Field Conversion for CCF
URC1 to URC2 Control Board

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Record of Changes

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URC1 to URC2 Control Board

1. Introduction

This section of the service bulletin provides instructions to convert a UCR1 board to a URC2 board for a Ferro-resonate Regulator.

2. Special Tools and Equipment Required

Refer to Tables 1 and 2 for the tools and equipment that are required.

Table 1. Required Equipment Supplied

Description	Part Number	Quantity
URC1 to URC2 Upgrade Kit(w/Current and Switch Bd Options)	94A0488/X	1
Each Upgrade kit contains the following parts:		
URC2 Board	44A6035/1	1
Ribbon Cable	89A0209/36	1
Switch Board	Standard = 44A6178 w/Relay Fdbk = 44A6744	1
Feedback Transformer for CCR output current	6.6A = 35A0548 20A = 35A0528	1
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Table 2. Required Equipment Not Supplied

Description	Quantity
Screw Drivers & Allen Wrench Tools to remove & replace Phoenix Adapter and Regulator Switch	A/R

3. General Instructions

Read and understand the service bulletin before working on the regulator. Turn off and remove power form the Regulator. Open front compartment door.

4. Removing URC1 Board

1. After opening the regulator enclosure, locate the main URC1 PCB board (44A5936) shown in Figure 1. Locate and label all of the green Phoenix style connectors with there corresponding value.

2. Carefully remove all the Phoenix style connectors. Remove the four mounting screws from the board and then remove board itself. (Note: Allow ground connector to hang lose. Do not remove.)

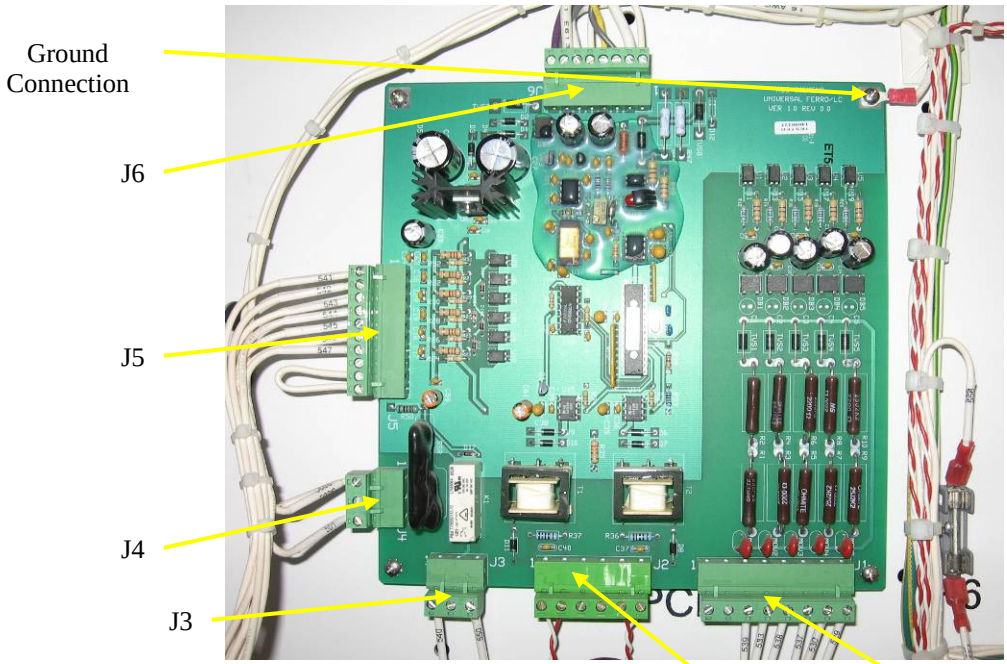

Figure 1: Picture of URC1 Board

5. Changing the Feedback Transformer

3. Remove the screws from the top panel and remove the top panel from the regulator. Locate T5 (35A0493). Refer to attached wiring diagram for assistance.

T5 (35A0493)

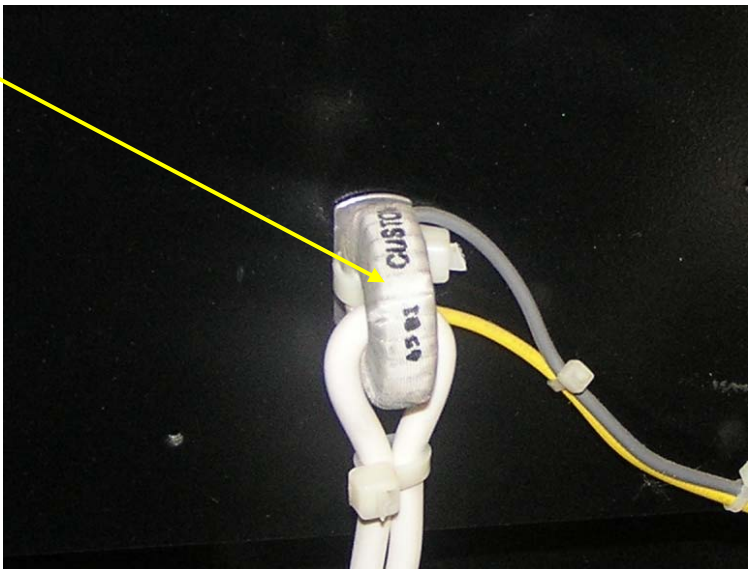

Figure 2: Feedback Transformer (35A0493)

Note: In 6.6A CCRs without an ACE, T5 is located on wire 202 leading from P2 of T2 to the output Lighting Arrestor. In 6.6A CCRs with an ACE, T5 is located on wire 201 leading from the regulator to the output Lighting Arrestor. In 20A versions, T5 is located on wire 524 leading from S2 of T2 to the meter display on the front compartment door.

4. For 6.6A CCRs:
    a. Carefully remove T5 (35A0493) and replace it with the new T5 supplied (35A0548).
    b. Run wires though the same opening the old T5 went though.
    c. See attached Wiring Diagrams for further clarification.

5. For 20A CCRs:
    a. Carefully remove T5 (35A0493) and reconnect the wire **without** adding the new T5 (35A0548).
    b. Instead, place the new T5 (35A0548) on wire 202 leading from P2 of T2 to the output Lighting Arrestor.
    c. Run the wires though the same opening the old T5 went though.
    d. See attached Wiring Diagrams for further clarification.

6. Removing the old Rotating Switch

6. Locate the Rotating Switch, on the front cover of the regulator.

7. Use an Allen wrench to loosen the hex head screw that secures the switch cap as shown in Figure 4.

Hex Screw

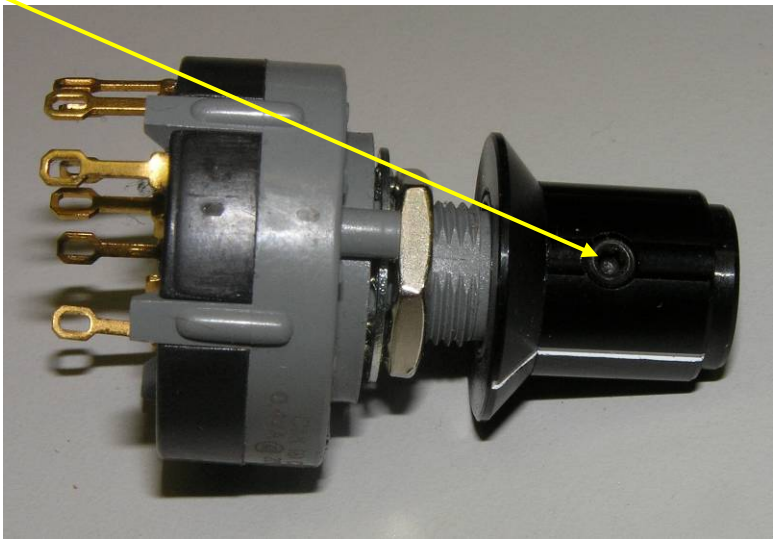

Figure 3: Rotating Switch

8. Next remove the screws (if present) that attach the switch to the regulator door, shown in Figure 5.

9. Once the cap has been removed, loosen the nut shown in Figure 6 that was located under the cap; remove the nut, the lock washer, and the switch from the regulator.

Be Careful not to turn the switch upside down when removing it from the door, or the switch stops may fall out.

Removing the old Rotating Switch *(Cont)*

10. Trace the wires from the switch, until you reach J5. Remove J5, the wires, and the switch from the regulator.

Lock Washer

Nut

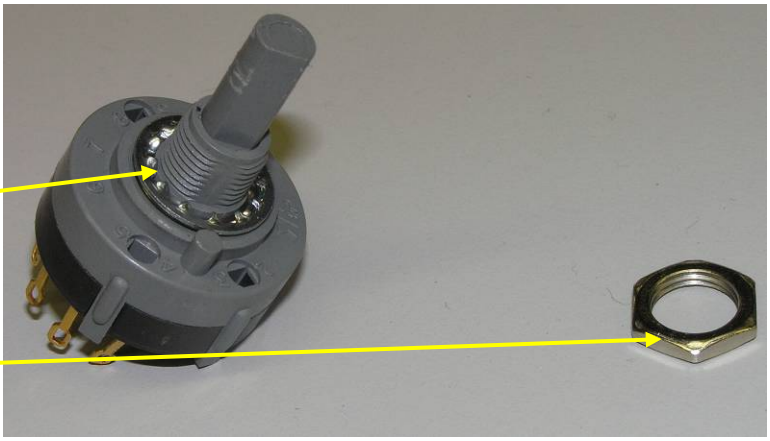

Figure 4: Rotating Switch Side View

7. Installing the new Rotating Switch

11. Loosen the Nut shown in Figure 5, remove it, the Lock Washer, and the Rubber Ring. After the Rubber Ring has been removed, turn the switch over and gently tap it on a flat surface, to remove the Switch Stops shown in Figure 6. There should be two Switch Stops. They are small, flat square metal pieces.

(Tip: Put paper down before tapping the switch this will help keep from losing the Switch Stops.)

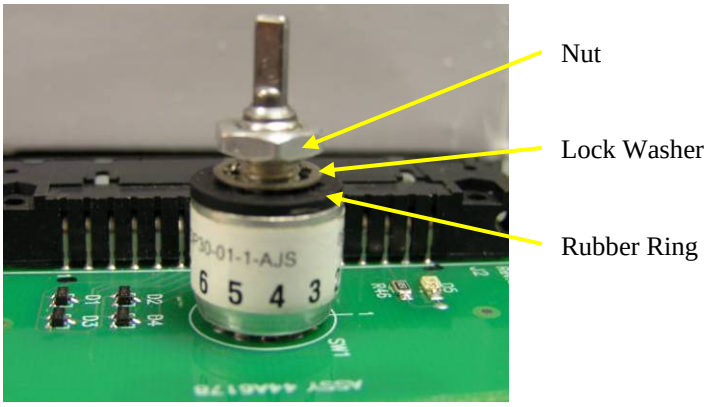

Figure 5: Rotating Switch Side View

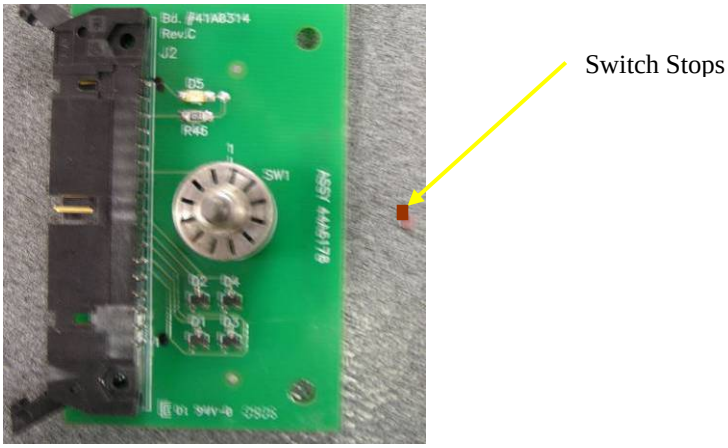

Figure 6: Rotating Switch Pin

Installing the new Rotating Switch *(Cont.)*

12. For 3 Step Regulators

    a. Carefully place one of the Switch Stops in the slot between 1 and 12 as marked on the switch shown in Figure 7. Insert the other Switch Stop in between 5 and 6

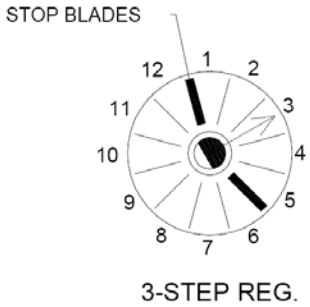

Figure 7: 3-Step regulator Switch Stops

    b. Replace the rubber ring, and carefully place back into regulator door switch hole.

    c. Place lock washer and nut on switch shaft and tighten, securing the switch do the door.

    d. If mounting standoffs are present on the door, tighten and secure the switch with the screws removed during step 8. If not, the switch will be secured with shaft nut and lock washer.

    e. Close the front cover and place the switch cap back into place. Tighten with hex screw with Allen wrench.

Installing the new Rotating Switch *(Cont.)*

13. For 5 Step Regulators

    a. Carefully place one of the Switch Stops in the slot between 1 and 12 as marked on the switch as shown in Figure 8. Insert the other Switch Stop in between 7 and 8.

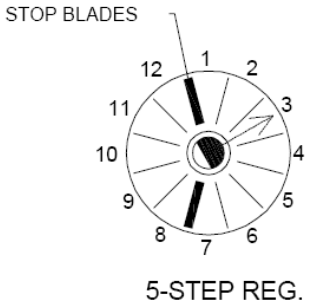

Figure 8: 5-Step regulator Switch Stops

    b. Replace the rubber ring, and carefully place back into regulator door switch hole.

    c. Place lock washer and nut on switch shaft and tighten, securing the switch do the door.

    d. If mounting standoffs are present on the door, tighten and secure the switch with the screws removed during step 8. If not, the switch will be secured with shaft nut and lock washer.

    e. Close the front cover and place the switch cap back into place. Tighten with hex screw with Allen wrench.

8. Install new URC2 Board

14. Before you install the new URC2 Board (44A6035/1), some wiring modifications are required.

15. Locate Fuses F5 and F6. Refer to attached wiring diagram for assistance. Remove the fast-on from F5, and then remove fast-on from F6. Attach fast-on from F6 to where fast-on from F5 used to be connected. Attach fast-on from F5 to where fast-on from F6 used to be connected.

16. In the Kit supplied locate the 6 Pin Phoenix Connector that plugs into J5 of the URC2 board, and attach a wire jumper from Pin 3 to Pin 4 as shown by Note 1 in Figure 9. Also if the regulator is a 3 step regulator, another jumper is placed in Pins 5 and 6 is required as shown. Finally, if the regulator is a 20A version, another jumper is required from Pin1 to Pin 2. Insert J5 into URC2 Board.

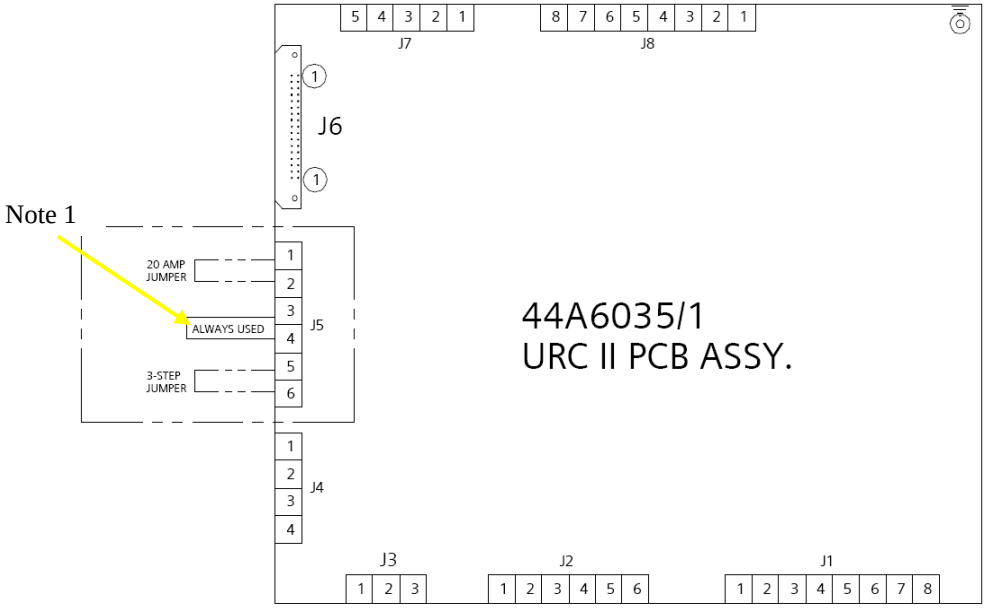

Figure 9: Drawing of URC2 Board

17. Remove Control Winding from J6 pin 7, and move it to J6 pin 1.

18. Move the jumper wire in Plug Labeled J6 from Pin 1 and place it in Pin 2. Leaving the side in Pin 5 alone.

19. Place wires from New T5 (35A0548 for 6.6A) (35A0528 for 20A) into the Plug Labeled J6 at Pins 3 and 4.

20. Insert URC2 Board into regulator so that J1, J2 and J3 are inline with your labeled Phoenix connectors. Fasten all the screws securely into place making sure to attach the ground wire.

Install new URC2 Board
(Cont)

21. Plug Connector labeled J1 into J1 connector on URC2 Board. Plug Connector labeled J2 into J2 connector on URC2 Board. Plug Connector labeled J3 into J3 connector on URC2 Board.

22. Depending on your version, J4 may have a 4 pin Phoenix connector or a 3 Pin Phoenix Connector. Follow the proper instructions below.

23. For a 3 Pin Phoenix Connector.

    a. Plug into J4 on URC2 Board making sure to move the 3 pins of Phoenix Connector labeled J4 into the bottom of the J4 connector. The pins should line up as follows. Pin 1 should line up with Pin 2, Pin 2 should line up with Pin 3, and Pin 3 should line up with Pin 4 on the Phoenix connector and URC2 board respectively. As shown in Figure 10. See attached drawings for further clarification.

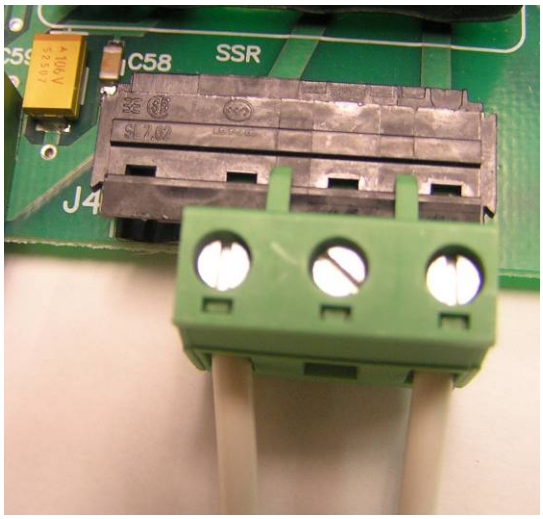

Figure 10: J4 Connector

24. For 4 Pin Phoenix Connector.
    a. Move the wire in the Phoenix Connector Labeled J6 from Pin 1 to Pin 2, and plug the Connector into J4 on URC2 Board. As seen in Figure 11.

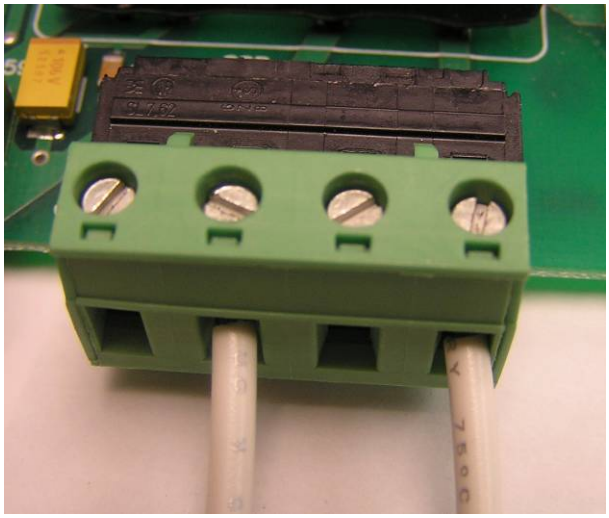

Figure 11: J4 Connector

25. J5 should already have a Phoenix connector plugged into it from step 16. Plug the ribbon cable (89A0209/36) supplied with kit (94A0488). Attach the other end of the ribbon cable to the Switch Board from Step 12 or Step 13.

26. J7 is left empty. Plug Phoenix Connector labeled J6 into J8 on URC2 Board.

9. Power up and Test

27. Check all connections and remove any excess wires or tools from inside the regulator. Remove regulator from field circuit, and short the output. Reattach top of enclosure with screws removed from Step 3. Close front enclosure and seal.

28. Restore power to the regulator, and step the regulator up to the highest Step. Monitor current using meter located on the front panel of the regulator, if current is close to 6.6A or 20A depending on your version turn off regulator, remove power and reattach to the field current. If the correct current is displayed, proceed to step 32.

29. If regulator goes to 10A and powers down due to over current on Step 1 turn off regulator, remove power and open front panel.

30. Remove control windings from J8 Pin 1 and Pin 2. Place wire from Pin 1 into Pin 2, and place wire from Pin 2 into Pin 1. Close regulator enclosure. Restore power to the regulator and turn to Step 1. Monitor current using meter located on the front panel of the regulator, if current is close to 6.6A or 20A depending on your version turn off regulator, remove power and reattach to the field current, and proceed to step 32.

31. If you are still having problems contact ADB Airfield Solutions.

32. To adjusting the output current, follow the below steps.

WARNING: Only personnel qualified to work on high voltage systems should attempt to make any adjustments on the constant current regulator.

WARNING: Never service the regulator when it is in protective shutdown mode, Remote controls or power fluctuations can restart the regulator.

Power up and Test *(Cont)*

To adjust the output current, perform the following procedure:

1. Connect a clamp-on true rms-reading instrument (such as a Fluke 87 multimeter with Y8101A current clamp or equivalent) around one of the output current leads. See Figure 12.

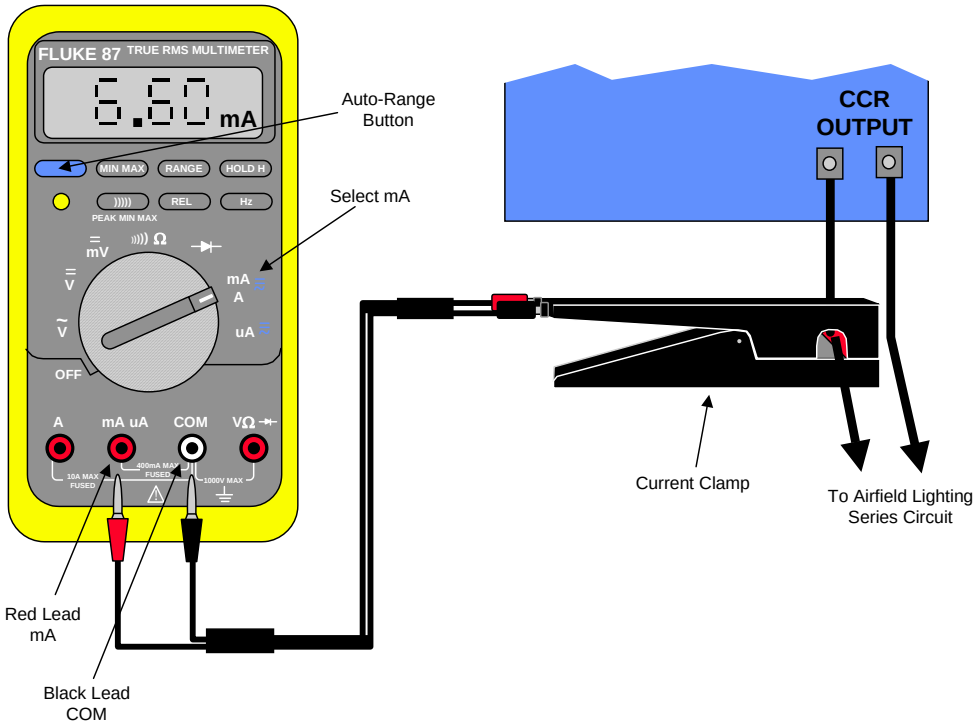

Figure 12: Output Current Clamp

NOTE: Make sure the meter is set on the AC current scale.

NOTE: Because the output current waveform is not a true sine wave, the ammeter must be of the true-rms type. Field instruments such as clamp-on ammeters and Simpson voltmeters will give erroneously low readings.

2. Energize the regulator locally, and set the rotary selector switch to the maximum brightness position S5 or B100.

3. See Figure 13. Carefully adjust R40 on the universal regulator controller board until the desired current is measured on the meter.

WARNING: Dangerous voltages are present on the URC PCB. It is strongly recommended that a nonconductive screwdriver be used during calibration to protect personnel as we as the card from accidentally shorting.

Power up and Test *(Cont)*

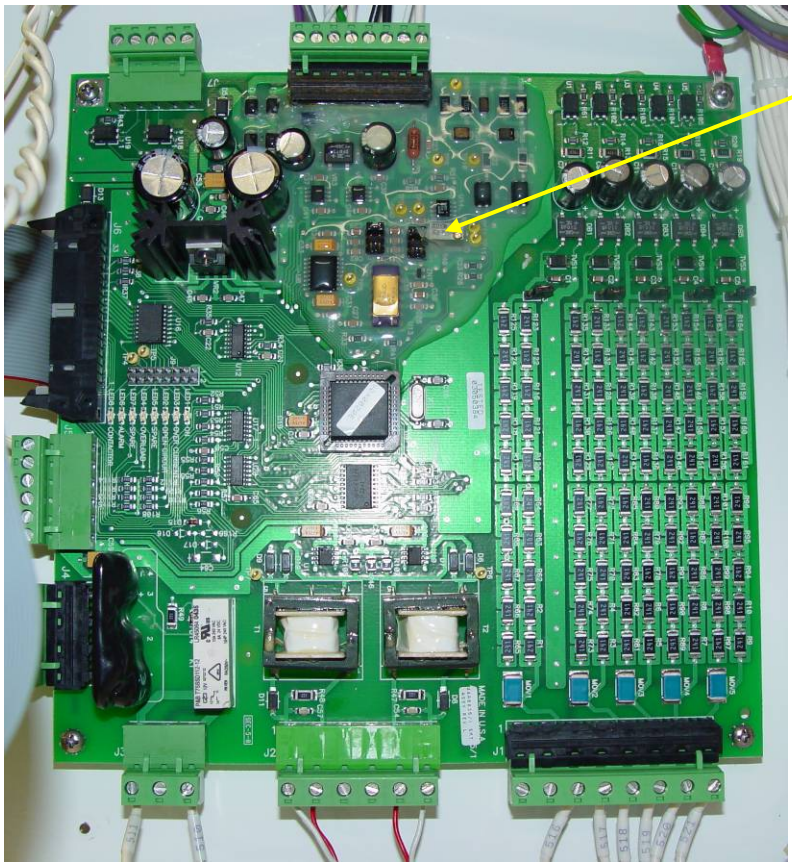

Figure 13: R40 (URC2 board)