

**DPO7000, DPO70000, and DSA70000 Series
Digital Phosphor Oscilloscopes
Service Manual**



077-0076-02

Tektronix

DPO7000, DPO70000, and DSA70000 Series Digital Phosphor Oscilloscopes

Service Manual

This document applies to firmware version 1.0 and above.

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.

www.tektronix.com

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Contacting Tektronix

Tektronix, Inc.
14200 SW Karl Braun Drive
P.O. Box 500
Beaverton, OR 97077
USA

For product information, sales, service, and technical support:

- In North America, call 1-800-833-9200.
- Worldwide, visit www.tektronix.com to find contacts in your area.

Warranty

Tektronix warrants that this product will be free from defects in materials and workmanship for a period of one (1) year from the date of shipment. If any such product proves defective during this warranty period, Tektronix, at its option, either will repair the defective product without charge for parts and labor, or will provide a replacement in exchange for the defective product. Parts, modules and replacement products used by Tektronix for warranty work may be new or reconditioned to like new performance. All replaced parts, modules and products become the property of Tektronix.

In order to obtain service under this warranty, Customer must notify Tektronix of the defect before the expiration of the warranty period and make suitable arrangements for the performance of service. Customer shall be responsible for packaging and shipping the defective product to the service center designated by Tektronix, with shipping charges prepaid. Tektronix shall pay for the return of the product to Customer if the shipment is to a location within the country in which the Tektronix service center is located. Customer shall be responsible for paying all shipping charges, duties, taxes, and any other charges for products returned to any other locations.

This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate maintenance and care. Tektronix shall not be obligated to furnish service under this warranty a) to repair damage resulting from attempts by personnel other than Tektronix representatives to install, repair or service the product; b) to repair damage resulting from improper use or connection to incompatible equipment; c) to repair any damage or malfunction caused by the use of non-Tektronix supplies; or d) to service a product that has been modified or integrated with other products when the effect of such modification or integration increases the time or difficulty of servicing the product.

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Table of Contents

General Safety Summary	v
Service Safety Summary	vii
Environmental Considerations	viii
Preface	ix
Manual Structure	ix
Manual Conventions	ix

Getting Started

Operating Information	1-1
-----------------------------	-----

Theory of Operation

Logic Conventions	2-1
Module Overviews	2-1

Adjustment Procedures

Adjustment Interval	3-1
Adjustment After Repair	3-1
Adjustment	3-1

Maintenance

Preventing ESD	4-1
Inspection and Cleaning	4-2
General Care	4-2
Interior Cleaning	4-2
Exterior Cleaning	4-3
Flat Panel Display Cleaning	4-4
Removal and Installation Procedures	4-7
Preparation	4-7
Module Removal	4-9
Troubleshooting	4-14
Service Level	4-14
Check for Common Problems	4-14
Equipment Required	4-16
Fault Isolation Procedure	4-16
Instrument Diagnostics	4-21
Software Updates	4-24
After Repair	4-24

μATX BIOS Error Messages	4-24
BIOS Beep Codes.....	4-38
Update/Restore the μATX Board CMOS.....	4-39
Installing an Authorization Key	4-40
Hard Disk Drive Repair	4-40
Returning the Instrument for Service.....	4-41

Replaceable Parts

Parts Ordering Information	5-1
Using the Replaceable Parts List.....	5-2

List of Figures

Figure 2-1: DPO7000 Series block diagram.....	2-4
Figure 2-2: DPO70000 and DSA70000 Series block diagram (B039999 and below).....	2-5
Figure 2-3: DPO70000 and DSA70000 Series block diagram (B040000 and above).....	2-6
Figure 4-1: DPO7000 Series module locations	4-9
Figure 4-2: DPO70000 and DSA70000 Series module locations.....	4-11
Figure 4-3: Removing the μ ATX/Power Interface assembly	4-13
Figure 4-4: Primary troubleshooting tree.....	4-17
Figure 4-5: Location of power-on and over-current LEDs.....	4-18
Figure 4-6: Power supply test points	4-20
Figure 4-7: Diagnostics control panel.....	4-22
Figure 5-1: External parts (< 4.0 GHz models)	5-4
Figure 5-2: Front panel and display (< 4.0 GHz models) (B039999 and below).....	5-6
Figure 5-3: Front panel and display (< 4.0 GHz models) (B040000 and above).....	5-7
Figure 5-4: Power supply and fans (< 4.0 GHz models).....	5-9
Figure 5-5: 039-0173-xx and 065-0745-xx μ ATX Motherboard (< 4.0 GHz models)	5-11
Figure 5-6: 039-0185-xx μ ATX Motherboard (< 4.0 GHz models)	5-12
Figure 5-7: Power interface and Acquisition assemblies (< 4.0 GHz models) (B039999 and below)	5-14
Figure 5-8: Power interface and Acquisition assemblies (< 4.0 GHz models) (B040000 and above)	5-15
Figure 5-9: Drives (< 4.0 GHz models) (B059999 and below)	5-17
Figure 5-10: Drives (< 4.0 GHz models) (B060000 and above)	5-18
Figure 5-11: External parts 1 (\geq 4.0 GHz models).....	5-21
Figure 5-12: External parts 2 (\geq 4.0 GHz models).....	5-23
Figure 5-13: Front panel and display (\geq 4.0 GHz models) (B039999 and below)	5-26
Figure 5-14: Front panel and display (\geq 4.0 GHz models) (B040000 and above)	5-27
Figure 5-15: Power supply and fans (\geq 4.0 GHz models)	5-30
Figure 5-16: 039-0173-xx and 065-0745-xx μ ATX assembly (\geq 4.0 GHz models)	5-32
Figure 5-17: 039-0185-xx μ ATX assembly (\geq 4.0 GHz models)	5-33
Figure 5-18: Acquisition assembly (\geq 4.0 GHz models).....	5-34
Figure 5-19: Interface board (\geq 4.0 GHz models) (B039999 and below).....	5-36
Figure 5-20: Interface board (\geq 4.0 GHz models) (B040000 and above)	5-37
Figure 5-21: Drives (\geq 4.0 GHz models) (B039999 and below).....	5-39
Figure 5-22: Drives (\geq 4.0 GHz models) (B040000 and above)	5-40

List of Tables

Table 4-1: External inspection checklist	4-3
Table 4-2: Internal inspection checklist	4-4
Table 4-3: Tools required for module removal	4-7
Table 4-4: DPO7000 Series module removal	4-10
Table 4-5: DPO70000 and DSA70000 Series module removal	4-12
Table 4-6: Failure symptoms and possible causes	4-14
Table 4-7: Power-on and over-current LEDs	4-18
Table 4-8: Power supply voltages	4-19
Table 4-9: Diagnostic tests	4-23
Table 4-10: μ ATX BIOS error messages.....	4-25
Table 4-11: 039-0173-xx and 065-0745-xx μ ATX POST codes	4-26
Table 4-12: 039-0185-xx μ ATX POST codes	4-28
Table 4-13: 039-0173-xx and 065-0745-xx μ ATX beep codes.....	4-38
Table 4-14: 039-0185-xx μ ATX beep codes.....	4-39
Table 5-1: Replaceable parts External (< 4.0 GHz models)	5-3
Table 5-2: Replaceable parts – Front panel and display (< 4.0 GHz models)	5-5
Table 5-3: Replaceable parts – Power supply and fans (< 4.0 GHz models)	5-8
Table 5-4: Replaceable parts – μ ATX Motherboard (< 4.0 GHz models).....	5-10
Table 5-5: Replaceable parts – Power interface and Acquisition assemblies (< 4.0 GHz models)....	5-13
Table 5-6: Replaceable parts – Drives (< 4.0 GHz models)	5-16
Table 5-7: Replaceable parts – Standard accessories (< 4.0 GHz models).....	5-19
Table 5-8: Replaceable parts – External 1 (\geq 4.0 GHz models)	5-20
Table 5-9: Replaceable parts – External 2 (\geq 4.0 GHz models)	5-22
Table 5-10: Replaceable parts – Front panel and display (\geq 4.0 GHz models)	5-24
Table 5-11: Replaceable parts – Power supply and fans (\geq 4.0 GHz models)	5-28
Table 5-12: Replaceable parts – μ ATX assembly (\geq 4.0 GHz models).....	5-31
Table 5-13: Replaceable parts – Acquisition assembly (\geq 4.0 GHz models)	5-34
Table 5-14: Replaceable parts – Interface board (\geq 4.0 GHz models).....	5-35
Table 5-15: Replaceable parts – Drives (\geq 4.0 GHz models).....	5-38
Table 5-16: Replaceable parts – Standard accessories (\geq 4.0 GHz models)	5-41

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.

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.

The inputs are not rated for connection to mains or Category II, III, or IV circuits.

Do not apply a potential to any terminal, including the common terminal, that exceeds the maximum rating of that terminal.

Power Disconnect. The power cord disconnects the product from the power source. Do not block the power cord; it must remain accessible to the user at all times.

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

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

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

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.

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.*

Symbols and 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.

The following symbol(s) may appear on the product:



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.

Environmental Considerations

This section provides information about the environmental impact of the product.

Product End-of-Life Handling

Observe the following guidelines when recycling an instrument or component:

Equipment Recycling. Production of this equipment required the extraction and use of natural resources. The equipment may contain substances that could be harmful to the environment or human health if improperly handled at the product's end of life. In order to avoid release of such substances into the environment and to reduce the use of natural resources, we encourage you to recycle this product in an appropriate system that will ensure that most of the materials are reused or recycled appropriately.



This symbol indicates that this product complies with the European Union's requirements according to Directive 2002/96/EC on waste electrical and electronic equipment (WEEE). For information about recycling options, check the Support/Service section of the Tektronix Web site (www.tektronix.com).

Battery Recycling. This product may contain a Nickel Cadmium (NiCd) or lithium ion (Li-ion) rechargeable battery, which must be recycled or disposed of properly. Please properly dispose of or recycle the battery according to local government regulations.

Mercury Notification. This product uses an LCD backlight lamp that contains mercury. Disposal may be regulated due to environmental considerations. Please contact your local authorities or, within the United States, the Electronics Industries Alliance (www.eiae.org) for disposal or recycling information.

Restriction of Hazardous Substances

This product has been classified as Monitoring and Control equipment, and is outside the scope of the 2002/95/EC RoHS Directive.

Preface

This manual contains service information for your instrument. Read this preface to learn how this manual is structured, the conventions it uses, and where to find additional supplemental information related to servicing this product.

You should also read the General and Service safety summaries before servicing the product.

Manual Structure

This manual is divided into sections, which are made up of related subordinate topics. These topics can be cross referenced as sections.

Be sure to read the introductions to all procedures. These introductions provide important information needed to do the service correctly, safely, and efficiently.

Manual Conventions

This manual uses certain conventions that you should become familiar with before attempting service.

Modules Throughout this manual, any replaceable component, assembly, or part is referred to as a *module*.

Replaceable Parts This manual refers to any field-replaceable assembly or mechanical part specifically by its name or generically as a replaceable part. In general, a replaceable part is any circuit board or assembly, (such as the hard disk drive), or a mechanical part, (such as the I/O port connectors), that is listed in the replaceable parts list. (See page 5-1, *Replaceable Parts*.)

Safety Symbols and terms related to safety appear in the *Service Safety Summary*.

Getting Started

Operating Information

Operating Information

For information on installing, operating, and networking the instrument, refer to the *DPO7000, DPO70000 and DSA70000 Series Digital Phosphor Oscilloscopes Quick Start User Manual*. This manual is available on the product software CD that came with your oscilloscope, and on the Tektronix Web site (www.tektronix.com/manuals).

Theory of Operation

Theory of Operation

This section describes the electrical operation of the instrument. The following figures show the module interconnections. (See Figure 2-1 on page 2-4.)

Logic Conventions

The instrument contains many digital logic circuits. This manual refers to these circuits with standard logic symbols and terms. Unless otherwise stated, all logic functions are described using the positive-logic convention: the more positive of the two logic levels is the high (1) state, and the more negative level is the low (0) state. Signal states may also be described as "true" meaning their active state or "false" meaning their nonactive state. The specific voltages that constitute a high or low state vary among the electronic devices.

Module Overviews

Module overviews describe the basic operation of each functional circuit block.

A Microsoft Windows processor system is the primary controller of the instrument. The instrument features an XGA resolution flat-panel display, a transparent touch screen, and a front-panel with direct access to commonly used instrument functions. You can also make complete use of the instrument with a mouse and keyboard.

Input Signal Path

A signal enters the instrument through a connection to the input connector on the front panel.

Acquisition Board. The acquisition board conditions the input signals and converts them to digital signals, then processes the data into a form that is handled by the display system. The acquisition system includes the multi-source trigger system, a timebase, and acquisition control circuitry, as well as a calibration reference system for internal calibration purposes. The acquisition board is located in the bottom compartment of the instrument. All input channels feature a probe interface system with the ability to recognize the probe type for proper unit display and for calibration out to the probe tip.

Processor System. The processor system contains a processor board with microprocessor that controls the entire instrument. The basic configuration supports input channels, provides an external trigger input, a trigger output, and a probe compensation output.

Each acquisition channel is equipped with a processor that uses its own host interface which communicates with the command interface processor.

Display Panel Waveforms and menus are displayed on a color, active-matrix LCD display with touch panel.

Display System. Text and menu image information from the Windows system is merged with the waveform images and processed by the display circuitry. The display system sends the combined graphical image to the active-matrix LCD display.

Touch Panel. The touch information from the touch screen is processed by a Windows driver, actively placing the pointer at the touched location. Actions from a mouse and actions from the touch panel are interchangeable, and treated alike by the user interface software.

Front Panel Front-panel push-button and knob encoder switches are read by an embedded micro controller, which sends the button and knob change information to the Windows system over the Universal Serial Bus path.

ON/STBY. The ON/STBY switch in the lower left corner of the instrument front is connected directly to the μ ATX board which, in turn, controls the off-line power supply system. This allows Windows to control the power based on standard Windows operating behavior.

μ ATX Board The μ ATX board provides standard Windows functionality and I/O port interfaces on a side or rear panel. This includes RS-232, Centronics, and Ethernet ports, as well as four USB ports, including a USB2.0 port placed in the lower right corner of the instrument front.

The μ ATX board receives input from the Front Panel and Touch Panel, and implements the appropriate changes. Video display data, containing waveform and graphical menu information, is transferred to the Windows system through the PCI bus interface.

The hard drive is connected to the μ ATX board through the SATA interface, while the CD/DVD is connected to the Windows system through the IDE parallel interface. The hard drive and CD provide access to stored waveform data and software to customize your instrument with your measurement needs.

Interface Board This board coordinates the flow of data through the Windows PCI port from the various devices that communicate with the μ ATX system. The devices include the display system, GPIB, TekLink, and a direct DMA path to the acquisition system.

The GPIB permits external control of the instrument both as a controller and as a slave device.

The acquisition system analog power supplies are generated on this interface board, from DC voltages supplied by the off-line power supply unit.

Power System The off-line power supply is a switching power converter with active power factor control. It auto detects the line voltage. It supplies power to all of the circuitry in the instrument.

No switch completely disconnects the line power from the instrument. The ON/STBY switch controls the power to the instrument through the μ ATX board circuitry. When in the "power off" condition, there is still a low power standby circuit to allow the system to monitor the ON/STBY switch.

Fans For cooling, the instrument fans draw air out of the instrument, for a negatively pressured instrument. The fans are controlled by an embedded processor on the acquisition board and are regulated by monitoring the temperature of the acquisition board circuitry. Cooling air enters the instrument through specific locations on the covers, where it flows directly over the heat sinks of each high wattage component.

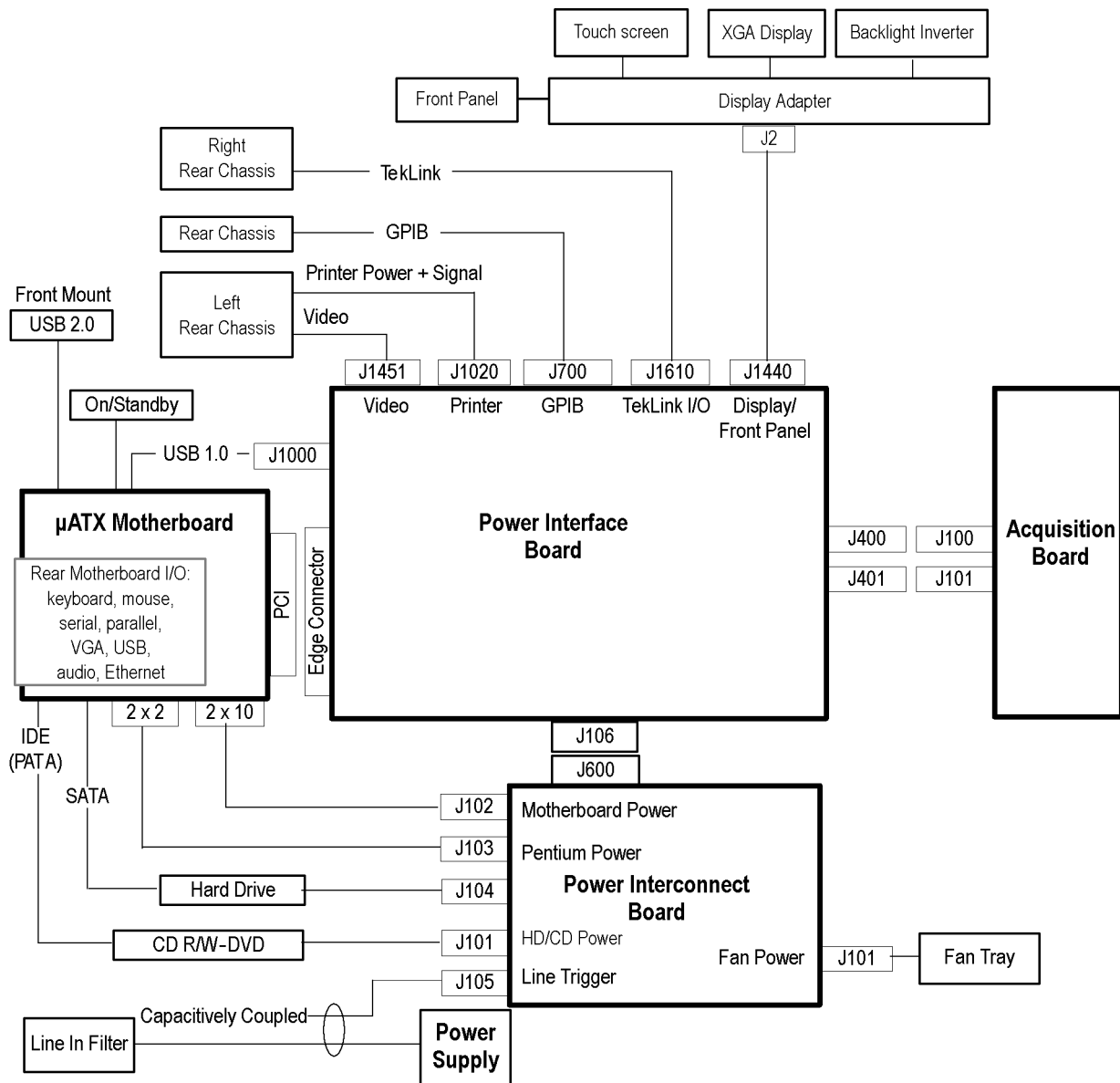


Figure 2-1: DPO7000 Series block diagram

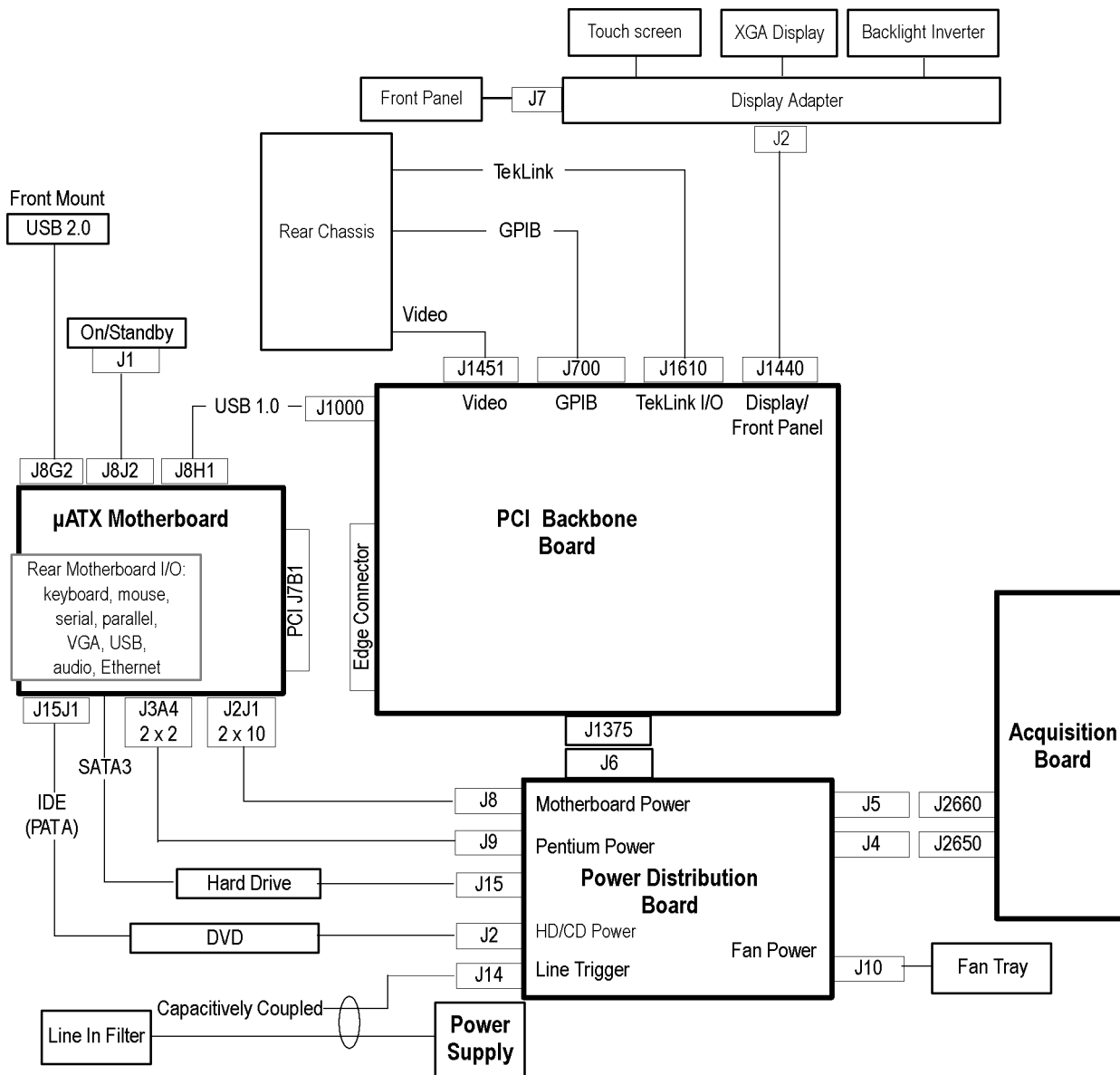


Figure 2-2: DPO7000 and DSA7000 Series block diagram (B039999 and below)

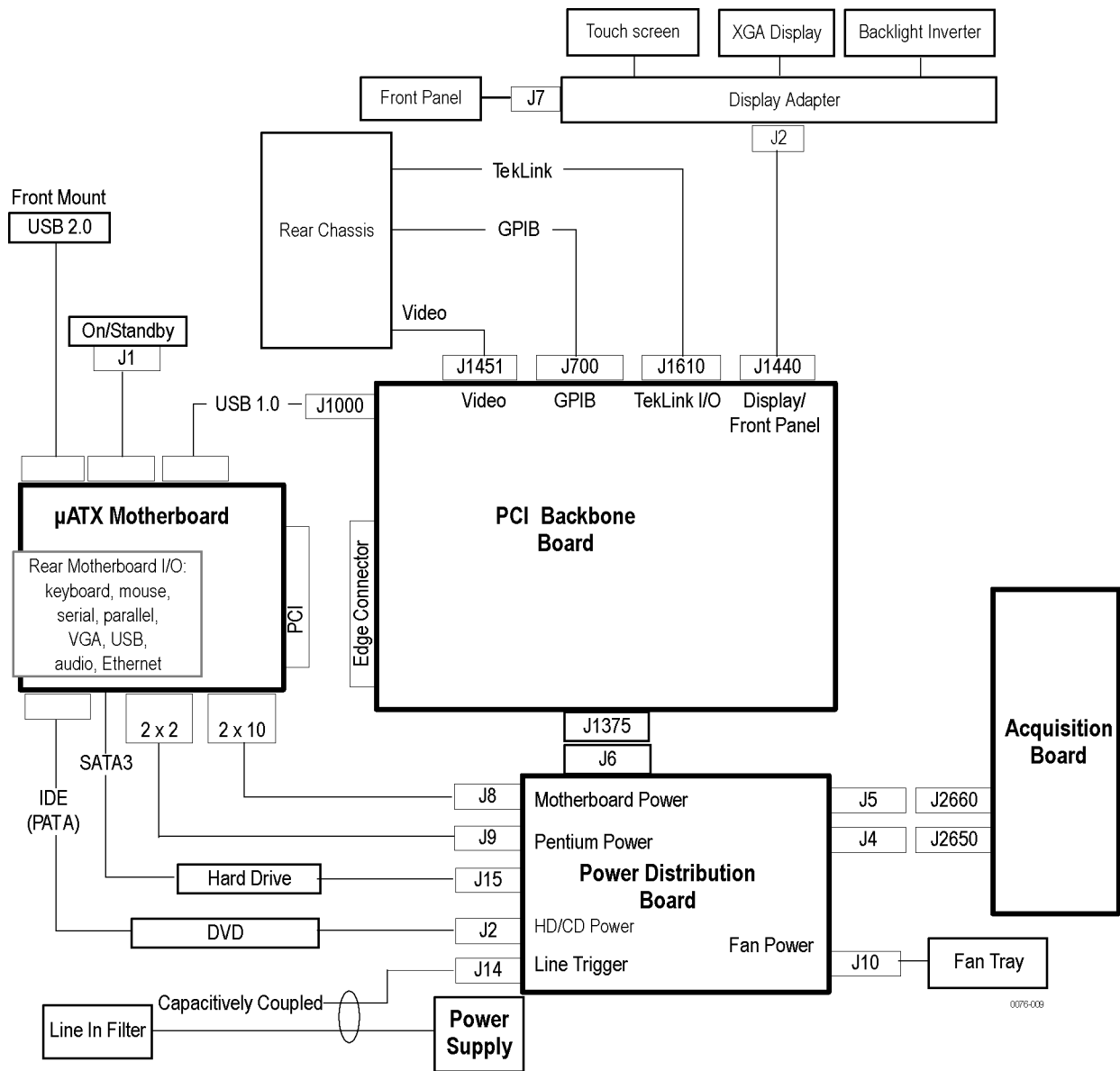


Figure 2-3: DPO7000 and DSA7000 Series block diagram (B040000 and above)

Adjustment Procedures

Adjustment Procedures

This chapter contains information about instrument adjustment.

Adjustment Interval

The voltage and timing references inside the instrument are very stable over time and should not need routine adjustment.

If the instrument fails performance tests (refer to the *DPO7000, DPO70000 and DSA70000 Series Digital Phosphor Oscilloscopes Specifications and Performance Verification* manual), adjustment may be required.

If periodic calibration is one of your requirements, a general rule is to verify performance and make adjustments (only if needed) every 2000 hours of operation or once a year if the instrument is used infrequently.

Adjustment After Repair

After removal and replacement of a module, you must perform the Performance Verification procedure, found in the *DPO7000, DPO70000 and DSA70000 Series Digital Phosphor Oscilloscopes Specifications and Performance Verification* manual, which was provided with the instrument. This manual is also available on the Tektronix Web site (www.tektronix.com/manuals).

If the instrument fails the Performance Verification tests, it must be returned to Tektronix for calibration.

Adjustment

Adjustment can be performed only by a Tektronix Service Center. See Contacting Tektronix, following the title page in this manual, for information on contacting Tektronix Service Support.

Maintenance

Maintenance

This section contains the information needed to do periodic and corrective maintenance on the instrument. The following subsections are included:

- *Preventing ESD* – General information on preventing damage by electrostatic discharge.
- *Inspection and Cleaning* – Information and procedures for inspecting the instrument and cleaning its external and internal modules.
- *Removal and Installation Procedures* – Procedures for the removal of defective modules and replacement of new or repaired modules. Also included is a procedure for disassembly of the instrument for cleaning.
- *Troubleshooting* – Information for isolating and troubleshooting failed modules. Included are instructions for operating the instrument diagnostic routines and troubleshooting trees. Most of the trees make use of the internal diagnostic routines to speed fault isolation to a module.
- *Repackaging Instructions* – Information on returning an instrument for service.

Preventing ESD

Before servicing this product, read the *Service Safety Summary* and *Introduction* at the front of the manual and the ESD information that follows.



CAUTION. *Static discharge can damage any semiconductor component in this instrument.*

When performing any service that requires internal access to the instrument, adhere to the following precautions to avoid damaging internal modules and their components due to electrostatic discharge (ESD):

1. Minimize handling of static-sensitive circuit boards and components.
2. Transport and store static-sensitive modules in their static protected containers or on a metal rail. Label any package that contains static-sensitive boards.
3. Discharge the static voltage from your body by wearing a grounded antistatic wrist strap while handling these modules. Do service of static-sensitive modules only at a static-free work station.
4. Nothing capable of generating or holding a static charge should be allowed on the work station surface.
5. Handle circuit boards by the edges when possible.
6. Do not slide the circuit boards over any surface.
7. Avoid handling circuit boards in areas that have a floor or work-surface covering capable of generating a static charge.

Inspection and Cleaning

Inspection and Cleaning describes how to inspect for dirt and damage. It also describes how to clean the exterior and interior of the instrument. Inspection and cleaning are done as preventive maintenance. Preventive maintenance, when done regularly, may prevent instrument malfunction and enhance its reliability.

Preventive maintenance consists of visually inspecting and cleaning the instrument and using general care when operating it.

How often to do maintenance depends on the severity of the environment in which the instrument is used. A proper time to perform preventive maintenance is just before instrument adjustment.

General Care

The cabinet helps keep dust out of the instrument and should normally be in place when operating the instrument.

Interior Cleaning

Use a dry, low-velocity stream of air to clean the interior of the chassis. Use a soft-bristle, non-static-producing brush for cleaning around components. If you must use a liquid for minor interior cleaning, use a 75% isopropyl alcohol solution and rinse with deionized water.



WARNING. To avoid electric shock or damage to the instrument, remove instrument power. Before performing any procedure that follows, power down the instrument and disconnect it from line voltage.

Exterior Cleaning

Clean the exterior surfaces of the chassis with a dry lint-free cloth or a soft-bristle brush. If any dirt remains, use a cloth or swab dipped in a 75% isopropyl alcohol solution. Use a swab to clean narrow spaces around controls and connectors. Do not use abrasive compounds on any part of the chassis that may damage the chassis.

Clean the On/Standby switch using a dampened cleaning towel. Do not spray or wet the switch itself.



CAUTION. *Avoid the use of chemical cleaning agents which might damage the plastics used in this instrument. Use only deionized water when cleaning the menu buttons or front-panel buttons. Use a 75% isopropyl alcohol solution as a cleaner and rinse with deionized water. Before using any other type of cleaner, consult your Tektronix Service Center or representative.*

Inspection – Exterior. Inspect the outside of the instrument for damage, wear, and missing parts. (See Table 4-1.) Immediately repair defects that could cause personal injury or lead to further damage to the instrument.

Table 4-1: External inspection checklist

Item	Inspect for	Repair action
Cabinet, front panel, and cover	Cracks, scratches, deformations, damaged hardware	Repair or replace defective module
Front-panel knobs	Missing, damaged, or loose knobs	Repair or replace missing or defective knobs
Connectors	Broken shells, cracked insulation, and deformed contacts. Dirt in connectors	Repair or replace defective modules. Clear or wash out dirt
Carrying handle, and cabinet feet	Correct operation	Repair or replace defective module
Accessories	Missing items or parts of items, bent pins, broken or frayed cables, and damaged connectors	Repair or replace damaged or missing items, frayed cables, and defective modules

Flat Panel Display Cleaning

The display is a soft plastic display and must be treated with care during cleaning.



CAUTION. *Improper cleaning agents or methods can damage the flat panel display.*

Avoid using abrasive cleaners or commercial glass cleaners to clean the display surface.

Avoid spraying liquids directly on the display surface. Avoid scrubbing the display with excessive force.

Clean the flat panel display surface by gently rubbing the display with a clean-room wipe (such as Wypall Medium Duty Wipes, #05701, available from Kimberly-Clark Corporation).

If the display is very dirty, moisten the wipe with distilled water or a 75% isopropyl alcohol solution and gently rub the display surface. Avoid using excess force or you may damage the plastic display surface.



CAUTION. *To prevent getting moisture inside the instrument during external cleaning, use only enough liquid to dampen the cloth or applicator.*

Inspection – Interior. To access the inside of the instrument for inspection and cleaning, refer to the *Removal and Installation Procedures* in this section.

Inspect the internal portions of the instrument for damage and wear. (See Table 4-2.) Defects should be repaired immediately.

If any circuit board is repaired or replaced, you must perform the Performance Verification procedure, found in the *DPO7000 Series Digital Phosphor Oscilloscopes Specifications and Performance Verification* manual, which was provided with the instrument. This manual is also available on the Tektronix Web site (www.tektronix.com/manuals). If the instrument fails the Performance Verification tests, it must be returned to Tektronix for calibration.



CAUTION. *To prevent damage from electrical arcing, ensure that circuit boards and components are dry before applying power to the instrument.*

Table 4-2: Internal inspection checklist

Item	Inspect for	Repair action
Circuit boards	Loose, broken, or corroded solder connections. Burned circuit boards. Burned, broken, or cracked circuit-run plating.	Remove and replace damaged circuit board.

Table 4-2: Internal inspection checklist (cont.)

Item	Inspect for	Repair action
Resistors	Burned, cracked, broken, blistered condition.	Remove and replace damaged circuit board.
Solder connections	Cold solder or rosin joints.	Resolder joint and clean with isopropyl alcohol.
Capacitors	Damaged or leaking cases. Corroded solder on leads or terminals.	Remove and replace damaged circuit board.
Semiconductors	Loosely inserted in sockets. Distorted pins.	Firmly seat loose semiconductors. Remove devices that have distorted pins. Carefully straighten pins (as required to fit the socket), using long-nose pliers, and reinsert firmly. Ensure that straightening action does not crack pins, causing them to break off.
Wiring and cables	Loose plugs or connectors. Burned, broken, or frayed wiring.	Firmly seat connectors. Repair or replace modules with defective wires or cables.
Chassis	Dents, deformations, and damaged hardware.	Straighten, repair, or replace defective hardware.

Cleaning Procedure – Interior. To clean the instrument interior, do the following steps:

1. Blow off dust with dry, low-pressure, deionized air (approximately 9 psi).
2. Remove any remaining dust with a lint-free cloth dampened in isopropyl alcohol (75% solution) and rinse with warm deionized water. (A cotton-tipped applicator is useful for cleaning in narrow spaces and on circuit boards).

NOTE. *If, after doing steps 1 and 2, a module is clean upon inspection, skip the remaining steps.*

3. If steps 1 and 2 do not remove all the dust or dirt, the instrument may be spray washed using a solution of 75% isopropyl alcohol by doing steps 4 through 8.
4. Gain access to the parts to be cleaned by removing easily accessible shields and panels. (See page 4-7, *Removal and Installation Procedures.*)
5. Spray wash dirty parts with the isopropyl alcohol and wait 60 seconds for the majority of the alcohol to evaporate.
6. Use hot (120 °F to 140 °F) deionized water to thoroughly rinse them.
7. Dry all parts with low-pressure, deionized air.
8. Dry all components and assemblies in an oven or drying compartment using low-temperature (125 °F to 150 °F) circulating air.

Lubrication. There is no periodic lubrication required for this instrument.

Removal and Installation Procedures

This subsection contains information about removal and installation of all modules.

Preparation



WARNING. Before doing this or any other procedure in this manual, read the safety summaries found at the beginning of this manual. Also, to prevent possible injury to service personnel or damage to the instrument components, read *Installation, and Preventing ESD* in this section.

This subsection contains the following items:

- This preparatory information that you need to properly do the procedures that follow.
- List of tools required to remove and disassemble all modules.
- Procedures for removal and reinstallation of the modules.



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.

NOTE. Read *Equipment Required* for a list of the tools needed to remove and install modules in this instrument. (See Table 4-3 on page 4-7.) Read the cleaning procedure before disassembling the instrument for cleaning.

Equipment Required. Most modules in the instrument can be removed with a screwdriver handle mounted with a size T-15, Torx®screwdriver tip. All equipment required to remove and reinstall the modules is listed in the following table.

Table 4-3: Tools required for module removal

Item no.	Name	Description	General Tool number
1	Screwdriver handle	Accepts Torx-driver bits	620-440
2	T-10 Torx tip	Used for removing instrument screws. Torx-driver bit for T-10 size screw heads	640-235

Table 4-3: Tools required for module removal (cont.)

Item no.	Name	Description	General Tool number
3	T-15 Torx tip	Used for removing most instrument screws. Torx-driver bit for T-15 size screw heads	640-247
4	1/8 inch flat-bladed screwdriver	Screwdriver for unlocking cable connectors	Standard tool
5	#0 Phillips screwdriver	Screwdriver for removing small phillips screws, CDRW & hard drive	Standard tool
6	Angle-Tip Tweezers	Used to remove front panel knobs	Standard tool
7	3/16 inch open-end wrench	Used to remove nut posts	Standard tool
8	9/32 inch open-end wrench	Used to remove nut posts	Standard tool
9	MA-800G Soldering Aid	Used to remove the front panel trim	Standard tool

Module Removal **DPO7000 Series.** To remove a module, refer to the module locator. (See Figure 4-1.) You can also refer to the exploded view diagrams. (See page 5-2, *Using the Replaceable Parts List.*) To access the modules, refer to the module removal table. (See Table 4-4.)

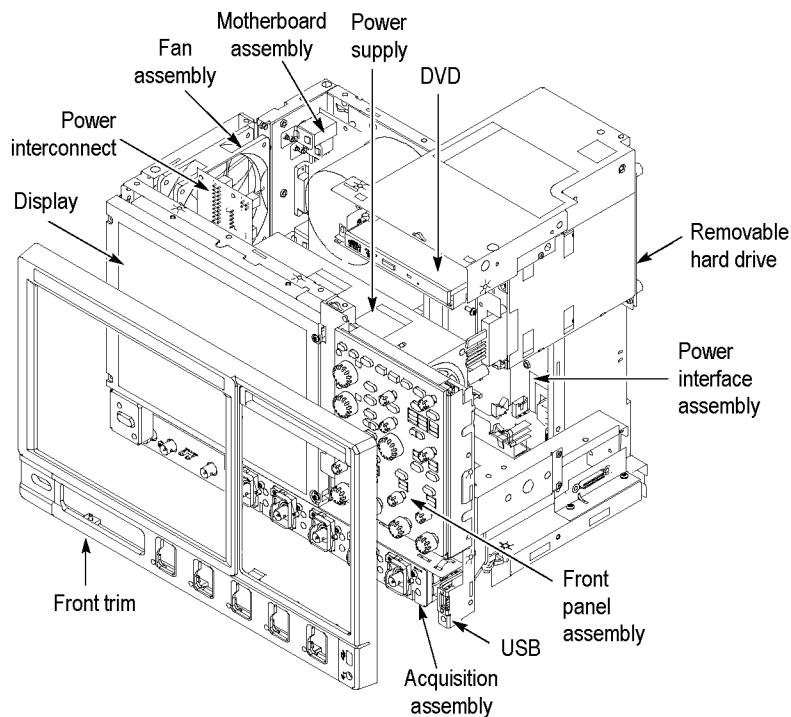


Figure 4-1: DPO7000 Series module locations

Table 4-4: DPO7000 Series module removal

	You must first remove					
	Trim & covers	DVD	Hard drive	Acquisition assembly	Power supply	Power interface
Front panel	X					
Display	X					
Front USB	X					
DVD	X					
Hard drive	X	X				
µATX motherboard	X			X		X
Power interface	X			X		
Acquisition assembly	X					
Power supply	X	X	X			
Power interconnect	X	X	X		X	
Fan assembly	X					
Power button	X					

DPO7000 and DSA7000 Series. To remove a module, refer to the module locator. (See Figure 4-2.) You can also refer to the exploded view diagrams. (See page 5-2, *Using the Replaceable Parts List.*) To access the modules, refer to the module removal table. (See Table 4-5.)

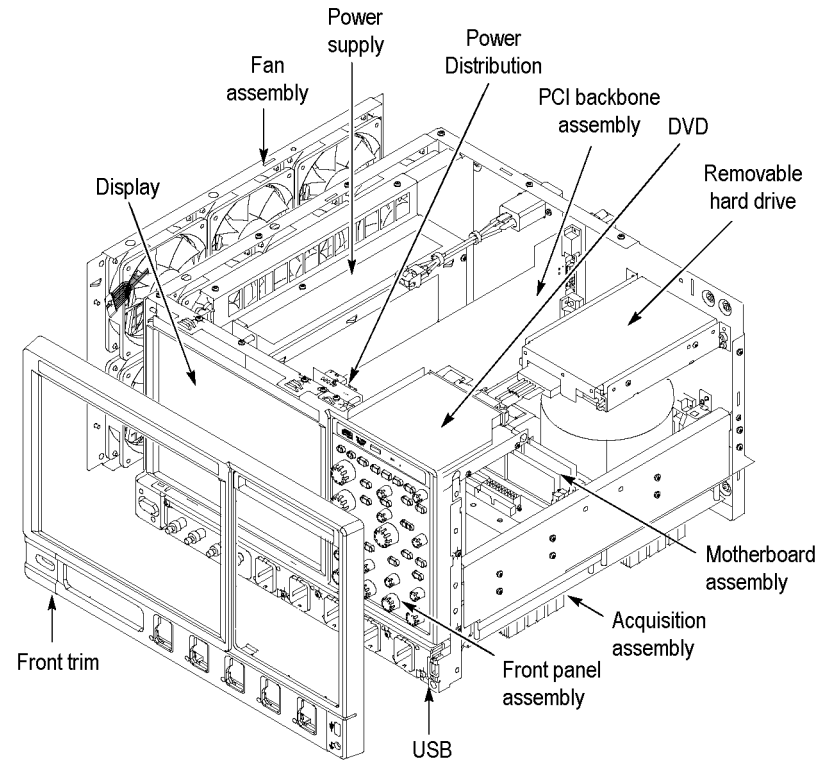


Figure 4-2: DPO7000 and DSA7000 Series module locations

Table 4-5: DPO70000 and DSA70000 Series module removal

	You must first remove						
	Trim & cosmetic covers	ESD (electrostatic discharge) Covers	DVD	Hard drive	Acquisition assembly	Power supply	PCI backbone
Front panel and Display	X						
Front USB	X	Bottom			X		
DVD	X	Top					
Hard drive cable and bracket	X	Top					
μATX motherboard	X	Top					X
PCI backbone	X	Top					
Acquisition assembly	X	Bottom					
Power supply	X	Top					
Power distribution	X	Both			X	X	X
Fan assembly	X						
Power button	X	Bottom					

μATX and Power Interface Removal, DPO7000 Series. Removal of the μATX motherboard and the Power Interface assembly is a complex process. To access or replace either one, remove both the μATX motherboard and the Power Interface board as an assembly. This procedure assumes the Acquisition board has been removed.

1. Working from the top of the instrument, unplug the cables connecting the μATX and Power interface boards to other parts of the instrument. Note where each cable connects.
2. Remove the screw securing the μATX board to the chassis on the right side of the instrument, near the TekLink connector.
3. Remove the eight screws securing the μATX board to the chassis through the back of the instrument.
4. Remove the three screws securing the μATX board to the chassis on the left side of the instrument.
5. Position the instrument on its back, with the bottom facing you.

6. Remove the three screws securing the Power Interface assembly to the chassis, along the top edge of the assembly.
7. Pull the μ ATX/Power Interface assembly out of the instrument. (See Figure 4-3.) It may take some force to pull it free. Use a soldering aid to pry the assembly free of the connectors near the top corners of the assembly, if necessary.

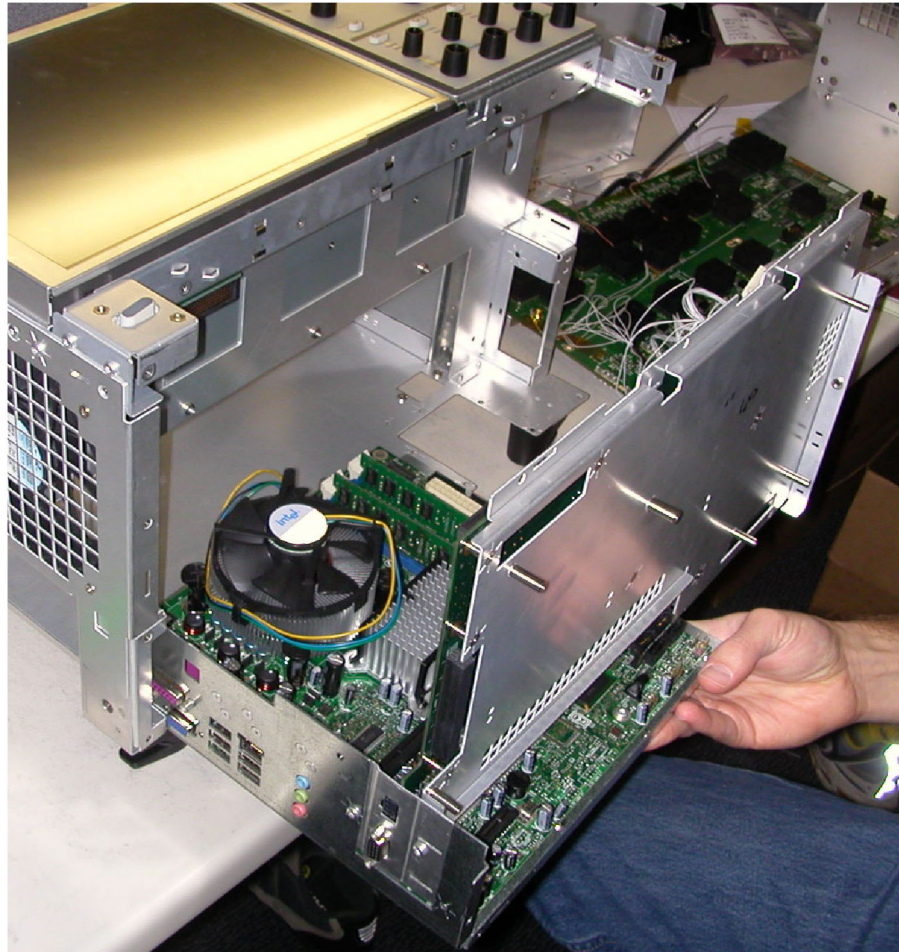


Figure 4-3: Removing the μ ATX/Power Interface assembly

8. Install the μ ATX/Power Interface assembly by performing these steps in reverse order.

Troubleshooting



CAUTION. Before performing this or any other procedure in this manual, read the General Safety Summary and Service Safety Summary found at the beginning of this manual.

To prevent possible injury to service personnel or damage to electrical components, please read information on Preventing ESD. (See page 4-1, Preventing ESD.)

This section contains information and procedures designed to help you isolate faults to a module.

This section requires that service personnel have the appropriate skills to work on this instrument, including PC troubleshooting and Microsoft Windows operating system skills. Details of PC and Windows operation and service are not in this manual.

For assistance, contact your local Tektronix Service Center.

Service Level

This subsection contains information and procedures designed to help you isolate faulty modules in the instrument. If a module needs to be replaced, follow the Removal and Installation Procedures located in this section.

Check for Common Problems

Use the following table to quickly isolate possible failures. The table lists problems and possible causes. The list is not exhaustive, but it may help you eliminate a problem that is quick to fix, such as a blown fuse or loose cable.

Table 4-6: Failure symptoms and possible causes

Symptom	Possible cause(s)
Instrument will not power on	<ul style="list-style-type: none"> ■ Power cord not plugged in ■ Faulty power supply ■ Faulty power interconnect board
Front panel light comes on (instrument powers on), but one or more fans will not operate	<ul style="list-style-type: none"> ■ Faulty fan cable ■ Defective fan assembly ■ Faulty power supply ■ Faulty μATX Motherboard ■ Faulty CPU ■ μATX Motherboard power problem

Table 4-6: Failure symptoms and possible causes (cont.)

Symptom	Possible cause(s)
Hard disk drive related symptoms	<ul style="list-style-type: none"> ■ Defective hard disk drive ■ Incorrect hard disk type selected in the BIOS setup ■ Replaceable hard disk drive not installed ■ Power supply failure ■ Corrupted BIOS module firmware, reinstall firmware ■ Loose cable ■ Corrupted OS image
DVD-ROM related symptoms	<ul style="list-style-type: none"> ■ Defective CDRW-ROM ■ Defective CDRW-ROM drive cable ■ Defective CDRW-ROM board ■ Incorrect CDRW-ROM configuration in the BIOS setup
Flat panel display blank	<ul style="list-style-type: none"> ■ Video adapter set to Integrated (connect monitor to μATX VIDEO port, enter BIOS, set Video Adapter = PCI) ■ BIOS setting not Advance > Video Configuration > Primary Video Adapter = PCI ■ Defective cable from display adapter board to power interface board ■ Defective cable from inverter board to display adapter board ■ Defective cable from inverter board to backlighting display lamp ■ Defective backlighting display lamp ■ Faulty display ■ Faulty power interface board ■ Faulty power interconnect board ■ Faulty inverter board ■ Faulty display adapter board
BIOS error messages	<ul style="list-style-type: none"> ■ Refer to the BIOS error message information.

Equipment Required You will need a digital voltmeter to check power supply voltages.

Fault Isolation Procedure Follow the primary troubleshooting tree for fault isolation. (See Figure 4-4.) This tree calls for you to run the diagnostics programs, and check for BIOS errors.

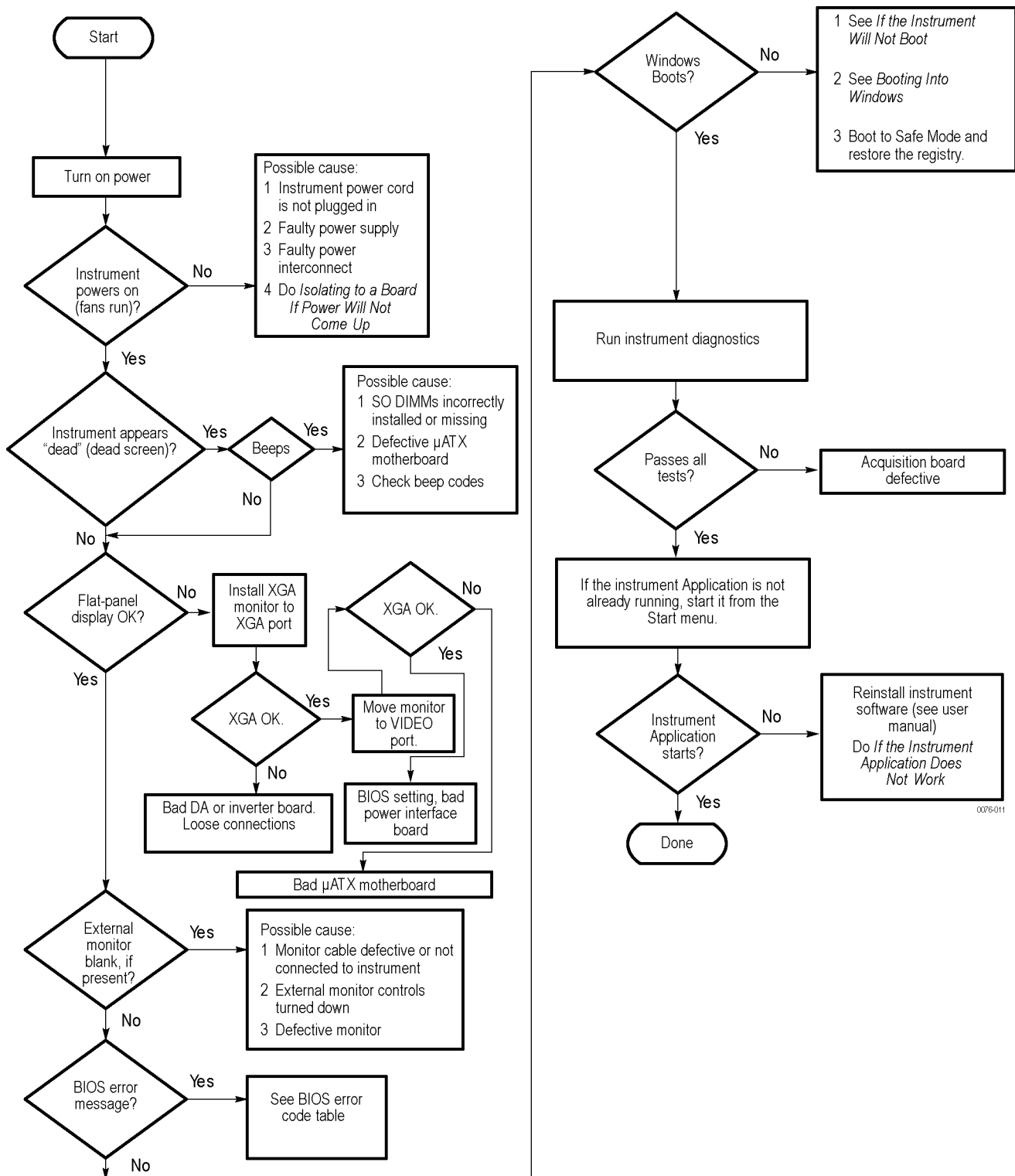
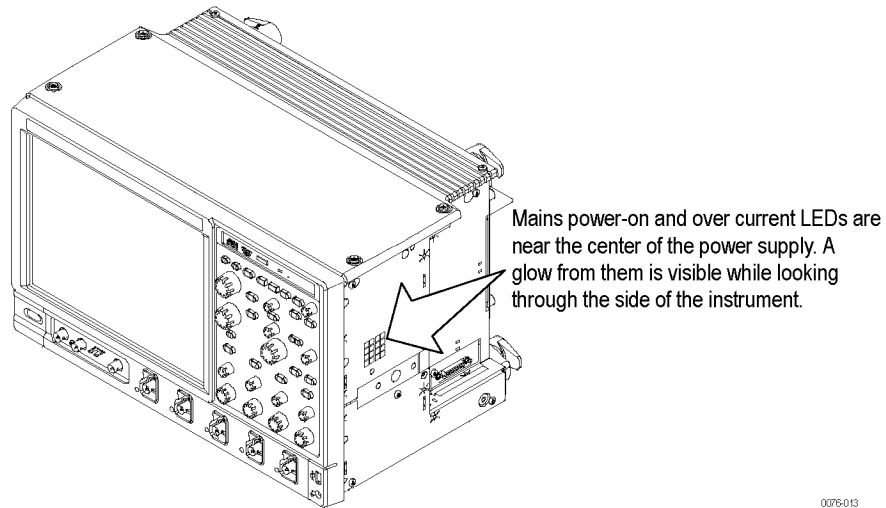


Figure 4-4: Primary troubleshooting tree

Isolating to a Board if Power Will Not Come Up, DPO7000 Series. If the instrument is in standby mode (plugged in, but not turned on), a red light is visible through the right side of the instrument. The location of the red light is shown in the following illustration. (See Figure 4-5.)

If the instrument is On, the red light should be off. A red light when the instrument is On means that there is a problem with one of the power supplies.



0076-013

Figure 4-5: Location of power-on and over-current LEDs

Table 4-7: Power-on and over-current LEDs

LED	Supply	Description
DS200	+15 VA	Green when supply is operating within tolerance.
DS201	+5 VA	Green when supply is operating within tolerance.
DS202	NA	Red if any of the supplies (+15VA, +5VA, +1.8VD, -15VA, and -5VA) are out of tolerance.
DS203	-5 VA	Green when supply is operating within tolerance.
DS204	-15 VA	Green when supply is operating within tolerance.
DS330	+1.8 VD	Green when supply is operating within tolerance.

Remove boards one at a time to locate a fault (the Display board, Acquisition board, Power interface board, and the μ ATX board). If this does not identify the problem, check the IEC power cable.

If this process did not correct the problem, replace the power supply.

Isolating to a Board if Power Will Not Come Up, DPO70000 and DSA70000 Series. Remove boards one at a time to locate a fault (the Display board, Acquisition board, Power distribution board, PCI backbone board, and the μ ATX board). If this does not identify the problem, check the IEC power cable.

If this process did not correct the problem, replace the power supply.

Checking the Power Supply Voltages. To check the power supply voltages, power on the instrument and connect the reference lead of a digital voltmeter to chassis ground, such as the top of the power supply.

Attach a 0.025 inch square pin to the probe tip of the other lead and insert it into a pin on one of the connectors. The following table shows the voltage you should find on each pin of J102 or J8 and J103 or J9. (See Figure 4-6 on page 4-20.)

Measure the power supply voltages with the voltmeter and compare each reading to the values listed in the table. If the voltages are within about 5% of the nominal voltages, your power supply is functional.

Table 4-8: Power supply voltages

Power interconnect board (J102) Power distribution board (J8)	Voltage	Power interconnect board (J103) Power distribution board (J9)	Voltage
Pins 1, 2, 11	+3.3 V	Pins 1, 2	COM
Pin 12	-12 V	Pins 3, 4	+12 V
Pin 10	+12 V		
Pin 18	-5 V*		
Pins 4, 6, 19, 20	+5 V		
Pin 9	+5 VSB		
Pins 3, 5, 7, 13, 15, 16, 17	COM		
Pin 14	PS-ON		
Pin 8	PW-OK		

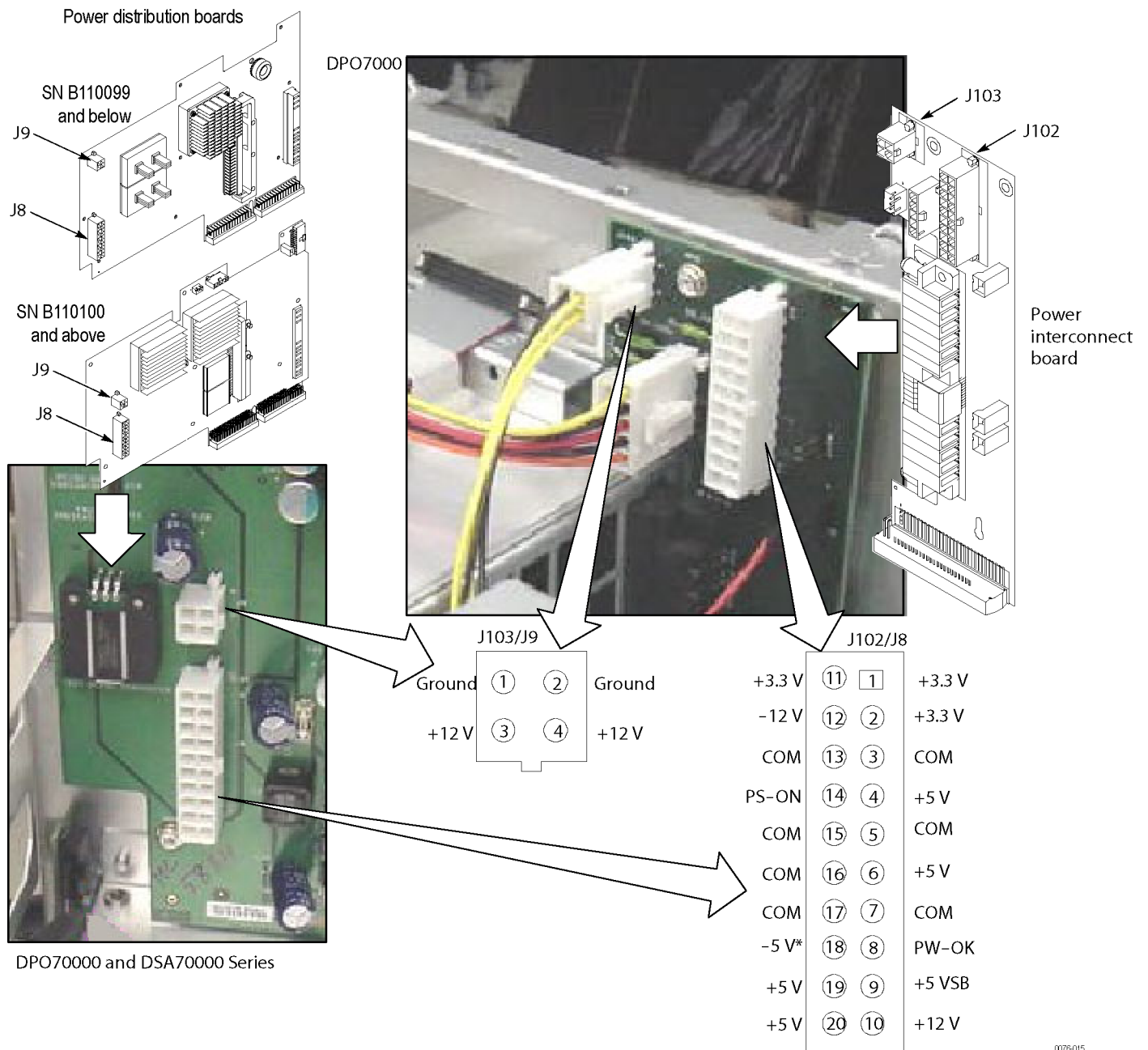


Figure 4-6: Power supply test points

If the Instrument Will Not Boot. If nothing is displayed, check that the display is turned on. At boot time, and while using an external monitor connected to the μ ATX external video port, press F2 to enter the BIOS setup. The Advanced Video Configuration menu lets you select PCI (LCD) or Integrated (the μ ATX VIDEO port on the rear panel). The lower XVGA port on the rear panel is the PCI video port (driven by the same video controller as the LCD).

If there is a display on the XVGA port, but not on the LCD, check the power supply voltages. If the voltages are okay but there is still no display on the LCD, replace the display assembly (LCD, lamps, and cable).

Booting Into Windows. If the instrument will not start, run the CMOS restore utility. (See page 4-39, *Update/Restore the μ ATX Board CMOS.*)

If the instrument starts, finds the hard disk, but locks up while displaying the Windows splash screen:

1. Select the Integrated video port using the setup menu.
2. Disable the buses and disconnect the PPC board by installing J111.
3. If the system boots (It will only boot to Windows, the instrument application will not run) to the external μ ATX video port, replace the Power Interface board.

If the Instrument Application Does Not Work. If the instrument starts Windows, but the instrument application does not work (the DPO Main graphic is displayed), check the following:

1. The application software.
2. The Acquisition board.
3. The Power Interface board (try removing and reinstalling the Power Interface board).
4. Did someone exit the application using Task Manager and then try to reenter the application without rebooting?
5. If the relays click, the acquisition is running.
6. On the Settings tab of the desktop properties, select Advanced and then the Performance tab. Hardware Acceleration must be set to Full for video merge to work. If you change the setting, restart.

Instrument Diagnostics

The primary diagnostics for the instrument are accessible through the oscilloscope application software. Procedures for running these diagnostics are described next.

The Instrument diagnostics check the basic functionality of the acquisition system at every power on.

The Instrument Diagnostics run after Windows has booted up and run its own set of system checks. If any failures occur at power on, a pop-up message indicates that a failure has occurred and provides a choice to go directly to the diagnostic results window to view the specific failures, or to ignore them and continue directly into the oscilloscope application.

Several diagnostic tests are available. (See Table 4-9 on page 4-23.) The table indicates which tests run automatically at power-up, and which tests are run manually.

The power on tests ensure that the hardware is installed and can be accessed by the software. The tests provide limited diagnostic information, and provide no performance information.

If there are no failures, you can view the results of the tests in the Instrument Diagnostics page, under the Utilities menu.

To run the instrument Diagnostics, do these steps:

1. Turn off all other applications.
2. From the menu bar, touch Utilities and then select Instrument Diagnostics; the Diagnostics control panel appears. (See Figure 4-7.)



Figure 4-7: Diagnostics control panel

Table 4-9: Diagnostic tests

Component	Group & test	Error codes	Power on	Manual	Instrument		
Processor	Memory	111 DRAMWalk1	✓		All		
		112 DRAMCell					
		113 DRAMMarch					
Registers	PCI	211 MIA	✓		All		
	Acquisition	221 ACL	✓		All		
		222 PCL					
		223 Preamp					
		224 TrkHld					
		225 ADC					
		226 DAC					
		227 Demux					
	Trigger	231 SBTL	✓		All		
		232 SGTL					
		233 TrigComp					
		234 CommTrig					
	Misc	241 FanCtrl	✓		All		
Acquisition	Demux	311 RunAB	✓		All		
		312 AcqDone					
		313 SysRdy					
		314 Interrupt					
		315 IdcLoSpeed					
		316 IdcHiSpeed					
		317 IdcAcqDataXfr					
		318 IdcDispDataXfr					
		DMA	321 PaDMA	✓			All
			322 IdeAcqDMA				
	Memory	331 MemData	✓		All		
		332 MemAddr	✓				
		333 MemSpeed		✓			
	Vertical	341 Preamp Inputs			All		
		342 TH Inputs	✓	✓			
		343 ADC Inputs		✓			
		344 ADC Outputs		✓			
		345 50 OhmOvld	✓	✓			
		346 LFCComp		✓			
	PLL	351 Clock Freq	✓		All		
	HFSource	361 SINE		✓	DPO7000 only		
		362 SINE33			All		
		363 SQUARE			All		
	AcqProcessor	371 SPI	✓		All		
		372 INT Line			All		
		373 Interrupt			All		
		374 RelayDrive			DPO/DSA70000 only		
		375 TWI			All		
		376 PrbInterrupts			All		
		377 TCpowerCtrl			DPO/DSA70000 only		
378 MAX517				All			

Table 4-9: Diagnostic tests (cont.)

Component	Group & test	Error codes	Power on	Manual	Instrument	
Trigger	Inputs	411 CH1	✓		All	
		412 CH2			All	
		413 CH3			All	
		414 CH4			All	
		415 Line			All	
		416 Video			DPO7000 only	
		417 Events			All	
		418 Serial			All	
	Outputs	421 523TrgOut	✓			DPO7000 only
		422 523Cpulnt	✓			DPO7000 only
		423 Fedge	✓			All
		424 Ftrig	✓			All
		425 TrigInfo		✓		All
	Timers	431 Delay			✓	All
		432 Delta				
		433 Holdoff				
		434 PostTrig				
		435 PreTrig				
436 Timeout						
TekLink	Topology	511 Signals ¹		✓	All	
	Trigger	521 Path ¹		✓	All	
	Reference	531 Path ¹		✓	All	

¹ 1 Requires external test fixture.

Software Updates

To update the application software, install the firmware CD in your instrument and follow the displayed instructions or the instructions that accompany the CD.

If you want to order a software update, contact your Tektronix service center. See *Contacting Tektronix* on the back of the title page.

After Repair

After removal and replacement of a module, you must perform the Performance Verification procedure, found in the instrument *Specifications and Performance Verification* manual, which was provided with the instrument. This manual is also available on the Tektronix Web site (www.tektronix.com/manuals).

If the instrument fails the Performance Verification tests, it must be returned to Tektronix for adjustment.

µATX BIOS Error Messages

When the µATX board powers on, the BIOS runs power-on self-tests (POST) to check the board. The BIOS writes error codes to location 80h and tries to write the codes to the display. If the error is fatal, the POST code indicates the last successful checkpoint reached. The following table lists the error messages that

are displayed by the BIOS. Another table lists the POST codes displayed by the BIOS. (See Table 4-12 on page 4-28.)

Once the display is enabled, errors are written to the display as text messages. These messages are always displayed unless the board is configured for silent startup or headless operation (no keyboard, mouse, or display).

Table 4-10: μ ATX BIOS error messages

Item no.	Error message	Description
1	GA20 Error	Error when switching to protected mode during the memory test.
2	Pri Master HDD Error, Pri Slave HDD Error Sec Master HDD Error, Sec Slave HDD Error	Could not read sector.
3	Pri Master Drive - ATAPI Incompatible PRI Slave Drive - ATAPI Incompatible Sec Master Drive - ATAPI Incompatible Sec Slave Drive - ATAPI Incompatible	Drive not an ATAPI device. Run setup, and make sure the device is set up correctly.
4	A: Drive Error	No response from the drive.
5	Cache Memory Bad	Memory may be bad.
6	CMOS Battery Low	Replace the battery.
7	CMOS Display Type Wrong	Check the setup to make sure the type is correct.
8	CMOS Checksum Bad	Run the setup to reset values.
9	CMOS Settings Wrong	Settings corrupted or the battery has failed.
10	CMOS Date/Time Not Set	Run the setup to correct values.
11	DMA Error	Error during read/write test of controller.
12	FDC Failure	Error while trying to access controller.
13	HDC Failure	Error while trying to access controller.
14	Checking NVRAM. . . .	NVRAM is being checked.
15	Update OK!	Invalid NVRAM has been updated.
16	Update Failed	Unable to update invalid NVRAM.
17	Keyboard Error	Make sure the keyboard is connected properly.
18	Keyboard/Interface Error	Keyboard test failed.
19	Memory Size Decreased	If no memory was removed, the memory may be bad.
20	Memory Size Increased	If no memory was added, the system may have a problem.
21	Memory Size Changed	If no memory was added or removed, the memory may be bad.
22	No Boot Device Available	Boot device not found.
23	Off Board Parity Error	Parity error occurred on an off-board card.
24	On Board Parity Error	Parity error occurred in on-board memory.
25	Parity Error	Error occurred in on-board memory at an unknown address.

Table 4-10: μ ATX BIOS error messages (cont.)

Item no.	Error message	Description
26	NVRAM/CMOS/PASSWORD cleared by Jumper	Turn off power and remove the jumper.
27	<CTRL_N> Pressed	CMOS is ignored and NVRAM is cleared. Enter Setup.

Table 4-11: 039-0173-xx and 065-0745-xx μ ATX POST codes

Item no.	Module	Displayed POST code	Description
1	Host Processor	10	Power-on initialization of the host processor (Boot Strap Processor)
		11	Host processor Cache initialization (including APs)
		12	Starting Application processor initialization
		13	SMM initialization
2	Chipset	21	Initializing a chipset component
3	Memory	22	Reading SPD from memory DIMMs
		23	Detecting presence of memory DIMMs
		24	Programming timing parameters in the memory controller and the DIMMs
		25	Configuring memory
		26	Optimizing memory settings
		27	Initializing memory, such as ECC init
		28	Testing memory
4	PCI Bus	50	Enumerating PCI busses
		51	Allocating resources to PCI bus
		52	Hot Plug PCI controller initialization
		53 - 57	Reserved for PCI Bus
5	USB	58	Resetting USB bus
		59	Reserved for USB
6	ATA/ATAPI/SATA	5A	Resetting PATA/SATA bus and all devices
		5B	Reserved for ATA
7	SMBus	5C	Resetting SMBUS
		5D	Reserved for SMBUS I went on Monday
8	Local Console	70	Resetting the VGA controller
		71	Disabling the VGA controller
		72	Enabling the VGA controller
9	Remote Console	78	Resetting the console controller
		79	Disabling the console controller
		7A	Enabling the console controller

Table 4-11: 039-0173-xx and 065-0745-xx μ ATX POST codes (cont.)

Item no.	Module	Displayed POST code	Description
10	Keyboard (PS2 or USB)	90	Resetting keyboard
		91	Disabling keyboard
		92	Detecting presence of keyboard
		93	Enabling keyboard
		94	Clearing keyboard input buffer
		95	Instructing keyboard controller to run Self Test (PS2 only)
11	Mouse (PS2 or USB)	98	Resetting mouse
		99	Disabling mouse
		9A	Detecting presence of mouse
		9B	Enabling mouse
12	Fixed Media	B0	Resetting fixed media
		B1	Disabling fixed media
		B2	Detecting presence of a fixed media (IDE hard drive detection etc.)
		B3	Enabling/configuring a fixed media
13	Removable media	B8	Resetting removable media
		B9	Disabling removable media
		BA	Detecting presence of a removable media (IDE, CD-ROM detection, etc.)
		BC	Enabling/configuring a removable media
14	BDS	Dy	Trying boot selection y (y=0 to 15)
15	PEI Core	E0	Started dispatching PEIMs (emitted on first report of EFI_SW_PC_INIT_BEGIN EFI_SW_PEI_PC_HANDOFF_TO_NEXT)
		E2	Permanent memory found
		E1, E3	Reserved for PEI/PEIMs
16	DXE Core	E4	Entered DXE phase
		E5	Started dispatching drivers
		E6	Started connecting drivers
17	DXE Drivers	E7	Waiting for user input
		E8	Checking password
		E9	Entering BIOS setup
		EA	TBD - Flash Update
		EB	Calling Legacy Option ROMs
		EE	TBD - Calling INT 19. One beep unless silent boot is enabled.
		EF	TBD - Unrecoverable Boot failure/S3 resume failure

Table 4-11: 039-0173-xx and 065-0745-xx μ ATX POST codes (cont.)

Item no.	Module	Displayed POST code	Description
18	Runtime Phase/EFI OS Boot	F4	Entering Sleep state
		F5	Exiting Sleep state
		F8	EFI boot service ExitBootServices () has been called
		F9	EFI runtime service SetVirtualAddressMap () has been called
		FA	EFI runtime service ResetSystem () has been called
19	PEIMs/Recovery	30	Crisis Recovery has initiated per User request
		31	Crisis Recovery has initiated by software (corrupt flash)
		34	Loading recovery capsule
		35	Handing off control to the recovery capsule
		3F	Unable to recover

Table 4-12: 039-0185-xx μ ATX POST codes

Item no.	Module	Displayed POST code	Description
1	Turn Off Chipset and CPU test	C0	OEM Specific-Cache control cache Processor Status (1FLAGS) Verification Tests the following processor status flags: Carry, zero, sign, overflow. The BIOS sets each flag and verifies. They are set, then turns each flag off and verifies if it is off. Read/Write/Verify all the CPU registers except SS, SP, and BP with data pattern FF and 00. RAM must be periodically refreshed to keep the memory from decaying. This function ensures that the memory refresh function is working properly.
2	Memory Presence	C1	First block memory detect OEM Specific-Test to size on-board memory Early chip set initialization Memory presence test OEM chip set routines Clear low 64K of memory Test first 64K memory
3	Early Memory Initialization	C2	OEM Specific-Board Initialization
4	Extend Memory DRAM select	C3	OEM Specific-Turn on extended memory Initialization Cyril CPU initialization Cache initialization

Table 4-12: 039-0185-xx μ ATX POST codes (cont.)

Item no.	Module	Displayed POST code	Description
5	Special Display Handling	C4	OEM Specific-Display/Video Switch Handling so that the Switch Handling display switch errors never occur
6	Early Shadow	C5	OEM specific-Early shadow enable for fast boot
7	Cache presence test	C6	External cache size detection
8	CMOS Check	CF	CMOS checkup
9	Spurious	B0	If interrupt occurs in protected mode.
10	Unclaimed NMI	B1	If unmasked NMI occurs, display Press F1 to disable NMI, F2 reboot.
11	Program Chip Set	BF	To program chipset from defaults values
12	Setup Pages	E1–EF	E1- Page 1, E2 - Page 2, and so on
	Force load Default to chipset	1	Chipset defaults program
	Reserved	2	
	Early Superio Init	3	Early Initialize of the super IO
	Reserved	4	
	Blank video	5	Reset the Video controller
	Reserved	6	
	Init KBC	7	Keyboard controller init
	KB test	8	Test the keyboard
	Reserved	9	
	Mouse Init	A	Initialize the mouse
	Onboard Audio init	B	Initialize the onboard audio controller if it exists
	Reserved	C	
	Reserved	D	
	Checksum Check	E	Check the integrity of the ROM, BIOS, and message
	Reserved	F	
	Auto detect EEPROM	10	Check the Flash type and copy flash write/erase routines to 0F000h segments
	Reserved	11	
	CMOS Check	12	Check CMOS Circuitry and reset CMOS
	Reserved	13	
	Chipset Default load	14	Program the chipset registers with CMOS values
	Reserved	15	
	Clock Init	16	Init onboard clock generator
	Reserved	17	
	Identify the CPU	18	Check the CPU ID and init L1/L2 cache

Table 4-12: 039-0185-xx μ ATX POST codes (cont.)

Item no.	Module	Displayed POST code	Description
12	Reserved	19	
	Reserved	1A	
	Setup Interrupt Vector Table	1B	Initialize first 120 interrupt vectors with SPURIOUS_INT_HDLR and initialize INT 00h-1Fh according to INT_TBL
	Reserved	1C	
	Early PM Init	1D	First step initialize if single CPU onboard
	Reserved	1E	
	Re-initial KB	1F	Re-init KB
	Reserved	20	
	HPM init	21	If support HPM, HPM get initialized here
	Reserved	22	
	Test CMOS Interface and Battery Status	23	Verifies CMOS is working correctly and detects bad battery. If failed, load CMOS defaults and load into chipset
	Reserved	24	
	Reserved	25	
	Reserved	26	
	KBC final Init	27	Final Initial KBC and setup BIOS data area
	Reserved	28	
	Initialize Video Interface	29	Read CMOS location 14h to find out type of video in use. Detect and Initialize Video Adapter.
	Reserved	2A	
	Reserved	2B	
	Reserved	2C	
	Video memory test	2D	Test video memory, write sign-on message to screen. Setup shadow RAM - Enable shadow according to Setup.
	Reserved	2E	Setup shadow RAM - Enable shadow according to Setup.
	Reserved	2F	
	Reserved	30	
	Reserved	31	
	Reserved	32	
	PS2 Mouse setup	33	Setup PS2 Mouse and reset KB
	Reserved	34	
	Test DMA Controller 0	35	Test DMA channel 0
	Reserved	36	
	Test DMA Controller 1	37	Test DMA channel 1

Table 4-12: 039-0185-xx μ ATX POST codes (cont.)

Item no.	Module	Displayed POST code	Description
12	Reserved	38	
	Test DMA Page Registers	39	Test DMA Page Registers.
	Reserved	3A	
	Reserved	3B	
	Test Timer Counter 2	3C	Test 8254 Timer 0 Counter 2.
	Reserved	3D	
	Test 8259-1 Mask Bits	3E	Verify 8259 Channel 1 masked interrupts by alternately turning off and on the interrupt lines.
	Reserved	3F	
	Test 8259-2 Mask Bits	40	Verify 8259 Channel 2 masked interrupts by alternately turning off and on the interrupt lines.
	Reserved	41	
	Reserved	42	
	Test Stuck 8259's Interrupt Bits Test 8259 Interrupt Functionality	43	Turn off interrupts then verify no interrupt mask register is on. Force an interrupt and verify the interrupt occurred.
	Reserved	44	
	Reserved	45	
	Reserved	46	
	Set EISA Mode	47	If EISA non-volatile memory checksum is good, execute EISA initialization. If not, execute ISA tests and clear EISA mode flag.
	Reserved	48	
	Size Base and Extended Memory	49	Size base memory from 256K to 640K and extended memory above 1MB.
	Reserved	4A	
	Reserved	4B	
	Reserved	4C	
	Reserved	4D	
	Test Base and Extended Memory	4E	Test base memory from 256K to 640K and extended memory above 1MB using various patterns. NOTE. This test is skipped in EISA mode and can be skipped with ESC key in ISA mode.
	Reserved	4F	
	USB init	50	Initialize USB controller
	Reserved	51	

Table 4-12: 039-0185-xx μ ATX POST codes (cont.)

Item no.	Module	Displayed POST code	Description
12	Memory Test	52	Test all memory of memory above 1MB using Virtual 8086 mode, page mode, and clear the memory
	Reserved	53	
	Reserved	54	
	CPU display	55	Detect CPU speed and display CPU vendor specific version string and turn on all necessary CPU features
	Reserved	56	
	PnP Init	57	Display PnP logo and PnP early init
	Reserved	58	
	Setup Virus Protect	59	Setup virus protect according to Setup
	Reserved	5A	
	Awdflash Load	5B	If required, will auto load Awdflash.exe in POST
	Reserved	5C	
	Onboard I/O Init	5D	Initializing onboard super IO
	Reserved	5E	
	Reserved	5F	
	Setup enable	60	Display setup message and enable setup functions
	Reserved	61	
	Reserved	62	
	Initialize & Install Mouse	63	Detect if mouse is present initialize mouse install interrupt vectors
	Reserved	64	
	PS2 Mouse special	65	Special treatment to PS2 Mouse port
	Reserved	66	
	ACPI init	67	ACPI sub-system initializing
	Reserved	68	
	Setup Cache Controller	69	Initialize cache controller
	Reserved	6A	
	Setup Entering	6B	Enter setup check and auto-configuration check up
	Reserved	6C	
	Initialize Floppy Drive & Controller	6D	Initialize floppy disk drive controller and any drives.
	Reserved	6E	
	FDD install	6F	Install FDD and setup BIOS data area parameters
	Reserved	70	

Table 4-12: 039-0185-xx μ ATX POST codes (cont.)

Item no.	Module	Displayed POST code	Description
12	Reserved	71	
	Reserved	72	
	Initialize Hard Drive & Controller	73	Initialize hard drive controller and any drives.
	Reserved	74	
	Install HDD	75	IDE device detection and install
	Reserved	76	
	Detect & Initialize Serial/Parallel	77	Initialize any serial and parallel ports (also game port)
	Reserved	78	
	Reserved	79	
	Detect & Initialize Math Coprocessor	7A	Initialize math coprocessor
	Reserved	7B	
	HDD Check for Write protection	7C	HDD check out
	Reserved	7D	
	Reserved	7E	
	POST error check	7F	Check POST error and display them and ask for user intervention
	Reserved	80	
	Reserved	81	
	Security Check	82	Ask password security (optional)
	Write CMOS	83	Write all CMOS values back to RAM and clear screen
	Pre-boot Enable	84	Enable parity checker Enable NMI, enable cache before boot.
	Initialize Option ROMs	85	Initialize any option ROMs present from C8000h to EFFFFh. NOTE. When FSCAN option is enabled, ROMs initialize from C8000h to F7FFFh.
	Reserved	86	
	Reserved	87	
	Reserved	88	
	Reserved	89	
	Reserved	8A	
	Reserved	8B	
	Reserved	8C	

Table 4-12: 039-0185-xx µATX POST codes (cont.)

Item no.	Module	Displayed POST code	Description
12	Reserved	8D	
	Reserved	8E	
	Reserved	8F	
	Reserved	90	
	Reserved	91	
	Reserved	92	
	Boot Medium detection	93	Read and store boot partition head and
	Final Init	94	Final init for last micro details before boot
	Special KBC patch	95	Set system speed for boot Setup NumLock status according to Setup
	Boot Attempt	96	Set low stack Boot via INT 19h.
	Boot	FF	
Quick POST Codes			
13	Init onboard device	65	Early Initialized the super IO Reset Video controller Keyboard controller init Test the Keyboard Initialized the mouse Onboard audio controller initialize if exist Check the intergraty of the ROM, BIOS, and message Check Flash type and copy flash write/erase routines to 0F000h segments Check CMOS Circuitry and reset CMOS Program the chipset registers with CMOS values Init onboard clock generator
	Early Sytem setup	66	Check the CPU ID and init L1/L2 cache Initialize first 120 interrupt vectors with SPURIOUS_INT_HDLR and initialize INT 00h-1Fh according to INT_TBL First step initialize if single CPU onboard. Re-init KB If support HPM, HPM get initialized here
	KBC and CMOS Init	67	Verifies CMOS is working correctly detects bad battery If failed, load CMOS defaults and load into chipset Final Initial KBC and setup BIOS data area.
	Video Init	68	Read CMOS location 14h to find out type of video in use. Detect and Initialize Video Adapter. Test video memory, write sign-on message to screen. Setup shadow RAM - Enable shadow according to Setup.
	8259 Init	69	Init 8259 channel 1 and mask IRQ 9

Table 4-12: 039-0185-xx μ ATX POST codes (cont.)

Item no.	Module	Displayed POST code	Description
13	Memory test	6A	Quick Memory Test
	CPU Detect and IO init	6B	Detect CPU speed and display CPU vendor specific version string and turn on all necessary CPU features Display PnP logo and PnP early init Setup virus protect according to Setup. If required, will auto load Awdflash.exe in POST Initializing onboard super IO
	Reserved	6C	
	Reserved	6D	
	Reserved	6E	
	Reserved	6F	
	Setup Init	70	Display setup message and enable setup functions Detect if mouse is present, initialize mouse, install interrupt vectors Special treatment to PS2 Mouse port ACPI sub-system initializing
	Setup Cache Controller	71	Initialize cache controller
	Install FDD	72	Enter setup check and auto-configuration check up Initialize floppy disk drive controller and any drives Install FDD and setup BIOS data area parameters
	Install HDD	73	Initialize hard drive controller and any drives IDE device detection and install Initialize any serial and parallel ports (also game port)
	Detect & Initialize Math Coprocessor	74	Initialize math coprocessor
	HDD Check for Write protection	75	HDD check out
	Reserved	76	
	Display POST error	77	Check POST error and display them and ask for user intervention Ask password security (optional)
	CMOS and Option ROM Init	78	Write all CMOS values back to RAM and clear screen Enable parity checker Enable NMI Enable cache before boot.

Table 4-12: 039-0185-xx µATX POST codes (cont.)

Item no.	Module	Displayed POST code	Description
13			Initialize any option ROMs present from C8000h to EFFFFh NOTE. When FSCAN option is enabled, ROMs initialize from C8000h to F7FFFh.
	Reserved	79	
	Reserved	7A	
	Reserved	7B	
	Reserved	7C	
	Boot Medium detection	7D	Read and store boot partition head and cylinders values in RAM
	Final Init	7E	Final init for last micro details before boot
	Special KBC patch	7F	Set system speed for boot Setup NumLock status according to Setup
	Boot Attempt	80	Set low stack Boot via INT 19h
	Boot	FF	
S4 POST Codes			
14	Early Chipset Init	5A	Early Initialized the super IO Reset Video controller Keyboard controller init Test the Keyboard Initilized the mouse
	Cmos Check	5B	Check CMOS Circuitry and reset CMOS
	Chipset default Prog	5C	Program the chipset registers with CMOS values. Init onboard clock generator
	Identify the CPU	5D	Check the CPU ID and init L1/L2 cache
	Setup Interrupt Vector Table	5E	Initialize first 120 interrupt vectors with SPURIOUS_INT_HDLR and INT 00h-1Fh according to INT_TBL First step initialize if single CPU Onboard Re-init KB If support HPM, HPM get initialized here.
	Test CMOS Interface and Battery status	5F	Verifies CMOS is working correctly detects bad battery. If failed, load CMOS defaults and load into chipset
	KBC final Init	60	Final Initial KBC and setup BIOS data area
	Initialize Video Interface	61	Read CMOS location 14h to find out type of video in use Detect and Initialize Video Adapter

Table 4-12: 039-0185-xx μ ATX POST codes (cont.)

Item no.	Module	Displayed POST code	Description
14	Video memory test	62	Test video memory, write sign-on message to screen Setup shadow RAM - Enable shadow according to Setup
	Setup PS2 mouse and test DMA	63	Setup PS2 Mouse and reset KB Test DMA channel 0
	Test 8259	64	Test 8259 channel 1 and mask IRQ 9
	Init Boot Device	65	Detect if mouse is present, initialize mouse, install interrupt vectors Special treatment to PS2 Mouse port ACPI sub-system initializing Initialize cache controller
	Install Boot Devices	66	Enter setup check and auto-configuration check up Initialize floppy disk drive controller and any drives Install FDD and setup BIOS data area Parameters Initialize hard drive
	Cache Init	67	Cache init and USB init
	PM init	68	PM initialization
	PM final Init and issue SMI	69	Final init Before resume
	Full on	FF	
	BootBlock POST Codes		
15	Base memory test	1	Clear base memory area (0000:0000–9000:ffffh)
	KB init	5	Initialized KBC
	Install interrupt vectors	12	Install int. vector (0-77) and initialized 00-1fh to their proper place
	Init Video	0D	Video initializing
	Init FDD	41	Scan floppy and media capacity for onboard super IO
	Boot	FF	Load boot sector

BIOS Beep Codes

When the μ ATX board powers on, a number of the BIOS checkpoints generate an audible 'beep' code on failure using the standard PC speaker (also routed through the board audio system). The beep codes are listed in the following table. Codes are also written to I/O port 80h and the video adapters. External ROM modules may issue a series of tones on error detection.

The BIOS generates one short beep if the power on self tests complete without error.

If your instrument does not contain a speaker, attach a speaker to the display-adaptor board square pins to hear the codes.

Table 4-13: 039-0173-xx and 065-0745-xx μ ATX beep codes

Item no.	Beep code	Error message
1	3 (long)	Memory error (beep freq = 1280 Hz)
2	4 (alternating hi-low)	Thermal warning (beep freq - high = 2 kHz, low = 1.5 kHz)
3	1	Refresh failure
4	2	Cannot reset parity
5	3	Memory failure, first 64 KB
6	4	Timer failure
7	5	Not used
8	6	Cannot toggle 8042 Gate A20
9	7	Exception interrupt error
10	8	Display memory R/W error
11	9	Not used
12	10	CMOS Shutdown register test error
13	11	Cache memory error

Table 4-14: 039-0185-xx μ ATX beep codes

Item no.	Beep code	Error message	Description
1	1 long, 2 short	Video adapter error	Bad video adapter or a bad connection to the video adapter. Ensure that the monitor cable is connected properly.
2	Repeating endless loop	Memory error	Check for improperly seated or missing memory.
3	1 long, 3 short	No video card or bad video RAM	Reseat or replace the video card.
4	High frequency beeps while running	Overheated CPU	Check the CPU fan for proper operation and check the case for proper air flow.
5	Repeating High/Low	CPU	Either the CPU is not seated properly or it is damaged. The problem can also be due to excess heat. Check the CPU fan or BIOS settings for proper fan speed.

Update/Restore the μ ATX Board CMOS

If the CMOS parameters become corrupted, restore the CMOS memory using one of the following procedures:



CAUTION. *Install only CMOS parameters from Tektronix. CMOS parameters from other manufactures may make your instrument inoperable.*

If you cannot restore the CMOS memory, replace the battery.

Restore the CMOS as follows:

1. Press the **F2** key during reboot to enter the BIOS SETUP UTILITY.
2. In the BIOS SETUP UTILITY, press the **F9** key.
3. Press the **Enter** key to Load Optimal Defaults.
4. In the BIOS SETUP UTILITY, press the **F10** key.
5. Press the **Enter** key to Save configuration changes and exit.

Installing an Authorization Key

If you add new options, you must install a new authorization key. Install the authorization key using the following procedure:

1. From the instrument menu bar, touch the **Utilities** menu, select **Option Installation**, and then touch **Continue**.
2. Enter the new key using an attached keyboard.
3. Touch **Continue**.

Hard Disk Drive Repair

Use the same procedures to maintain the instrument hard disk drive that you use to maintain a hard disk drive in a personal computer.

Using ScanDisk, you may be able to repair the disk without destroying data on the disk. To use ScanDisk, perform the following steps:

1. Remove the hard disk drive from the instrument.
2. Install the hard disk drive into a personal computer.
3. Power on the computer and run ScanDisk. Set Scandisk to perform a thorough surface scan and to automatically fix errors.
 - Using Microsoft Windows 2000: select My Computer\File\Properties\Tools\Error-checking
 - Using Microsoft MSDOS: enter SCANDISK *drive:* /SURFACE /AUTOFIX
4. If ScanDisk cannot repair the disk, format the hard disk drive using the File Utilities Format command. Format will destroy all data currently on the disk.
5. If reformatting the hard disk and reloading the software does not repair the disk, install a new hard disk drive.

Returning the Instrument for Service

When repacking the instrument for shipment, use the original packaging. If the packaging is unavailable or unfit for use, contact your local Tektronix representative to obtain new packaging.

Seal the shipping carton with an industrial stapler or strapping tape.

Before returning the instrument for service, contact the Service Center to get an RMA (return material authorization) number, and any return or shipping information you may need.

If the instrument is being shipped to a Tektronix Service Center, enclose the following information:

- The RMA number.
- The owner's address.
- Name and phone number of a contact person.
- Type and serial number of the instrument.
- Reason for returning.
- A complete description of the required service.

Mark the address of the Tektronix Service Center and the return address on the shipping carton in two prominent locations.

Replaceable Parts

Replaceable Parts

This section contains a list of the replaceable modules. Use this list to identify and order replacement parts.

Parts Ordering Information

Replacement parts are available through your local Tektronix field office or representative.

Changes to Tektronix products are sometimes made to accommodate improved components as they become available and to give you the benefit of the latest improvements. Therefore, when ordering parts, it is important to include the following information in your order:

- Part number
- Instrument type or model number
- Instrument serial number
- Instrument modification number, if applicable

If you order a part that has been replaced with a different or improved part, your local Tektronix field office or representative will contact you concerning any change in part number.

Module Servicing

Modules can be serviced by selecting one of the following three options. Contact your local Tektronix service center or representative for repair assistance.

Module Exchange. In some cases, you may exchange your module for a remanufactured module. These modules cost significantly less than new modules and meet the same factory specifications. For more information about the module exchange program, call 1-800-833-9200. Outside North America, contact a Tektronix sales office or distributor; see the Tektronix Web site (www.tektronix.com) for a list of offices.

Module Repair and Return. You may ship your module to us for repair, after which we will return it to you.

New Modules. You may purchase replacement modules in the same way as other replacement parts.

Using the Replaceable Parts List

This section contains a list of the replaceable mechanical and/or electrical components. Use this list to identify and order replacement parts. The following table describes each column in the parts list.

Parts list column descriptions

Column	Column name	Description
1	Figure & index number	Items in this section are referenced by figure and index numbers to the exploded view illustrations that follow.
2	Tektronix part number	Use this part number when ordering replacement parts from Tektronix.
3 and 4	Serial number	Column three indicates the serial number at which the part was first effective. Column four indicates the serial number at which the part was discontinued. No entry indicates the part is good for all serial numbers.
5	Qty	This indicates the quantity of parts used.
6	Name & description	An item name is separated from the description by a colon (:). Because of space limitations, an item name may sometimes appear as incomplete. Use the U.S. Federal Catalog handbook H6-1 for further item name identification.

Abbreviations Abbreviations conform to American National Standard ANSI Y1.1-1972.

Table 5-1: Replaceable parts External (< 4.0 GHz models)

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description
5-1	EXTERNAL PARTS				
-1	016-1966-00			1	POUCH; ACCESSORIES, BLACK, SNAP-ON
-2	200-4956-00			1	COVER, TOP; COSMETIC
-3	211-1224-00			8	SCREW, MACHINE; 6-32 X 0.312 L, PNH, STL CAD PLT, T15
-4	200-4954-00			1	COVER; EMI TOP, SAFETY CONTROLLED
-5	348-1861-00			4	FOOT; REAR, ASSY. W/ CORD WRAP, THERMOPLASTIC, SRY
-6	174-5227-00			1	CABLE ASSY; LINE FILTER; SAFETY CONTROLLED
-7	200-4958-00			1	COVER, LEFT; COSMETIC STINGRAY
-8	212-0232-00				SCREW, MACHINE: 8-32 X 1.125L, PNH, STL, BLACK OXIDE, T-20
-9	367-0528-00			1	HANDLE, CARRYING; DUAL DUROMETER MOLDED, POLYPROPYLENE, VINYL GRIP SECTION, SAFETY CONTROLLED
	407-4887-00			1	BRACKET: HANDLE BASE, PC/ABS ALLOY, BAYER BAYBLEND FR-110,TEK BLUE
-10	200-4955-00			1	COVER; EMI BOTTOM, SAFETY CONTROLLED
-11	101-0172-00			1	TRIM, ACQUISITION INSERT (VPI ONLY)
	101-0173-00			1	TRIM, ACQUISITION INSERT (HPI ONLY)
-12	200-4963-00			1	COVER, FRONT; PC/ABS ALLOY BAYBLEND
-13	335-1757-00			1	MARKER, IDENT; LABEL, IDENTIFICATION; (7354 ONLY)
	335-1520-00			1	MARKER,IDENT; LABEL,IDENTIFICATION; (7254 ONLY)
	335-1551-00			1	MARKER, IDENT; LABEL, IDENTIFICATION; (7104 ONLY)
	335-1552-00			1	MARKER, IDENT; LABEL, IDENTIFICATION; (7054 ONLY)
-14	101-0174-00			1	TRIM, DVD
-15	101-0171-00			1	TRIM RING; FR110, PC/ABS
-16	200-4957-00			1	COVER, RIGHT; COSMETIC STINGRAY
-17	355-0303-00			4	STUD.SNAP: 0.570 DIA, 0.165 THK, STAINLESS STEEL
-18	211-0721-00			4	SCREW,MACHINE; 6-32 X 0.375,PNH,STL,CDPL,T-15 TORX DR
-19	335-1517-00			1	LABEL, REAR, LEXAN, MOTHERBOARD TAPPEN, SAFETY CONTROLLED, 039-0173-xx
	335-2011-00				LABEL, REAR, LEXAN, MOTHERBOARD ADVANTECH AIMB-562, SAFETY CONTROLLED, 039-0185-xx

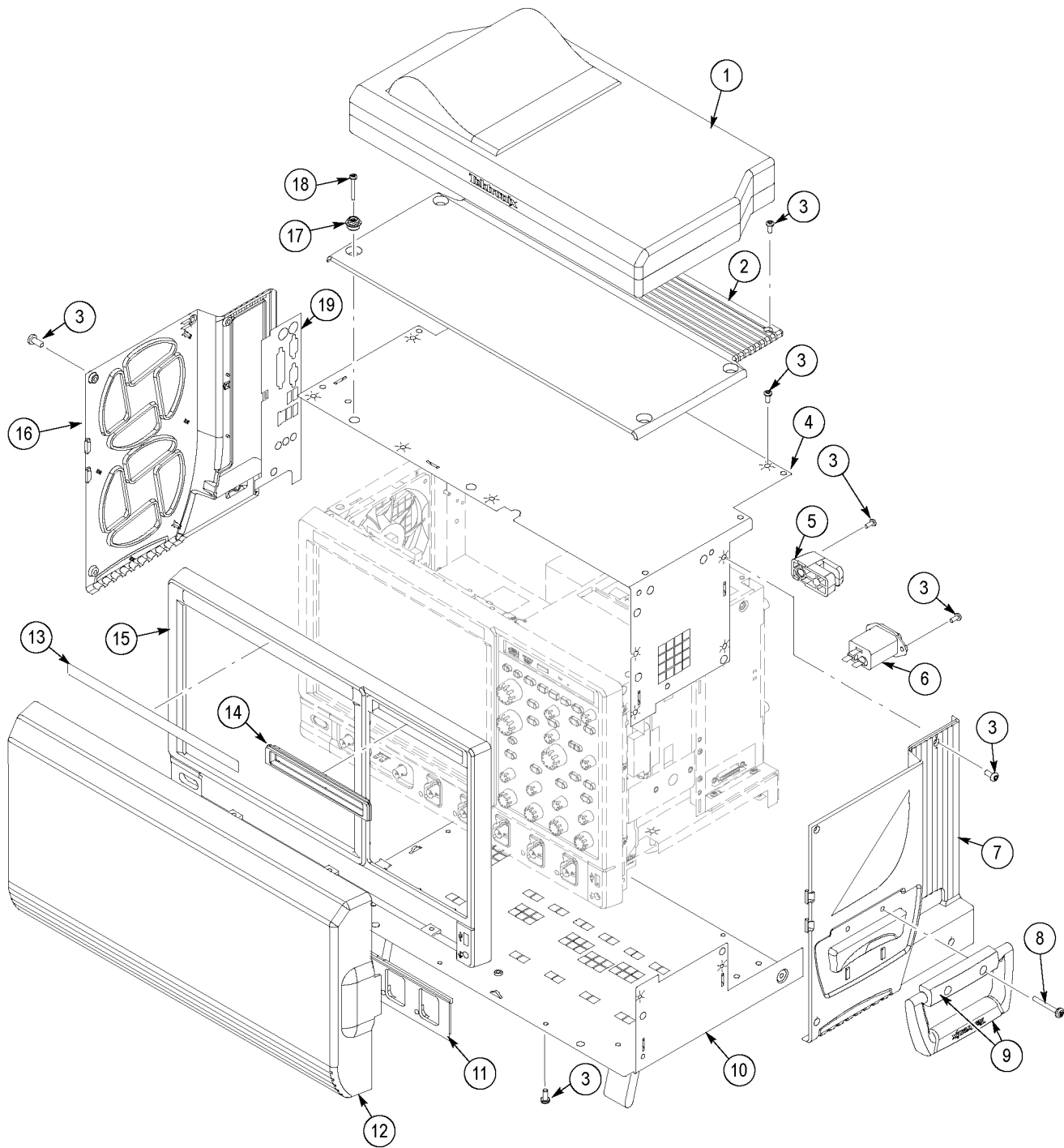


Figure 5-1: External parts (< 4.0 GHz models)

Table 5-2: Replaceable parts – Front panel and display (< 4.0 GHz models)

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description
5-2 and 5-3					FRONT PANEL AND DISPLAY
-1	174-5165-00			1	CABLE ASSY; POWER SWITCH
-2	211-1221-00			2	SCREW; M2.0 6-MM LONG PHILLIPS FLATHEAD ZINC-PLATED
-3	671-6107-00			1	CIRCUIT BOARD ASSY; USB
-4	211-1050-00			4	SCREW, MACHINE; 6-32 X 0.312 L, PNH, STL CAD PLT, T15
-5	174-5164-00			1	CA ASSY; USB 2.0
-6	065-0756-01			1	MODULAR ASSY, FRONT PANEL, TERMINATOR
-7	407-5140-00			1	BRACKET; TRIM, FRONT PANEL, SHEET METAL, SAFETY CONTROLLED
-8	065-0760-01			1	CIRCUIT BD ASSY; FRONT PANEL; TERMINATOR
-9	671-6062-00			1	CIRCUIT BD ASSY; FRONT PANEL ENCODER; TERMINATOR
-10	366-0859-01			1	ASSEMBLY, KNOB; 470 DIAMETER, SOFT TOUCH
-11	366-0860-01			1	ASSEMBLY, KNOB; .685 DIAMETER, SOFT TOUCH
-12	366-0861-01			1	ASSEMBLY, KNOB; .925 DIAMETER, SOFT TOUCH
-13	174-5162-00			1	CABLE ASSY; DISPLAY ADAPTER TO FRONT PANEL BOARD
-14	211-0747-00			8	SCREW, MACHINE; 6-32 X 0.188, PNH, STL, CDPL, T-15 TORX DR
-15	211-0721-00			4	SCREW, MACHINE; 6-32 X 0.375, PNH, STL, CDPL, T-15 TORX DR
-16	065-0742-00			1	MODULE ASSY; SERVICE REPLACEMENT, TOUCH PANEL W/ PACKAGING
-17	065-0766-01			1	MODULE ASSY; SERVICE REPLACEMENT, LCD, INTERCONNECT DISPLAY ADAPTER BOARD W/PACKAGING
-18	174-5160-00			1	CABLE ASSY; DISPLAY ADAPTER TO DISPLAY
-19	065-0746-01			1	POWER BUTTON ASSEMBLY

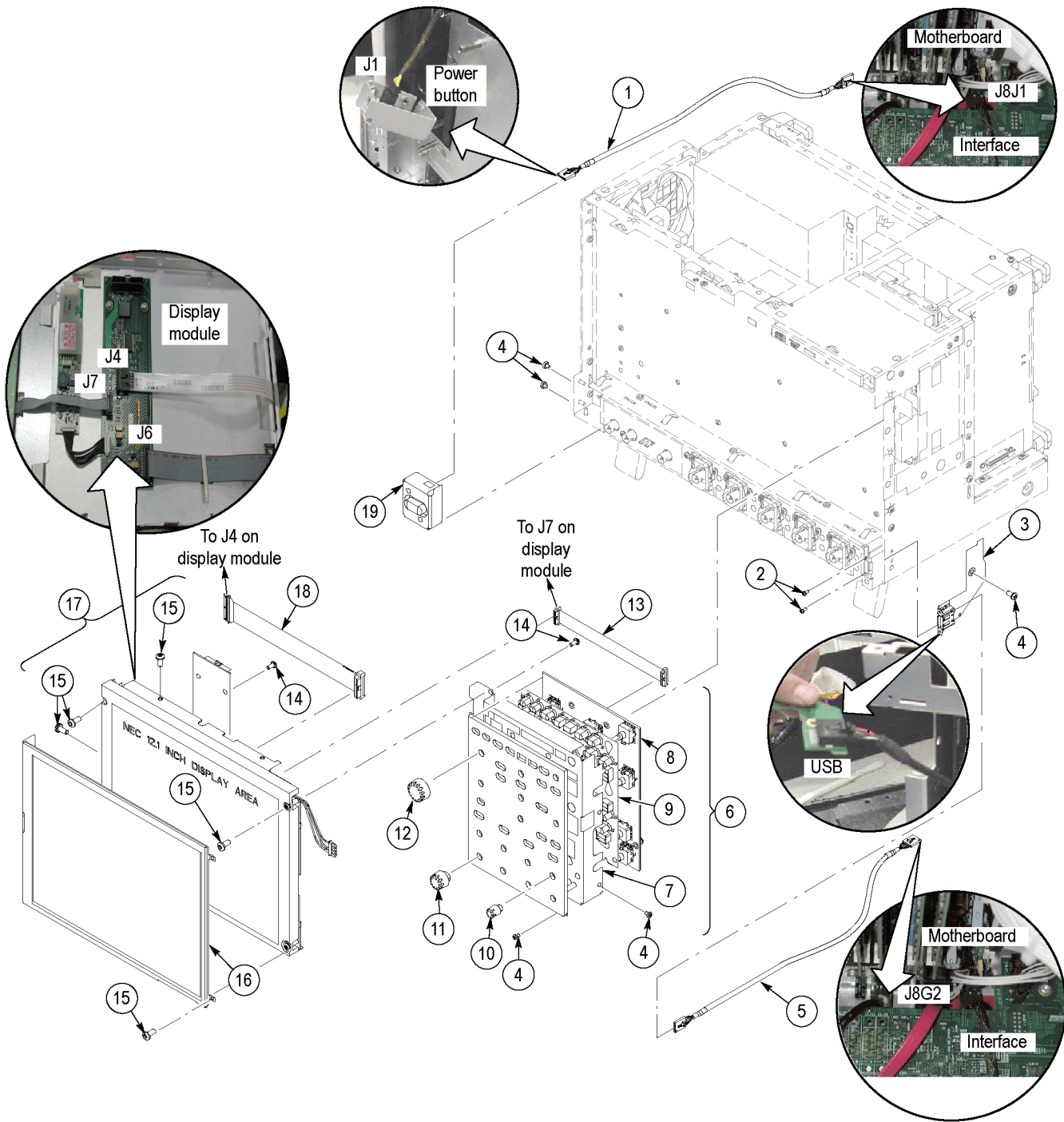


Figure 5-2: Front panel and display (< 4.0 GHz models) (B039999 and below)

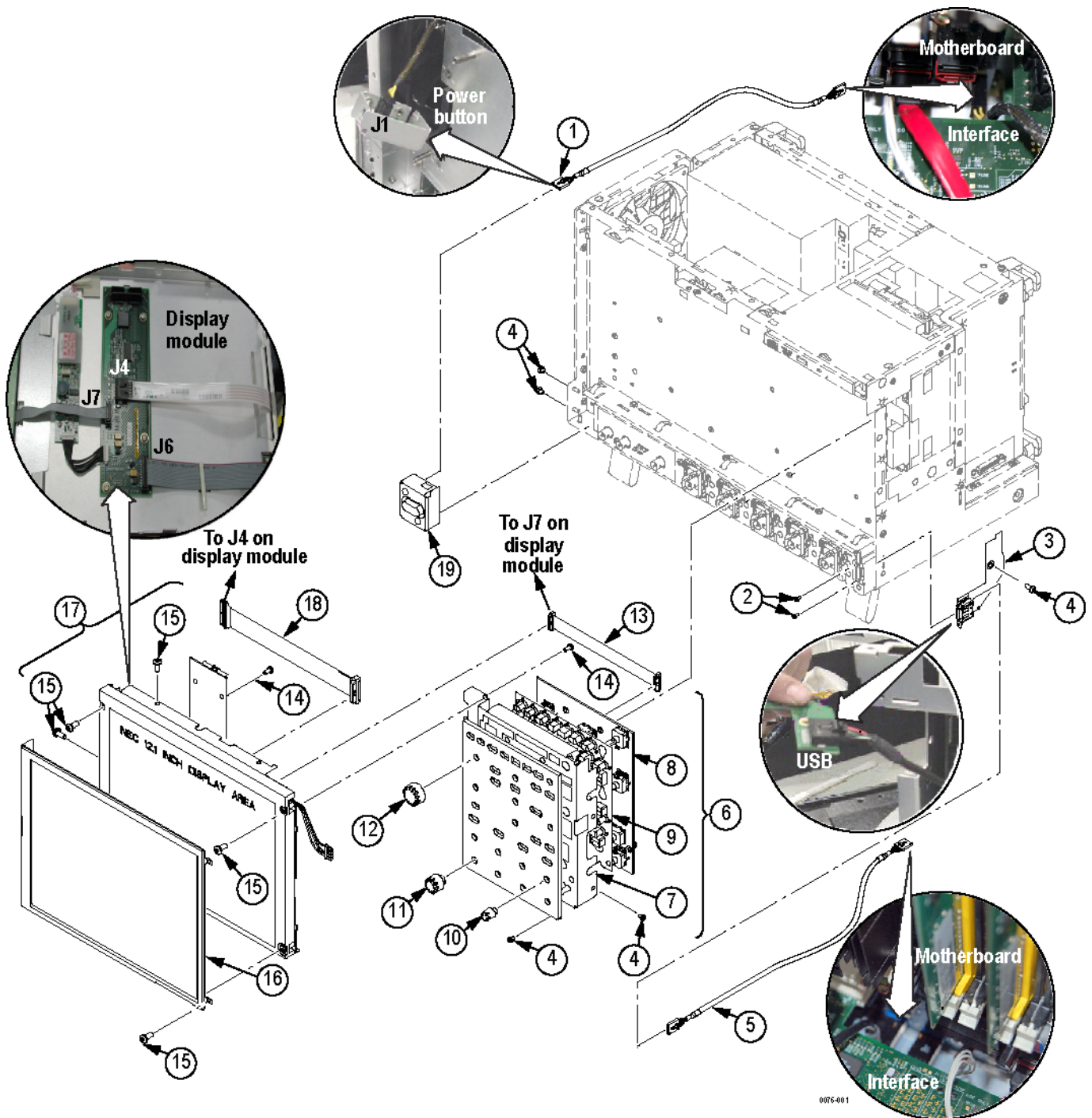


Figure 5-3: Front panel and display (< 4.0 GHz models) (B040000 and above)

Table 5-3: Replaceable parts – Power supply and fans (< 4.0 GHz models)

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description
5-4					POWER SUPPLY AND FANS
-1	119-6986-00			1	POWER SUPPLY; AC-DC; 460W; +3.3V 40A, +5V 34A, +12V 25A, -12V 1A, +5VSB, 2A; 90-264VAC, 47-63HZ; BERG 51624-XX001; 9.5X4.9X3.8IN, SAFETY CONTROLLED
-2	407-5089-00			1	BRACKET; LVPS, SAFETY CONTROLLED
-3	211-1050-00			9	SCREW, MACHINE; 6-32 X 0.312 L, PNH, STL CAD PLT, T15
-4	436-0421-00			1	TRAY, FAN; CHASSIS ASSY, W/FANS MOUNTED; STINGRAY, SAFETY CONTROLLED
-5	441-2435-00			1	CHASSIS; MAIN; AL, SAFETY CONTROLLED
-6	671-5930-00			1	CIRCUIT BD SUBASSY; POWER INTERCONNECT; 389-3659-00; WIRED; SAFETY CONTROLLED
-7	343-1584-00			4	CLAMP; WIRE ROUTING, 0.51 H X 0.625W, NYLON
-8	335-1515-00			1	LABEL, CHASSIS, REAR, SAFETY CONTROLLED

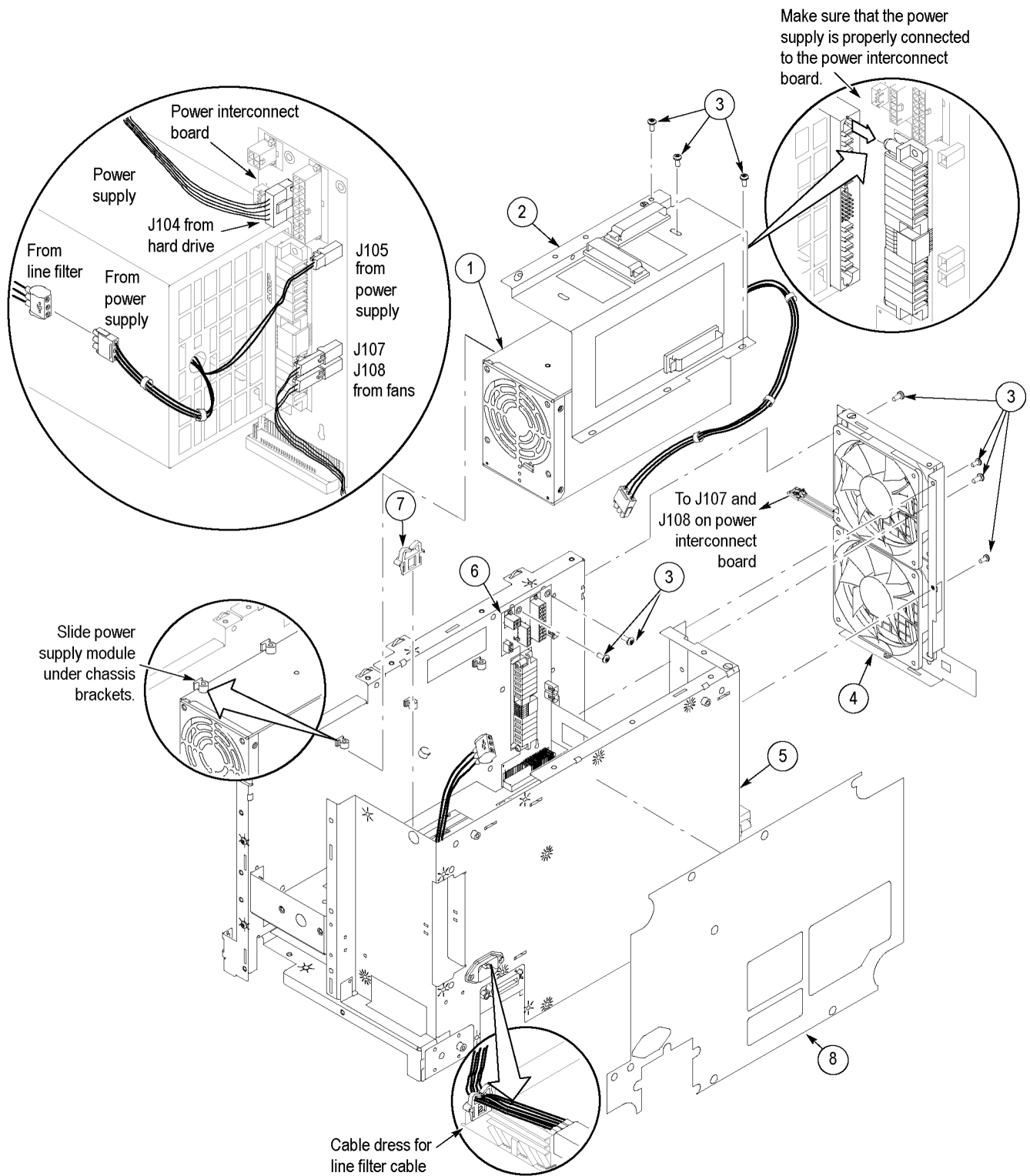


Figure 5-4: Power supply and fans (< 4.0 GHz models)

Table 5-4: Replaceable parts – μ ATX Motherboard (< 4.0 GHz models)

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description
5-5 and 5-6					
MOTHERBOARD					
-1	065-0745-02			1	SERVICE KIT FOR COMPUTER BOARD; CPU, FAN AND HEATSINK
	167-0657-00			1	PROCESSOR; PENTIUM 4, 3.4 GHZ INTERNAL CLOCK, 400MHZ BUS, SOCKET 478 COMPATIBLE, W/O FAN HEATSINK, JM80547PG0961M
-2	119-7333-00			1	FAN AND HEAT SINK WITH BRACKET
-3	119-7333-00			1	BRACKET WITH FAN AND HEATSINK
-4	167-0428-00	B010100	B010856	4	IC, MEMORY; 64M X 64, 512 MB DDR2, 1.8V, 3-3-3; MT16HTF6464AY-40E, DIMM240, DS1
	167-1048-00	B010857		2	IC, MEMORY; 128M X 64, 1 GB DDR2, 1.8V, 3-3-3; MT16HTF12864AY-40E, DIMM240, DS1
-5	174-5271-00			1	IDE CABLE WITH STRAIN RELIEF & PULL-TAB
-6	211-1050-00			5	SCREW, MACHINE; 6-32 X 0.312 L, PNH, STL CAD PLT, T15
-7	174-4797-00			1	CA ASSY; 20 PIN ATX POWER, SAFETY CONTROLLED
-8	174-4865-00			1	CA ASSY; 4 PIN P4 POWER, 9.5 L, MOTHER BOARD TO INTERFACE BOARD, SAFETY CONTROLLED
-9	441-2466-01			1	CHASSIS; REAR PROCESSOR, 039-0173-xx
	441-2551-00			1	ATX CHASSIS; MOTHERBOARD ADVANTECH AIMB-562, 039-0185-xx
	065-0826-00	B110100		1	DISK DRIVE ASSY;SERVICE REPLACEMENT, UNPROGRAMMED HARD DRIVE 1197524XX W/ PACKAGING;DSA/DPO70000B

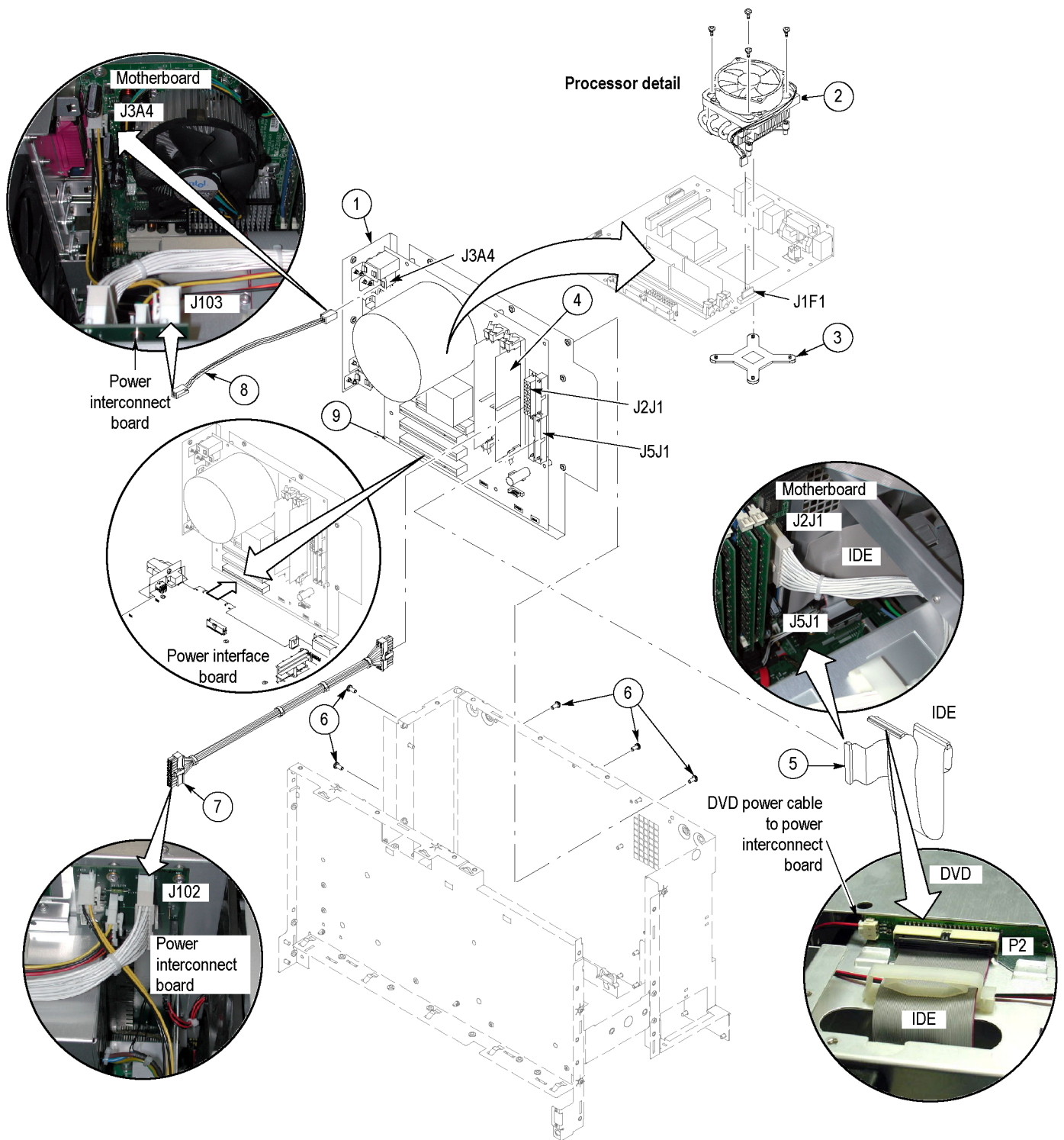


Figure 5-5: 039-0173-xx and 065-0745-xx μATX Motherboard (< 4.0 GHz models)

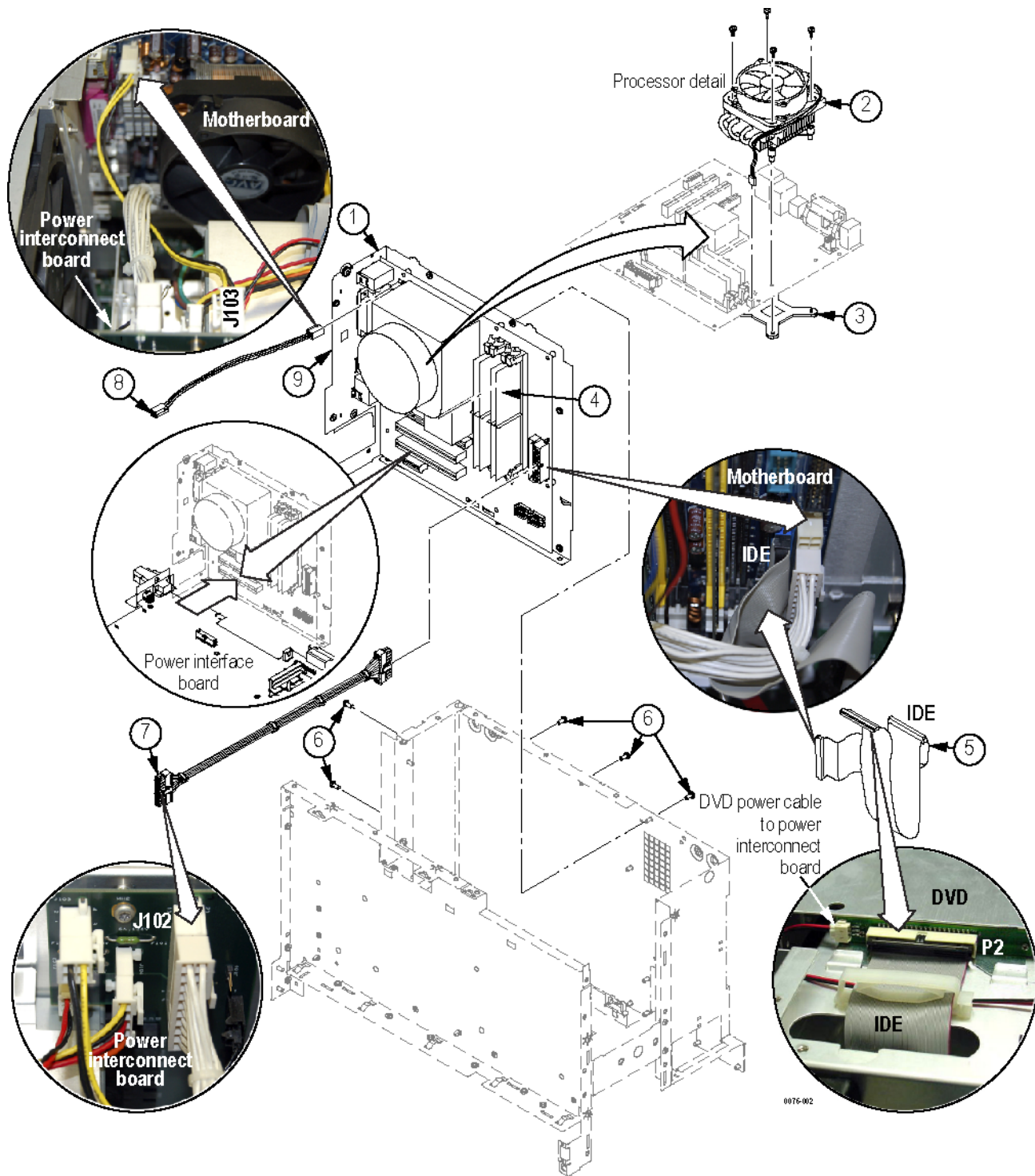


Figure 5-6: 039-0185-xx μATX Motherboard (< 4.0 GHz models)

Table 5-5: Replaceable parts – Power interface and Acquisition assemblies (< 4.0 GHz models)

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discontinued	Qty	Name & description
5-7 and 5-8					POWER INTERFACE AND ACQUISITION ASSEMBLIES
-1	211-1050-00			19	SCREW, MACHINE; 6-32 X 0.312 L, PNH, STL CAD PLT, T15
-2	174-5048-00			1	CA ASSY; USB 1.0
-3	174-5159-00			1	CABLE ASSY; GPIB
-4	335-1518-00			1	LABEL, TEKLINK, SAFETY CONTROLLED
-5	211-1206-00			2	SCREW, JACK; 2-56 ID X 4-40 OD., 188 HEX, SS
-6	671-5912-02			1	CIRCUIT BD ASSY; POWER INTERFACE, 6795912XX, TESTED; WIRED, 389352600
-7	213-1061-00			2	JACKSCREW; 6-32 X 0.320 EXT THD, M3.5 X 0.6-6 INT THD X 0.215L, GPIB, BLACK OXIDE, BULK PACK
-8	211-0747-00			3	SCREW, MACHINE; 6-32 X 0.188, PNH, STL, CDPL, T-15 TORX DR
-9	672-5819-54			1	CIRCUIT BD ASSY; ACQ, 6725819XX, TESTED; WIRED, (DPO7254 ONLY)
	672-6166-54			1	CIRCUIT BD ASSY; ACQ, 6726166XX, TESTED; WIRED, (DPO7104, DPO7054 ONLY)
	672-6172-50			1	CIRCUIT BD ASSY; ACQ, 6726172XX, TESTED; WIRED, (DPO7354 ONLY)
-10	441-2436-00			1	CHASSIS; ACQ; AL, SAFETY CONTROLLED
-11	174-5161-00			1	CABLE ASSY; DISPLAY ADAPTER TO PCI BOARD

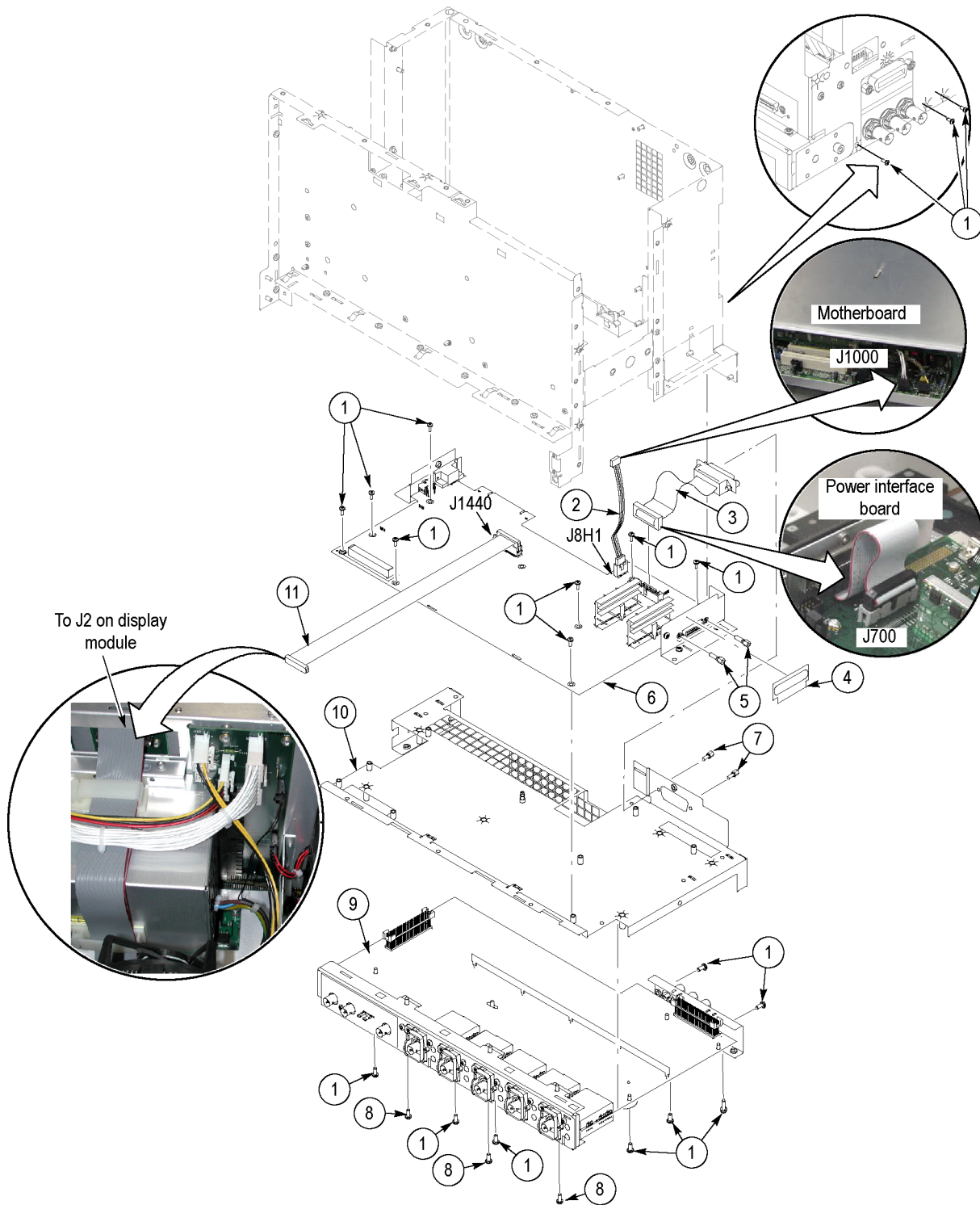


Figure 5-7: Power interface and Acquisition assemblies (< 4.0 GHz models) (B039999 and below)

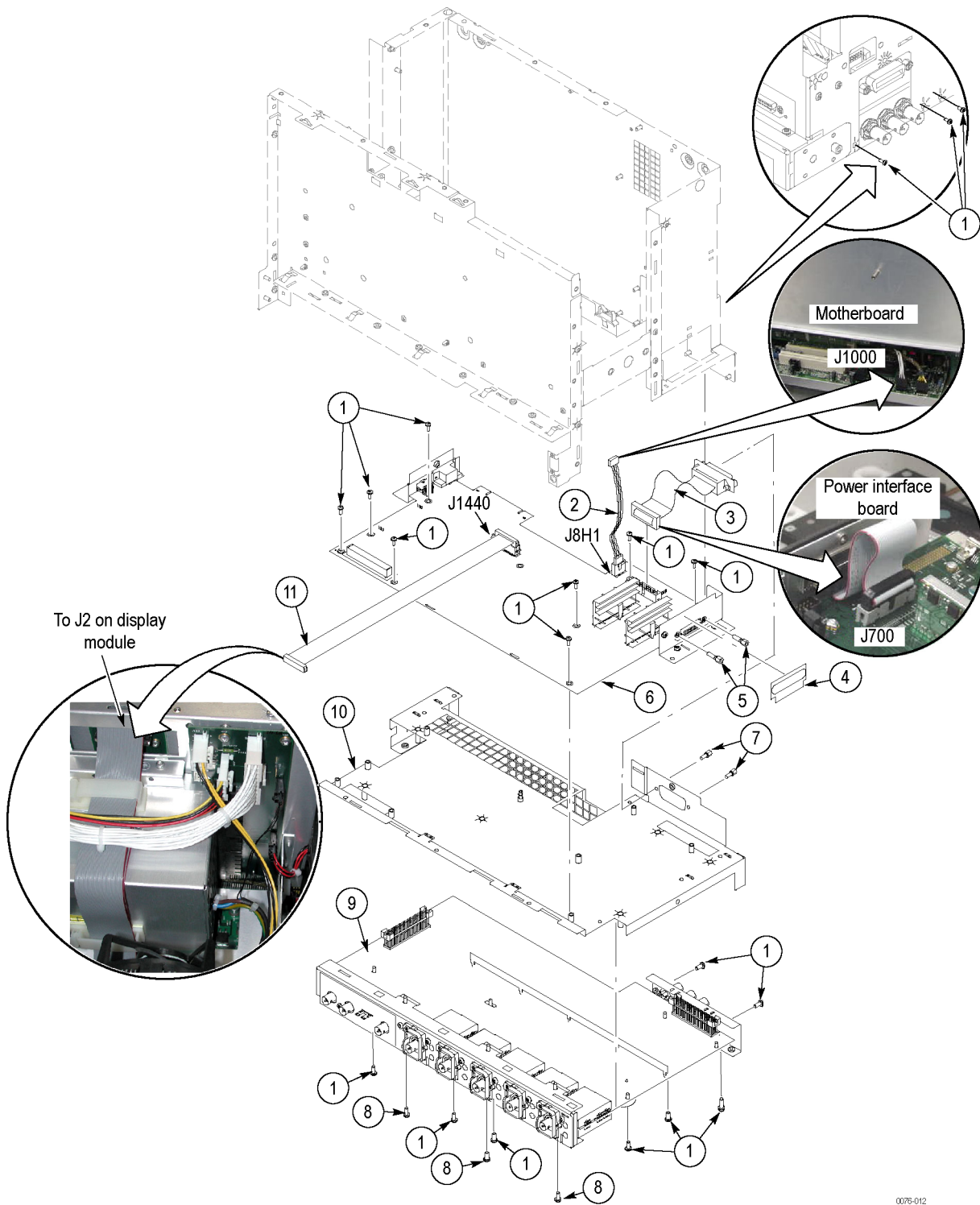


Figure 5-8: Power interface and Acquisition assemblies (< 4.0 GHz models) (B040000 and above)

Table 5-6: Replaceable parts – Drives (< 4.0 GHz models)

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description
5-9 and 5-10					DRIVES
-1	065-0744-00			1	DISK DRIVE ASSY; SERVICE REPLACEMENT W/O SOFTWARE, W/ PACKAGING
-2	211-1050-00			11	SCREW, MACHINE; 6-32 X 0.312 L, PNH, STL CAD PLT, T15
-3	407-5069-00			1	BRACKET, RHDD; SATA COMBO CABLE, 3.5 INCH REMOVABLE HARD DISK DRIVE RECEPTACLE
-4	174-5169-00			1	CABLE ASSY; SATA COMBO, HARD DRIVE CABLE
-5	679-5915-00			1	CKT BD SUBASSY; DVD-CD/RW ADAPTER, UNTESTED, 389-3689-00 WIRED
-6	129-1618-00			1	SPACER; DVD-CD/RW SLIMLINE DRIVE ADAPTER, PLASTIC
-7	065-0666-02			1	DISK DRIVE; OPTICAL, 644MB, CD-RW/DVD ROM, COMBO, 16.7 MB/SEC, IDE/ATAPI; DW-224E-C93, SAFETY CONTROLLED
-8	211-0950-00			3	SCREW, MACHINE; M2X.4X3L, PHL, PNH, STL NI PL
-9	407-5156-00			1	BRACKET, DVD-CD/RW, COMBO; ADAPTER FOR DVD-CD/RW, COMBO, SLIMLINE
-10	174-5017-00			1	CABLE ASSEMBLY; DVD POWER

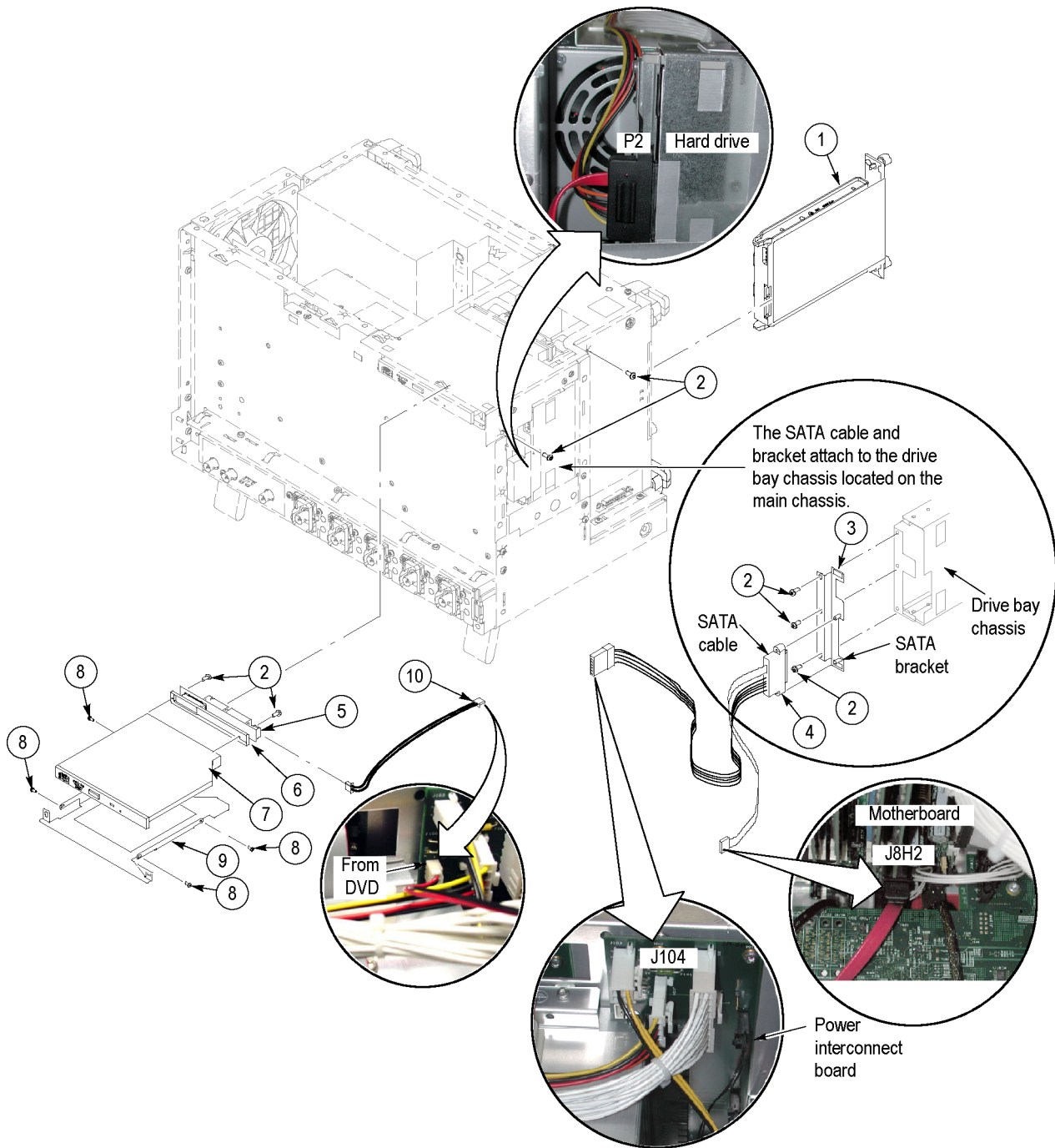


Figure 5-9: Drives (< 4.0 GHz models) (B059999 and below)

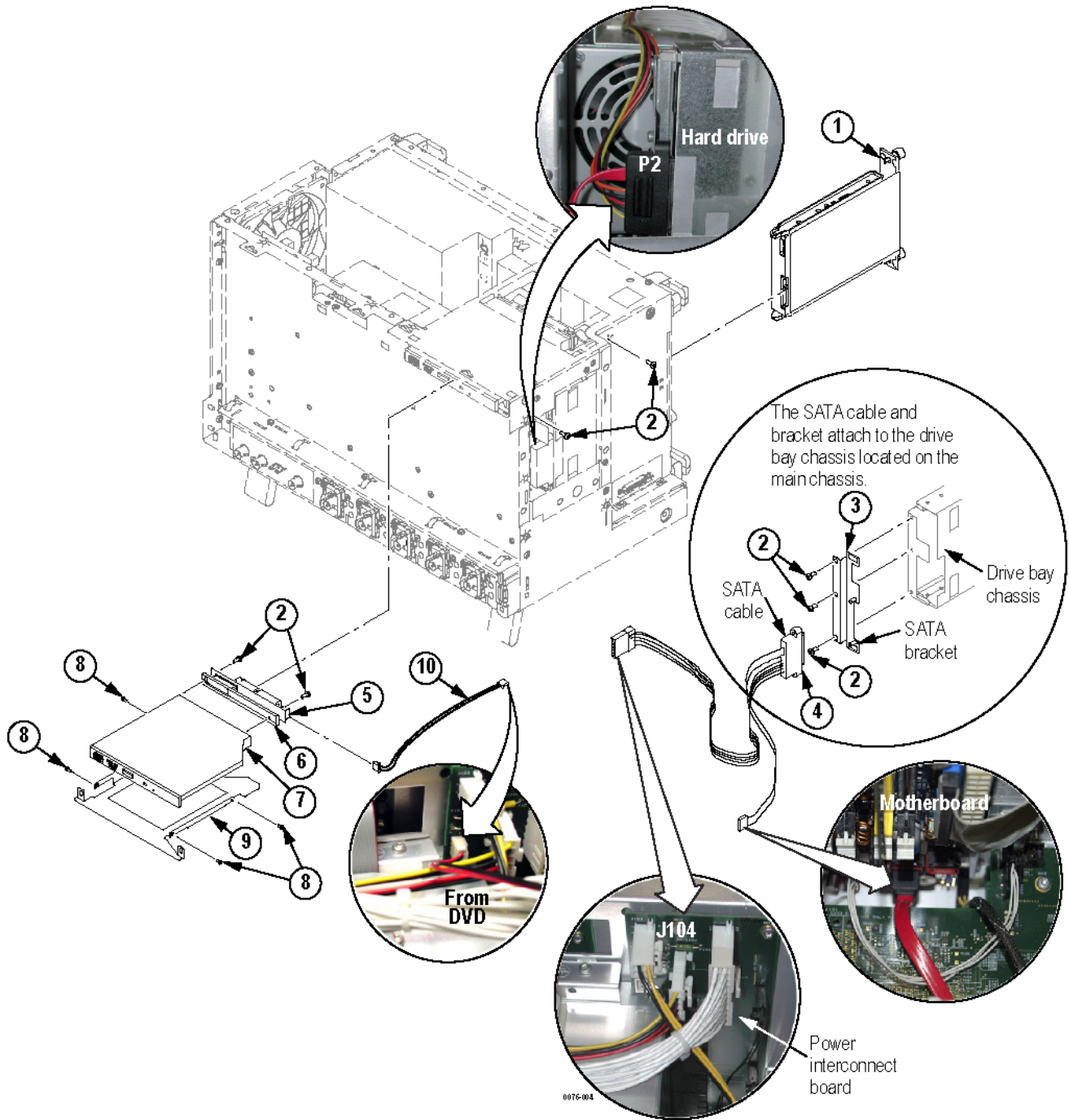


Figure 5-10: Drives (< 4.0 GHz models) (B060000 and above)

Table 5-7: Replaceable parts – Standard accessories (< 4.0 GHz models)

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description																											
STANDARD ACCESSORIES																																
See Description				1	CABLE ASSY, POWER																											
					<table border="1"> <thead> <tr> <th><i>Option</i></th> <th><i>Country</i></th> <th><i>P/N</i></th> </tr> </thead> <tbody> <tr> <td>A0</td> <td>N. AMERICA</td> <td>161-0066-00</td> </tr> <tr> <td>A1</td> <td>UNIV EURO</td> <td>161-0104-06</td> </tr> <tr> <td>A2</td> <td>UK</td> <td>161-0104-07</td> </tr> <tr> <td>A3</td> <td>AUSTRALIA</td> <td>161-0104-05</td> </tr> <tr> <td>A5</td> <td>SWITZERLAND</td> <td>161-0167-00</td> </tr> <tr> <td>A10</td> <td>CHINA</td> <td>161-0306-00</td> </tr> <tr> <td>A11</td> <td>INDIA</td> <td>161-0324-00</td> </tr> </tbody> </table>	<i>Option</i>	<i>Country</i>	<i>P/N</i>	A0	N. AMERICA	161-0066-00	A1	UNIV EURO	161-0104-06	A2	UK	161-0104-07	A3	AUSTRALIA	161-0104-05	A5	SWITZERLAND	161-0167-00	A10	CHINA	161-0306-00	A11	INDIA	161-0324-00			
<i>Option</i>	<i>Country</i>	<i>P/N</i>																														
A0	N. AMERICA	161-0066-00																														
A1	UNIV EURO	161-0104-06																														
A2	UK	161-0104-07																														
A3	AUSTRALIA	161-0104-05																														
A5	SWITZERLAND	161-0167-00																														
A10	CHINA	161-0306-00																														
A11	INDIA	161-0324-00																														
See Description				1	QUICKSTART USER MANUAL																											
					<table border="1"> <thead> <tr> <th><i>Option</i></th> <th><i>Language</i></th> <th><i>P/N</i></th> </tr> </thead> <tbody> <tr> <td>L0</td> <td>ENGLISH</td> <td>071-1733-XX</td> </tr> <tr> <td>L1</td> <td>FRENCH</td> <td>071-1734-XX</td> </tr> <tr> <td>L3</td> <td>GERMAN</td> <td>071-1735-XX</td> </tr> <tr> <td>L5</td> <td>JAPANESE</td> <td>071-1736-XX</td> </tr> <tr> <td>L7</td> <td>CHINESE, S</td> <td>071-1738-XX</td> </tr> <tr> <td>L8</td> <td>CHINESE, T</td> <td>071-1743-XX</td> </tr> <tr> <td>L9</td> <td>KOREAN</td> <td>071-1737-XX</td> </tr> <tr> <td>L10</td> <td>RUSSIAN</td> <td>071-1739-XX</td> </tr> </tbody> </table>	<i>Option</i>	<i>Language</i>	<i>P/N</i>	L0	ENGLISH	071-1733-XX	L1	FRENCH	071-1734-XX	L3	GERMAN	071-1735-XX	L5	JAPANESE	071-1736-XX	L7	CHINESE, S	071-1738-XX	L8	CHINESE, T	071-1743-XX	L9	KOREAN	071-1737-XX	L10	RUSSIAN	071-1739-XX
<i>Option</i>	<i>Language</i>	<i>P/N</i>																														
L0	ENGLISH	071-1733-XX																														
L1	FRENCH	071-1734-XX																														
L3	GERMAN	071-1735-XX																														
L5	JAPANESE	071-1736-XX																														
L7	CHINESE, S	071-1738-XX																														
L8	CHINESE, T	071-1743-XX																														
L9	KOREAN	071-1737-XX																														
L10	RUSSIAN	071-1739-XX																														
	119-7054-00			1	POINTER ASSY; MOUSE, MICROSOFT BLACK OPTICAL WHEELED, USB AND PS2																											
	020-2659-00			1	OS RESTORE CD AND INSTRUCTIONS																											
	020-2693-00			1	PRODUCT SW CD AND INSTRUCTIONS																											
	067-0405-00			1	PROBE CALIBRATION AND DESKEW FIXTURE																											
	P6139A			4	P6139A 500 MHZ, 10X PASSIVE PROBES (DPO7054 ONLY)																											

Table 5-8: Replaceable parts – External 1 (≥ 4.0 GHz models)

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description
5-11	EXTERNAL PARTS				
-1	016-1441-01			1	ACCESSORY POUCH; BLACK CORDURA
-2	200-5029-00	B010100	B110099	1	COVER, TOP; COSMETIC
	200-5065-00	B110100		1	COVER, TOP; COSMETIC
-3	211-1224-00			8	SCREW, MACHINE; 6-32 X 0.375, PNH, STL, CDPL, T-15
-4	355-0298-00			1	STUD.SNAP; 0.570 DIA, 0.165 THK, STAINLESS STEEL
-5	200-4937-00	B010100	B110099	1	COVER; EMI TOP
	200-5066-00	B110100		1	COVER; EMI TOP
-6	211-1050-00			14	SCREW, MACHINE; 6-32 X 0.312 L, PNH, STL CAD PLT, T15
-7	348-1859-00			4	FOOT; REAR, W/ CORD WRAP, THERMOPLASTIC
-8	101-0173-01			1	TRIM, ACQUISITION INSERT
-9	101-0171-00			1	TRIM RING; FR110, PC/ABS
-10	200-4963-00			1	COVER, FRONT; PC/ABS ALLOY BAYBLEND
-11	101-0174-00			1	TRIM, DVD
-12	335-1628-00	B010100	B110099	1	MARKER, IDENT; DPO70404
	335-1629-00	B010100	B110099		MARKER, IDENT; DPO70604
	335-1630-00	B010100	B110099		MARKER, IDENT; DPO70804
	335-1680-00	B010100	B110099		MARKER, IDENT; DPO71254
	335-1681-00	B010100	B110099		MARKER, IDENT; DPO71604
	335-1682-00	B010100	B110099		MARKER, IDENT; DPO72004
	335-1631-00	B010100	B110099		MARKER, IDENT; DSA70404
	335-1632-00	B010100	B110099		MARKER, IDENT; DSA70604
	335-1633-00	B010100	B110099		MARKER, IDENT; DSA70804
	335-1683-00	B010100	B110099		MARKER, IDENT; DSA71254
	335-1684-00	B010100	B110099		MARKER, IDENT; DSA71604
	335-1685-00	B010100	B110099		MARKER, IDENT; DSA72004
-12	335-1940-00	B110100		1	MARKER, IDENT; DPO70404B
	335-1939-00	B110100			MARKER, IDENT; DPO70604B
	335-1938-00	B110100			MARKER, IDENT; DPO70804B
	335-1943-00	B110100			MARKER, IDENT; DPO71254B
	335-1942-00	B110100			MARKER, IDENT; DPO71604B
	335-1941-00	B110100			MARKER, IDENT; DPO72004B
	335-1946-00	B110100			MARKER, IDENT; DSA70404B
	335-1945-00	B110100			MARKER, IDENT; DSA70604B
	335-1944-00	B110100			MARKER, IDENT; DSA70804B
	335-1949-00	B110100			MARKER, IDENT; DSA71254B
	335-1948-00	B110100			MARKER, IDENT; DSA71604B
	335-1947-00	B110100			MARKER, IDENT; DSA72004B
-13	348-1817-00			2	FOOT, SKID

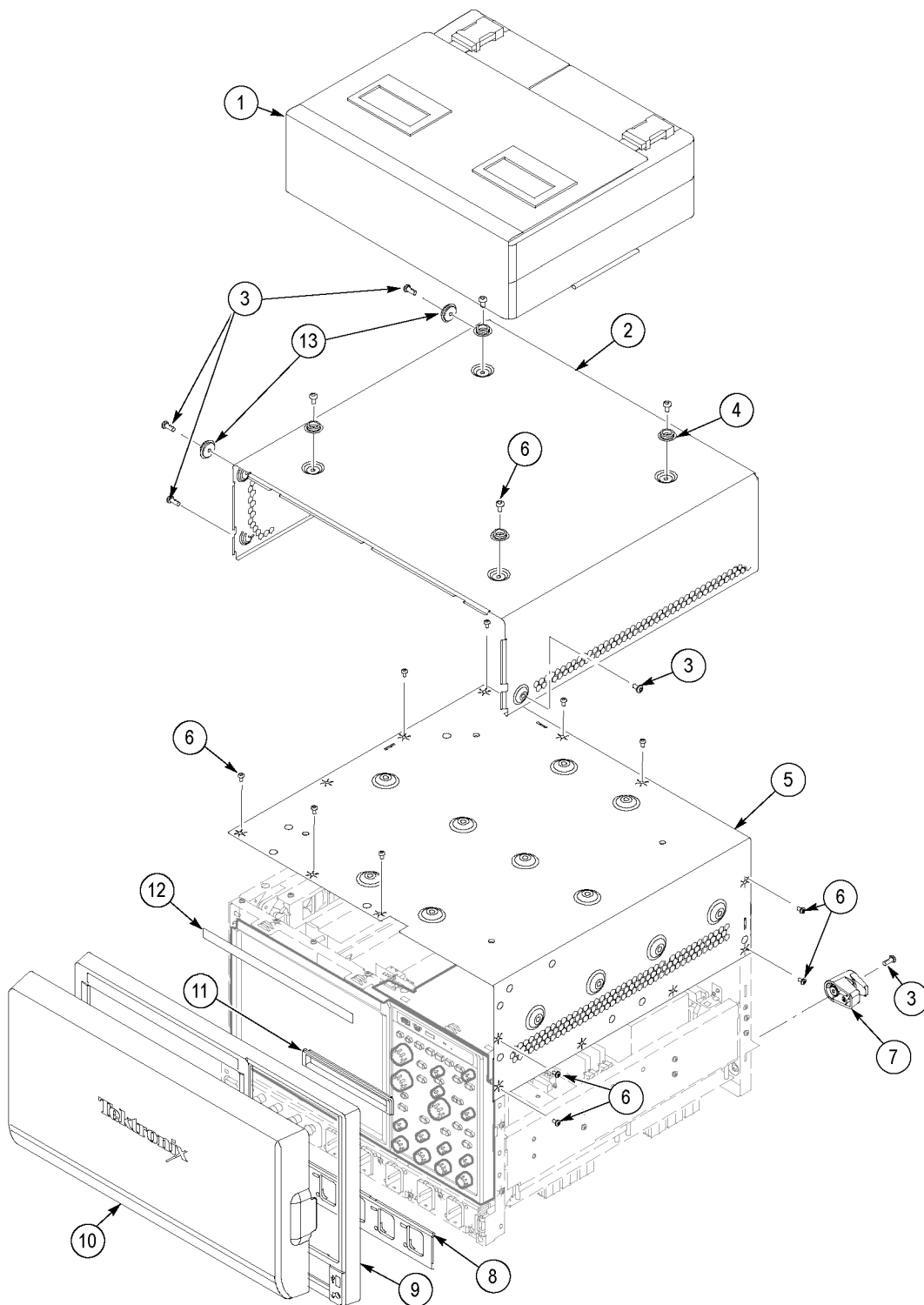


Figure 5-11: External parts 1 (≥ 4.0 GHz models)

Table 5-9: Replaceable parts – External 2 (≥ 4.0 GHz models)

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description
5-12	EXTERNAL PARTS				
-1	174-5226-00			1	CABLE ASSY; LINE FILTER
-2	211-1050-00			16	SCREW, MACHINE; 6-32 X 0.312 L, PNH, STL CAD PLT, T15
-3	200-4936-00			1	COVER; EMI BOTTOM, DPO/DSA70804/70604/70404
	200-5007-00			1	COVER; EMI BOTTOM, DPO/DSA720004/71604/71254
	200-5007-00			1	COVER; EMI BOTTOM, DPO/DSA7
-4	200-5030-01	B010100	B110099	1	COVER, BOTTOM; COSMETIC; W/FEET
	200-5067-00	B110100		1	COVER, BOTTOM; COSMETIC; W/FEET
-5	212-0232-00			2	SCREW, MACHINE; 8-32 X 1.125L, PNH, STL, BLACK ZINC SPEC #ASTM B633 TYPE II, T-20
-6	367-0528-00			1	HANDLE, CARRYING; DUAL DUROMETER MOLDED, POLYPROPYLENE, VINYL GRIP SECTION
	407-4887-00			1	BRACKET; HANDLE BASE, PC/ABS ALLOY, BAYER BAYBLEND FR-110, TEK BLUE
-7	348-1515-00			1	FEET, CABINET; BLACK, GLASS-FIBRE REINFORCED PLASTIC, SET OF 4 FEET, 4 RUBBER INSERTS
-8	211-1224-00			4	SCREW, MACHINE, BLACK
-9	348-1817-00			2	FOOT, SKID

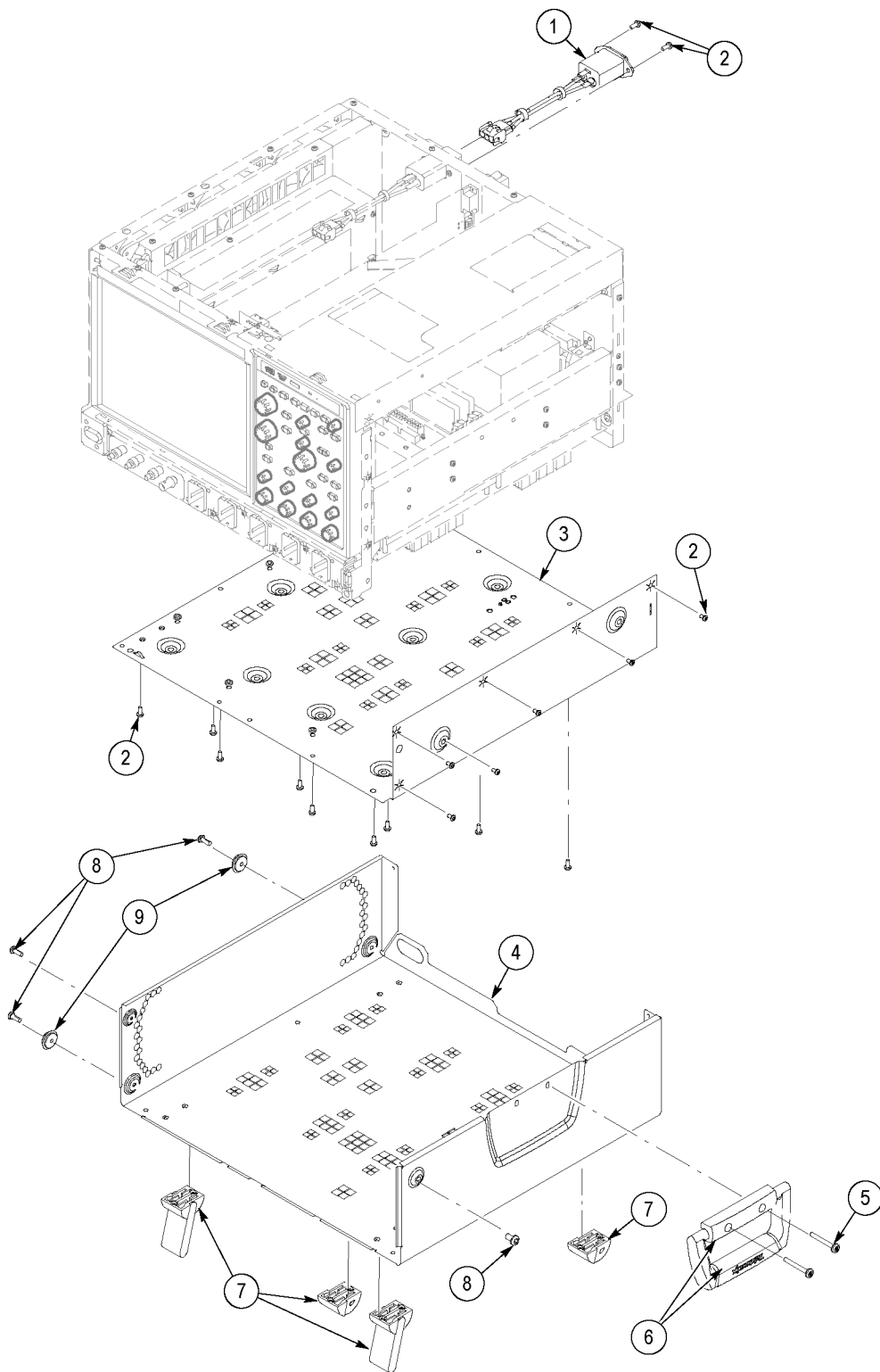


Figure 5-12: External parts 2 (≥ 4.0 GHz models)

Table 5-10: Replaceable parts – Front panel and display (≥ 4.0 GHz models)

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description
5-13 and 5-14					FRONT PANEL AND DISPLAY
-1	174-5165-00			1	CABLE ASSY; POWER SWITCH
-2	065-0756-02			1	MODULE ASSY;SERVICE REPLACEMENT KIT,614104101 FRONT PANEL ASSEMBLY W/ PACKAGING;DPO7000 & DPO/DSA70000 SERIES
-3	671-6062-00			1	CIRCUIT BOARD ASSY; FRONT PANEL ENCODER
-4	065-0760-00			1	CIRCUIT BD ASSY; FRONT PANEL MAIN
-5	260-2818-00			1	SWITCH, KEYPAD; ELASTOMER EMAT
-6	211-1150-00			1	SCREW, MACHINE; 6-32 X 0.172, PNH, STL, T-15 TORX DR, BLACK OXIDE
-7	407-5140-00			1	BRACKET; TRIM,FRONT PANEL, SHEET METAL
-8	333-4522-00			1	PANEL ASSEMBLY; FRONT SUBPANEL, W/BRACKET ASSEMBLY, BEZEL & LABEL
		B010100	B031366		DPO70404 BASE
		B010100	B031366		DPO70604 BASE
		B010100	B031366		DPO70804 BASE
		B010100	B031366		DSA70404 BASE
		B010100	B031366		DSA70604 BASE
		B010100	B031366		DSA70804 BASE
		B010100	B067587		DPO7054 BASE
		B010100	B067587		DPO7104 BASE
		B010100	B067587		DPO7254 BASE
		B010100	B020910		DPO71254 BASE
		B010100	B020910		DPO71604 BASE
		B010100	B020910		DPO72004 BASE
		B010100	B020910		DSA71254 BASE
		B010100	B020910		DSA71604 BASE
		B010100	B020910		DSA72004 BASE
	333-4564-00			1	PANEL ASSEMBLY; FRONT SUBPANEL, W/BRACKET ASSEMBLY, BEZEL & LABEL
		B031367			DPO70404 BASE
		B031367			DPO70604 BASE
		B031367			DPO70804 BASE
		B031367			DSA70404 BASE
		B031367			DSA70604 BASE
		B031367			DSA70804 BASE
		B067588			DPO7054 BASE
		B067588			DPO7104 BASE
		B067588			DPO7254 BASE
		B020911			DPO71254 BASE
		B020911			DPO71604 BASE
		B020911			DPO72004 BASE
		B020911			DSA71254 BASE
		B020911			DSA71604 BASE
		B020911			DSA72004 BASE
-9	366-0859-01			1	ASSEMBLY, KNOB; .470 DIAMETER, SOFT TOUCH

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discount'd	Qty	Name & description
-10	366-0860-01			1	ASSEMBLY, KNOB; .685 DIAMETER, SOFT TOUCH
-11	366-0861-01			1	ASSEMBLY, KNOB; .925 DIAMETER, SOFT TOUCH
-12	174-5162-00			1	CABLE ASSY; DISPLAY ADAPTER TO FRONT PANEL BOARD
-13	211-0747-00			4	SCREW, MACHINE; 6-32 X 0.188, PNH, STL, CDPL, T-15
-14	065-0742-00			1	TOUCH SCREEN ASSEMBLY, 12.1 IN, RESISTIVE, 5-WIRE, W/GASKETS, W/BRACKETS
-15	211-0721-00			5	SCREW, MACHINE; 6-32 X 0.375, PNH, STL, CDPL, T-15
-16	065-0743-01			1	COMPONENT KIT; LCD DISPLAY ADAPTER MODULE SUBASSEMBLY, STANDARD
-17	174-5160-00			1	CABLE ASSY; DISPLAY ADAPTER TO DISPLAY
-18	174-5163-00			1	CABLE ASSY; DISPLAY ADAPTER TO INVERTER BOARD
-19	065-0746-01			1	MODULE ASSY; SERVICE REPLACEMENT KIT, POWER BUTTON ASSY
-20	679-6283-01			1	CIRCUIT BOARD ASSY; DISPLAY ADAPTER
-21	119-7016-00			1	CIRCUIT BOARD ASSY; INVERTER

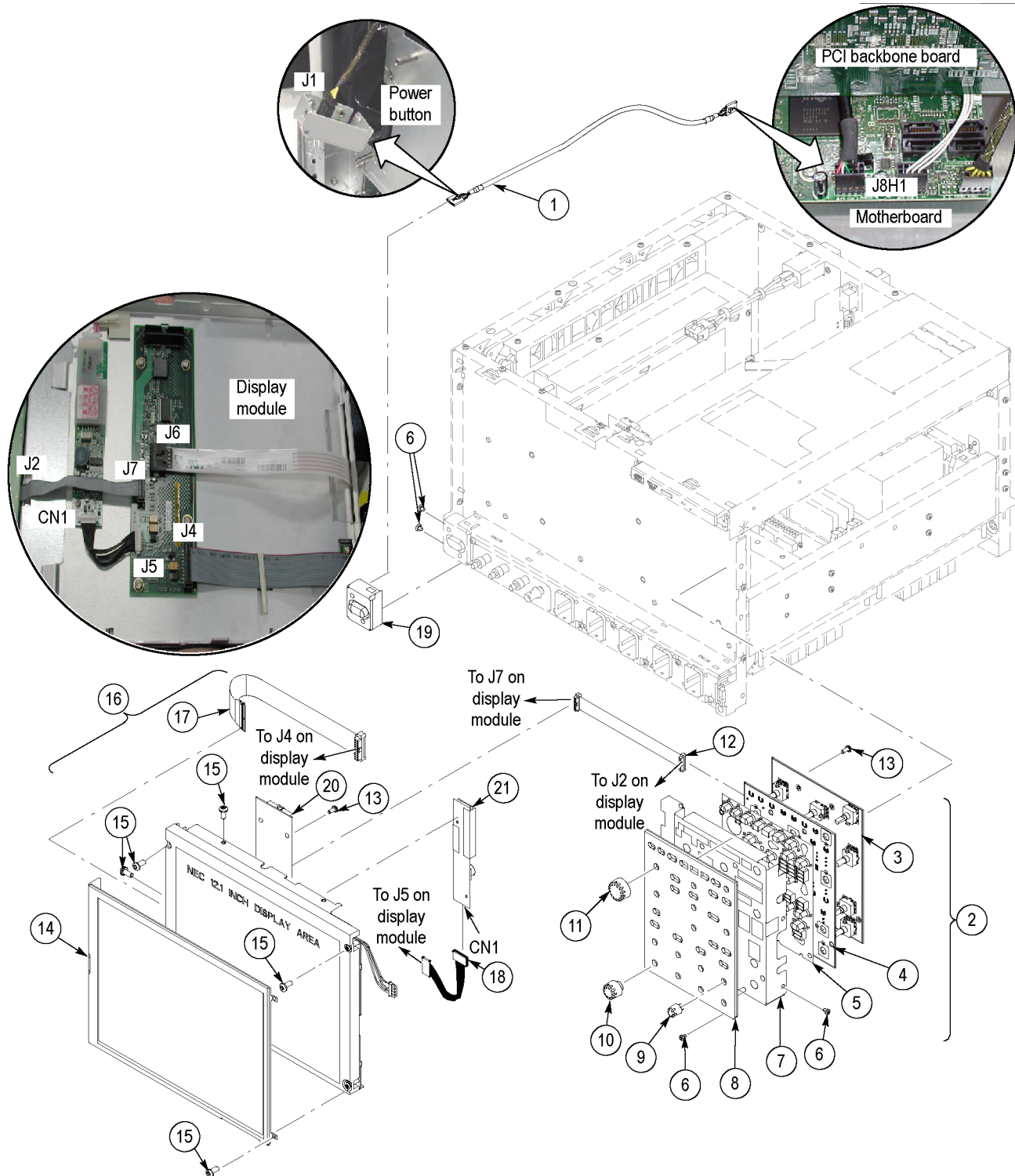


Figure 5-13: Front panel and display (≥ 4.0 GHz models) (B039999 and below)

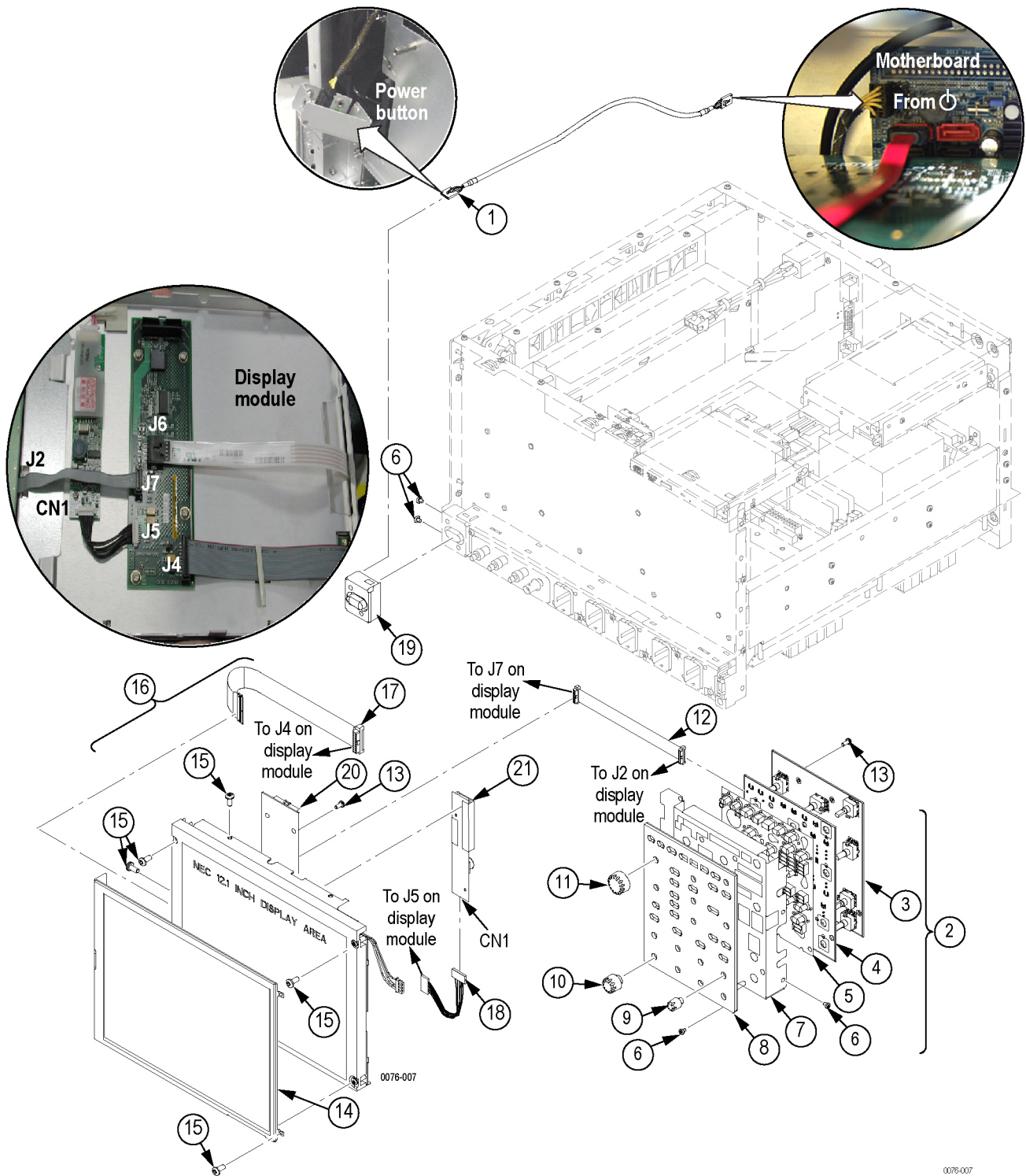
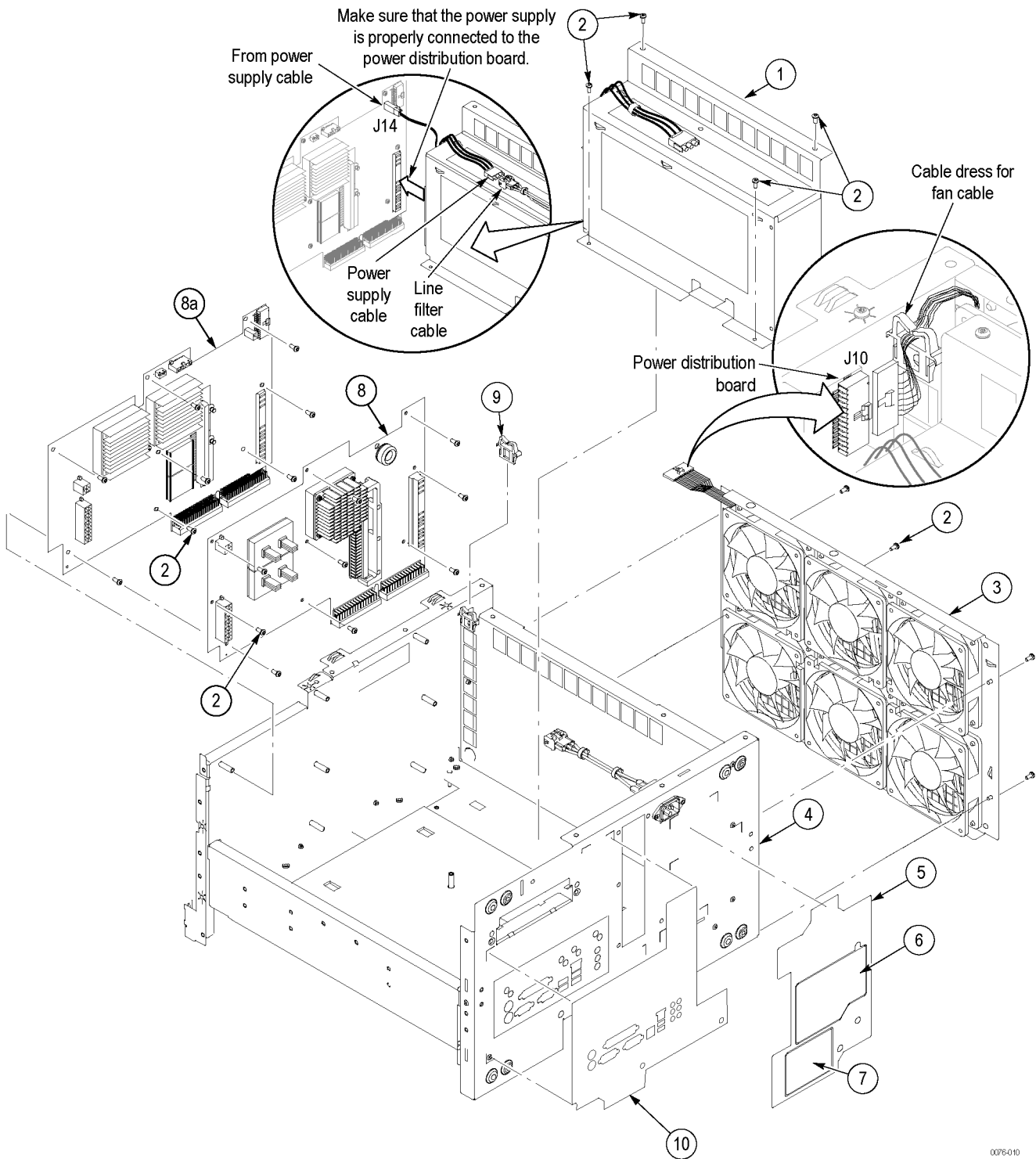


Figure 5-14: Front panel and display (≥ 4.0 GHz models) (B040000 and above)

Table 5-11: Replaceable parts – Power supply and fans (≥ 4.0 GHz models)

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description
5-15					
POWER SUPPLY AND FANS					
-1	119-6982-03			1	POWER SUPPLY: AC-DC; 1200W, +48V 25A, +12V 1A, 85-264VAC, 47-63HZ, ELCON 377-0002-00100A, IEC320-C22; 11.5X6.75X2.75IN; CLOSED CHASSIS
	407-5381-00	B110100			BRACKET;POWER SUPPLY
-2	211-1050-00			12	SCREW, MACHINE; 6-32X0.312 L, PNH, STL CAD PLT, T15
-3	436-0422-00			1	TRAY, FAN; CHASSIS ASSY, W/6 FANS MOUNTED; HAMMERHEAD
-4	441-2497-00			1	CHASSIS; MAIN, 039-0173-xx
		B010314	B020846		DPO71254 BASE
		B010314	B020846		DSA71254 BASE
		B010315	B020847		DSA72004 BASE
		B010315	B020847		DPO72004 BASE
		B010319	B031253		DPO71604 BASE
		B010319	B031253		DSA71604 BASE
		B010258	B031253		DPO71604 BASE exception
		B010258	B031253		DSA71604 BASE exception
	441-2552-00			1	ATX CHASSIS MOTHERBOARD ADVANTECH AIMB-562, 039-0185-xx
		B031254	B110099		DPO70404
		B067252	B110099		DPO7054
		B031254	B110099		DPO70604
		B031313	B110099		DPO70804
		B067252	B110099		DPO7104
		B020847	B110099		DPO71254
		B020847	B110099		DPO71604
		B020848	B110099		DPO72004
		B067252	B110099		DPO7254
		B067252	B110099		DPO7354
		B031254	B110099		DSA70404
		B031254	B110099		DSA70604
		B031313	B110099		DSA70804
		B020847	B110099		DSA71254
		B020847	B110099		DSA71604
		B020848	B110099		DSA72004
	441-2563-00	B110100		1	CHASSIS ASSEMBLY, MAIN, ADVANTECH AIMB-562 UATX, SAFETY CONTROLLED;DPO70000 SERIES
	407-5366-00	B110100		1	BRACKET, IO BACK PANEL PLATE, DPO/DSA7000B SERIES
-5	335-1634-00			1	LABEL, CHASSIS, REAR COSMETIC
-6	335-0263-01			1	MARKER, IDENT; SUPER LABEL, BLANK ROLL STOCK
-7	335-0347-00			1	MARKER,IDENT; REAR PANEL, BLANK, 2.100 X 2.700
-8	065-0759-01	B010100	B110099	1	CIRCUIT BOARD; POWER DISTRIBUTION
-8a	065-0827-00	B110100		1	CIRCUIT BOARD; POWER DISTRIBUTION
-9	343-1585-00			1	CLAMP; WIRE ROUTING CLAMP, FLAT CABLE BLIND HOLE MOUNTED, NYLON

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description
-10	335-1603-00			1	LABEL, REAR, LEXAN, 039-0173-xx
	335-2012-00			1	LABEL, REAR, LEXAN, 039-0185-xx
		B031254	B110099		DPO70404
		B067252	B110099		DPO7054
		B031254	B110099		DPO70604
		B031313	B110099		DPO70804
		B067252	B110099		DPO7104
		B020847	B110099		DPO71254
		B020847	B110099		DPO71604
		B020848	B110099		DPO72004
		B067252	B110099		DPO7254
		B067252	B110099		DPO7354
		B031254	B110099		DSA70404
		B031254	B110099		DSA70604
		B031313	B110099		DSA70804
		B020847	B110099		DSA71254
		B020847	B110099		DSA71604
		B020848	B110099		DSA72004
	335-2119-00	B110100		1	LABEL, REAR I/O PLATE, SAFETY CONTROLLED



0076-010

Figure 5-15: Power supply and fans (≥ 4.0 GHz models)

Table 5-12: Replaceable parts – μ ATX assembly (\geq 4.0 GHz models)

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discount'd	Qty	Name & description
5-16 and 5-17					MOTHERBOARD
-1	174-4797-00			1	CA ASSY; 20 PIN ATX POWER, SAFETY CONTROLLED
-2	065-0745-02			1	SERVICE KIT FOR CPU BRD, CPU, FAN AND HEAT SINK ASSEMBLY
	167-0657-00			1	PROCESSOR; PENTIUM 4, 3.4 GHZ INTERNAL CLOCK, 400MHZ BUS, W/O FAN HEATSINK, HH80552PG0962M
	119-7333-00			1	FAN, HEATSINK AND BRACKET
-3	211-0935-00			8	SCREW, MACHINE; 6-32 X 0.50, PNH, T-15, SST, PASSIVATED
-4	174-4798-00			1	CA ASSY; 4 PIN P4 POWER
-5	039-0173-00	B010100	B039999	1	COMPUTER BOARD; PENTIUM 4, BOARD, UATX, TAPPEN, GIG E, PROCESSOR LGA775, DDR2 667MHZ, TOTAL 4 GIG; BLKD945GTPLKR
	039-0185-00	B040000		1	COMPUTER BOARD; ADVANTECH MICROATX, LGA 775 CORE 2 DUO, DDR2, PCI-E X1, SINGLE GBE LAN
-6	167-1048-00			2	IC, MEMORY; 128M X 64, 1GB DDR2 1.8V, 3-3-3; MT16HTF12864AY-40E, DIMM240, DS1
-7	119-7333-00			1	HEATSINK AND BRACKET
-8	361-1834-00			1	DAMPENER, PORON FOAM FOR P4 HEATSINK
-9	174-5271-00			1	IDE CABLE WITH STRAIN RELIEF & PULL-TAB

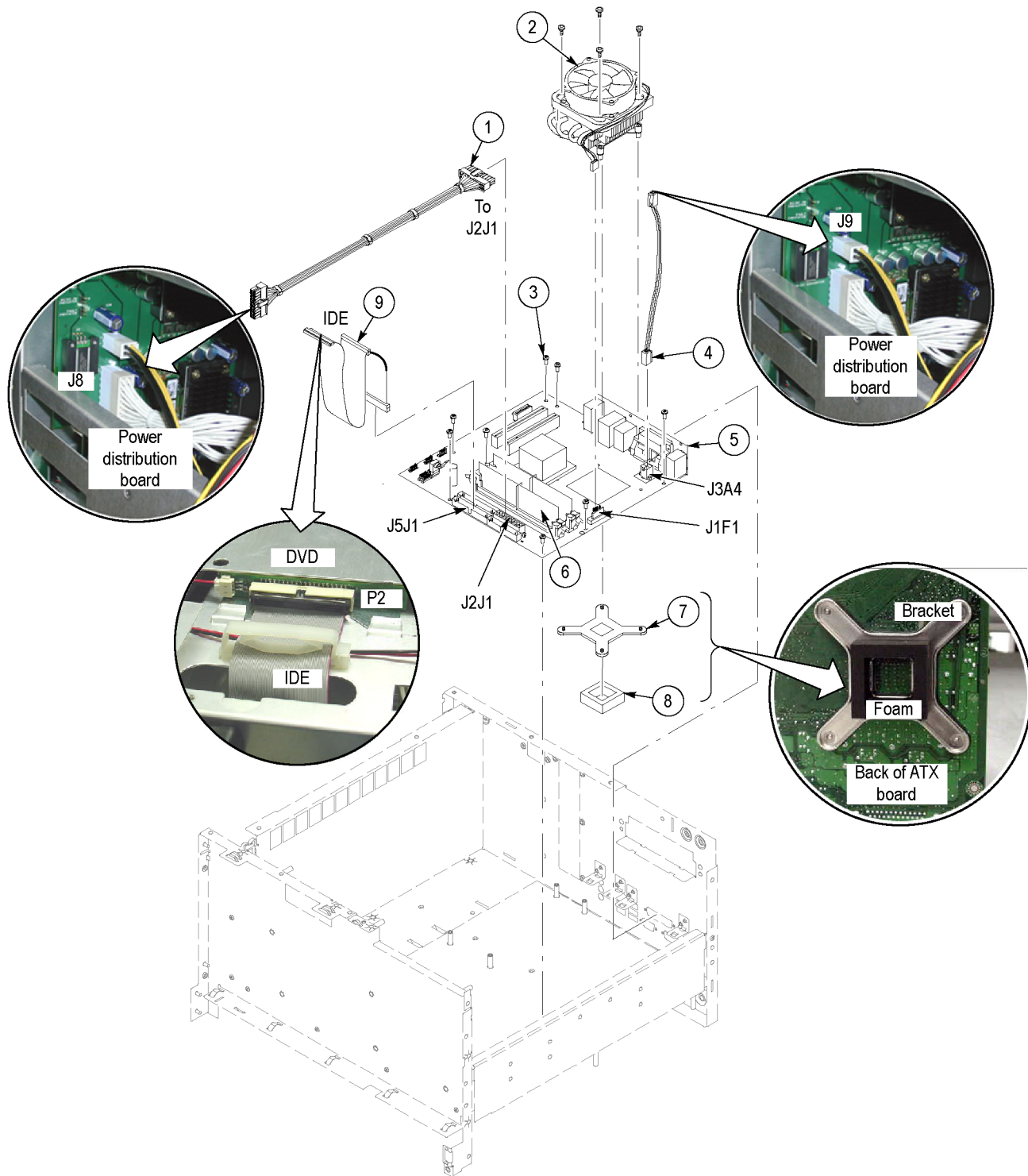


Figure 5-16: 039-0173-xx and 065-0745-xx μATX assembly (≥ 4.0 GHz models)

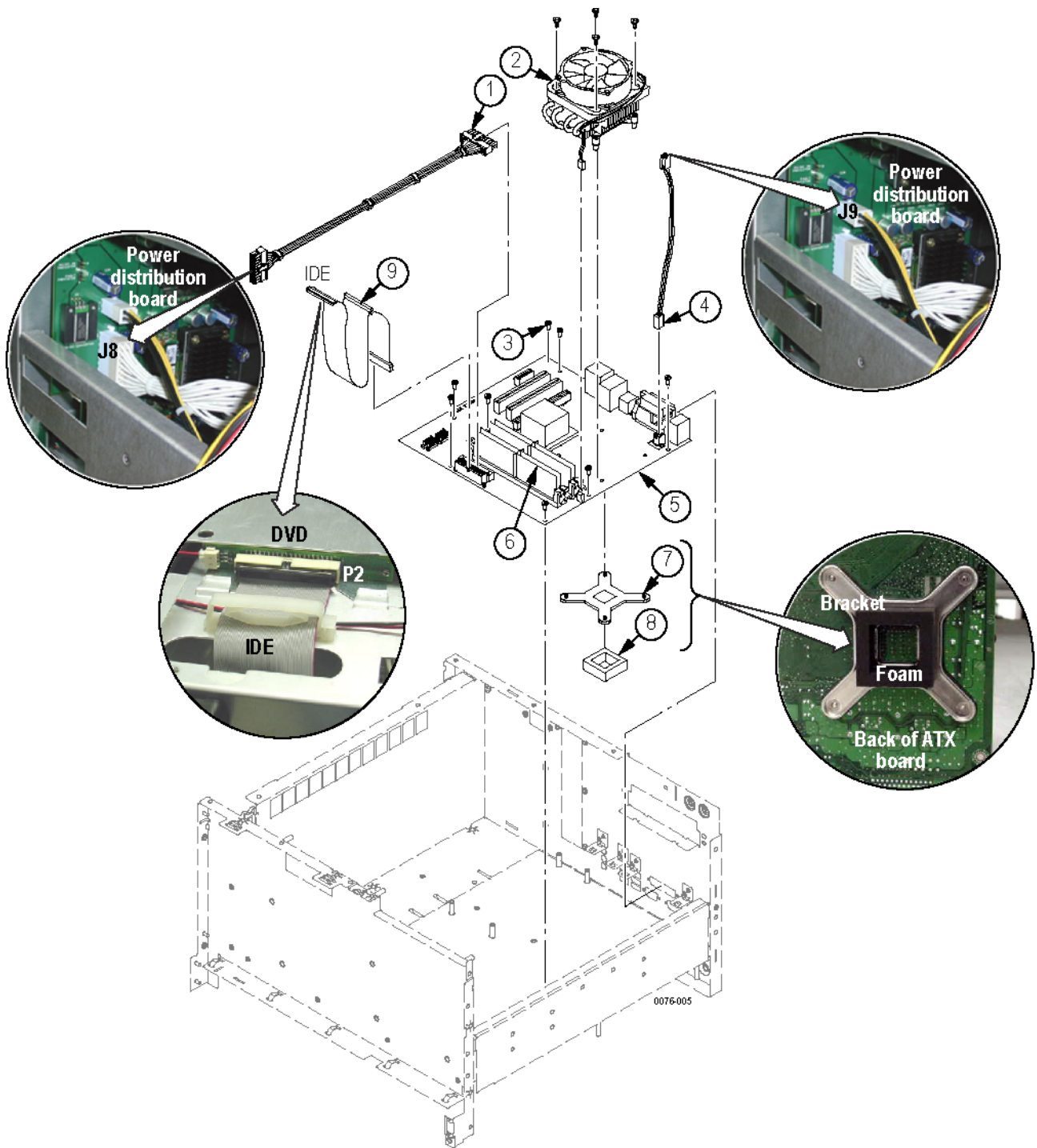


Figure 5-17: 039-0185-xx μATX assembly (≥ 4.0 GHz models)

Table 5-13: Replaceable parts – Acquisition assembly (≥ 4.0 GHz models)

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description
5-18					ACQUISITION
-1	214-3903-00			8	SCREW, JACK; 4-40 X 0.312 LONG, 0.188 H HEX HEAD STAND OFF, 4-40 INT THD, X 0.312 THD EXT 4-40
-2	-----			1	ACQUISITION MODULE, RETURN TO TEKTRONIX FOR SERVICE
-3	211-0752-00			10	SCREW, MACHINE; 6-32 X 0.75, PNH, TORX
-4	211-1050-00			7	SCREW, MACHINE; 6-32 X 0.312 L, PNH, STL CAD PLT, T15

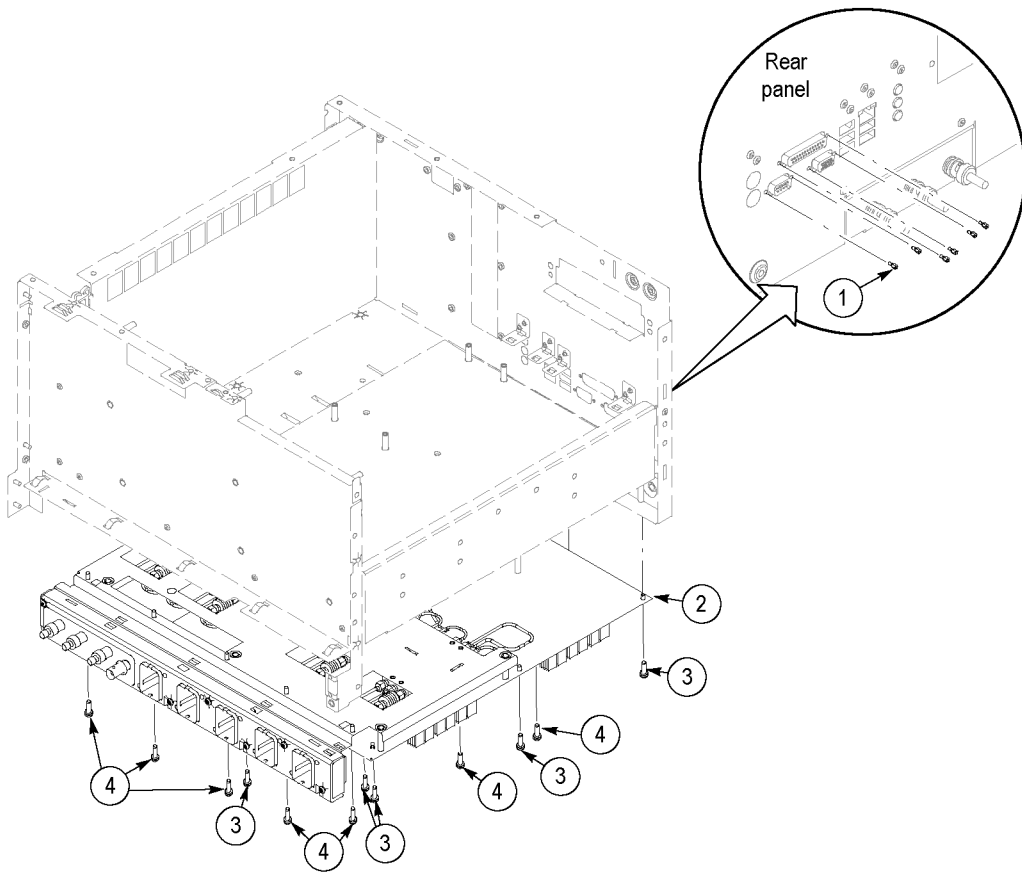


Figure 5-18: Acquisition assembly (≥ 4.0 GHz models)

Table 5-14: Replaceable parts – Interface board (≥ 4.0 GHz models)

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description
5-19 and 5-20					INTERFACE BOARD
-1	065-0758-00	B010100	B110099	1	CIRCUIT BD ASSY; PCI BACKBONE BOARD
	065-0825-00	B110100		1	KIT, SERVICE REPLACEMENT, BACKBONE BOARD ASSY, 6646431XX TESTED W/ PACKAGING
-2	211-1050-00			6	SCREW, MACHINE; 6-32 X 0.312 L, PNH, STL CAD PLT, T15
-3	335-1604-00			1	LABEL REAR I/O PLATE, SAFETY CONTROLLED
-4	214-3903-00			2	SCREW, JACK; 4-40 X 0.312 LONG, 0.188 H HEX HEAD STAND OFF, 4-40 INT THD, X 0.312 THD EXT 4-40
-5	211-1206-00			2	SCREW, JACK; 2-56 ID X 4-40 OD, 0.188 HEX, SS
-6	214-1061-00			2	CONTACT, ELEC; GROUNDING, CU BE SAFETY CONTROLLED
-7	386-7447-00			1	PLATE; REAR, PCI I/O
-8	174-5164-00			1	CA ASSY; USB 2.0
-9	679-6107-00			1	CIRCUIT BD ASSY; USB
-10	211-1221-00			2	SCREW; M2.0 6-MM LONG PHILLIPS FLATHEAD ZINC-PLATED
-11	174-5048-00			1	CA ASSY; USB 1.0
-12	174-4241-00			1	CABLE ASSY; RIBBON, BUS, IDC, 32 AWG, 16.50 L, 60POS, BOX, IDC, FEMALE, RTANG, 0.050CTR X 2
-13	386-7481-00			1	BRACKET, BRACE BETWEEN PCI PCB AND DRIVE BRACKET

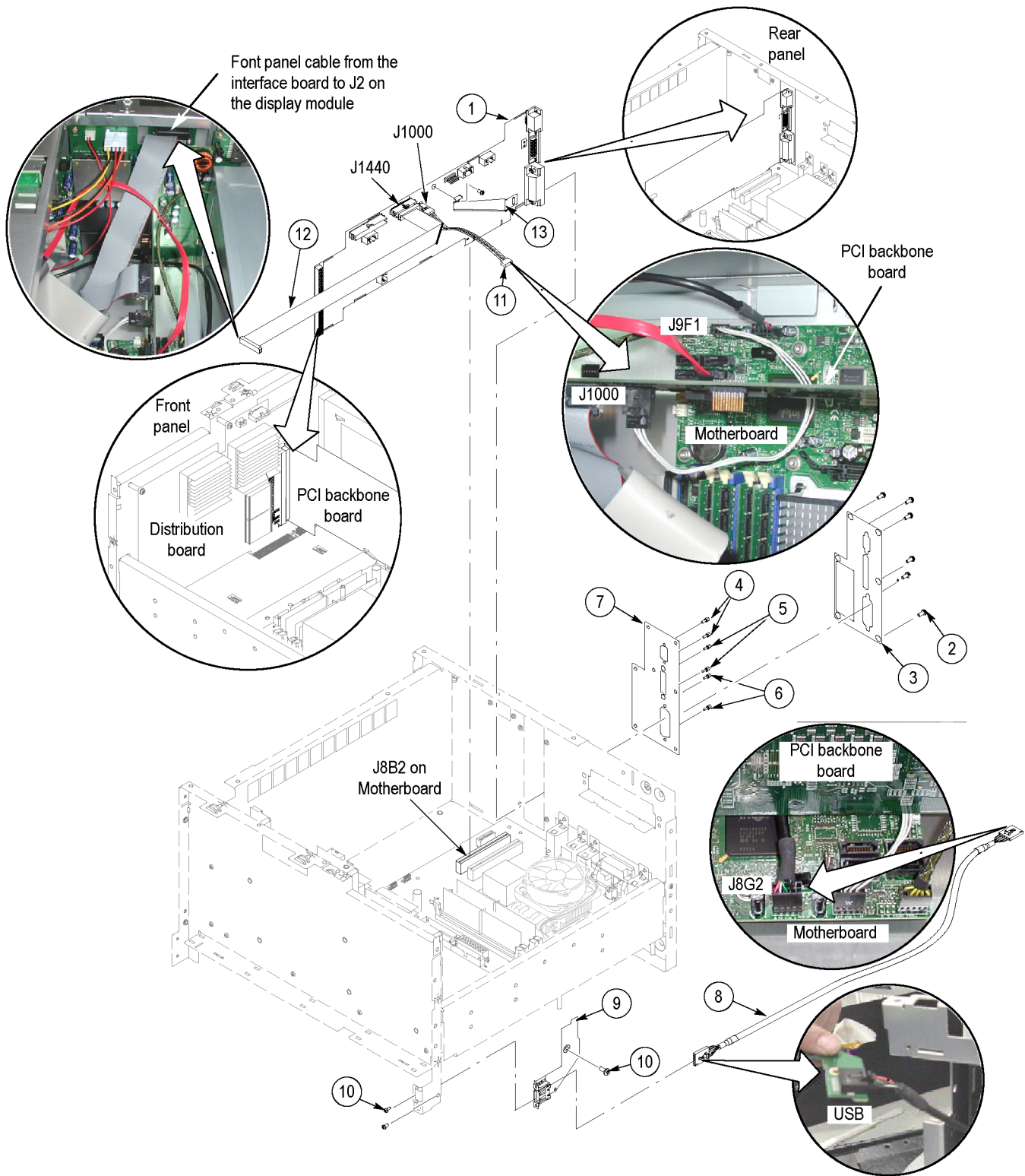


Figure 5-19: Interface board (≥ 4.0 GHz models) (B039999 and below)

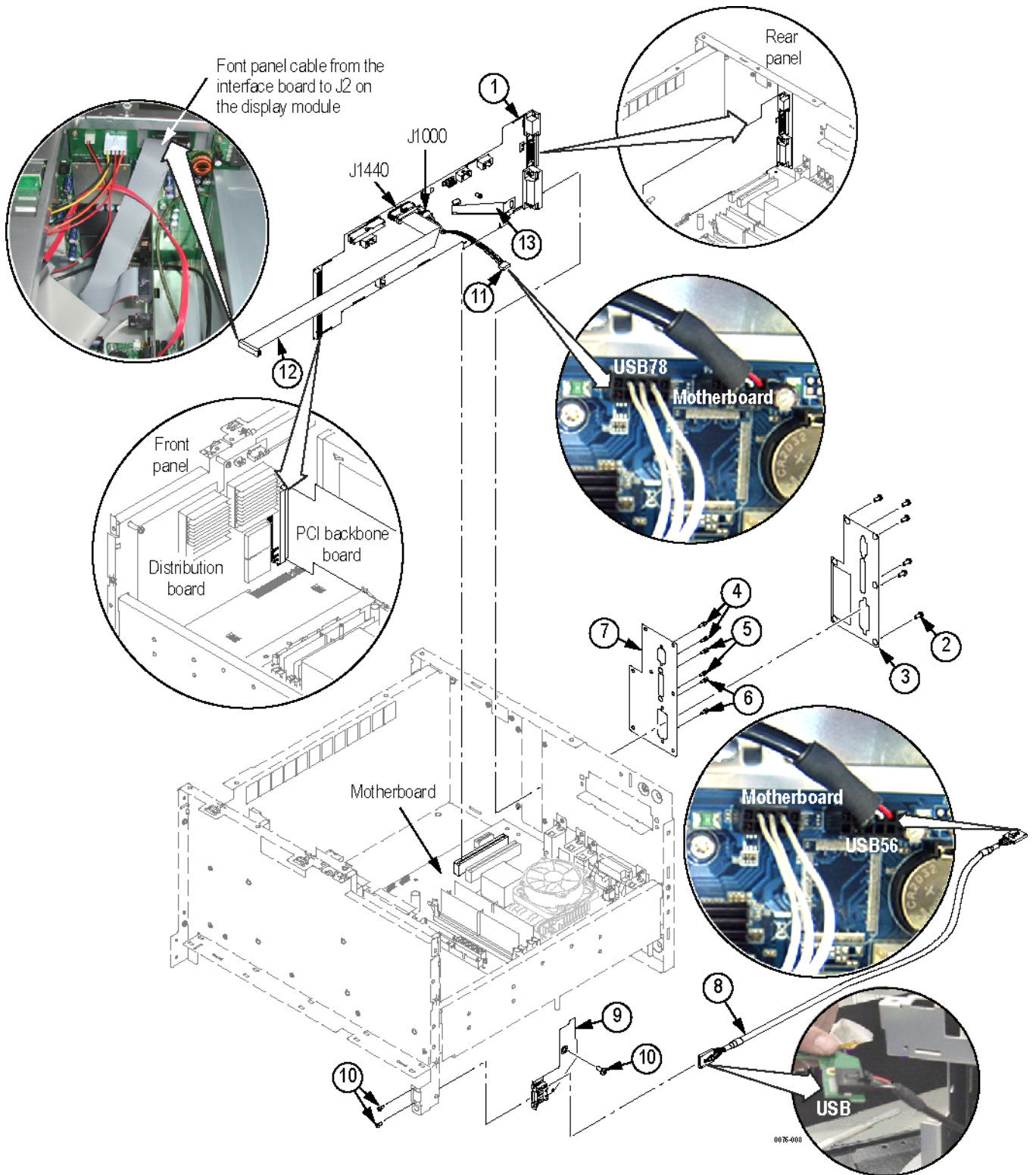


Figure 5-20: Interface board (≥ 4.0 GHz models) (B040000 and above)

Table 5-15: Replaceable parts – Drives (≥ 4.0 GHz models)

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discount'd	Qty	Name & description
5-21 and 5-22					DRIVES
-1	065-0755-00	B010100	B110099	1	DISK DRIVE ASSY KIT, UNPROGRAMMED 119718900
	065-0826-00	B110100			DISK DRIVE ASSY;SERVICE REPLACEMENT, UNPROGRAMMED HARD DRIVE 1197524XX W/ PACKAGING;DSA/DPO70000B
-2	211-1050-00			8	SCREW, MACHINE; 6-32 X 0.312 L, PNH, STL CAD PLT, T15
-3	407-5069-00			1	BRACKET, RHDD; SATA COMBO CABLE, 3.5 INCH REMOVABLE HARD DISK DRIVE RECEPTACLE
-4	174-5169-00			1	CABLE ASSY; SATA COMBO, HARD DRIVE CABLE
-5	174-5017-00			1	CABLE ASSEMBLY; DVD POWER
-6	679-5915-00			1	CKT BD SUBASSY; DVD-CD/RW ADAPTER, UNTESTED, 389-3689-00 WIRED
-7	129-1618-00			1	SPACER; DVD-CD/RW SLIMLINE DRIVE ADAPTER, PLASTIC
-8	211-0950-00			4	SCREW, MACHINE; M2X.4X3L, PHL, PNH, STL NI PL
-9	407-5156-00			1	BRACKET, DVD-CD/RW; ADAPTER FOR DVD-CD/RW SLIMLINE
-10	119-7196-00			1	DISK DRIVE; OPTICAL, 644MB, CD-RW/DVD ROM, COMBO, 16.7 MB/SEC, IDE/ATAPI; DW-224E-C93
-11	441-2496-01			1	CHASSIS; DRIVE BAY; METAL

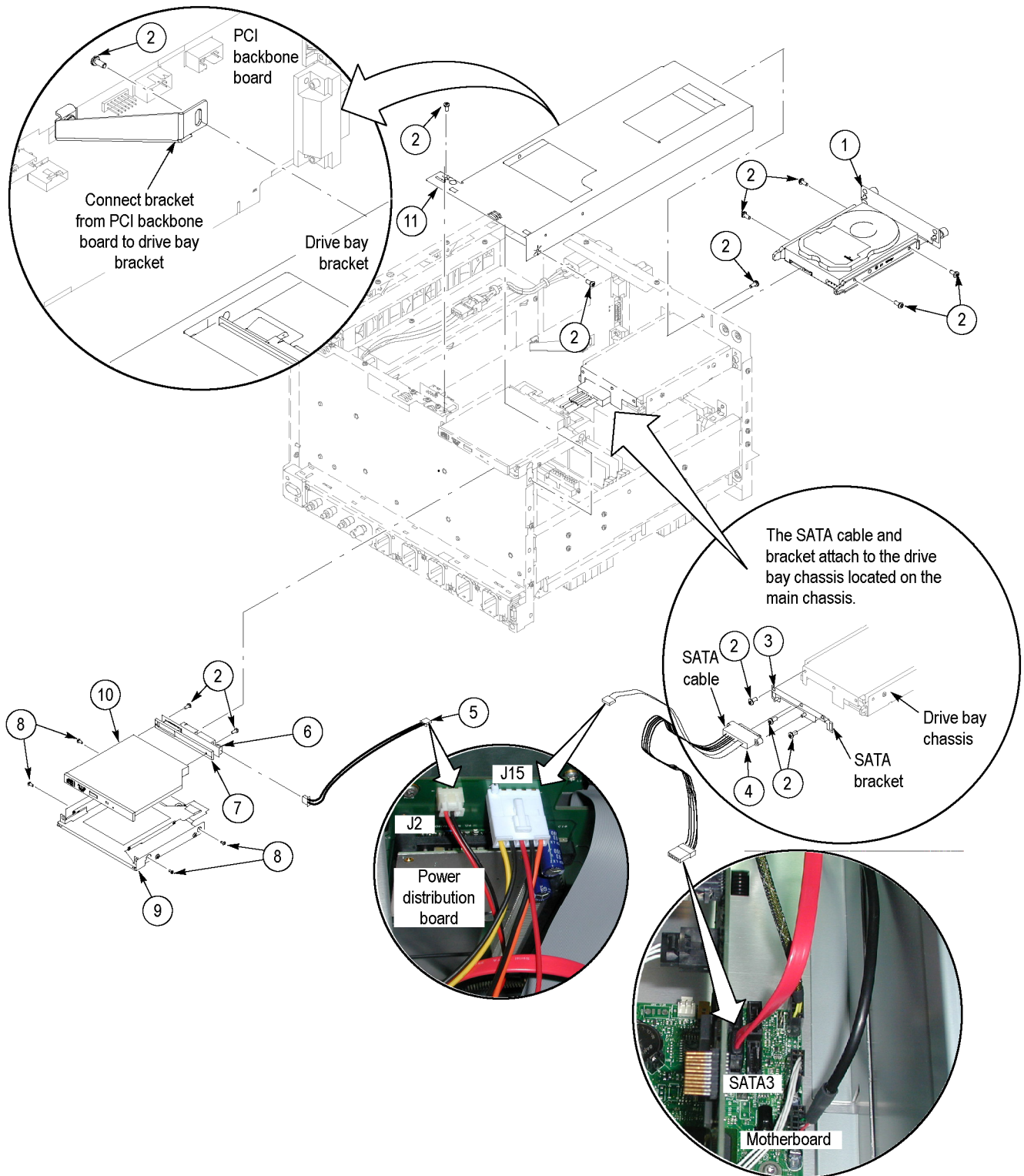


Figure 5-21: Drives (≥ 4.0 GHz models) (B039999 and below)

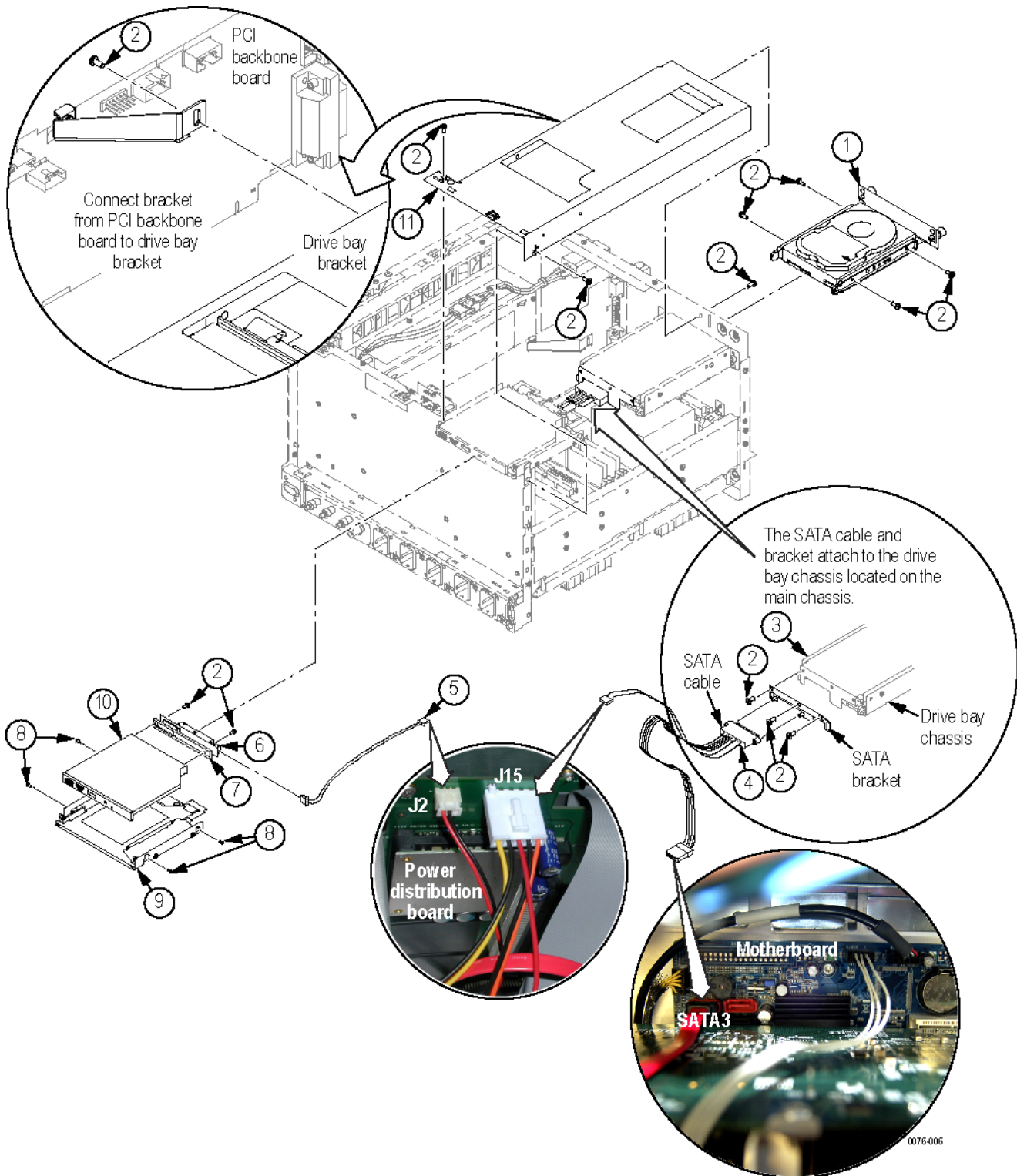


Figure 5-22: Drives (≥ 4.0 GHz models) (B040000 and above)

Table 5-16: Replaceable parts – Standard accessories (≥ 4.0 GHz models)

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description																											
STANDARD ACCESSORIES																																
See Description				1	CABLE ASSY, POWER																											
					<table border="1"> <thead> <tr> <th>Option</th> <th>Country</th> <th>P/N</th> </tr> </thead> <tbody> <tr> <td>A0</td> <td>N. AMERICA</td> <td>161-0213-00</td> </tr> <tr> <td>A1</td> <td>UNIV EURO</td> <td>161-0209-06</td> </tr> <tr> <td>A2</td> <td>UK</td> <td>161-0210-07</td> </tr> <tr> <td>A3</td> <td>AUSTRALIA</td> <td>161-0211-05</td> </tr> <tr> <td>A5</td> <td>SWITZERLAND</td> <td>161-0212-00</td> </tr> <tr> <td>A6</td> <td>JAPAN</td> <td>161-0213-00</td> </tr> <tr> <td>A10</td> <td>CHINA</td> <td>161-0320-XX</td> </tr> <tr> <td>A11</td> <td>INDIA</td> <td>161-0325-00</td> </tr> </tbody> </table>	Option	Country	P/N	A0	N. AMERICA	161-0213-00	A1	UNIV EURO	161-0209-06	A2	UK	161-0210-07	A3	AUSTRALIA	161-0211-05	A5	SWITZERLAND	161-0212-00	A6	JAPAN	161-0213-00	A10	CHINA	161-0320-XX	A11	INDIA	161-0325-00
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L9	KOREAN	071-2601-XX																														
L10	RUSSIAN	071-2604-XX																														
	020-2693-19			1	PRODUCT SW CD AND INSTRUCTIONS																											
	119-7083-00			1	POINTER ASSY; MOUSE, MICROSOFT BLACK OPTICAL WHEELED, USB AND PS2																											
	119-7054-00			1	KEYBOARD; USB W/ 2-PORT HUB; MINI (69 KEYS) BLACK																											
	071-1733-01			1	MANUAL, TECH; QUICK START, ENGLISH																											
	020-2700-00			1	CD; OPTIONAL APPS																											
	TCA-292MM			4	ADAPTER; TEKCONNECT, 2.92MM																											
	TCA-BNC			4	ADAPTER; TEKCONNECT, BNC																											
	200-4963-00			1	COVER; FRONT																											
	063-3781-00			1	CD; NERO, DVD WRITER SW																											