TDS5000B Series
Digital Phosphor Oscilloscope

Read This First

www.tektronix.com

061-4331-05

Tektronix

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.

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General Safety Summary

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

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

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.

Connect the probe reference lead to earth ground only.

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

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

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

Do Not Operate in Wet/Damp Conditions.

Do Not Operate in an Explosive Atmosphere.

Keep Product Surfaces Clean and Dry.

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

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:

Compliance Information

This section lists the EMC (electromagnetic compliance), safety, and environmental standards with which the instrument complies. This EMC section replaces the Certifications and Compliances section in Table 1–11, of the TDS5000B Series Technical Reference manual (071-1420-xx).

EMC Compliance

EC Declaration of Conformity – EMC

Meets intent of Directive 2004/108/EC for Electromagnetic Compatibility. Compliance was demonstrated to the following specifications as listed in the Official Journal of the European Communities:

EN 61326-1:2006, EN 61326-2-1:2006. EMC requirements for electrical equipment for measurement, control, and laboratory use. [1] [2] [3] [4]

- CISPR 11:2003. Radiated and conducted emissions, Group 1, Class A
- IEC 61000-4-2:2001. Electrostatic discharge immunity
- IEC 61000-4-3:2002. RF electromagnetic field immunity [5]
- IEC 61000-4-4:2004. Electrical fast transient/burst immunity
- IEC 61000-4-5:2001. Power line surge immunity
- IEC 61000-4-6:2003. Conducted RF immunity [5]
- IEC 61000-4-11:2004. Voltage dips and interruptions immunity [6]

EN 61000-3-2:2006. AC power line harmonic emissions

EN 61000-3-3:1995. Voltage changes, fluctuations, and flicker

European Contact.

Tektronix UK, Ltd.
Western Peninsula
Western Road
Bracknell, RG12 1RF
United Kingdom

1 This product is intended for use in nonresidential areas only. Use in residential areas may cause electromagnetic interference.

2 Emissions which exceed the levels required by this standard may occur when this equipment is connected to a test object.

3 To ensure compliance with the EMC standards listed here, high quality shielded interface cables should be used.

4 Instrument rebooting may be experienced where the EUT takes longer than 10 seconds to recover from IEC 61000-4-11 transient immunity test.

5 Under these conditions, the specifications are amended as follows: 1 mV/division to 1 V/division: < 0.2 division waveform displacement or < 0.4 division increase in peak -to peak noise for (IEC 61000-4-3 and IEC 61000-4-6 tests)

6 Performance Criterion C applied at the 70%/25 cycle Voltage-Dip and the 0%/250 cycle Voltage-Interruption test levels (IEC 61000-4-11).

Australia / New Zealand Declaration of Conformity – EMC

Complies with the EMC provision of the Radiocommunications Act per the following standard, in accordance with ACMA:

- CISPR 11:2003. Radiated and Conducted Emissions, Group 1, Class A, in accordance with EN 61326-1:2006 and EN 61326-2-1:2006.

Safety Compliance

EC Declaration of Conformity – Low Voltage

Compliance was demonstrated to the following specification as listed in the Official Journal of the European Communities:

Low Voltage Directive 2006/95/EC.

- EN 61010-1: 2001. Safety requirements for electrical equipment for measurement control and laboratory use.

U.S. Nationally Recognized Testing Laboratory Listing

- UL 61010B-1. Standard for electrical measuring and test equipment.

Canadian Certification

- CAN/CSA-C22.2 No. 61010.1-97. Safety requirements for electrical equipment for measurement, control, and laboratory use. Part 1.

Additional Compliances

- IEC 61010-1: 2001. Safety requirements for electrical equipment for measurement, control, and laboratory use.

Equipment Type

Test and measuring equipment.

Safety Class

Class 1 – grounded product.

Pollution Degree Description

A measure of the contaminants that could occur in the environment around and within a product. Typically the internal environment inside a product is considered to be the same as the external. Products should be used only in the environment for which they are rated.

- Pollution Degree 2. Normally only dry, nonconductive pollution occurs. Occasionally a temporary conductivity that is caused by condensation must be expected. This location is a typical office/home environment. Temporary condensation occurs only when the product is out of service.

Pollution Degree

Pollution Degree 2 (as defined in IEC 61010-1). Note: Rated for indoor use only.

Installation (Overvoltage) Category Descriptions

Terminals on this product may have different installation (overvoltage) category designations. The installation categories are:

- Measurement Category IV. For measurements performed at the source of low-voltage installation.
- Measurement Category III. For measurements performed in the building installation.
- Measurement Category II. For measurements performed on circuits directly connected to the low-voltage installation.
- Measurement Category I. For measurements performed on circuits not directly connected to MAINS.

Overvoltage Category

Overvoltage Category II (as defined in IEC 61010-1)

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 applicable European Union requirements according to Directives 2002/96/EC and 2006/66/EC on waste electrical and electronic equipment (WEEE) and batteries. For information about recycling options, check the Support/Service section of the Tektronix Web site (www.tektronix.com).

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, refer to the E-cycling Central Web page (www.eiae.org) for disposal or recycling information.

Perchlorate Materials. This product contains one or more type CR lithium batteries. According to the state of California, CR lithium batteries are classified as perchlorate materials and require special handling. See www.dtsc.ca.gov/hazardouswaste/perchlorate for additional 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

The following information affects the TDS5000B Series Quick Start User manual and the TDS5000B Series Service manual.

Quick Start User Manual Information

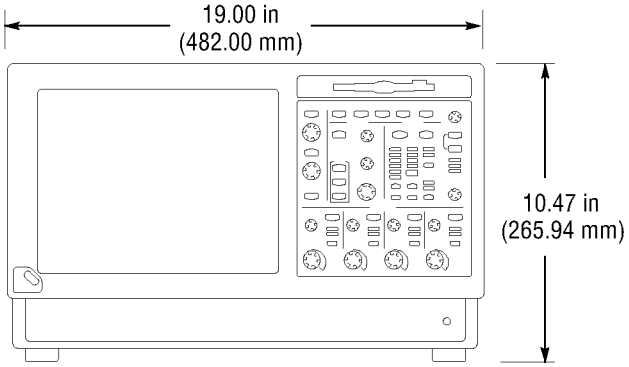
Getting Started

Use the following information to replace or clarify information contained in your instrument quick start user manual documentation.

Operating Requirements

Place the bottom feet of the instrument on a cart or bench and observe the following clearance requirements:

- Top, Rear, Front, and Right Side: 0 in (0 mm)
- Left Side: 3 in (76 mm)
- Bottom: 0.75 in (19 mm) minimum or 0 in (0 mm) standing on feet, flip stand down



CAUTION. *To ensure proper cooling, keep the bottom and sides of the instrument clear of obstructions.*

Environmental Requirements

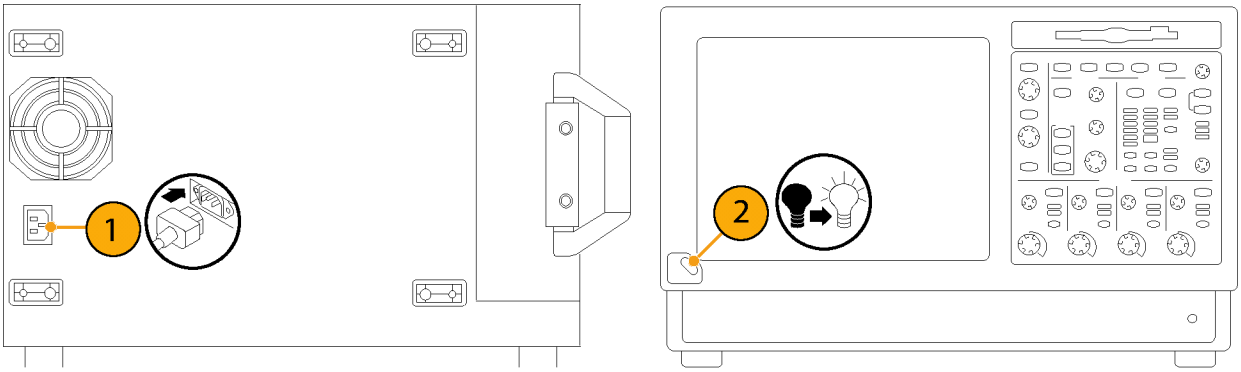
Characteristic	Description
Humidity, operating	20% to 80% relative humidity with a maximum wet bulb temperature of +29 °C (+84.2 °F) at or below +45 °C (+113 °F) noncondensing. Upper limit derated to 30% relative humidity at +45 °C (+113 °F)
Altitude, operating	9,842 ft. (3,000 m)
Temperature, ambient operating	+5 °C to +45 °C (+41 °F to +113 °F)
Maximum voltage	
1 MΩ input impedance	150 VRMS CAT I, and ≤400 peak
	For steady-state sinusoidal waveforms, derate at 20 dB/decade above 200 kHz to 9 VRMS at ≥3 MHz
50 Ω input impedance	<1 Vrms for settings below 100 mV/div
	<5 Vrms for 100 mV/div settings and above

Powering On the Instrument

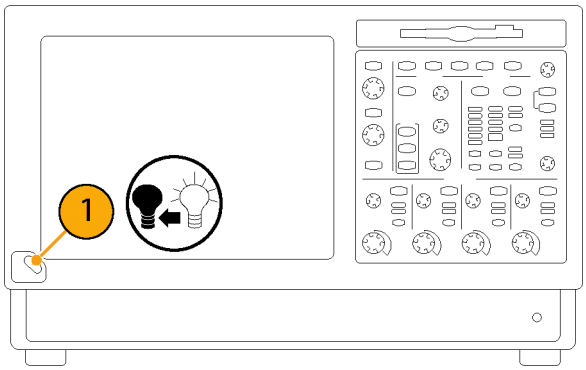
Power Supply Requirements

Source voltage and frequency	Power consumption
100-240 V_{RMS} ±10%, 47-63 Hz, or 115 V_{RMS} ±10%, 360-440 Hz	<220 watts

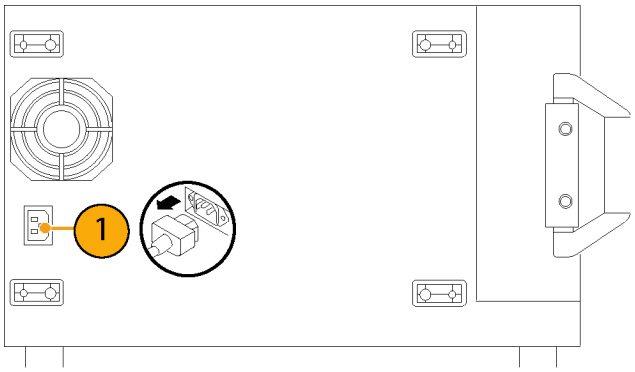
WARNING. *To avoid fire or shock hazard that could result in injury or loss of life, observe all ratings and markings on the product. Consult the product manual for further ratings information before making connections to the product.*



Powering Off the Instrument



Removing the Power



Using Your Instrument

Documentation for your instrument is found by selecting **Help > Documentation...**.

Before using your instrument, read the following information in the quick start user manual:

- Safety Summary
- Creating an Emergency Startup Disk
- Getting Acquainted with Your Instrument

Standard Accessories

The standard accessories list in the TDS5000B Series Quick Start User manual (071-1355-XX) has been upgraded to include the following discs:

TDS5000B Series Operating System Restore disc (SN B040000 and above) 063-4160-xx.

TDS5000B Series Operating System Restore disc (SN B030000 to B039999) 063-3985-xx.

TDS5000B Series Operating System Restore disc (SN B020000 to SN B029999) 063-3759-xx

TDS5000B Series Operating System Restore disc (SN B010100 to SN B019999) 063-3693-xx

NOTE. *Only serial numbers below B060100 include a floppy disc.*

Service Manual Information

Use the following information to replace or clarify information contained in your *TDS5000B Series Digital Phosphor Oscilloscopes* (071-1362-XX) service manual. This service manual is on the Tektronix Web site.

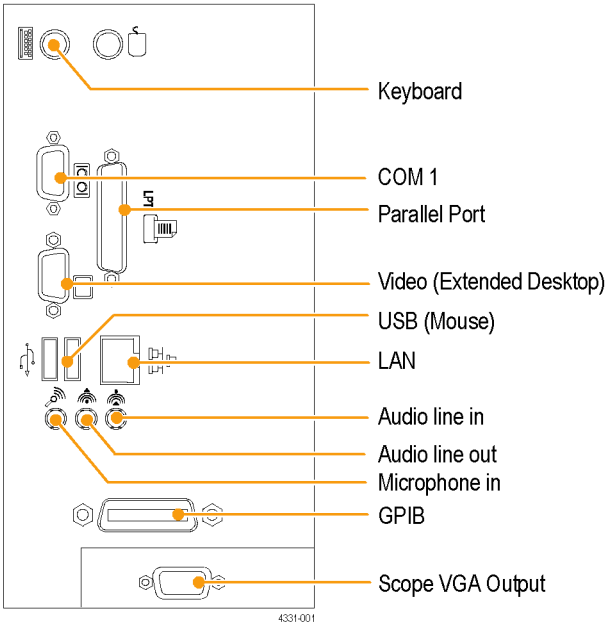
Options

The TDS5054B and TDS5104B instruments have been upgraded to include the following options: Option 18 (Touch Screen) and Option 3M (16 M points record length).

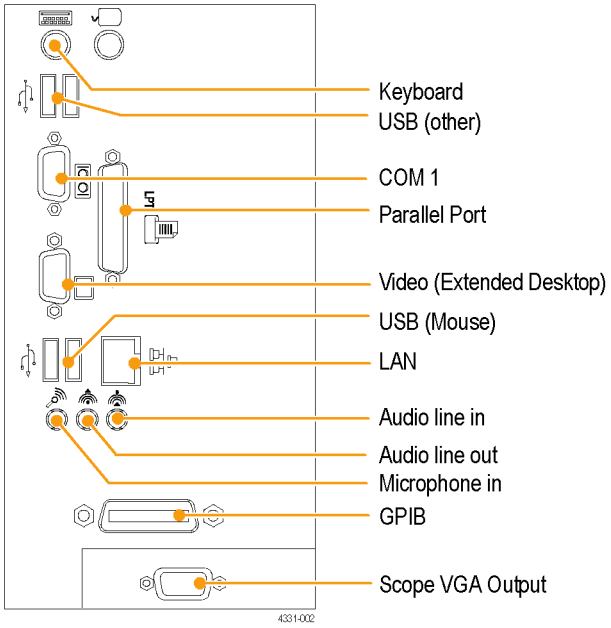
Side and Rear Panels

The following side-panel illustrations (in the *Theory of Operation* section) have been upgraded to include the latest component locations and are for reference only. Use the instructions in the TDS5000B Series Quick Start User manual (071-1355-XX) to connect your instrument.

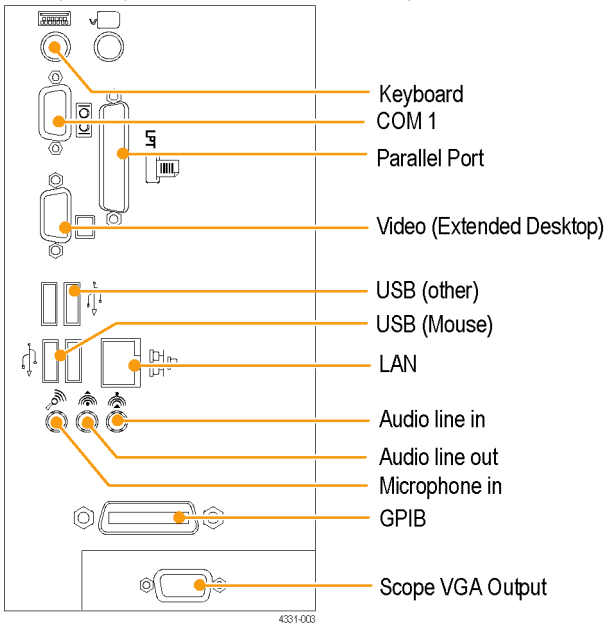
Side panel (SN B010100 to SN B019999)

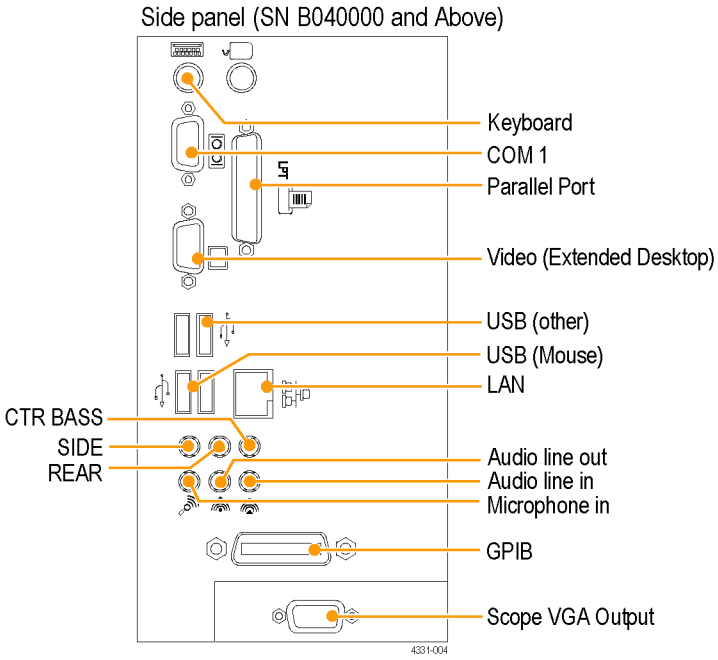


Side panel (SN B020000 to SN B029999)



Side panel (SN B030000 to SN B039999)





Cleaning

Use these procedures to clean your oscilloscope. If additional cleaning is required have your oscilloscope serviced by qualified service personnel.

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 directly.

CAUTION. *Do not use chemical cleaning agents that might damage the plastics used in this oscilloscope. Use only deionized water when cleaning the front-panel buttons. Use a 75% isopropyl alcohol solution as a cleaner and rinse with deionized water. Before using any other type of cleaner, contact your Tektronix Service Center or representative.*

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).

PC Interface Board and Motherboard Cable Connections

Replace Figures 6-17 and 6–18 in the *Removal and Installation Procedures*).

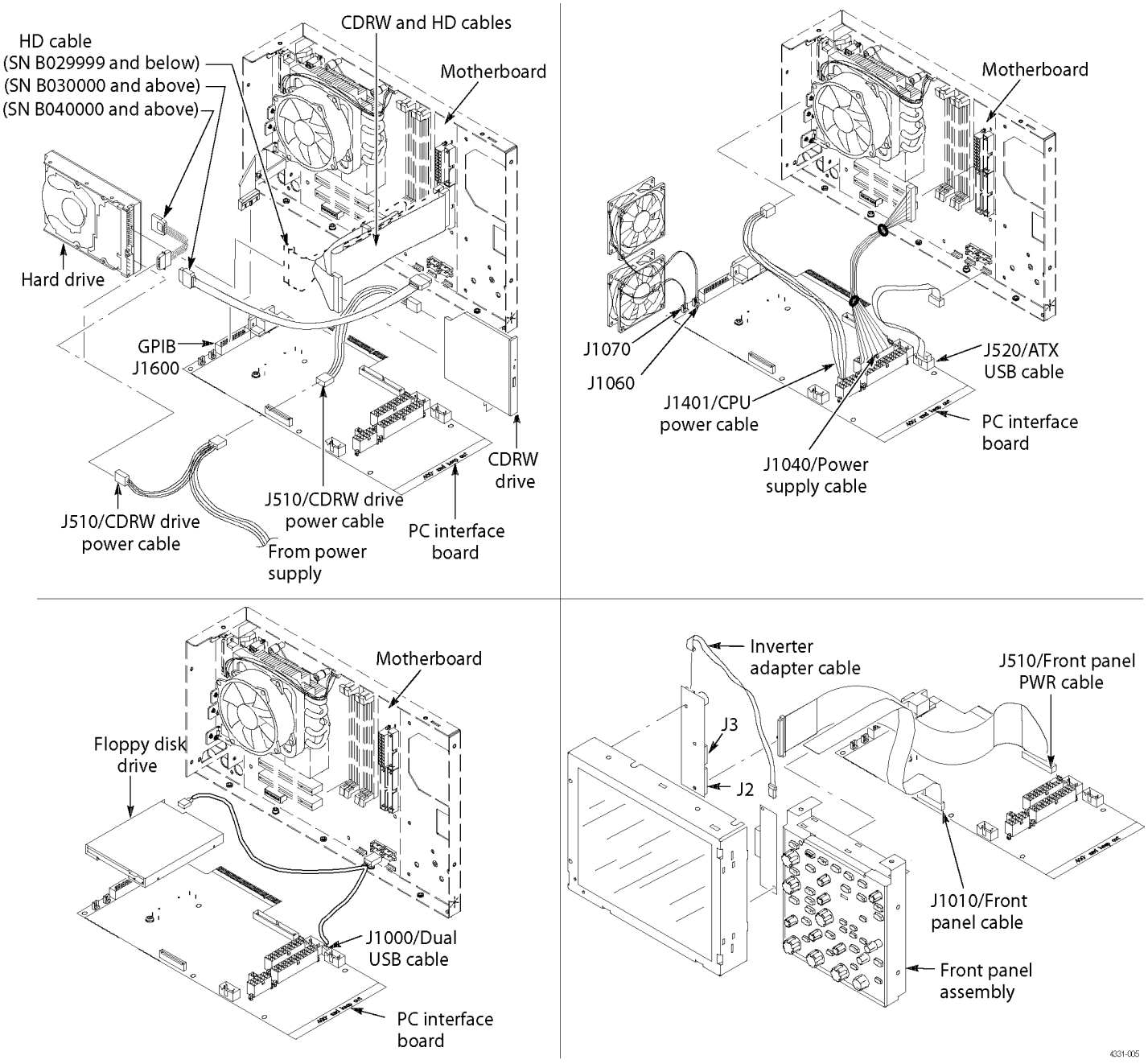


Figure 6-17: PC Interface board and motherboard cable connections

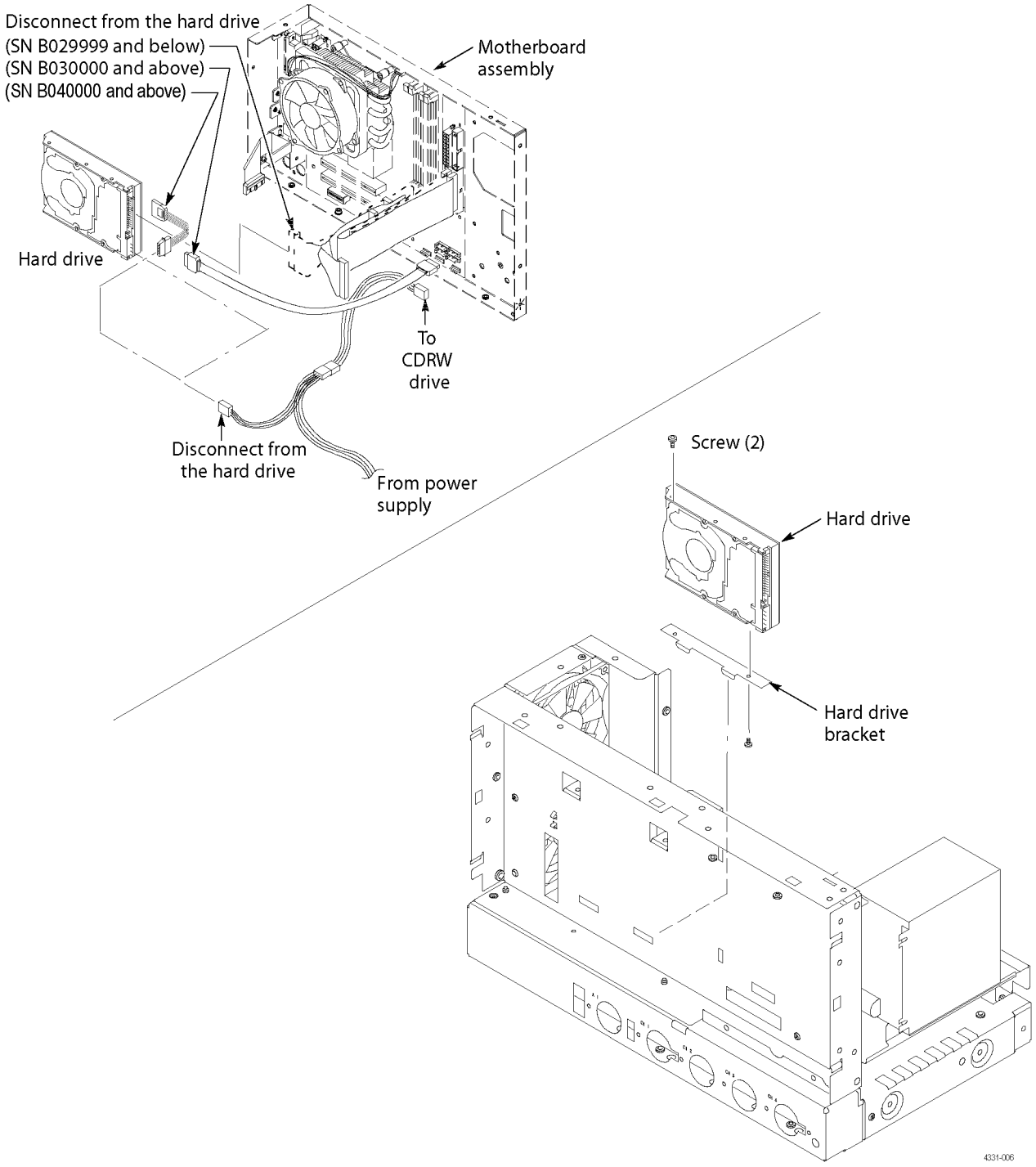


Figure 6-18: Desktop hard drive removal

039-0185-xx Service Information

Use the following information when servicing instruments with serial numbers B040000 and above or instruments using the 039-0185-xx Mother board. This information is only for qualified service personnel.

Table 1: 039-0185-xx µATX 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.
			The flags 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
			Cyrix CPU initialization
			Cache initialization

Table 1: 039-0185-xx µATX 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 Super IO 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 exits
	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 1: 039-0185-xx µATX 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 1: 039-0185-xx µATX 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 an clear EISA mode flag.
	Reserved	48	
	Size Base and Extended Memory	49	Size base memory from 256 K to 640 K and extended memory above 1 MB.
	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 1 MB 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 1: 039-0185-xx µATX POST codes, (cont.)

Item no.	Module	Displayed POST code	Description
12	Memory Test	52	Test all memory of memory above 1 MB 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 1: 039-0185-xx µATX 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 1: 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 integrity 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 System 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 1: 039-0185-xx µATX 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 1: 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 Initialized 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 1: 039-0185-xx µATX 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

Table 2: 039-0185-xx µATX 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.

Replaceable Parts

Use the following information to replace or clarify parts list information in the service manual.

External parts

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description
10-1-(not shown)	101-0158-xx	**B030000**		1	TRIM RING; FR110,PC/ABS

Inner Panels

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description
10-2-10	441-2226-xx	B010100	B019999	1	CHASSIS ASSY;FOR ASHLAND MOTHER BOARD,0.050 AL W/BRACKETS & HARDWARE
	441-2376-xx	B020000	B029999	1	CHASSIS ASSY;FOR LACROSSE MOTHER BOARD,0.050 AL W/BRACKETS & HARDWARE
	441-2491-xx	B030000	B039999	1	CHASSIS ASSY;FOR TAPPEN MOTHER BOARD,0.050 AL W/BRACKETS & HARDWARE
	441-2557-xx	B040000		1	CHASSIS ASSY;FOR ADVANTECH MOTHER BOARD,0.050 AL W/BRACKETS & HARDWARE

Modules

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description
10-3-5	039-0154-xx	B010100	B019999	1	MOTHER BOARD ASSY;PENTIUM 4/CELERON BD, UATX,ASHLAND 2.1,W/O PROCESSOR,D845GVAD2L
	039-0159-xx	B020000	B029999	1	MOTHER BOARD ASSY;PENTIUM 4/CELERON BD, UATX,LA CROSSE,W/O PROCESSOR,BLKD865GLCLK INTEL P/N,SAFETY CONTROLLED
	039-0173-xx	B030000	B039999	1	MOTHER BOARD ASSY;PENTIUM 4, UATX,TAPPEN BD,GIG E, PROCESSOR LGA775,DDR2 667MHZ,TOTAL 4 GIG,BLKD945GTPLKR,SAFETY CONTROLLED
	039-0185-xx	B040000		1	MOTHER BOARD ASSY;ADVANTECH MICROATX, LGA 775 CORE 2 DUO, DDR2, PCI-E X1, SINGLE GBE LAN; ADVANTECH AIMB-562VG-00A1E WITH ADD2 DISABLE AND BIOS 562X126N.BIN SAFETY CONTROLLED

External parts

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description
10-4-1	119-7524-xx			1	DISK DRIVE,HARD; 160GB, 3.5 INCH, 7200 RPM, SATA II 3.0 GB/S INTERFACE;,SAFETY CONTROLLED
4b	174-5639-xx	B040000+		1	CABLE ASSY MOLEX TO SATA POWER ADAPTER
-5	119-6833-xx	B010100	B060099	1	DISK DRIVE; USB FLOPPY,3.5 INCH;1.44MB,0.5 INCH,TWO SIDED,DOUBLE DENSITY,SAFETY CONTROLLED

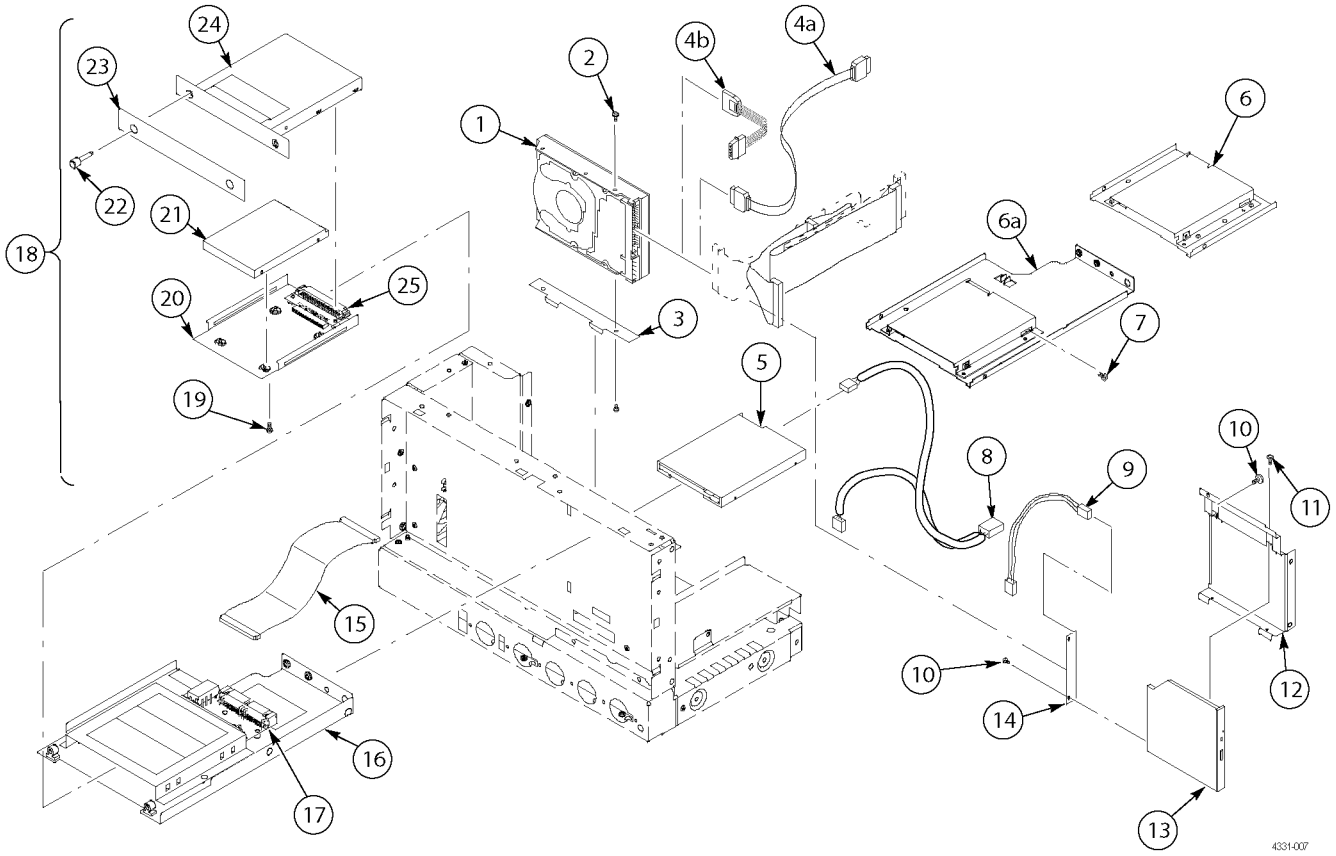


Table 10–4 Drives

Accessories

Fig. & index number	Tektronix part number	Serial no. effective	Serial no. discont'd	Qty	Name & description
10-6-	063-3693-xx	B010100	B019999	1	TDS5000B SERIES OPERATING SYSTEM RESTORE CD
	063-3759-xx	B020000	B029999	1	TDS5000B SERIES OPERATING SYSTEM RESTORE CD
	063-3985-xx	B030000	B039999	1	TDS5000B SERIES OPERATING SYSTEM RESTORE CD
	020-2969-xx	B040000		1	TDS5000B SERIES OPERATING SYSTEM RESTORE CD KIT

Specification and Performance Verification

Check the *TDS5000B Series Digital Phosphor Oscilloscopes Specifications and Performance Verification* (071-1420-XX) manual on the Tektronix Web site for the latest updates and a complete list of instrument specifications. The Web site address is located on the copyright page at the front of this Read This First document.