

Instructions



050-3543-05 and Above

TDS5000 Series

Microprocessor and Motherboard Replacement Kit

075-0770-04

Warning

The servicing instructions are for use by qualified personnel only. To avoid personal injury, do not perform any servicing unless you are qualified to do so. Refer to all safety summaries prior to performing service.

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Service Safety Summary

Only qualified personnel should perform service procedures. Read this *Service Safety Summary* and the *General Safety Summary* in the product service manual or the instruction manual.

Do Not Service Alone. Do not perform internal service or adjustments of this product unless another person capable of rendering first aid and resuscitation is present.

Disconnect Power. To avoid electric shock, switch off the instrument power, then disconnect the power cord from the mains power.

Use Care When Servicing With Power On. Dangerous voltages or currents may exist in this product. Disconnect power and disconnect test leads before removing protective panels, soldering, or replacing components.

To avoid electric shock, do not touch exposed connections.

Kit Description

This kit contains instructions and parts to replace the microprocessor and motherboard in your TDS5000 Series oscilloscope. The new motherboard is not a direct replacement and requires a new rear chassis. Also, you will need install software to change the operating system of the instrument from Windows ME to Windows 2000. This kit includes a new rear chassis and software that is compatible with the new motherboard.

This document supports Tektronix corporate modifications: BV202, BV450, BV493, BV706, 201, 833, 974, and 30179

Products

TDS5000 Series B029999 and below
TDS5052 B030000 to B030038

Kit Parts List

Figure 1 on page 4	Quantity	Part number	Description
1-1	1 ea	119-6612-XX	Microprocessor: 1.2 GHz Celeron
1-2	1 ea	065-0690-XX	Computer board: Processor, for a Pentium III
1-3	1 ea	650-4511-XX	Chassis: Rear with serial number label
1-4	6 ea	211-1164-XX	Screw, mach: 6-32 x 0.25, T-15, black oxide
1-5	1 ea	075-0770-04	Kit Instructions: TDS5000 Series Microprocessor and Motherboard Replacement
1-6	1 ea	063-3509-50	Software, product: TDS5000
1-6	1 ea	063-3508-07	Software, operating system: restore CD, Windows 2000, with license agreement

NS - Not Saleable

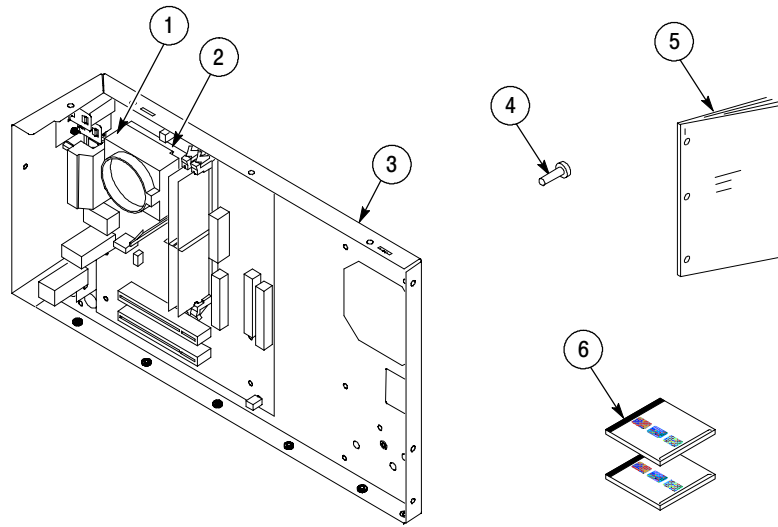


Figure 1: Microprocessor and motherboard replacement kit parts

Installation Instructions

This section contains all procedures needed to install your new motherboard, processor, rear chassis and software into your TDS5000 Series instruments.

These instructions are for personnel who are familiar with servicing the product. If you need further details for disassembling or reassembling the product, refer to the appropriate product manual. Contact your nearest Tektronix Service Center or Tektronix Factory Service for installation assistance.

NOTE. Verify that the serial number on your oscilloscope matches the serial number on the new rear panel assembly provided in this kit. If not notify your Tektronix service center.

Minimum Tool and Equipment List

The following tools are required to perform this upgrade. All tools are standard tools that are readily available.

Table 1: Tools required for module removal

Item no.	Name	Description	General tool number
1	Screwdriver handle	Accepts Torx-driver bits	620-440
2	T-15 Torx tip	Used for removing most oscilloscope screws. Torx-driver bit for T-15 size screw heads	640-247
3	1/8 inch flat-bladed screwdriver	Screwdriver for unlocking cable connectors	Standard tool
4	9/32 inch nut driver	Used to remove the rear panel nut posts	Standard tool

Preparation



WARNING. Before doing this or any other procedure in this manual, read the Safety Summary found at the beginning of this manual. Also, to prevent possible injury to service personnel.



WARNING. Before doing any procedure in this subsection, disconnect the power cord from the line voltage source. Failure to do so could cause serious injury or death.



CAUTION. To avoid data loss, back up any important user files stored on the hard disk. This operating system restoration process reformats the hard disk, which erases any user-installed files and applications.

NOTE. Read Equipment Required for a list of the tools needed to remove and install modules in this oscilloscope. See Table 1, page 5.
Read the cleaning procedure before disassembling the oscilloscope for cleaning.

NOTE. Discard all Intel software that comes with the 1.2 GHz Celeron microprocessor. Only install the Tektronix operating and product software included in this kit.

Equipment Required. Most modules in the TDS5000 Series Oscilloscope can be removed with a screwdriver handle mounted with a size T-15, Torx screwdriver tip. Use this tool whenever a procedure step instructs you to remove or install a screw unless a different size screwdriver is specified in that step. All equipment required to remove and reinstall each module is listed in the first step of its procedure.

Procedures for External Modules

The following procedures are found here and are listed in order presented.

- Line cord
- Trim (all)
- Bottom cover
- Left and right covers

Line Fuse and Line Cord

1. *Orient the oscilloscope:* Set the oscilloscope on the work surface with the rear of the oscilloscope facing you.
2. *Remove the line cord:* Pull the line cord away from the AC power connector.

Trim and Carrying Handle

3. *Remove feet and the top cover:* Use Figure 4, on page 9 as a guide.
 - a. Remove the feet from the top rear of the oscilloscope by removing the two T-15 Torxdrive screws.
 - b. Open the accessory tray door or printer door and pull the door straight up to remove it from the hinge.
 - c. Remove the accessory tray or internal printer (two T-15 TORX-drive screws). See Figure 2, on page 8.
 - d. If the internal printer is installed, disconnect the cable from the printer. See Figure 3, on page 8.
 - e. Slide the top cover towards the rear of the oscilloscope allowing the tabs to clear the cover openings, then pull out to remove the cover from the oscilloscope.
4. *Remove the right side panel:* Use Figure 4, on page 9 as a guide. Remove the CD Drive trim by inserting a flat blade screwdriver in the bottom slot of the CD trim and gently prying the trim piece out of the side panel. Pull the trim up and out from the oscilloscope.
5. *Remove the carrying handle and the left side panel:* Use Figure 4, on page 9 as a guide. Remove the two T-15 TORX-drive screws that secure the handle to the oscilloscope. Remove the handle from the oscilloscope.
6. *Orient the instrument:* Set the instrument on the work surface with the bottom of the oscilloscope facing the installer.
7. Remove all nine T-15 TORX-drive screws that secure the left, right, and bottom trim panels. Remove all panels from the instrument.

8. *Remove the VGA panel:* Remove the VGA panel trim by gently pulling the trim up and out from the oscilloscope. Refer to Figure 4, on page 9 as a guide.

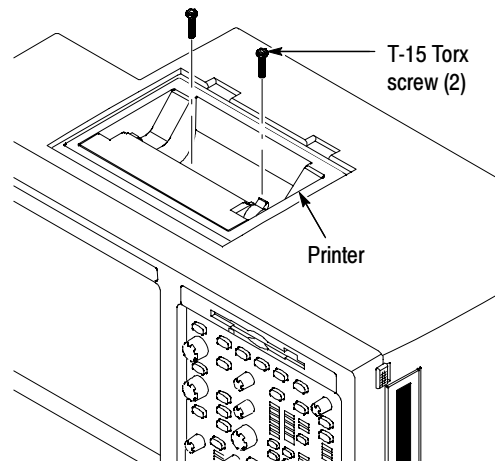


Figure 2: Printer screw mounting

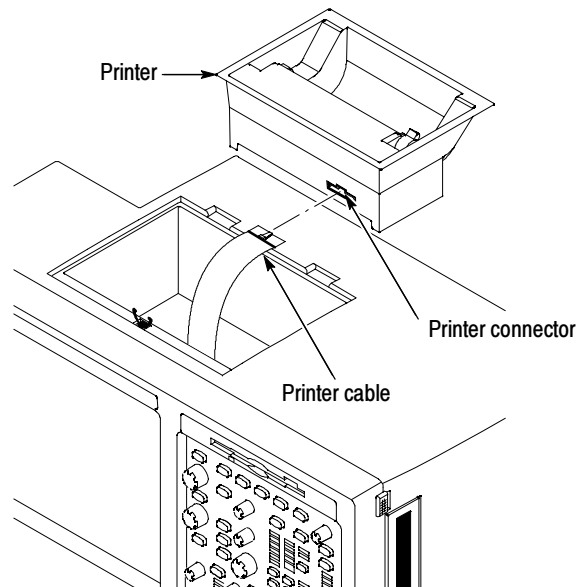


Figure 3: Printer cable connection

9. *Remove the front panel and acquisition trim:*
 - a. Remove the three T-15 TORX-drive screws that secure the front panel trim to the oscilloscope.

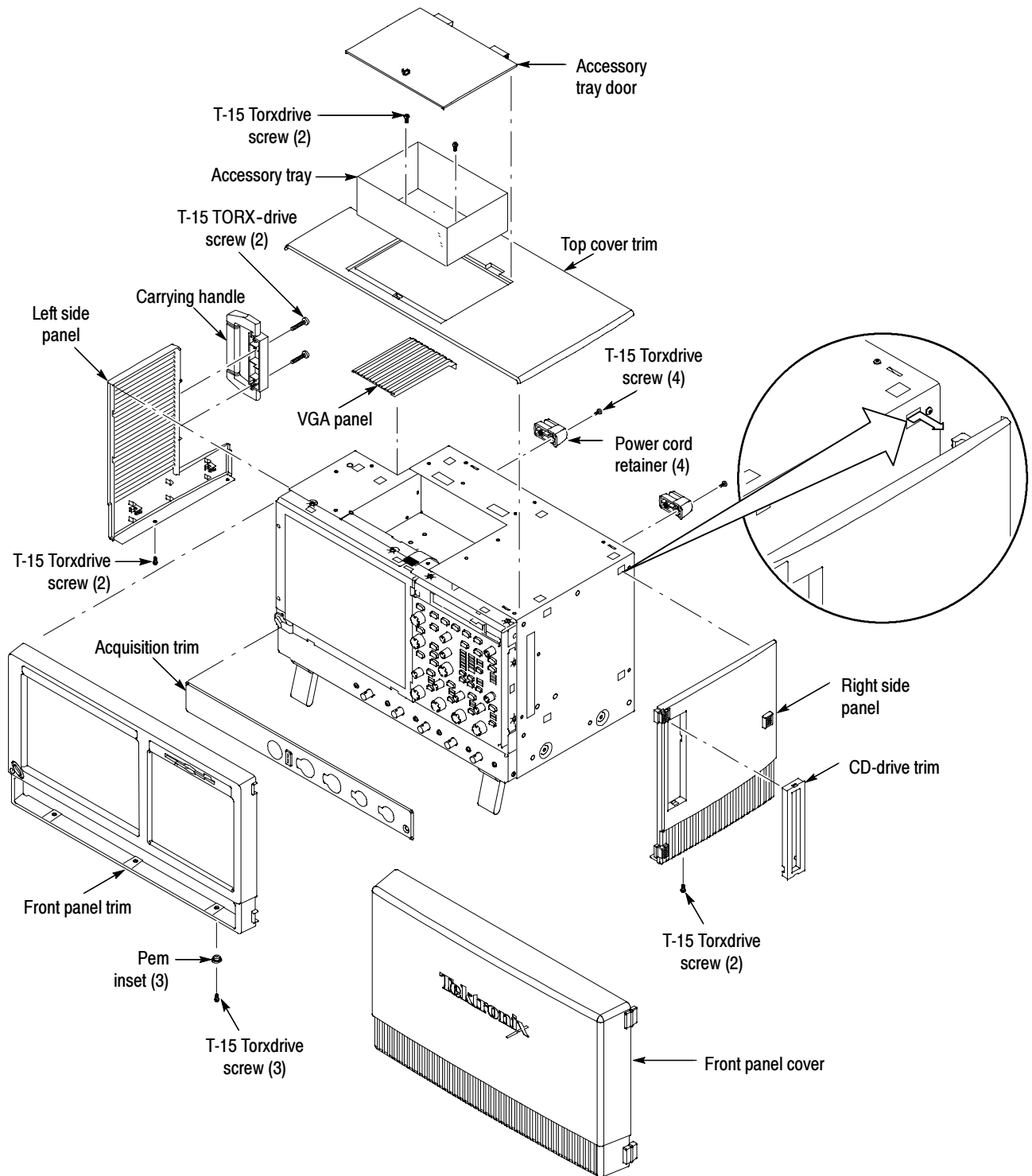


Figure 4: Trim removal

Bottom Covers

1. Remove the seven T-15 Torxdrive screws that secure the bottom metal cover to the oscilloscope. Discard two of the four T-15 Torxdrive screws.



CAUTION. Discard five of the T-15 Torxdrive screws. These screws will be replaced with five shorter (black oxide) screws that are provided in this kit. The five screws are located on the rear edge of the bottom cosmetic and metal covers. The new shorter screws will prevent damage to the new CPU assembly. See Figure 5, on page 10.

2. Remove the bottom cover from the oscilloscope.

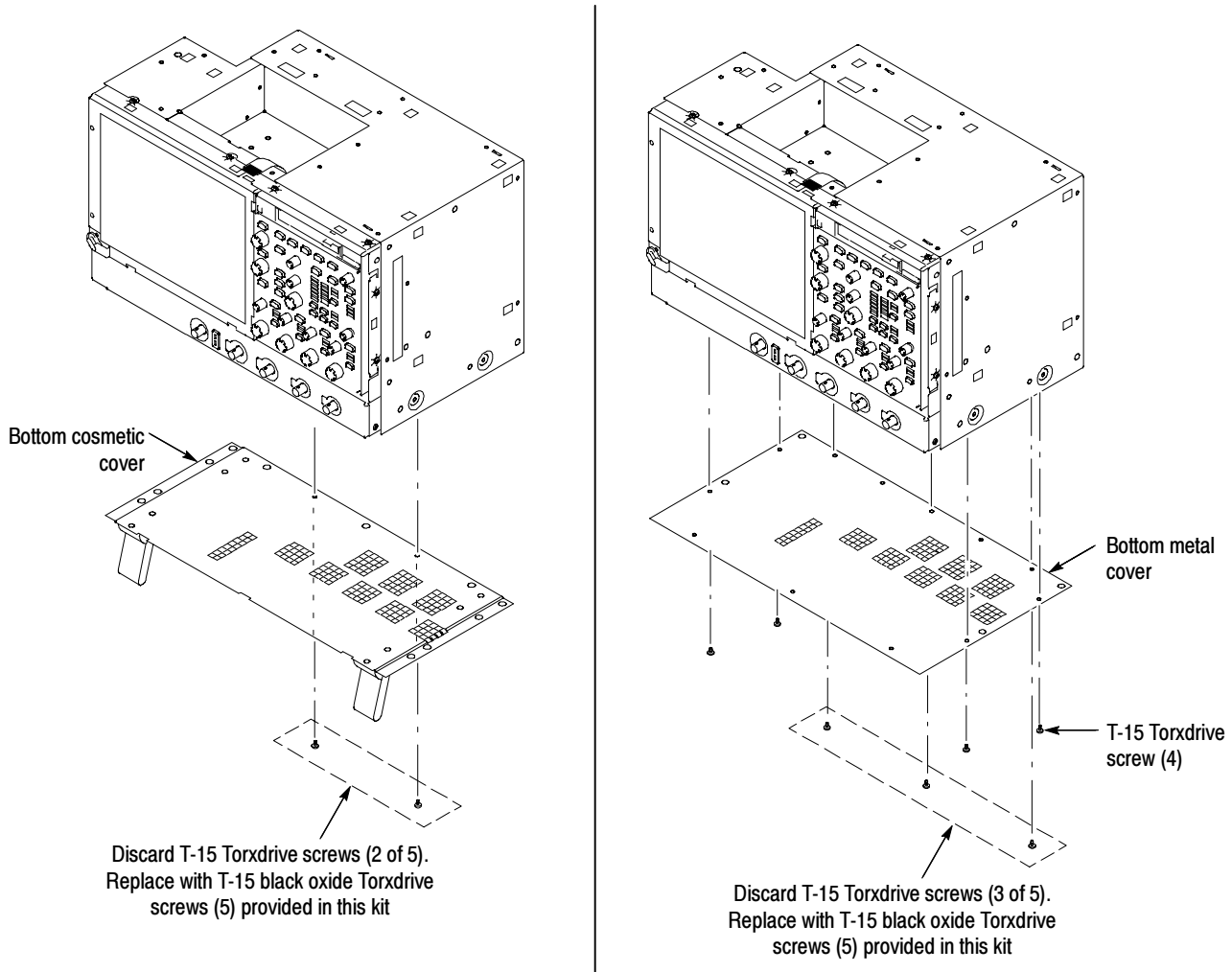


Figure 5: Metal and cosmetic cover removal/install

Right-Side Cover

1. *Remove the top right-side metal cover:* See Figure 6.
2. *Orient the oscilloscope:* Set the oscilloscope on the work surface with the front of the oscilloscope facing you.

NOTE. All mounting screw holes are indicated by a star etched around the mounting hole.

3. Remove the fifteen T-15 Torxdrive screws that secure the top right-side cover to the top and right sides of the chassis. Discard one screw, it will be replaced with a new T-15 shorter screw when reassembled. See Figure 6.
4. Remove the right-side cover.



CAUTION. Take care not to bind or snag the cover on the oscilloscope internal cabling as you remove or install.

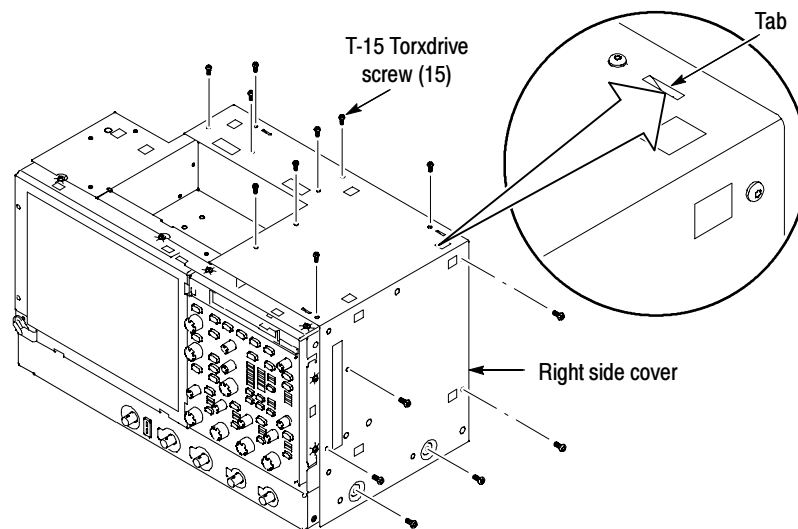


Figure 6: Right-side cover removal

NOTE. Discard one of the T-15 Torxdrive screws and replace with the new shorter (black oxide) screw provided in this kit. See figure 7 for the location of the screw.

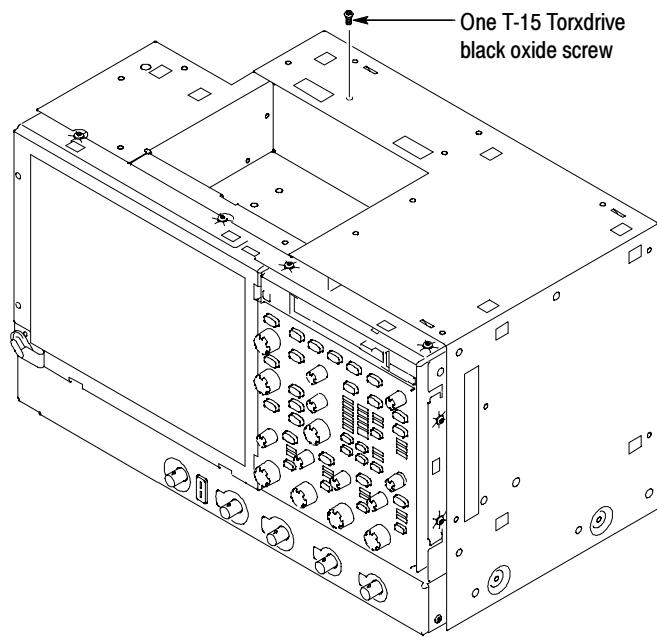


Figure 7: Replacing the T-15 Torxdrive screw to the right-side cover

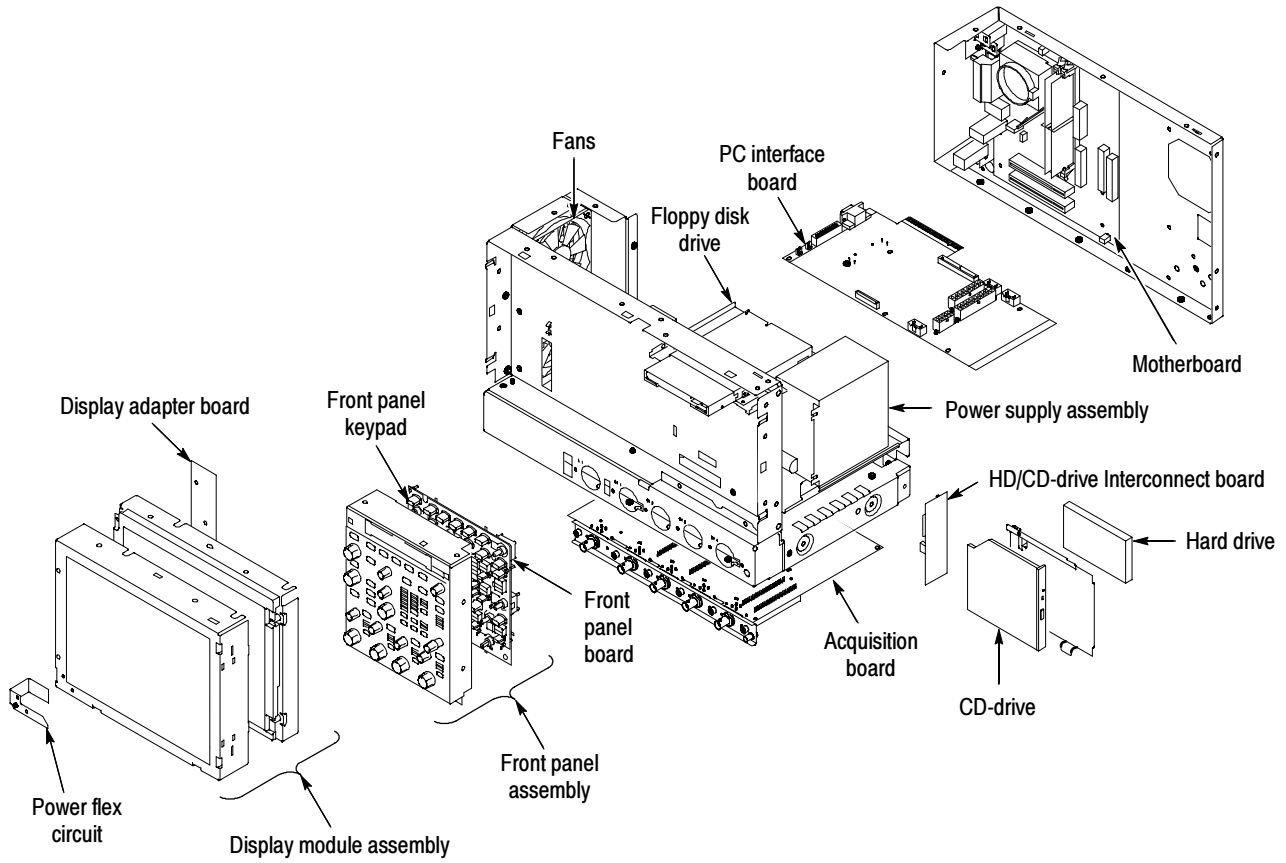


Figure 8: Internal modules

Remove CPU/Motherboard assembly from the Instrument

Locate module to be removed: Locate the CPU/Motherboard assembly in the locator diagram *Internal Modules*, Figure 8, on page 13. Additional modules to be removed:

1. *Orient the oscilloscope:* Set the oscilloscope down on the work surface with its rear panel facing you.
2. *Remove the Motherboard assembly:* See Figure 11, on page 18.
 - a. Remove the four T-15 Torx screws that secure the four ATX Power Supply retainers to the rear chassis. Remove and save the power cord retainers for later reassembly on the new CPU assembly.
 - b. Remove the twelve T-15 Torx screws that secure the motherboard assembly to the side of the chassis.

NOTE. *The new chassis, provided in this kit, will include all important labels such as the instrument's serial number, option label and safety data.*

- c. Remove the two jack screws that secure the GPIB connector to the rear chassis using the $\frac{9}{32}$ inch nut driver.
- d. Disconnect all the cables from the motherboard assembly.

NOTE. *Depending on the revision level of the board assembly, the quantity of the cables may range from five to seven cables.)*

NOTE. *Note cable and connector locations for later reassembly. J8F1, J9H3, J6B3, J4H1, and J6H2 connector locations have changed on the new CPU assembly, see Figure 9, on page 15 and Figure 10, on page 16.*

- e. Carefully lift the assembly out of the instrument.
3. Remove the memory stick(s) from the old board to install into the new CPU assembly. See Figure 12, on page 19.
4. Remove the six hex screws from the I/O ports. Use these screws to reattach the I/O ports to the new chassis.
5. Discard the old CPU assembly.
6. Install the processor and saved memory stick(s) on the new CPU assembly board.
7. Install the motherboard to the rear panel. Use the six T-25 Torxdrive screws from the old CPU assembly.

8. Install the new CPU assembly provided in this kit. Perform the procedures in this section in reverse order, steps 2a through 2d, on page 14.
 - a. J8F1 and J9H3 connector locations on the new motherboard. See Figure 9.

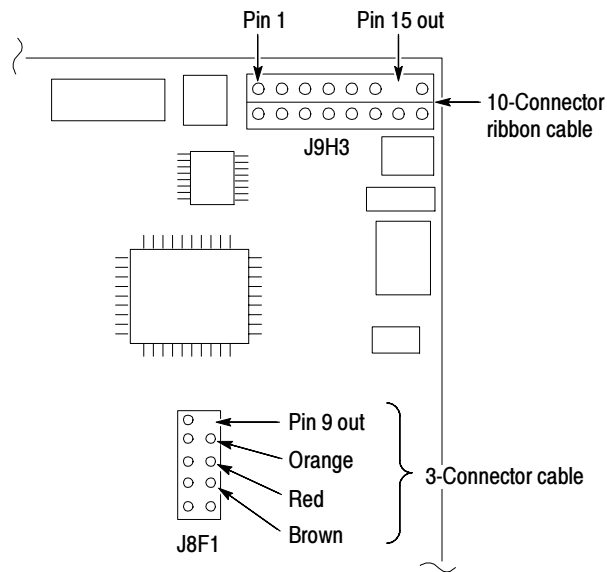


Figure 9: J8F1 and J9H3 connector locations on the motherboard

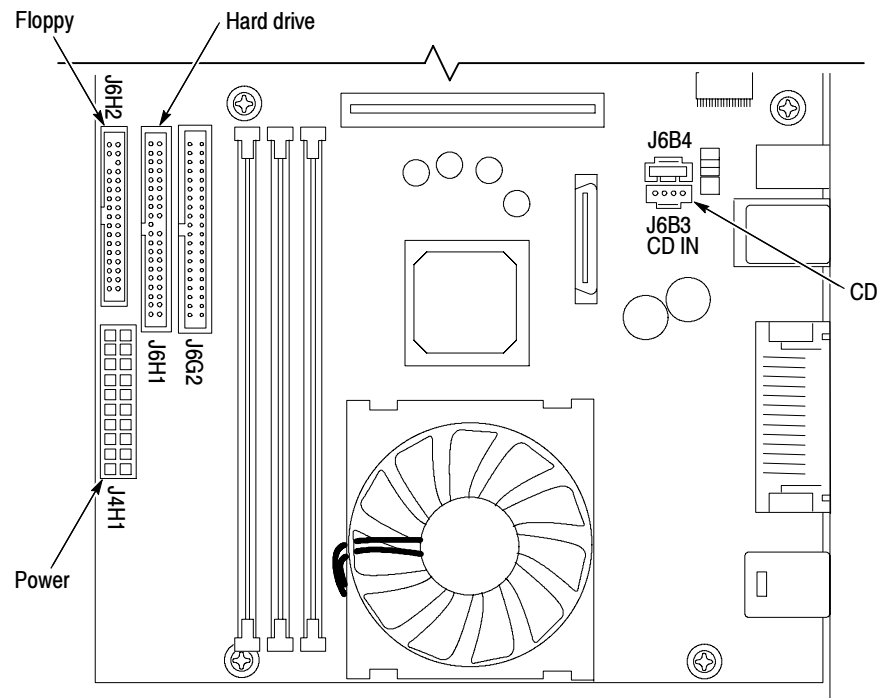


Figure 10: J6B3, J4H1, J6H2, and J4H1 connector locations on the motherboard

- b. Reinstall the power cord retainers with the T-15 Torxdrive screws removed from the old CPU assembly.
 - c. Reinstall the printer tray removed earlier. Reuse the T-15 Torxdrive screws removed earlier.
9. *Reinstallation:* Perform the following procedures to reassemble your instrument.
 - a. Reinstall the right-side cover, perform the procedures in reverse order, steps 2 and 3, on page 11. See Figures 6 and 7, on pages 11 and 12 for screw locations.

NOTE. Install the new shorter (black oxide) screw provided in this kit. See figure 7, on page 12, for the location of the screw.

- b. Reinstall the bottom covers. Perform the procedures in reverse order, steps 1 and 2, on page 10. See Figure 5, on page 10, for screw locations.



CAUTION. *Install the new shorter (black oxide) screws that are provided in this kit. See Figure 5, on page 10. The new shorter screws will prevent damage to the new CPU assembly.*

- c. J6B3, J4H1, J6H2, and J4H1 connector locations on the motherboard. See Figure 10, on page 16.
- d. Reinstall the appropriate trim and carrying handle. Perform the procedures in reverse order steps 4 through 9, on pages 7 through 8. See Figure 4, on page 9, for trim locations.
- e. Reconnect the power cord to the instrument.

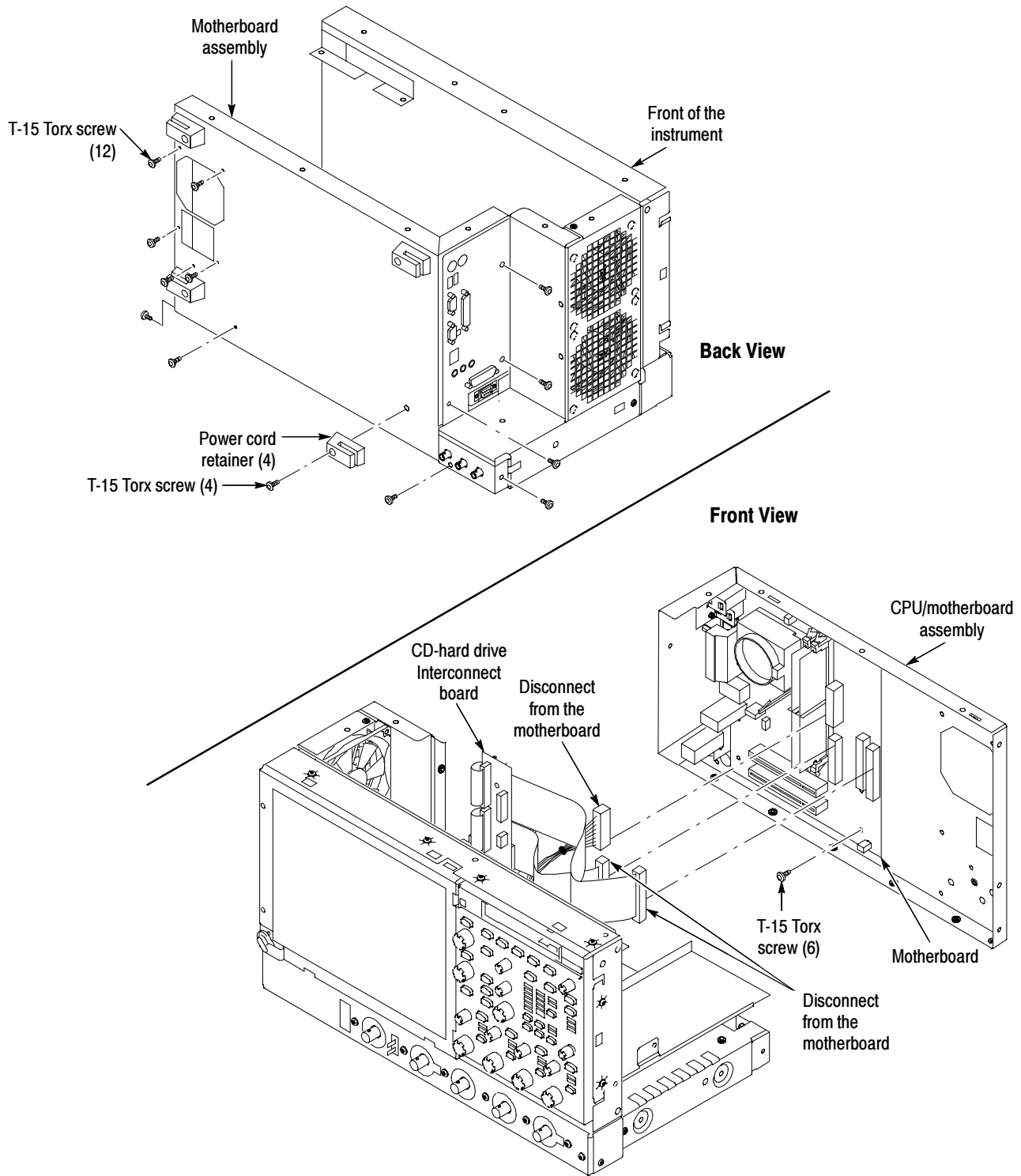


Figure 11: CPU/motherboard removal

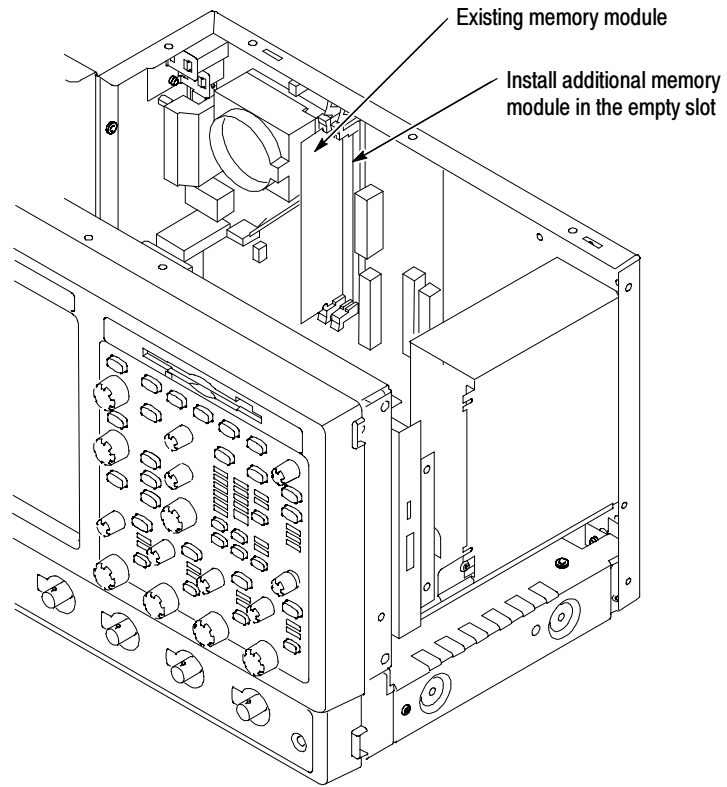


Figure 12: Memory from your old CPU

Install the Product and Operating System Software

After you install the microprocessor/motherboard assembly, you need to install the software provided on the *TDS5000 Windows 2000 Operating System Restore*, the TDS5000 Series Product Software, and the *Optional Applications Software on Windows Based Oscilloscopes CDs*.

Use the following procedure to install the software:

1. Power on the instrument, and press F2 during boot up. After a short time, the BIOS Setup Utility appears.
2. Update the BIOS as follows:
 - a. Select the Advanced tab (use the arrow keys on your keyboard).
 - b. Select Video Configuration from the displayed list, and press Enter.
 - c. Select Primary Video Adapter, and press enter.
 - d. Select PCI, and press Enter.
 - e. Press F10.
 - f. Select OK, and press Enter.
 - g. Wait for the instrument boot-up process to complete.
3. Install the Windows 2000 Operating System Restore CD. Follow the instructions provided with the CD.
4. Install the TDS5000 Series Product software CD. Follow the instructions provided with the Product software CD.
5. Install the *Optional Applications Software on Windows Based Oscilloscopes* CD that shipped with your instrument. Follow the instructions provided with the CD.

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