

Overview

These instructions describe the steps necessary to upgrade a 3A, AS4428 F3200 panel to a 6A version. The upgrade involves replacing the panel's existing MAF/PSU board, adding an internal heatsink for the high current devices, an extra transformer and rectifier board, and modifying the FIP's internal mains wiring.

For reference, there is a photograph of a completed upgrade on the last page of this document, refer also to drawing 1931-44 that is attached.

**** WARNINGS ****

Ensure that **adequate fire protection measures** have been set in place before de-powering the FIP.

Upgrading the F3200 FIP includes changes to the FIP internal, 240V wiring. Ensure that the **mains supply** to the FIP has **been isolated at the switchboard and locked out**, and the **batteries disconnected** before attempting to upgrade the system.

Disconnect the batteries at the battery terminals so that the leads are not live.

The 240V wiring re-work must be done by, or inspected by a suitably qualified person, and must comply with AS/NZS 3000 "Wiring Rules".

Also note that the F3200 MAF/PSU FET/Rectifier components contained in the upgrade are susceptible to damage by static electricity. Therefore anti-static procedures must be followed when handling the circuit boards and FET.

Kit Contents

FP0779 FP F3200, AS4428, PSU UPGRADE KIT 3A TO 6A 1931-44:

CL0423	COIL,F3200 MAINS,240V:29VRMS	1	
CN0482	CRIMP RECEPTACLE H1972	2	TFMR PRIM WIRES * 4
CN0546	CRIMP RECEPTACLE COVER 6.3MM	2	FIT TO RECEPTACLES
FA1163	FAB,BARREL NUT,M4 X 14mm,7mm	2	HEATSINK MOUNTING
FA1237	FAB 1931-38 F3200 6A PSU HEATSINK (A)	1	FOR FET/RECT PCB
HW0022	HARDWARE GROMMET PLASTIC 3/8IN	1	
HW0130	HARDWARE PCB STANDOFF PBR10	4	3A RECT MTG
HW0208	HARDWARE PCB STANDOFF ADHESIVE BASE	4	3A RECT MTG,USE SUPER GLUE
IN0024	INSULATION SLEEVING HEAT SHRINK 5MM BLACK	30mm	SPARE
LM0083	LOOM FRC 20W STYLE C 700MM	1	
LM0278	LOOM 0.75APP G/Y 250MM CRIMP M4 LUG:2.3QC	1	PCB EARTH
LM0279	LOOM 150AUTO RED 200MM BOTH CRIMP 2.3QC	1	42V POS
LM0280	LOOM 150AUTO BLK 200MM BOTH CRIMP 2.3QC	1	42V NEG
LM0571	LOOM,1982-148,20A ATQ FUSED BATTERY LEAD,6mm LUGS	1	FIT BETWEEN BATTS
ME0519	MECH ASSY,1948-41,INSULATED MAINS MOV,10N CAP	1	FIT TO MAINS TERMINAL
NT0007	NUT HEX M3 ZP	2	FOR FET/RECT PCB
PA0874	PCB ASSY 1931-3-4 F3200 AS4428 MAF/PSU 6A	1	
PA1030	PCB ASSY 1931-133 F3200 3A RECT. & 6A FET+RECT BDS	1	
SC0044	SCREW MACHINE PH POZI M3 X 16 ZP	2	FOR FET/RECT MTG
SC0052	SCREW MACHINE PH POZI M4 X 16 ZP	2	HEATSINK MTG
SC0176	SCREW MACHINE PH PHIL M4 X 10 C/W WASHERS	4	4 X COIL MTG
SU0020	SUNDRY CABLE TIE 3.62IN TY-RAP TY-523M	1	TIE YEL WIRES
TR0063	TRANSISTOR MOUNTING BUSH TO220	2	FET/RECT HTSK
TR0064	TRANSISTOR INSULATOR TO220 SILPAD	2	FOR FET/RECT HTSK
WA0005	WASHER FLAT M3 ZP 7MM OD 0.6MM THICK	2	FOR FET/RECT HTSK
WA0006	WASHER FLAT M4 ZP 9MM OD 1MM THICK	2	2 X HEATSINK MTG
WA0010	WASHER SHAKEPROOF M3 I.T LOCK ZP	2	FET/RECT HTSK
WA0011	WASHER SHAKEPROOF M4 I.T LOCK ZP	2	HEATSINK MTG

Upgrading a Non-Gearplate Panel

Note that 8U FIPs (FP0874) cannot be upgraded to 6A.

The upgrading of a panel that does not contain a gearplate requires the removal of the FIP cabinet from its location. Holes are then drilled in the metalwork for mounting the second transformer.

It is therefore recommended that all PCBs be removed from the cabinet (using anti-static procedures) to eliminate the possibility of board contamination or damage due to metal fragments shorting components.

Leave the existing transformer in place. Also note down the wiring positions to the mains switch.

- Step 1. On the cabinet rear, rule 2 vertical lines through the centres of both pairs of existing transformer mounting holes. Mark 60mm down from the bottom holes.
- Step 2. Take the supplied transformer and hold against the rear of the cabinet with marks aligned with top mounting holes. (Transformer laminations in the horizontal plane). Mark all 4 holes.
- Step 3. Centre punch and drill all 4 holes with a 5mm drill bit. De-burr the holes.
- Step 4. Remove all the swarf from the inside of cabinet.

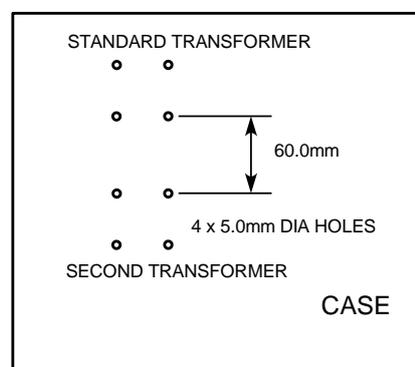
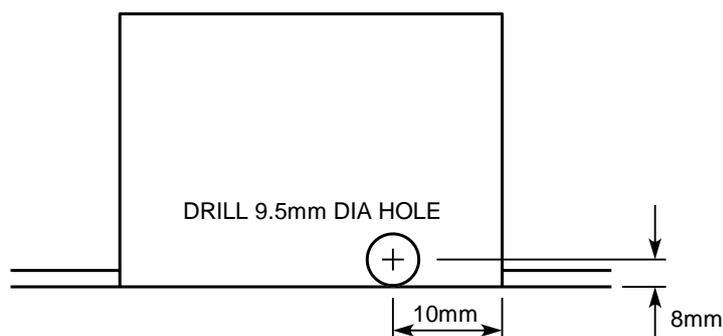


FIG 1
TRANSFORMER MOUNTING - DRILL DETAIL

- Step 5. Remove the mains cover and with it in the correct orientation a hole must be drilled in the bottom. Mark the hole centre 8mm from rear and 10mm from the right hand side.
- Step 6. Centre punch the centre mark and drill the hole with a 9.5mm drill bit. De-burr.



BOTTOM VIEW
FIG 2
MAINS COVER - DRILL DETAIL

- Step 7. Fit the 3/8" grommet to the hole in the mains cover from the bottom.
- Step 8. Fit the new transformer (laminations horizontal) using the 4 off M4 x 10 screws with spring and flat washers (from the rear of the cabinet).
- Step 9. Cut off the connectors on the primary leads of the existing transformer and strip 5mm of insulation.

Feed the primary wires of the bottom transformer through the grommet and the primary wires of the top transformers over the top of the mains enclosure.

Using the supplied 6mm crimp receptacles crimp one onto the 2 brown phase wires, and the other onto the blue neutral wires.
Reconnect to the mains switch.

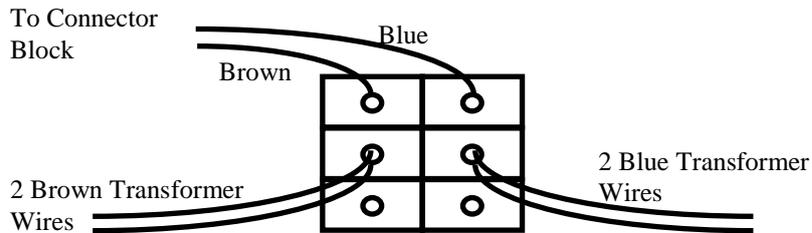


FIG 3
REAR VIEW OF SWITCH IN CORRECT ORIENTATION

Replace the mains enclosure and secure to the cabinet with appropriate hardware.

- Step 10. Take the supplied 6A MAF/PSU board, plug the new 20-way FRC loom into J2 and fold it under the board.
- Mount the MAF/PSU in place (down one 90mm pitch from the normal position). Attach the supplied earth loom to the earth stud on the cabinet and connect to J9 on the MAF/PSU. Connect the two batteries in series using the ATQ 20A, Fused Battery Lead.

- Step 11. Fit the adhesive base standoffs to the 3A Rectifier board. Remove the stand-off covers and apply a drop of Loctite or similar "super glue" to each. Mount the board adjacent to the lower transformer.

Connect the supplied red lead between J4/1 on the MAF/PSU and J3 on the Rectifier board and the black lead between J4/2 on the MAF/PSU and J4 on the Rectifier board.

- Step 12. The secondary wires from the bottom transformer connect to J3/1 and J3/2 on the MAF/PSU. The top transformers secondary connects to the 3A Rectifier PCB.

- Step 13. Fit the 6A heatsink to the studs on the cabinet side with M4 flat washer, M4 shake-proof washer and M4 barrel nut (in that order). Use a screw-driver to secure tightly.

- Step 14. Connect the flying leads from the 6A MAF/PSU into the circuit board on the heatsink. The top wire connects into top location on the heatsink PCB and continues in the same order working down. See Figure 4. Cable tie the 5 wires together near the centre.

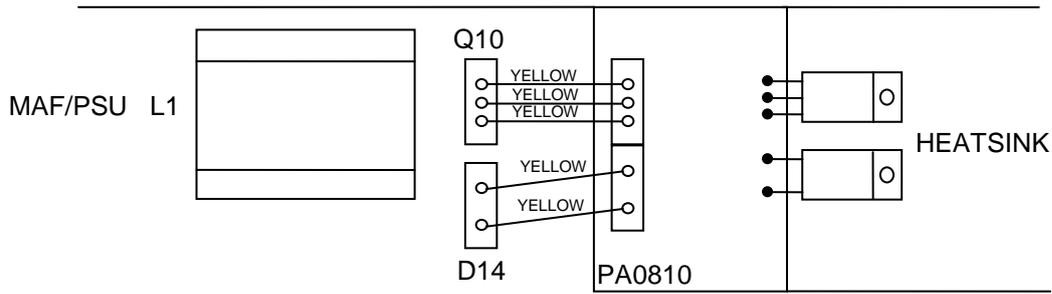


FIG 4

- Step 15. Replace the boards back into the cabinet (except the old MAF/PSU). Connect the new FRC from the MAF/PSU into I/O BUS IN (J5) on the 8 Zone Module. Connect the 26 way FRC cable from the controller into J1 on the MAF/PSU.
- Step 16. Refit the FIP cabinet to its position and reconnect to batteries and mains.

Upgrading a Gearplate Panel

The upgrading of a panel that contains a gear plate requires only the gearplate being removed. Again ensure the batteries and mains have been disconnected prior to starting the upgrade.

Drawing 1931-44 (attached) shows the assembly and wiring of the 6A kit in a new panel as done in the factory. This can be used to show where things are fitted for upgrading a panel in the field.

- Step 1. Disconnect the FRCs and remove the existing MAF/PSU board from the gearplate.
- Step 2. Fit the new transformer (laminations horizontal) using the 4 off M4 x 10 screws with spring and flat washers (from the rear of the gearplate) in the location above the existing transformer.
- Step 3. Disconnect from the mains switch and cut off the connectors on the primary leads of the existing transformer. Strip 5mm of insulation off.

Using the supplied 6mm crimp receptacles, crimp one onto the 2 brown phase wires and the other onto the 2 blue neutral wires. Feed both sets of primaries through the bottom of the mains enclosure.

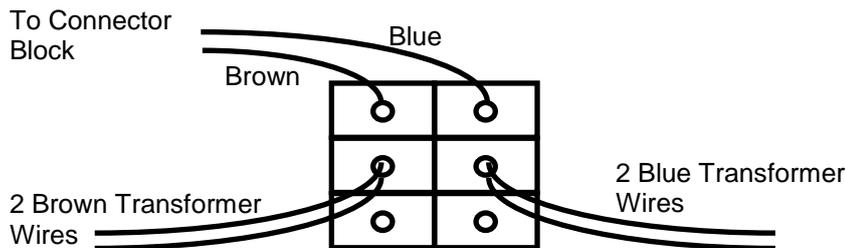


FIG 5

REAR VIEW OF SWITCH IN CORRECT ORIENTATION

Reconnect to the mains switch – see Figure 5.

Step 4. Take the supplied 6A MAF/PSU, sit the FRC from the 8 zone on top of the gear plate such that the MAF/PSU sits over the top and the FRC does not pull hard against the component leads on the bottom of the PCB. Fit the board to the stand-offs. Plug the FRC from the 8 zone board into J2 on the MAF/PSU.

Step 5. Fit the 4 x plastic stand-offs to the gearplate directly under the earth stud label. Mount the Rectifier board on these stand-offs.

Connect the supplied red lead between J4/1 on the MAF/PSU and J3 on the Rectifier board and the black lead goes between the J4/2 on the MAF/PSU and J4 on the Rectifier board.

Step 6. Connect the secondary wires from the bottom transformer to J3/1 and J3/2 on the MAF/PSU. Connect the top transformer secondary to the 3A Rectifier PCB.

Step 7. Fit the 6A heatsink to the right hand side of the gearplate (beside MAF/PSU) using a M4 x 16 screw (from the back of the gearplate), M4 flat washer, M4 shake-proof washer and M4 barrel nut (in that order). Secure tightly.

Connect the flying leads coming from the 6A MAF/PSU into the circuit board on the heatsink. The top wire connects into the top location on the heatsink PCB and continues in the same order working down. Refer Figure 6. Cable tie the 5 wires together near the centre.

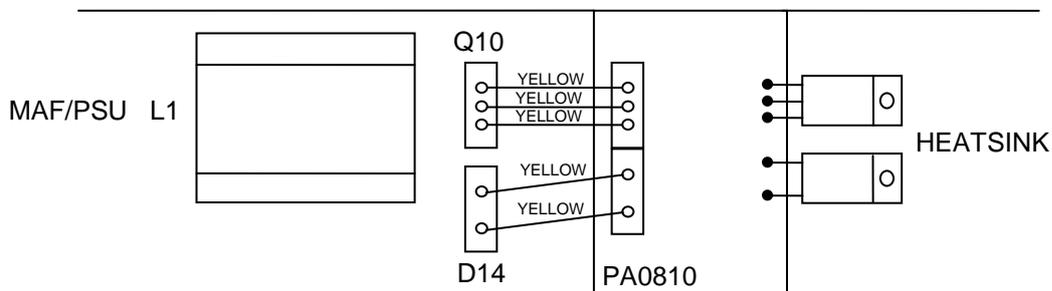


FIG 6

Step 8. Refit the gearplate into the cabinet. Reconnect the 26 way FRC cable from the controller to J1 on the MAF/PSU.

Step 9. Replace the battery lead that joins the +ve of the first battery to the -ve of the second with the LM0571 lead that has a 20A fuse, but do not yet connect the battery.

Step 10. Inspect all the mechanical work and wiring, including that wires are connected to correct places, terminals gripping the wires and done up tightly, no exposed conductor, crimp terminals crimped tightly (do a pull test) . especially check the 240V wiring.

Step 11. Replace the mains enclosure and secure to the gearplate with the appropriate hardware.

Step 12. De-isolate the mains at the switchboard.

Step 13. Power up the panel by turning the mains switch on and then connecting the batteries.

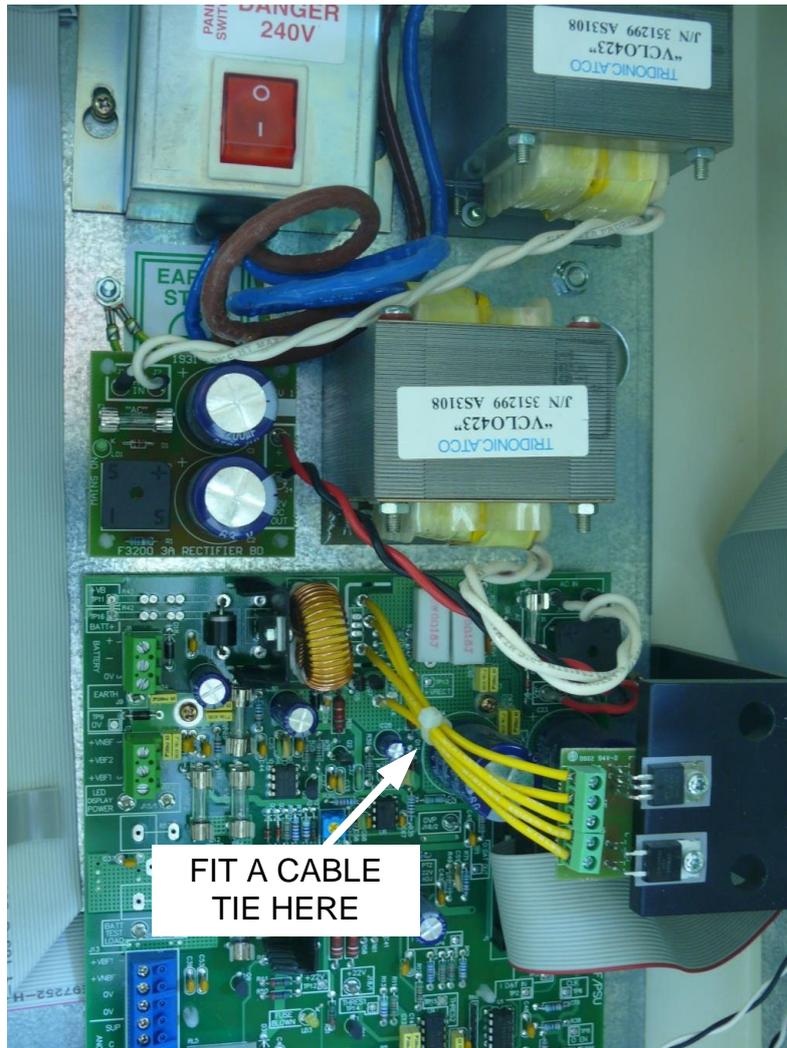
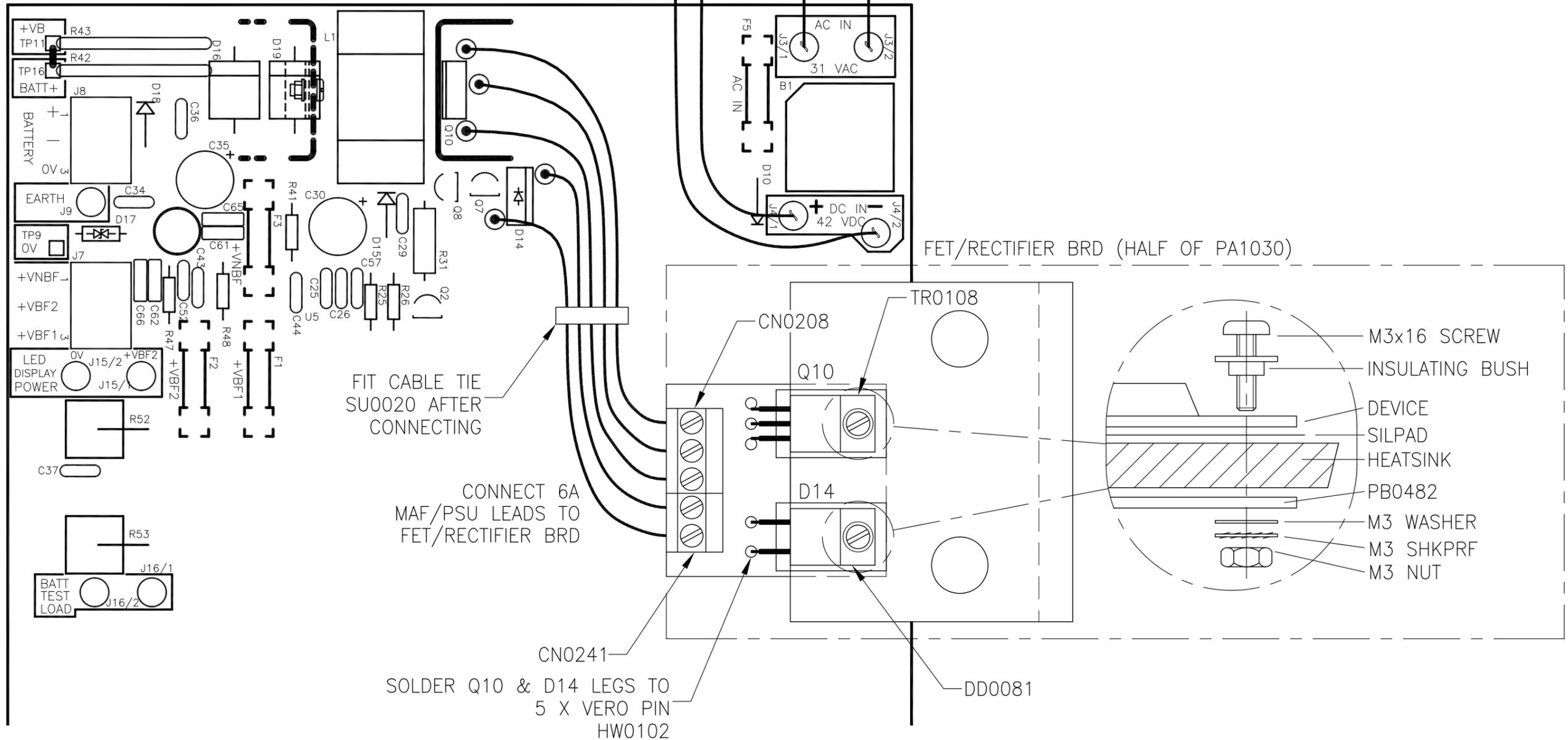


FIG 7

RUN 2 X 200mm AUTO 150 LEADS FROM 3A RECTIFIER BRD TO MAF/PSU BRD. EACH END OF LEADS TERMINATED WITH A 2.3mm CRIMP RECP (CN0028).

CONNECT SECONDARY LEADS FROM BOTTOM TRANSFORMER UNIT ONTO MAF/PSU BRD.



6 AMP MAF/PSU PCB AND HEAT SINK CONNECTION DETAIL

PA0809, 1931-3-2, F3200 MAF/PSU, 6A
 PA0874, 1931-3-4, F3200 4428.1 MAF/PSU, 6A

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UNLESS OTHERWISE STATED: ALL DIMENSIONS IN MILLIMETRES. DO NOT SCALE. TOLERANCES ARE TO BE: 1 DECIMAL PLACE ±0.5, 2 DECIMAL PLACES ±0.3, 3 DECIMAL PLACES ±0.1

3rd ANGLE PROJECTION

ISS/REV	AMENDMENTS	ECO	DRN	CHKD	AUTH	APVD	DATE
G	REDRAWN ON A1 & A3 SHEET, PA0810 AND GEAR PLATE ASSEMBLY DETAILS ADDED.	2803	KJS	GEL	TH	DSP	29-5-98
H	PA0810 CONNECTORS WERE 1 X CN0355 & 0.65 X CN0361.	ECS603	KJS	GEL	TWH	DSP	24-8-99
I	PA AND DRAWING REFERENCES CHANGED TO ACCOMMODATE AS4428.1 PRODUCTS	3041	KJS	GEL	TWH	DSP	18-10-00
J	MAF/PSU BOARD LAYOUT CHANGED. WIRES WERE COLOUR CODED.	3456	RMH	KJS	LSC	DSCP	20-10-03
K	Q10 / D14 LEGS SOLDERING INSTRUCTION ADDED.	3801	GEL	PAA	LSC	DSCP	24-10-06
L	Q10 ON PA0810 WAS TYPE TR0075	3834	GEL	PAA	LSC	DSCP	22-03-07
M	CABLE TIE ADDED TO WIRES.	4926	KJS	DG	RC	DP	4-7-16

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F3200
6A MAF/PSU AND HEATSINK
ASSEMBLY DETAILS

DRAWING No: **1931-44** SHEET **1** of **2**

A3	ISS/REV M	PART No:
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