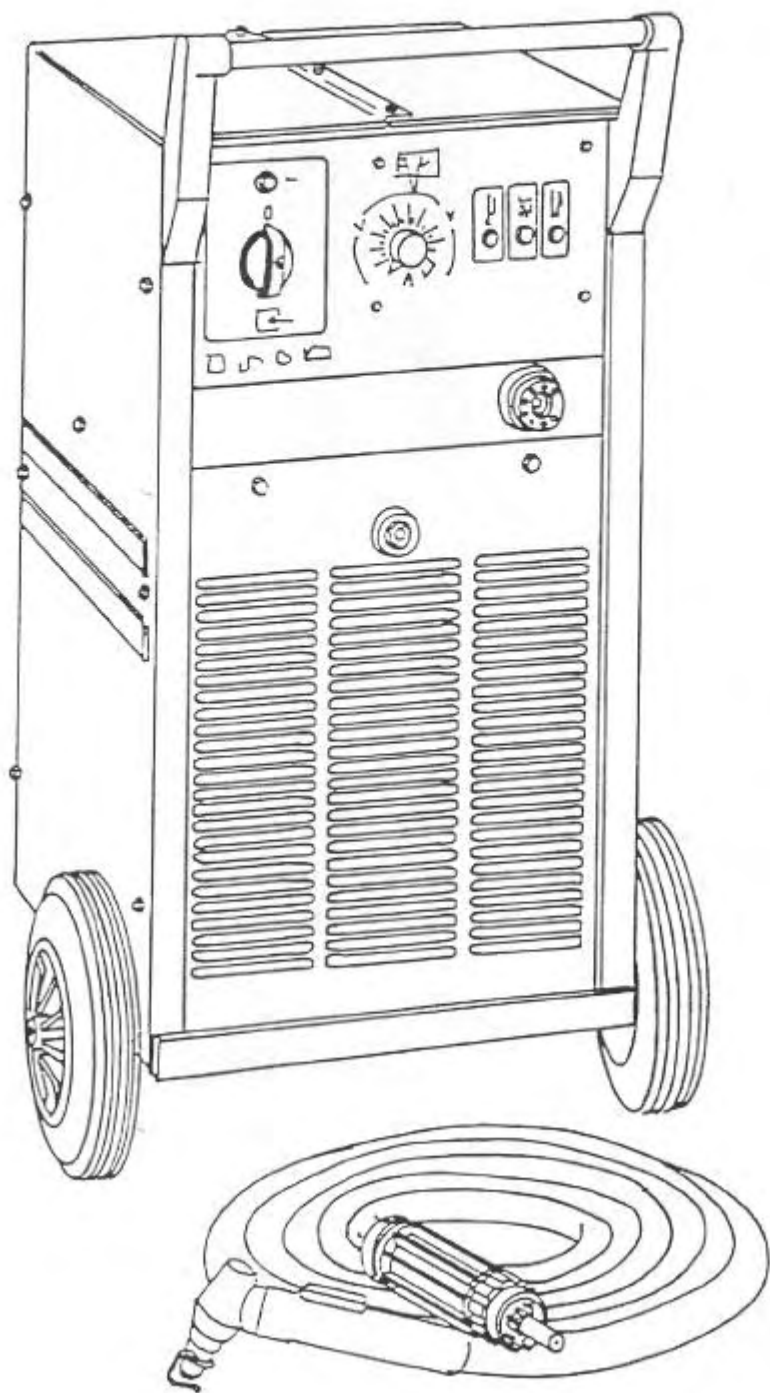




Plasma generators require dangerous voltages for operation. When working inside the machine, be especially careful around non-insulated wires and terminals and moving parts (fan).

This repair manual is divided into two sections:

- Section 1: Description of operating logic, and operating checks
- Section 2: Examples of possible errors, at the end.

DESCRIPTION OF OPERATING LOGIC AND OPERATING CHECKS.

When the machine is turned on by tripping the main switch 15, this powers the power transformer 59, the service transformer 4, the white pilot light 19, and the motor-driven fan 37 through the 1 (one) Ampere protective fuse.

Measure the secondary voltage on the power transformer 59: it must be 165 V AC between points 1-2, 1-3, 2-3 of the connections on the SCR 36.

Measure the voltage at the output from the synchrony circuit 6: it must be 430 V AC between points A-A on the connector, and 20 V AC between points D-K, D-C and D-A.

NOTE: it is very important to make sure not to reverse the position of the wires connecting the synchrony circuit 6 to the power transformer 59.

Cut out the high-frequency (HF) circuit 9 by disconnecting the connector with wires B-G on the regulator circuit 7, or by disconnecting the fastons A-A of the synchrony circuit 6.

Press the torch trigger and measure the secondary voltage between the positive (+) and negative (-) of the SCR bridge 36: it must be 220 V DC.

Check the efficiency of the fuses located on the circuit above the service transformer 4 (5600941), and make sure that the voltages on the secondary circuits correspond to those indicated on the diagram. Specifically, there must be 18 V AC between D-A and A-D (36 V AC between D-D) of the four-pole connector, 20 V AC between K-K, 27 V AC between D-D and 24 V AC between A-A.

When the torch trigger is pressed, the following are controlled through the control circuit 16 (5600933): the pre-flow solenoid valve 25, the remote switch 17. This also carries a power supply of 37 V DC between points A-B (faston) of the regulator circuit 7, and thus controls the power relay of the SCR drivers.

Between points C-F and C-K of the connector from the sensor 23 you should measure the following, respectively: -15 V DC and +15 V DC, even without pressing the torch trigger.

The green LED on the regulator circuit 7 must light when the torch trigger is pressed: if it is off, it is reasonable to assume that the control circuit 16 and/or the regulator circuit 7 are defective. The thermostat and microswitch of the pressure switch disable the trigger via the control circuit 16. The command to start the high frequency is given by the voltage at the ends of the torch. When a voltage greater than 170 V DC is present (220 V DC with HF off) between points A-B of the filter circuit 5 a signal is sent through the regulator circuit 7, which starts the HF circuit 9 through a special pulse transformer located on the circuit 7. When the voltage falls below 170 V DC, thus during the pilot arc or during cutting, the HF command is automatically shut off. Once these measures have been completed, connect the HF circuit 9. If the pilot arc does not light when the torch trigger is pressed, check whether the HF circuit 9 is working by placing your ear near the protective casing of the HF circuit 9. If you hear nothing, you may reasonably assume that the HF circuit 9 is not working, or that the command does not arrive from the regulator circuit 7. The electrode consumed function is active only during transfer (cutting), and is performed by measuring the voltage between the nozzle and the electrode between points E and A on the filter circuit 5. Based on the value measured, a photo-coupling on the control circuit 16 is commanded through points J and K of the filter circuit 5, which can block the machine. It is pos-

sible to deactivate the electrode consumed function by jumpering the pins JP1 on the regulator circuit 7, located at the top near the left holding screw of the circuit.

When the reed 34 in the coil 33 closes, through the control circuit 16, this enables the cutting current setting potentiometer located on the regulator circuit 7 (5600933).

The machine therefore distributes 20 A. during the pilot arc, and the current set on the potentiometer when the current passes through the coil 33, thus during cutting.

When cutting begins, the reed 34 also enables the solenoid valve 25 and opens the remote switch 17, again through the control circuit 16.

To ensure that the solenoid valve 25 is actually open, make sure that the pressure gauge indicator drops slightly and momentarily when transfer (cutting) begins.

EXAMPLES OF POSSIBLE ERRORS.

A) PILOT ARC DOES NOT WORK:

Probable causes:

1 - The torch trigger command is missing.

Check the trigger and safety contacts.

2 - High frequency is missing:

Check the HF board 9

Check the isolation of the HF transformer 22

Check the filter circuit 5

Check the regulator circuit - 7

Check the synchrony circuit 6.

B) NO TRANSFER TAKES PLACE

1 - The earth cable is interrupted, or not connected properly

Make sure that the earth clamp is not closed on insulating surfaces

2 -The reed 34 is defective. Replace it.

C) TRANSFER ONLY LASTS A FEW SECONDS.

1 - The reed 34 does not work.

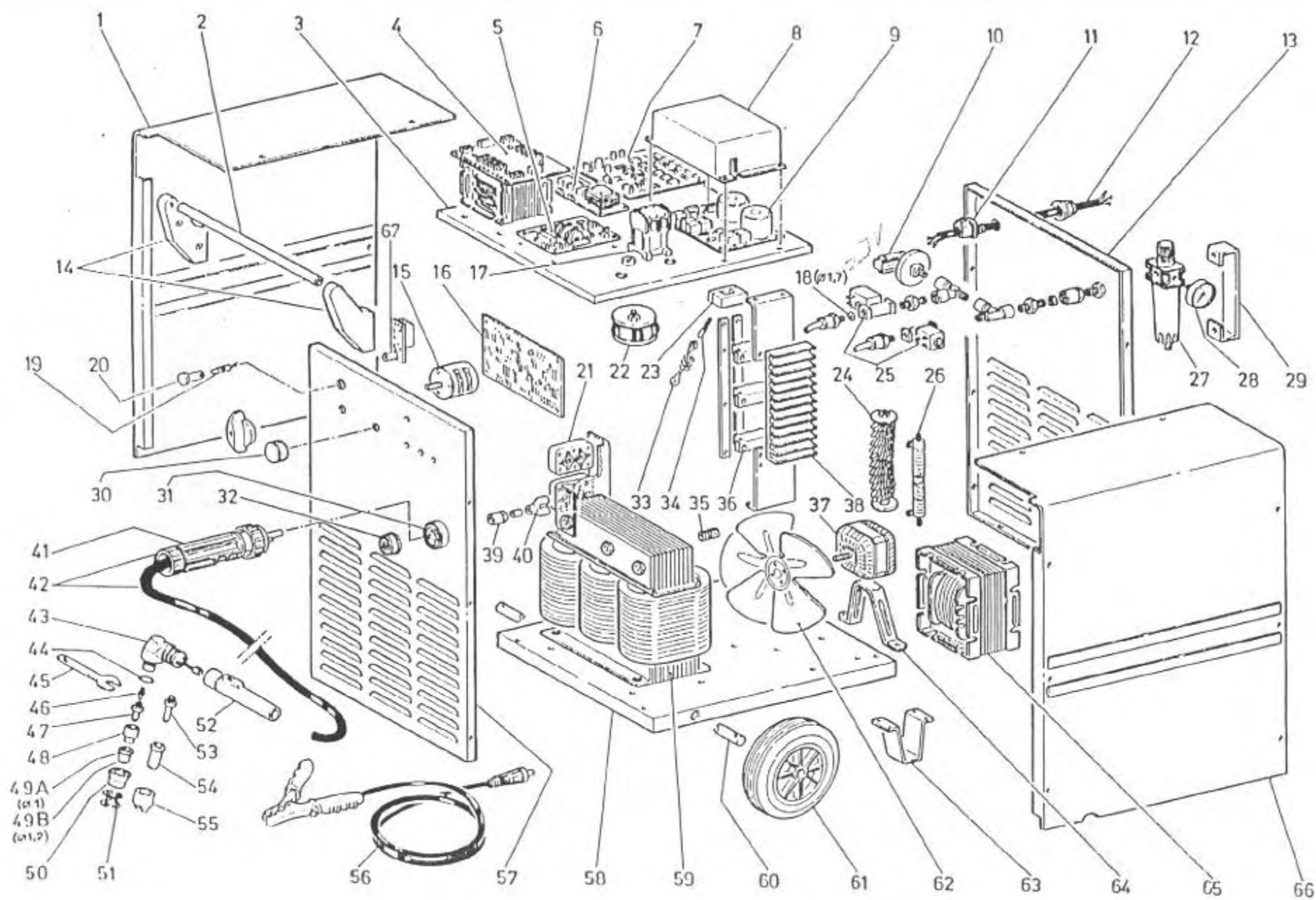
Make sure it is working properly

2 - The control circuit 16 does not work. Replace it.

NOTES:

Always use genuine CEBORA spare parts.

After each repair operation, you must perform the isolation tests required by standard IEC 974.1.



M12152, 83-384 70 Amp 3 Phase Plasma Cutter

Item	Lincoln Stock #	Customer #	Description
1	411-109-026	250907	Left Side Panel
2	312-512-666	250728	Handle
3		250725	Center Divider
4		251204	Control Transformer
5		250891	Filter Circuit
6		250727	Synchronism Circuit
7		251205	Reg. Circuit Board
8		251014	Cover
9		250892	High Voltage Circuit
10	246-532-666	B7005380	Pressure Switch
11	541-279-666	250874	Strain Relief
12		251206 (3195302)	Power Cord
13	411-120-016	250877	Back Panel
14	312-514-666	250896	Handle Support
15		250903 (3190038)	Switch w/knob
16		251207 (5600933)	Control Circuit Board
17		B7100370 (3190268)	Remote Switch
18	541-279-666	250894	Thermostat
19		246254 (3175409)	Pilot Lamp
20	245-168-666	246250	Lamp Holder
21		250868 (3170054)	Terminal Board
22		251208	High Voltage Transformer
23		250900 (5710303)	Transducer
24	215-036-666	B7029380	Resistor
25		B7105370 (3160181)	Solenoid
26		250887 (3205065)	Resistor
27	254-006-666	B7006380	Air Regulator
28		250876 (3160165)	Gauge
29	215-031-666	250901	Metal Shield
30		246946 (3055121)	Knob
31		250882 (3080155)	Torch Connector
32	079-306-666	B7073370	Quick Connector
33	210-358-666	251192	Coil
34	411-125-666	250885	Reed
35		251209 (3175600)	Fuse Holder
36		250883 (3200129)	SCR

Item	Lincoln Stock #	Customer #	Description
37	216-108-666	246224	Fan Motor
38		250731 (3065088)	Radiator
39	253-341-666	B7004380	Coupling
40		250872 (3160046)	Fitting
41		251210 (3080156)	Adaptor
42		251211 (5580637)	Torch Cable
43	334-599-000	M15820,250747,83-673	Torch Head
44	512-264-666	251194	O-Ring
45		M15818,250745,83-671	Electrode Wrench
46		251195	Diffuser
47	334-591-000	M15815,YA5550A1,83-668	Short Electrode
48	334-589-000	M15852,M15803,YA22257,83-667	Diffusers (2)
49	334-653-000	M15814,YA22252,83-666	Short Nozzle (1.0mm)
		M15812,83-664	Short Nozzle (1.2mm)
50	334-651-000	M15810,YA22259,83-662	Nozzle Holder
51		M15809, YA5550A8, 83-661	Spring Standoff
52	312-518-666	B7037380	Handle & Trigger
53	334-638-000	M15816Ya5550A4,83-669	Long Electrode
54		M15813,YA5550A5,83-665	Long Nozzle (0.9mm)
55		M15808	Two Point Standoff
56	238-714-666	251196	Ground Cable
57		251212, 251213, 251034	Front Panel
58	411-124-666	250893	Base
59		251214 (5600650)	Transformer
60	413-121-666	250881	Axle
61	413-118-666	B7033380	Wheel
62	216-109-666	250726	Fan Blade
63	412-756-666	B7035380	Foot
64		250879 (5803475)	Support
65		251125 (3205319)	Reactor Coil
66	411-108-026	250897	Right Side Panel

Not Shown

67		250890 (5600992)	Filter
68		247506m, 250508n, 251255s	Label
69		247509	Warning Label
70		M15823, 250749, 83-676	Complete Torch Assy.

11/10/05

Model	Primary Input	Input Plug	Duty Cycle at Rated Output
M12152, 83-384	220 - 380 Vac, 3 Phase, 77A	N/A	40%

Rated Output	Voltage Settings	Agency Listing	Max Cutting Thickness
70 amps	Infinite	CSA	3/4"

	WIRING DIAGRAM COLOUR CODE
A	BLACK
B	RED
C	GREY
D	WHITE
E	GREEN
F	PURPLE
G	YELLOW
H	BLUE
K	BROWN
J	ORANGE
I	PINK
L	PINK-BLACK
M	GREY-PURPLE
N	WHITE-PURPLE
O	WHITE-BLACK
P	GREY-BLUE
Q	WHITE-RED
R	GREY-RED
S	WHITE-BLUE
T	BLACK-BLUE
U	YELLOW-GREEN

