Edit 02-14-18

AMADA MIYACHI AMERICA, INC.

1820 South Myrtle Ave, PO Box 5033, Monrovia, CA 91017-7133 (626) 303-5676 FAX: (626) 599-9636

E01: Power Supply Cover Opened

Troubleshooting a *Power Supply Cover Opened* Error

An "**E01 – Power Supply Cover Opened**" indicates that one of the side, rear or front panels is loose or removed. Laser operation will not be possible until this error is cleared.

Each Laser panel that protects personnel from IR Laser Energy is safety interlocked. The safety interlock function prevents the Laser from firing in cases where the panels are removed for maintenance/service. In order to operate the Laser with one or more panels removed, the corresponding redundant Interlock switches (hereinafter called **I/L Switches**) must be bypassed. Initially all early Laser designs had redundant I/L switches protecting every panel, even though it was unnecessary. More recent designs have eliminated these unnecessary I/L switches for a simpler interlock circuit.

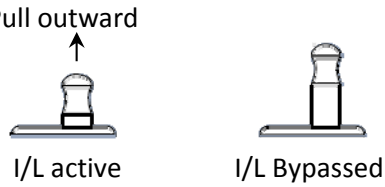
An **E01: Power Supply Cover Opened** error can be caused by:

1. Loose or Removed Laser cover
2. Faulty Interlock switch
3. Faulty Power Supply
4. Faulty CPU (Main PCB)

1. Loose or Removed Laser Cover

If a Laser panel is loose or removed, the Interlock circuit may be active. If maintenance or service is not being performed on the Laser check all side, rear, front and top panels. Make sure panels are securely fastened and then press the *Trouble Reset* button to clear the error. If the error does not clear, continue with the next step.

If maintenance or service is being performed on the Laser, the corresponding I/L switch(es) may be bypassed by pulling the switch shaft outward. Use caution when bypassing the I/L switches because personnel can be exposed to IR Laser Energy. Proper eye protection is required when a Laser is operated without the protective Laser panels. If the corresponding I/L switches are bypassed and an **E01** error is still present after pressing the *Trouble Reset* button, continue with the next step.



2. Faulty Interlock Switch

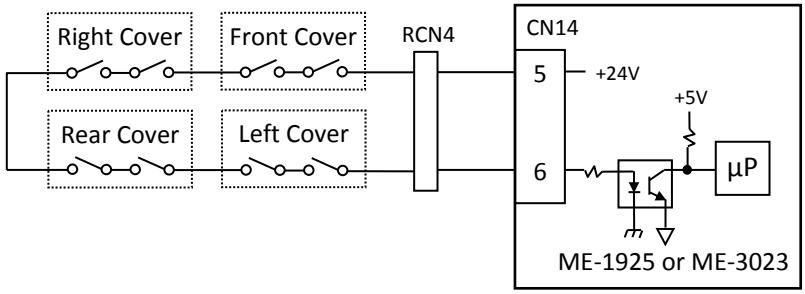
If an I/L switch is faulty, an **E01** error will occur. The panel interlock switches operate in one of 3 modes;

(1) Bypass mode – when switch is pulled outward, the switch is closed.
(2) Interlock mode – when panels are removed (without intervention), the switch opens and
(3) Normal mode – When panels are (re)installed, the switches automatically engage. Switch is closed.

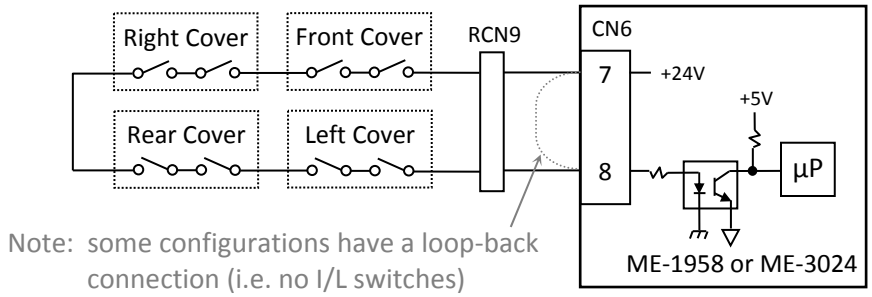
All of the I/L switches that protect the side, rear, front and top panels are connected in series and terminate at the CPU (Main PCB). Using a DMM, verify continuity of the I/L switches at the CPU (Main PCB) as shown in the

schematic(s) below. If the resistance shows open, test each switch independently and isolate the faulty switch. Depending on the date of manufacture, some or all of the I/L switches may not exist (i.e. not every Laser panel is interlocked). Test only those switches that are present and replace the faulty switch (**AMYA # 680-317**). If the I/L switches test OK (< 5Ω), continue with the next step.

LW5A/15A/25A and LW2AG/5AG Laser Welder

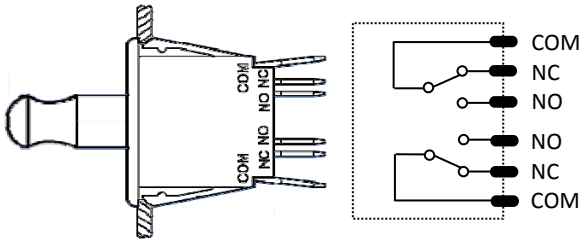


LW50A(C)/70A(C)/150A/300A(H)/400A/500A/600A Laser Welder



Interlock Switch details:

Mfg P/N	E79-30A
AMYA #	680-171

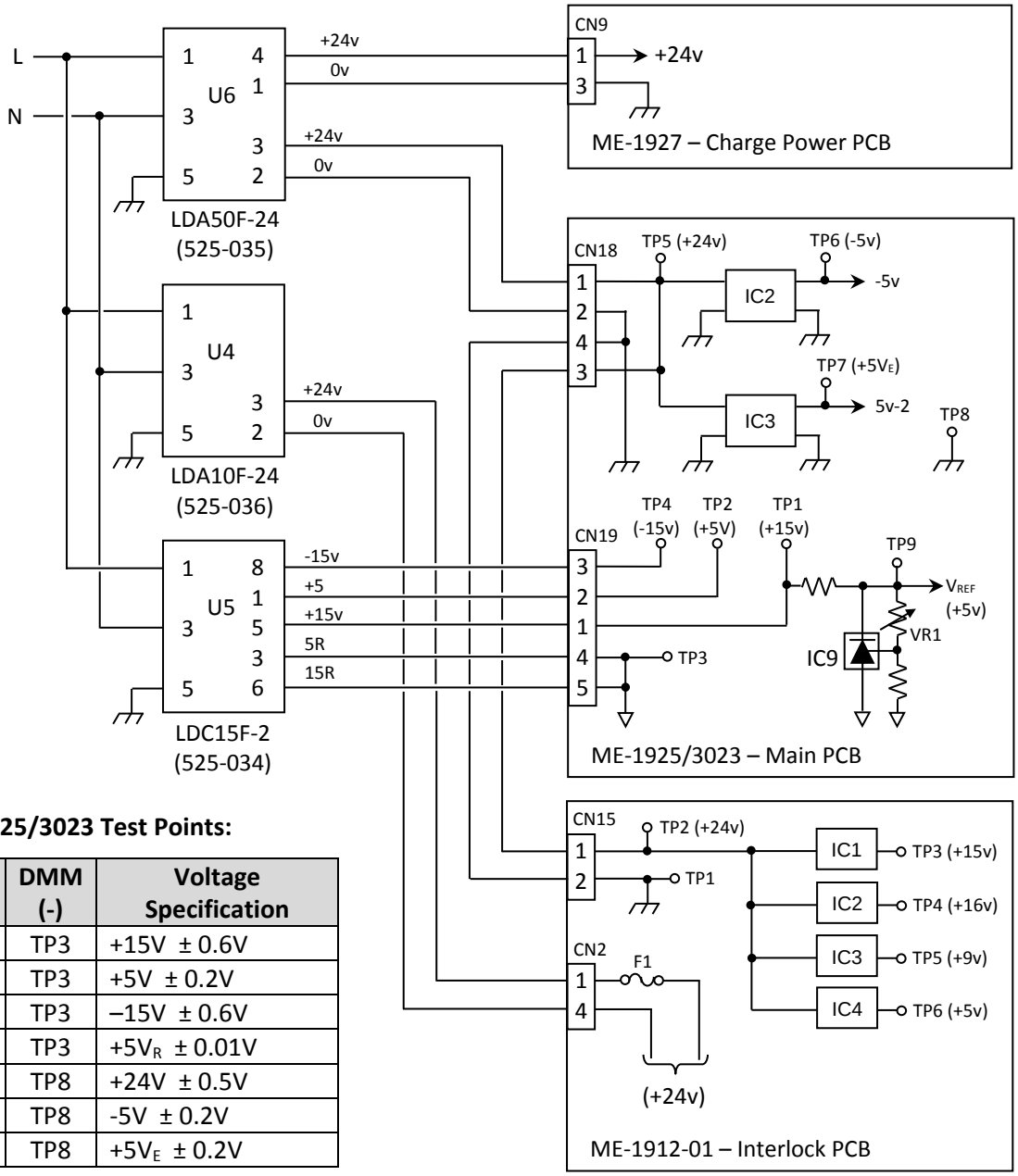


Note: In the schematics above, the connections shown are simplified (i.e. the actual wiring is more complicated than shown). When testing an individual switch, check the connections on the switch itself, then inspect the harness.

Faulty Power Supply

An **E01** error can also be caused by faulty Power Supply voltage. Typically a power supply fault will also yield other error messages as well. Using a DMM, measure the power supply voltages on the **CPU** (Main PCB) at the appropriate test points (see tables below for a list of test points and expected voltages). If all voltages test OK, continue with the next step. If there is a problem with one or more of the power supply voltages, isolate the failure based on the schematics below. Refer to the AMYA Support site (www.amyasupport.com/lsd) under "Service" for more information on component / test point locations.

LW5A(M)/15A/25A/2AG/5AG Laser Welders (8-xxx-01-xx)
with ME-1925/ME-3023 Main PCB – Power Distribution for Single E-Stop/Interlock Lasers



ME-1925/3023 Test Points:

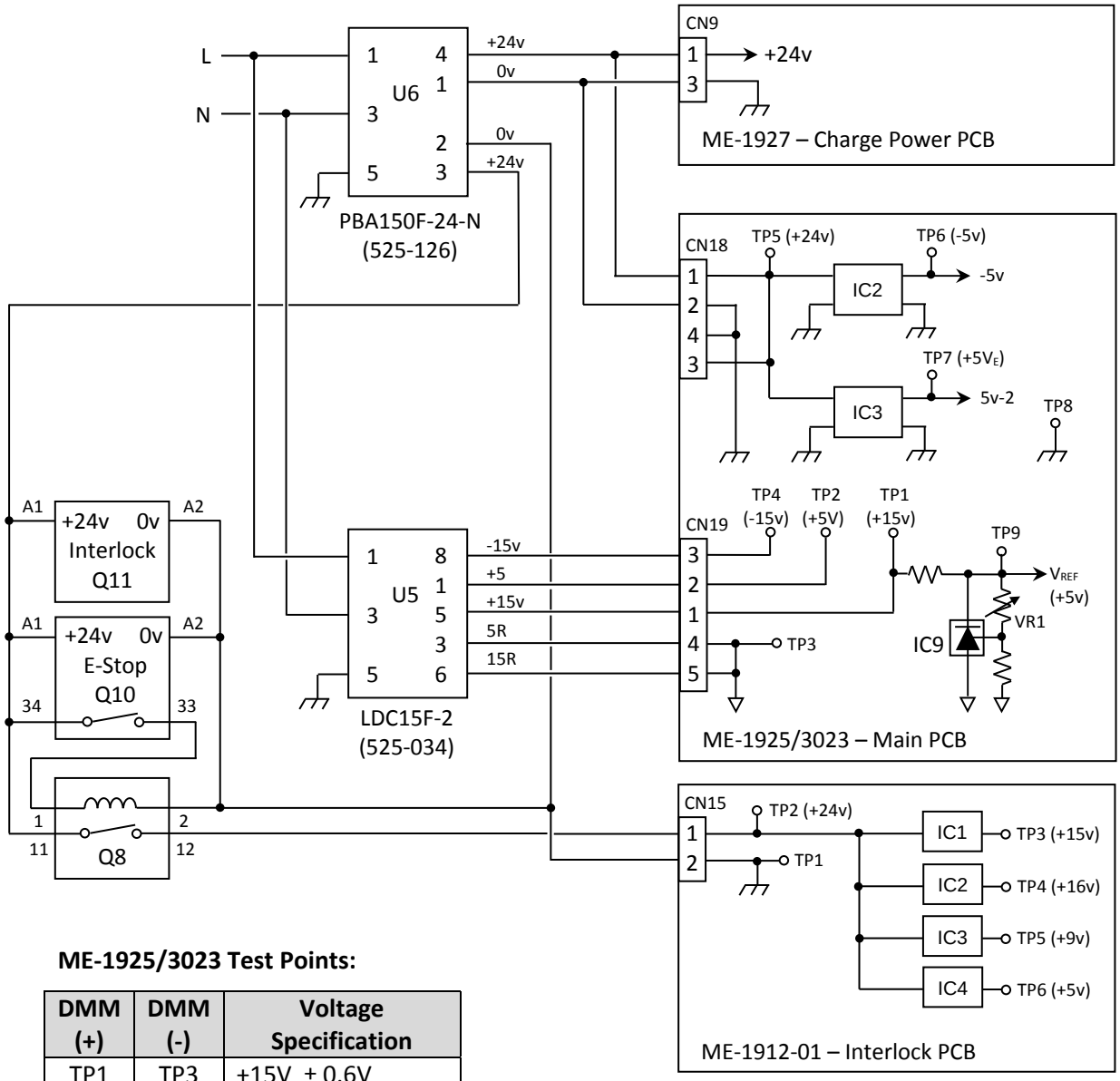
DMM (+)	DMM (-)	Voltage Specification
TP1	TP3	+15V ± 0.6V
TP2	TP3	+5V ± 0.2V
TP4	TP3	–15V ± 0.6V
TP9	TP3	+5V$_R$ ± 0.01V
TP5	TP8	+24V ± 0.5V
TP6	TP8	-5V ± 0.2V
TP7	TP8	+5V$_E$ ± 0.2V

Note: +5V$_R$ is adjusted by VR1 on Main PCB

Fuse F1: 218.002P (AMYA # 330-198)

U4, U5 and U6 are mounted to the inside chassis wall behind the Main PCB and Interlock PCB.

LW5A(M)/15A/25A/2AG/5AG Laser Welders (8-xxx-02-xx)
with ME-1925/ME-3023 Main PCB – Power Distribution for Dual E-Stop/Interlock Lasers



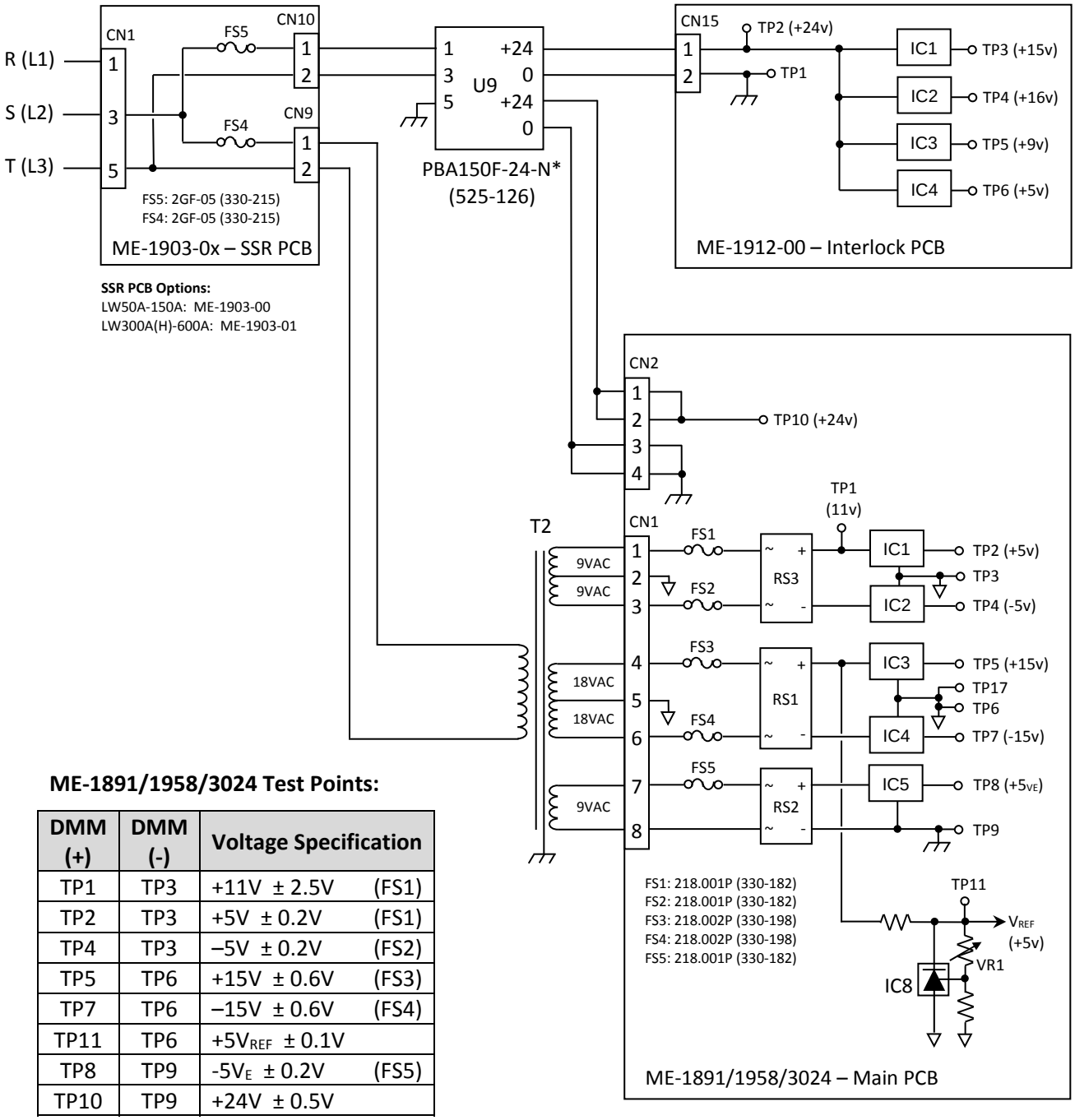
ME-1925/3023 Test Points:

DMM (+)	DMM (-)	Voltage Specification
TP1	TP3	+15V ± 0.6V
TP2	TP3	+5V ± 0.2V
TP4	TP3	–15V ± 0.6V
TP9	TP3	$+5V_R$ ± 0.01V
TP5	TP8	+24V ± 0.5V
TP6	TP8	-5V ± 0.2V
TP7	TP8	$+5V_E$ ± 0.2V

Note: $+5V_R$ is adjusted by VR1 on Main PCB

Power Supplies U5 & U6 are mounted to the inside chassis wall behind the Main PCB and Interlock PCB. Safety Relays Q10 / Q11 and relay Q8 are mounted on the chassis wall just below the Main PCB.

LW50A(C)/70A(C)/150A/300A(H)/400A/500A/600A Laser Welders (8-xxx-01-xx)
with ME-1891/ME-1958/ME-3024 Main PCB – Power Distribution for Single E-Stop/Interlock Lasers



ME-1891/1958/3024 Test Points:

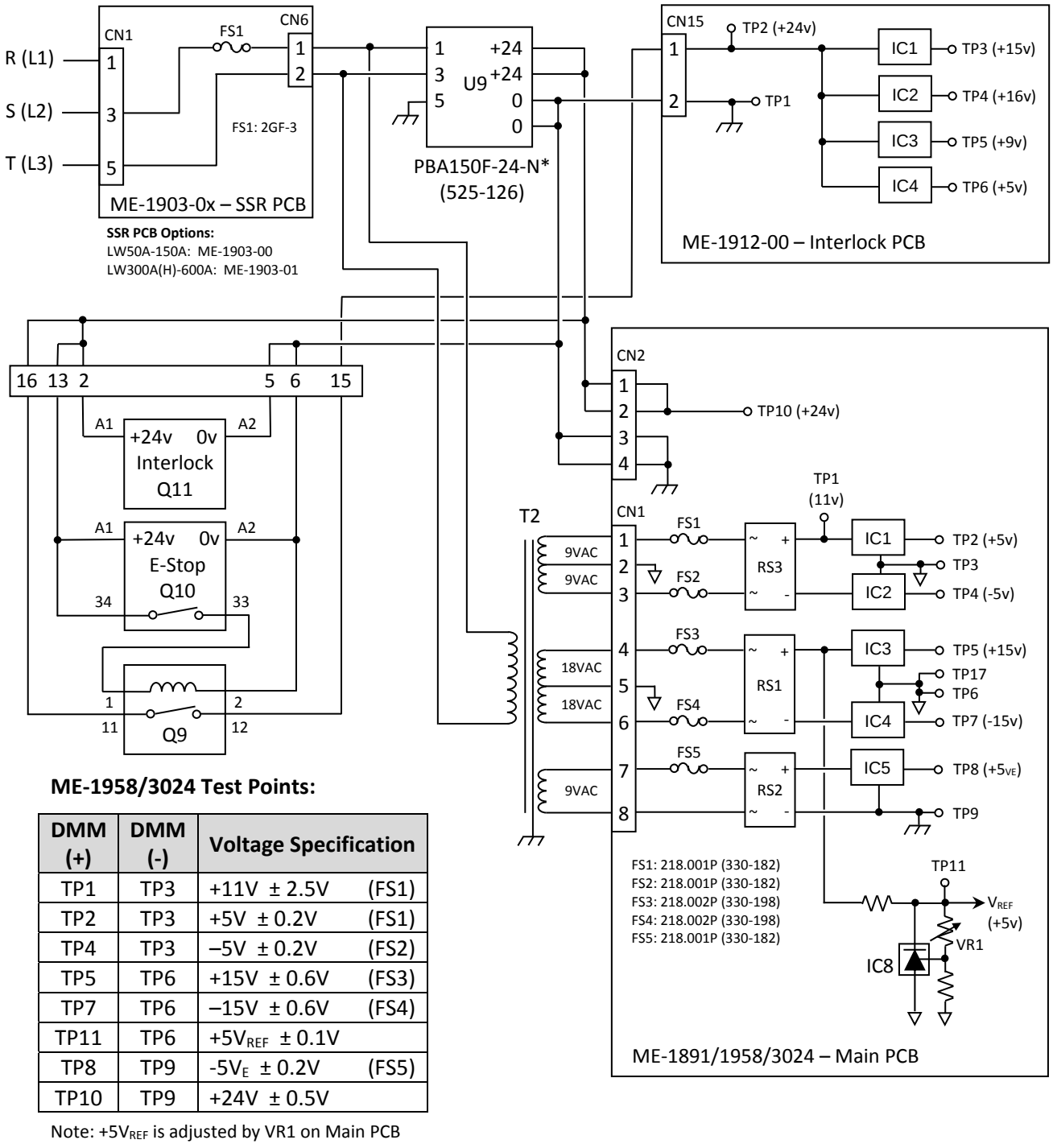
DMM (+)	DMM (-)	Voltage Specification	
TP1	TP3	+11V ± 2.5V	(FS1)
TP2	TP3	+5V ± 0.2V	(FS1)
TP4	TP3	–5V ± 0.2V	(FS2)
TP5	TP6	+15V ± 0.6V	(FS3)
TP7	TP6	–15V ± 0.6V	(FS4)
TP11	TP6	$+5V_{REF}$ ± 0.1V	
TP8	TP9	$-5V_E$ ± 0.2V	(FS5)
TP10	TP9	+24V ± 0.5V	

Note: $+5V_{REF}$ is adjusted by VR1 on Main PCB

The simplified schematic shown above highlights all important power supply connections and does not show all discrete components.

* At the time of this document's publish date, Power Supply U9 shown above is typical for 220VAC U.S. LW50A/70A/150A Laser Models. However, depending on the Laser Model, Date of Manufacture and destination country, Power Supply U9 may be different than shown. If a faulty power supply is found, read the model number of the power supply itself in order to determine the correct replacement.

LW50A(C)/70A(C)/150A/300A(H)/400A/500A/600A Laser Welders (8-xxx-02-xx)
with ME-1958/ME-3024 Main PCB – Power Distribution for Dual E-Stop/Interlock Lasers



ME-1958/3024 Test Points:

DMM (+)	DMM (-)	Voltage Specification	
TP1	TP3	+11V ± 2.5V	(FS1)
TP2	TP3	+5V ± 0.2V	(FS1)
TP4	TP3	–5V ± 0.2V	(FS2)
TP5	TP6	+15V ± 0.6V	(FS3)
TP7	TP6	–15V ± 0.6V	(FS4)
TP11	TP6	$+5V_{REF}$ ± 0.1V	
TP8	TP9	$-5V_E$ ± 0.2V	(FS5)
TP10	TP9	+24V ± 0.5V	

Note: $+5V_{REF}$ is adjusted by VR1 on Main PCB

The simplified schematic shown above highlights all important power supply connections and does not show all discrete components.

* At the time of this document's publish date, Power Supply U9 shown above is typical for 220VAC U.S. LW50A/70A/150A Laser Models. However, depending on the Laser Model, Date of Manufacture and destination country, Power Supply U9 may be different than shown. If a faulty power supply is found, read the model number of the power supply itself in order to determine the correct replacement.

3. Faulty CPU (Main PCB)

The Interlock circuit is very basic. If all switches test OK, all connections are intact and all Power Supplies are at their correct potential, then the CPU (Main PCB) is faulty. Replace and re-test.

End of procedure