

for

HDA-200 AND HDA-300 CONSTANT CURRENT WELDING POWER SUPPLIES



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I. Introduction

This booklet covers the installation, operation, maintenance and repair of the HDA-200 and HDA-300 Constant Current Welding Power Supplies.

A. Description

The HDA-200 and HDA-300 assemblies are 200 and 300 ampere ac-dc production welders. Each contains a built-in high frequency generator which makes it especially suitable for tungsten inert gas welding. They are also suitable for both metal inert gas and metal arc welding. The addition of an optional timer makes the HDA-200 and HDA-300 useful for spot and other timed welding processes.

Both units have welded frame construction and tough sheet steel panels which provide solid protection against dirt and damage. A sturdy, simple cabinet design makes all parts readily available for inspection and service. Ample cooling is provided by a large fan and generous openings at the base of the enclosure.

Figure 2 shows an HDA-300 Power Supply mounted on a water-cooler truck with optional ac and dc welding voltmeters and ammeters and a foot operated contactor and amperage control. The HDA-200 is identical in appearance and size.

B. Wide Range of Output Currents

A three position current selector switch offers a choice of AC, DCRP or DCSP welding current. A four step range selector switch provides HIGH, MEDIUM, LOW and SPECIAL LOW current ranges. Available ac and dc currents range from a low of 2 amperes to full rated 200 or 300 ampere output with a 60% duty cycle. Higher currents may be drawn at reduced duty cycles. A 3/4 turn of the panel mounted Current Set control provides fine adjustment throughout the range selected.

Both manual and foot operated remote current and contactor control devices may be used in addition to the panel control. A soft start control switch minimizes burn-through when welding thin metal. A stabilizing reactor smooths the current in dc welding.

C. Welding Process Control

A three position MODE switch on the front panel affords a selection of Inert Gas, Metal Arc or Timed Welding. Gas and water flow are turned on and off in the "Inert Gas" and "Timed Weld" positions and locked out in the "Metal Arc" position. Both pre-purge and post-purge of the water and gas lines are provided in the "Inert Gas" and "Timed Weld" positions.

D. High Frequency Circuitry

A three position switch provides a choice of continuous high frequency (for ac inert gas welding), high

frequency starting (for dc inert gas welding) or no high frequency. A panel operated high frequency intensity control permits precise adjustment of the oscillator circuit when working with "hard to weld" metals. A high frequency phase shift control, which is adjusted concurrently with the intensity control, makes it easy to achieve just the right arc characteristics.

The intensity rheostat in the oscillator circuit is in series with the oscillator condenser. Its function is to dampen the high voltage peaks in the oscillator circuit. These peaks could be of very high magnitude and could increase the radio interference range beyond allowable limits. The limiting of this radio interference was the original purpose for using the rheostat. However, in Inert Gas Welding, adjustment of this resistor also helps in reducing the tendency of sporadic action of the high frequency in the arc zone to give smoother welding operation.

The phase shift rheostat is in series with the primary of the high frequency transformer which is supplied by 60 cycle ac power. Adjustment of this rheostat also affects the magnitude of the high frequency, since the input voltage to the oscillator circuit can be varied. However, this adjustment does not affect the peaks in the two megacycle oscillator circuits. The purpose of the phase shift rheostat is to shift the high frequency to a position where it will give maximum ionization at the proper instant to allow the available open circuit to reestablish the welding current flow after it has gone through the zero point on the alternating wave.

Cleaning action is essential in tig welding of aluminum to produce proper coalescence of metal. To aid in this end, a cleaning circuit is added across the output of the welder. This circuit consists of a 10 ohm non-inductive resistor and 10 microfarad capacitor in series connected across the welder output and mounted on the high frequency and induction coil assembly.

This RC combination acts to produce a phase shifted condenser discharge into the arc. This discharge fires ahead of the welding current, thus producing a higher degree of cleaning action.

E. Auxiliary Control Circuit

An auxiliary control transformer supplies power to the fan, control valves, and the 115 volt service outlet which is fused for 600 watts. Provision has been made for remote on-off control of the welding current, high frequency, and gas and water solenoid valves.

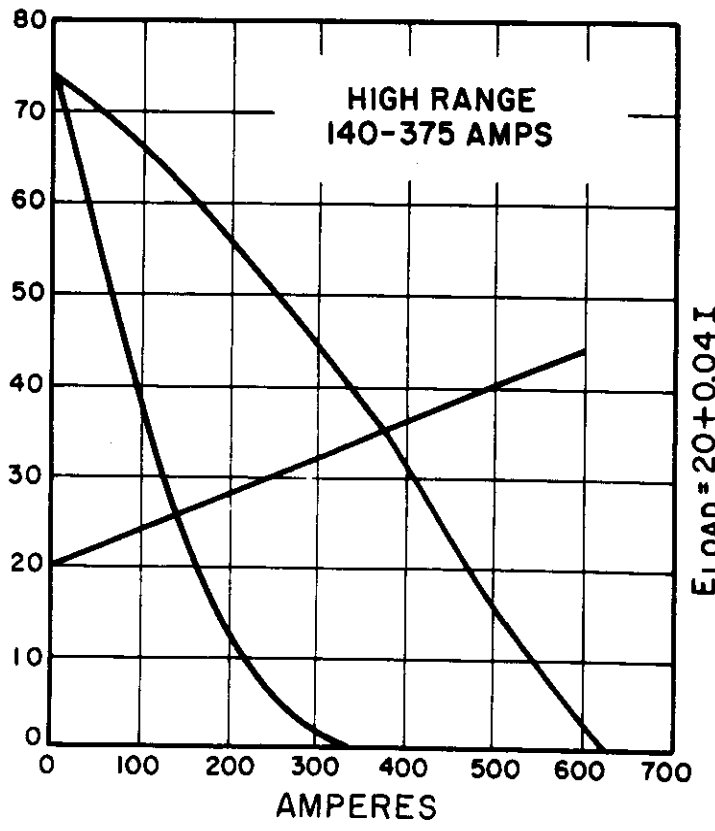
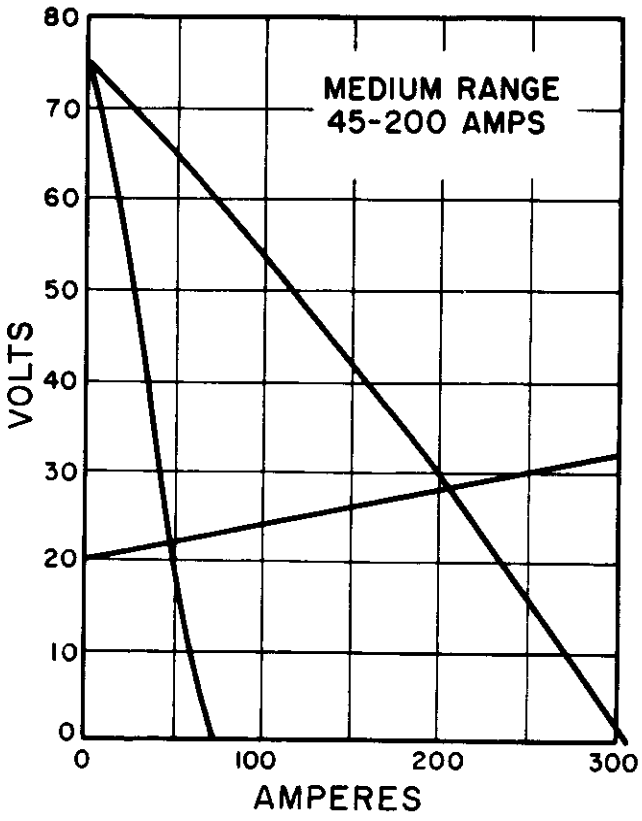
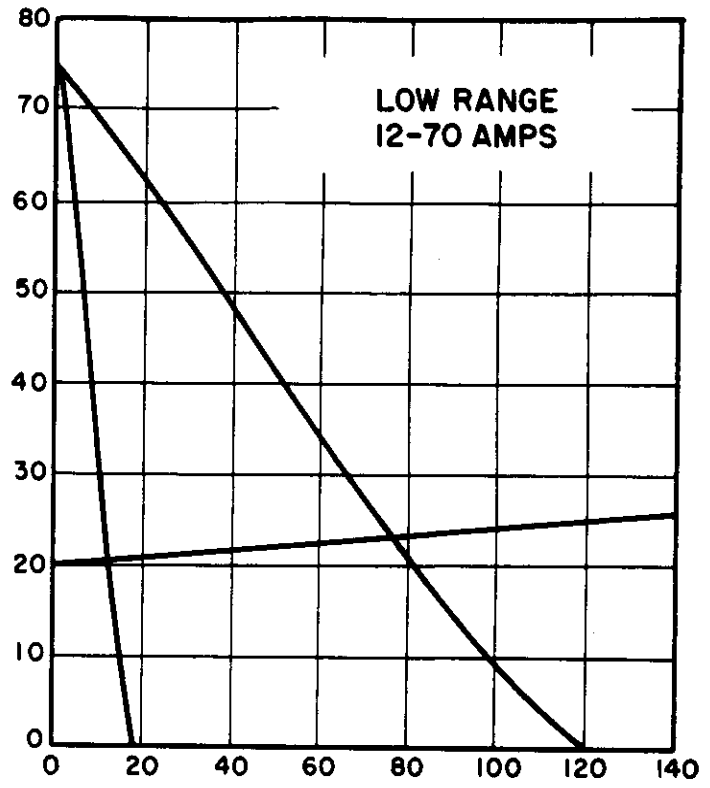
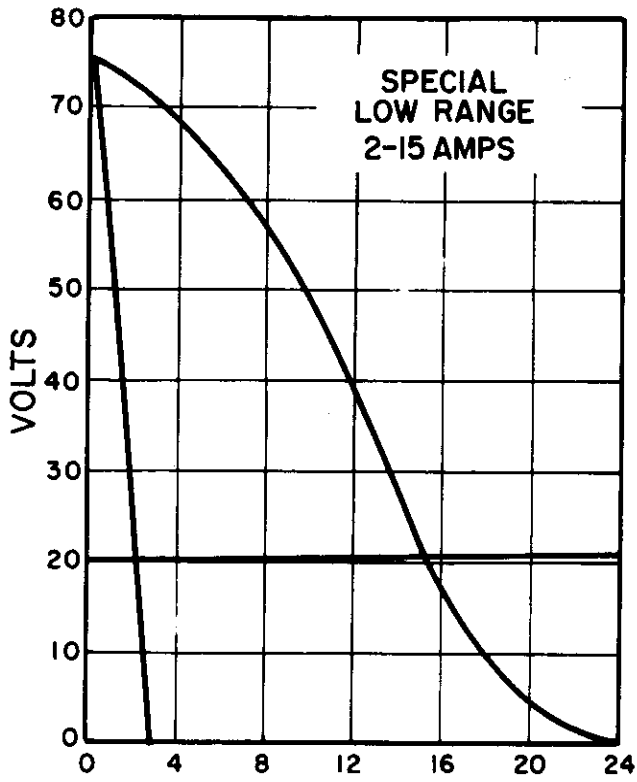
F. Specifications (See Figures 1-A and 1-B for HDA-300 Volt-Ampere Curves)

Model	HDA-200	HDA-300
RATED OUTPUT, AC OR DC		
60% Duty Cycle	200 amps., 28 volts	300 amps., 32 volts
35% Duty Cycle	250 amps., 30 volts	375 amps., 35 volts
100% Duty Cycle	150 amps., 26 volts	225 amps., 30 volts
RATED INPUT		
60/50 cycles, single phase	208 volts, 66 amps. 230 volts, 60 amps. 460 volts, 30 amps.	208 volts, 106 amps. 230 volts, 96 amps. 460 volts, 48 amps.
AC WELDING RANGES		
Special Low	2- 16 amps.	2- 18 amps.
Low	6- 35 amps.	13- 75 amps.
Medium	25-125 amps.	45-210 amps.
High	80-250 amps.	150-390 amps.
DC WELDING RANGES		
Special Low	2- 14 amps.	2- 15 amps.
Low	5- 30 amps.	12- 70 amps.
Medium	25-130 amps.	45-200 amps.
High	90-270 amps.	140-375 amps.
OPEN CIRCUIT VOLTAGE		
AC	80 volts	80 volts
DC	75 volts	75 volts
WEIGHT		
Net	640 lbs.	750 lbs.
Shipping	690 lbs.	800 lbs.
DIMENSIONS		
Height	42-in.	42-in.
Width	28-in.	28-in.
Depth	36-in.	36-in.

G. Optional Accessories

The following optional accessories are available for use with the HDA-200 and HDA-300 Power Supplies.

Description	Part No.
Plug-in Weld Timer Kit for spot gun and other timed operations. (Maximum timing cycles from 6 seconds to 5 minutes. Specify maximum welding period when ordering.).....	131B20
Type FC-2 Foot Control, with 20 ft. cable (Used with HDA-200 to control current.).....	131B21
Type FC-2S Foot Control, with 20 ft. cable (Used with HDA-200 to control contactor and current.).....	131B22
Type FC-3 Foot Control, with 20 ft. cable (Used with HDA-300 to control current).....	131B23
Type FC-3S Foot Control, with 20 ft. cable (Used with HDA-300 to control contactor and current.).....	131B36
Hand Operated Remote Current Control, with 20 ft. cable	131B29
Hand Operated Remote Contactor Control, with 18-in. leads.....	131B59
2100H1634 HDA-200 Meter Box Kit.....	131B43
2100H1635 HDA-300 Meter Box Kit.....	131B44
Type TR-25 Water-Cooler Truck, 25 gals.....	131B33
Type TR-50 Water-Cooler Truck, 50 gals.....	131B34
Type WC-10 Stationary Water Cooler, 10 gals	131B35



$E_{LOAD} = 20 + 0.04 I$

FIG. 1-A - LINDE HDA-300 Power Supply DC Volt-Ampere Curves

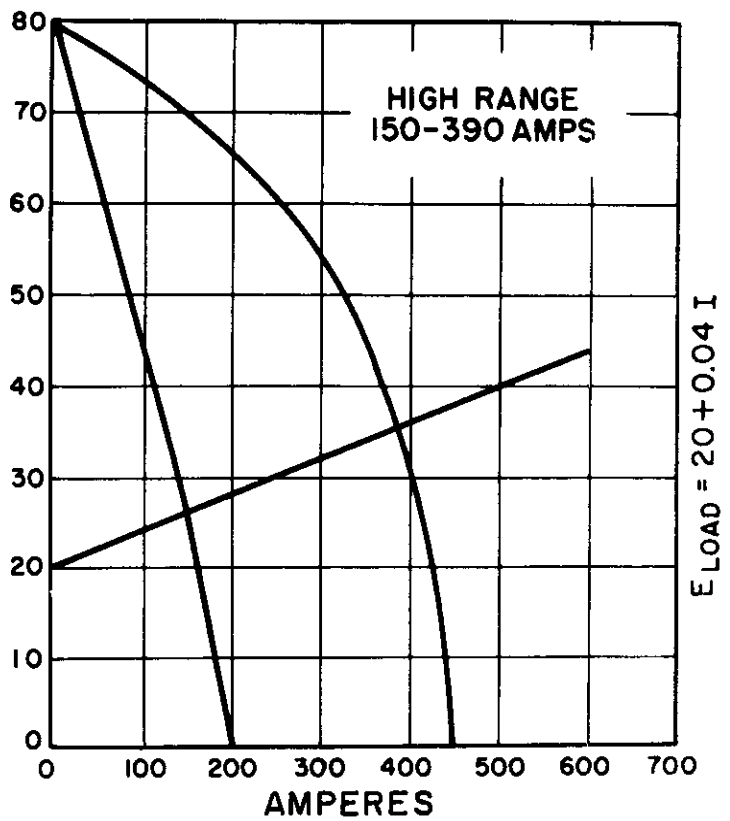
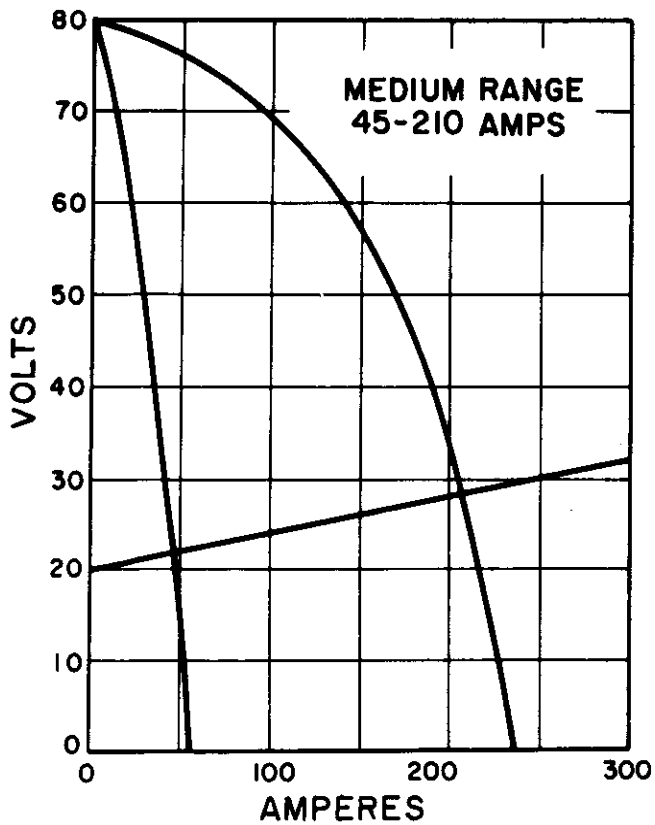
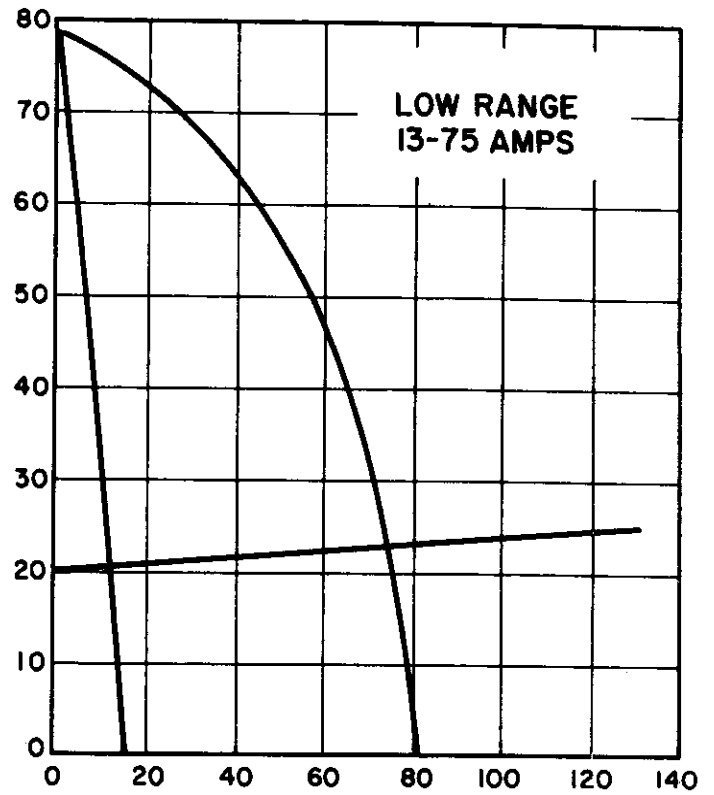
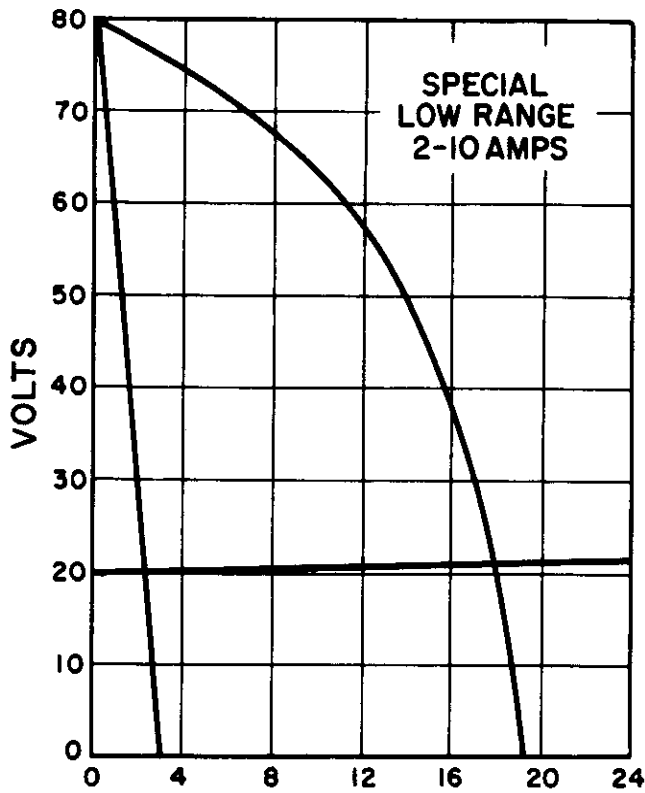


FIG. 1-B - LINDE HDA-300 Power Supply AC Volt-Ampere Curves

II. Installation

Remove all packing materials and make sure that the passages for cooling air are not obstructed. Choose an open area where there will be circulation of clean, fresh air. Leave at least two feet of clearance at the back of the case to ensure proper circulation of air.

A. Moving the Power Supply

The power supplies can be lifted and moved by means of a fork truck. Large reinforced openings are provided in the base of the HDA-200 and HDA-300 power supplies for this purpose.

B. Water-Cooler Truck

If a water-cooler truck is used, it will be more convenient to fill the water tank before the power supply is placed on the carriage. Remove the small cover mounted on the top of the tank. Once the power supply has been set on the truck, the filler hole is quite difficult to reach.

Ordinary tap water is usually suitable as a coolant. However, if you use high frequency and have tap water with a high mineral content, it may be necessary to substitute distilled water to prevent erratic high frequency performance.

If freezing temperatures are expected and you do not use high frequency, add PRESTONE Anti-Freeze to the water. If high frequency is to be used, add methanol instead of PRESTONE.

C. Electrical Connections

BEFORE MAKING ANY POWER CONNECTIONS, BE SURE THAT ALL POWER IS OFF. Refer to the diagram in the back of this booklet for a layout of the terminal board connections. Be sure that the primary power source is a 208, 230 or 460 volt, single phase, 50 or 60 cycle alternating current line.

Also refer to the manual entitled "Installation, Operation, Care of High-Frequency Stabilized Arc Welding Equipment" to determine what precautions should be taken to prevent radio interference. This manual is enclosed in an envelope which is packed with the power supply. The user must sign the User's Certification on the envelope. The signed envelope and the manual should be kept with the power supply at all times.

A copy of the "Certificate of Compliance-Scientific and Medical Equipment", FCC Form 724, is on file at Union Carbide Corporation, Linde Division, 270 Park Avenue, New York, N.Y., 10017.

1. Open the lower half of the rear shroud and set the voltage links for the main transformer and control transformer to match the input voltage, as shown in Fig. 15. Refer to the tables below for recommended input conductor and line fuse sizes.

Table 1 - Recommended Sizes for Input Conductors and Line Fuses for HDA-200

Volts	Primary Amps. Rated	Recommended Fuse Size, Amp.	Recommended Input Conductor Size
208	66	100	#6
230	60	90	#6
460	30	50	#10

Table 2 - Recommended Sizes for Input Conductors and Line Fuses for HDA-300

Volts	Primary Amps. Rated	Recommended Fuse Size, Amp.	Recommended Input Conductor Size
208	100	150	#3
230	90	150	#3
460	45	75	#8

2. Connect the input leads from a wall disconnect switch to the line leads which are brought out at the rear of the power supply. Connect a ground wire to the ground stud located on the base at the rear of the power supply. It is of the utmost importance that the frame be connected to a good electrical ground. Make sure that the terminals are well insulated when the connections are completed.
3. Connect welding cables to the designated terminals on the front of the power supply. Connect the leads as marked and the Current Selector Switch will automatically indicate the correct polarity.
4. Close the input (wall disconnect) switch. The input side of the primary contactor and the Line Switch will now be energized. Put the Line Switch in the "POWER ON" position. (See Figure 2). This will energize the fan motor, control transformer and control circuitry.
5. If a remote output control rheostat is used, plug it into the remote control receptacle and set the Panel-Remote Switch in the "REMOTE" position.

If a remote output control rheostat is not used, place the Panel-Remote Switch in the "PANEL" position.

6. If the Mode Switch is placed in the "METAL ARC" position, the contactor will be automatically energized when the Line Switch is in the "ON" position and open circuit voltage will appear at the output terminals.

If the Mode Switch is in the "INERT GAS" position, the contactor may be energized by triggering a remote contactor control switch which has been plugged into the Remote Contactor Receptacle. The contactor may also be energized by inserting an internally shorted plug into the receptacle. A suitable four prong plug (233B10) is supplied with the power supply. To de-energize the contactor, break the continuity by opening the switch contacts or removing the plug.

If the Mode Switch is in the "TIMED WELD" position, and a timed weld kit has been installed, the contactor may be controlled by an external 115 volt ac source. The contactor coil can still be energized by means of the aforementioned shorting type switch or shorting plug, but the shorting switch does not have to be held closed during a timed weld.

7. If a weld timer kit is to be installed, remove the cover plate in the upper right hand corner of the front panel. Mount the timer in the opening and connect the assembly to the 12-prong socket provided inside the power supply (see Fig. 6).

If remote contactor control from an external 115 volt source is required, connect the two prong female plug provided to a suitable control circuit and plug it into the Remote Contactor Control Receptacle on the timer panel in the upper right hand corner.

A dc output signal voltage, which indicates the presence of open circuit voltage and welding voltage, is available at the Output Voltage Signal Receptacle on the timer panel for use with automatic welding heads and related equipment.

8. If inert gas welding is being performed, connect the gas and water inlet hoses to the "GAS-IN" and "WATER-IN" fittings on the front panel. The torch gas and water inlet hoses should be connected to the "GAS-OUT" and "WATER-OUT" fittings.
9. Before using the power supply, make each of the checks listed in the "Check List of High Frequency Stabilized Arc-Welding Equipment Installation" section of Form #232H128.

NOTE: DO NOT APPLY VOLTAGE TO THE REMOTE CONTACTOR RECEPTACLE ON THE LEFT SIDE OF THE FRONT PANEL.

III. Operating Instructions

Before making a weld, set the controls to establish the desired starting conditions. (See Figure 2.)

A. Current Selector Switch

Set the Current Selector Switch to AC, DCRP or DCSP. DO NOT SWITCH UNDER LOAD.

B. Current Range Switch

Set the Current Range Switch to "HIGH", "MEDIUM", "LOW" or "SPECIAL LOW" depending on the range desired. Ranges are printed on the panel.

DO NOT SWITCH UNDER LOAD.

C. Current Set Control

The output current may be controlled either at the panel or from a remote location such as the work position.

1. Panel Control

If the output current is to be adjusted from the panel, place the Panel-Remote Switch in the "PANEL" position. Depending upon the welding range in which the power supply is operating, adjust the Current Set Control for the value of welding current desired. For example, when welding with ac in the "SPECIAL LOW" range, a Current Set read-

ing of 5 will produce a mid-range current of approximately 10 amperes.

2. Remote Control

If a manual or foot operated remote current control is used the 4-prong plug on the remote current control cable should be inserted in the Remote Control Receptacle. Then place the Panel-Remote Switch in the "REMOTE" position.

Caution: Always make sure that the Remote Current Control is plugged into the power supply BEFORE PLACING THE SWITCH IN THE "REMOTE" POSITION. Never disconnect the Current Control Cable while the switch is in the "REMOTE" position. Failure to follow these instructions may result in failure of the rectifier.

Adjust the Current Set Control on the panel for the maximum welding current desired. The remote control may then be used to vary the current from the bottom of the range in which the power supply is operating up to the current value at which the panel control is set. This will also enable you to avoid exceeding the current rating of the welding torch.

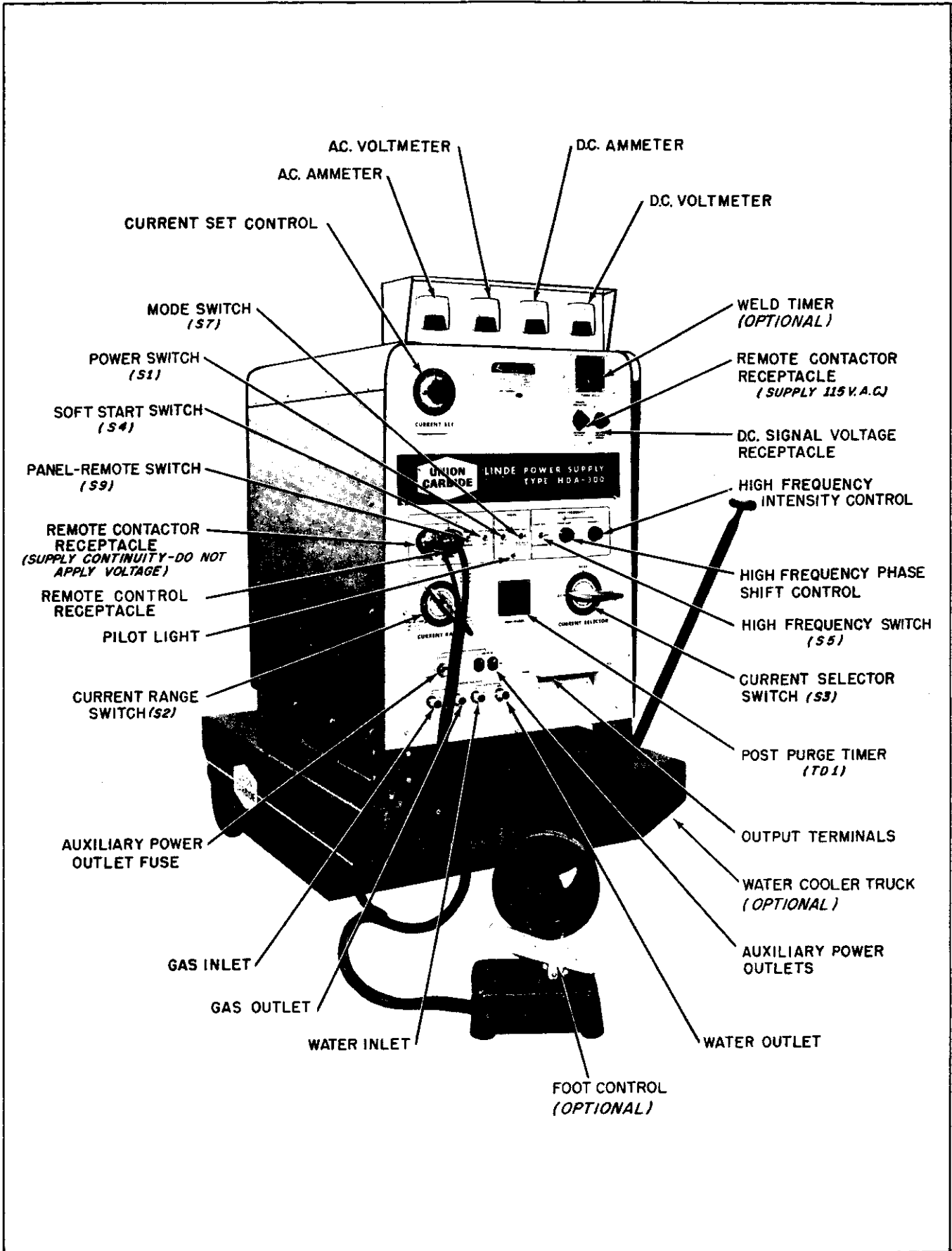


FIG. 2 - HDA-300 Power Supply, Front Panel Controls

D. High Frequency Switch

If high frequency starting is desired, place the High Frequency Switch in the "START ONLY" position.

If continuous high frequency is desired, set the switch in the "CONTINUOUS" position.

If high frequency is not used, it should be locked out by placing the High Frequency Switch in the "OFF" position.

E. High Frequency Intensity Control

The optimum setting of the High Frequency Intensity rheostat is about 2 o'clock. For a specific welding operation, alternately adjust this rheostat and the phase shift rheostat for the best operating condition.

F. High Frequency Phase Shift Control

The optimum setting of the High Frequency Phase Shift rheostat is at about 12 o'clock. For a specific welding operation, alternately adjust this rheostat and the intensity rheostat for the best operating condition.

G. Soft Start Switch

If a low starting current is desired, put the Soft Start Switch in the "SOFT START" position. This will produce the minimum possible current for the range in which the power supply is set.

If instantaneous full welding current is desired, put the Soft Start Switch in the "OFF" position.

H. Post Purge Timer

The post purge timer is a synchronous, 60 second adjustable unit which controls the flow of gas and water after the arc is broken.

I. Mode Switch

Place the Mode Switch in the center position for METAL ARC welding. When the line switch is turned on, the contactor will be automatically energized and open circuit voltage will appear at the output terminals.

Place the Mode Switch in the upper position for INERT GAS welding. This will provide gas and water control, post purge control and remote contactor control.

Place the Mode Switch in the lower position for TIMED WELDS. Only gas and water flow control will be provided unless the optional Weld Timer kit has been installed in the upper right hand corner of the front panel.

The weld timer kit provides timed welds up to 6 seconds long, contactor control from an external 115 volt ac source, and a dc signal voltage which indicates open circuit voltage and welding voltage.

The contactor may also be controlled by providing continuity through a remote switch or a shorted plug inserted into the remote contactor receptacle on the left side of the power supply.

J. Power Switch

Close the wall disconnect switch. Place the Power Switch on the front panel in the "ON" position. When the main transformer is energized, open circuit voltage will appear at the output terminals. Open circuit voltage will remain until an arc has been established.

WARNING: DO NOT USE HIGH FREQUENCY WELDING CURRENT UNLESS THE MANUFACTURER OF YOUR TORCH OR WELDING MACHINE SPECIFICALLY RECOMMENDS ITS USE. FAILURE TO OBSERVE THIS PRECAUTION MAY RESULT IN DAMAGE TO YOUR OTHER WELDING EQUIPMENT.

IV. Maintenance and Trouble-Shooting

CAUTION: BE SURE THAT ALL POWER IS SHUT OFF BEFORE PERFORMING ANY MAINTENANCE ON THE POWER SUPPLY.

Periodically blow out the air passages in the power unit with low pressure air. It is imperative that the passages be kept free to ensure adequate circulation of air, especially over the plates of the rectifier.

Do not, under any circumstances, oil the sliders on the current rheostat or the switch contacts.

If the power supply is operating improperly, the following trouble-shooting information may be used to locate the source of trouble. Follow the local electrical maintenance procedure in making your trouble shooting checks.

TROUBLE SHOOTING

Possible Causes of Trouble	Check
No Current Control	
Remote control switch	Switch in wrong position. For panel control of welding current, switch must be in "Panel" position. When welding with remote control, switch must be in "Remote" position.
Rheostat	May be open. Check contact arm and winding.
Control rectifier	Check DC voltage with voltmeter. Voltage should be between 22 and 26 volts. Connect voltmeter leads to black and red terminals of rectifier.
Control transformer - 24 V. winding	Check AC voltage to control rectifier. Disconnect leads to yellow terminals on rectifier and connect voltmeter to leads. Voltage should be 24 volts.
DC coil	Check for open, ground or short in coil.
Reactor coil	Check for short or ground.
Welder Fails to Maintain Arc	
Loose connections	Check all electrical connections for loose bolts and solder connections inside welder.
Improper ground connection on work	Tighten ground clamp. Check for excessive dirt and grease on grounded work area.
Faulty main power rectifier	Check rectifier for evidence of damage.
Low Output Current	
Control rectifier	Check with DC voltmeter. (See "NO CURRENT CONTROL")
Loose connections	Check all electrical connections for loose bolts and solder connections inside welder.
No Output Current	
Secondary circuit	Check for open.
Primary circuit	Check for open, including line fuses.
Contactors	May not be closing. Check the contactor coil and welding control.
Power rectifier	Check open circuit voltage. Check visually for burned or damaged plates.
Welder Fails to Start an Arc	
Line switch	Must be in "ON" position.
Contactors	Contactors not closing. Check coil.
Contactors control	Shorting plug not plugged into contactor control receptacle or not properly internally shorted. Shorting switch not triggered.
Power rectifier	Check open circuit voltage. Check visually for damaged or burned plates.
Open in primary or secondary circuit	Check open circuit voltage. Check coils and lead connection in circuits.
Improper ground connections	Tighten ground clamp. Clean the grounding area.

TROUBLE SHOOTING

Possible Causes of Trouble	
Primary Fuses Blow	
Power factor condenser	Check for shorted condensers.
Primary coil	May be shorted or grounded.
Fuses	Check recommended fuse sizes. See page 6.
Main transformer terminal board	Check for proper connection of voltage selector links. See Figure 8.
No High Frequency - High Frequency Fails To Start	
High frequency switch - S ₅	May be in "OFF" position. May be defective.
High frequency transformer	Secondary or primary coil may be open or shorted.
Spark gaps	Check and reset each gap at .006-in.
Phase shift rheostat	May be open.
Intensity rheostat	May be open.

CAUTION: TO AVOID SEVERE AND POSSIBLE FATAL INJURIES, MAKE CERTAIN THAT THE MAIN LINE DISCONNECT SWITCH IS IN THE "OFF" POSITION PRIOR TO ENTERING THE WELDER.

V. Replacement Parts

How To Order Replacement Parts

1. Replaceable parts are keyed on the parts illustrations which follow. They are also itemized in the list below. Order these parts by part number and complete description as shown in the parts list. **DO NOT ORDER BY PART NUMBER ALONE.** Figures 3-8 illustrate the HDA-300. An identical arrangement of parts is used for the HDA-200 except as noted.
2. When ordering, be sure to state the quantity of each part needed and the serial number of the power supply in which it will be used.
3. Order replacement parts from the **nearest Linde region office.**

<u>Part No.</u>	<u>Description</u>	<u>Used In</u>
231B34	19Z140 D1 Pin	HDA-200 & HDA-300
231B46	206F3 D4 Handle	HDA-200 & HDA-300
231B52	287Z41 Receptacle, Fustat	HDA-200 & HDA-300
231B75	279Z20 Relay, A.C. (R2, R6).....	HDA-200 & HDA-300
232B51	216E58 Chassis	HDA-200 & HDA-300
232B52	216F443 Upright Weldment.....	HDA-200 & HDA-300
232B53	227F272 D1 Rectifier Baffle	HDA-200 & HDA-300
232B54	275Z29 Power Rectifier.....	HDA-300
232B55	227E227 Side Shroud-L.H.	HDA-200 & HDA-300
232B56	216E48 D1 Mounting Angle-L.H.....	HDA-200 & HDA-300
232B57	216E48 D2 Mounting Angle-R.H.....	HDA-200 & HDA-300
232B58	227H48 Baffle.	HDA-300
232B59	227H49 Baffle	HDA-300
232B60	227B157 Baffle.....	HDA-300
232B61	227F158 Baffle.....	HDA-300
232B62	227F200 Front Baffle	HDA-300
232B63	227H15 Baffle Support	HDA-300

<u>Part No.</u>	<u>Description</u>	<u>Used In</u>
232B65	9275H3 Cable Holddown Assembly.....	HDA-200 & HDA-300
232B66	284Z9 Condenser, Power Factor.....	HDA-200 & HDA-300
232B67	279U2 D8 Contactor.....	HDA-300
232B68	216H523 Contactor Support.....	HDA-200 & HDA-300
232B69	9279F270 F2 Auxiliary Reactor & Support Assembly.....	HDA-300
232B70	9279E148 Control Panel Assembly.....	HDA-200 & HDA-300
232B71	227E220 Cover.....	HDA-200 & HDA-300
232B72	227E219 Side Shroud-R.H.....	HDA-200 & HDA-300
232B73	9280F6 F1 Resistor Assembly.....	HDA-200 & HDA-300
232B74	275Z28 Power Rectifier.....	HDA-200
232B75	279U2 D6 Contactor.....	HDA-200
232B76	9279F270 F1 Auxiliary Reactor & Support Assembly.....	HDA-200
232B77	279Z21 Switch, Line (S1).....	HDA-200 & HDA-300
232B78	280Z23 Rheostat, Output Control.....	HDA-300
232B79	279Z27 Switch (S4, S9).....	HDA-200 & HDA-300
232B80	279Z23 Switch (S5, S7).....	HDA-200 & HDA-300
232B81	287Z11 Receptacle, Remote Contactor Control.....	HDA-200 & HDA-300
232B82	287Z12 Receptacle, Remote Current Control.....	HDA-200 & HDA-300
232B83	279Z56 D3 Timer, Post Purge (TD-1).....	HDA-200 & HDA-300
232B84	2100F76 Switch, Range (S2).....	HDA-200 & HDA-300
232B85	2100E105 Switch, Current Selector (S3).....	HDA-200 & HDA-300
232B86	280Z22 Rheostat, Phase Shift.....	HDA-200 & HDA-300
232B87	80Z57 Rheostat, Intensity.....	HDA-200 & HDA-300
232B88	236Z4 Solenoid Valve, Gas & Water.....	HDA-200 & HDA-300
232B89	287Z13 Receptacle, 115 Volt Output.....	HDA-200 & HDA-300
232B90	9279H21 F5 Output Terminal Assembly.....	HDA-200 & HDA-300
232B91	275Z14 Rectifier, Output Control.....	HDA-300
232B92	6Z35 Knob, Rheostat.....	HDA-200 & HDA-300
232B93	6Z34 Knob, Rheostat.....	HDA-200 & HDA-300
232B94	279Z53 Relay, D.C. (R3).....	HDA-200 & HDA-300
232B95	287Z32 Receptacle, 2 Wire, Signal Voltage.....	HDA-200 & HDA-300
232B96	9279F174 Terminal Board Assembly.....	HDA-200 & HDA-300
232B97	275Z13 Rectifier, Relay.....	HDA-200 & HDA-300
232B98	9279H20 F2 Resistor Assembly.....	HDA-200 & HDA-300
232B99	279Z29 Relay, D.C. (R1).....	HDA-200 & HDA-300
233B01	84Z55 Condenser.....	HDA-200 & HDA-300
233B02	287Z38 Male Plug, Output Signal Voltage.....	HDA-200 & HDA-300
233B03	279Z54 Relay, A.C. (R5).....	HDA-200 & HDA-300
233B04	279Z24 Relay, A.C. (R4, R9).....	HDA-200 & HDA-300
233B05	279H255 D2 Terminal Cover.....	HDA-200 & HDA-300
233B06	279E178 Relay Panel.....	HDA-200 & HDA-300
233B07	287Z44 Male Receptacle, 3 Wire.....	HDA-200 & HDA-300
233B08	279Z112 D9 Adaptor.....	HDA-200 & HDA-300
233B09	279Z111 D21 Fustat.....	HDA-200 & HDA-300
233B10	9279H69 Plug, Remote Contactor Control.....	HDA-200 & HDA-300
233B11	44Z206 D3 Street Elbow.....	HDA-200 & HDA-300
233B12	244Z2 Water Adaptor.....	HDA-200 & HDA-300
233B13	244Z3 Argon Adaptor.....	HDA-200 & HDA-300
233B14	214H80 Door.....	HDA-200 & HDA-300
233B15	287Z42 Weld Timer Socket, 12 Prong.....	HDA-200 & HDA-300
233B16	280Z31 Rheostat, Output Control.....	HDA-200
233B17	275Z24 Rectifier, Output Control.....	HDA-200
233B18	216E97 D1 Transformer Support.....	HDA-200 & HDA-300
233B19	276F9 D2 Transformer Core.....	HDA-300
233B20	276H5 D3 Transformer Yoke.....	HDA-300
233B21	9275A155 F1 Transformer Coil - L.H.....	HDA-300
233B22	9275A156 F1 Transformer Coil-R.H.....	HDA-300
233B23	275H158 Insulation Set.....	HDA-300
233B24	9279F233 F2 Terminal Board Assembly.....	HDA-200 & HDA-300

<u>Part No.</u>	<u>Description</u>	<u>Used In</u>
233B25	9279F234 Control Transformer.....	HDA-200 & HDA-300
233B26	276F9D1 Transformer Core.....	HDA-200
233B27	276H5 D2 Transformer Yoke.....	HDA-200
233B28	9275A134 F2 Transformer Coil-L.H.....	HDA-200
233B29	9275A135 F2 Transformer Coil-R.H.....	HDA-200
233B30	275H157 Insulation Set.....	HDA-200
233B31	276E30 D1 Reactor Core & Support.....	HDA-300
233B33	9275E274 F1 Reactor Coil.....	HDA-300
233B34	9275F53 F2 D.C. Exciter Coil.....	HDA-300
233B35	275H151 Insulation Set.....	HDA-300
233B36	598 Gap Filler.....	HDA-300
233B37	276F8 Reactor Core.....	HDA-200
233B38	276H4 D2 Reactor Yoke.....	HDA-200
233B39	9275E273 F1 Reactor Coil.....	HDA-200
233B40	9275F32 F2 D.C. Exciter Coil.....	HDA-200
233B41	275H150 Insulation Set.....	HDA-200
233B42	279F366 D23 Contact Points.....	HDA-200 & HDA-300
233B44	579F89 High Frequency Transformer.....	HDA-200 & HDA-300
233B45	9579F81 F1 Spark Gap Assembly.....	HDA-200 & HDA-300
233B46	284Z4 Capacitor.....	HDA-200 & HDA-300
233B47	280Z20 Non-inductive Resistor.....	HDA-200 & HDA-300
233B48	284Z5 Capacitor.....	HDA-200 & HDA-300
233B49	80Z11 Resistor.....	HDA-200 & HDA-300
233B51	216F416 Support, Contactor, Reactor.....	HDA-200 & HDA-300
233B52	276F62 D2 Reactor Core.....	HDA-300
233B53	276F63 D2 Reactor Yoke.....	HDA-300
233B54	9275F148 F1 Reactor Coil.....	HDA-300
233B55	9275F148 F2 Reactor Coil.....	HDA-300
233B56	275H64 Insulation Set.....	HDA-300
233B57	276F62 D1 Reactor Core.....	HDA-200
233B58	276F63 D1 Reactor Yoke.....	HDA-200
233B59	9275E109 F2 Reactor Coil.....	HDA-200
233B60	275H65 Insulation Set.....	HDA-200
233B61	88Z39 Fan Motor.....	HDA-300
233B62	49Z49 Fan Blade.....	HDA-300
233B63	227U1 Fan Support.....	HDA-200 & HDA-300
233B64	20H1708 D16 Elastic Stop Nut, #10-32.....	HDA-200
233B65	232H302 D1 Clip, Fan Support.....	HDA-200 & HDA-300
233B66	227E167 D4 Rear Shroud, Top.....	HDA-200 & HDA-300
233B67	227F406 Rear Shroud, Bottom.....	HDA-200 & HDA-300
233B68	287Z45 Female Plug, 3 Wire.....	HDA-200 & HDA-300
233B69	88Z23 D2 Fan Motor.....	HDA-200
233B70	574H411 Fan Blade.....	HDA-200
233B71	279Z56 D1 Timer, 6 Seconds.....	HDA-200 & HDA-300
233B72	287Z43 Male Plug, 12 Prong.....	HDA-200 & HDA-300
233B73	281Z3 Pilot Light Socket.....	HDA-200 & HDA-300
233B74	281Z4 Pilot Light Bulb.....	HDA-200 & HDA-300
233B75	20H1708 D14 Elastic Stop Nut, #8-32.....	HDA-300
233B76	275H178 D7 Shim, A.C. Reactor.....	HDA-200
233B77	275H178 D8 Shim, A.C. Reactor.....	HDA-300
233B78	279H385 Control Terminal Board Insulation Strip.....	HDA-200 & HDA-300
233B79	216F371 Support, (Power Rectifier).....	HDA-200 & HDA-300
233B80	227F282 Air Baffle, Power Rectifier.....	HDA-200 & HDA-300
233B81	216H601 Lifting Bail.....	HDA-200 & HDA-300
233B82	216H553 Condenser Support.....	HDA-200 & HDA-300
233B83	287Z31 D15 Snap Bushings, Power Rectifier Baffle.....	HDA-200 & HDA-300
233B84	287Z31 D16 Snap Bushings, Power Rectifier Baffle.....	HDA-200 & HDA-300
233B85	20H1708 D13 Elastic Stop Nut, #6-32.....	HDA-200 & HDA-300
233B86	9279E194 High Frequency & Induction Coil Assembly.....	HDA-200 & HDA-300
233B88	9275A177 Induction Coil Assembly.....	HDA-200 & HDA-300
233B89	216E138 D2 High Frequency Mounting Plate.....	HDA-200 & HDA-300
233B90	284Z23 By pass Capacitor.....	HDA-200 & HDA-300
234B57	276F30 D2 Reactor Yoke.....	HDA-300
235B69	279H375 Power Cable, Adaptor.....	HDA-200 & HDA-300

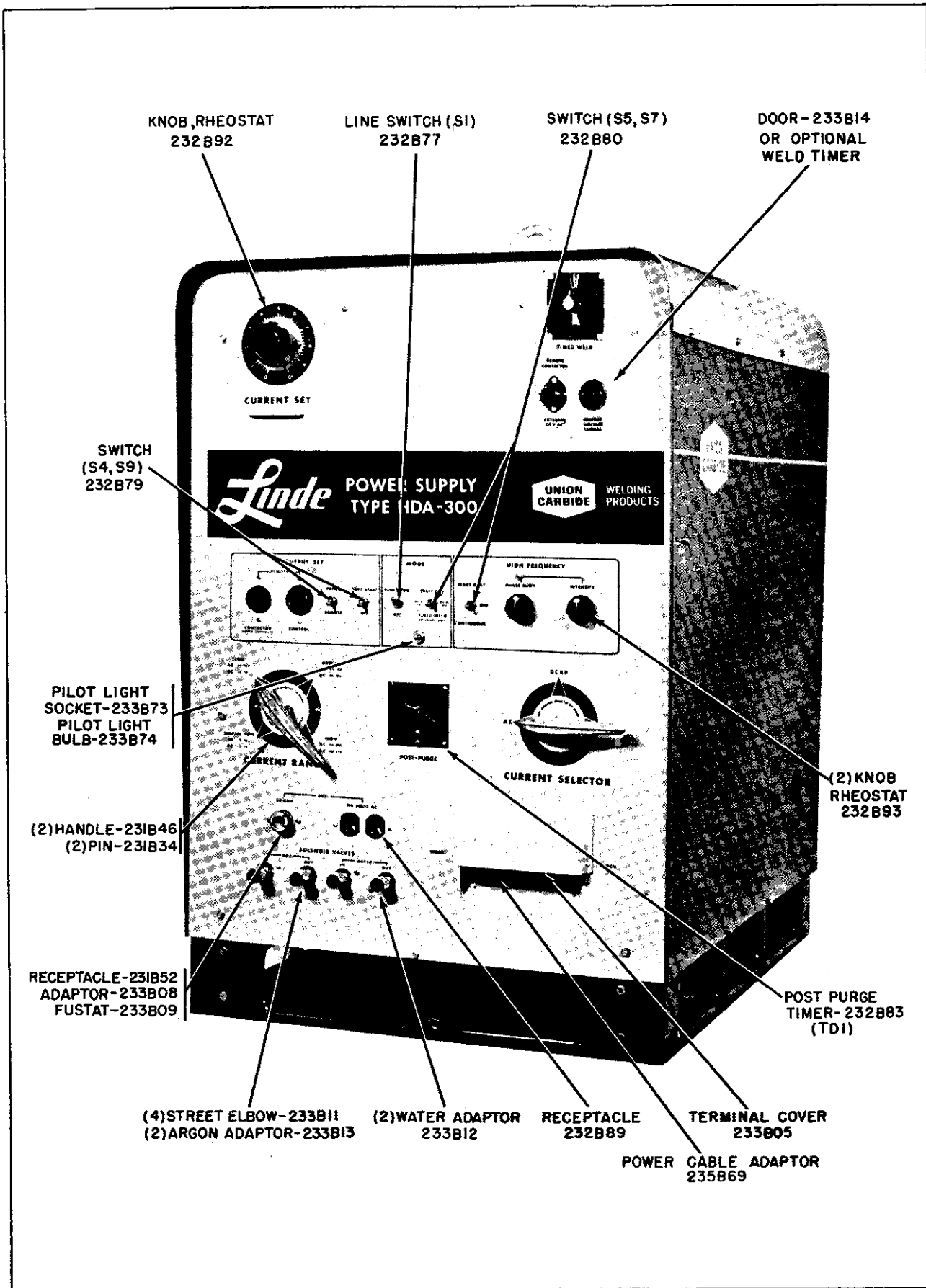


FIG. 3 - HDA-300, Front View

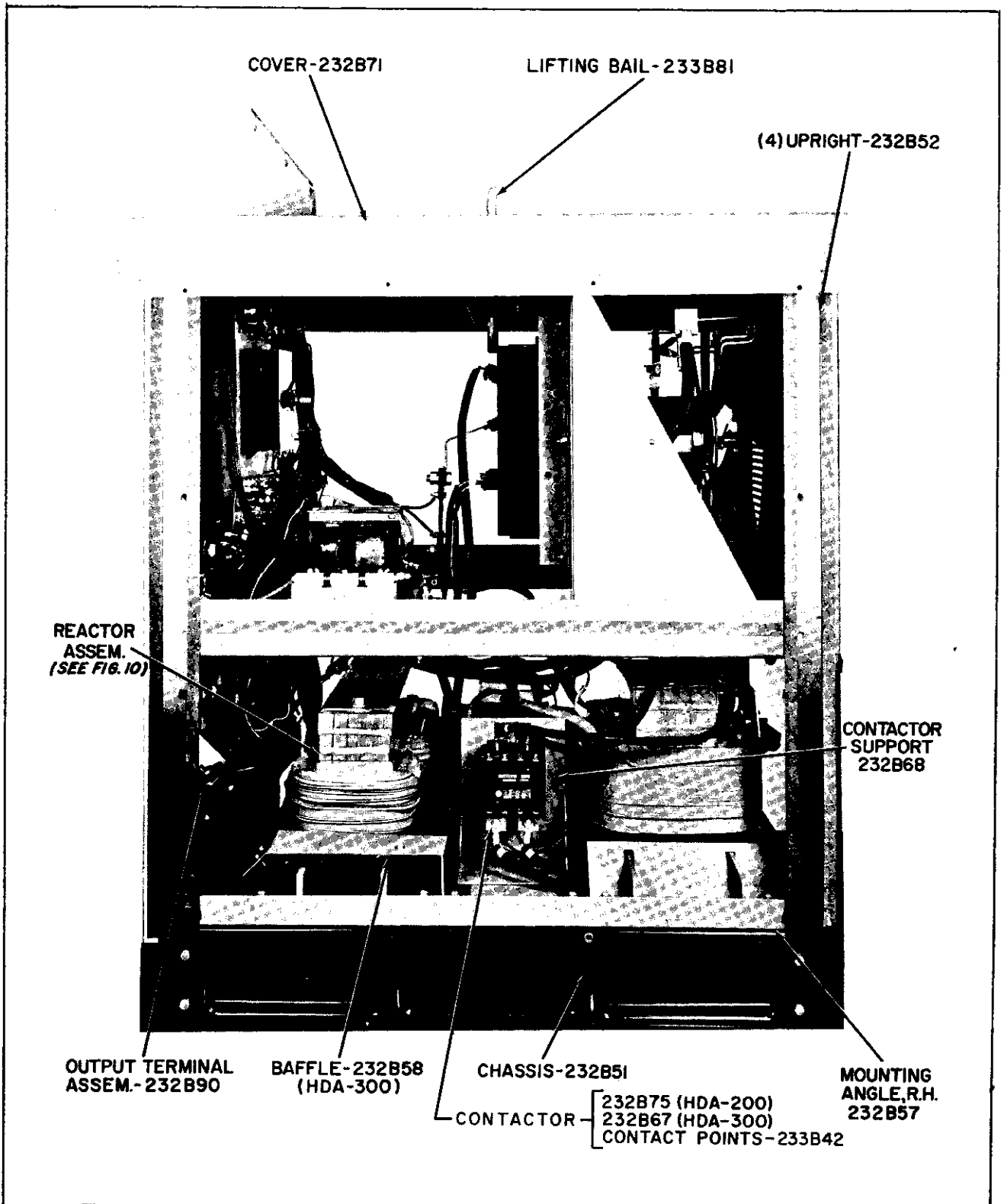


FIG. 4 - HDA-300, Right Side View

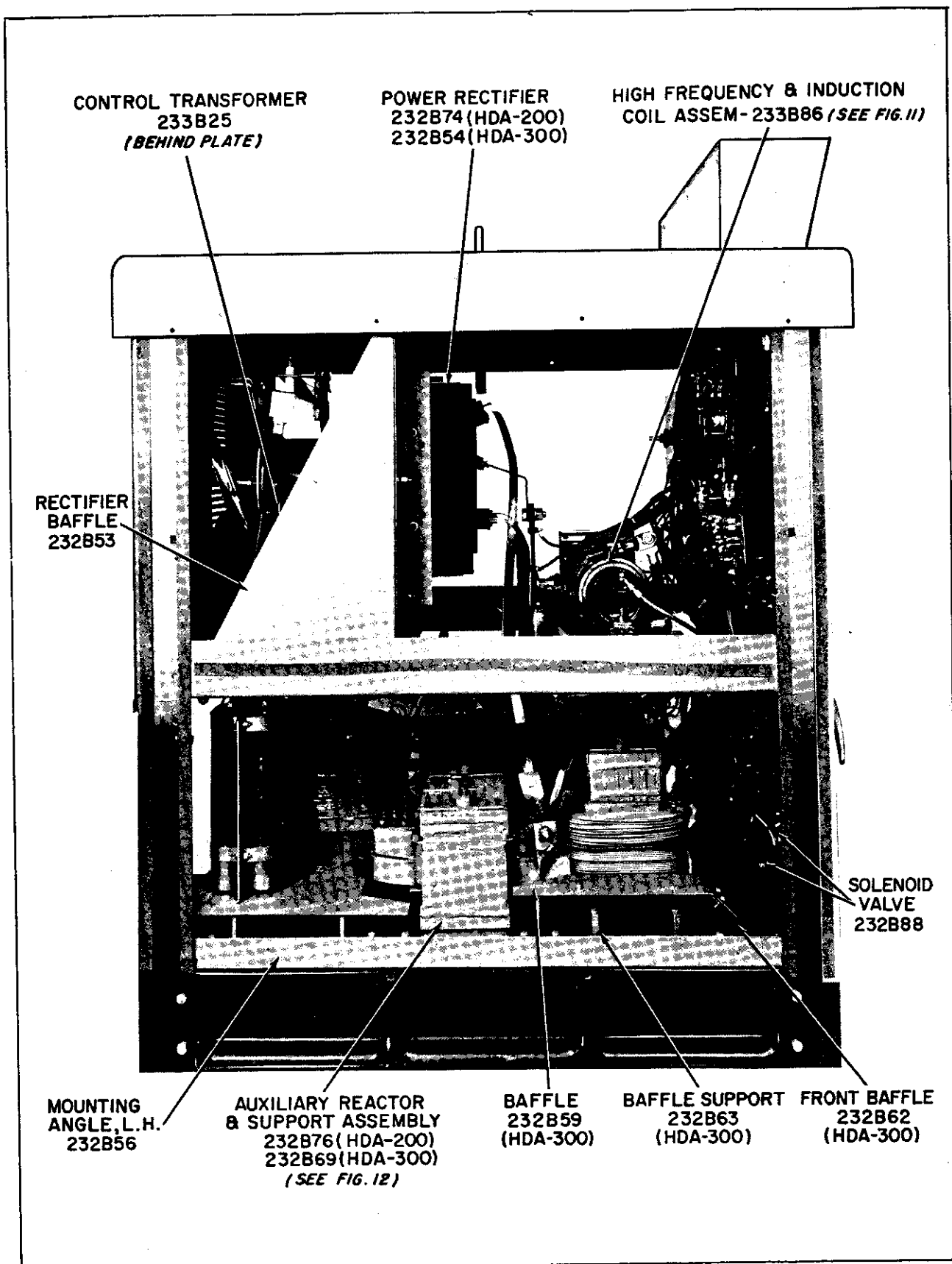
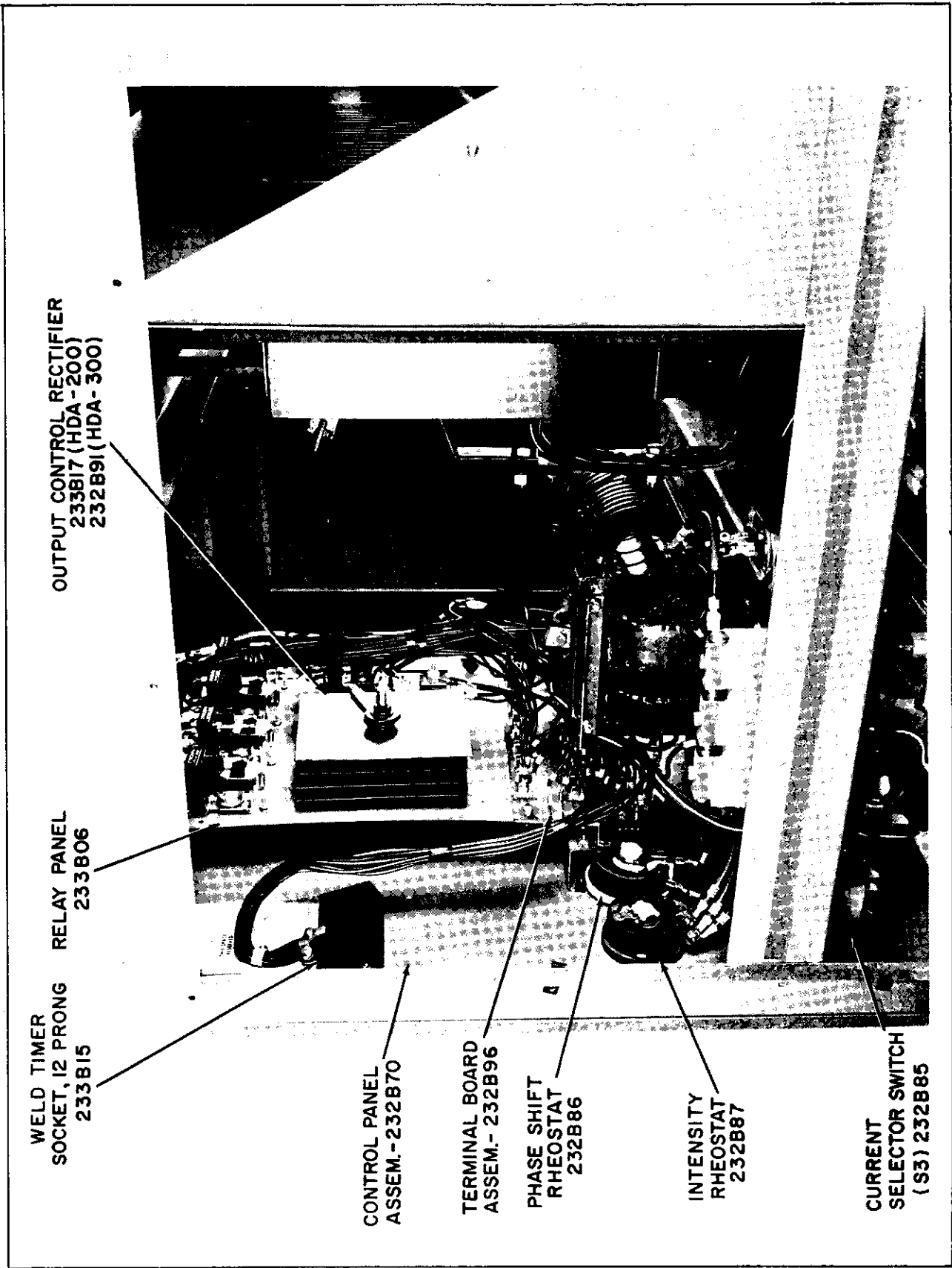


FIG. 5 - HDA-300, Left Side View



WELD TIMER
 SOCKET, 12 PRONG
 233B15

RELAY PANEL
 233B06

OUTPUT CONTROL RECTIFIER
 233B17 (HDA - 200)
 232B91 (HDA - 300)

CONTROL PANEL
 ASSEM. - 232B70

TERMINAL BOARD
 ASSEM. - 232B96

PHASE SHIFT
 RHEOSTAT
 232B86

INTENSITY
 RHEOSTAT
 232B87

CURRENT SWITCH
 SELECTOR SWITCH
 (S3) 232B85

FIG. 6 - HDA-300, Right Side, Upper Deck

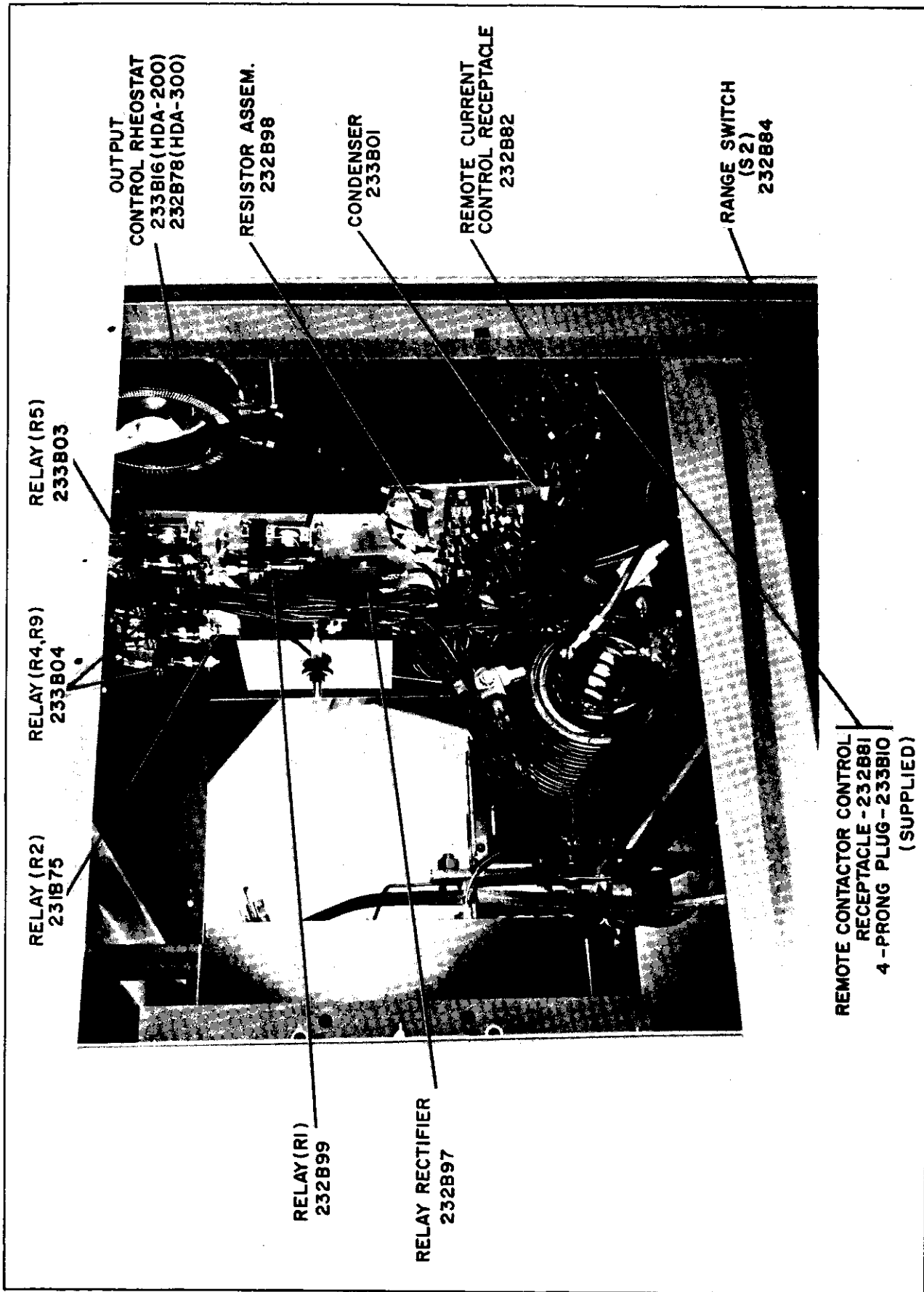
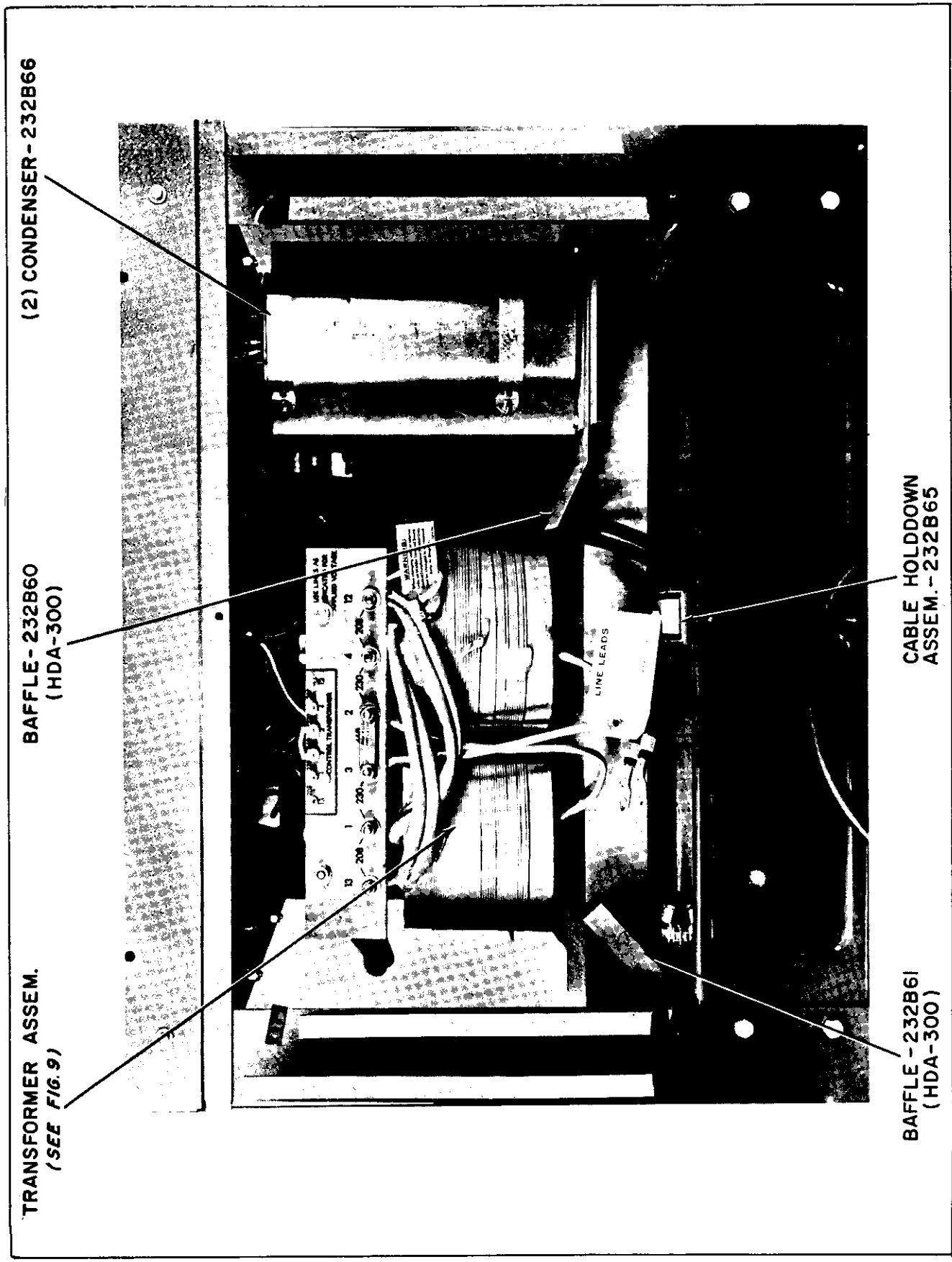


FIG. 7 - HDA-300, Left Side, Upper Deck



(2) CONDENSER - 232B66

BAFFLE - 232B60
(HDA-300)

TRANSFORMER ASSEM.
(SEE FIG. 9)

CABLE HOLDDOWN
ASSEM. - 232B65

BAFFLE - 232B61
(HDA-300)

FIG. 8 - HDA-300, Rear View, Lower Deck

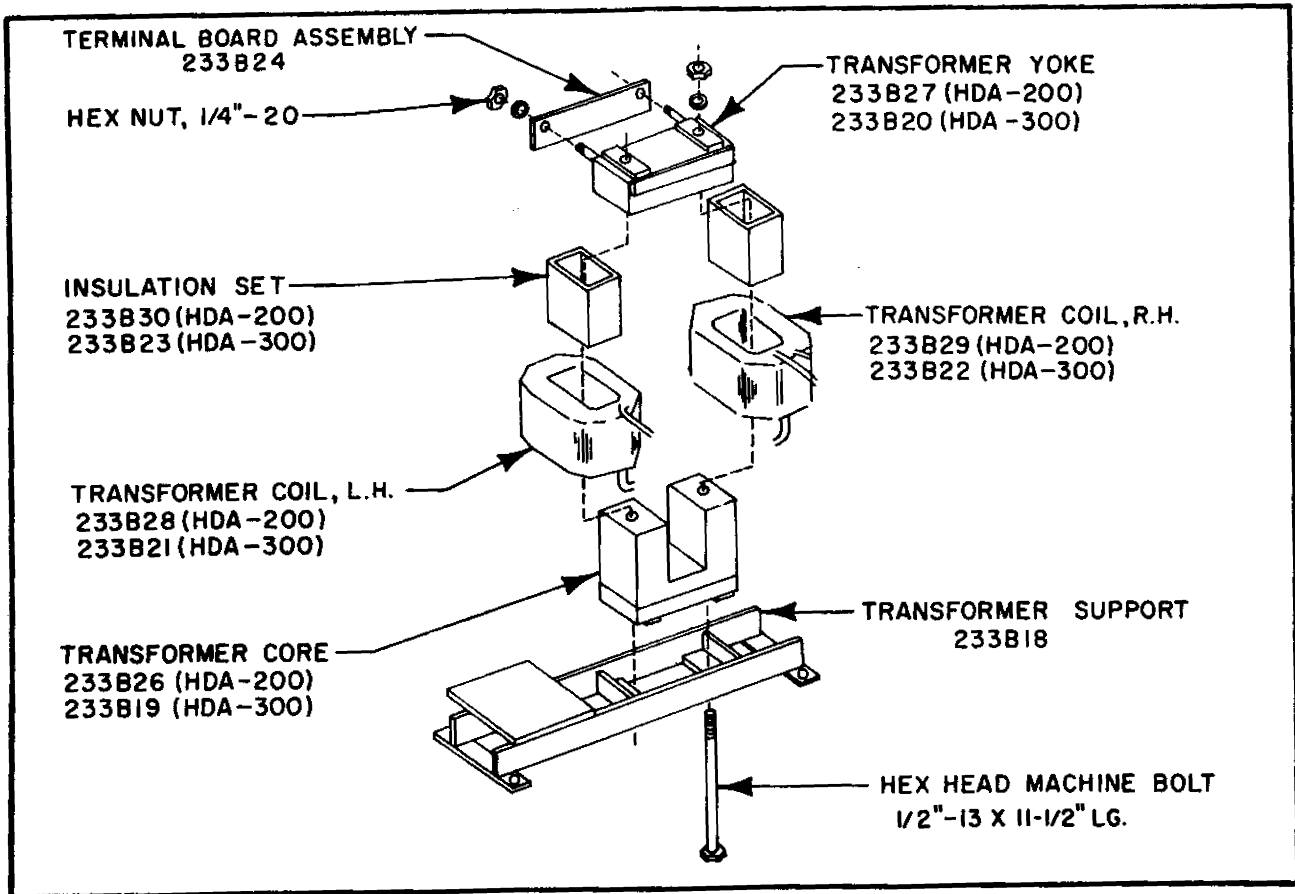


FIG. 9 - Main Transformer Assembly

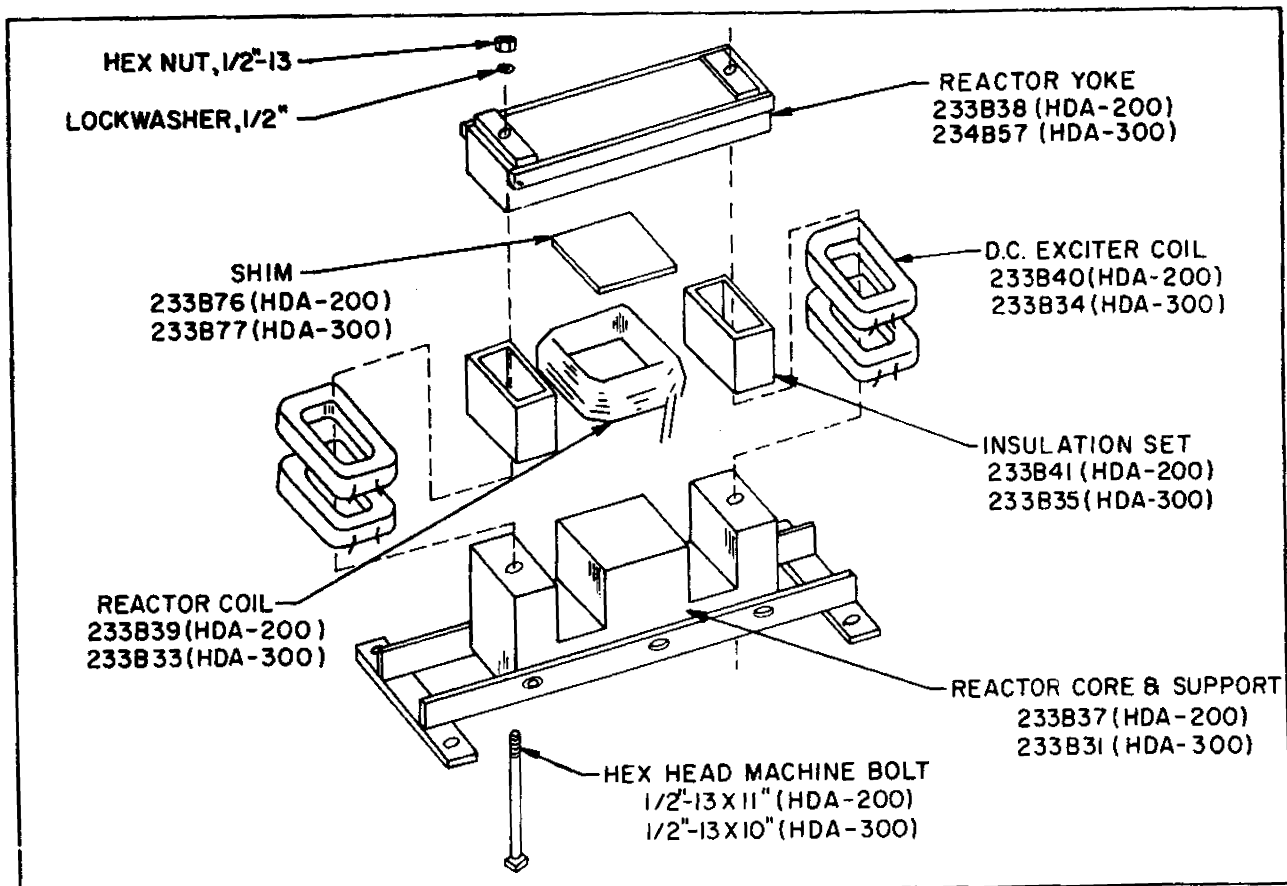


FIG. 10 - Reactor Assembly

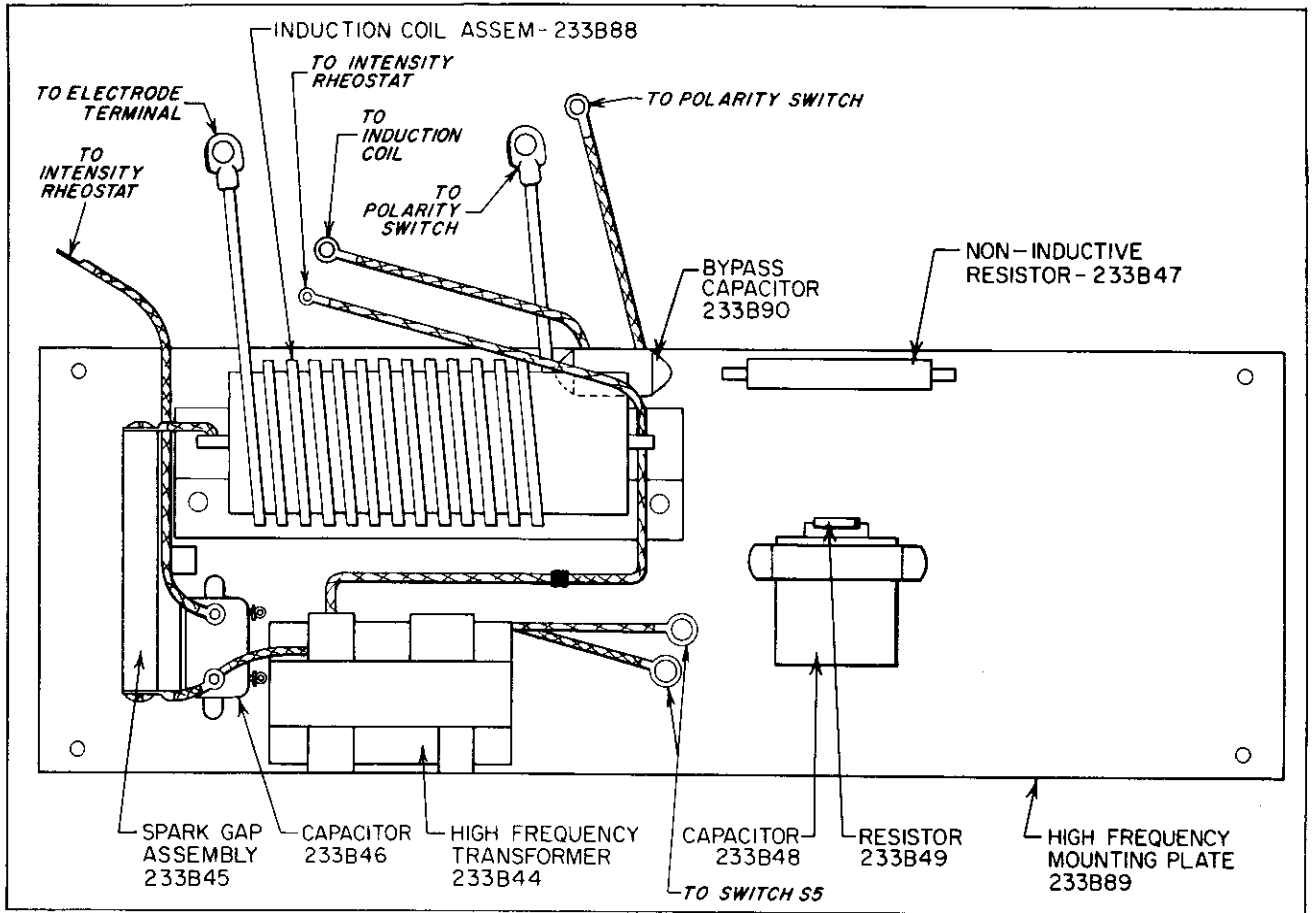


FIG. 11- High Frequency and Induction Coil Assembly,
Part No. 233B86 *

* Replaces 232B64 used in earlier models and contains improvements over previous design.

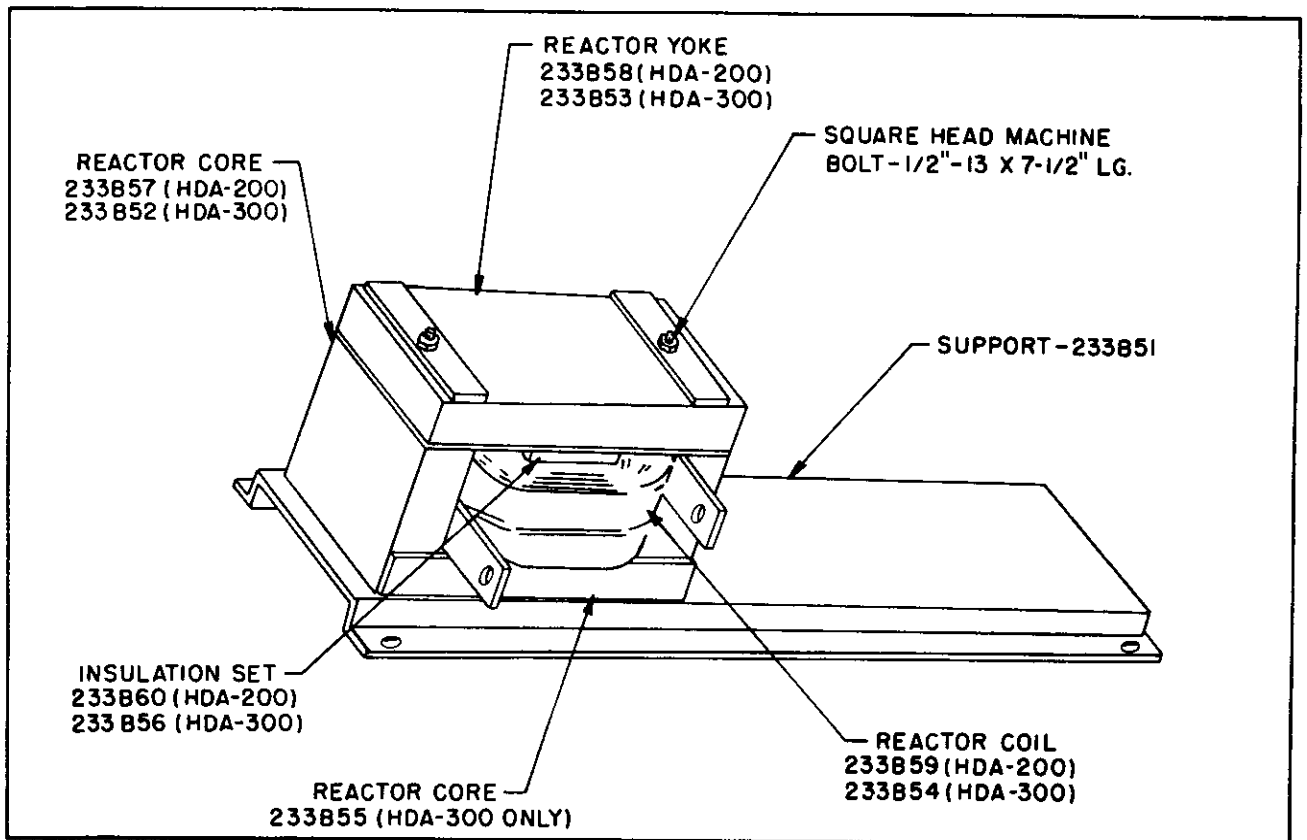


FIG. 12 - Auxiliary Reactor Assembly, Part No. 232B76 (HDA-200)
232B69 (HDA-300)

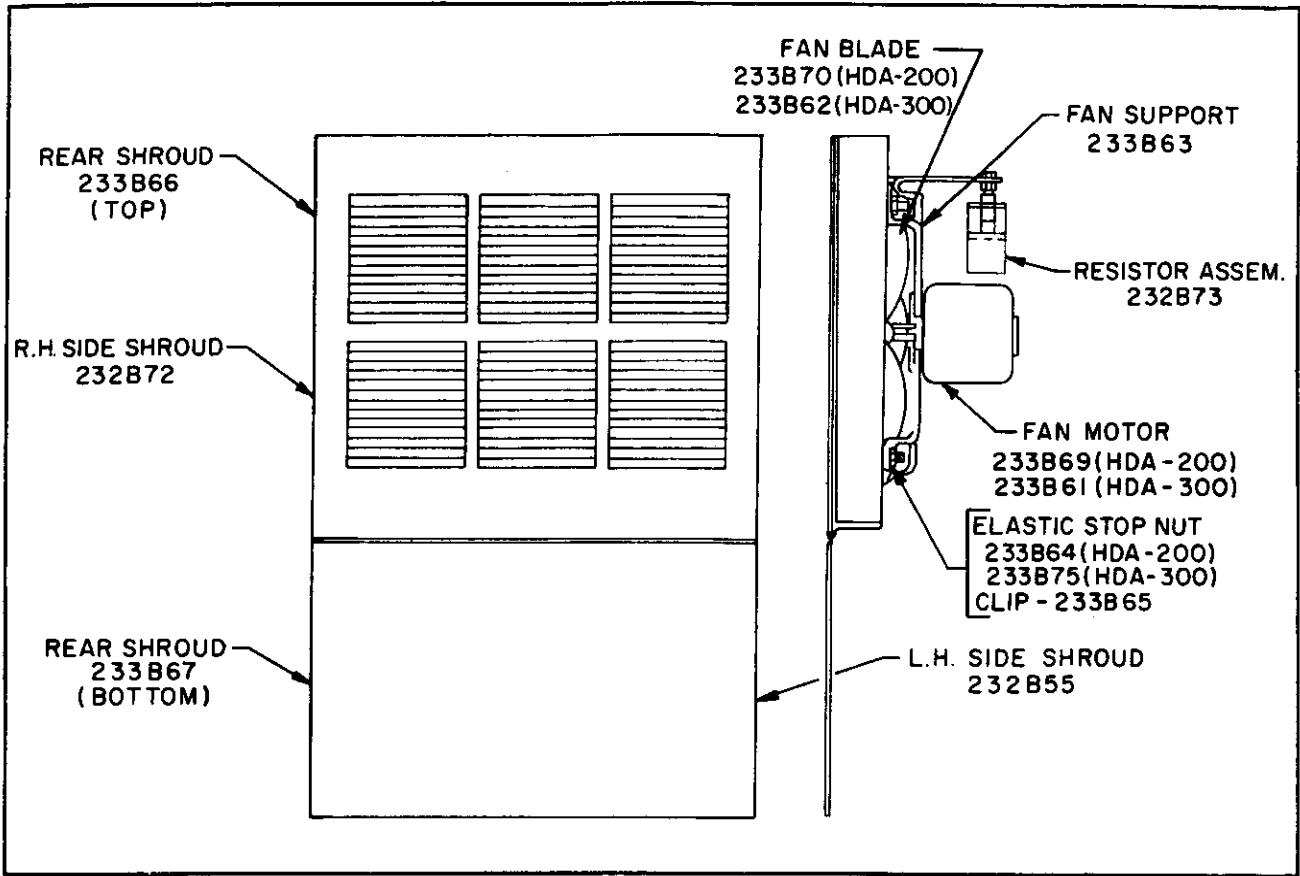


FIG. 13 - Rear Shroud and Fan Assembly

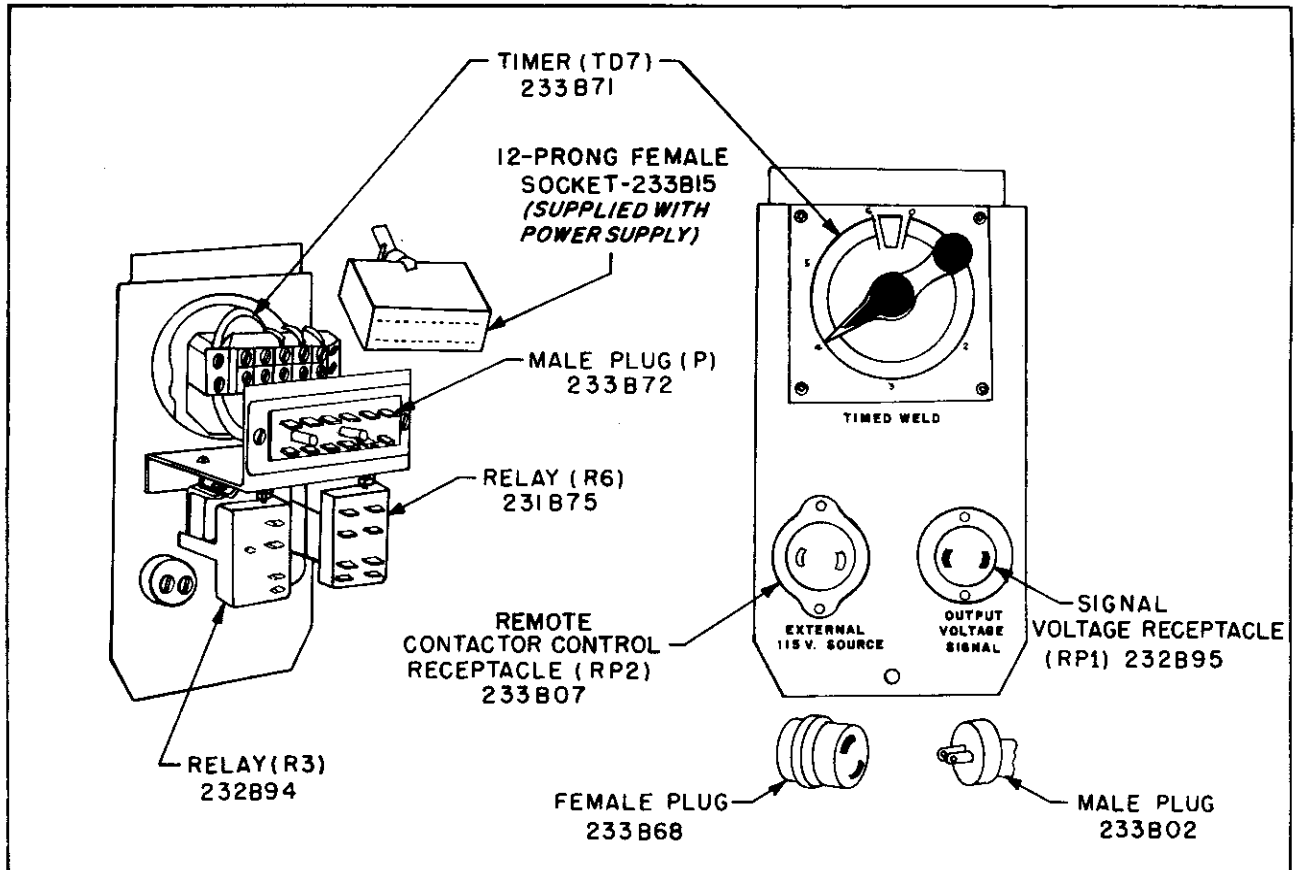
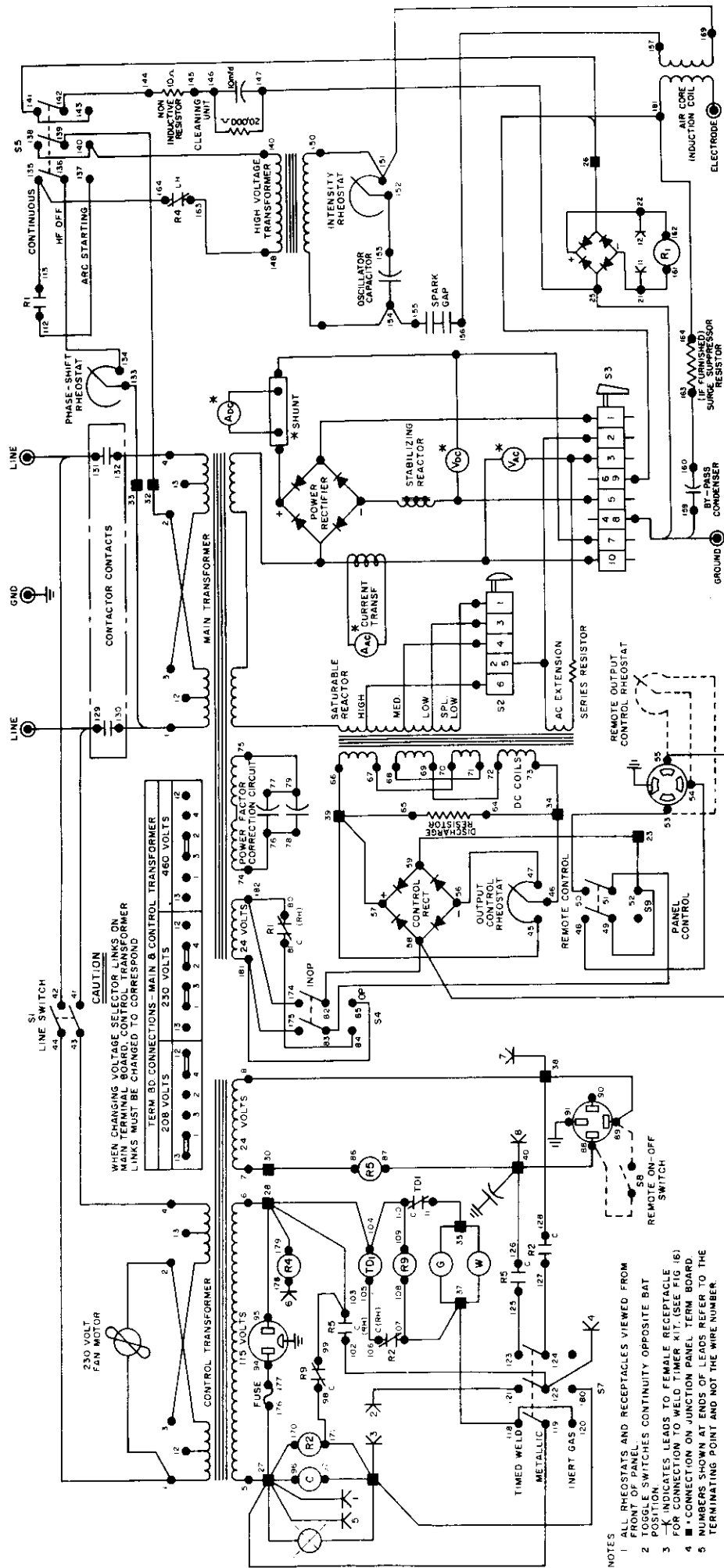


FIG. 14 - Weld Timer Unit, Part No. 131B20 (Optional)



- NOTES
- 1 ALL RHEOSTATS AND RECEPTACLES VIEWED FROM FRONT OF PANEL.
 - 2 TOGGLE SWITCHES CONTINUITY OPPOSITE BAT POSITION.
 - 3 POSITIONING LEADS TO FEMALE RECEPTACLE FOR CONNECTION TO WELD TIMER KIT (SEE FIG. 16)
 - 4 ■ CONNECTION ON JUNCTION PANEL TERM BOARD
 - 5 NUMBERS SHOWN AT ENDS OF LEADS REFER TO THE TERMINATING POINT AND NOT THE WIRE NUMBER.

NOTES
 S2 AND S3 SWITCH NUMBERS INDICATE CONNECTION TERMINALS STARTING AT HANDLE END OF SWITCH ON S2 AND S3 SWITCHES. TERMINAL NUMBERS IN A COMMON BLOCK INDICATE THEY ARE PHYSICALLY PARALLELED ON THE SWITCH.
 * ACCESSORIES SUPPLIED WITH METER KIT

SWITCH IDENT	SWITCH POS	TERMINALS BRIDGED
S2	SPL LOW	(1-2)
	LOW	(2-3)
	MED	(4-5)
	HIGH	(5-6)
S3	A.C.	(3-4) (9-10)
	D.C. REV	(1-2) (4-5) (6-7)
	D.C. STR	(1-2) (5-6) (7-8)

SWITCH IDENT	SWITCH POS	TERMINALS BRIDGED
S2	SPL LOW	(1-2)
	LOW	(2-3)
	MED	(4-5)
	HIGH	(5-6)
S3	A.C.	(3-4) (9-10)
	D.C. REV	(1-2) (4-5) (6-7)
	D.C. STR	(1-2) (5-6) (7-8)

LINE SWITCH	REMOTE CONTROL - PANEL CONTROL	NOMENCLATURE
S1	S9	R5
S2	R1	R5
S3	G	TD1
S4	W	C
S5	R2	AAC
S7	R4	A _{DC}
S8	R9	

FIG. 15 - Diagram for HDA-200 and HDA-300 Welding Power Supplies

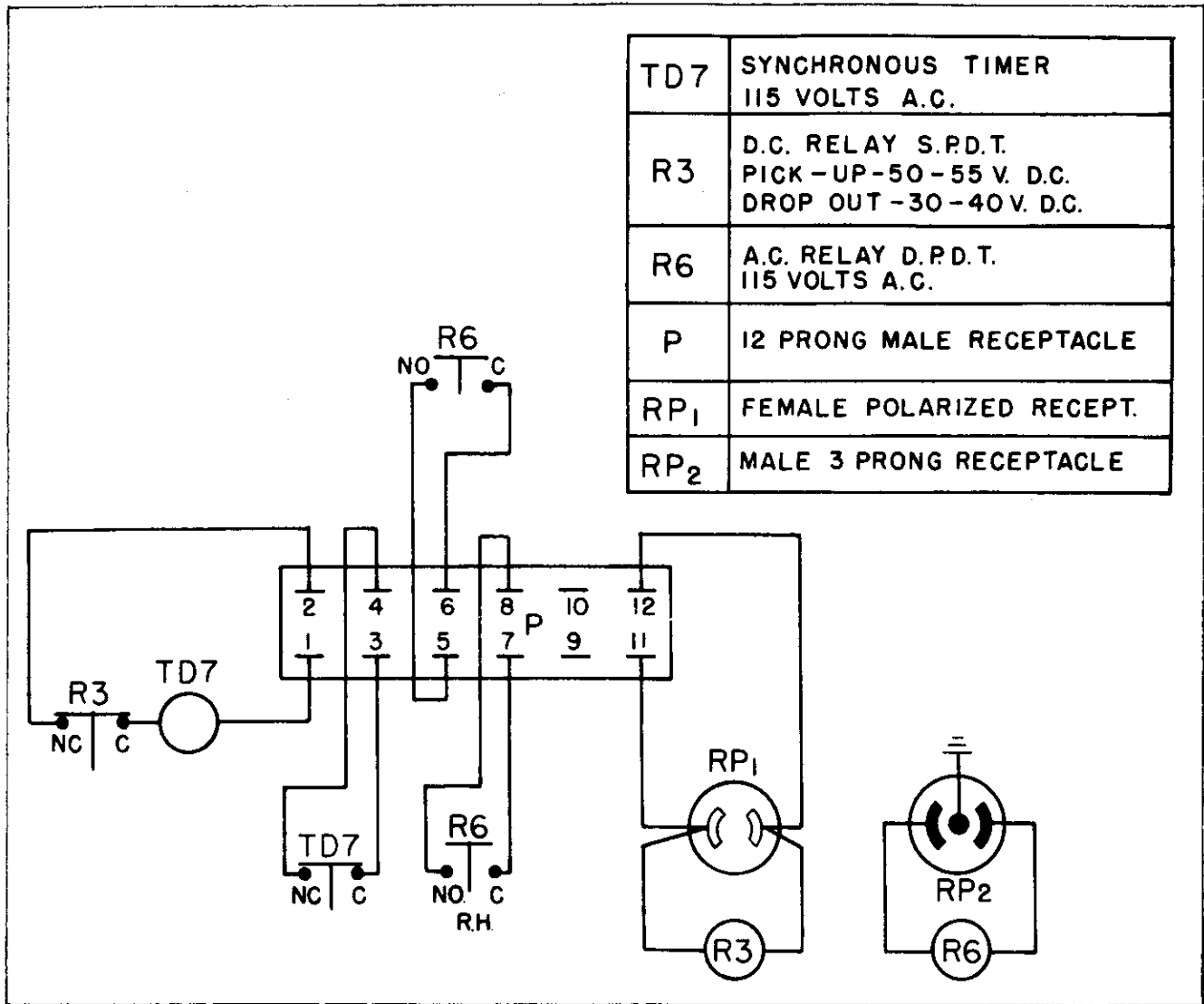


FIG. 16 - Wiring Diagram, Weld Timer Unit

**UNION CARBIDE CORPORATION
LINDE DIVISION**

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UNION CARBIDE CANADA LIMITED, TORONTO

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