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OWNERS MANUAL

WELDMATIC 255S

MODEL NO. CP107-1, REV. A

WITH W42-0 WIREFEEDER

09/2000

QUALITY WELDING PRODUCTS, SYSTEMS AND SERVICE

The information contained in this manual is set out to enable you to properly maintain your new equipment and ensure that you obtain maximum operating efficiency.

Please ensure that this information is kept in a safe place for ready reference when required at any future time.

When requesting spare parts, please quote the model and serial number of the machine and part number of the item required. All relevant numbers are shown in lists contained in this manual. Failure to supply this information may result in unnecessary delays in supplying the correct parts.

SAFETY

Before this equipment is put into operation, the Safe Practices section at the back of the manual must be read completely. This will help to avoid possible injury due to misuse or improper welding applications.

PLASTIC HANDLE

Please note that the handle fitted to the WELDMATIC W42-0 WIREFEEDER is intended for carrying the machine by hand only.

DO NOT use this handle for suspending or mounting the machine in any other manner.

CONTENTS

FIGURES

1. INTRODUCTION

Gas Metal Arc Welding (G.M.A.W.) is a welding process where a consumable wire is fed by motor driven drive rollers to a welding gun, and where welding current is supplied from the welding power source. The welding arc is struck between the work piece and the end of the wire, which melts into the weld pool. The arc and the weld pool are shielded by gas flow from the gun, or in the case of "self shielded" wires, by gases generated by the wire core.

By selection of the correct wire composition, diameter and shielding gas, G.M.A.W. can be used for applications ranging from sheetmetal to heavy plate, and metals ranging from carbon steel to aluminium alloys.

The WELDMATIC 255S has been designed to be used with consumable wires in the range from 0.6mm to 1.2mm diameter. The smaller wire sizes are used when welding at lower currents, such as sheet-metal applications. Increasing the wire diameter permits higher welding currents to be selected.

A common application of G.M.A.W. is for welding Mild Steel. In this application, a Mild Steel solid consumable such as AUSTMIG ES6 is used with a shielding gas of Argon mixed with 5 - 25% Carbon Dioxide. Alternatively, Flux-cored consumables are available in both gas shielded, and 'gasless' self shielding types.

Stainless steel and Aluminium can be welded with G.M.A.W. using the correct consumable wire and shielding gas.

2. RECEIVING

Check the equipment received against the shipping invoice to make sure the shipment is complete and undamaged. If any damage has occurred in transit, please immediately notify your supplier.

The CP107-1 package contains;

- WELDMATIC 255S Power source.
- W42-0 Enclosed Wirefeeder (with Controls).
- AM283-0/8 Inter-connecting Lead Kit, 8 metre.
- BEXT2-4E310AE BERNARD Gun cable, 3 metre, Euro connector.
- WGAC24 Regulator and Flowgauge. (Argon)
- (This) Owners Manual.

3. SPECIFICATIONS

Manufactured to Australian standard AS1966.1-1985
Rated to ISO/IEC 60974-1 (10 minute duty cycle)

WELDING INDUSTRIES of AUSTRALIA

Weldmatic 255s

Made in Australia

1~ ⎓ RATED TO ISO/IEC 60974-1 N803

	30A/16V - 255A/27V					
		U_1	480			
	⎓	X	25%	100%		
	U_{20}(V)	I_2(A)	255	105		
	20-45	U_2(V)	27	19		

	PF = .87 (255A)			.62 (105A)		
	U_1(V)	I_{1max}(A)	24	9		
	240V	I_{1eff}(A)	12	9		
CLASS INS H	50Hz	S_1(kVA)	11.5	4.3		
COOLING AF	IP21					

WIN305R-1

Under ISO/IEC 60974-1, duty cycle is defined as the ratio of arcing time to an operating time of 10 minutes, expressed as a percentage.

4. CONTROL LOCATIONS. POWER SOURCE AND WIREFEEDER

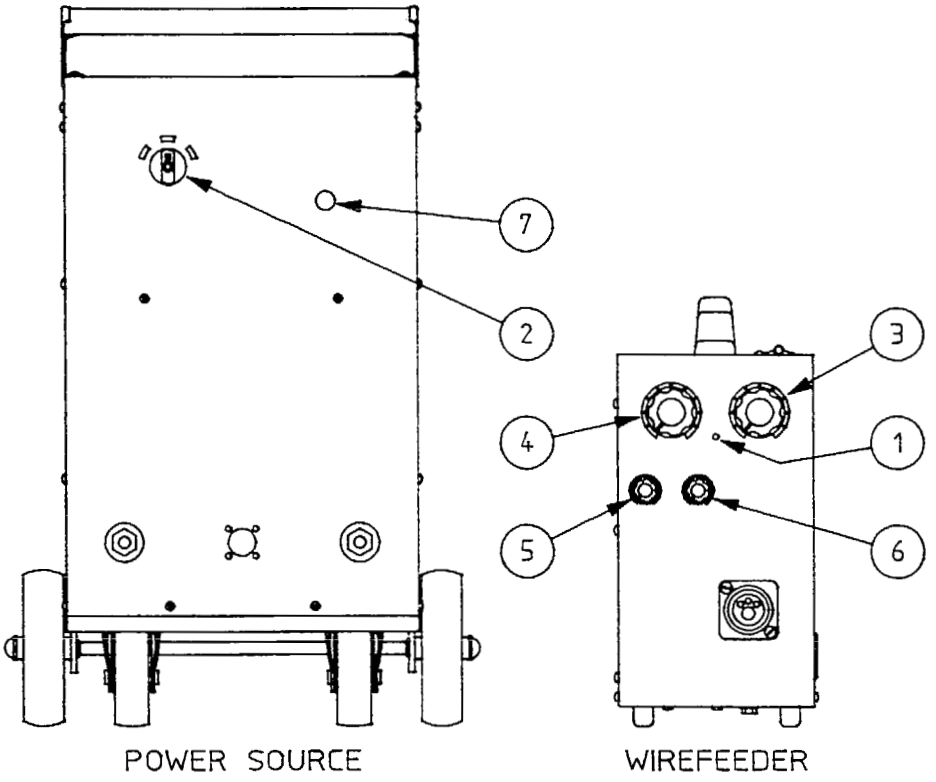

FIGURE 1. CONTROL LOCATIONS. POWER SOURCE AND WIREFEEDER

1. POWER ON INDICATOR

This is illuminated when the wirefeeder is energised, that is when electrical mains power is connected to the welding power source.

2. COARSE VOLTAGE CONTROL

This switch provides Coarse adjustment of the Output Welding Voltage over three ranges, Low, Medium and High.

3. FINE VOLTAGE CONTROL

This control provides Fine adjustment of the Output Welding voltage. Rotating the control in a clockwise direction will increase the output voltage.

4. WIRE SPEED CONTROL

This control provides adjustment of the wirefeed speed. Rotating the dial in a clockwise direction will increase the wirefeed speed, thereby increasing the welding current.

5. SPOT TIME CONTROL

When operating the machine in Spot Weld mode, this control will vary the spot weld time. Rotating the dial in a clockwise direction will increase the spot weld time, in the range 0.5 - 2.5 seconds. If the Spot Weld mode is not required this feature may be turned off by rotating the control anti-clockwise until it 'clicks' into the minimum position.

6. INTERVAL CONTROL

When operating the machine in Cycle Arc mode this control sets the period between welds. The spot time control sets the welding period. Rotating the dial in a clockwise direction will increase the interval time, in the range 0.5 - 2.5 seconds. If the Cycle Arc mode is not required this feature may be turned off by rotating both controls fully anti-clockwise.

7. WIREFEEDER FUSE

This 5 Amp standard action fuse protects the 30Vac Wirefeeder supply circuit.

5. INSTALLATION

CONNECTION TO ELECTRICAL MAINS POWER SUPPLY

NOTE. All electrical work shall only be undertaken by a qualified electrician.

The WELDMATIC 255S (480V) is factory fitted with a 3 metre, 3 core 30/0.25 Heavy Duty PVC mains power supply cable.

The minimum capacity of the mains wiring and power outlet supplying a welder is selected according to the *effective primary current* of the machine. The effective primary current for a Weldmatic 255S is 12 Amps.

The minimum recommended circuit breaker rating for a Weldmatic 255S is 16 Amps. Note : The tripping time of a typical 15A circuit breaker can limit the duty cycle available from the Weldmatic 255S. A higher rated circuit breaker can be selected, but the mains wiring capacity must be increased to suit. The current rating of the mains cable depends on cable size and method of installation. Refer to AS/NZS 3008.1, Table 9.

If it becomes necessary to replace the mains flexible supply cable, use only cable with correct current rating. Access to the machine supply terminals is gained by removing the power source left hand side panel. (Power source viewed from front). Pass the cable through the bush fitted to the machine back panel. The cables are terminated at the terminal block as shown in Figure 2. Tighten the cable clamp leaving just sufficient slack in the cable so that the terminated wires are not in tension.

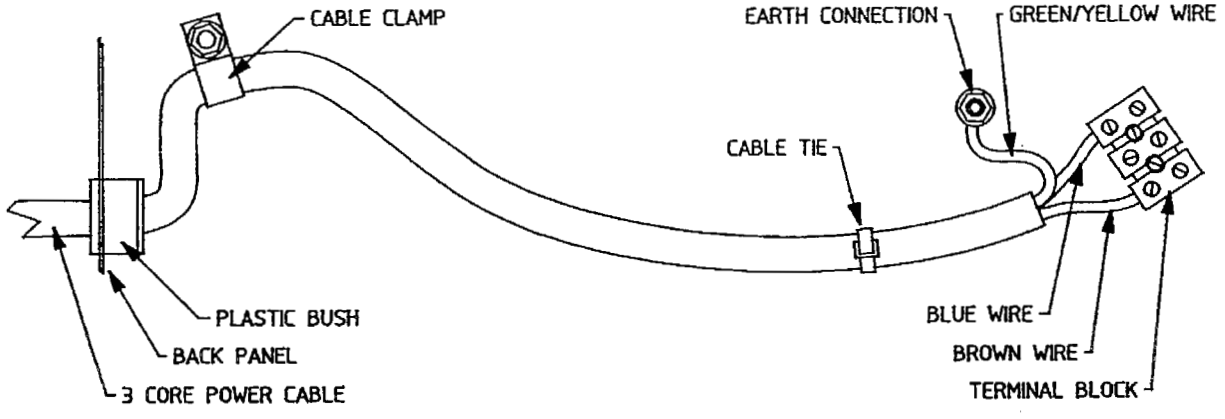

FIGURE 2. CONNECTION OF SUPPLY FLEXIBLE CABLE

FITTING THE GAS BOTTLE

Depending on configuration of the cylinder to be used, the gas flowmeter / regulator may be fitted directly to the cylinder, or in conjunction with an elbow fitting. DO NOT apply any grease to these joints, and tighten the nuts securely.

Fit the end of the gas inlet hose from the inter-connecting lead kit to the connector supplied with the flow regulator, and secure with the clamp also supplied.

FITTING THE REMOTE WIREFEEDER

The W42-0 remote wirefeeder is connected to the WELDMATIC 255S Power Source using an AM283 inter-connecting lead kit. The connection details are shown in Figure 3.

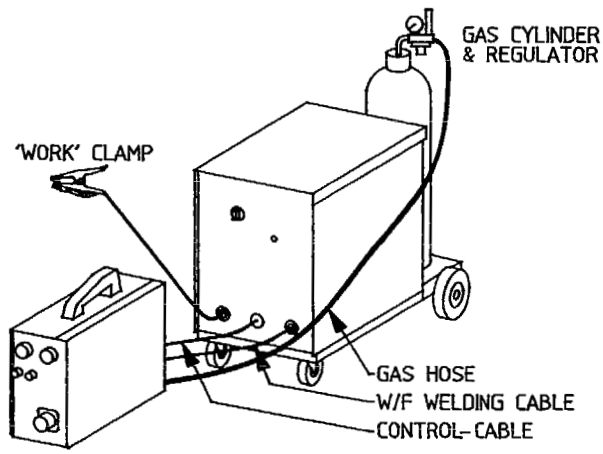

FIGURE 3. REMOTE WIREFEEDER CONNECTIONS

FITTING THE GUN CABLE

The BERNARD BEXT2-4E310AE gun cable is equipped with a 'Euro' wirefeeder connector which incorporates all required connection points to the gun cable for welding current, shielding gas and gun switch control.

To attach the gun cable to the W42-0 wirefeeding mechanism, engage the mating parts of the male and female Euro connectors, then rotate the locking ring clockwise to firmly secure the connection.

FITTING THE CONSUMABLE WIRE

The quality of the consumable wire greatly affects how reliably a gas metal arc welder will operate. For best results when welding mild steel, we recommend quality WIA AUSTMIG ES6. Dirty, rusty or kinked wire will not feed smoothly through the gun cable and will cause erratic welding. Deposits from the wire will clog the gun cable liner requiring it to be replaced prematurely.

Place the spool of welding wire onto the spool holder. The location pin should mate with a hole provided on the wire spool body. Fit the spool retaining 'R' clip supplied. Check the adjustment of the spool brake, which should be set to prevent over-run of the wire spool at the end of a weld, without unduly loading the wirefeed motor. The braking can be adjusted by the Nyloc nut using a 15/16" AF or 24mm socket wrench.

FEEDING THE CONSUMABLE WIRE

With reference to Figure 16, release the pressure screw (10), and rotate the pressure arm (8) to the open position. The end of the welding wire can now be passed through the inlet guide, over the bottom driven roller, and into the output wire guide tube. Check that the drive roller groove is correct for the wire in use. The appropriate size is stamped on the visible side of the installed roller. Check also that the correct size contact tip is fitted at the gun end. Drive roller and tip details are available in Section 11 of this manual.

Return the pressure arm to the closed position and, adjust the compression screw to provide sufficient clamping of the drive rolls drive to achieve constant wirefeed. Do not over tighten.

OUTPUT VOLTAGE POLARITY.

The design of the WELDMATIC 255S allows external selection of the output voltage polarity.

POSITIVE WIRE

Most solid wire G.M.A.W. is carried out with the work piece Negative and the welding consumable wire Positive.

To set the machine for this condition, insert the 'WORK' lead plug into the (-) output socket on the front of the power source. Insert inter-connecting 'WELD' lead plug into the (+) output socket on the front of the power source. See Figure 4 below.

NEGATIVE WIRE

Some 'self-shielded' flux cored consumables are intended to be operated with the work piece Positive and the consumable wire Negative. Refer to the manufacturers data for the particular consumable to be used.

To set the machine for this condition, insert the 'WORK' lead plug into the (+) output socket on the front of the power source. Insert inter-connecting 'WELD' lead plug into the (-) output socket on the front of the power source. See Figure 5 below.

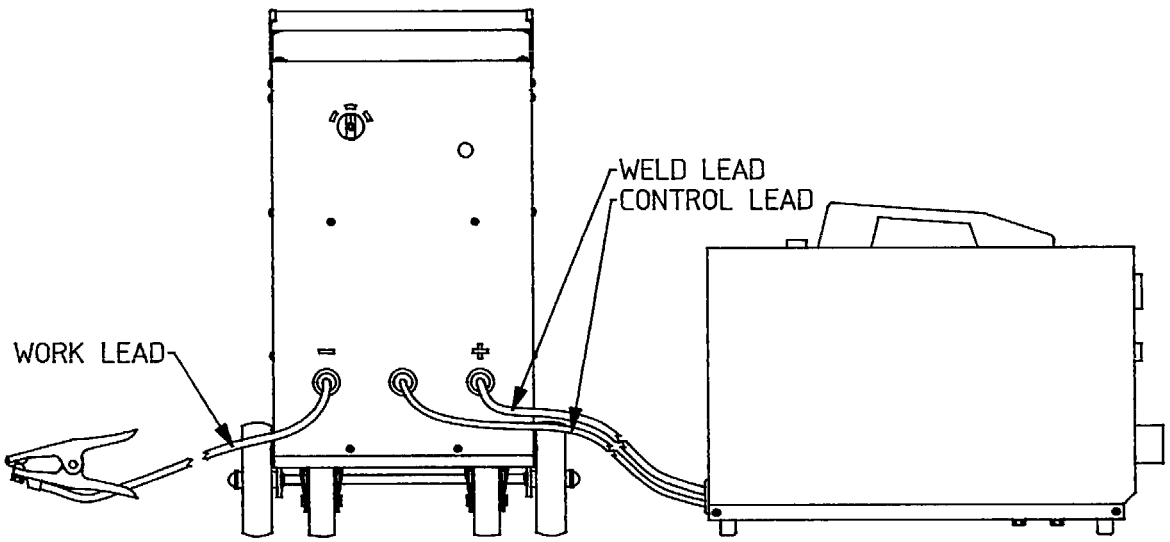

FIGURE 4. POSITIVE WIRE

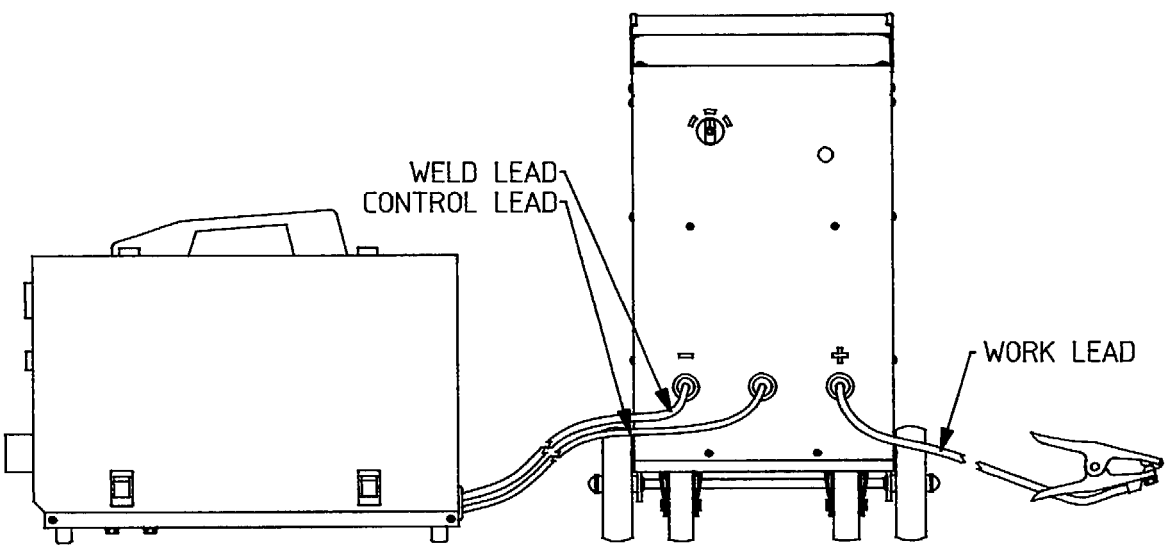

FIGURE 5. NEGATIVE WIRE

6. NORMAL WELDING SEQUENCE

WELD START

Closing the welding gun switch initiates this sequence of events:

- The gas valve is energised, gas flow commences;
- The power source contactor function is initiated. Welding voltage is applied between the work piece and the consumable wire.
- The wire drive motor is energised. Wirefeed commences and the arc is established.

WELD END

Releasing the gun switch initiates this sequence of events:

- The wire drive motor is de-energised, and is dynamically braked to a stop;
- After a short pre-set period, known as the 'burn-back' time, the Power-source contactor function is released. This period ensures that the consumable wire does not 'freeze' in the weld pool. To adjust the 'burn-back' time, refer to Figure/Section 12.
- The gas valve is de-energised and the flow of shielding gas ceases.

7. BASIC WELDING INFORMATION

CHOICE OF SHIELDING GAS

The choice of shielding gas is largely determined by the consumable wire to be used. Many proprietary shielding gas mixtures are available.

The recommended shielding gases for use with the WELDMATIC 255S are :

- Mild Steel ..... Argon + 5 to 25% Carbon Dioxide;
- Aluminium ..... Argon;
- Stainless Steel ..... Argon + 1 to 2% Oxygen.

Consult your gas supplier if more specific information is required.

SHIELDING GAS FLOW RATE

In G.M.A. welding, one of the functions of the shielding gas is to protect the molten weld pool from the effects of oxygen in the atmosphere. Without this protection the weld deposit becomes 'honeycombed' in appearance, an effect which is described as weld porosity.

In draft-free conditions the gas flow rate required to give adequate protection is typically 10 litres/min. In situations where drafts cannot be avoided, it may be necessary to increase this rate and/or to provide screening of the work area.

Weld porosity can also be caused by air entering the gas stream through a damaged hose, loose gas connection, or from restriction in the nozzle, such as from excess build-up of spatter.

ESTABLISHING A WELD SETTING

Once the consumable wire type, wire size and shielding gas have been chosen, the two variables which are adjusted in order to obtain a stable arc are;

- Wirefeed speed,
- Welding arc voltage.

The wirefeed rate determines the welding current; increasing the feed rate increases the current, and decreasing it decreases current. The selected wirefeed rate must be matched with sufficient arc voltage; an increase of wirefeed rate requires an increase of arc voltage.

If the voltage is too low the wire will stub and stutter, and there will not be a steady arc. If the voltage is too high the arc will be long with the metal transfer within the arc occurring as a series of large droplets.

The welding current should be chosen to suit the thickness of the metal to be welded. It is important to check that the deposited weld provides sufficient strength to suit the application.

A "good" weld will have the characteristics illustrated in Figure 6. The weld has penetrated into the parent metal, fusing the root of the joint where the two plates meet, and the weld blends smoothly into the side walls.

A "bad" weld is shown in Figure 7. The weld has not penetrated the joint root, and there is poor side wall fusion. This lack of fusion would normally be corrected by increasing the arc voltage, or by increasing both wirefeed rate and arc voltage to achieve a higher current weld setting.

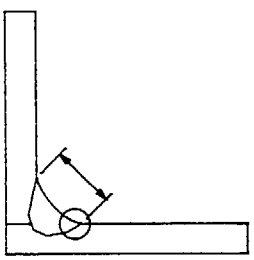

FIGURE 6. "GOOD" WELD

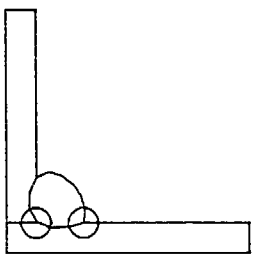

FIGURE 7. "BAD" WELD

GUN POSITION

For "down hand" fillet welding, the gun is normally positioned as shown in Figure 8 below with the nozzle end pointing in the direction of travel.

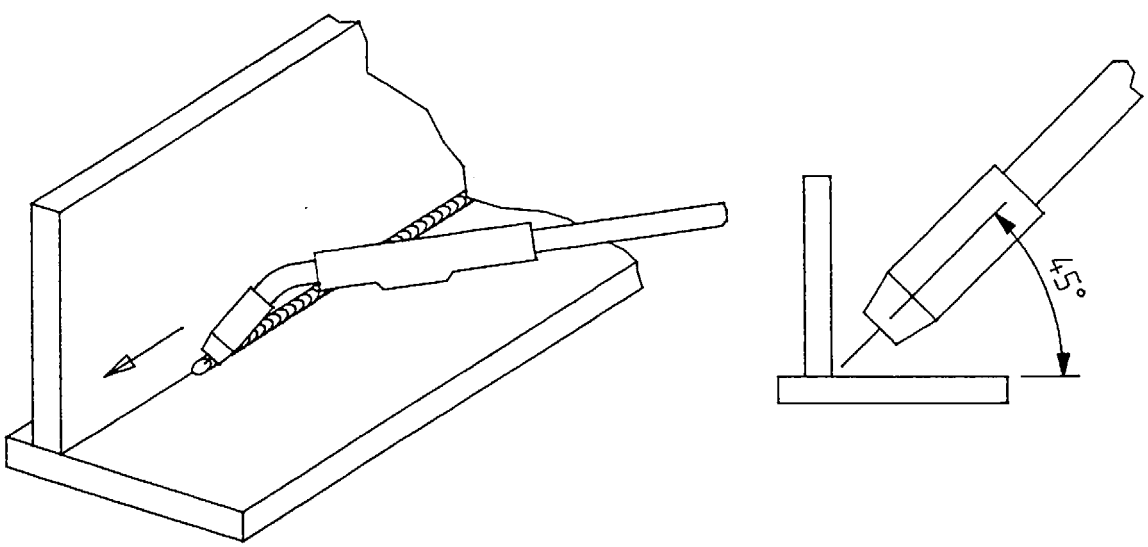

FIGURE 8. GUN POSITION

8. GENERAL MAINTENANCE

Before removing the machine cover, ENSURE that the unit is disconnected from the mains power supply. When the unit is energised LETHAL VOLTAGES are present on the electrical components enclosed.

DUST

Care should be taken to prevent excessive build-up of dust and dirt within the welding power source. It is recommended that at regular intervals, according to the prevailing conditions, the machine covers and enclosed wirefeeder covers be removed and any accumulated dust be removed by the use of dry, low pressure compressed air, or a vacuum cleaner.

WIREFEED

In order to obtain the most satisfactory welding results from the G.M.A.W. process, the wirefeed must be smooth and constant. It is therefore important to observe the following points;

- Keep the gun cable liner clear of dust and swarf build-up. When replacement becomes necessary, fit only the correct liner to suit the gun cable model. See page 23. The build-up of dust in a cable liner can be minimised by regular purging of the liner with dry compressed air. This may be conveniently done each time the wire spool is replaced.
- Replace the welding tip as it becomes worn.
- Keep the wire drive mechanism clean. Periodically check the drive rollers for wear and for free rotation.
- Check that the consumable wire spool holder rotates smoothly and that the braking action is not excessive. This also may be conveniently done each time the wire is replenished.

9. TROUBLE SHOOTING

FAULT	REMEDY
Power source has no power	Turn on mains supply switch
	Check mains voltage, fuses or circuit breaker
	Check all primary connections in power source and in primary plug
Power source has no output when gun switch is closed and wirefeeder has no power but : 1) power source fan is running 2) wirefeeder power light is off	Check control lead is plugged to front socket of power source
	Check 5A wirefeeder fuse on power source. Replace if blown
	Check all connections to W42-10 circuit board in wirefeeder
	Check control lead for damage or broken solder joints in the 6 pin plug
	Check control transformer in power source for an input voltage of 480Vac and an output voltage of 32Vac. Replace if faulty
	Replace W42-10 circuit board in wirefeeder
Power source has no output when gun switch is closed but: 1) power source fan is running 2) wirefeeder power light is on 3) there is no wirefeed	Gun switch circuit incomplete. Check gun switch for continuity with Ohm meter when switch is pressed. Replace if faulty
	Gun switch circuit incomplete. Check the 2 pin receptacles in euro adaptor of wirefeeder are making contact with the 2 pins from the gun cable. If the pins have been accidentally pushed in, push and fix the pins back in place with glue or Loctite
	Check the two wires from wirefeed motor are connected to W42-10 circuit board
	Replace W42-10 circuit board.
Power source has no output when gun switch is closed but 1) power source fan is running 2) wirefeeder power light is on 3) there is wirefeed	Power source overheated. Allow thermostats to cool with fan on
	Check control lead for damage or broken solder joints in the 6 pin plug
	After cooling, check rectifier thermostat and inductance thermostat for open circuit. Replace if faulty
	Check all connections to CP107-10 circuit board in power source
	Replace CP107-10 circuit board in power source
	Replace W42-10 circuit board in wirefeeder
Live output all the time when power source is switched on and gun switch is off	Check solid state relay in power source. Switch off mains power and disconnect wires from terminals 3 & 4 of solid state relay. Switch on mains power and if output is still live, replace solid state relay
	Replace CP107-10 circuit board in power source
	Replace W42-10 circuit board in wirefeeder
Power source has low weld output	Check all cable connections in power source for hot spots. Check welding circuit is making good electrical connection
Wirefeeder fuse blows instantly when power source is switched on	Check control lead for internal bridging of wires
	Replace W42-10 circuit board in wirefeeder
	Replace CP107-10 circuit board in power source
Wirefeeder fuse blows after a period of welding	Too much drive roller pressure on wire. Reduce pressure
	Check gun liner for build up of dirt or blockage. Replace if dirty

TROUBLE SHOOTING cont.

FAULT	REMEDY
Mains fuses blow or circuit breaker trips instantly when power source is switched on	Check welding transformer for a fault to earth. Replace if faulty
	Check fan in power source for short circuit or fault to earth. Replace if faulty
	Check control transformer for short circuit or fault to earth. Replace if faulty
Mains fuses blow or circuit breaker trips instantly when gun switch is closed	Check welding transformer for shorted turns. Replace if faulty
	Check rectifier for shorted diodes. Replace if faulty
Mains fuses blow or circuit breaker trips when welding	Check that the recommended fuse or circuit breaker rating has been used

UNSATISFACTORY WELDING PERFORMANCE AND RESULTS

FAULT	REMEDY
Erratic arc characteristics caused by poor wirefeed	Check gun liner for build up of dirt or blockage. Replace if dirty
	Check if wire is slipping on roller assembly. Replace feed roll if worn
	Check if there is too much drive roller pressure on wire
	Check spool holder is rotating smoothly
	Check that gun liner is not too short and is fitted correctly. Refer to page 23 for fitting instructions.
Constant poor arc characteristics	Check correct polarity has been selected for work and weld cables. Refer to page 8
	Check shielding gas is correct for the consumable in use
	Check welding circuit is making good electrical connection
	Check all connections in power source and wirefeeder for hot spots
Porosity in weld caused by lack of shielding gas	Check gas solenoid. Replace if faulty
	Check that the correct gas flow rate has been set
	Check for leaks in gas hose. Replace if leaking
	Check for leaks in gun cable, eg. o-rings. Replace if leaking
	Check nozzle is firmly attached to gun and that no air is being drawn in

10. SERVICE INFORMATION. POWER SOURCE

SOLID STATE RELAY CONTROL BOARD CP107-10

The Solid State Relay Control board and associated Solid State Relay provides the following functions, when Power Source is connected to Wirefeeder.

- Welding transformer ON/OFF control in response to an output from the wirefeed control board, (the contactor function).
- Output voltage control by means of Phase-shifting of the Welding transformer primary voltage, as adjusted by the wirefeeder front panel "FINE VOLTAGE SELECTION" knob.

Connections to the board are detailed in the drawing below.

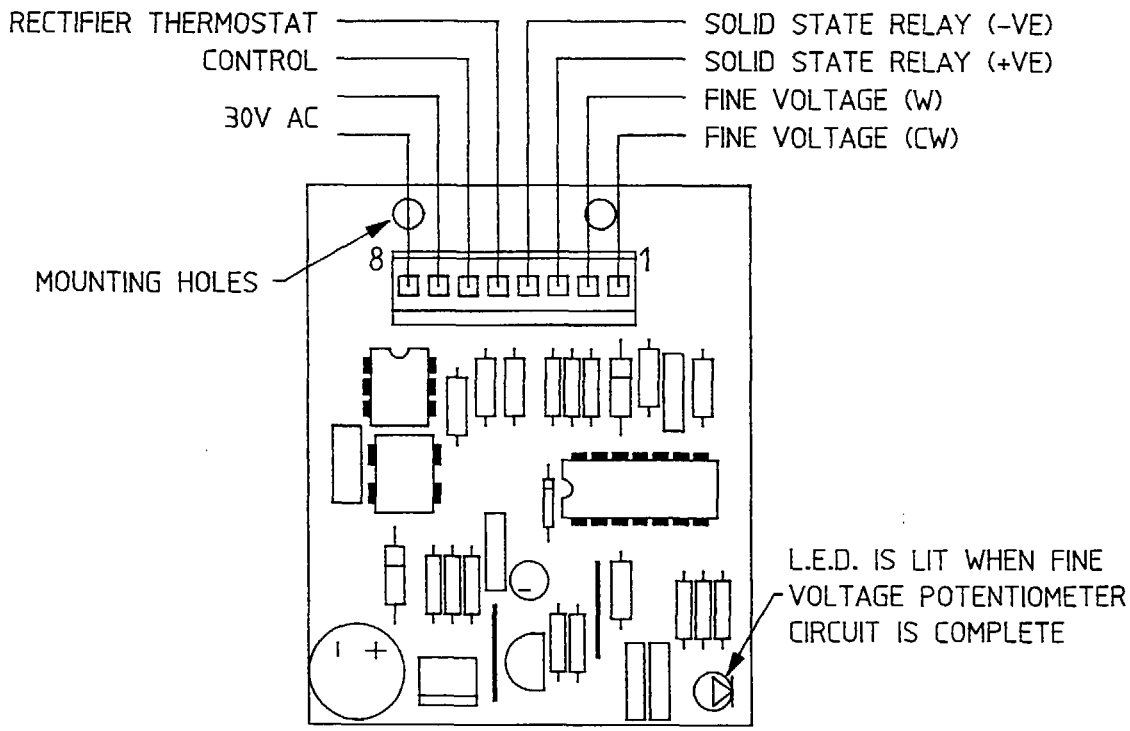

FIGURE 9. SOLID STATE RELAY CONTROL BOARD

11. PARTS LIST

WELDMATIC 255S POWER SOURCE

ITEM #	PART #	DESCRIPTION
1	CP107-34	Rectifier Assembly
Includes		
1.1	CP106-0/1	Rectifier Assembly with Thermal overload
1.2	CP107-51	Solid State Relay Heatsink Assy (480V)
1.2.1	CP107-10	PCB Assy Solid State Relay Control
1.2.2	CP106-1/2	Solid State Relay 480V
1.2.3	CP107-41/2	Heatsink
1.2.4	CP107-41/1	Dust Shield
2	CP107-55L	Welding Transformer Assembly inc. Wire Loom
3	CP107-42	Inductance Assembly inc. Overload
4	CP107-43	Capacitor Bank
Includes		
4.1	CP43-25	Mounting Bracket
4.2	CP102-12/8	Capacitor (4)
4.3	CP105-31/2	Capacitor Rail (2)
5	CP106-20/2	Discharge Resistor (4)
6	CP43-23	Base Assembly
Includes		
6.1	CP42-24/6	Castor Wheel (2)
7	CP107-22Y	Front Panel
8	CP43-21Y	Back Panel
9	CP43-24Y	Side Panel (2)
10	CP106-25Y	Top Panel
11	CP44-22	Shelf Panel
12	CP42-0/3	Rubber Tyre Wheel (2)
13	MC11-53/6	Ratchet Cap (2)
14	MK6/3	Terminal Block, 3 position
15	W1-23	Fuse Holder
16	F3AG5A	Fuse 5 Amp Standard Action
17	CP44-0/2	Cooling Fan 415V
17A	CP107-1/3	Fan Resistor (Not Shown)
18	CP107-1/1	Auxiliary Transformer
19	CP107-44	Cable Inductor End to Capacitor Neg. Rail
20	CP107-45	Cable Transformer to Rectifier AC
21	CP107-46	Cable Capacitor Pos. Rail to Pos. O/P Terminal
22	CP107-52	Cable Limit Ind. Start to Rectifier Neg.
23	CP107-53	Cable Capacitor Pos. Rail to Rectifier Pos.
24	CP107-54	Cable Inductor Start to Neg. O/P Terminal
25	CP107-47	Busbar Transformer to Rectifier AC
26	W39-0/1	Switch Coarse
27	CP107-38	Loom Assembly - High Voltage (Not Shown)
28	CP107-49	Loom Assembly - Low Voltage (Not Shown)
Includes		
28.1	CP107-49/1	Socket 6 pin
29	H774	Cup Terminal
30	H774W	Washer
31	H285	Earth Tab
32	H907	Cable Clamp
33	MC14-0/10	Male Insulating Bush
34	MC14-0/11	Female Insulating Bush
35	CX58	Output Terminal Assembly (2)
36	SCG030M	Steel Chain 650mm
37	CP107-1/4	Primary Flex
39	CP42-39	Handle Assembly

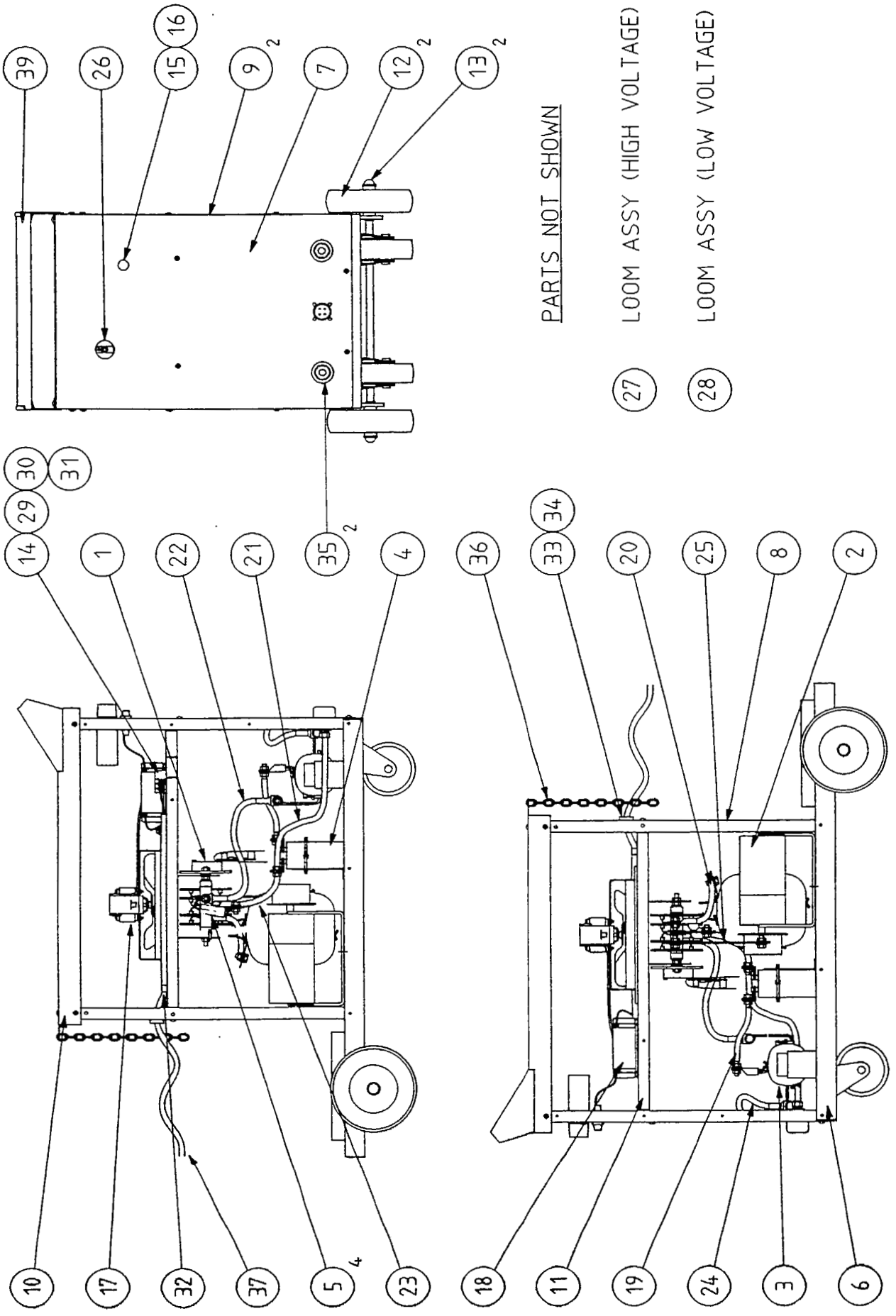

FIGURE 10. WELDMATIC 255S POWER SOURCE ASSEMBLY

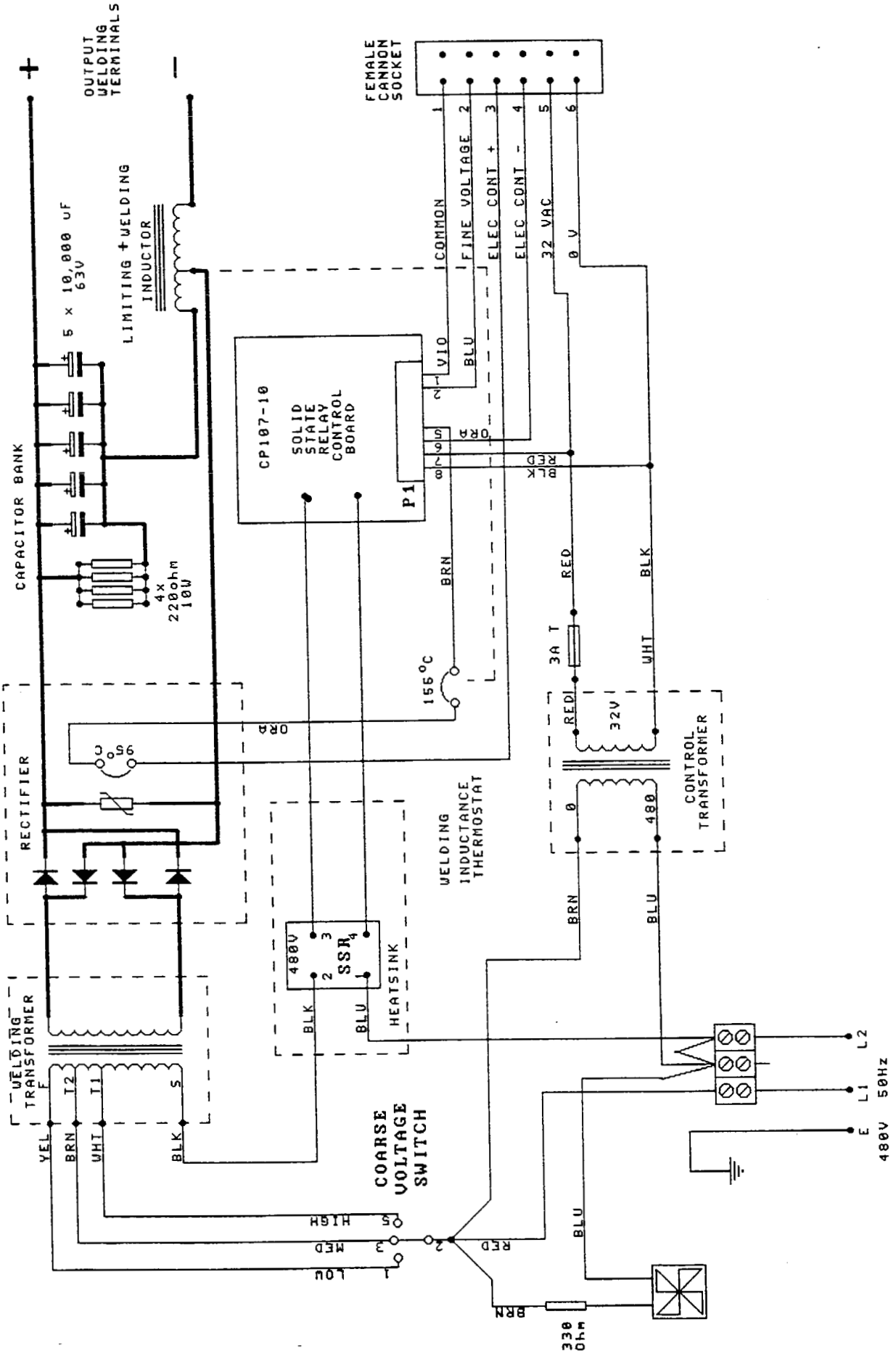

FIGURE 11. CP107-1 CIRCUIT DIAGRAM

12. SERVICE INFORMATION. REMOTE WIREFEEDER

WIREFEED CONTROL BOARD W42-10

The Wirefeed control board provides the following circuit functions, when Power Source is connected to Wirefeeder:

- Wirefeed motor ON / OFF control in response to the gun-switch.
- Speed control of the wirefeed motor.
- 'Burn-back' control.
- Braking of the wirefeed motor at end of weld.
- Spot-weld timer.
- Interval timer.
- Control of the gas solenoid valve.

Connections to the board, and Service points are detailed in the drawing below.
The circuit is factory adjusted to provide a maximum drive roller speed of 160 rpm.

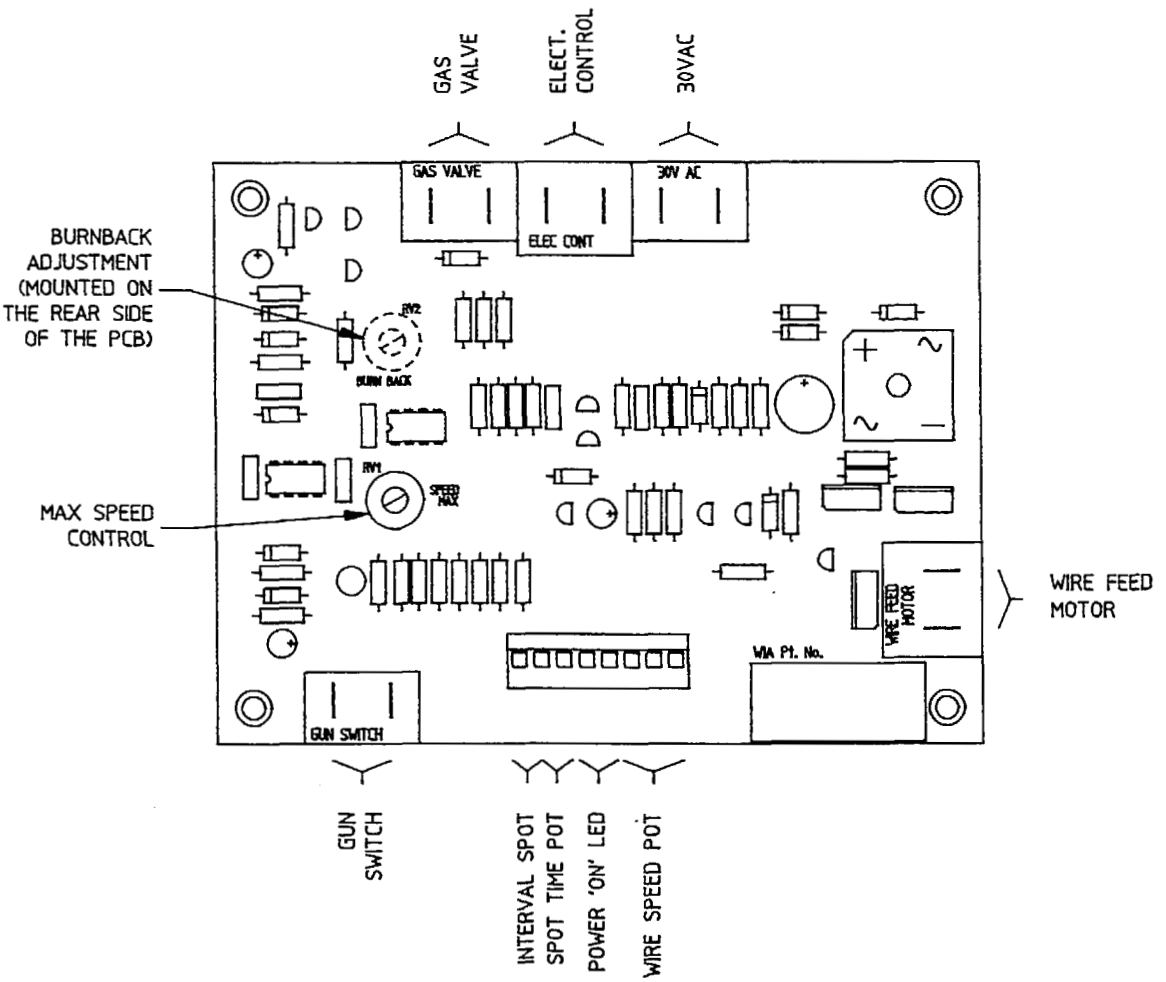

FIGURE 12. WIREFEED CONTROL BOARD

13. PARTS LIST

W42-0 WIREFEEDER (WITH CONTROLS)

ITEM #	PART #	DESCRIPTION
1	W42-10	PCB Assembly Wirefeed Control
2	W41-20Y	Base Panel
3	W39-12Y	Front Panel
4	W39-13Y	Back Panel
5	W39-14Y	Top/Side Panel
6	W39-15Y	Door Panel
7	W39-16Y	Divider Panel
8	W40-1	Motor and 2 Roll Drive
9	MC11-32/2	Insulating Bush (2)
10	W39-17	Motor Insulator (2)
11	TC396-12	Euro Adaptor
12	CP101-0/18	Gas Valve
13	W11-11/1	Hose Tail (2)
14	OCL8	'O' Clip 5/16"
15	AM177	Spool Holder Assembly
Includes		
15.1	AM133-3	'R' Clip
16	W42-18	Loom Assembly, Gas Valve
17	W39-20	Loom Assembly, Fine Voltage
Includes		
17.1	CP34-36/2	Potentiometer, 1K
18	W42-21	Loom Assembly, Remote Pots
Includes		
18.1	CP27-11/26	Potentiometer, 50K, Switched (2)
18.2	CP101-11/8	Potentiometer, 10K. A Type
18.3	W17-0/11	Indicator Light
19	HF200-1/15	Support Foot (4)
20	MC36-56/21	Male Bush
21	CP5-0/8	Female Bush
22	H907	Cable Clamp
23	W41-0/1	Hinge L.H.
24	W41-0/2	Hinge R.H.
25	W29-1/20	Slam Action Latch (2)
26	W5-10/19	Small Knob (2)
27	W11-0/16	Large Knob (2)
28	S140-0/1	Handle
29	CP102-0/18	PCB Support (4)

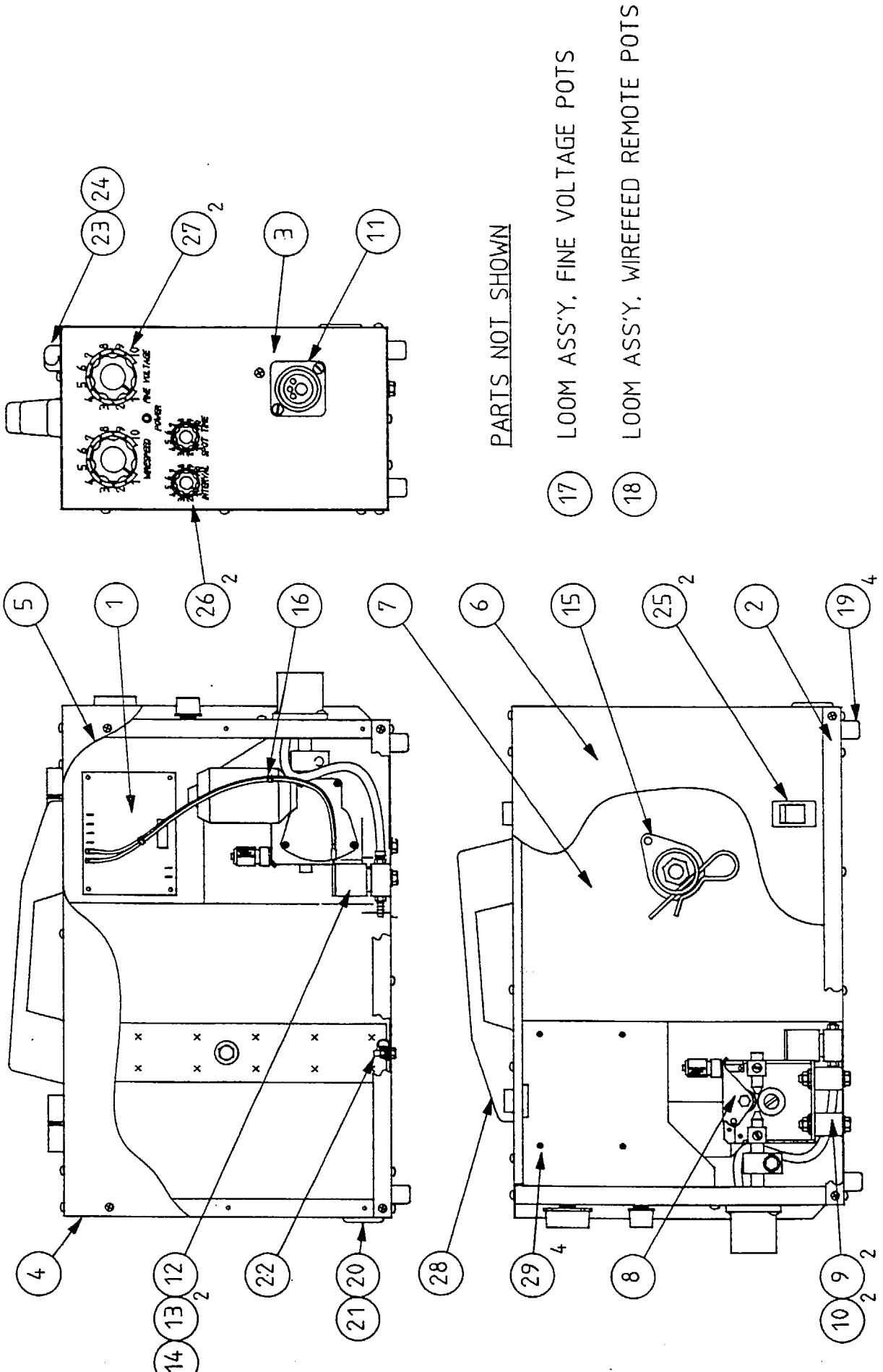

FIGURE 13. W42-0 WIREFEEDER (WITH CONTROLS)

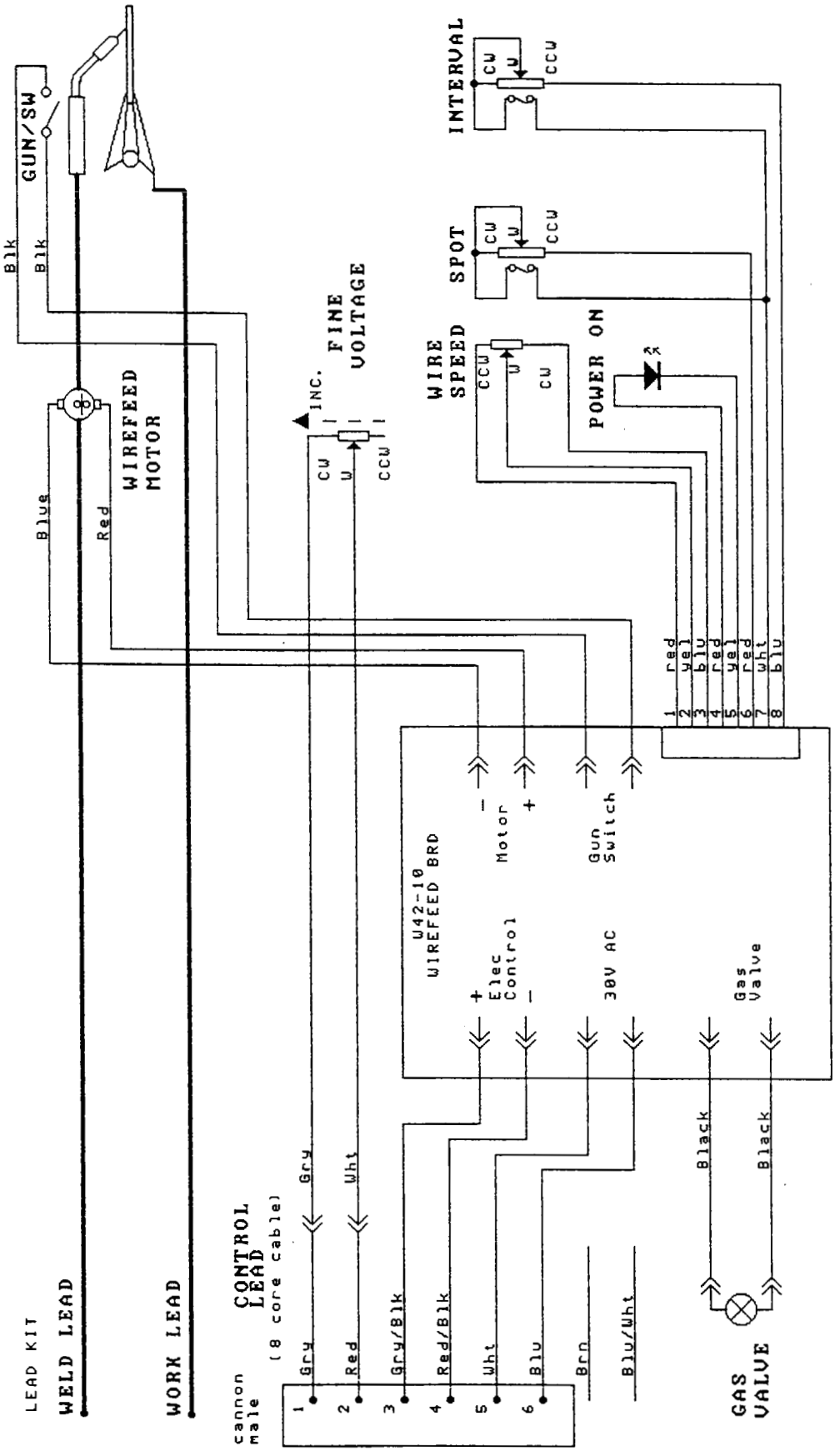

FIGURE 14. W42-0 WIRE FEEDER CIRCUIT DIAGRAM (WITH LEAD KIT)

BEXT-4E310AE GUN ASSEMBLY

1	BE4392	Nozzle
2	BE7497	Contact Tip 0.6mm
	BE7488	Contact Tip 0.8mm
	BE7498	Contact Tip 0.9mm
	BE7490	Contact Tip 1.2mm
3	BE4335	Head
4	BE4323R	Cap
5	BE4780	Nut Insulator
6	BE1370117	Insulator
7	BE1370116	Body Tube
8	BE1780006	Handle Kit
9	BE5662	Trigger Assembly
10	BE1880004	Screw Kit
14	BE1480012	Cable Assembly 3M.
15	BE4E213B	End Fitting
16	BE4305	Cone Nut
17	BE2660001	Terminal
18	BE1520008	Clamp
19	BE2520017	Strain Relief, Flexible
20	BE1470007	Bushing
21	BE1880135	Strain Relief, Rigid
22	BE2280002	Screw
23	H2072	Insulated Link
24	BE4816	Nut
25	BE5060	Euro Block
26	BE4421	'O' Ring
27	BE9165	'O' Ring (Small)
28	BE43110	Liner 0.9mm-1.2mm

To replace liner: Disconnect gun cable assembly from the Euro adaptor on the machine case, remove nozzle (1) and head (3). Withdraw old liner from the wire feeder end. Insert new liner and refit gun cable assembly to Euro adaptor on the machine case. At the gun end, compress the liner within the gun cable, then cut it one contact tip length past the end of the body tube (7). Refit head, tip and nozzle.

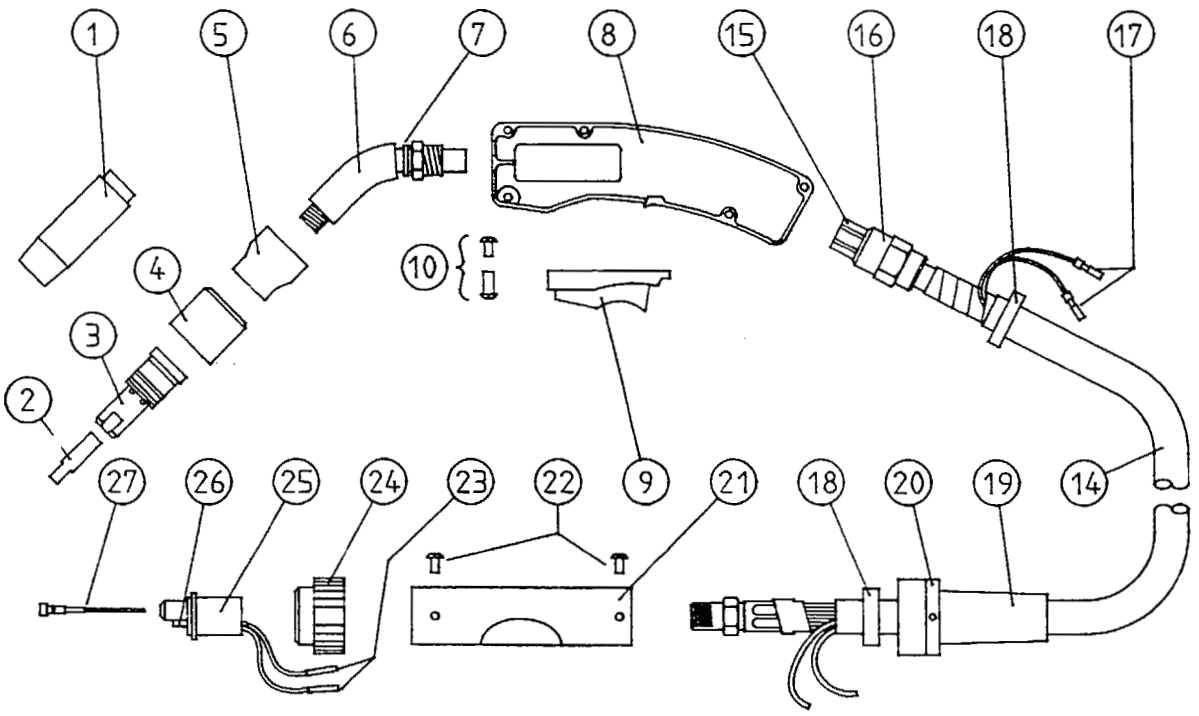

FIGURE 15. BEXT-4E310AE (300 AMP) GUN CABLE ASSEMBLY

W40-1 MOTOR & TWO ROLL DRIVE ASSEMBLY

ITEM #	PART #	DESCRIPTION
1	W26-0/1	Motor & Gearbox
2	W26-0/3	Screw M6x12
3	W26-0/4	Key
4	W27-1/1	Feed Plate
5	W26-5/8	Feed Roll 0.9 - 1.2mm
6	W27-0/9	Positioning Screw
7	W27-1/2	Axle
8	W27-1/4	Pressure Arm complete
Includes		
8.1	W27-1/5	Axle
8.2	W27-1/6	Pressure Arm
8.3	W27-1/7	Spacer (narrow)
8.4	W27-1/8	Pressure Roll
8.5	W27-1/9	Spacer (large)
8.6	W27-1/10	Axle Clip
9	W26-0/13	Inlet Guide
10	W27-1/11	Pressure Screw complete
Includes		
10.1	W27-1/12	Thumbscrew
10.2	W27-1/20	Spring
10.3	W27-1/14	Base
10.4	W27-1/15	Pressure Link
11	W27-1/16	Pressure Screw Axle
12	W27-1/17	Spring
13	W27-1/18	Pin
14	W27-1/3	External Circlip 4mm ID
15	W27-1/19	External Circlip 5mm ID

ALTERNATIVE PARTS

(5)	W26-1/8	Feed Roll 0.8 + 1.0mm
(5)	W26-2/8	Feed Roll 1.0 + 1.2mm
(5)	W26-3/8	Feed Roll 1.0 + 1.2mm Alum.
(5)	W26-4/8	Feed Roll 1.2 + 1.6mm
(5)	W26-5/8	Feed Roll 0.9 + 1.2mm
(5)	W26-6/8	Feed Roll 1.2 + 1.6mm, Knurled.
(5)	W26-7/8	Feed Roll 1.0 + 1.2mm, Knurled.
(9)	W27-1/13	Inlet Guide 3mm
(9)	W27-2/13	Inlet Guide 2mm
(9)	W26-2/13N	Inlet Guide 2mm, Nylon

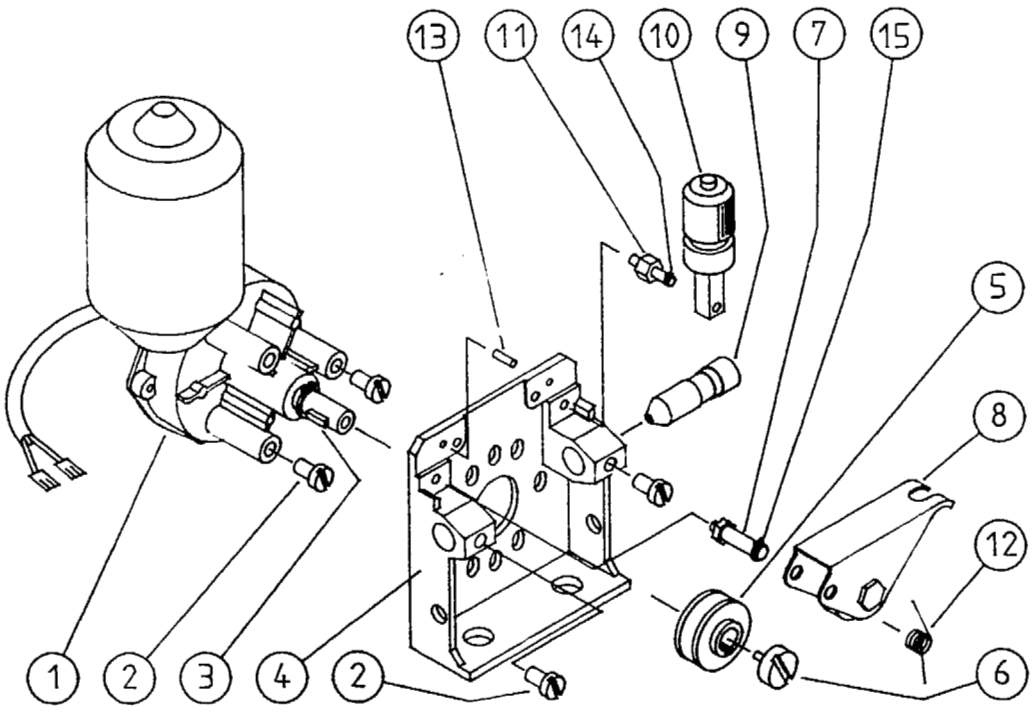

FIGURE 16. W40-1 TWO ROLL DRIVE ASSEMBLY

AM283 INTER-CONNECTING LEAD KIT

ITEM #	PART #	DESCRIPTION
1	AM280-1/5	Work Lead
Includes		
1.1	CABW25	Welding Cable 25mm^2
1.2	CX21	Plug
1.3	C232-CM	Work Clamp 300Amp
1.4	H1369	Cable Lug
2	AM280-2/8	Weld Lead
Includes		
2.1	CABW25	Welding Cable 25mm^2
2.2	CX21	Plug
2.3	H1368	Cable Lug
3	AM283-3/8	Control Lead
Includes		
3.1	CAB8C32	Cable 8 Core
3.2	AM283-1	Plug 6 Pin
3.3	H1972ET	Quick Connect Lug, Female (6)
3.4	H1138	Insulator (2)
4	AM280-4/8	Gas Hose
Includes		
4.1	62513	Gas Hose 5mm
4.2	OCL13	'O' Clip 1/2" (2)

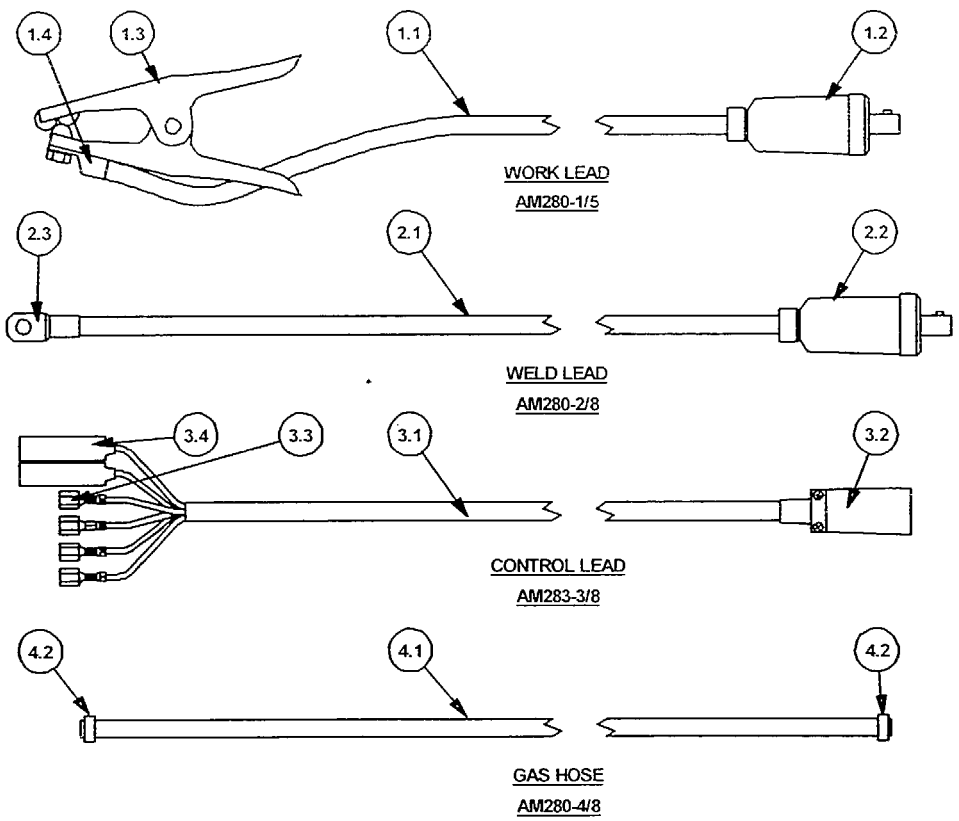

FIGURE 17. AM283 INTER-CONNECTING LEAD KIT

14. SAFE PRACTICES WHEN USING WELDING EQUIPMENT

These notes are provided in the interests of improving operator safety. They should be considered only as a basic guide to Safe Working Habits. A full list of Standards pertaining to industry is available from the Standards Association of Australia, also various State Electricity Authorities, Departments of Labour and Industry or Mines Department and other Local Health or Safety Inspection Authorities may have additional requirements. WTIA Technical Note TN7-98 also provides a comprehensive guide to safe practices in welding.

EYE PROTECTION

NEVER LOOK AT AN ARC WITHOUT PROTECTION. Wear a helmet with safety goggles or glasses with side shields underneath, with appropriate filter lenses protected by clear cover lens. This is a MUST for welding, cutting, and chipping to protect the eyes from radiant energy and flying metal. Replace the cover lens when broken, pitted, or spattered.

Recommended shade filter lens.

Amps	TIG	MMAW	MIG	Pulsed MIG
0-100	10	9	10	12-13
100-150	11	10	10	12-13
150-200	12	10-11	11-12	12-13
200-300	13	11	12-13	12-13
300-400	14	12	13	14
400-500	--	13	14	14
500 +	--	--	14	14

BURN PROTECTION.

The welding arc is intense and visibly bright. Its radiation can damage eyes, penetrate lightweight clothing, reflect from light-coloured surfaces, and burn the skin and eyes. Burns resulting from gas-shielded arcs resemble acute sunburn, but can be more severe and painful.

Wear protective clothing - leather or heat resistant gloves, hat, and safety-toe boots. Button shirt collar and pocket flaps, and wear cuffless trousers to avoid entry of sparks and slag.

Avoid oily or greasy clothing. A spark may ignite them. Hot metal such as electrode stubs and work pieces should never be handled without gloves.

Ear plugs should be worn when welding in overhead positions or in a confined space. A hard hat should be worn when others are working overhead.

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

TOXIC FUMES.

Adequate ventilation with air is essential. Severe discomfort, illness or death can result from fumes, vapours, heat, or oxygen depletion that welding or cutting may produce. 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 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 air-supplied respirator.

Vapours from chlorinated solvents can be decomposed by the heat of the arc (or flame) to form PHOSGENE, a highly toxic gas, and lung and eye irritating products. The ultra-violet (radiant) energy of the arc can also decompose trichlorethylene and perchlorethylene vapours to form phosgene. Do not weld or cut where solvent vapours can be drawn into the welding or cutting atmosphere or where the radiant energy can penetrate to atmospheres containing even minute amounts of trichlorethylene or percholorethylene.

FIRE AND EXPLOSION PREVENTION.

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 operator. Sparks and slag can travel up to 10 metres from the arc.

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

If combustibles are present in the work 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 can not be moved, move combustibles at least 10 metres 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.

A person acting as Fire Watcher must be standing by with suitable fire extinguishing equipment during and for some time after welding or cutting if;

- Combustibles (including building construction) are within 10 metres.
- Combustibles are further than 10 metres but can be ignited by sparks.
- Openings (concealed or visible) in floors or walls within 10 metres may expose combustibles to sparks.
- Combustibles adjacent to walls, ceilings, roofs, or metal partitions can be ignited by radiant or conducted heat.

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

A tank or drum which has contained combustibles can produce flammable vapours when heated. Such a container must never be welded on or cut, unless it has first been cleaned as described in AS.1674-1974, the S.A.A. Cutting and Welding Safety Code. 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 AS.1674-1974. Water-filling just below working level may substitute for inerting.

Hollow castings or containers must be vented before welding or cutting. They can explode. Never weld or cut where the air may contain flammable dust, gas, or liquid vapours.

SHOCK PREVENTION.

Exposed conductors or other bare metal in the welding circuit, or ungrounded electrically alive equipment can fatally shock a person whose body becomes a conductor. Ensure that the machine is correctly connected and earthed. If unsure have machine installed by a qualified electrician. On mobile or portable equipment, regularly inspect condition of trailing power leads and connecting plugs. Repair or replace damaged leads.

Fully insulated electrode holders should be used. Do not use holders with protruding screws. Fully insulated lock-type connectors should be used to join welding cable lengths.

Terminals and other exposed parts of electrical units should have insulated knobs or covers secured before operation.