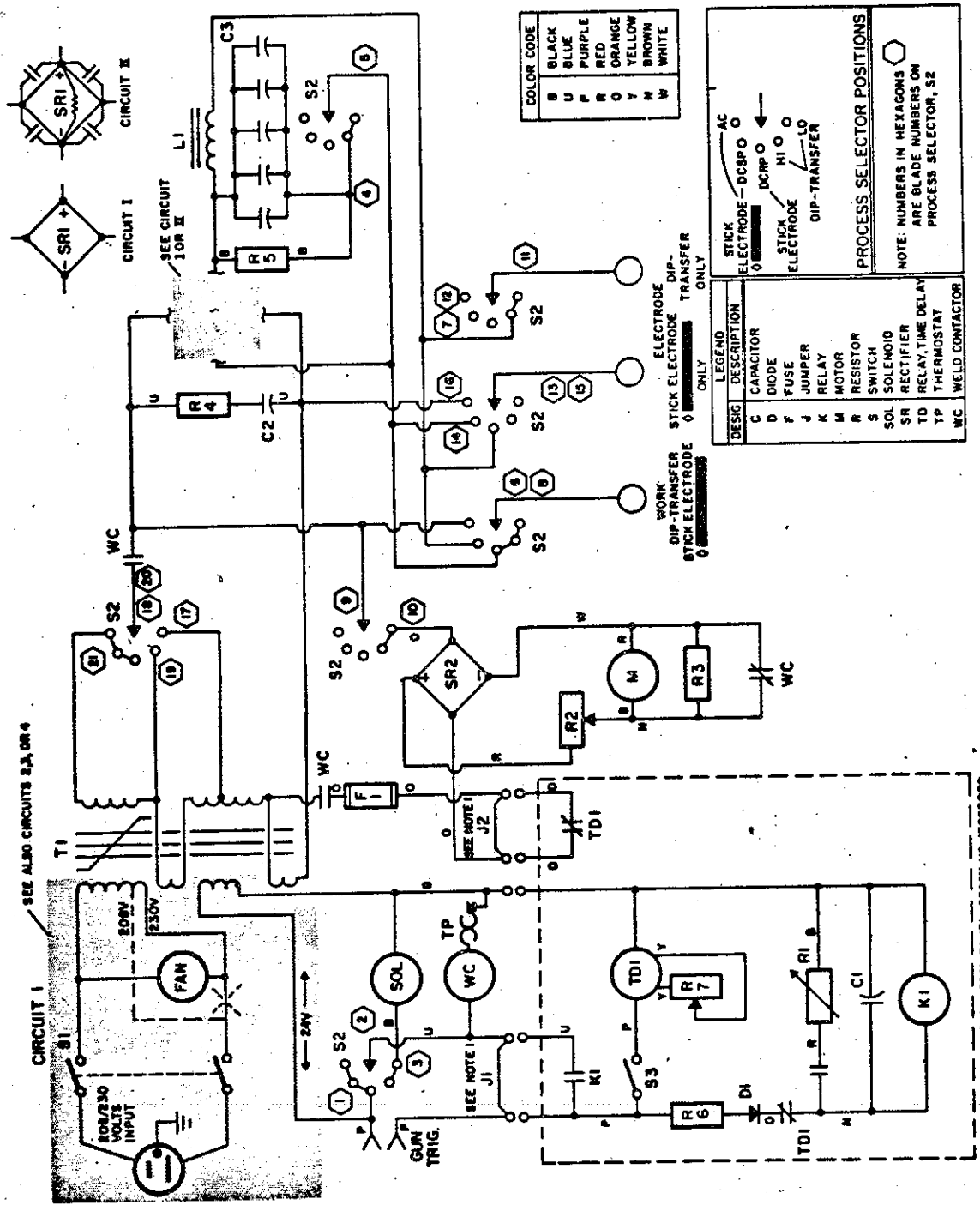
INSTRUCTIONS FOR ADDING RUNNING GEAR KIT

RUNNING GEAR KIT INCLUDES:

1 PULL HANDLE	1 BOTTLE SUPPORT WITH CHAIN ATT.
1 BOTTLE RACK	1 CASTER MOUNTING ANGLE
2 CASTERS	4 CAP SCREWS, 3/8-16
2 WHEELS	4 LOCK WASHERS, 3/8
1 AXLE	4 NUTS, 3/8-16
2 FLAT WASHERS	4 CAP SCREWS, 1/4-20x1/2"
2 "PUSH ON" SPEED NUTS	8 CAP SCREWS, 1/4-20x3/4"
2 HUB CAPS	12 LOCK WASHERS, 1/4
2 SPACER TUBES	8 NUTS, 1/4-20

1. Remove all lumber from base of machine.
 2. Raise back end of machine high enough so that bottle rack can be placed under mounting legs of base with the 4 holes in rack matching the 4 holes in the legs.
 3. Insert 3/8-16 Cap Screws and add Lock Washers and Nuts.
 4. Slide axle through holes in sides of bottle rack.
 5. Add flat washer next to side of rack, add Spacer Tube, and then add wheel, making sure that wheel is turned so the protruding hub is next to the washer.
 6. Push speed nut on to axle all the way up to the wheel. Then force hub cap over the end of axle. Repeat steps #6 & #7 for the other wheel.
 7. Lower back end on to wheels and raise front end of machine to mount casters.
 8. Place caster mounting angle, with flange up, on top of front holes of base mounting legs.
 9. Place 1 caster under the leg and insert 4 long cap screws (1/4-20x3/4) through the 4 holes in the leg and mounting angle.
NOTE: Screws must be inserted from bottom with lock washers and nuts on top.
- Repeat the procedure for the other caster.
10. The Pull Handle is mounted with 2 cap screws (1/4-20x1/2) and lock washers using the 2 tapped holes at the top of the front panel of the machine.
 11. The Bottle Support is mounted with 2 cap screws (1/4-20x1/2) and lock washers using the 2 tapped holes near the top of the back panel of the machine.

NOTE: It is recommended that the axle be welded to the underside of the gas cylinder tray to keep it from turning and wearing on the narrow edges of the holes.



32

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LEGEND

DESIG	DESCRIPTION
C	CAPACITOR
D	DIODE
F	FUSE
J	JUMPER
K	RELAY
M	MOTOR
R	RESISTOR
S	SWITCH
SOL	SOLENOID
SR	RECTIFIER
TD	RELAY, TIME DELAY
TP	THERMOSTAT
WC	WELD CONTACTOR

AC
ELECTRODE - DC/SP
STICK ELECTRODE - DC/MP
STICK ELECTRODE - HI
ELECTRODE - LO
DIP-TRANSFER

PROCESS SELECTOR POSITIONS

NOTE: NUMBERS IN HEXAGONS ARE BLADE NUMBERS ON PROCESS SELECTOR, S2

MM SERIAL NO.	MM VOLTS @ HZ	O (3 PLACES)	CIRCUIT (NO.)	CIRCUIT (NO.)
PRIOR TO 62026	208/230	60	I	I
			II	II
G 21026	208/230	60	I	I
			II	II
PRIOR TO 62026	220/240	50	I	I
			II	II
G 21026	220/240	50	I	I
			II	II
LL	230/240	60	I	I
ALL	230/240	60	I	I

SCHEMATIC DIAGRAM

MM VOLTS @ HZ, SINGLE-PHASE EFFECTIVE WITH MM

NOTE: WHEN INSTALLING OPTIONAL SPOT WELD PANEL, REMOVE JUMPERS J1 AND J2.

OPTIONAL SPOT WELD CONTROL PANEL, STOCK NO. 13880000