Instructions

Tektronix

050-3591-00 or above
PC Interface Circuit Board Replacement Kit
TDS5000B Series

075-0834-00

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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General Safety Summary

Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it.

To avoid potential hazards, use this product only as specified.

Only qualified personnel should perform service procedures.

While using this product, you may need to access other parts of the system. Read the *General Safety Summary* in other system manuals for warnings and cautions related to operating the system.

To Avoid Fire or Personal Injury

Use Proper Power Cord. Use only the power cord specified for this product and certified for the country of use.

Connect and Disconnect Properly. Do not connect or disconnect probes or test leads while they are connected to a voltage source.

Ground the Product. This product is grounded through the grounding conductor of the power cord. To avoid electric shock, the grounding conductor must be connected to earth ground. Before making connections to the input or output terminals of the product, ensure that the product is properly grounded.

Observe All Terminal Ratings. To avoid fire or shock hazard, observe all ratings and markings on the product. Consult the product manual for further ratings information before making connections to the product.

Powering Off. The power cord provides Mains disconnect.

Do Not Operate Without Covers. Do not operate this product with covers or panels removed.

Avoid Exposed Circuitry. Do not touch exposed connections and components when power is present.

Do Not Operate With Suspected Failures. If you suspect there is damage to this product, have it inspected by qualified service personnel.

Do Not Operate in Wet/Damp Conditions.

Do Not Operate in an Explosive Atmosphere.

Keep Product Surfaces Clean and Dry.

Provide Proper Ventilation. Refer to the manual's installation instructions for details on installing the product so it has proper ventilation.

Symbols and Terms

Terms in this Manual. These terms may appear in this manual:

⚠ *WARNING. Warning statements identify conditions or practices that could result in injury or loss of life.*

⚠ *CAUTION. Caution statements identify conditions or practices that could result in damage to this product or other property.*

Terms on the Product. These terms may appear on the product:

DANGER indicates an injury hazard immediately accessible as you read the marking.

WARNING indicates an injury hazard not immediately accessible as you read the marking.

CAUTION indicates a hazard to property including the product.

Symbols on the Product. The following symbols may appear on the product:

CAUTION Refer to Manual	WARNING High Voltage	Protective Ground (Earth) Terminal	Standby	Chassis Ground

Service Safety Summary

Only qualified personnel should perform service procedures. Read this *Service Safety Summary* and the *General Safety Summary* before performing any service procedures.

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, remove battery (if applicable), and disconnect test leads before removing protective panels, soldering, or replacing components.

To avoid electric shock, do not touch exposed connections.

PC Interface Circuit Board Replacement Kit

Kit Description

This kit provides the parts and instructions to replace the PC Interface circuit board in a TDS5000B instrument. The new PC Interface circuit board requires a new cable (provided in this kit) that connects the PC Interface board to the Mother board. It also requires the correct operating system restore software (provided in this kit).

This document supports Tektronix modification: ECO 1403

Products

TDS5000B   B010100 to B019999

Kit Parts List

Quantity	Part number	Description
1 ea	671-5883-00	Circuit bd assy: PC Interface, wired
1 ea	174-4865-00	Cable assy: 4 Pin, P4, (PC Interface board to Mother board)
1 ea	075-0834-XX	Kit Instructions: PC Interface Circuit Board Replacement (050-3591-00)
1 ea	063-3693-01	TDS5000B Series Operating System Restore CD for INTEL AshlandII Motherboard,V2.0.5

PC Interface Circuit Board Replacement Kit

Installation Instructions

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, Inc., Service Center or Tektronix Factory Service for installation assistance.

⚠ *CAUTION. To avoid data loss, back up any important user files stored on the hard disk to another media before continuing these instructions. The operating system restoration process reformats the hard disk, which erases any user-installed files and applications.*

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

Name	Description
Screwdriver handle	Accepts Torx®-driver bits
T-15 Torx tip	Used for removing most oscilloscope screws. Torx®-driver bit for T-15 size screw heads
T-20 Torx tip	Used for removing carrying handle. Torx®-driver bit for T-20 size screw heads
$^1/_8$ inch flat-bladed screwdriver	Screwdriver for unlocking cable connectors
$^9/_{32}$ inch nut driver	Used to remove the GPIB nut posts
$^3/_{16}$ inch nut driver	Used to remove the VGA connector nut posts

⚠ *CAUTION. To prevent static discharge damage, service the product only in a static-free environment. Observe standard handling precautions for static-sensitive devices while installing this kit. Always wear a grounded wrist strap, grounded foot strap, and static resistant apparel while installing this kit.*

Remove

Figure 1 shows the location of cables and cable connectors for the PC Interface board and the Mother board. Pay close attention to this diagram and the cable connections when you disassemble and reassemble the instrument.
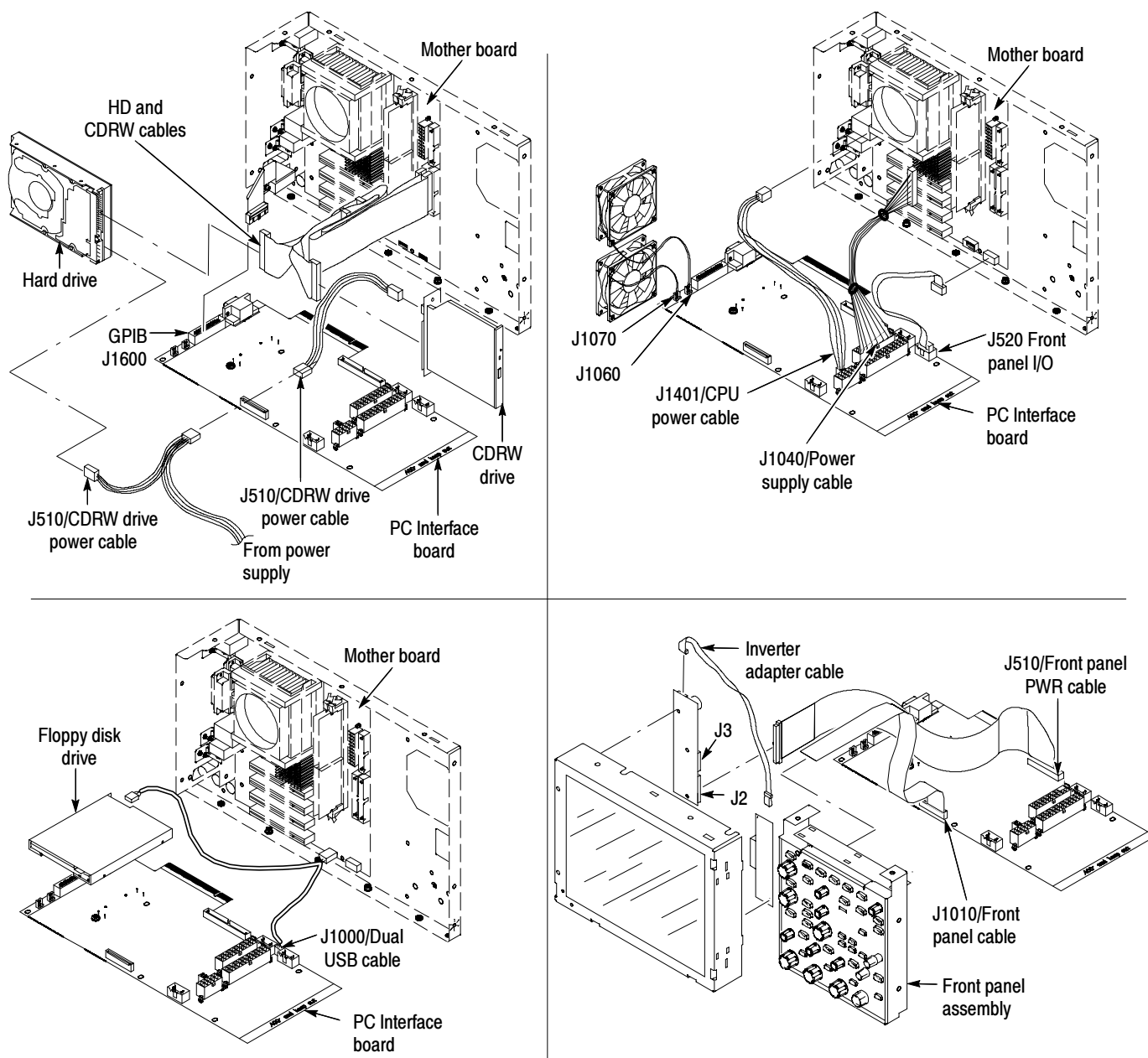

Figure 1: PC Interface board and Mother board cable connections

⚠️ **WARNING.** *Before doing any of the following procedures, disconnect the power cord from the line voltage source. Failure to do so could cause serious injury or death.*

To access the PC Interface board complete the following procedures in the order presented:

- Line cord

- Trim and carrying handle

- Bottom covers

- Right-side cover

- Floppy disk drive assembly

- Hard drive assembly

- CDRW drive assembly

- Power supply

- Mother board assembly

Line Cord   Disconnect the line cord from the AC power connector on the oscilloscope.

Trim and Carrying Handle   1. Locate the trim in the locator diagram. See Figure 4, page 12.

2. *Remove the right side panel:* Use Figure 4, page 12 as a guide.

   a. 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.

   b. Remove the two T-15 Torxdrive screws that secure the right side panel to the bottom of the instrument. Slide the right side panel towards the rear of the oscilloscope allowing the tabs to clear the cover openings, then pull out to remove the panel from the oscilloscope.

3. *Remove the carrying handle and the left side panel:* Use Figure 4, page 12 as a guide.

   a. Remove the two T-20 Torxdrive screws that secure the handle to the oscilloscope. Remove the handle from the oscilloscope.

   b. Remove the two T-15 Torxdrive screws that secure the left side panel to the bottom of the instrument. Slide the left side panel towards the rear of

the oscilloscope allowing the tabs to clear the cover openings, then pull out to remove the panel from the oscilloscope.

4. *Remove the VGA panel:* Remove the VGA panel by gently pulling the trim up and out from the oscilloscope. Refer to Figure 4, page 12 as a guide.

5. *Remove the top cover:* Use Figure 4, page 12 as a guide.

   a. Remove the accessory tray door or printer door and pull the door straight up to remove it from the hinge.

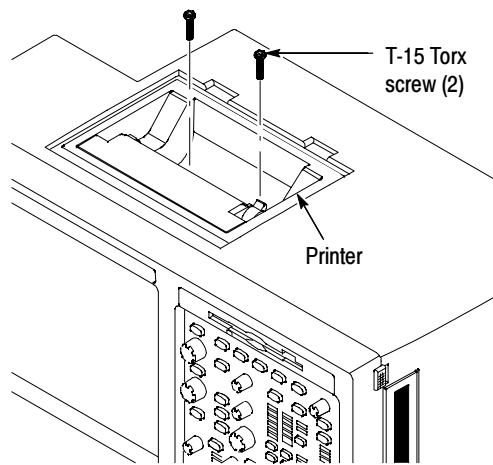   b. Remove the accessory tray or internal printer (two T-15 Torxdrive screws). See Figure 2, on page 10.

T-15 Torx screw (2)

Printer

Figure 2: Printer screw mounting

   c. If the internal printer is installed, disconnect the cable from the printer. See Figure 3.

   d. Remove the feet from the top rear of the oscilloscope by removing the two T-15 Torxdrive screws.

   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.
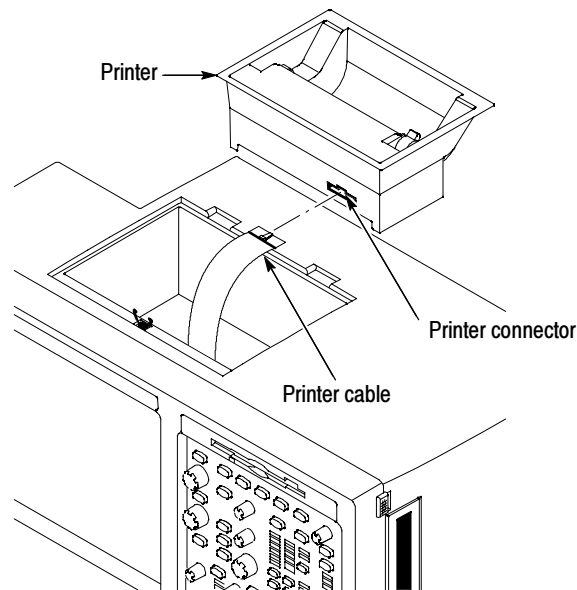
Figure 3: Printer cable connection

6. *Remove the front panel and acquisition trim:*

    a. To prevent the power button from falling out of the front panel trim, place a piece of tape over the button.

    b. Remove the three T-15 Torxdrive screws that secure the front panel trim to the bottom of the instrument.

    c. Grasp the trim ring by its top edge and pull toward you to detach the three plastic snaps. (Alternatively, you can use a flat-bladed solder aid or other small prying tool to help you detach the snaps.)

    d. Grasp the trim ring by its side edges and slide it back and forth to release the snap in the middle of the trim ring. The snap is at the bottom "T" of the front panel above the channel 1 and 2 BNCs.

    e. Pull off the trim ring. As you do so, take care not to lose the 3 pem inserts in the bottom of the trim ring.

    f. Remove the acquisition trim from the oscilloscope. Use Figure 4, on page 12 as a guide.

Accessory tray door

T-15 Torxdrive screw (2)

Accessory tray

T-20 Torxdrive screw (2)

Top cover trim

Carrying handle

Left side panel

T-15 Torxdrive screw (4)

VGA panel

Power cord retainer (4)

T-15 Torxdrive screw (2)

Acquisition trim

Right side panel

CD-drive trim

Front panel trim

Pem inset (3)

T-15 Torxdrive screw (2)

T-15 Torxdrive screw (3)
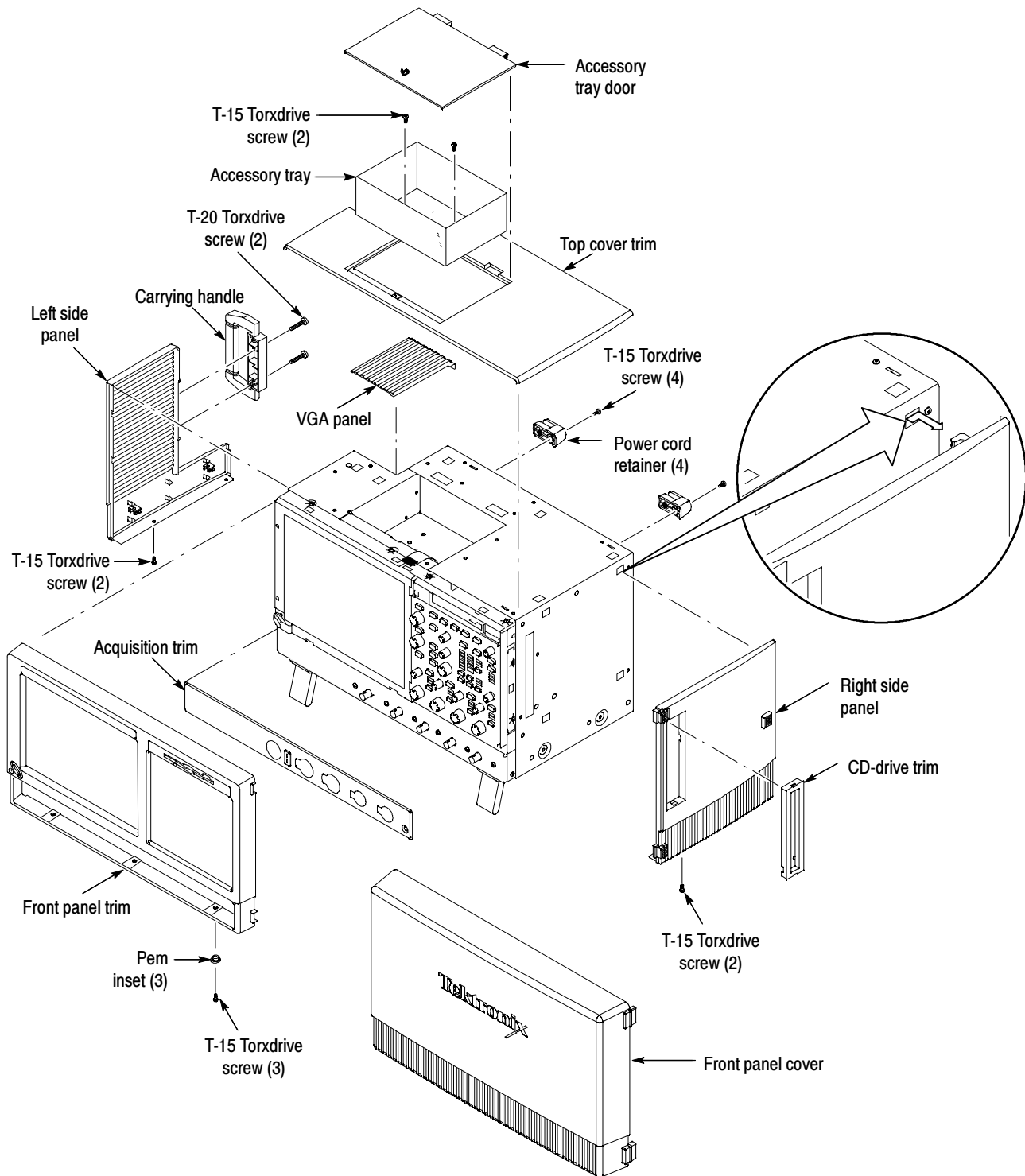
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Front panel cover

Figure 4: Trim removal

Bottom Covers

1. *Remove the bottom covers:* See Figure 5.

2. *Orient the oscilloscope:* Set the oscilloscope so the top is down on the work surface and the bottom is facing you.

   a. Remove the two T-15 Torxdrive screws that secure the bottom cosmetic cover to the oscilloscope, and remove the cover.

   b. Remove the seven T-15 Torxdrive screws that secure the bottom metal cover to the oscilloscope, and remove the cover.
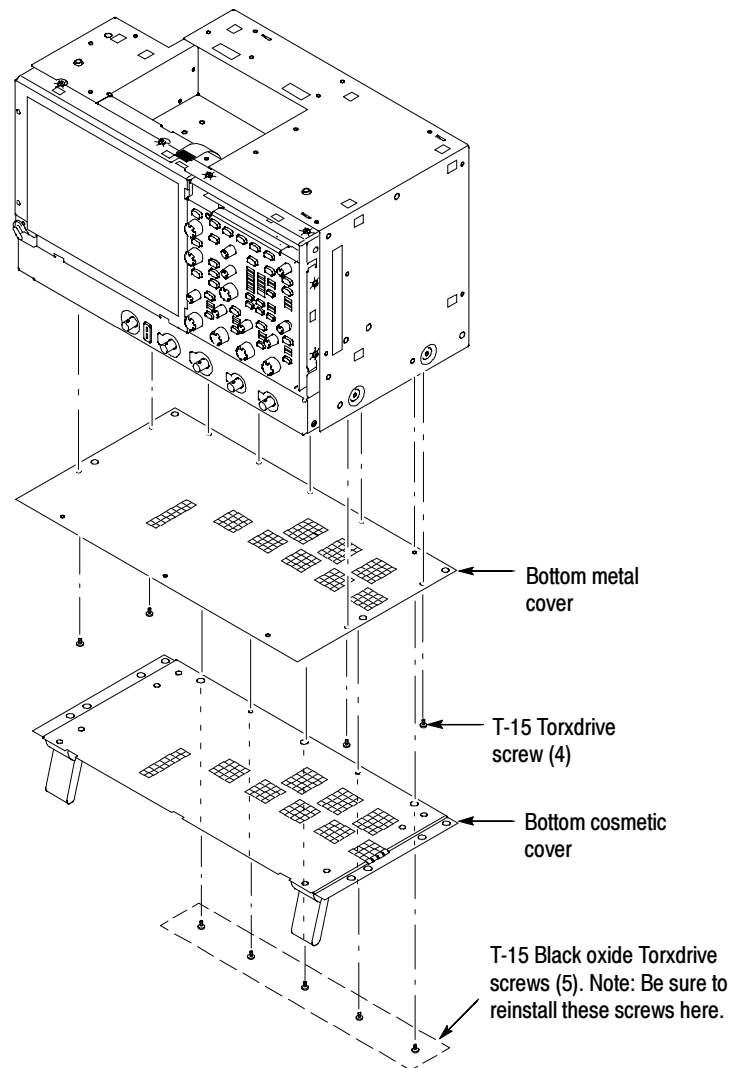

Bottom metal cover

T-15 Torxdrive screw (4)

Bottom cosmetic cover

T-15 Black oxide Torxdrive screws (5). Note: Be sure to reinstall these screws here.

Figure 5: Bottom cover removal

Right-Side Cover

1. *Remove the right-side 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. Some of the screws have different lengths; note the length of the screws when you remove them to ensure you reinstall them correctly.*

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3. Remove the 15 T-15 Torxdrive screws that secure the right-side cover to the top and right sides of the chassis. See Figure 6.

4. Remove the right-side cover (and printer tray, if installed).

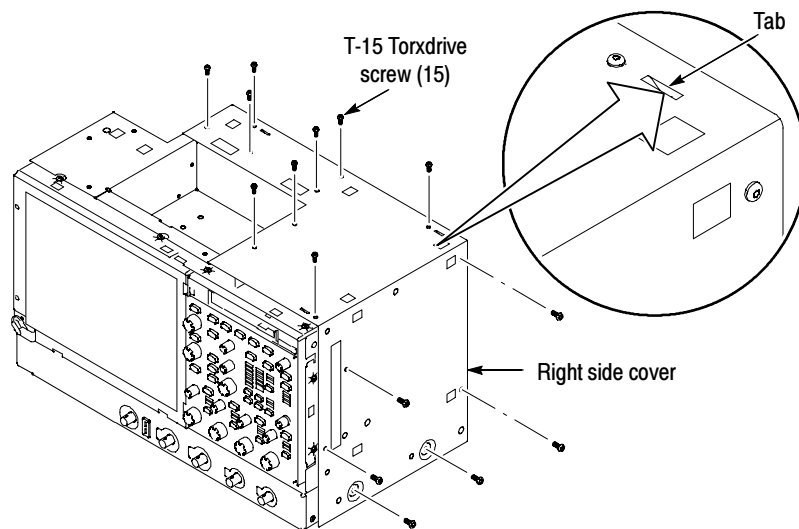⚠ **CAUTION.** *Take care not to bind or snag the covers on the oscilloscope internal cabling as you remove or install.*

Figure 6: Right-side cover removal

PC Interface Circuit Board Replacement Kit

Floppy Disk Drive Assembly

1. Set the oscilloscope so the bottom is down on the work surface and the front panel is facing you.

2. Use Figure 7 as a guide and remove the cable from the back of the floppy disk drive.

3. Remove the two T-15 Torxdrive screws that secure the floppy disk drive assembly to the chassis.

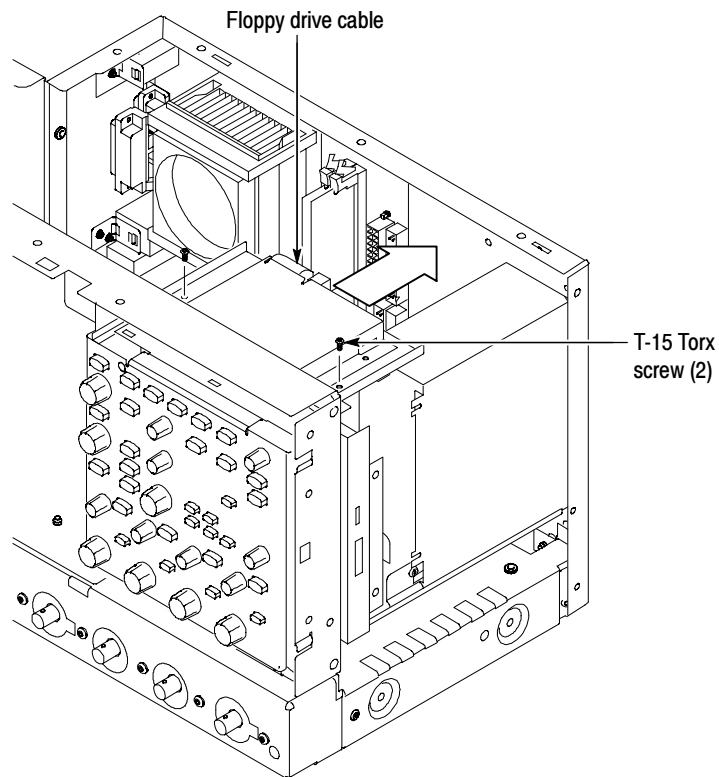4. Set the assembly aside on a static-free surface.

Figure 7: Floppy disk drive assembly removal

Hard Disk Drive Assembly

1. Set the oscilloscope so the bottom is down on the work surface and the right side panel is facing you.

2. Remove the 2 T-15 Torx screws that secure the Hard Disk Drive assembly to the chassis.

3. Pull the Hard Disk Drive assembly away from the chassis far enough to access the cables.

4. Disconnect the 2 cables from the Hard Disk Drive assembly. See Figure 8.

5. Remove the Hard Disk Drive assembly and set it aside on a static-free surface.
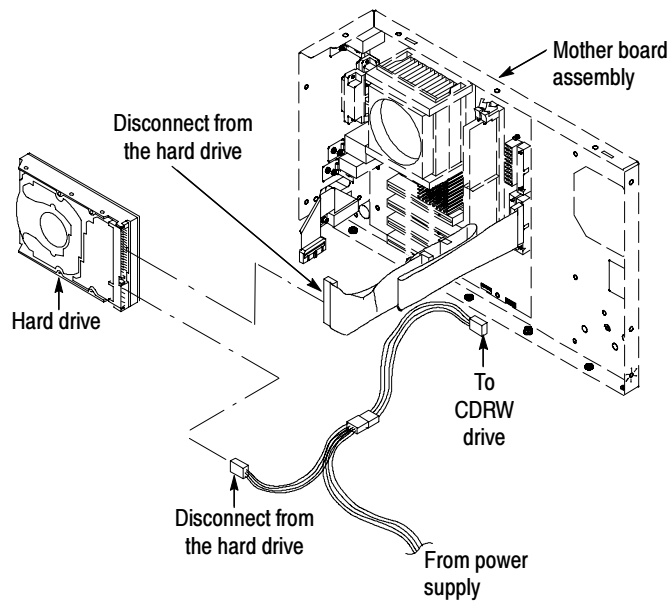
Figure 8: Desktop hard drive removal

CDRW Disk Drive Assembly

1. Remove the T-15 Torxdrive screw that secures the CDRW Disk Drive assembly to the chassis.

2. Pull the CDRW Disk Drive assembly away from the chassis far enough to disconnect the cables. See Figure 9.

3. Remove the CDRW Drive from the assembly and set it aside on a static-free surface.

Mother board
assembly

Disconnect from
the CDRW drive
assembly

To hard
drive

Disconnect from
the CDRW drive
assembly

From power
supply

CDRW drive
assembly

T-15 Torxdrive
screw (1)

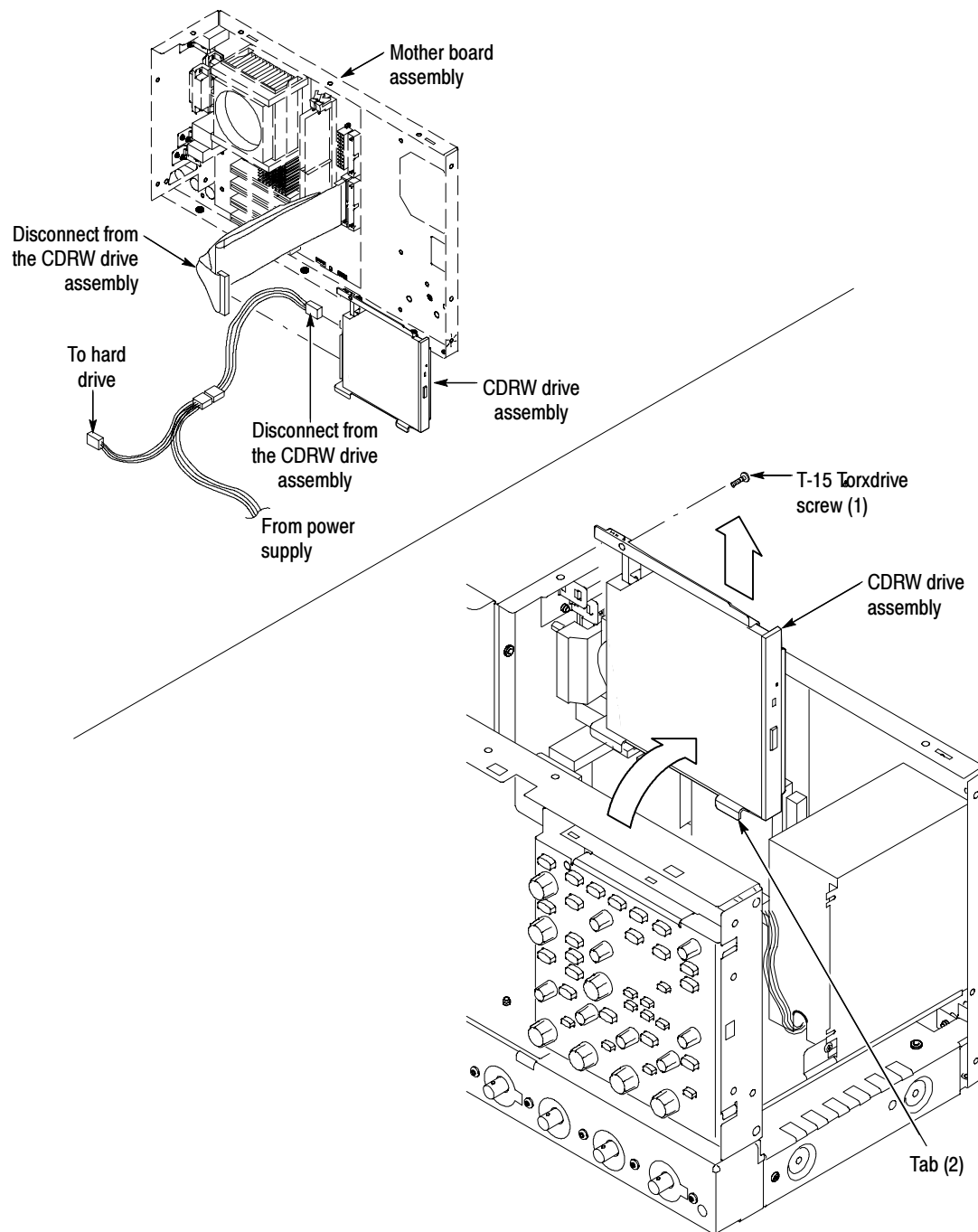CDRW drive
assembly

Tab (2)

Figure 9: CDRW drive assembly removal

Power Supply

1. Set the oscilloscope so the bottom is down on the work surface and the back is facing you.

2. Remove the four T-15 Torxdrive screws that secure the power supply to the back of the chassis. See Figure 10.

3. Remove the T-15 Torxdrive screw that secures the power supply to the right side of the chassis.

4. Move the power supply towards the back of the instrument to access the cables and unplug the two power supply cables from the PC Interface board.

5. Lift the power supply away from the chassis and guide the cables out.
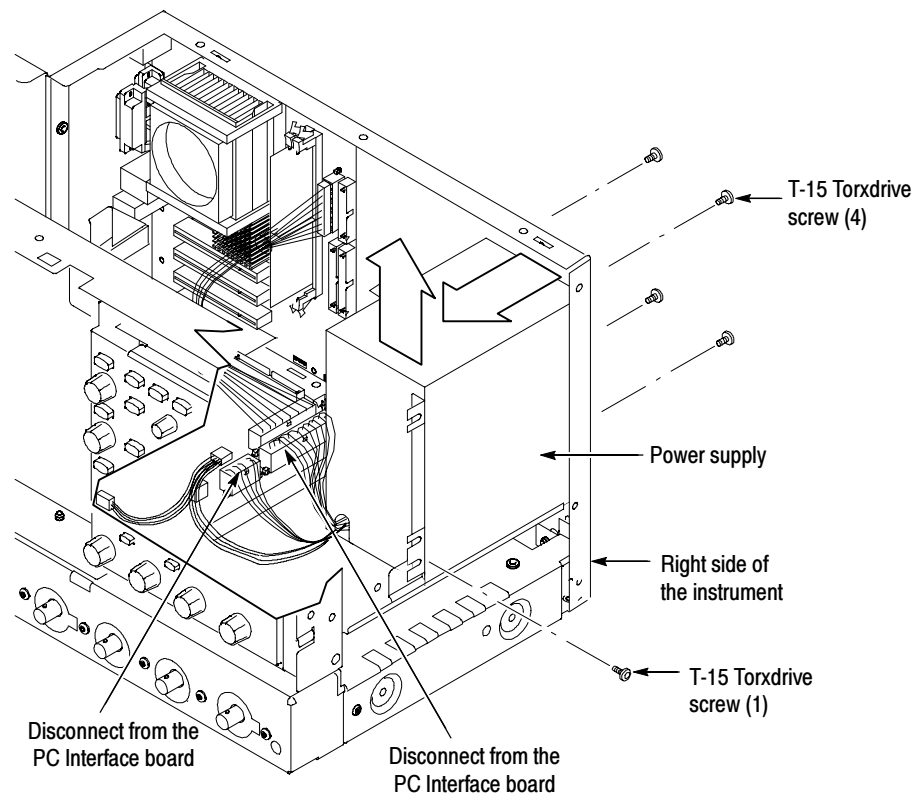

T-15 Torxdrive screw (4)

Power supply

Right side of the instrument

T-15 Torxdrive screw (1)

Disconnect from the PC Interface board

Disconnect from the PC Interface board

Figure 10: Power supply removal

Mother board Assembly

1. Set the oscilloscope so the bottom is down on the work surface and the top panel is facing you.

NOTE. The Mother board and rear chassis are removed as one assembly.

2. *Remove the Mother board assembly:* See Figure 11, on page 20.

   a. Remove the two jack screws that secure the VGA connector to the bracket.

   b. Remove the single T-15 Torxdrive screw that secures the VGA bracket to the chassis.

NOTE. Note the location of the cables and connectors on the Mother board before removing them. This will make it easier to connect them properly. If necessary, refer to Figure 1 on page 8 to determine the correct locations of the cables.

   c. Disconnect the hard disk drive and CDRW drive ribbon cables from the Mother board assembly.

   d. Disconnect the 4–wire cable and the 20-wire cable from the Mother board assembly to the PC Interface board.

   e. Disconnect the GPIB cable from the PC Interface board.

   f. Remove the eight T-15 Torxdrive screws that secure the Mother board assembly to the main chassis.

   g. Carefully lift the assembly part way out of the chassis.

   h. Remove the VGA bracket and set it aside.

   i. Disconnect the two cables at the bottom of the Mother board assembly.

   j. Remove the Mother board assembly and set it aside on a static-free surface.

VGA bracket

Jack screw (2)

Mother board
assembly

Pouch bracket

Front of the
instrument

Rear View

Power cord
retainer (4)

T-15 Torxdrive
screw (4)

T-15 Torxdrive
screw (9)

Front View

Mother board
assembly

Disconnect from the
PC Interface board

Disconnect from
the Mother board

T-15 Torxdrive
screw (6)

Mother board

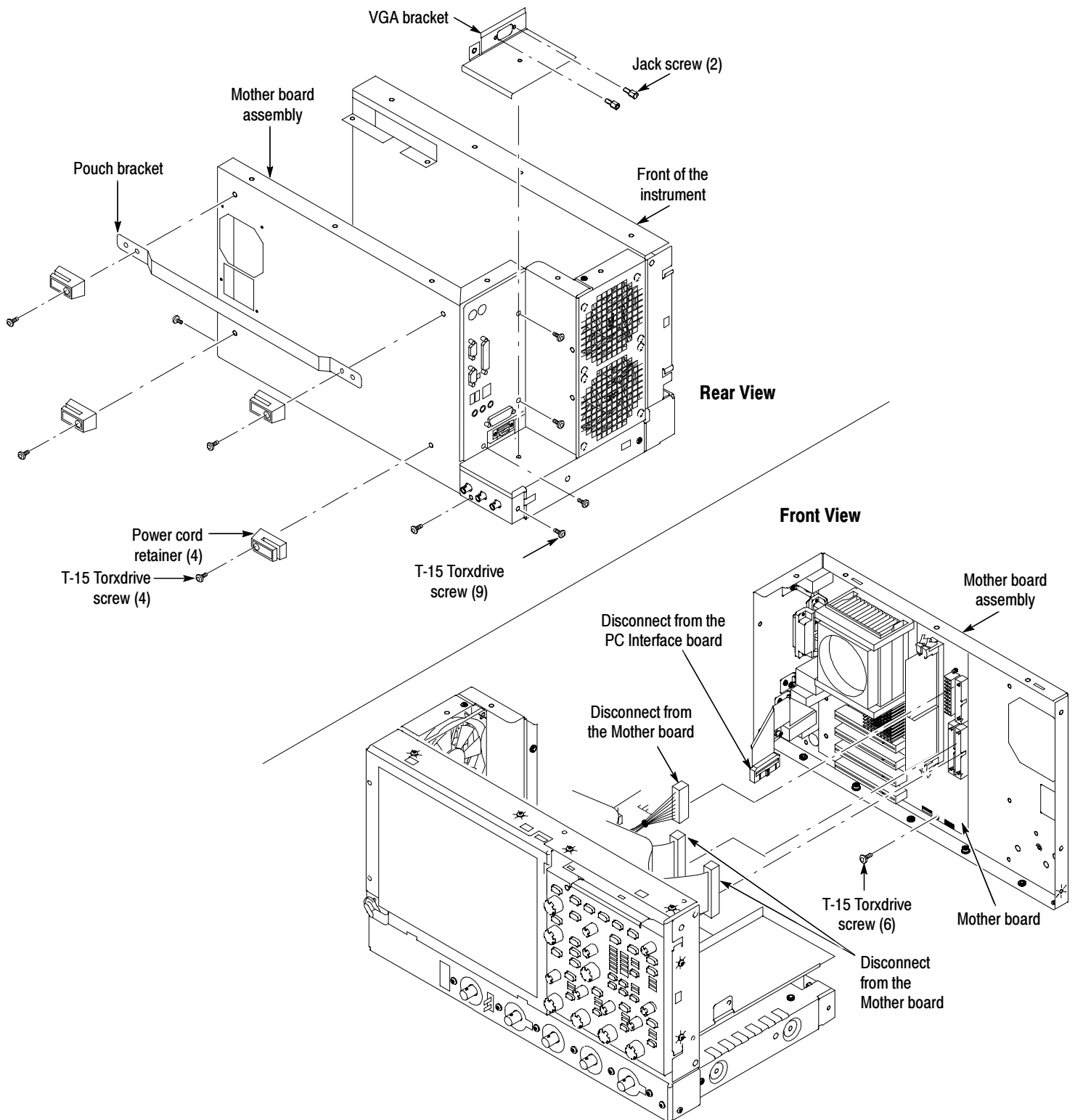Disconnect
from the
Mother board

Figure 11: Mother board removal

PC Interface Board

1. Set the oscilloscope so the bottom is down on the work surface and the top panel is facing you.

2. *Remove the PC Interface board:* See Figure 12, on page 22.

   a. Disconnect the ribbon cables at J510, J1010, and J1090 from the PC Interface board to the front panel, display, and printer (if installed).

   NOTE. *Note the location of the cables and connectors on the PC Interface board before removing them. This will make it easier to connect them properly. If necessary, refer to Figure 1 on page 8 to determine the correct locations of the cables.*

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   b. Disconnect the two fan cables from the PC Interface board.

   c. Remove the ribbon cable at J520 and the split cable at J1000 from the PC Interface board.

   d. Remove the heavy-duty 20-wire cable from the PC Interface board at J1040.

   e. Remove and discard the white 4-wire cable from the PC Interface board at J1044 (you will replace this cable with the new cable that came with this kit).

   f. Remove the six T-15 Torx screws that secure the PC Interface board to the chassis.

   ⚠ **CAUTION.** *Do not remove the screw next to J1800 (See Figure 12 on page 22). The screw secures an indexing pin used to align the J1800 connectors together.*

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   g. Grasp the PC Interface board near J1800 (see Figure 12) and carefully pull the board up to disconnect J1800. Once you have cleared the connector, remove the board from the chassis.
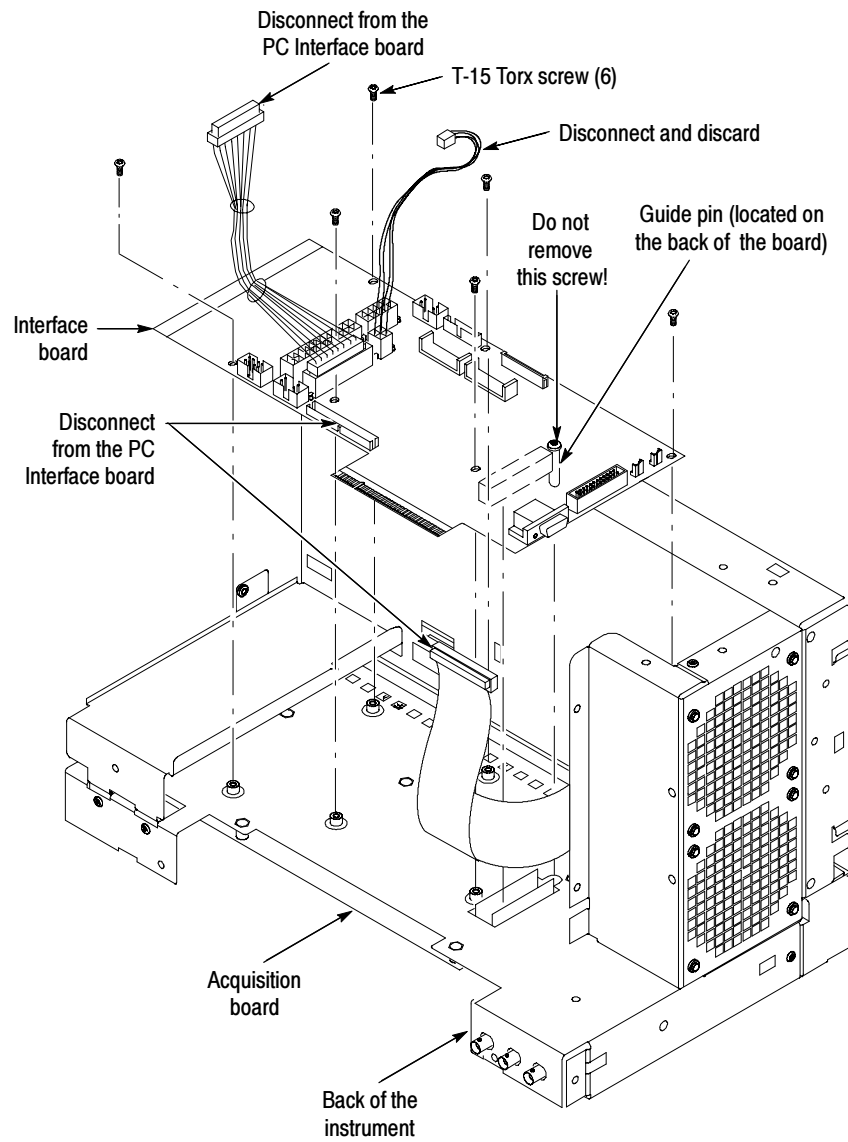
Disconnect from the
PC Interface board

T-15 Torx screw (6)

Disconnect and discard

Do not
remove
this screw!

Guide pin (located on
the back of the board)

Interface
board

Disconnect
from the PC
Interface board

Acquisition
board

Back of the
instrument

Figure 12: PC Interface board removal

Install

The installation procedures are done in reverse order of the removal procedures. Refer to Figure 1 on page 8 for the location of cables and cable connectors for the PC Interface board and the Mother board.

1. Remove the new PC Interface board from the kit packaging.

2. Set the board in place and align the J1800 halves using the guide pin. Gently press the board into place to seat the connector between the PC Interface board and the acquisition board.

3. Install the six T-15 Torx screws that secure the PC Interface board to the chassis.

⚠ **CAUTION.** *Use only the 4-wire (yellow and black) cable that came with this kit with the new PC Interface board. Using the old (white) 4-wire cable will damage the instrument when you apply power.*

4. Connect the new 4-wire cable to the PC Interface board at J1044.

5. Reconnect all other cables to the PC Interface board (see Figure 1 on page 8 and Figure 12 on page 22 as necessary to reinstall all the cables to the PC Interface board).

6. Orient the Mother board assembly so the bottom is down on the work surface and the connector panel is facing you.

7. Follow the steps 2a through 2j under *Mother board Assembly* on page 19 in reverse order to reconnect all cables on the Mother board and to install the Mother board assembly in the chassis. If necessary, refer to Figure 1 on page 8 and Figure 11 on page 20 to reinstall all the cables.

8. Reinstall the power supply.

9. Reinstall the CDRW Disk Drive Assembly, Hard Disk Drive assembly, and Floppy Disk Drive assembly. Refer to the individual removal procedures as necessary.

10. Reinstall the right-side cover (and printer tray).

11. Reinstall the bottom covers.

12. Reinstall the front panel and acquisition trim, top cover, printer, VGA panel, left side panel and carrying handle, and the right side trim.

Install the Operating System Software

After you reassemble the instrument, you need to install the software that support the new hardware. Use the following procedure to install the software:

1. Install the TDS5000B Operating System Restore CD that came with this kit. Follow the instructions provided with the CD.

2. Install the TDS5000B Series Product software CD that came with your original instrument. Follow the instructions provided with the CD.

3. Install any Optional Application software on Windows based Oscilloscopes CD. Follow the instructions provided with the CD.

4. Install any software that you may have backed up prior to installing this upgrade kit.

▪▪ **End of document** ▪▪