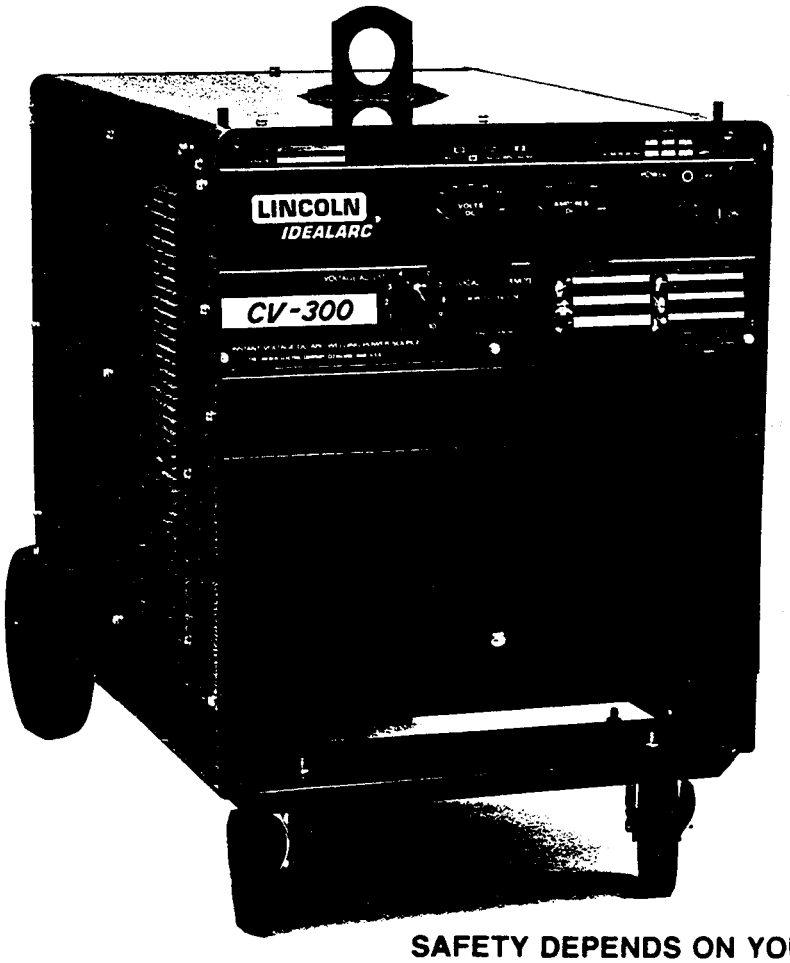
LINCOLN WELDERS

IM-372
Temporary
Oct 1988

OPERATING MANUAL

CV-300

This manual covers equipment which is obsolete and no longer in production by The Lincoln Electric Co. Specifications and availability of optional features may have changed.



DAMAGE CLAIMS

When this equipment is purchased, title passes to the purchaser upon receipt by the carrier. Consequently, claims for material damaged in shipment must be made by the purchaser against the transportation company at the time the equipment is received.

SAFETY DEPENDS ON YOU

Lincoln welders are designed and built with safety in mind. However, your overall safety can be increased by proper installation ... and thoughtful operation on your part. DO NOT INSTALL, OPERATE OR REPAIR THIS EQUIPMENT WITHOUT READING THIS OPERATING MANUAL AND THE ARC WELDING SAFETY PRECAUTIONS ON THE INSIDE FRONT COVER. And, most importantly, think before you act and be careful.

LINCOLN ELECTRIC

THE LINCOLN ELECTRIC COMPANY
World's Largest Manufacturer of Arc Welding Products • Manufacturer of Industrial Motors
Sales and Service Worldwide
Cleveland, Ohio 44117-1199 U.S.A

ARC WELDING SAFETY PRECAUTIONS

WARNING: PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH.

ELECTRIC SHOCK can kill.

1. a. The electrode and work (or ground) circuits are electrically "hot" when the welder is on. Do not touch these "hot" parts with your bare skin or wet clothing. Wear dry, hole-free gloves to insulate hands.

   b. In semiautomatic or automatic wire welding, the electrode, electrode reel, welding head, nozzle or semiautomatic welding gun are also electrically "hot".

   c. Insulate yourself from work and ground using dry insulation. When welding in damp locations, on metal framework such as floors, gratings or scaffolds, and when in positions such as sitting or lying, make certain the insulation is large enough to cover your full area of physical contact with work and ground.

   d. Always be sure the work cable makes a good electrical connection with the metal being welded. The connection should be as close as possible to the area being welded.

   e. Ground the work or metal to be welded to a good electrical (earth) ground.

   f. Maintain the electrode holder, work clamp, welding cable and welding machine in good, safe operating condition. Replace damaged insulation.

   g. Never dip the electrode in water for cooling.

   h. Never simultaneously touch electrically "hot" parts of electrode holders connected to two welders because voltage between the two can be the total of the open circuit voltage of both welders.

   i. When working above floor level, protect yourself from a fall should you get a shock.

   j. Also see Items 4c and 6.

ARC RAYS can burn.

2. a. Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing open arc welding. Headshield and filter lens should conform to ANSI Z87.1 standards.

   b. Use suitable clothing made from durable flame-resistant material to protect your skin and that of your helpers from the arc rays.

   c. Protect other nearby personnel with suitable non-flammable screening and/or warn them not to watch the arc nor expose themselves to the arc rays or to hot spatter or metal.

FUMES AND GASES can be dangerous.

3. a. Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. When welding, keep your head out of the fume. Use enough ventilation and/or exhaust at the arc to keep fumes and gases away from the breathing zone. When welding on galvanized, lead or cadmium plated steel and other metals which produce toxic fumes, even greater care must be taken.

   b. Do not weld in locations near chlorinated hydrocarbon vapors coming from degreasing, cleaning or spraying operations. The heat and rays of the arc can react with solvent vapors to form phosgene, a highly toxic gas, and other irritating products.

   c. Shielding gases used for arc welding can displace air and cause injury or death. Always use enough ventilation, especially in confined areas, to insure breathing air is safe.

   d. Read and understand the manufacturer's instructions for this equipment and the consumables to be used, including the material safety data sheet (MSDS) and follow your employer's safety practices.

   e. Also see item 7b.

WELDING SPARKS can cause fire or explosion.

4. a. Remove fire hazards from the welding area. If this is not possible, cover them to prevent the welding sparks from starting a fire. Remember that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas. Have a fire extinguisher readily available.

   b. Where compressed gases are to be used at the job site, special precautions should be used to prevent hazardous situations. Refer to "Safety in Welding and Cutting" (ANSI Standard Z49.1) and the operating information for the equipment being used.

   c. When not welding, make certain no part of the electrode circuit is touching the work or ground. Accidental contact can cause overheating and create a fire hazard.

   d. Do not heat, cut or weld tanks, drums or containers until the proper steps have been taken to insure that such procedures will not cause flammable or toxic vapors from substances inside. They can cause an explosion even though they have been "cleaned." For information purchase "Recommended Safe Practices for the Preparation for

Welding and Cutting of Containers and Piping That Have Held Hazardous Substances", AWS F4.1-80 from the American Welding Society (see address below).

e. Vent hollow castings or containers before heating, cutting or welding. They may explode.

f. Sparks and spatter are thrown from the welding arc. Wear oil free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes and a cap over your hair. Wear ear plugs when welding out of position or in confined places. Always wear safety glasses with side shields when in a welding area.

g. Connect the work cable to the work as close to the welding area as practical. Work cables connected to the building framework or other locations away from the welding area increase the possibility of the welding current passing through lifting chains, crane cables or other alternate circuits. This can create fire hazards or overheat lifting chains or cables until they fail.

h. Also see item 7c.

CYLINDER may explode if damaged.

5. a. Use only compressed gas cylinders containing the correct shielding gas for the process used and properly operating regulators designed for the gas and pressure used. All hoses, fittings, etc. should be suitable for the application and maintained in good condition.

b. Always keep cylinders in an upright position securely chained to an undercarriage or fixed support.

c. Cylinders should be located:
- Away from areas where they may be struck or subjected to physical damage.
- A safe distance from arc welding or cutting operations and any other source of heat, sparks, or flame.

d. Never allow the electrode, electrode holder, or any other electrically "hot" parts to touch a cylinder.

e. Keep your head and face away from the cylinder valve outlet when opening the cylinder valve.

f. Valve protection caps should always be in place and handtight except when the cylinder is in use or connected for use.

g. Read and follow the instructions on compressed gas cylinders, associated equipment, and CGA publication P-1, "Precautions for Safe Handling of Compressed Gases in Cylinders," available from the Compressed Gas Association, 1235 Jefferson Davis Highway, Arlington, VA 22202.

FOR ELECTRICALLY powered equipment.

6. a. Turn off input power using the disconnect switch at the fuse box before working on the equipment.

b. Install equipment in accordance with the National Electrical Code, all local codes and the manufacturer's recommendations.

c. Ground the equipment in accordance with the National Electrical Code and the manufacturer's recommendations.

FOR ENGINE powered equipment.

7. a. Turn the engine off before troubleshooting and maintenance work unless the maintenance work requires it to be running.

b. Operate engines in open, well-ventilated areas or vent the engine exhaust fumes outdoors.

c. Do not add the fuel near an open flame, welding arc or when the engine is running. Stop the engine and allow it to cool before refueling to prevent spilled fuel from vaporizing on contact with hot engine parts and igniting. Do not spill fuel when filling tank. If fuel is spilled, wipe it up and do not start engine until fumes have been eliminated.

d. Keep all equipment safety guards, covers and devices in position and in good repair. Keep hands, hair, clothing and tools away from V-belts, gears, fans and all other moving parts when starting, operating or repairing equipment.

e. In some cases it may be necessary to remove safety guards to perform required maintenance. Remove guards only when necessary and replace them when the maintenance requiring their removal is complete. Always use the greatest care when working near moving parts.

f. Do not put your hands near the engine fan. Do not attempt to override the governor or idler by pushing on the throttle control rods while the engine is running.

g. To prevent accidentally starting gasoline engines while turning the engine or welding generator during maintenance work, disconnect the spark plug wires, distributor cap or magneto wire as appropriate.

h. To avoid scalding, do not remove the radiator pressure cap when the engine is hot.

HAVE ALL INSTALLATION, OPERATION, MAINTENANCE AND REPAIR WORK performed by qualified people.

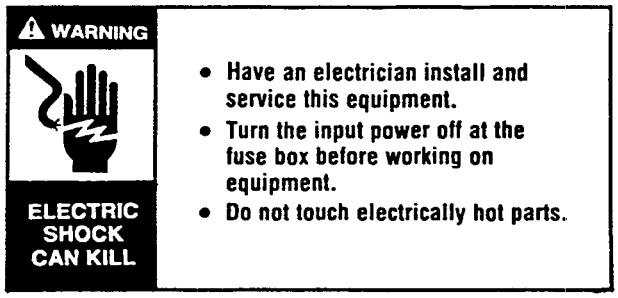
For more detailed information, it is strongly recommended that you purchase a copy of "Safety in Welding & Cutting — ANSI Standard Z49.1" from the American Welding Society, P.O. Box 351040, Miami, Florida 33135.

SPECIFICATION SUMMARY

Model	CV-300
Type	K1352
Input Frequency	60 Hz
Phase	3
Output Ratings (DC)	NEMA Class I (100) 300A/32V/100% 350A/35V/70% 400A/32V/60%
Current/Voltage Range	50A/7V - 400A/32V
Maximum OCV:	55
Normal OCV:	10-43
Input Power	
Standard Voltage	230/460/3/60
Nameplate Amps	58/29
Other Voltages	
Idle Current	6.7/3.3
Idle Power	700 W
Power Factor at Rated Load	.68
Auxiliary Power	115 volts AC and 42 volts AC, 10 amp maximum combined load, terminal strip connection, protected by 10 amp circuit breaker.
Dimensions (inches)	21.50 H x 19.50 W x 27.00 D (Lift Hook, add 3.12)
Net Weight	300 lbs.

1. CV-300 INSTALLATION

1.1 Safety Precautions



- Connect the CV-300 grounding terminal located on the welder base near the reconnect panel (marked ⏚) to a good electrical earth ground.

- Turn the Power switch on the CV-300 "OFF" before connecting or disconnecting output cables, terminal strip connections, or other equipment.

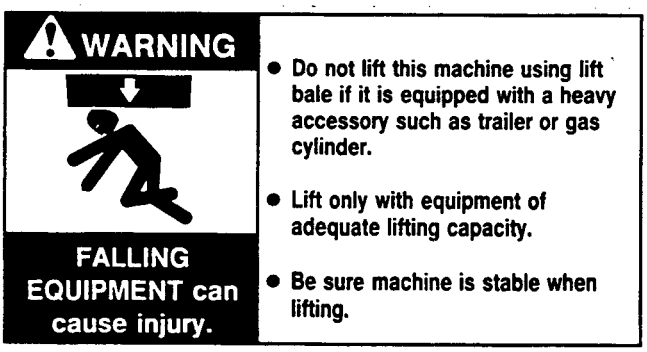
1.2 Machine Installation

1.2.1 Location

Place the welder where clean cooling air can freely circulate in through the side louvers and out through the rear louvers. Dirt, dust or any foreign material that can be drawn into the welder should be kept at a minimum. Failure to observe these precautions can result in excessive operating temperatures and nuisance thermostat trips.

1.2.2 Stacking

The CV-300 may be stacked three-high provided the bottom machine is on a stable, hard, level surface. Be sure that the two pins in the roof fit into the slots in the base of the CV-300 above it.



1.2.3 Input Connections

WARNING: ELECTRIC SHOCK CAN KILL. TURN THE INPUT POWER OFF AT THE DISCONNECT SWITCH BEFORE ATTEMPTING TO CONNECT TO THE POWER LINES.

Be sure the voltage, phase, and frequency of the input power is as specified on the welder nameplate.

Gain access to the input reconnect panel by removing the right case side of the CV-300 (side nearest to the Power switch.)

Have a qualified electrician connect the input leads to L1, L2, and L3 of the input reconnect panel in accordance with the National Electrical Code, all local codes, and the connection diagram located on the inside of the right case side. Use a three phase line.

The frame of the welder must be grounded. A ground terminal marked with the symbol ⏚ located at the bottom of the input box is provided for this purpose. See the National Electrical Code for details on proper grounding methods.

Fuse the input circuit with the recommended super lag fuses. Choose an input and grounding wire size according to local codes or use the following table. "Delay type" (1) circuit breakers may be used in place of fuses. Using fuses or circuit breakers smaller than recommended may result in "nuisance" tripping from welder inrush currents even if not welding at high currents.

RECOMMENDED INPUT LEAD AND FUSE SIZES

Based on the 1987 National Electrical Code — 100% Duty Cycle

Input Volt/Freq.	Input Ampere Rating on Nameplate	Type 75°C Wire in Conduit AWG Copper Cond.	Grounding Wire AWG Copper Cond.	Fuse Size (Super Lag)
230/60	58	6	8	100
460/60	29	10	10	50

(1) Also called "inverse time" or "thermal/magnetic" circuit breakers; circuit breakers which have a delay in tripping action that decreases as the magnitude of the current increases.

1.3 Installation of Required Equipment-Control Cable Connections

Gain access to the wire feeder and remote control terminal strip connections by raising the output cover on the case front, removing the two screws from the terminal strip cover, and opening it to the right.

The control cables can now be brought through the strain reliefs in the base located directly below the terminal strips. Follow the instructions below which are appropriate for the wire feeder that will be used.

NOTE: Not compatible with LN-9 or NA-5 type feeders

1.3.1 LN-7 to CV-300

WARNING: ELECTRIC SHOCK CAN KILL. - Turn the Power switch on the CV-300 "OFF" before making terminal strip connections.

a) Turn the CV-300 Power switch to the "OFF" position.

b) Connect wires 2, 4, 31, and 32 to the appropriate terminals.

c) Connect the ground lead to the terminal marked ⏚.

d) See the connection diagram in this manual for connection of the number 21 lead.

e) See Section 1.5 for connection of work and electrode cables.

1.3.2 LN-8 to CV-300

WARNING: ELECTRIC SHOCK CAN KILL. - Turn the Power switch on the CV-300 "OFF" before making terminal strip connections.

a) Turn the CV-300 Power switch to the "OFF" position.

b) Connect wires 2, 4, 31, 32, 75, 76, and 77 to the appropriate terminals.

c) Connect the ground lead to the terminal marked ⏚.

d) See the connection diagram in this manual for connection of the number 21 lead.

e) See Section 1.5 for connection of work and electrode cables.

1.3.3 Connection of LN-22 or LN-25 to CV-300

> WARNING: ELECTRIC SHOCK CAN KILL.
>
> - Turn the Power switch on the CV-300 "OFF" before making terminal strip connections.

a) Turn the CV-300 Power switch to the "OFF" position.

b) Connect a jumper between terminals 2 and 4 on the terminal strip.

c) See Section 1.5 for connection of work and electrode cables.

NOTE: The output terminals are energized at all times when terminals 2 and 4 are jumpered.

1.3.4 Connection of Remote Voltage Control (K775)

> WARNING: ELECTRIC SHOCK CAN KILL.
>
> - Turn the Power switch on the CV-300 "OFF" before making terminal strip connections.

a) Connect leads 75, 76, and 77 to the appropriate terminals.

b) Connect the ground lead to the terminal marked $\pm$.

1.3.5 CV-300

After all terminal strip connections are made, close the terminal strip door, being careful not to pinch any of the control leads. Secure the door with two screws. Lower the output cover and secure with the latch provided.

1.4 Output Connections

WARNING: ELECTRIC SHOCK CAN KILL. - Turn the Power switch on the CV-300 "OFF" before connecting or disconnecting output cables.

The output leads are connected to the output terminals marked "+" and "-". They are located behind the output cover on the case front. Strain relief for the electrode and work cables is provided by routing the leads through the hole in the base below the output terminals before connecting them to the output terminals.

Cable Sizes for Combined Lengths of Copper Electrode and Work Cable

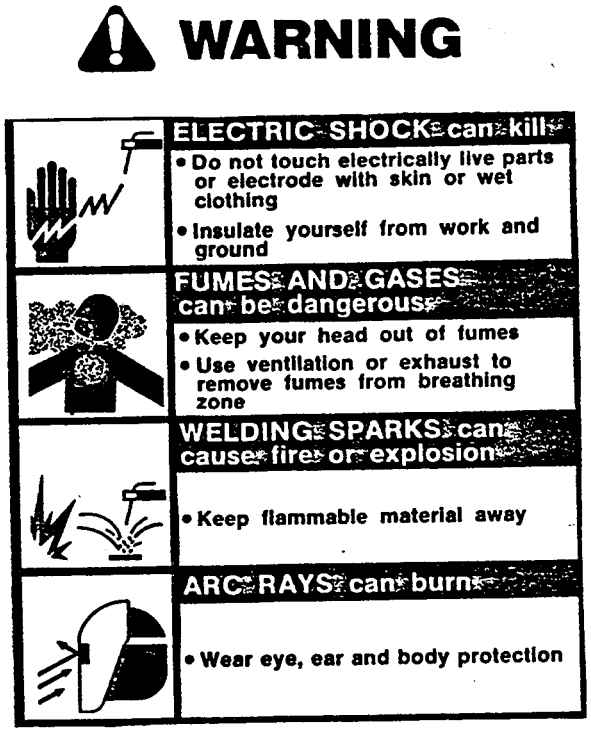
Machine Size	Lengths up to 100 Ft.	100 to 200 Ft.	200 to 250 Ft.
300	#1	1/0	2/0

1.5 Paralleling

The CV-300 is not designed to be paralleled with any other power source.

2. OPERATION

2.1 Safety Precautions



CAUTION:
When using a CV-300 power source with wire feeders which do not have an electrical trigger interlock (or with wire feeders with the electrical trigger interlock in the OFF position), there will be a small spark if the electrode contacts the work or ground within several seconds after releasing the trigger.

When used with some wire feeders with the electrical trigger interlock in the ON position, the arc can restart if the electrode touches the work or ground during these several seconds.

2.2 Power Source Operation

Be sure the CV-300 is properly installed, and that all accessories are properly hooked up before attempting operation.

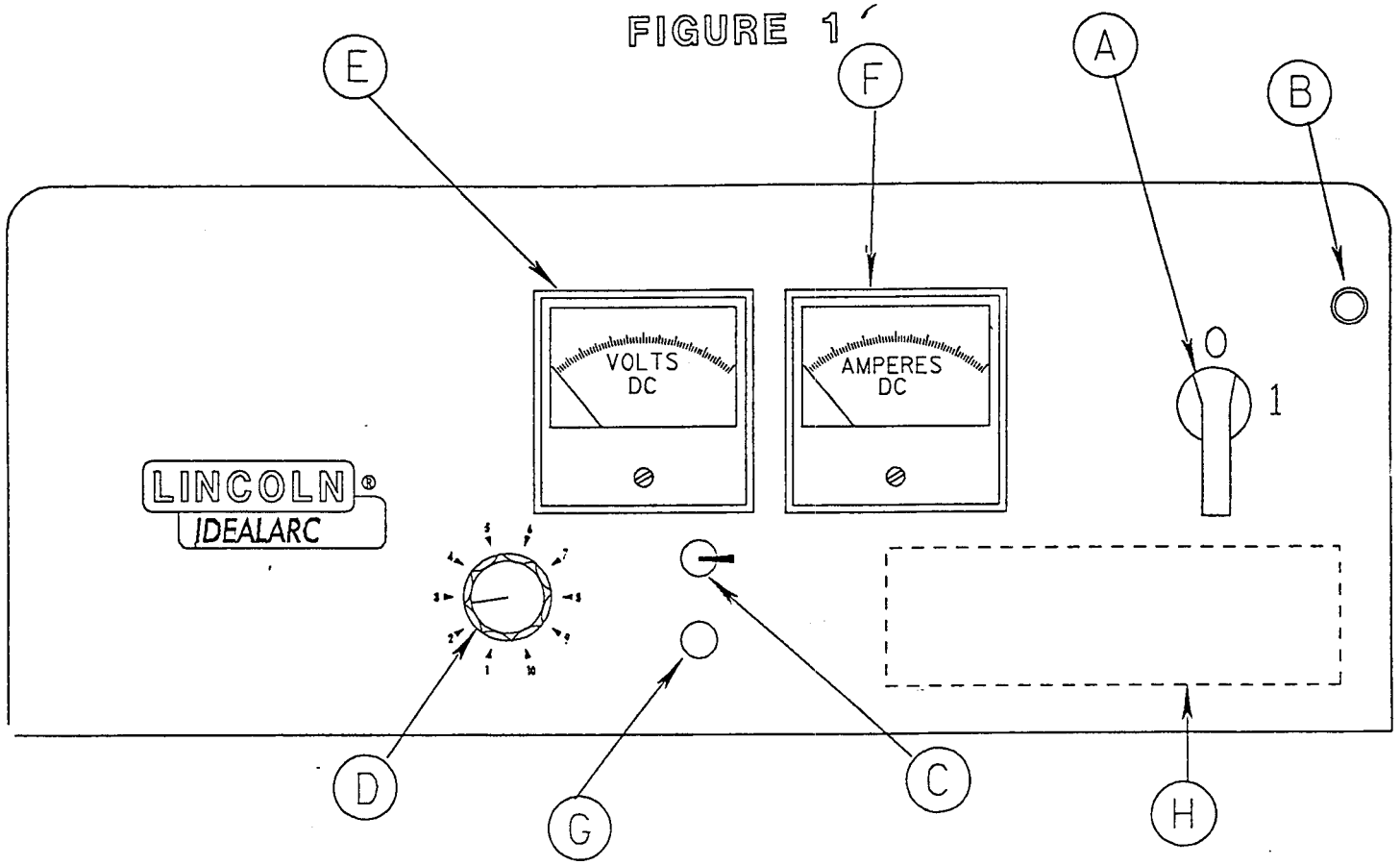
2.2.1 Duty Cycle

The CV-300 is rated at the following duty cycles:

Amps	Volts	Duty Cycle (10 minute period)
300	32	100%
350	35	70%
400	32	60%

2.2.2 Control Panel

CONTROL PANEL
FIGURE 1



A. Power Switch

A two-position rotary switch.

Controls the input power to the CV-300.

B. Pilot Light

Indicates when the CV-300 is energized (input power is "ON".)

C. Local/Remote Switch

A two-position toggle switch:

Local: Output voltage is controlled by the front panel Voltage Adjust (4.).

Remote: Output voltage is controlled by a remote control connected to 75, 76 and 77 on terminal strip TS2 (5.).

D. Voltage Adjust

Controls the CV-300 output voltage when the Local/Remote switch is in the local position.

E. Voltmeter

Displays the CV-300 output voltage as measured at the CV-300 output terminals.

NOTE: Due to voltage drops in the welding cables and at cable connection points, the actual arc voltage may be lower than that displayed on the voltmeter. Use welding cables of the proper capacity and make sure all connections are tight to minimize this effect.

F. Ammeter

Displays the CV-300 output current.

G. Circuit Breaker

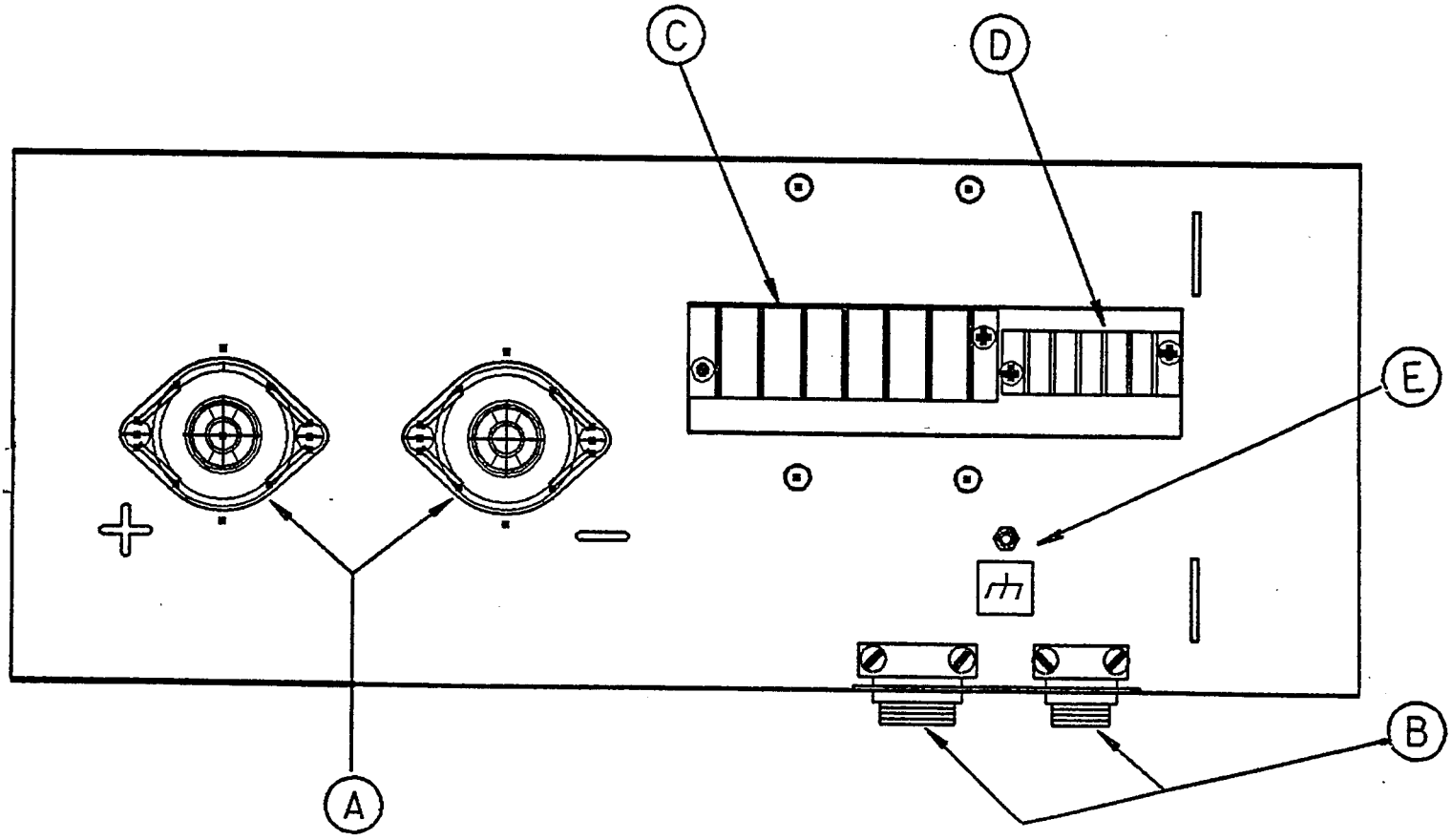
Protects the 115 volt 31-32 circuit on terminal strip TS2 and the 42 volt 41-42 circuit on terminal strip TS1 from overloads and shorts. If this circuit breaker opens, the CV-300 will work normally, however, any equipment powered by the 31-32 circuit or the 41-42 circuit will not work.

H. Warning Plate

Safety information pertaining to the operation and service of the CV-300.

2.2.3 Output Panel Connections

OUTPUT PANEL
FIGURE 2



(SHOWN WITH COVERS REMOVED)

A. Output Connectors

Connections for welding cables. Polarity is as marked on the panel. 1/2-13 threaded studs are provided on the CV-300.

B. Control Cable Strain Reliefs

Two strain reliefs are provided -- one for Terminal Strip TS1, and one for Terminal Strip TS2.

C. Terminal Strip TS2

Provides connections for wire feeder voltmeter lead (21), output contactor (2 and 4), and 115 VAC (31 and 32).

D. Terminal Strip TS1

Provides connection for remote control (75, 76, and 77) and 42 VAC (41 and 42).

E. Control Cable Ground Connection

Ground terminal for control cable grounding leads.

2.2.4 Starting the Machine

The power switch at the extreme right side of the control panel energizes the CV-300.

The red light to the right of the power switch indicates when the CV-300 is energized.

2.2.5 Adjusting the Output Voltage

Adjustment without a remote control - place the Local/Remote switch in the LOCAL position. Change the Voltage Adjust control setting to give the proper arc voltage for the welding procedure being used. The knob can be adjusted anywhere from 1 to 10 on the dial. This control may be adjusted while welding to change the CV-300 output.

Adjustment with a K775 Remote Control - place the Local/Remote switch in the REMOTE position. Change the Remote Control setting to give the proper arc voltage for the procedure being used. The Remote Control knob can be adjusted from 1 to 10 on the dial. This control may be adjusted while welding to change the CV-300 output.

2.3 Auxiliary Power

The CV-300 supplies both 115 volt and 42 volt AC power needed for some wire feeding equipment. The 115 volt power is available from terminals #31 and #32 on terminal strip TS2. The 42 volt power is available from terminals 41 and 42 on terminal strip TS1. A 10 amp circuit breaker on the machine control panel protects the auxiliary power from excessive overloads.

NOTE: Do not use terminals 2 or 4 for control of auxiliary loads. (The 2-4 circuit is isolated from the 31-32 and 41-42 circuits.)

3. MAINTENANCE

3.1 Safety Precautions

WARNING: ELECTRIC SHOCK CAN KILL. HAVE QUALIFIED PERSONNEL DO ALL INSTALLATION, MAINTENANCE AND TROUBLESHOOTING WORK. TURN THE INPUT POWER OFF AT THE FUSE BOX BEFORE WORKING ON THE MACHINE.

3.2 General Maintenance

1. The fan motor has sealed bearings which require no service.

2. In extremely dusty locations, dirt may clog the air channels causing the welder to run hot. Blow out the welder with low pressure air at regular intervals to eliminate excessive dirt and dust build-up on internal parts.

3. In extremely dusty locations, dirt may accumulate on the control cable connection terminal strips. Wipe or blow these terminal strips off at regular intervals. This is particularly important in damp locations.

Machine and Circuit Protection

The power source is thermostatically protected with proximity thermostats against overload or insufficient cooling. If the machine is overloaded, the thermostat will open and the output will be zero. The fan will continue to run. The thermostat will remain open until the machine cools, at which time it will close and the output will again be available.

The CV-300 is electronically protected against overloads and accidental short circuits. If the circuitry senses a short circuit or an overload condition, it will limit the CV-300 output to a low value by phasing back the SCR's. These protection circuits can be reset by turning the CV-300 Power switch OFF for at least 10 seconds. Remove the overload or short before turning the Power switch ON again.

The CV-300 circuitry is also protected from miswirings on terminal strip connections 2, 4, 75, 76, and 77. If any of these are misconnected, fuses on the printed circuit board may blow. This will result in either low output or no output from the CV-300. Correct the miswirings, and reinstall new PC board fuses before proceeding.

3.3 TROUBLESHOOTING THE CV-300

- **Have an electrician install and service this equipment.**
- **Turn the input power off at the fuse box before working on equipment.**
- **Do not touch electrically hot parts.**

3.3.1 Troubleshooting Guide

Trouble	Cause	What To Do
Machine has no output.	1. Secondary contactor circuit (2 and 4 on TS1) not working.	1. Check PC board fuses, 2 and 4 circuit wiring, and thermostats.
	2. Electrode or work lead loose or broken.	2. Repair connection.
	3. Defective PC board.	3. See PC Board Troubleshooting Procedure.
	4. Protective circuits operating due to output short circuit.	4. Turn power off. Remove output short circuit.
Machine has minimum output and no control.	1. Terminals 75, 76, or 77 misconnected.	1. Check 75, 76, or 77 wiring. Check PC board fuses.
Machine has low output and no control.	1. Local/Remote Switch in wrong position.	1. Check position of switch. Change to "Local".
	2. Local/Remote Switch faulty.	2. Check switch and replace if faulty.
	3. Open in feedback circuitry.	3. Check wiring and control and PC board wiring harness plugs.
	4. Faulty PC board.	4. See PC Board Troubleshooting Procedure.
	5. Output Control potentiometer circuit open (lead 75).	5. Check and replace potentiometer if faulty. Check wiring of lead #75.

Trouble	Cause	What To Do
Machine does not have maximum output.	1. Faulty PC board.	1. See PC Board Troubleshooting Procedure.
	2. Output Control potentiometer defective.	2. Check and replace if faulty.
	3. Output Control potentiometer leads open.	3. Check and repair broken leads.
Machine has output but reduces to low output and remains there until the load is broken and arc restarted.	1. Excessive load causing the overload protection on the PC board to operate.	1. Reduce load.
	2. Machine output shorted causing overload protection on PC board to operate.	2. Turn machine off and remove short.
	3. PC board defective.	3. See PC Board Troubleshooting Procedure.
Machine will not shut off.	1. Defective power switch.	1. Replace.
Variable or sluggish welding arc.	1. Poor work or electrode connection.	1. Check and clean all connections.
	2. Welding leads too small.	2. Check table in operating manual.
	3. Welding current or voltage too low.	3. Check procedures for recommended settings.
	4. Defective SCR bridge.	4. Check and replace if defective.

Trouble	Cause	What To Do
Output Control not functioning on the machine.	1. Local/Remote switch in the wrong position.	1. Place switch in "Local" position.
	2. Faulty Local/Remote switch.	2. Check and replace if found faulty.
	3. Faulty Voltage Adjust potentiometer.	3. Check and replace if found faulty.
	4. Leads or connections open in control circuit.	4. Check lead continuity and connections for an open and repair if necessary.
	5. Faulty PC board.	5. See PC Board Troubleshooting Procedure.
Output Control not functioning on Remote Control or on wire feeder.	1. Local/Remote switch in wrong position.	1. Place switch in "Remote".
	2. Faulty Local/Remote switch.	2. Check and replace if found faulty.
	3. Faulty Remote Control potentiometer.	3. Check and replace if found faulty.
	4. Leads or connections open in control circuit.	4. Check all leads and connections, internal or remote, for continuity; repair if necessary.
	5. Faulty PC board.	5. See PC Board Troubleshooting Procedure.
Poor arc striking with semiautomatic wire feeders.	1. Poor work connection.	1. Work connection must be adequate for application.
	2. Improper procedures.	2. Adjust procedures for improved starting.
	3. Defective PC board.	3. See PC Board Troubleshooting Procedure.
Poor arc characteristics.	1. PC board defective.	1. See PC Board Troubleshooting Procedure.

3.3.2 Troubleshooting Procedures

WARNING: ELECTRIC SHOCK CAN KILL. - TURN THE INPUT POWER OFF AT THE DISCONNECT SWITCH BEFORE WORKING INSIDE THE MACHINE CASE.

3.3.2.1 PC Board Troubleshooting Procedure

Perform the following checks before replacing the Control PC board.

A. With the Control Panel folded down, and the Power "ON", LED's 1 and 2 on the Control PC board must be glowing. If not, check the following.

1. Check for loose connections in the PC board plugs, particularly J2.

2. Check for the following voltages, accessible at PC board plug J2:

Wire #	60 Hz	50 Hz
201-204	17-19.5 VAC	16.5-18.5 VAC
202-204	17-19.5 VAC	16.5-18.5 VAC
203-204	17-19.5 VAC	16.5-18.5 VAC

These voltages are to be taken with the machine hooked up to rated input voltage. If the input line is high or low, these voltages will vary accordingly.

If these voltages are not present, check the wiring back to the main transformer.

If these voltages are correct, refer to "Procedure for Replacing PC Boards."

B. With the Control panel folded down, and the power "ON", LED 3 must glow only when connections 2 and 4 are jumpered on Terminal Strip TS2.

1. If LED 3 will not glow when 2 and 4 are jumpered, check the following: Wiring between TS1 and PC board connectors 2J3 and 1J2, thermostats L1 and L2, and PC board fuses F1 and F5.

2. If LED 3 always glows, even when there is no connection between 2 and 4, check the wiring between TS1 and PC board plugs 2J3 and 1J2.

3. If all checks OK, refer to "Procedure for Replacing PC Boards."

3.3.2.2 Procedure for Replacing PC Boards

When a PC board is to be replaced, the following procedure must be followed:

A. Visually inspect PC board in question.

1. Are any of the components damaged?

2. Is a conductor on the back side of the board damaged?

3. Are any of the PC board fuses blown? If so, replace with 1/8 amp fuses and see if the problem is corrected.

4. If there is no damage to the PC board, insert a new PC board and see if this remedies the problem. If the problem is remedied, reinstall the old PC board and see if the problem still exists with the old PC board.

   a. If the problem does not exist with the old board, check the PC board lead harness plugs.

   b. Check leads in the harness for loose connections.

5. If there is damage to the PC board, return it to the local Lincoln Electric Field Service Shop.

B. Output Voltage

The open circuit voltage of the machine should be adjustable from about 7 to 35 volts. If any other condition exists, refer to the Troubleshooting Guide.

C. Fault Protection Operation

The overload protection circuit on the PC board will reduce the welding current to less than 100 amps if a short or overload is applied to the machine. The CV-300 power switch must be turned "OFF" and then "ON" to return the machine to normal output.

D. Checking Snubber Circuit

In case of an SCR malfunction or failure, the snubber assembly should be checked. Disconnect the input power to the CV-300 and remove the right side of the machine.

1. Visually inspect the snubber PC board assembly located behind the terminal strips on the case front for overheated components or damaged components.

E. Checking Output Control on Machine

1. Turn machine off.

2. Turn the Local/Remote switch to "Remote".

3. Remove the screws around the control panel and lower the control panel.

4. Disconnect the four harness plugs from the PC board.

5. With an ohmmeter on X1K, connect across the potentiometer.

6. Rotate the output control knob to its min. ("1"), then to its max. ("10") position. The resistance reading should range from around zero to 10K. Check the resistance reading between 75 on the terminal strip and 177 on the Local/Remote switch (S2). The reading must be 10K. No reading will indicate an open potentiometer and a low reading will indicate a shorted or partially shorted potentiometer; in either case, replace.

F. Remote Control Check

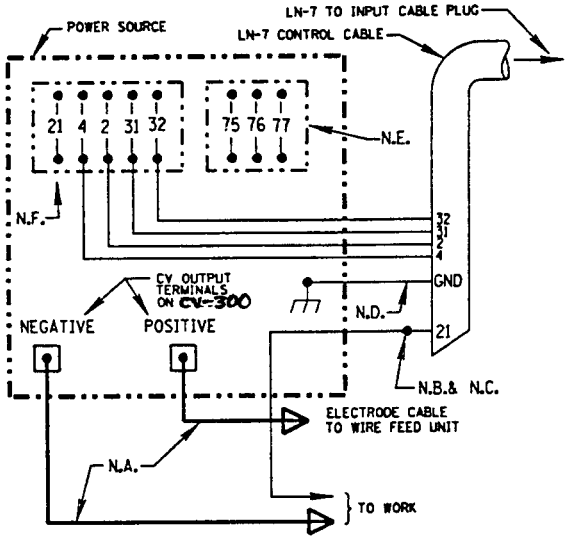
Disconnect the remote output control and connect an ohmmeter across leads 75 and 76 and rotate the rheostat in the remote control. The resistance reading should go from zero to 10K ohms. Repeat with ohmmeter across 77 and 76 with the same results. Connect ohmmeter across 75 and 77. The reading should be 10K ohms. A lower reading will indicate a shorted or partially shorted rheostat. A very high reading will indicate an open rheostat. In either of the last two cases, replace rheostat.

3.4 Temporary Parts List for CV-300 Code 9342

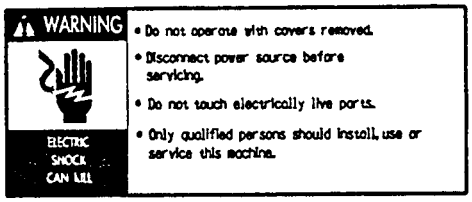
Part Description	CV-300 Part Number
Sheet Metal	
Roof	L7699
Case Front, Welded Assembly	L7698
Left Side	G1879
Right Side	G1878
Case Back	G1877
Fan Baffle	G1882
Fan Motor Bracket	M15562
Control Panel	L7678
Output Cover Assembly	M15543
Terminal Strip Cover	M15561
Base Welded Assembly	G1885
Control Panel Components	
Nameplate	L7676
Power Switch	M15470-3
Pilot Light	T13486
DC Voltmeter	M15538-1
DC Ammeter	M15539-1
Local/Remote Switch	T10800-24
Voltage Adjust Potentiometer	T10812-40
Circuit Breaker (10 amp)	T12287-20
Output Panel Components	
Output Connector	M13900
Terminal Strip 1 (5 conn.)	S13323-7
Terminal Strip 2 (6 conn.)	S8542
Internal Components	
Lift Bail Assembly	L7674
SCR Bridge Assembly	L7675
Free Wheeling Diode (D5)	S18794
Capacitor Bank Assembly	M15568
Choke Assembly	M15549
Main Transformer Assembly	G1881
Shunt	S17078-1
Snubber PC Board	M15370-1
Control PC Board	G1818-1
Fan	M6819-4A
Fan Motor	M7468-2
Reconnect Panel	M15564
Reconnect Instructions	S18699
Wiring Diagram	M15567
Tube Resistor (R1) (7.5 ohms 225W)	S10404-102
Harness	L7700
Miscellaneous	
Roof Cover Seal	S12934

S17372
8-26-88A

Connection of LN-7 to CV-300



Above diagram shows electrode connected positive. To change polarity, turn power off, reverse the electrode and work leads at the power source and position the switch on power source and wire feeder (if equipped) to proper polarity. Also refer to note N.F.



N. A. Welding cables must be of proper capacity for the current and duty cycle of immediate and future applications. See LN-7 Operating Manual for proper sizes.

N. B. If LN-7 is equipped with a meter kit, extend LN-7 control cable lead #21 using 14 AWG or larger insulated wire physically suitable for the installation. An S16586-[LENGTH] remote voltage sensing work lead may be ordered for this purpose. Connect it directly to the work piece independent of the welding work cable connection. For convenience, this extended #21 lead should be taped to the welding work lead. (If the length of welding work cable is short, less than 25 feet, and connections can be expected to be reliable, then control cable lead #21 does not need to be extended and can be directly connected to terminal #21 on the terminal strip. Note that this is not the preferred connection because it adds error to the LN-7 voltmeter reading.)

N. C. Tape up bolted connection if lead #21 is extended.

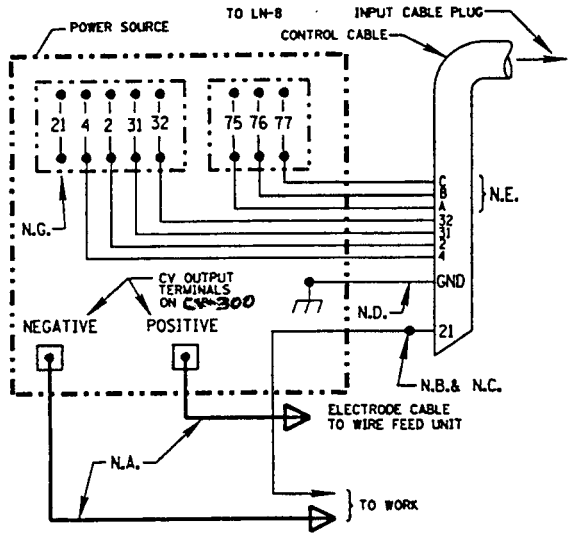
N. D. Connect the control cable ground lead to the frame terminal marked ⏚ near the power source terminal strip. The power source grounding terminal (marked ⏚ and located near the power source input power connections) must be properly connected to electrical ground per the power source operating manual.

N. E. If an optional remote voltage control is used, connect it to this terminal strip.

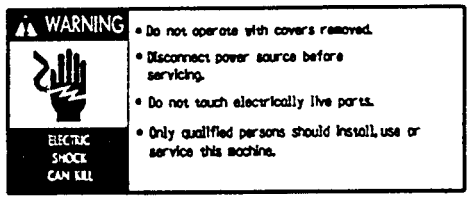
N. F.* If lead #21 is to be connected to the terminal strip, connect to the #21 terminal that matches work polarity. This connection must be changed whenever the electrode polarity is changed.

S17373
8-26-88A

Connection of LN-8 to CV-300



Above diagram shows electrode connected positive. To change polarity, turn power off, reverse the electrode and work leads at the power source and position the switch on power source and wire feeder (if equipped) to proper polarity. Also refer to note N.G.



N. A. Welding cables must be of proper capacity for the current and duty cycle of immediate and future applications.

N. B. Extend lead #21 using #14 AWG or larger insulated wire physically suitable for the installation. An S16586-[LENGTH] remote voltage sensing work lead is available for this purpose. Connect it directly to the work piece keeping it electrically separate from the welding work lead circuit and connection. For convenience, this extended #21 lead should be taped to the welding work lead. (If the length of work lead circuit is short, and connections can be expected to be reliable, then control cable lead #21 does not need to be extended and can be directly connected to terminal #21 on the terminal strip. Note that this is not the preferred connection because it adds error to the wire feeder voltmeter reading.)

N. C. Tape up bolted connection if lead #21 is extended.

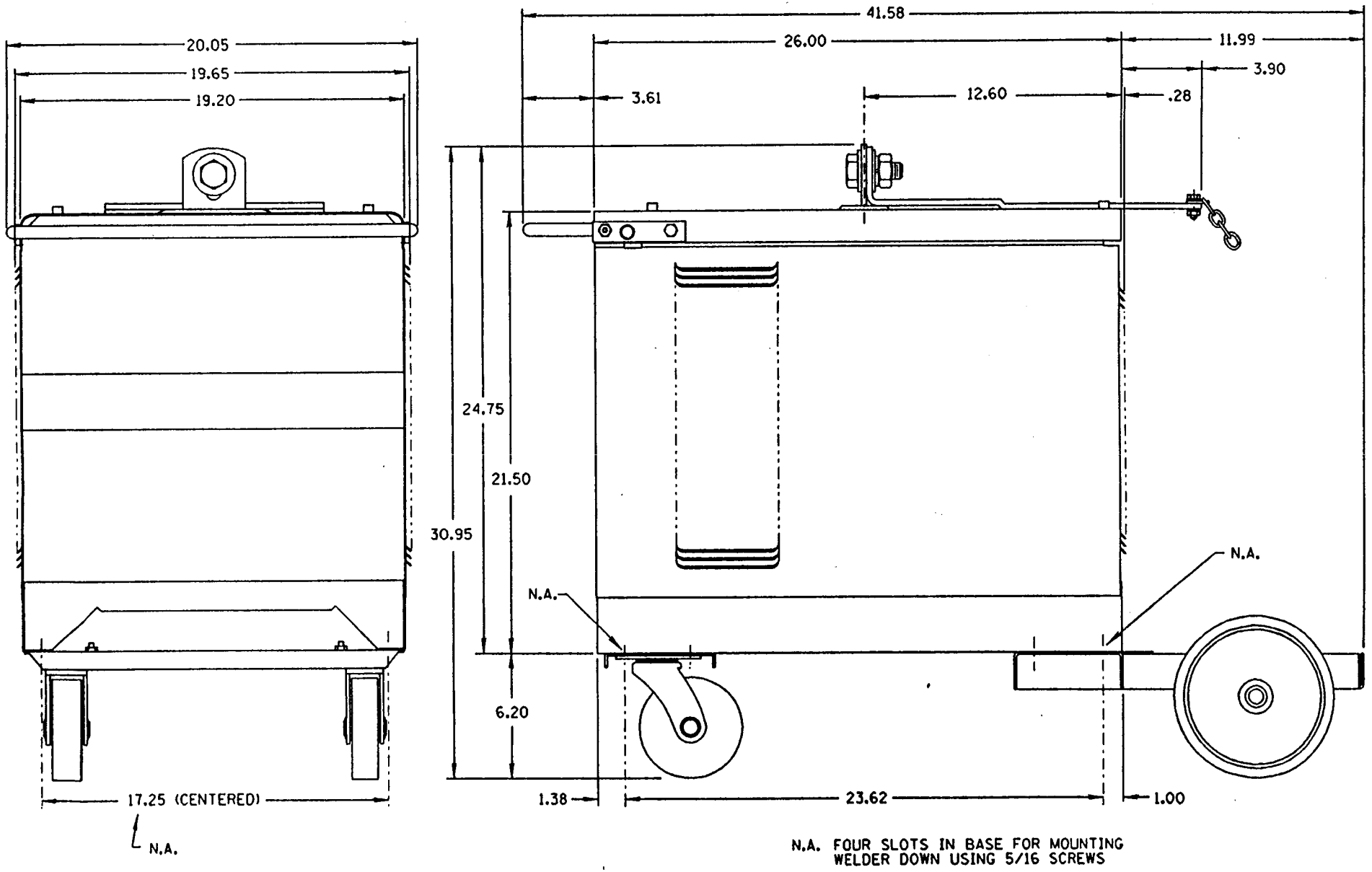
N. D. Connect the control cable ground lead to the frame terminal marked ⏚ near the power source terminal strip. The power source grounding terminal (marked ⏚ and located near the power source input power connections) must be properly connected to electrical ground per the power source operating manual.

N. E. If using an older LN-8 control cable; connect lead #75 to #75 on terminal strip, connect lead #76 to #76 on terminal strip, connect lead #77 to #77 on the terminal strip.

N. G.* If lead #21 is to be connected to the terminal strip, connect to the #21 terminal that matches work polarity. This connection must be changed whenever the electrode polarity is changed.

Dimension Print
CV-300 Undercarriage type K835

M15665
6-2-88



N.A. FOUR SLOTS IN BASE FOR MOUNTING
WELDER DOWN USING 5/16 SCREWS

HOW TO ORDER REPLACEMENT PARTS

Order parts only from Lincoln offices or from the Authorized Field Service Shops listed in the "Service Directory". Give the following information:

(a) From the nameplate — machine model, code and serial numbers.
(b) From this manual — complete part name and description, item number, quantity required and the number of the list used to get this information.

Any items indented in the "Parts Name" column are included in the assembly under which they are listed. The indented items may be ordered separately. If the entire assembly is needed, do ***not*** order the indented parts.

GUARANTEE

The Lincoln Electric Company, the Seller, warrants all new equipment except engines and accessories thereof against defects in workmanship and material for a period of one year from date of shipment, provided the equipment has been properly cared for, and operated under normal conditions. Engines and engine accessories are warranted free from defects for a period of ninety days from the date of shipment.

If the Buyer gives the Seller written notice of any defects in equipment or electrode or flux within any period of warranty and the Seller's inspection confirms the existence of such defects, then the Seller shall correct the defect or defects at its option, either by repair or replacement F.O.B. its own factory or other place as designated by the Seller. The remedy provided Buyer herein for breach of Seller's warranty shall be exclusive.

No expense, liability or responsibility will be assumed by the Seller for repairs made outside of the Seller's factory without written authority from the Seller.

The Seller shall not be liable for any consequential damages in case of any failure to meet the conditions of any warranty. The liability of the Seller arising out of the supplying of said equipment or electrode or its use by the Buyer, whether on warranties otherwise, shall not in any case exceed the cost of correcting defects in the equipment or replacing defective electrode in accordance with the above guarantee. Upon the expiration of any period of warranty, all such liability shall terminate.

The foregoing guarantees and remedies are exclusive and except as above set forth. There are no guarantees or warranties with respect to engines, accessories, equipment, electrodes or flux, either express or arising by operation of law or trade usage or otherwise implied, including without limitation the warranty of merchantability, all such warranties being waived by the Buyer.

WARRANTY SUPERSEDED
SEE IMIS 1

LINCOLN ELECTRIC

THE LINCOLN ELECTRIC COMPANY
World's Largest Manufacturer of Arc Welding Products • Manufacturer of Industrial Motors
Sales and Service Worldwide
Cleveland, Ohio 44117-1199 U.S.A.
Toronto M4G 2B9 – Canada • Sydney 2211 – Australia • Rouen 76120 – France

5-84
Litho in U.S.A.