

VERIFICATION AND ADJUSTMENT PROCEDURE

490B

EQUIPMENTS REQUIRED

- Digital multimeter, 3½ digits or better.
- Oscilloscope.
- 300K 1W resistor.

START-UP AND ADJUSTMENT PROCEDURE

- With the appliance NOT connected to the mains, set the **POWER [6]** switch in ON. Check the total insulation between PHASES and GROUND.
- Adjust the mechanical zero of the 3 measuring instruments **R, G** and **B [2]**.
- Turn the rotary selectors to the left.
- Set all the adjusting potentiometers of the PCB to its middle point.
- Connect the unit to the mains. The neon indicator **POWER [5]** must light. Measure the following voltages in the power supply circuit.

POWER SUPPLY CIRCUIT VOLTAGES

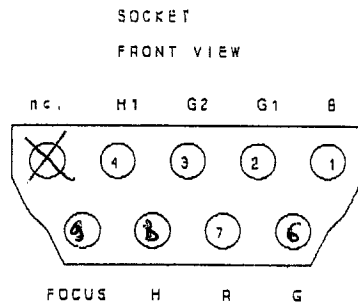
J8	⊕	Nº 8	~15 Vac	(15,40 Vac)
J9	⊕	Nº 14		
J10	⊕	Nº 2B	+18,5 V.	(19,2 V)
J11	⊕	Nº 12	+600 V.	(621 V)
J12	⊕	Nº 25	+594 V.	(615 V)
J13	⊕	Nº 24	+300 V.	(320 V)
J14	⊕	Nº 9	GND (comun de las medidas)	
J15	⊕	Nº 6	-180 V.	(-185 V)
J16	⊕	Nº 15	-290 V.	(-304 V)
J17	⊕	Nº 4	-50 o -70 V. (according to switch S0170V)	(-57,8776,5 V)
J18	⊕	Nº 16	-100 V.	(-105,8 V)
J19	⊕	Nº 2	-290 V. (C. 47uF)	(-306 V)
J20	⊕			

seen from the solder side.

- 3 -

Check the heater voltages:

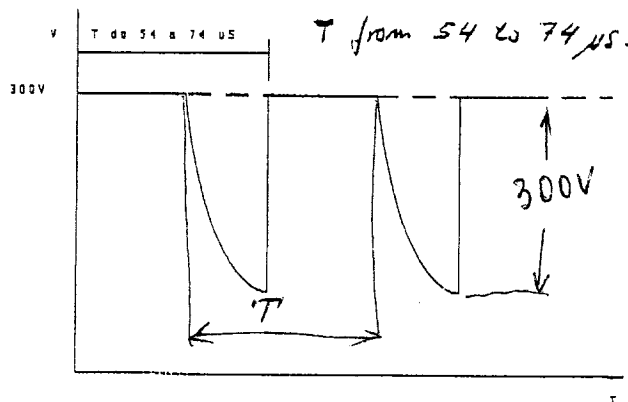
- 1 Push the **HEATER VOLTAGE 6.3V** (SW1) [19] and the **SHORTS** (SW3) [18] keys. Measure 7.5 Vac approx. between **H** (pin6-J1) and **H1** (pin4-J1) of the **SOCKET**(J1) [9] connector.
- 2 Push the **LIFE TEST** [13] key. Check the heater voltages decreases 0.5 Vac approx.
- 3 Push the **HEATER VOLTAGE 12V** (SW2) [19] and the **SHORTS** (SW3) [18] keys. Measure 13 Vac approx. between the **H** (pin6-J1) and **H1**(pin4-J1) keys.
- 4 Push the **LIFE TEST** [13] key. Check the heater voltage decreases 1 Vac approx.



- 5 Push the **BW R** (SW8) [23] key and press the **RESTORER START** [10] button. Check the heater voltage increases 2 V approx. in **HEATER VOLTAGE 6.3V** (SW1) [19] (8.5V approx.) and increases 4 V approx. in **HEATER VOLTAGE 12V** (SW2) [19] (16V approx.).
- 6 Push the **G1 Variable** (SW5) [20] key and set the **CUT OFF VOLTAGE** [25] switch in the **300 V** position. Using the tester measure voltage between **B** (pin1-J1) and **G2** (pin3-J1) pins. Check that voltage varies between 30 and 300 V when turning the **CUT OFF SET** (P3/P4) [26] potentiometer.
- 7 Set the **CUT OFF VOLTAGE** [25] switch in **600V**. Check that voltage between **B** (pin1-J1) and **G2** (pin3-J1) pins, varies between 300 and 600 V when turning the **CUT OFF SET** (P3/P4) [26] potentiometer.
- 8 Push the **CUT OFF** (SW6) [21] key and set the **CUT OFF VOLTAGE** [25] switch at **300 V**. Using the multimeter measure voltage between **B** (pin1-J1) and **G2** (pin3-J1). Check the voltage varies between 30 and 300V when turning the potentiometer **CUT OFF SET** (P3/P4) [26].
- 9 Set the **CUT OFF VOLTAGE** [25] switch at **600V**. Check voltage between **B** (pin1-J1) and **G2** (pin3-J1), varies between 300 and 600 V when turning the **CUT OFF SET** (P3/P4) [26] potentiometer.
- 10 Push the **EMISSION TEST** (SW7) [22] key and set the **CUT OFF VOLTAGE** [25] switch at **300 V**. Using the multimeter measure voltage between **B** (pin1-J1) and **G2** (pin3-J1). Check voltage varies between 30 and 300V when turning the **CUT OFF SET** (P3/P4) [26] potentiometer.

- 4 -

- 11 Set the **CUT OFF VOLTAGE** [25] switch at **600V**. Check voltage between **B** (pin1-J1) and **G2** (pin3-J1), varies between 300 and 600V when turning the **CUT OFF SET**(P3/P4) [26] potentiometer.
- 12 Push the **RESTORER BW-R**(SW8) [23] key. Measure 600 V approx. between **G2** (pin3-J1) and **R**(pin7-J1).
- 13 Push the **RESTORER G** (SW9) [23] key. Measure -600V approx. between **G2** (pin3-J1) and **G**(pin8-J1).
- 14 Push the **RESTORER B** (SW10) [23] key. Measure -600V approx. between **G2** (pin3-J1) and **B** (pin1-J1).
- 15 Push the **SHORTS** (SW3) [18] key. Measure -130V approx. between **B** (pin3-J1) and **G1**(pin2-J1). *(-120V)*
- 16 Push the **REMOVE G1 SHORTS** (SW4) [17] key. Measure 0 V between **B** (pin3-J1) and **G1** (pin2-J1). Pressing the **G1-K SHORT REMOVE** [16] push button, should measure -290V approx. between **B** (pin3-J1) and **G1**(pin2-J1). *1*
- 17 Push the **G1 VARIABLE** (SW5) [20] key. Should measure from -100 to 0V approx. between **B** (pin3-J1) and **G1** (pin2-J1) when varying the **G1 VOLTAGE** (P1) [27] potentiometer. *1*
- 18 Push the **CUT OFF** (SW6) [21] key. Set the sliding switch **G1 BIAS** [15] at **-50V**, you should measure -50V approx. between **B** (pin3-J1) and **G1** (pin2-J1). Now set the sliding switch **G1 BIAS** [15] at **-70V**, you should measure -70V approx. between **B** (pin3-J1) and **G1** (pin2-J1). Press the **COLOUR TRACKING (CUT OFF)** [14] push button and measure -4V approx. between **B** (pin3-J1) and **G1** (pin2-J1). *1*
- 19 Push the **EMISSION TEST** (SW7) [22] key. You should measure 0V approx. between **B** (pin3-J1) and **G1**(pin2-J1). *1*
- 20 Push the **RESTORER BW R** (SW8) [23] key. With the oscilloscope probe (10/1 position) measure signal between **G1** (pin2-J1) and **R** (pin7-J1) (connect to this last pin the ground connection). Press the **RESTORER START** [10] push button, the **RESTORER ON** (DL7) [11] led should lit. Measure 300V approx. as maximum, the period should oscillate between 54 μ s and 74 μ s approximately.



- 5 -

Check the same signal but now pressing the **RESTORER G** (SW9) [23] key, changing the probe ground connection to **G** (pin8-J1).

Check the same signal but now pressing the **RESTORER B** (SW10) [23] key, changing the probe ground connection to **B** (pin1-J1).

- 21 Check the light indicators. Push the **SHORTS**(SW3) [18] and **HEATER VOLTAGE 6.3V** (SW1) [19] keys. Make a short circuit between the following pins:

Pins	Indicators on SHORTS [24]
H1 (pin4-J1) and B (pin1-J1)	E and B
H1 (pin4-J1) and G (pin8-J1)	E and G
H1 (pin4-J1) and R (pin7-J1)	E and B
G1 (pin2-J1) and B (pin1-J1)	G1 and B
G1 (pin2-J1) and G (pin8-J1)	G1 and G
G1 (pin2-J1) and R (pin7-J1)	G1 and B
G1 (pin2-J1) and G2 (pin3-J1)	G1 and G2

- 22 Push the **EMISSION TEST** (SW7) [22] and the **HEATER VOLTAGE 6.3V** (SW1) [19] keys. Make a short circuit between **B** (pin1-J1) and **FOCUS** (pin5-J1). Check the **FOCUS** [8] indicator lights and that the **B** [2] measuring instrument indicates the middle of scale approximately.
- 23 Push the **EMISSION TEST** (SW7) [22] and the **HEATER VOLTAGE 6.3V** (SW1) [19] keys. Make a short circuit between **FOCUS** (pin5-J1) and **R** (pin7-J1). Check the **FOCUS** [8] indicator lights and that the **B/W R** [2] measuring instrument indicates the middle of scale approximately.
- 24 Push the **EMISSION TEST** (SW7) [22] and the **HEATER VOLTAGE 6.3V** (SW1) [19] keys. Make a short circuit between **FOCUS** (pin5-J1) and **G** (pin8-J1). Check the **FOCUS** [8] indicator lights and that the **G** [2] measuring instrument indicates the middle of scale approximately.

Current test. Full scale deviation adjustment for the three instruments.

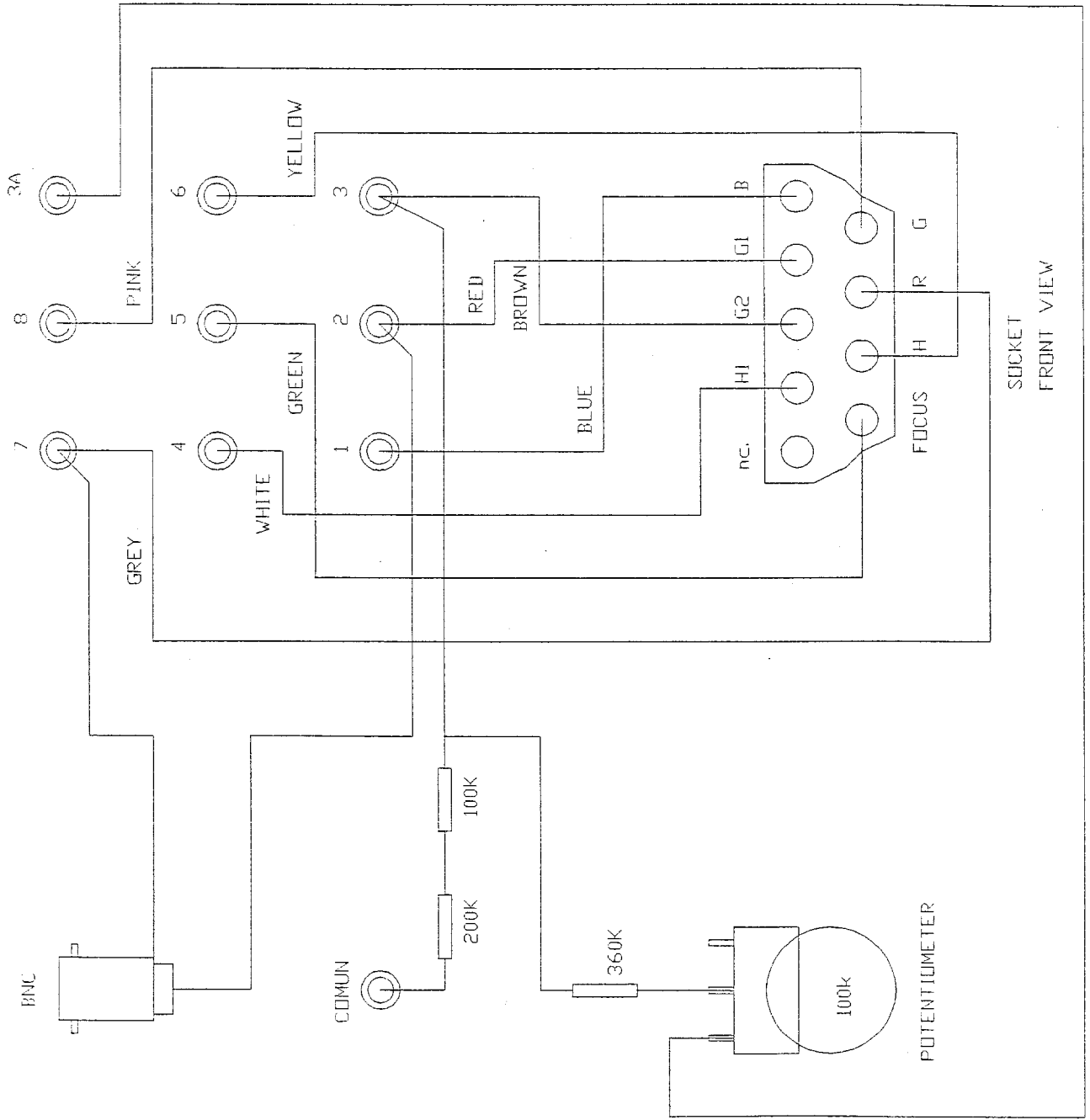
- 25 Push **EMISSION TEST** (SW7) [22] and **HEATER VOLTAGE 6.3V** (SW1) [19] keys. Connect the multimeter (ammeter operation) and a 300 K 1W resistor in series between **G2** (pin3-J1) and **R** (pin7-J1). Adjust the **CUT OFF SET** (P3/P4) [26] potentiometer to obtain 1.6 mA. Adjust **P1** of the PCB so that the instrument **B/W R** [2] measures full scale deviation. Check that turning the front panel potentiometer **B/W R** (P6) [3] the needle varies some tenths. (cut off +600V)
- 26 Push **EMISSION TEST** (SW7) [22] and **HEATER VOLTAGE 6.3V** (SW1) [19] keys. Connect the multimeter (ammeter operation) and a 300 K 1W resistor in series between **G2** (pin3-J1) and **G** (pin8-J1). Adjust the **CUT OFF SET** (P3/P4) [26] potentiometer to obtain 1.6 mA. Adjust **P2** of the PCB so that the instrument **G** [2] measures full scale deviation. Check that turning the front panel potentiometer **G** (P5) [3] the needle varies some tenths.

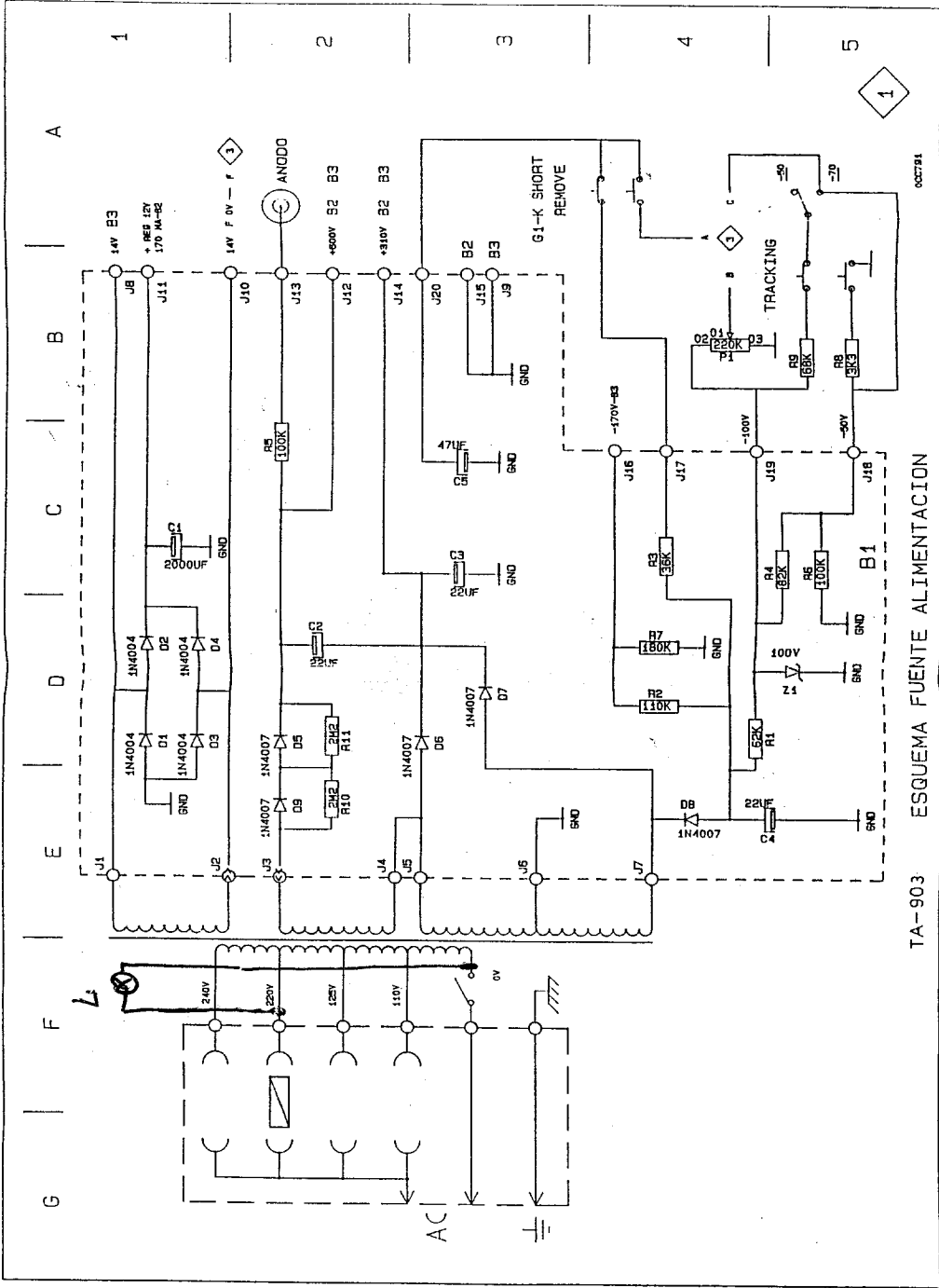
- 6 -

- 27 Push **EMISSION TEST** (SW7) [22] and **HEATER VOLTAGE 6.3V** (SW1) [19] keys. Connect the multimeter (ammeter operation) and a 300 K 1W resistor in series between **G2** (pin3-J1) and **B** (pin1-J1). Adjust the **CUT OFF SET** (P3/P4) [26] potentiometer to obtain 1.6 mA. Adjust **P3** of the PCB so that the instrument **B** [2] measures full scale deviation. Check that turning the front panel potentiometer **B** (P7) [3] the needle varies some tenths.
- 28 Push **RESTORER B/W-R** (SW8) [23] and **HEATER VOLTAGE 6.3V** (SW1) [19] keys. Set the sliding switch **RESTORER CURRENT** [12] at **50 mA**. Make a short circuit between **G1** (pin2-J1) and **R** (pin7-J1). Press the **RESTORER STAR** [10] push button, the **RESTORER ON** (DL7) [11] led should lit. The regeneration process starts. Adjust **P4** so needle indication of the measuring instrument **B/W B** [2], oscillates between **1.3 and 1.6 mA** approximately.
- Set the sliding switch **RESTORER CURRENT** [12] at **25 mA**. Press the **RESTORER STAR** [10] push button. Check the needle indication oscillates between **0.7 and 1 mA** approximately.
- Push the **RESTORER G** (SW9) [23] key. Remove previous short circuit and now make a new one between **G1** (pin2-J1) and **G** (pin8-J1). Check that the needle oscillation of the **G** [2] measuring instrument is between **1.3 and 1.6 mA** or between **0.7 and 1 mA** approximately, according to the position of the **RESTORER CURRENT** [12] sliding switch: **50 mA** or **25 mA**.
- Push the **RESTORER B** (SW10) [23] key. Remove previous short circuit and now make a new one between **G1** (pin2-J1) and **B** (pin1-J1). Check that the needle oscillation of the **B** [2] measuring instrument is between **1.3 and 1.6 mA** or between **0.7 and 1 mA** approximately, according to the position of the **RESTORER CURRENT** [12] sliding switch: **50 mA** or **25 mA**.
- 29 Push the **EMISSION TEST** (SW7) [22] and the **HEATER VOLTAGE 6.3V** (SW1) [19] keys. Pressing the **RESTORER STAR** [10] push button, the regenerating cycle starts and the **RESTORER ON** (DL7) [11] indicator should light. Turning **P1** adjust the total regenerating time to 75 seconds. Turning **P2** adjust the interval between each relay "CLICK" to 15 seconds, bearing in mind that first "CLICK" is heard at 23 seconds from the start and the rest between 14 and 15 seconds.
- 30 Push the **EMISSION TEST** (SW7) [22] key. You must measure +600V approx. between **ANODE** [4] and **B** (pin1-J1).

End

TEST FIXTURE :





TA-903 ESQUEMA FUENTE ALIMENTACION

002791

A B C D E F G

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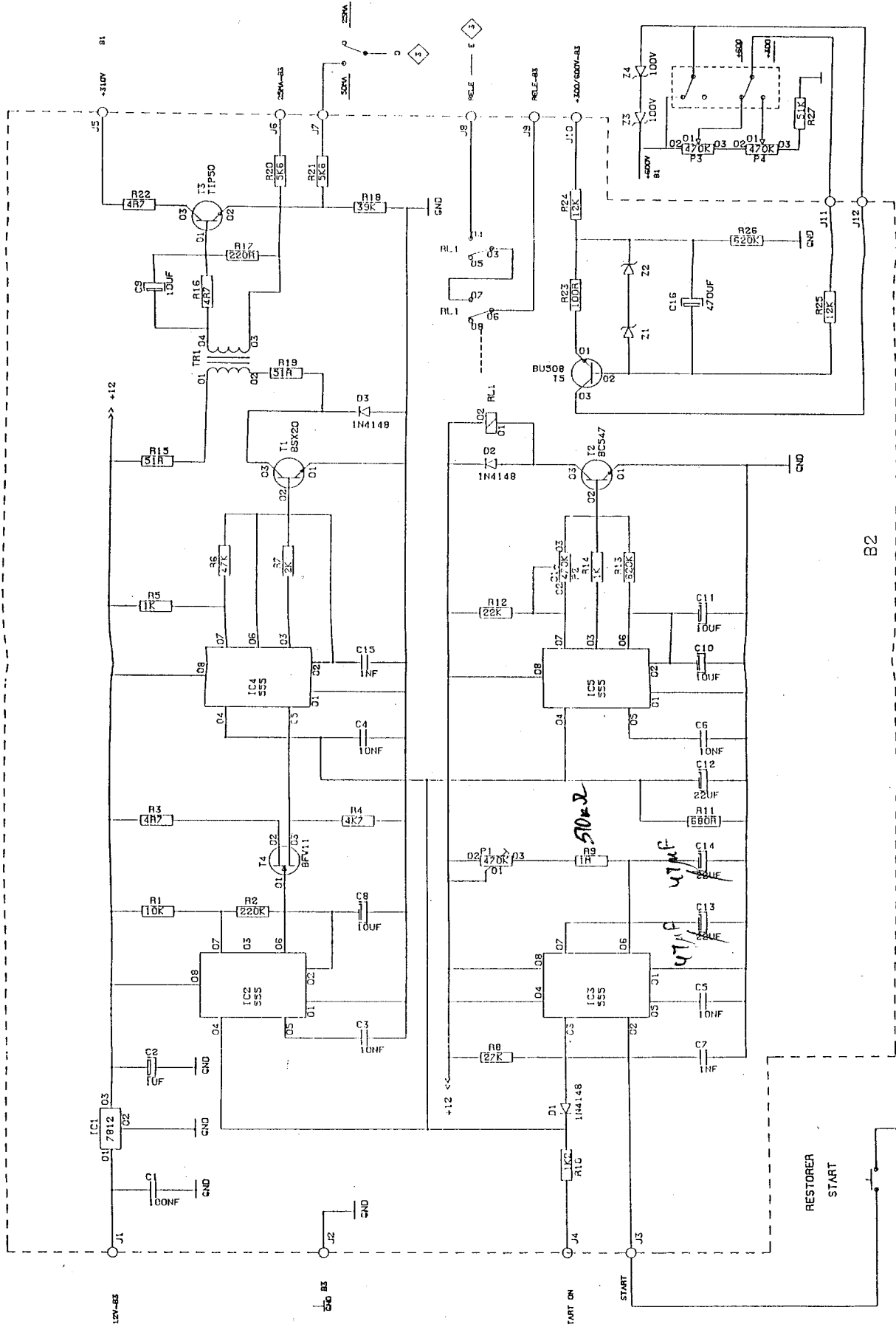
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3

4

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2



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TA-903 ESQUEMA REGENERADOR

