SERVICE BULLETIN

28 June 2006 BULLETIN #205

MC91-0, 92-0 & 93-0

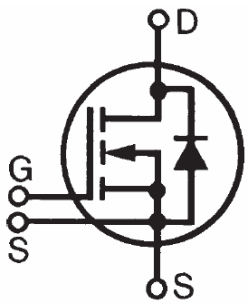
MODIFICATION TO PWA002 VOLTAGE BOOST PCB

There have been some field failures of the output rectifier accompanied by mosfet failure in the Weldarc 125i, 145i or 165i series. If a service agent receives a machine with a short circuit output rectifier, contact WIA Technical Service for advice before proceeding any further as it is most important that repairs involving mosfet replacement are only undertaken by service agents experienced in repairing inverter welders. The repair time is lengthy and the likelihood of immediate or subsequent failure is high unless great care is taken.
The nature of these failures is consistent and it is the breakdown of a 150 volt tranzorb on the voltage boost pcb which initiates failure of other components.
Initially 3 x 47 volt tranzorbs were used on the voltage boost pcb. Then for production reasons this was changed to a single 150 volt tranzorb. This mode of failure has never occurred on a machine with 3 x 47 volt tranzorbs, so 3 x 47 volt tranzorbs are now used for all machines, starting with the following serial numbers:

M910B0606017009 for the Weldarc 125i (MC91-0)
M920B0606016013 for the Weldarc 145i (MC92-0) and
M930B0606016005 for the Weldarc 165i (MC93-0)

Symptoms
A machine which has developed this fault will have no display lights or fan running. The bus capacitors will not charge to their nominal 340 volts because the PTC protection resistor on the Power Control pcb blocks excessive current draw by the short circuit mosfets.

Output Rectifier Test
With multi meter set to diode test, measure between the 2 output terminals. The reading of a good output rectifier is:
Black meter lead to +ve terminal, red meter lead to –ve terminal typically 200 mv.
Red meter lead to +ve terminal, black meter lead to –ve terminal typically open circuit.

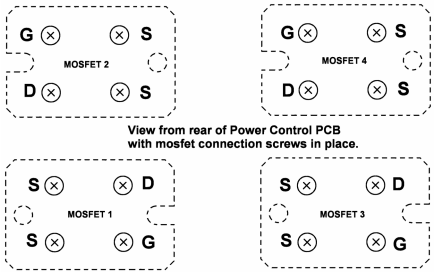


MOSFET Test

Warning: MOSFETs are sensitive to damage from static electricity. Effective anti static techniques must be employed when handling these devices out of circuit.

Mosfet **in circuit** typical reading (diode test)	
S+ D-	D+ S-
400	open

Mosfet **out of circuit** typical reading (diode test)					
S+ G-	S+ D-	D+ S-	G+ S-	D+ S-	G+ D-
open	400	open	open	500	open



The mosfet test is designed to be done in the order shown in the table above to turn the mosfet off and then on by the meter voltage during the test. If tested in a different order the result for S+/D- may be different to that shown.

QUALITY WELDING PRODUCTS, SYSTEMS AND SERVICES

If you encounter a machine with a short circuit output rectifier, and WIA have authorised a repair, check the following for short circuit:

- mosfets (typically 2 of the 4 mosfets fail)
- 150 volt tranzorb on the voltage boost pcb
- D1 and D2 on the voltage boost pcb (normally only D1 **or** D2 fail)

Also check the short section of printed circuit track on the voltage boost board between the tranzorb and P4 (as per fig 3). This track can go open circuit if the tranzorb shorts.

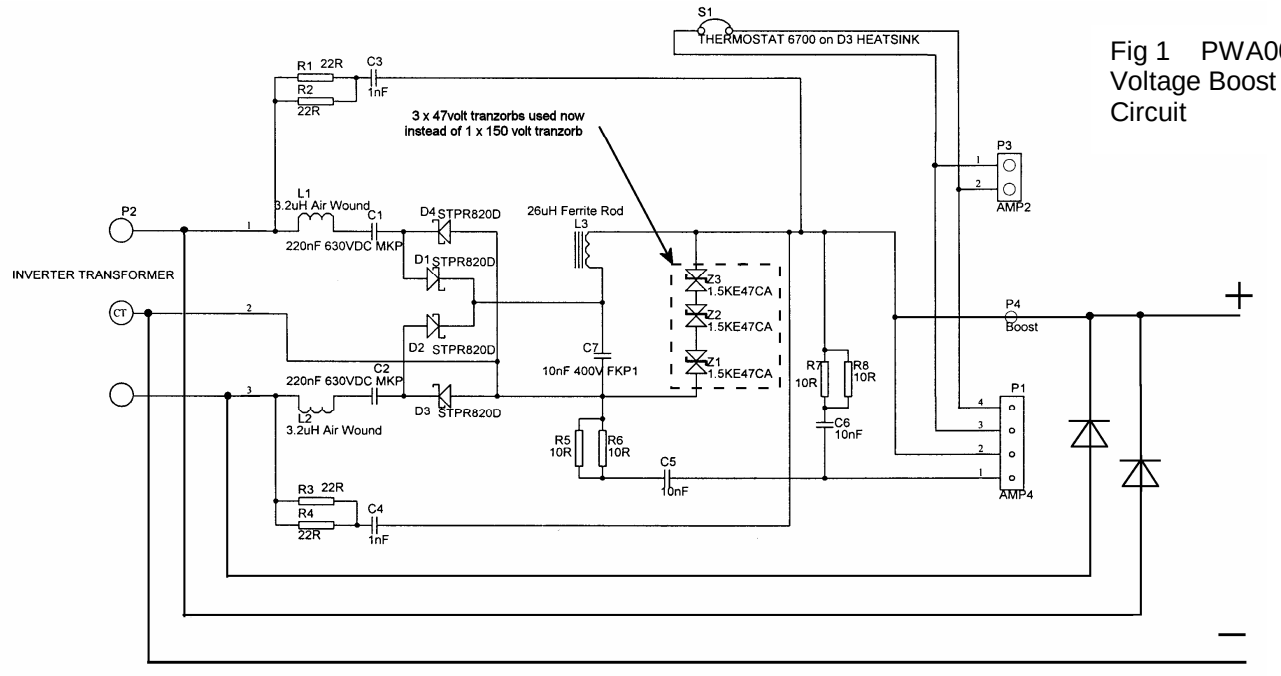
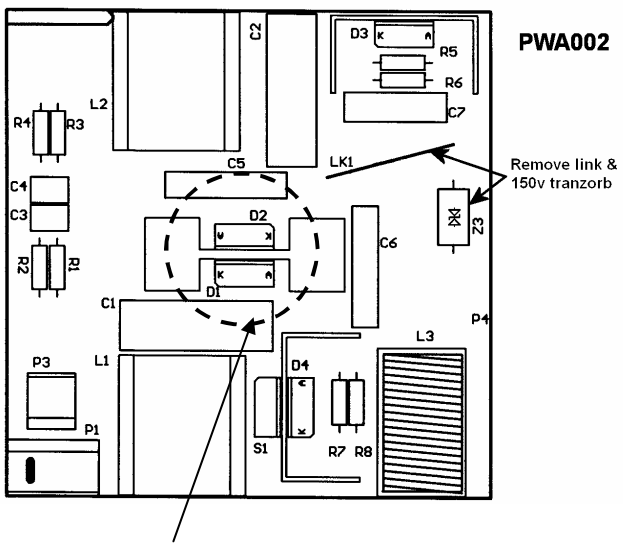


Fig 1 PWA002 Voltage Boost PCB Circuit

If the checks indicate failures as described above, a repair can be carried out as follows:

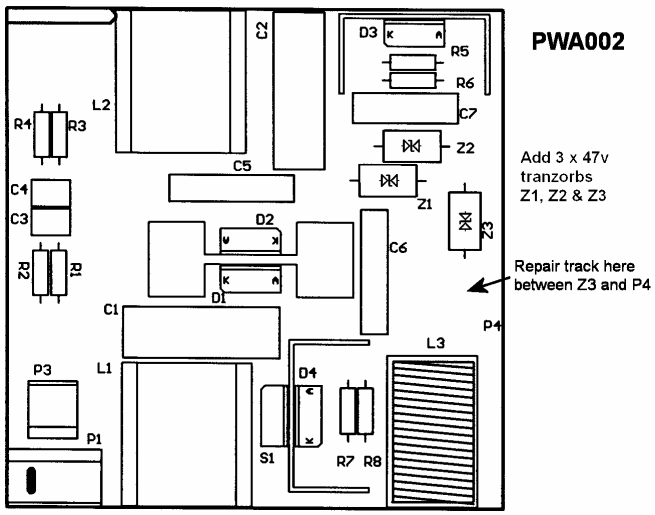
Replace: Damaged mosfets (D0019), output rectifier (D0017, refer Service Bulletin 202 for extra advice re new output rectifier) and damaged D1 or D2 (STPR820D) on Voltage Boost PCB.
Remove 150 volt tranzorb and link as per Fig 2 and fit 3 x 47 volt tranzorbs (D0023) as per Fig 3.
Repair printed circuit track as per Fig 3.

Fig 2



Check D1 and D2 for short circuit.
Replace if req.

Fig 3



Hugh Stewart,
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