050-1732-01

M48976, M49839

P31 CATHODE RAY TUBE REPLACEMENT

For the following TEKTRONIX® Oscilloscopes:

7704A Serial Numbers B010100 - B221299
R7903 Serial Numbers B010100 - B192158
7904 Serial Numbers B010100 - B282978

The included P31 phosphor cathode ray tube (CRT) replaces CRTs, pn 154-0644-00 or pn 154-0644-05. The value of the series resistor in the CRT heater circuit is increased to lower the CRT heater voltage and extend the life of the CRT.

NOTE

If the serial number of your instrument is greater than those listed above or if this kit has been installed previously, disregard the instructions and use the included CRT, pn 154-0644-05, as a direct replacement for V5050 (7704A) or V1725 (R7903 and 7904).

3-29-83
Supersedes 050-1732-00

PARTS INCLUDED IN PARTS REPLACEMENT KIT:

Ckt. No.	Quantity	Part Number	Description
*	1 ea	154-0644-05	Electron tube, CRT, P31, int scale, T7900-31-2
R4219	1 ea	315-0100-00	Resistor, cmpsn, 10Ω, 5%, 0.25W
R1887	1 ea	315-0160-00	Resistor, cmpsn, 16Ω, 5%, 0.25W
	1 ea		Label, 050-kit

* V5050 in 7704A; V1725 in R7903 and 7904.

INSTRUCTIONS:

WARNING

Before proceeding, position the POWER switch to off, then disconnect the instrument from the power source.

Use care when handling a CRT. Protective clothing and safety glasses should be worn. Avoid striking the CRT on any object which might cause it to crack or implode. When storing a CRT, place it in a protective carton or set it face down in a protected location on a smooth surface with a soft mat under the faceplate to protect it from scratches.

( ) 1. Remove the upper left and right cabinet sides or top cover (R7903). If installing the CRT in an R7903, also remove the vertical access cover on the left side of the instrument.

( ) 2. Remove the plastic CRT mask, light filter, and metal light shield.

( ) 3. Remove the four screws securing the CRT retainer (bezel) to the front panel.

( ) 4. Pull the bezel out far enough to disconnect the multipin connector (camera power) from the left side of the bezel. Remove the bezel and clear implosion shield.

( ) 5. Remove the black CRT mask from around the CRT faceplate.

( ) 6. Release the CRT anode lead from the plastic cable clamp(s) near the top center of the instrument.

WARNING

The CRT may retain a dangerous electrical charge. Before removing the CRT, the anode must be fully discharged by shorting the anode lead from the CRT to the chassis. Wait approximately ten minutes and again short the anode lead to the chassis. After CRT removal, short the anode lead to the silvered patch on the funnel portion of the CRT just prior to further handling.

( ) 7. Disconnect the anode plug from the jack on the high voltage compartment. Ground the plug to the chassis to dissipate any stored charge.

( ) 8. Disconnect the deflection plate connectors (6) from the CRT neck pins. Be careful not be bend these pins. On R7903 instruments, it is necessary to remove the hardware securing the Horizontal Amplifier circuit board so it may be lifted to gain access to the horizontal neck pin connectors.

( ) 9. Remove the CRT base socket from the rear of the CRT.

( ) 10. Loosen the two screws located on each side of the CRT socket until the tension of the springs on these screws is released. Then, press in on the screws to be sure that the CRT clamp is loose.

( ) 11. Hold one hand on the CRT faceplate and push forward on the CRT base with the other. As the CRT starts out of the shield, grasp it firmly. Guide the anode lead through the cutout in the CRT shield as the CRT is removed.

( ) 12. Install the new CRT, provided in the kit, into the shield. Guide the anode lead through the hole in the CRT shield.

( ) 13. Set the CRT firmly against the cushions mounted on each corner of the frame panel.

( ) 14. Clean the CRT faceplate, plastic implosion shield, and light filter with denatured alcohol.

( ) 15. Install the black CRT mask over the CRT faceplate.

( ) 16. Reconnect the multipin connector to the CRT bezel, aligning the indicator arrow on the connector with the arrow on the bezel.

( ) 17. Position the implosion shield in the bezel and install the bezel using the four screws removed previously.

( ) 18. Push forward on the CRT base to be certain that the CRT is as far forward as possible. Tighten the two screws beside the CRT base socket until the springs on the screws are fully compressed.

( ) 19. Connect the base socket to the CRT.

( ) 20. Secure the CRT anode lead with the plastic cable clamp and connect the CRT anode plug to the jack on the high voltage compartment.

( ) 21. Carefully reconnect the deflection plate connectors. On R7903 instruments, secure the Horizontal Amplifier circuit board with the hardware removed previously.

( ) 22. Install the metal light shield, light filter, and CRT mask in the CRT bezel.

( ) 23. **R7903 AND 7904 ONLY.** Make the following change on the Z-axis circuit board:

( ) a. Remove the two screws securing the circuit board shield to the Z-axis circuit board and remove the shield. In R7903 instruments, slide the shield up the high voltage cable, then disconnect P1704 (yellow multi-pin connector) from the circuit board.

( ) b. Replace R1887, a 10Ω resistor, with the 16Ω resistor provided in the kit. R1887 is adjacent to pin 9 of P1704.

( ) c. Reconnect P1704, if disconnected, then reinstall the circuit board shield.

( ) 24. **7704A ONLY.** Make the following change on the High Voltage circuit board:

( ) a. Remove the screws securing the High Voltage circuit board cover and remove the cover.

( ) b. Replace R4219, a 5.1Ω resistor, with the 10Ω resistor provided in the kit. R4219 is located near the center upper edge of the High Voltage circuit board and is connected to pad 13 (6.3 VAC CRT heater voltage).

( ) c. Reinstall the High Voltage circuit board cover using the screws removed previously.

( ) 25. Refer to the Calibration Section (4) of your Service Manual and make any necessary checks and adjustments.

( ) 26. Install the cabinet sides or top cover and vertical access cover removed previously.

( ) 27. Remove the protective backing from the 050-kit label, provided in the kit, and apply it to a clean, dry area on the rear panel. The label indicates that this kit has been installed.

( ) 28. For future reference, use the information contained in the kit parts list on page 2 of these instructions to update the Replaceable Electrical Parts list in your Service Manual.

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