File of Breakdown Service of the Welding machine GYSMI 183

SYNOPSYS

	File of breakdown file of welding machine of GYSMI 183
Version Indication:4	Le 16/01/03: Rewriting of the complete file Le 26/09/03 : Add Electric Schematics 3.2 and evolution of PCB before 3.2

1) Preliminary analyse and advice on the GYSMI 183

1.1) Reminder about safety

➢ The interventions done on the welding machine must be entrusted to qualified people.

➢ The welding machine must be disconnected and you will have to wait at least 30 minutes to intervene with the welding machine, or discharge high voltage capacitor..

1.2) The general advice on the intervention (internet page)

➢ Read the general information on Inverters Gysmi
➢ Before all interventions on the GYSMI 183, check with the customer if it handles with a "diagnostic of external breakdown " **on the model Inverter Gys**, (See Internet Page).
➢ Read the clause of un-warranty on all the Inverter models**, (See Internet page)**.
➢ Carry out a visual monitoring to detect the obvious breakdowns (Zones of overheating, badly crimped thimble, browned diode, burnt transformer, mechanical breakage, modulate power (destroyed component, browned zone).
➢ Refer to the categories of not-reparable breakdowns on the Internet page.

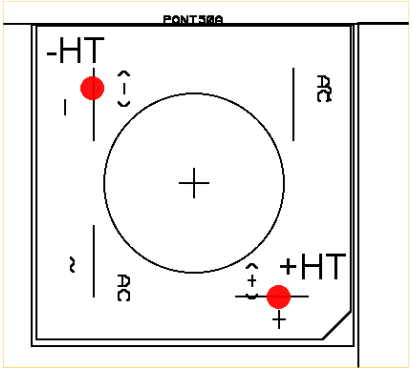
1.3) The useful advice for the continuation of the diagnosis of the breakdowns.

➢ Don't charge the welding machine immediately.
➢ Components CMS can be put in short-circuit or open circuit. The checking of resistors is done in "ohmmeter", the Zener Diode and other Diode are measured in position "Diode" on the Multimeter. For all connections on the chart, weld legs onto the indicated points of contacts (the card is varnished, attention with the risks of bad contacts due to the dielectric isolation that occurred with varnish, use test probes with a pointed end in order to break the layer of varnish).
➢ Provide a resistor(1KΩ 7 W) to discharge the capacitors of high capacity.
➢ Check the chapter of usual breakdowns on present procedure.
- **Take the page 12 or 13 according to the index (Test point on the main board)**
- Control points by points this file and carry out repairs if necessary

➢ See the **list of components SAV and their distributor's reference** (see Internet page)

2) Diagnoses of the most usual breakdowns on the GYSMI 183

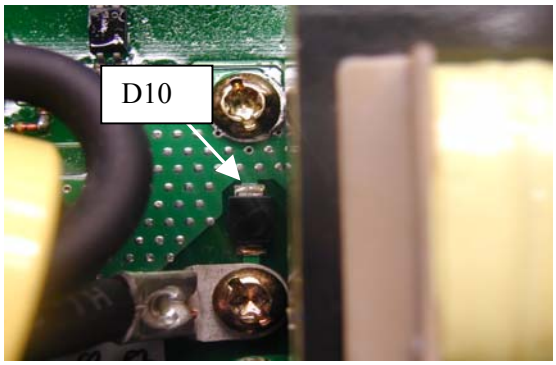
- Disconnect the welding Gysmi from the power supply
- Unscrew the 8 Screws of welding machine on the higher cap
- Put the upper side card of PCB on the table.
- Reassembly in opposite order.
- Provide a Multimeter and with the pages 12 or 13 "Points of Test on the principal card"
- Discharge the capacitors of high capacity with a resistor 1KΩ 7W (to see photo opposite) between the points –HT and +HT, and check the voltage =0.



2.1) The welding machine does not start:

2.1.a) Control of transil Diodes:

Check with a Multimeter in position ‘‘Diode’’ on the output of welding machine if the Diode D10 is not in short- circuit (See the picture)



Put it + Multimeter on Texas - and - on the Texas +, Read a value must be around 0,33 V”.

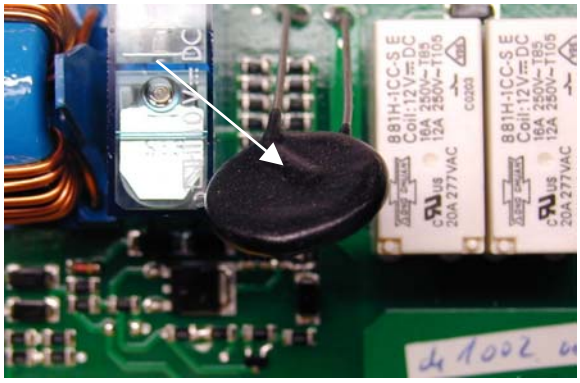
- If you read “0,00 V”, You can delicately unsolder the Transil Diode on the PCB.

D10 SMCJ 188CA Réf: 64117

2.1.*b) Control the surge garde or the resistor of start:*

Index PCB <2.0 : Surge garde = SG1
The value of surge garde is 2Ω in at the cold state
If you read an open circuit,
Change the Surge garde SG1.
SG1 = SG110 (32A) Ref: 63280

Sight of top



Index of PCB > 2.0 : Résistance de 4.7Ω
If a resistor 4.7Ω, Check its value
If you read on the Multimeter a open circuit
Change the resistor R1 Ref: 64121
If the components are bad, you have a risk of short-circuit on the SMI

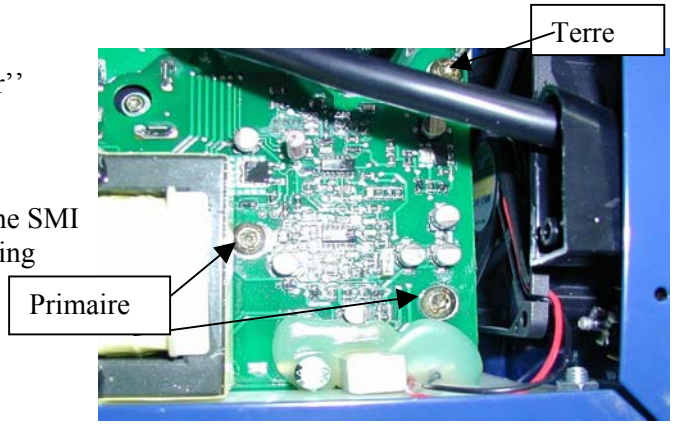
2.2) The welding machine trip the main supply:

2.2.a*) Control of SMI insulation between of earth :*

In the case of the welding trip the main supply:
Check with a Multimeter in position ‘‘Ohmmeter’’

Check between each primary screw and the earth.

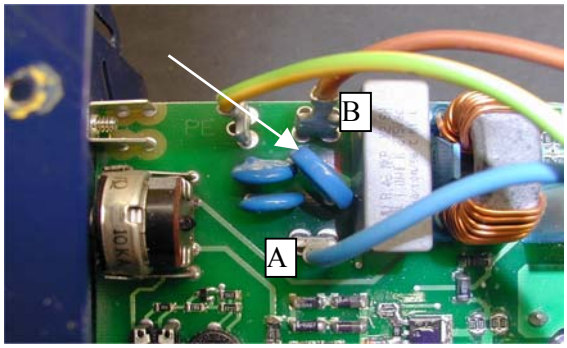
You read a infinite resistor, in the contrary case the SMI is probably put in short-circuit, to return the welding machine to the SAV



2.2.a*) Check the Input varistor(VDR):*

Check with a Multimeter in position ‘‘Diode’’

Check between the pins of the power supply cable Blue and brown, if the varistor is not in short-circuit
(See A and B on the picture).



If you read “0,00 V”, change the varistor.

VAR00_1 = SK14K420 Réf :63446

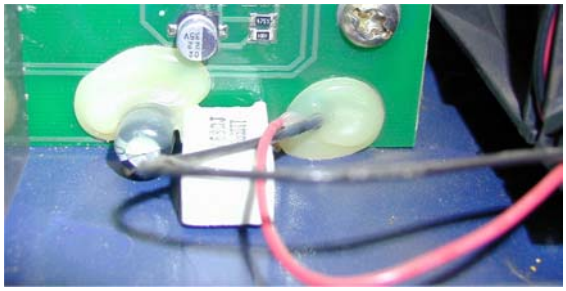
2.3) The welding machine start:

2.3.a) the fans don't start:

Check the solder of the fan's wires on the PCB

Check if the fan is not blocked or broken

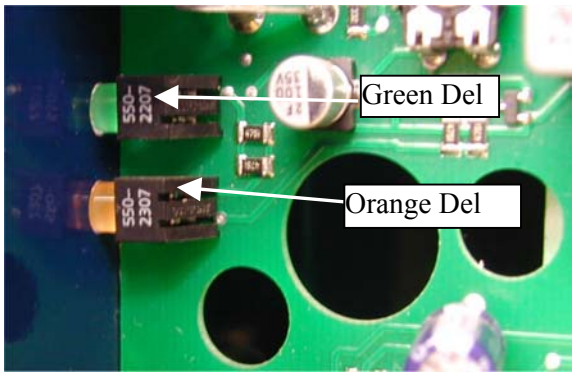
Ref: 51032.
Unsolder the fan's wire and connect the power supply 24 volts on the wire, The nominal current is I = 0.28A



2.3.b) the welding machine start and the indicator are breakdown:

Change the indicator green and orange according to their references if necessary

Orange Del L08_1: Ref: 63328
Green Del L01_1 Ref: 63327



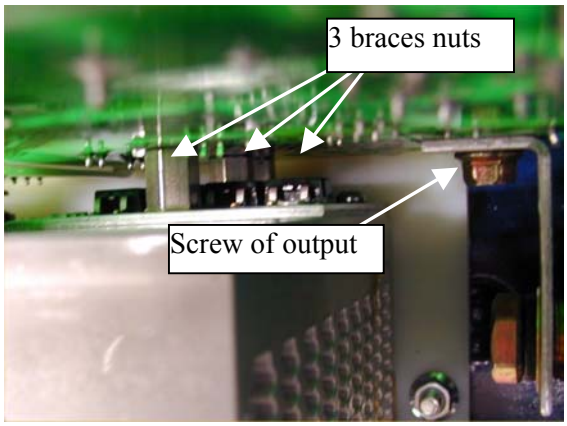
2.4) The welding machine start but don't welding:

2.4.a) the green led in the face is light, not current in the output of welding:

Check by loosening the Screws on the PCB if the braces nuts on the SMI are not unsoldered.

In the case, you have don't 'current on the output of welding machine, Return the welding machine to the service SAV GYS

Caution: correctly tighten the Screws after.
Check the tightening of the screws of output



3) Procedure of breakdown service of the GYSMI 183

One voltmeter or Multimeter
One oscilloscope + one voltage probes *10
Two DC Isolated power supplies (30 Volts minimum: 40V max.), limit of Current 1 Amp.
Electrics Cables and wires
For the following operations, take the page 12 or 13 (Test points and components).

For the next test, the measures are checked **under low voltage** :

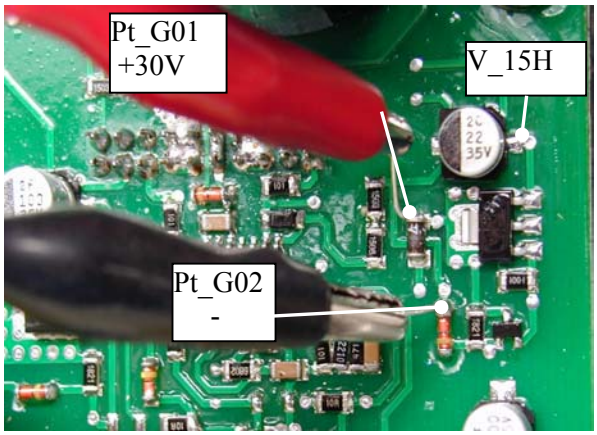
Check the function of each part of the electronic board with external power supply. In the absence of the oscilloscope, you could use a voltmeter with the average voltage "CH1 average" the measure indicated on the chronogram
Regulate the power supply according to the points to be controlled and current limited to 0.5 Amps.

3.1) Check the high power supply VCC_Haut 15V :

This part of the circuit is on the PCB close to the fan

Connect the power supply 30V between Pt_G01(+) and Pt_G02 (-) like the opposite picture

If **I_Alim = 0.01A** go to the next point 3.2
If **I_Alim = 0A**
Check zener diode D01_6 and the transistor Q01_4
In position Diode on the Multimeter.
If **I_Alim** > 0.02A change the circuit U5_1 L6386 and the diode D05_3

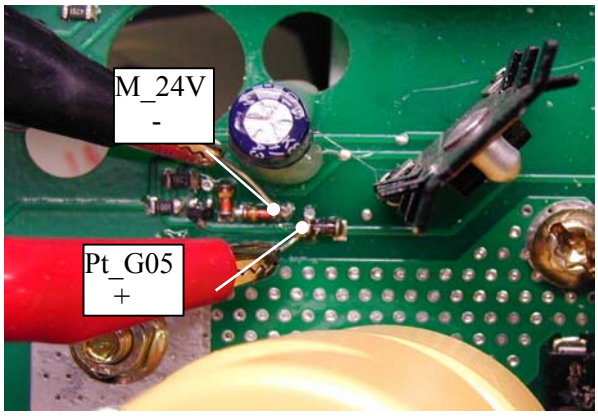


3.2) Check the power supply 24V :

Connect the power supply 30v between the test point Pt_G05 (+) and M_24V(-) **: The fan is turn.**

If **I_Alim ≈ 0.18A** go to the next point 3.3
If I_Alim = short-circuit, check the fan

If **I_Alim =0A**
Regulation by the zener diode D01_9, D01_10 and the transistor Q01_6

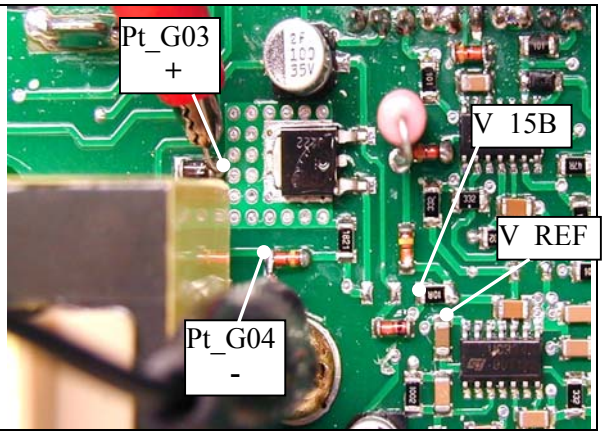


3.3) Check the low power supply 15V :

Connect the power supply 30V between the Test point Pt_G03(+) and the point Pt_G04(-) : **I_Alim = 0.18A**

The green Del lit in front face.

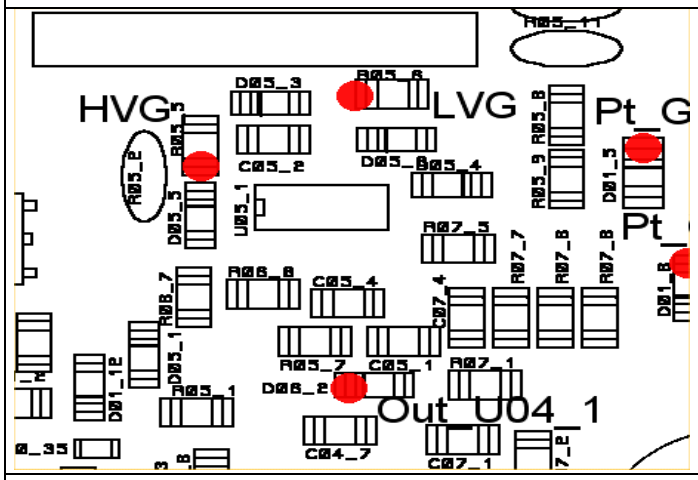
V_15B = 15V, Regulation by the Zener Diode D01_3 and the transistor Q01_2
V_REF= 5V, Reference voltage of UC3845

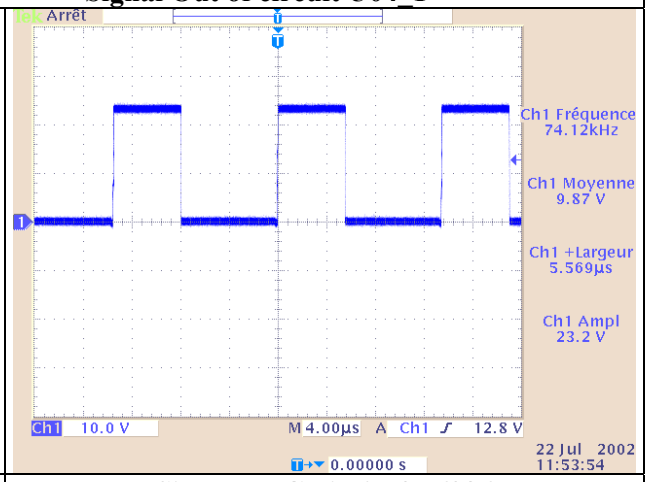


3.3.a) Check the Generator PWM.

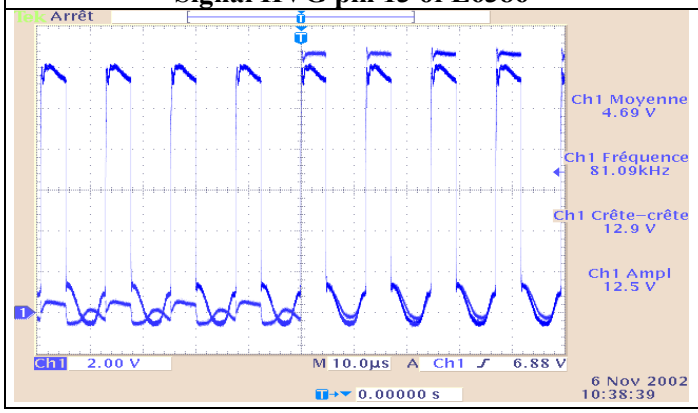
For checking a next part, preserve power supply 30V on the low power supply (picture on the top)

Signal Out of circuit U04_1

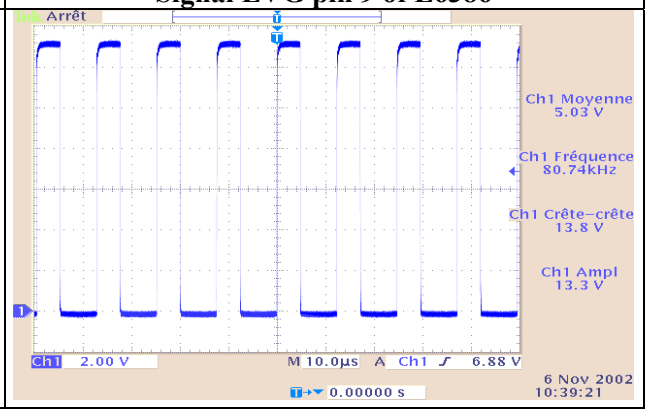




Signal HVG pin 13 of L6386



Signal LVG pin 9 of L6386



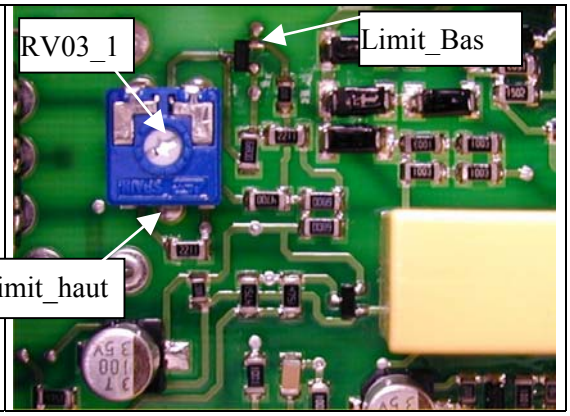
If the signal HVG and LVG are not present and Out de U05_1 present, change U5_1 L6386 and D05_3

3.3.b) Check the current limitation

Check the points Limit_bas and Limit_Haut, You must obtain respectively 3,2V and ≈1,6 V, whatever the position of the potentiometer of adjustment of the current opposite front.

The possible components broken are Q03_1 transistor and the potentiometers of adjustment

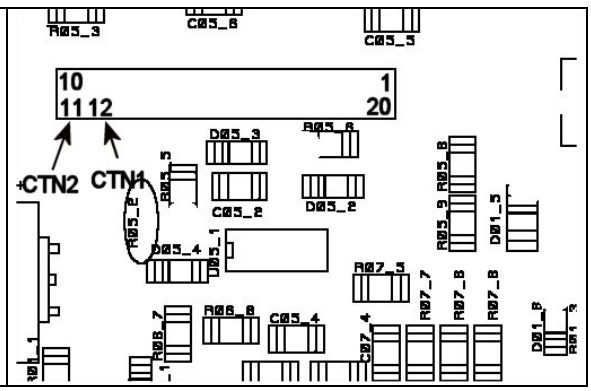
The version Gysmi183 >Ind_3 doesn't have a potentiometer of fixed adjustment RV03_2 but a resistor for the Limit_bas adjustment.



3.3.c) Check the thermal protection

You will place a resistor (lower than 1KΩ) in parallel between pin CTN1 and CTN2, Take as points of contact (11et 12) on the connector of the SMI.

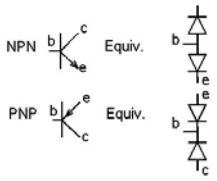
The orange Del in front face in this case light.

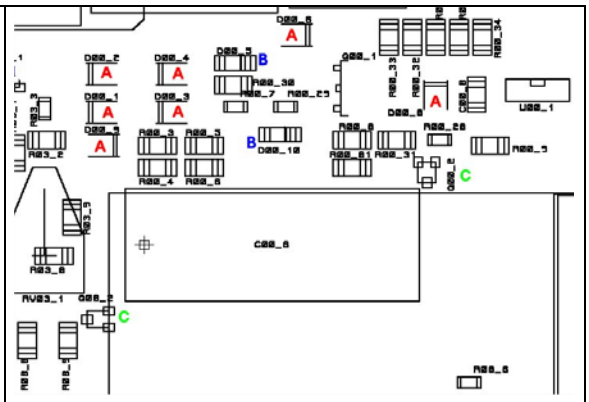


3.4) Check the over-voltage protection on power group

You checking with a Multimeter in position Diode the components,

A: Diode 1N4007 measured 0.53V around
B: Diodes Zener in parallel, measured 0.63V around
C: Transistor, measured the internal Diodes



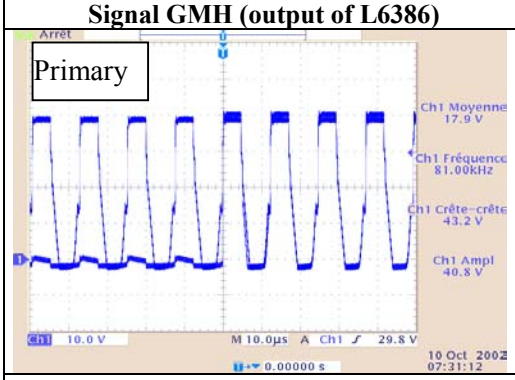
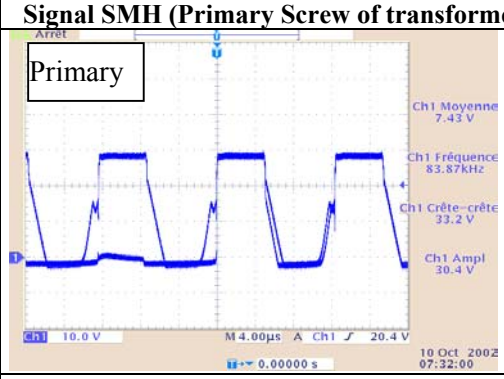
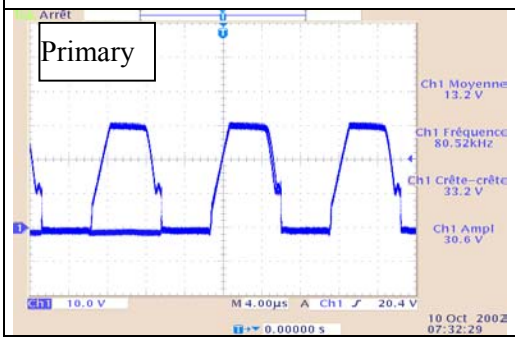
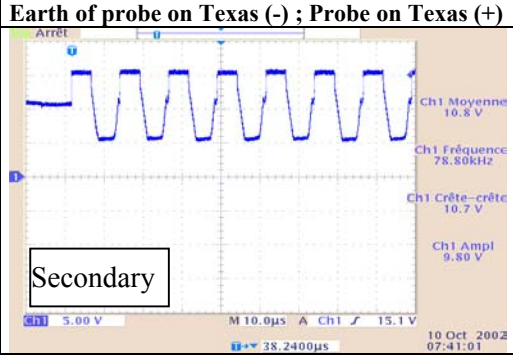


3.5) Check SMI functionality

After checking the previous points:

- Connected a power supply 30 Volts on points V_15_B as a chapter 3.3
- Connect one other power supply 30V isolated over power supply (current limited 0.5A) on the pin's (+) and (-) of bridge of Diode

Checking the signal following on the PCB with the mass of the probe on the mass of the bridge of Diode (- HT) to refer to the plan page 12 or 13 for the points of test.

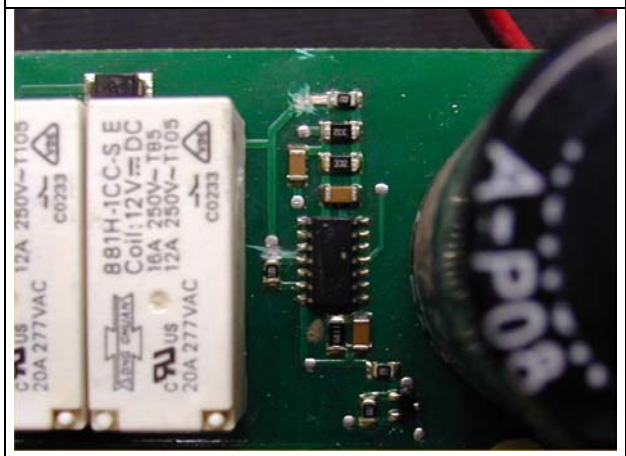
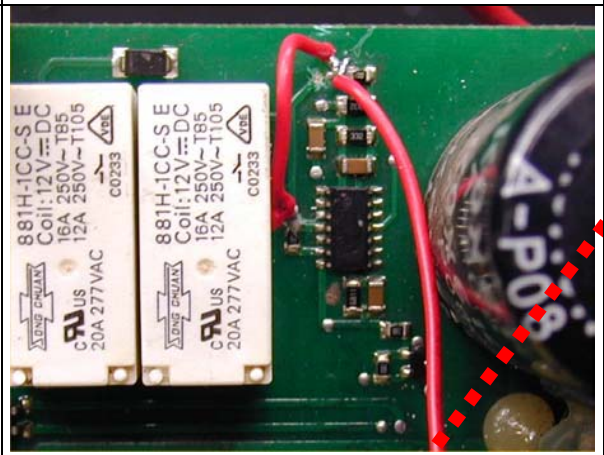
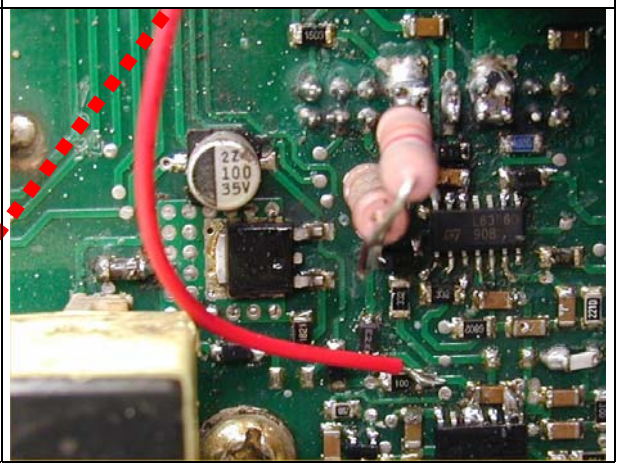
Signal GMH (output of L6386)	**Signal SMH (Primary Screw of transformer)**
	
Signal DMB (Input Screw of Transfo)	**Signal on pin's of Texas output of welding Earth of probe on Texas (-) ; Probe on Texas (+)**
	

4) Evolution of product GYSMI 183

Evolution of PCB

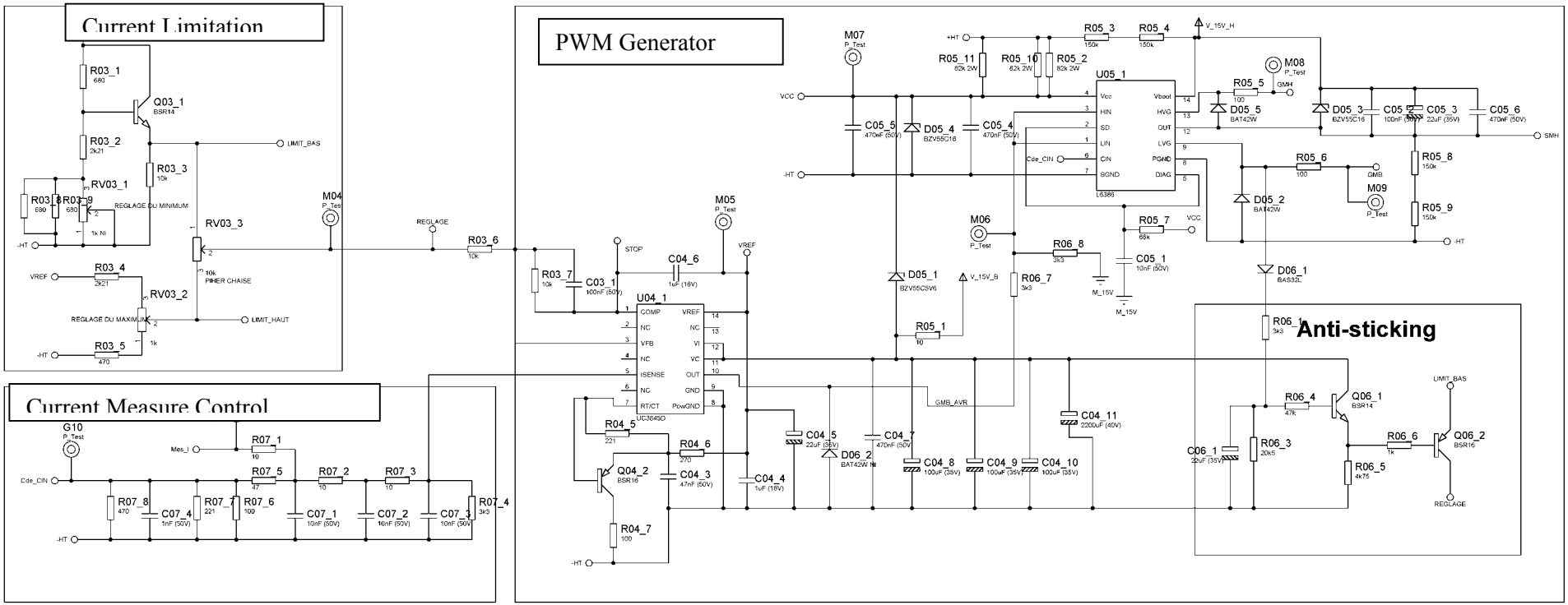
Index	Designation	Old. Value	Ref. GYS	New Value	Ref. GYS	Electric part	Remark
1.1	XXX	XXX	XXX	22k	64005	System of starting	Put in // R00_26
1.2	R05_5	47	64018	100	64015	PWM Generator	Reliability of L6386
1.2	R05_6	47	64018	100	64015	PWM Generator	Reliability of L6386
1.3	R00_7	10 K	64011	15 K	64037	System of starting	Over-voltage less low
1.3	R00_30	47 K	64033	15 K	64037	System of starting	Over-voltage less low
1.4	R07_8	XXX	XXX	470	64108	Current of measure	Current Limitation Max
1.5	R08_17	4.75 K	64013	3.3K	64021	Thermal Protection	
1.5	R08_1	2.21 K	64010	3.3K	64021	Thermal Protection	
1.5	R08_2	10 K	64011	6.82K	64043	Thermal Protection	
3.2	R06_1	4k75	64013	3k3	64021	Anti-sticking	
3.4	R05_2			82k 3W PR03	63031	Wire Thermal Protection	Put in // R05_2
3.4	Modification wire random thermal protection, to apply the modification below						

3.4 Modification wire random thermal protection, to apply the modification below

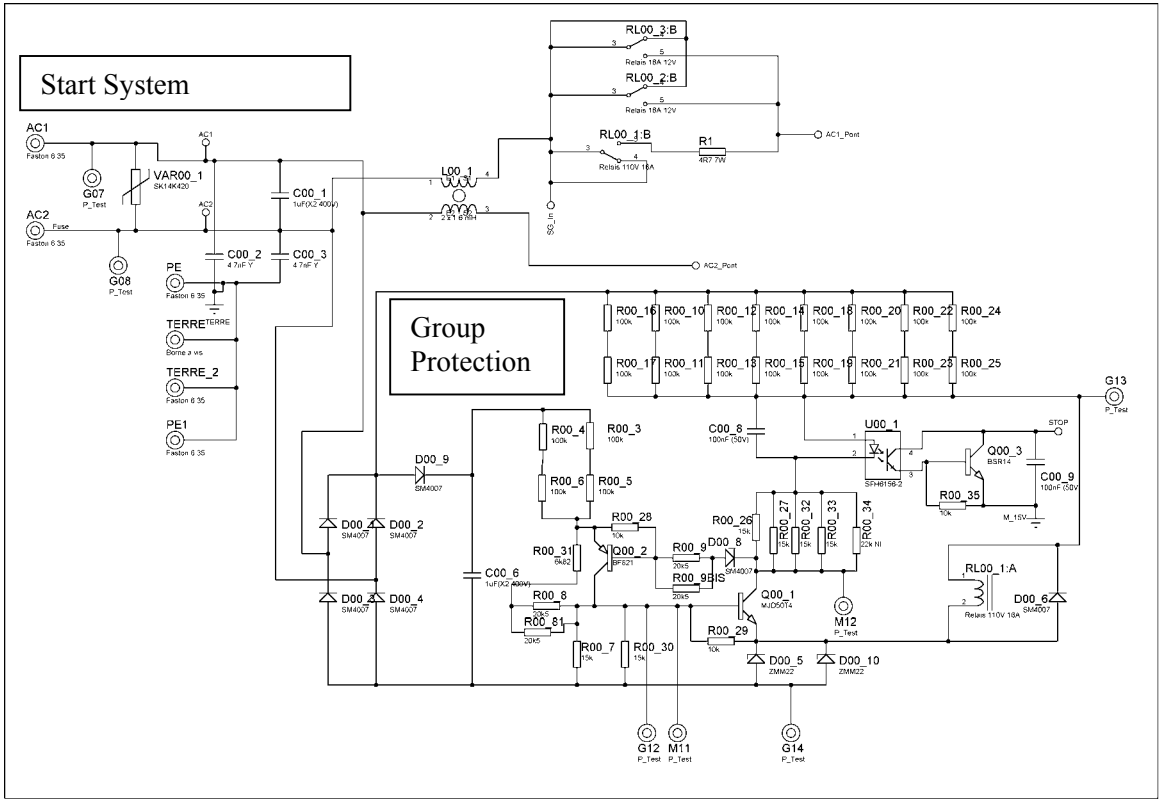
1) Cut the wire between the relay and the resistors	**2)** Sold a wire **between** R08_3 and R08_4	**3)** Sold o resistor 82k 3W in parallel to R05_2 and a wire as below
		

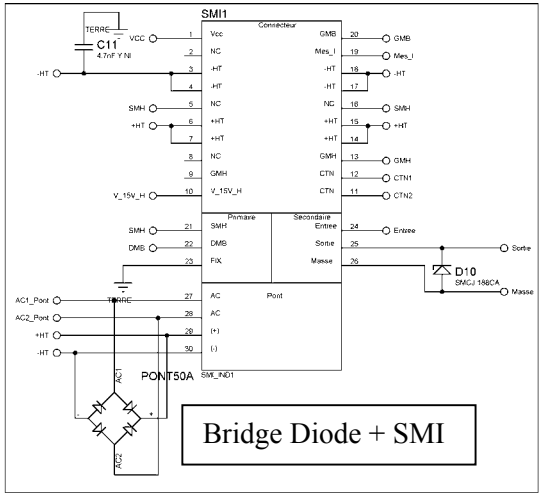
5) Electrical Schematics:

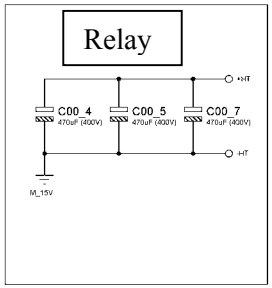
Schema 1 : PWM Generator + Function of command

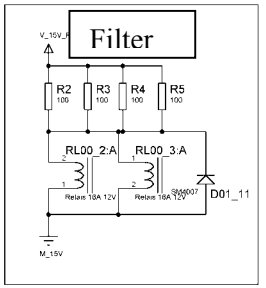


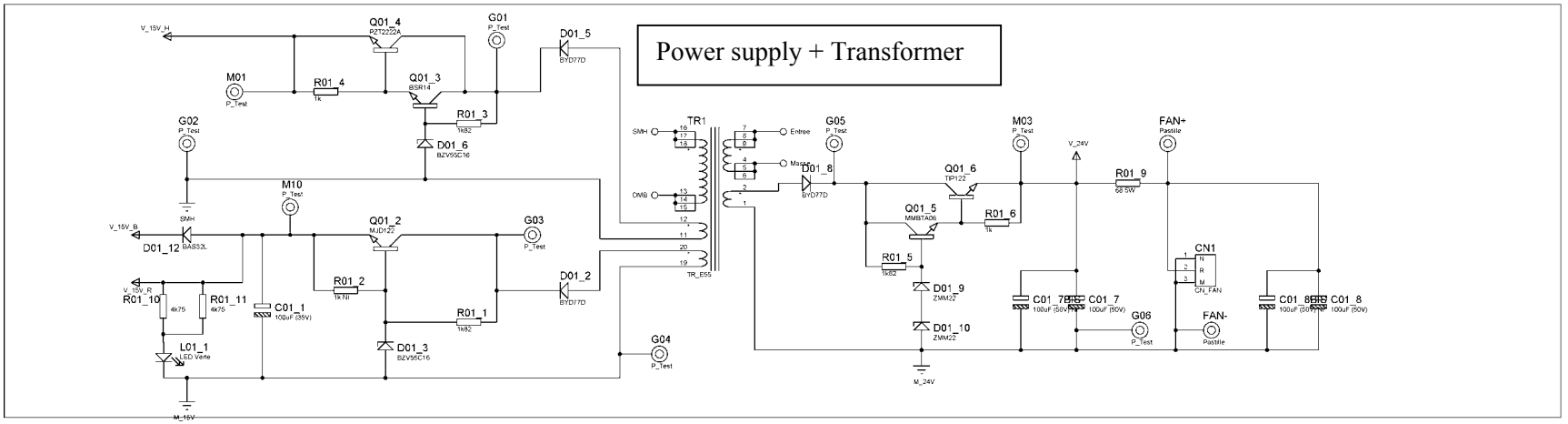
Schema 2 : Power supply + transformer. + Start of system



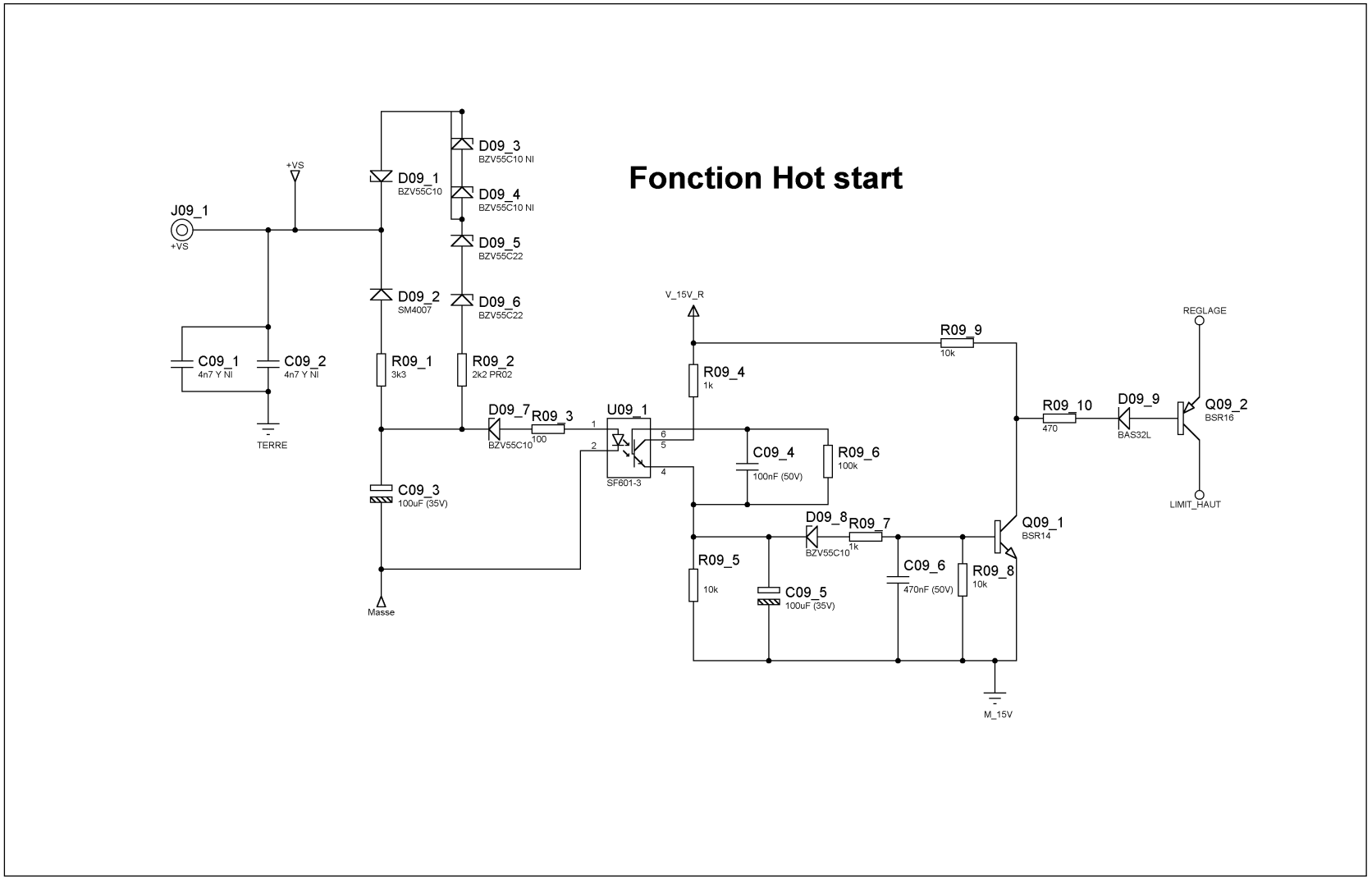




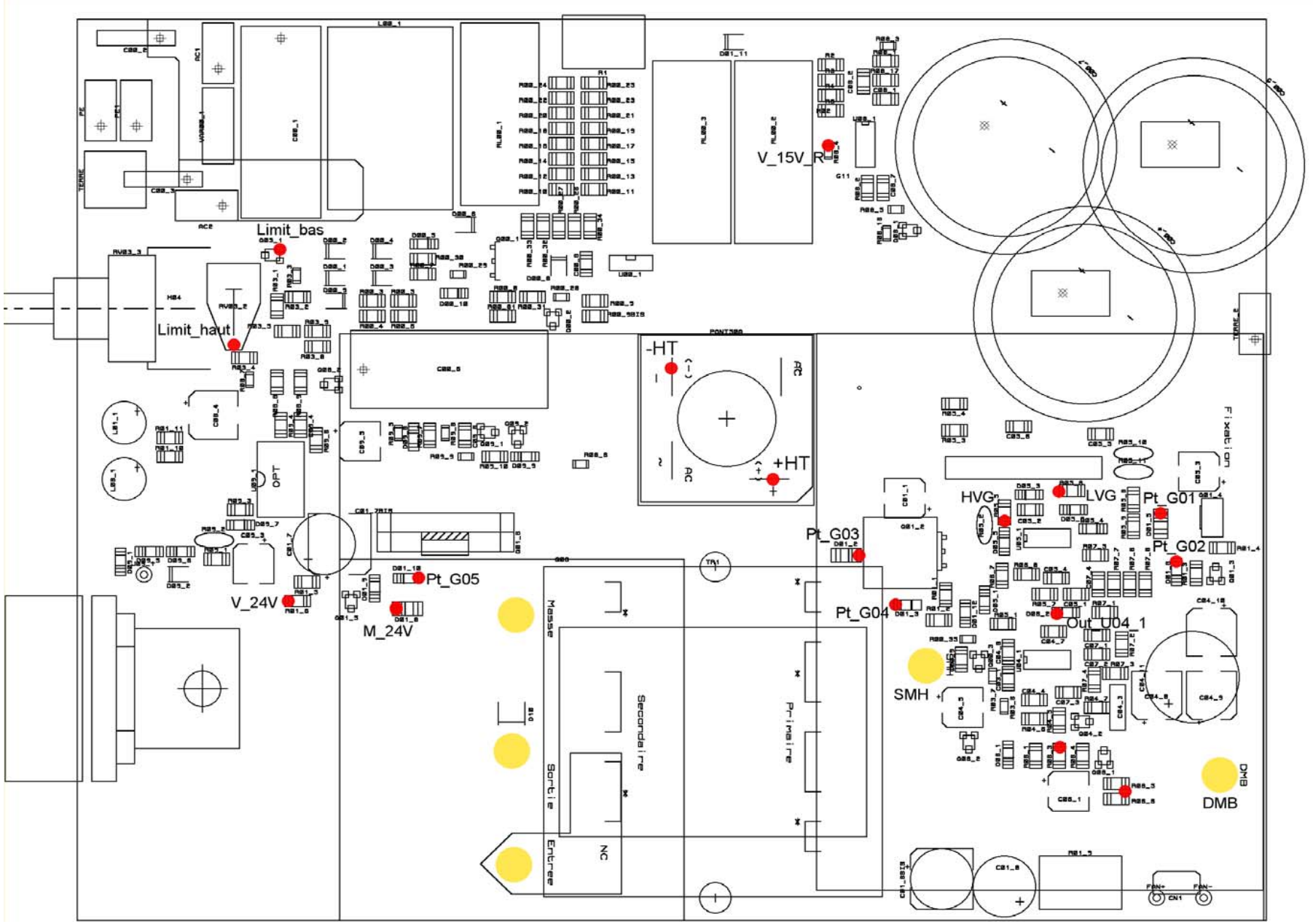




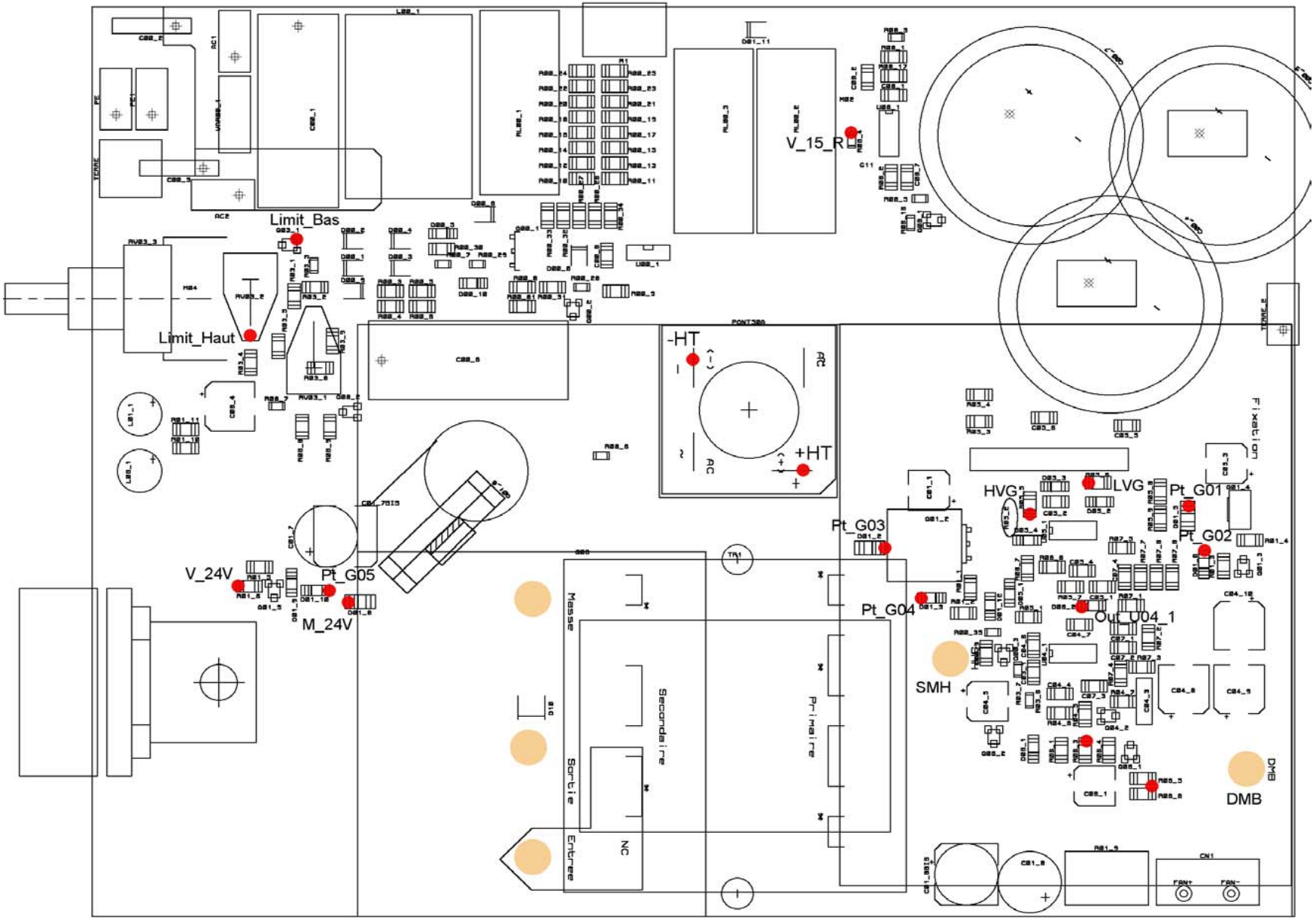
Schema 3 : Fonction Hot Start ((fonction on PCB > 3.2)



6.1) Test Points and designation components on the main Board after index > 3.2 included



6.2) Test Points and designation components on the main Board before index < 3.2



7) Bill of materials of the PCB Gysmi 183.

QTY	PART-REFS	VALUE	REFGYS
	Resistors		
21	R00_3,R00_4,R00_5,R00_6, R00_10,R00_11,R00_12,R00_13, R00_14,R00_15,R00_16,R00_17, R00_18,R00_19,R00_20,R00_21, R00_22,R00_23,R00_24,R00_25, R09_6	100k	64040
6	R00_7,R00_26,R00_27,R00_30, R00_32,R00_33	15k	64037
5	R00_8,R00_9,R00_9BIS,R00_81, R06_3	20k5	64039
15	R00_28,R00_29,R00_35,R03_3, R03_6,R03_7,R08_3,R08_4, R08_5,R08_6,R08_7,R08_16, R09_5,R09_8,R09_9	10k	64048
2	R00_31,R08_2	6k82	64043
1	R00_34	22k NI	64005 NI
3	R01_1,R01_3,R01_5	1k82	64009
1	R01_2	1k NI	64004 NI
5	R01_4,R01_6,R06_6,R09_4, R09_7	1k	64004
1	R01_9	68 5W	63133
5	R01_10,R01_11,R06_5,R08_8, R08_9	4k75	64013
1	R1	4R7 7W	64121
9	R2,R3,R04_7,R4,R05_5,R05_6, R5,R07_6,R09_3	100	64015
3	R03_1,R03_8,R03_9	680	64003
2	R03_2,R03_4	2k21	64010
3	R03_5,R07_8,R09_10	470	64108
2	R04_5,R07_7	221	64035
1	R04_6	270	64252
4	R05_1,R07_1,R07_2,R07_3	10	64012
3	R05_2,R05_10,R05_11	82k 2W	63031
4	R05_3,R05_4,R05_8,R05_9	150k	64020
1	R05_7	68k	64053
7	R06_1,R06_7,R06_8,R07_4, R08_1,R08_17,R09_1	3k3	64021
1	R06_4	47k	64033
1	R07_5	47	64018
1	R09_2	2k2 PR02	63112
	Capacitors		
2	C00_1,C00_6	1uF(X2 400V)	63462
2	C00_2,C00_3	4.7nF Y	63461
3	C00_4,C00_5,C00_7	470uF (400V)	63447
6	C00_8,C00_9,C03_1,C05_2, C08_2,C09_4	100nF (50V)	64006
7	C01_1,C04_8,C04_9,C04_10, C08_4,C09_3,C09_5	100uF (35V)	64051
2	C01_7,C01_8	100uF (50V)	63364
2	C01_7BIS,C01_8BIS	100uF (50V) NI	NI
1	C04_3	47nF (50V)	63457
2	C04_4,C04_6	1uF (16V)	64029
3	C04_5,C05_3,C06_1	22uF (35V)	64050
7	C04_7,C05_4,C05_5,C05_6,	470nF (50V)	64028

	C08_1,C08_7,C09_6		
1	C04_11	2200uF (40V)	63267
4	C05_1,C07_1,C07_2,C07_3	10nF (50V)	64007
1	C07_4	1nF (50V)	64008
2	C09_1,C09_2	4n7 Y NI	63461 NI
1	C11	4.7nF Y NI	63461 NI

Integrated Circuits

1	U00_1	SFH6156-2	64055
1	U04_1	UC3845D	64057
1	U05_1	L6386	64079
1	U08_1	LM324D	64054
1	U09_1	SF601-3	63455

Transistors

1	Q00_1	MJD50T4	64071
1	Q00_2	BF821	64073
7	Q00_3,Q01_3,Q03_1,Q06_1, Q08_1,Q08_2,Q09_1	BSR14	64002
1	Q01_2	MJD122	64052
1	Q01_4	PZT2222A	64106
1	Q01_5	MMBTA06	64070
1	Q01_6	TIP122	63449
3	Q04_2,Q06_2,Q09_2	BSR16	64001

Diodes

9	D00_1,D00_2,D00_3,D00_4, D00_6,D00_8,D00_9,D01_11, D09_2	SM4007	64030
4	D00_5,D00_10,D01_9,D01_10	ZMM22	64031
3	D01_2,D01_5,D01_8	BYD77D	64000
4	D01_3,D01_6,D05_3,D05_4	BZV55C16	64023
3	D01_12,D06_1,D09_9	BAS32L	64014
1	D05_1	BZV55C5V6	64036
2	D05_2,D05_5	BAT42W	64026
1	D06_2	BAT42W NI	64026 NI
3	D09_1,D09_7,D09_8	BZV55C10	64027
2	D09_3,D09_4	BZV55C10 NI	64027 NI
2	D09_5,D09_6	BZV55C22	64031
1	D10	SMCJ 188CA	64117

Relay

1	RL00_1	Relais 110V 16A	52617
2	RL00_2,RL00_3	Relais 16A 12V	52669

Resitor var

1	RV03_1	1k NI	63086 NI
1	RV03_2	1k	63086
1	RV03_3	10k	63094

Divers

1	L00_1	2 x 1.6 mH	63667
1	L01_1	LED Verte	63327
1	L08_1	LED Orange	63328
1	SG1	SG110	63280
1	PONT50A		52215
1	TR1	TR_E55	64124
1	VAR00_1	SK14K420	63446
1	Ventilateur	92*92*25 6.4W	51032