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-1 JUL 1983

Tektronix
COMMITTED TO EXCELLENCE

IMPORTANT - FOR THE ATTENTION OF THE CHIEF ENGINEER

Dear Tektronix 2213/2215 Oscilloscope Customer:

One of Tek's continuing responsibilities is to maintain an ongoing support program for our products. Testing of 2213 and 2215 oscilloscopes has shown that a minor modification will extend the useful life of the CRT. This applies to the following products manufactured at:

- Hoddesdon, United Kingdom
  2213's prior to serial number 203411 and 2215s prior to serial number 206198 shipped on or before February 25th 1983.

- Beaverton, Oregon, USA
  2213s prior to serial number B029390 and 2215s prior to serial number B031640 shipped on or before February 13 1983.

This modification consists of a slight change to the power supply transformer. A removal of 1/2 turn from the CRT heater winding reduces heater voltage and will prolong CRT life without compromising brightness or writing rate.

This adjustment should take no longer than 30 minutes. Before September 30th, 1983, we are asking our customers to have this modification made to their oscilloscopes in one of two ways:

1) Have the work done in-house by using the enclosed instructions. As long as a qualified service technician makes the change, your oscilloscope's current warranty will remain in effect.

2) Or, phone us at the nearest office. We will make arrangements to collect your oscilloscope and make the modification free of charge.

Tektronix U.K. Ltd.,
Harpenden (05827) 63141

Tektronix U.K. Ltd.,
Maidenhead (0628) 73211

Tektronix U.K. Ltd.,
Manchester 061-428-0799

Tektronix U.K. Ltd.
Livingston 32766/7

Tektronix U.K. Ltd.,
Dublin 850685

Your date of order and reference number are detailed below to assist you in tracing the unit. Also indicated is our acknowledgement number.

Tektronix has a firm commitment to you and to the quality of our products. Thank you for allowing us to follow through on this commitment.

Order: 5X/1282130
Tek Ack: Y300091

Date: 14.12.82
Date: 04.01.83

MODIFICATION TO CRT HEATER TRANSFORMER

For the following TEKTRONIX oscilloscopes

2213 prior to 203411 (UK manufacture)
prior to B029390 (USA manufacture)
2215 prior to 206198 (UK manufacture)
prior to B031640 (USA manufacture)

WARNING

Before proceeding, ensure the power switch is in the off position then disconnect the instrument from the power source.

CABINET REMOVAL

( ) 1. If the instrument has a detachable power cord, disconnect it from the instrument. Remove the screw from the right rear side of the cabinet and the two screws from the rear panel.

( ) 2. Remove the rear panel. (On instruments with non-detachable power cords, feed the cord through the cutout as the rear panel is removed.)

( ) 3. Slide the instrument forward out of the cabinet.

HIGH VOLTAGE SHIELD REMOVAL

( ) 4. Set the instrument on its left side (as viewed from the front panel) to gain access to the bottom side of the Main circuit board.

( ) 5. Remove the screw securing the plastic high voltage cover to the Main circuit board. Press down on rear of cover, slide away from chassis, and remove.

( ) 6. Remove the screw securing the high voltage shield to the Main circuit board (located below rear corner of cutout in right chassis side, adjacent to TP500).

( ) 7. Set instrument down and remove the two flathead screws securing the left rear of the high voltage shield to the rear of the chassis frame.

( ) 8. Remove the screw securing the front, upper right corner of the shield to the chassis.

( ) 9. Remove the screw from the front, upper left corner and rotate the plastic support bracket away from the high voltage shield.

( ) 10. If present, remove the panhead screw from the perforation in the front of the high voltage shield (second row of perforations, directly above CRT anode lead).

( ) 11. Remove screw securing the upper, right rear corner of the shield to the rear of the chassis.

( ) 12. Lift the shield up and out of the chassis frame by removing the right rear corner first.

PREREGULATOR CIRCUIT BOARD ASSEMBLY REMOVAL

NOTE:

2213 instruments, SN B020100 and up, and 2215 instruments, SN B022000 and up, have a Preregulator circuit board assembly mounted above T940. Also, any instrument with Option 48 installed has this circuit board. To facilitate access to T940, remove the Preregulator assembly from these instruments by performing steps 13 through 16.

( ) 13. Disconnect the following wires with quick disconnect terminals from the Preregulator circuit board:

( ) a. The grey-black-brown wire from P801.

( ) b. The grey-black-red wire from P802.

( ) c. The grey-black-orange wire from P803.

( ) d. The grey-black-yellow wire from P804.

( ) 14. Remove the two screws securing the Preregulator circuit board mounting brackets to the chassis (one at the upper rear of the frame and one on the right side, near the right rear corner).

( ) 15. Remove the screw securing the Preregulator circuit board to the aluminum heat sink bracket. Access to the screw is through the hole in the clear plastic shield near the front right corner of the board.

( ) 16. Lift the Preregulator circuit board assembly from the instrument.

TRANSFORMER MODIFICATION

( ) 17. Locate the lead of T940 labelled (3) in Fig. 1. Unsolder this lead from the Main circuit board, noting location for later reassembling.

( ) 18. Unhook wire (3) from small retaining clip in transformer bobbin and unwind one complete turn. Refer to Fig. 2.

( ) 19. Snap wire back into the retaining clip and pull tight.

( ) 20. Cut off 3 inches of lead. Trim 3/16 inch insulation off remaining lead. Take care not to nick or cut the wires.

( ) 21. Dress wire (3) back through the transformer core as indicated in Fig. 3.

( ) 22. Tin the stripped lead and resolder it to the Main circuit board pad, noted previously. The dress of the wire is not critical except it should not be pulled tight against the edge of the transformer core.

FIG 1

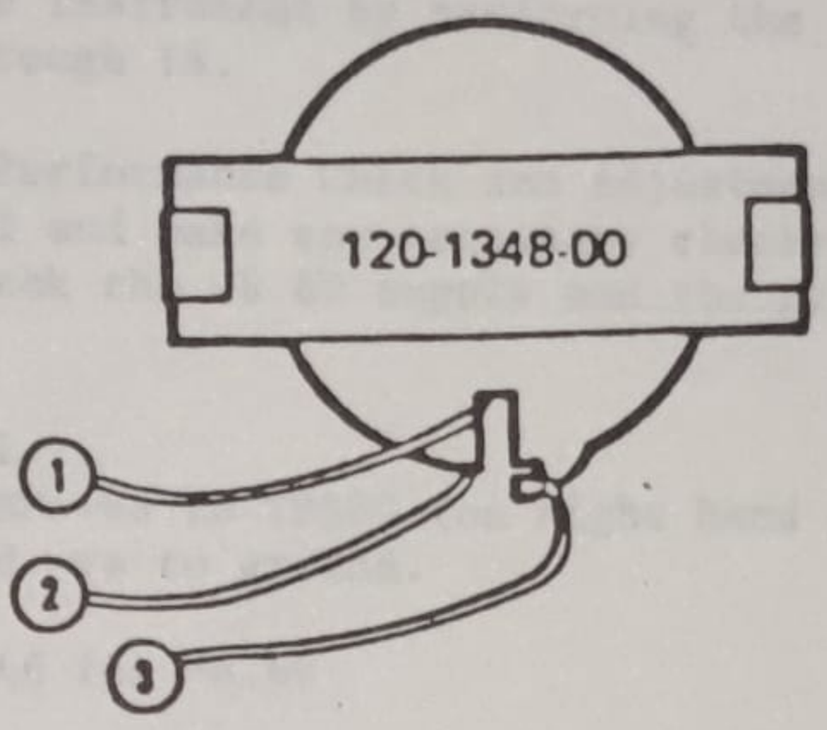


FIG 2

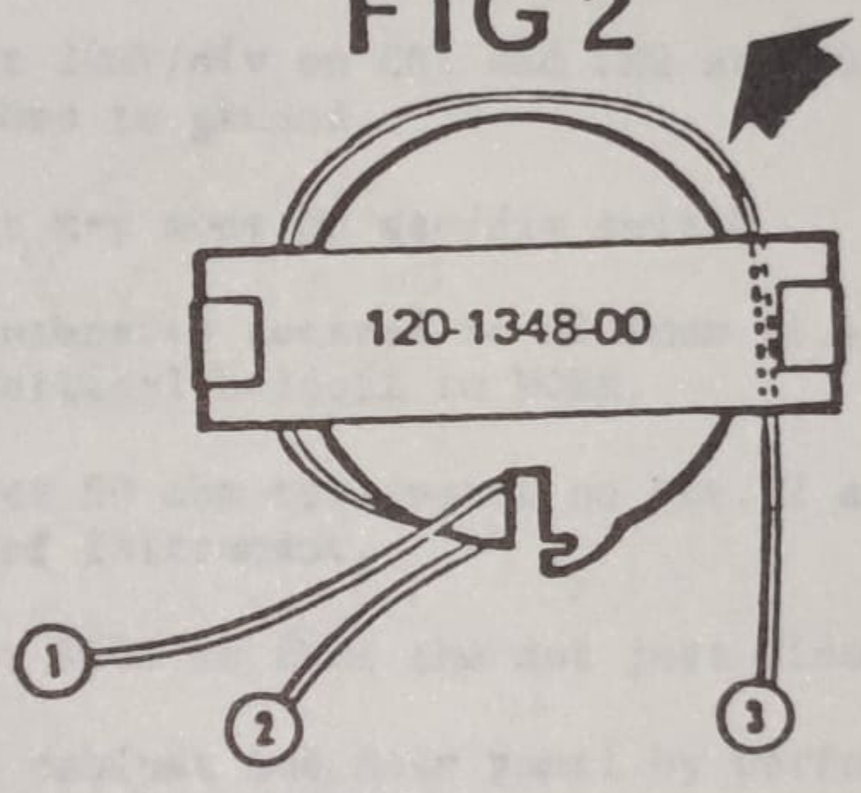
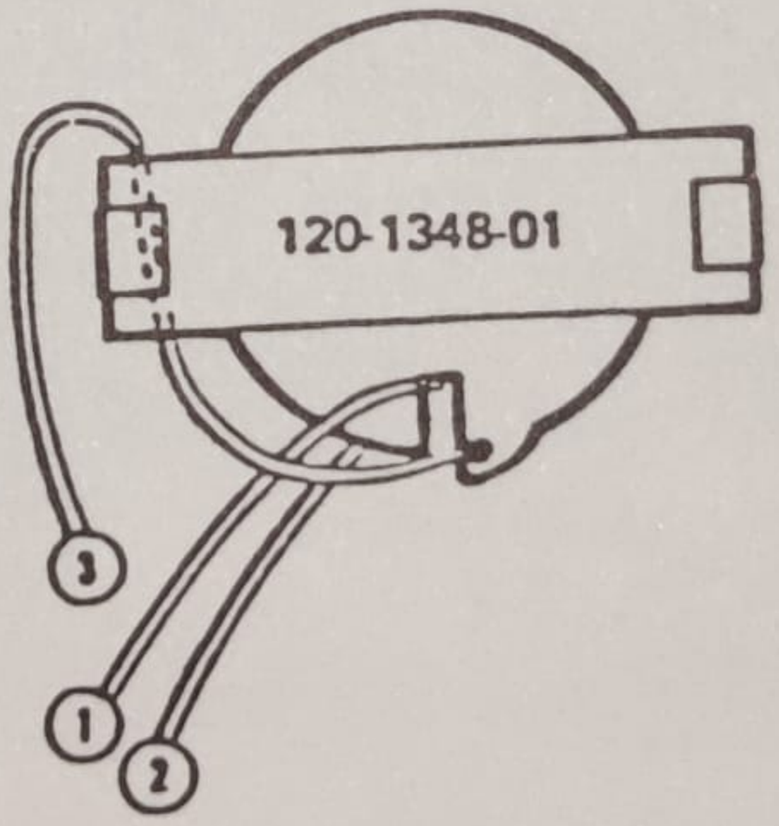


FIG 3



T940 Heater Voltage Winding Modification.

( ) 23. Change the part number on top of the transformer from 120-1348-00 to 120-1348-01.

PERFORMANCE CHECK AND REASSEMBLY

( ) 24. Reassemble the instrument by performing the reverse of the procedure in steps 4 through 16.

( ) 25. Refer to the Performance Check and Adjustment sections of your Service Manual and make any necessary checks and adjustments. Especially check the -8.6V supply and the grid bias adjustment, as below:

a) -8.6V RAIL

Connect DMM +ve to TP500 (on right hand side of alternate sweep board) and -ve to ground.

Adjust R946 for -8.6V

Specification (-8.56V to -8.64V).

b) GRID BIAS

a) Select 20mV/div on CH1 and CH2 attenuator and set coupling switches to ground.

b) Select x-y mode on sec/div switch.

c) Set intensity control to minimum (i.e. full anti-clockwise) and vertical holdoff to NORM.

d) Connect 50 ohm terminator on Ext. Z axis input socket at the rear of instrument.

e) Adjust R860 so that the dot just disappears.

( ) 26. Reinstall the cabinet and rear panel by performing the reverse of the procedure in steps 1 through 3.