Dell™ Latitude™ E5400 Discrete Service Manual

Notes, Cautions, and Warnings

NOTE: A NOTE indicates important information that helps you make better use of your computer.

CAUTION: A CAUTION indicates potential damage to hardware or loss of data if instructions are not followed.

WARNING: A WARNING indicates a potential for property damage, personal injury, or death.

If you purchased a Dell™ n Series computer, any references in this document to Microsoft® Windows® operating systems are not applicable.

System Setup

Dell™ Latitude™ E5400 Discrete Service Manual

- <F12> Menu
- Entering System Setup
- Boot Menu
- Drive BIOS Quicktest
- Navigation Keystrokes
- System Setup Menu Options

Your computer offers the following BIOS and System Setup options:

- Access System Setup by pressing <F2>
- Bring up a one-time boot menu by pressing <F12>
- Start the Pre-boot System Assessment by pressing <Fn> and the power button

<F12> Menu

Press <F12> when the Dell™ logo appears to initiate a one-time boot menu with a list of the valid boot devices for the computer. **Diagnostics** and **Enter Setup** options are also included in this menu. The devices listed on the boot menu depend on the bootable devices installed in the computer. This menu is useful when you are attempting to boot to a particular device or to bring up the diagnostics for the computer. Making changes in the boot menu does not make any changes to the boot order stored in the BIOS.

Entering System Setup

Press <F2> to enter System Setup and make changes to user-definable settings. If you have trouble entering System Setup using this key, press <F2> when the keyboard lights first flash.

Boot Menu

Your computer features an enhanced one-time boot menu:

- **Easier access**—Access the menu by pressing <F12> during system boot
- **User prompting**—The missing keystroke is now displayed on the BIOS splash screen
- **Added diagnostics options**—The boot menu now includes two new options: **IDE Drive Diagnostics** (90/90 hard drive diagnostics) and **Boot to the Utility Partition**

Drive BIOS Quicktest

The Drive BIOS Quicktest allows you to test the physical functionality of the hard drive without having to locate and download files from **support.dell.com** or make bootable floppies or CDs. Select **IDE Drive Diagnostics** from the boot menu to initiate the test.

Navigation Keystrokes

Use the following keystrokes to navigate the System Setup screens.

Navigation Keystrokes	
Action	**Keystroke**
Expand and collapse field	<Enter>, left- or right-arrow key, or +/−
Expand or collapse all fields	< >
Exit BIOS	<Esc>—Remain in Setup, Save/Exit, Discard/Exit
Change a setting	Left or right-arrow key
Select field to change	<Enter>
Cancel modification	<Esc>
Reset defaults	<Alt><F> or **Load Defaults** menu option

System Setup Menu Options

The following tables describe the menu options for the System Setup BIOS.

General	
Option	**Description**

	This section lists the primary hardware features of your computer. There are no configurable options in this section.
	
	l **System Information**
	   o BIOS Version
	   o Service Tag
	   o Asset Tag
	   o Ownership Tag

System Information	l **Memory Information**
	   o Memory Installed
	   o Memory Available
	   o Memory Speed
	   o Memory Channel Mode
	   o Memory Technology
	   o DIMM A Size
	   o DIMM B Size
	l **Processor Information**
	   o Processor Type
	   o Core Count
	   o Processor ID
	   o Current Clock Speed
	   o Minimum Clock Speed
	   o Maximum Clock Speed
	l **Device Information**
	   o Primary Hard Drive
	   o Modular Bay Device
	   o System eSATA Device
	   o Dock eSATA Device
	
	   o Video Controller
	   o Video BIOS Version
	   o Video Memory
	   o Panel Type
	   o Native Resolution
	
	   o Audio Controller
	   o Modem Controller
	   o Wi-Fi Device
	   o Cellular Device
	   o Bluetooth Device

Battery Information	Indicates the primary battery and the media bay battery status. Also displays the type of AC adapter connected to the computer.
Boot Sequence	The computer attempts to boot from the sequence of devices specified in this list: l Diskette drive l USB Storage Device l CD/DVD/CD-RW Drive. l Internal HDD l Cardbus NIC l Onboard NIC This list specifies the order that the BIOS searches devices when trying to find an operating system to boot. To change the boot order, select the device to be changed in the list then click the up/down arrows or use the keyboard PgUp/PgDn keys to change the boot order of the device. The boot devices can also be de-selected from the list using the check boxes.
Date/Time	Displays current date and time settings.

System Configuration	
Option	**Description**
NOTE:	The System Configuration group contains options an settings relater to integrated system devices. (Depending on your computer and installed devices, the items listed in this section may or may not appear.)
Integrated NIC	Enables or disables the onboard LAN controller. Default setting: **Enabled w/PXE**
System Management	Controls system management mechanism. The setting options are **Disabled**, **Alert Only**, and **ASF 2.0**. Default setting: **Disabled**
Parallel Port	This field determines how the parallel port on the docking station operates. Default setting: **ECP**
Serial Port	This field determines how the integrated serial port operates. The settings are **Disabled**, **COM1**, **COM2**, **COM3** and **COM4**. Default setting: **COM1**
SATA Operation	This option configures the operating mode of the internal SATA hard drive controller. The settings are **Disabled**, **ATA**, and **AHCI**. Default setting: **AHCI**
Miscellaneous Devices	Use the check boxes to enable/disable the following devices: l Internal Modem l Module Bay l Media Card, PC Card and 1394 l External USB Port l Microphone l eSATA Ports Default setting: **All enabled**.
USB PowerShare	This option configures the USB PowerShare feature behavior. Use the check box to enable / disable the feature (default state is disabled). The settings are **0%**, **3%**, **10%**, **25%**, **50%**, and **75%**.

Video	
Option	**Description**
LCD Brightness	This option (represented by a slider bar for On Battery and On AC) sets the panel brightness when the ambient light sensor is off.

Security	
Option	**Description**
Admin Password	This field lets you set, change, or delete the administrator (admin) password (sometimes called the "setup" password). The admin password enables several security features when set including: l Restricts changes to the settings in Setup l Restricts the boot devices listed in the <F12> Boot Menu to those enabled in the "Boot Sequence" field. l Prohibits changes to the owner and asset tags. l Substitutes for the system password if the system prompts for a password during power on. Successful changes to this password take effect immediately. If you delete the admin password, the system password is also deleted. Also, the admin password can be used to delete the HDD password. For this reason, you cannot set an admin password if a system password or HDD is already set. The admin password must be set first if used in conjunction with a system and/or HDD password.
System Password	This field lets you set, change, or delete the system password (previously called the "Primary" password).
Internal HDD PW	This field lets you set, change, or delete the password on the system's internal hard disk drive (HDD). Successful changes take place immediately and require a system restart. The HDD password travels with the hard drive, so the HDD is protected even when installed in another system.
Password Bypass	This option lets you bypass the system and internal HDD password prompts during a system restart or when resuming from a standby state. Settings are **Disabled**, **Reboot Bypass**, **Resume Bypass**, and **Reboot & Resume Bypass**. The system will always prompt for the set system and internal HDD password when powered on from an off state (cold boot).
Password Change	This option lets you determine whether changes to the System and HDD passwords are permitted when an Admin password is set. Use the check box to allow or disallow changes.
TPM Security	This option lets you control whether the Trusted Platform Module (TPM) in the system is enabled and visible to the operating system. When disabled (check box is empty), the BIOS will not turn on the TPM during POST. The TPM will be non-functional and invisible to the operating system. When enabled (check box filled) the BIOS will turn the TPM on during POST so the it can be used by the operating system. Disabling this option does not change any settings you may have made to the TPM, nor does it delete or change any information or keys you may have stored there. It simply turns off the TPM so that it cannot be used. When you re-enable the TPM, it will function exactly as it did before it was disabled. Once TPM is enabled (check box filled), the available settings are: **Deactivate**, **Activate**, and **Clear**. With the TPM in Deactivate mode it will not execute any commands that use the resources of the TPM, nor will it allow any access to stored owner information. The Clear setting allows the owner information stored in the TPM to be cleared. Use this to restore the TPM to its default state if you lose or forget the owner authentication data.
Computrace®	This field lets you activate or disable the BIOS module interface of the optional Computrace software. The settings are **Deactivate**, **Disable**, and **Activate**. The Activate and Disable options will permanently activate or disable the feature and no further changes will be allowed.
CPU XD Support	This field enables or disables the Execute Disable mode of the processor. Use the check box to enable / disable this feature. Default setting: **Enabled**
Non-Admin Setup Changes	This option lets you determine whether changes to the setup option are permitted when an administrator password is set. If disabled the setup option is locked by the admin password. It cannot be modified unless setup is unlocked. Use the check boxes to allow / deny access to the Wi-Fi Catcher Changes and / or Wireless Switch Changes within the system setup.

Performance	
Option	**Description**
Multi Core Support	Use the check box to enable / disable multi core support for the CPU.
HDD Acoustic Mode	This option allows you to optimize your HDD's performance and acoustic noise level based on your personal preferences. Settings are **Bypass**, **Quiet**, and **Performance**.
Intel® SpeedStep	Use the check box to enable / disable mode for the CPU.

Power Management	
Option	**Description**
Wake on AC	Use the check box to enable / disable the computer to power up from the off or hibernation state when an AC adapter is inserted.
Auto On Time	This field sets the of days, if any, when you would like the system to turn on automatically. The settings are **Disabled**, **Everyday**, or **Weekdays**. Default setting: **Off**
USB Wake Support	Use the check box to enable / disable the ability for USB devices to wake the system from Standby. This feature is only functional when the AC power adapter is connected. If the AC power adapter is removed during Standby, the BIOS will remove power from all of the USB ports to conserve battery power.
	This field allows the computer to power up from the off state when triggered by a special LAN signal or from Hibernate state when triggered by a special wireless LAN signal. Wake-up from the Standby state is unaffected by this setting and must be enabled in the operating system.

Wake on LAN/WLAN	l **Disabled** — Do not allow the system to power on when it receives a wake-up signal from the LAN or wireless LAN. l **LAN Only** — Allow the system to be powered on by special LAN signals. l **WLAN Only** — Allow the system to be powered on by special WLAN signals. l **LAN or WLAN** — Allow the system to be powered on by special LAN or wireless LAN signals. The factory default setting is **Off**.
ExpressCharge	This field lets you select fast the battery will charge. Standard = The battery will charge over a longer period of time. ExpressCharge = Dell fast charging technology (not available for all batteries). Default setting: **ExpressCharge**
Charger Behavior	This field lets you enable / disable the battery charger. If disabled, the battery will not lose power when the system is connected to an AC adapter but it will not charge either. Default setting: **Charger Enabled**

POST Behavior	
Option	**Description**
Adapter Warnings	Use the check box to enable / disable the BIOS warning messages when you use certain power adapters. The BIOS displays these messages if you attempt to use a power adapter that has too little capacity for your configuration. The factory default setting is **Enabled**.
Keypad (Embedded)	This option lets you choose one of two methods to enable the keypad that is embedded in the internal keyboard. l **Fn Key Only** — The keypad is only enabled when you hold down the <Fn> key. l **By Num Lk** — The keypad is enabled when (1) the Num Lock LED is on and (2) no external keyboard is attached. Note that the system might not notice immediately when an external keyboard is detached. When Setup is running, this field has no effect—Setup works in the FN Key Only mode. The factory default setting is **Fn Key Only**.
Mouse/Touchpad	This option defines how the system handles mouse and touch pad input. l **Serial Mouse** — Use a serial mouse and disable the internal touch pad. l **PS/2 Mouse** — Disable the integrated touch pad when an external PS/2 mouse is present. l **Touchpad-PS/2** — Leave the integrated touch pad enabled when an external PS/2 mouse is present. The factory default setting is **Touchpad-PS/2**.
Numlock LED	Use the check box to enable / disable the Num Lock LED when the system boots. The factory default setting is **Enabled**.
USB Emulation	This option defines how the BIOS, in the absence of a USB-aware operating system, handles USB devices. USB emulation is always enabled during POST. Use the check box to enable / disable this feature. The factory default setting is **Enabled**.
Fn Key Emulation	This field lets you use the <Scroll Lock> key on an external PS/2 keyboard the same way you use the <Fn> key on the computer's internal keyboard. Use the check box to enable / disable this feature. USB keyboards cannot emulate the <Fn> key if you are running an ACPI operating system such as Microsoft® Windows® XP. USB keyboards will only emulate the <Fn> key in non-ACPI mode (e.g., when you are running a DOS). The factory default setting is **Enabled**.
Fast Boot	This field can speed up the boot process by bypassing some compatibility steps. l **Minimal** — Boot quickly unless the BIOS has been updated, memory changed, or the previous POST did not complete. l **Thorough** — Do not skip any steps in the boot process. l **Auto** — Allow the operating system to control this setting (this works only when the operating system supports Simple Boot Flag). The factory default setting is **Minimal**.

Virtualization Support	
Option	**Description**
Virtualization	This field specifies whether a Virtual Machine Monitor (VMM) can utilize the additional hardware capabilities provided by Intel® Virtualization Technology. Use the check box to enable/disable this feature. The factory default setting is **Disabled**.
VT for Direct I/O	This option specifies whether a Virtual Machine Monitor (VMM) can utilize the additional hardware capabilities provided by Intel Virtualization Technology for Direct I/O. Use the check box to enable/disable this feature. The factory default setting is **Disabled**.
Trusted Execution	This option specifies whether a Measured Virtual Machine Monitor (MVMM) can utilize the additional hardware capabilities provided by Intel Trusted Execution Technology. The TPM, Virtualization Technology, and Virtualization Technology for Direct I/O must be enabled to use this feature. Use the check box to enable/disable this feature. The factory default setting is **Disabled**.

Wireless

Option	Description
Wi-Fi Catcher	This field lets you enable or disable the Wi-Fi Catcher™ feature. If this setting is set to **Disabled**, the Wi-Fi Catcher request position on the wireless switch will be ignored. If this setting is set to **Enabled**, the Wi-Fi Catcher switch is enabled and will use the previously configured options. If **Reset to Basic Mode** is selected the Wi-Fi Catcher options will be written such that the Wi-Fi Catcher will search for any available network and the Wi-Fi catcher will be set to Enabled. The QuickSet application should be used to configure and view the Wi-Fi catcher advanced options. The factory default setting is **Enabled**.
Wireless Switch	Use the check boxes to determine which wireless devices will be controlled by the wireless switch. The available options are **WWAN**, **WLAN**, and **Bluetooth®**.
Wireless Devices	Use the check boxes to enable/disable the various wireless devices. The available options are **Internal WWAN**, **Internal WLAN**, and **Internal Bluetooth.**

Maintenance	
Option	Description
Service Tag	This field displays your system's Service Tag. If for some reason the Service Tag was not already set, you would be able to use this field to set it. If a Service Tag has not been set for this system, the computer will automatically bring up this screen when users enter the BIOS. You will be prompted to enter the Service Tag.
Asset Tag	This field allows you to create a system Asset Tag. The field can only be updated if the Asset Tag is not already set.

System Logs	
Option	Description
BIOS Events	This field allows you to view and clear BIOS POST events. It includes the date and time of the event as well as the LED code.
DellDiag Events	This field allows you to view the diagnostic results from DellDiags and PSA. It includes the time and date, the diagnostic and version which was run and the resulting code.
Thermal Events	This field allows you to view and clear thermal events. It includes the date and time as well as the name of the event.
Power Events	This field allows you to view and clear power events. It includes the date and time of the event as well as the power state and reason.

Diagnostics
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- Device Status Lights
- Battery Status Lights
- Battery Charge and Health
- Keyboard Status Lights
- LED Error Codes

Device Status Lights

⏻	Turns on when you turn on the computer and blinks when the computer is in a power management mode.
▯	Turns on when the computer reads or writes data.
🔋	Turns on steadily or blinks to indicate battery charge status.
📶	Turns on when wireless networking is enabled.
✲	Turns on when a card with Bluetooth® wireless technology is enabled. To turn off only the Bluetooth wireless technology function, right-click the icon in the system tray and select **Disable Bluetooth Radio**.

Battery Status Lights

If the computer is connected to an electrical outlet, the battery light operates as follows:

- **Alternately blinking amber light and blue light** — An unauthenticated or unsupported, non-Dell AC adapter is attached to your laptop.
- **Alternately blinking amber light with steady blue light** — Temporary battery failure with AC adapter present.
- **Constantly blinking amber light** — Fatal battery failure with AC adapter present.
- **Light off** — Battery in full charge mode with AC adapter present.
- **Blue light on** — Battery in charge mode with AC adapter present.

Battery Charge and Health

To check the battery charge, press and release the status button on the battery charge gauge to illuminate the charge-level lights. Each light represents approximately 20 percent of the total battery charge. For example, if four lights are on, the battery has 80 percent of its charge remaining. If no lights appear, the battery has no charge.

To check battery health using the charge gauge, press and hold the status button on the battery charge gauge for at least 3 seconds. If no lights appear, the battery is in good condition and more than 80 percent of its original charge capacity remains. Each light represents incremental degradation. If five lights appear, less than 60 percent of the charge capacity remains, and you should consider replacing the battery.

Keyboard Status Lights

The green lights located above the keyboard indicate the following:

🔒9	Turns on when the numeric keypad is enabled.
🔒A	Turns on when the Caps Lock function is enabled.
🔒↓	Turns on when the Scroll Lock function is enabled.

LED Error Codes

The following table shows the possible LED codes that may display in a no-POST situation.

Appearance	Description	Next Step
ON-FLASH-FLASH	No SODIMMs are installed	1. Install supported memory modules. 2. If memory is already present, reseat the module(s) one at time in each slot. 3. Try known good memory from another computer or replace the memory. 4. Replace the system board.
FLASH-ON-ON	System board error	1. Reseat the processor. 2. Replace the system board. 3. Replace the processor.

FLASH-ON-FLASH	LCD panel error	1. Reseat the LCD cable. 2. Replace the LCD panel. 3. Replace the video card/system board.
OFF-FLASH-OFF	Memory compatibility error	1. Install compatible memory modules. 2. If two modules are installed remove one and test. Try the other module in the same slot and test. Test the other slot with both modules. 3. Replace the memory. 4. Replace the system board.
ON-FLASH-ON	Memory is detected but has errors	1. Reseat the memory. 2. If two modules are installed remove one and test. Try the other module in the same slot and test. Test the other slot with both modules. 3. Replace the memory. 4. Replace the system board.
OFF-FLASH-FLASH	Modem error	1. Reseat the modem. 2. Replace the modem. 3. Replace the system board.
FLASH-FLASH-FLASH	System board error	1. Replace the system board.
FLASH-FLASH-OFF	Option ROM error	1. Reseat the device. 2. Replace the device. 3. Replace the system board.
OFF-ON-OFF	Storage device error	1. Reseat the hard drive and optical drive. 2. Test the computer with just the hard drive and just the optical drive. 3. Replace the device that is causing the failure. 4. Replace the system board.
FLASH-FLASH-ON	Video card error	1. Replace the system board.

Adding and Replacing Parts
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Specifications

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NOTE: Offerings may vary by region. For more information regarding the configuration of your computer, click **Start** (or **Start** in Windows® XP)→ **Help and Support**, and then select the option to view information about your computer.

Processor	
Processor type	Intel® Core™ 2 Duo processors Intel Celeron® processor (Socket P)
Bus speed	maximum, 1066 MHz for Intel Core 2 Duo
L1 cache	32 KB
L2 cache	1 MB

System Information	
System chipset	Mobile Intel GE45 Express chipset
Data bus width	64 bits
DRAM bus width	Dual-channel (2) 64 bit buses
Processor address bus width	32 bits
Flash EPROM	16 MB
PCI bus	32 bits

3-in-1 Memory Card Reader	
Cardbus controller	Ricoh R5C847
Connector	3-in-1 combo card connector
Cards supported	SecureDigital (SD), SDIO, MultiMediaCard (MMC)

Memory	
Memory module connectors	two DIMM sockets
Memory module capacities	512 MB, 1, 2, 3, or 4 GB capable
Memory type	DDR II 667 MHz and 800 MHz SDRAM
Minimum memory	512 MB
Maximum memory	8 GB

Ports and Connectors	
PC Card	Type I/II PC Card connector
Audio	microphone connector, and stereo headphone/speakers connector
IEEE 1394	4-pin connector
Mini-Card	One full Mini-Card and one half Mini-Card slot
Modem	Optional RJ-11 connector
Network adapter	RJ-45 connector
Video	S-video (supports S/PDIF adapter), VGA
USB	four USB connectors
E-family docking	144-pin docking connector

Communications	
Modem	internal (optional)
Network adapter	10/100/1000 Ethernet LAN on system board
Wireless	WLAN and WPAN Mini-Cards
Mobile Broadband	Mini-Card
GPS	supported by Mobile Broadband Mini-Card

Video	
Video type	Intel integrated UMA graphics
Video controller	NVIDIA NB9M
Video memory	up to 512 MB (256 MB onboard, up to 256 MB shared from system memory)
LCD interface	LVDS
TV support	S-video (S/PDIF) connector

Audio	
Audio type	high definition audio
Audio controller	IDT® 92HD71B
Stereo conversion	24-bit (stereo digital-to-analog) 24-bit (stereo analog-to-digital)
Interfaces:	
Internal	high definition audio
External	microphone-in connector, stereo headphones/speakers mini-connector
Speakers	two 4-ohm speakers
Internal speaker amplifier	1-Watt channel into 4 ohms
Internal microphone	single analog microphone
Volume controls	volume control buttons and program menus

Display	
Type (active-matrix TFT)	WSVGA or WSGA touch screen
Dimensions	VESA standard on all models
Operating angle	0° (closed) to 160°
Viewing angles:	
WXGA horizontal	40 / 40°
WXGA vertical	15 / 30°
WXGA+ horizontal	40 / 40°
WXGA+ vertical	15 / 30°
Pixel pitch:	
WXGA	0.2373
WXGA+	0.2109

Keyboard	
Number of keys	83 (all countries except Denmark, United Kingdom, Brazil, and Japan); 84 (Denmark and United Kingdom); 85 (Brazil); 87 (Japan)
Layout	QWERTY/AZERTY/Kanji
Size	full-sized (19 mm key pitch)

Touch Pad	
X/Y position resolution (graphics table mode)	240 CPI

Size:	
Width	65.7 mm
Height	38.2 mm

Battery	
Type	4, 6, or 9-cell "smart" lithium ion (6-cell is default)
Dimensions:	
Depth	
4- or 6-cell lithium-ion battery	54 mm (1.12 inches)
9-cell lithium-ion battery	76 mm (1.99 inches)
Height	
4- or 6-cell lithium-ion battery	19.8 mm (0.77 inches)
9-cell lithium-ion battery	21.1 mm (0.83 inches)
Width	
4- or 6-cell lithium-ion battery	206 mm (7.11 inches)
9-cell lithium-ion battery	224 mm (7.81 inches)
Weight	
4- or 6-cell lithium-ion battery	326 g (.72 pounds)
9-cell lithium-ion battery	487 g (1.07 pounds)
Voltage	
4-cell lithium-ion battery	14.8 VDC
6- or 9-cell lithium-ion battery	11.1 VDC
Charge time (approximate)	
Dell™ ExpressCharge™ mode	2 hours to fully charge
Normal charge mode	4 hours to fully charge
Operating time	varies depending on operating conditions and can be significantly reduced under certain power-intensive conditions
Recharge limit	300 discharge/charge cycles
Temperature range	
Operating	0° to 35°C (32° to 95°F)
Storage	-40° to 65°C (-40° to 149°F)
Coin-cell battery	4-year life

AC Adapter	
Type	65 W auto-air adapter (optional) 90 W E-series
Input voltage	100-240 VAC
Input current (maximum)	1.5 A
Input frequency	50-60 Hz
Output current	
65 W	3.34 A (maximum at 4-second pulse) 4.62 A (continuous)
90 W	5.62 A (maximum at 4-second pulse) 4.62 A (continuous)
Output power	65 W or 90 W
Rated output voltage	19.5 VDC
Dimensions	
65 W	
Height	16 mm (0.63 inches)
Width	66 mm (2.6 inches)
Depth	127 mm (5.0 inches)
Weight (with cables)	0.29 kg (0.64 lb)
90 W	
Height	16 mm (0.63 inch)
Width	70 mm (2.76 inches)
Depth	147 mm (5.8 inches)
Weight (with cables)	0.345 kg (0.76 lb)

Temperature range	
Operating	0° to 40° C (32° to 104° F)
Storage	−40° to 70° C (−40° to 158° F)

Physical	
Height	338 mm (13.31 inches)
Width	240 mm (9.45 inches)
Depth	37.0 mm (1.46 inches)
Weight	2.54 kg (5.6 lb) 6-cell battery, and DVD

Environmental	
Temperature range:	
Operating	0° to 35°C (32° to 95°F)
Storage	−40° to 65°C (−40° to 149°F)
Relative humidity (maximum):	
Operating	10% to 90% (non-condensing)
Storage	5% to 95% (non-condensing)
Maximum vibration (using a random-vibration spectrum that simulates user environment):	
Operating	0.66 GRMS
Storage	1.3 GRMS
Maximum shock (measured with hard drive in head-parked position and a 2-ms half-sine pulse):	
Operating	140 G
Storage	163 G
Altitude	
Operating	−15.2 to 3048 m (−50 to 10,000 ft)
Storage	−15.2 to 10,668 m (−50 to 35,000 ft)
Airborne contaminant level	G2 or lower as defined by ANSI/ISA-S71.04-1985

Battery
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⚠ **WARNING: Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.**
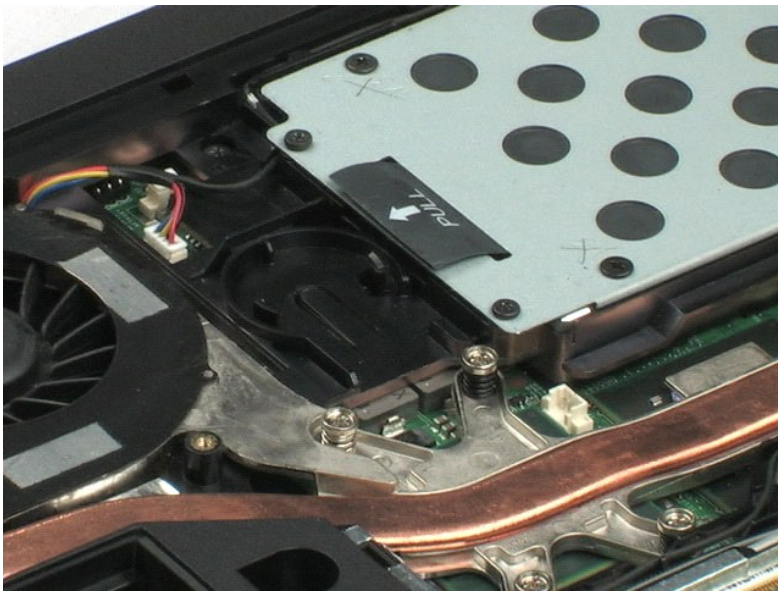
Removing the Battery

📝 **NOTE:** You may need to install Adobe Flash Player from **Adobe.com** in order to view the illustrations below.

1. Follow the procedures in Before Working Inside Your Computer.
2. Slide the battery release latch into the unlocked position.

3. Remove the battery from the computer.

Access Panel
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Removing the Access Panel
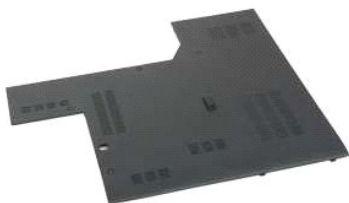
📝 **NOTE:** You may need to install Adobe Flash Player from **Adobe.com** in order to view the illustrations below.

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. Loosen the four captive screws that secure the access panel to the computer.

4. Remove the access panel from the computer.

Coin-Cell Battery
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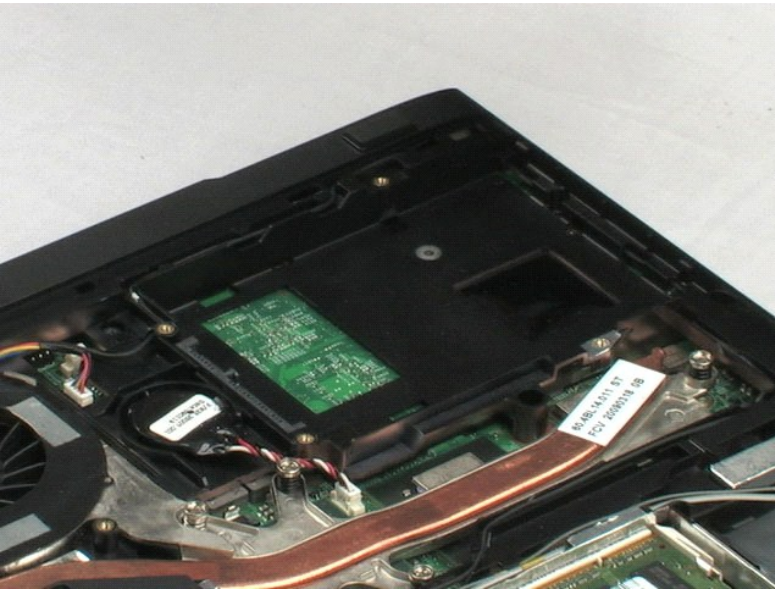
Removing the Coin-Cell Battery

📝 **NOTE:** You may need to install Adobe Flash Player from **Adobe.com** in order to view the illustrations below.

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. Remove the access panel from the computer.
4. Disconnect the coin-cell battery cable from the system board.

1.

5. Release the coin-cell battery from the retention clips.

Hard Drive
Dell™ Latitude™ E5400 Discrete Service Manual

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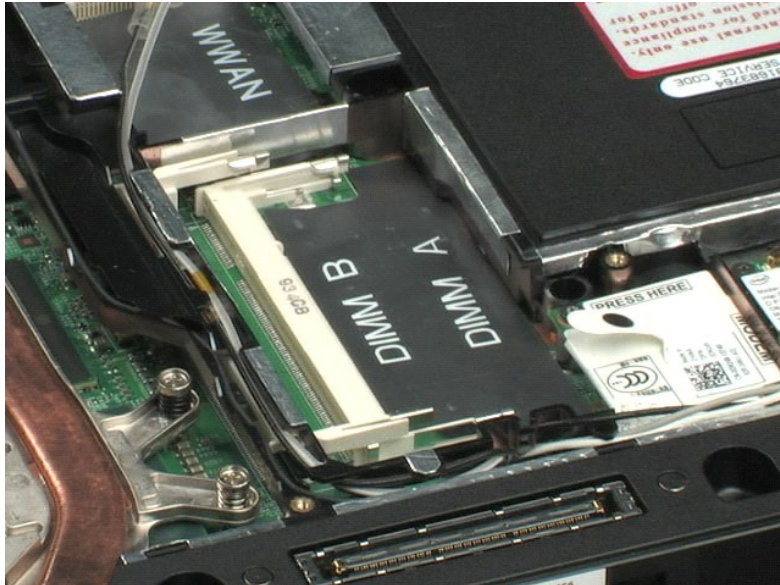
Removing the Hard Drive

📝 **NOTE:** You may need to install Adobe Flash Player from **Adobe.com** in order to view the illustrations below.

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. Remove the access panel from the computer.
4. Remove the four screws that secure the hard drive to the computer.

5. Using the pull tab, lift the hard drive from the computer.

Memory
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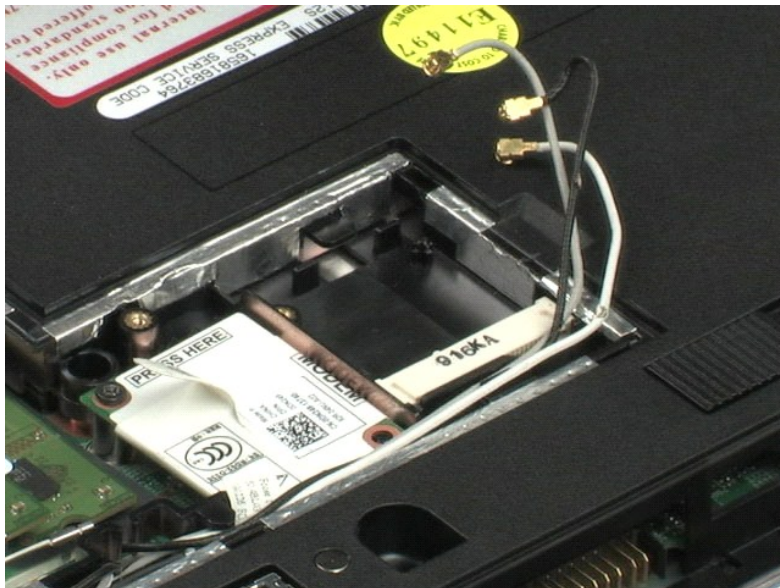
Removing Memory Modules

🖉 **NOTE:** You may need to install Adobe Flash Player from **Adobe.com** in order to view the illustrations below.

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. Remove the access panel from the computer.
4. Gently pry the retention clips away from the first memory module.

5. Remove the first memory module from the computer.

6. Gently pry the retention clips away from the second memory module.

7. Remove the second memory module from the computer.

Wireless Local Area Network (WLAN) Card
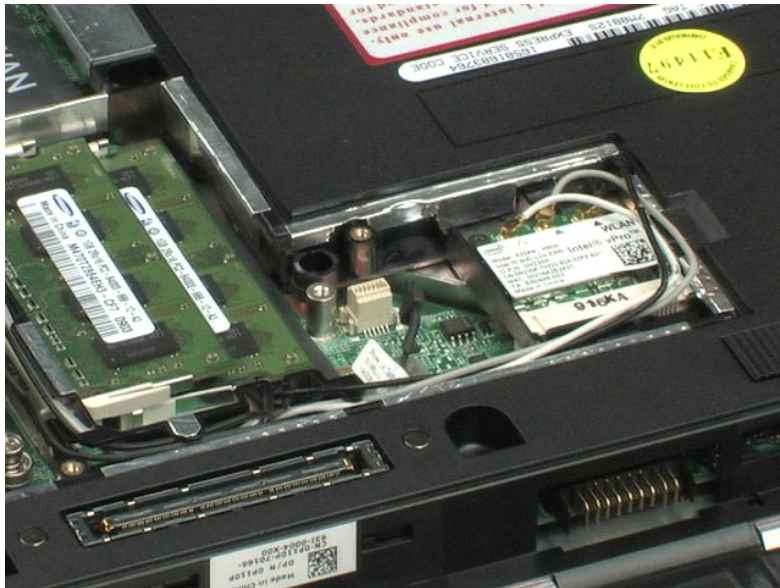**Dell™ Latitude™ E5400 Discrete Service Manual**

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Removing the WLAN Card

📓 **NOTE:** You may need to install Adobe Flash Player from **Adobe.com** in order to view the illustrations below.

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. Remove the access panel from the computer.
4. Disconnect the WLAN antenna cables from the WLAN card.

5. Remove the screw that secures the WLAN card to the computer.

6. Remove the WLAN card from the computer.

Modem
Dell™ Latitude™ E5400 Discrete Service Manual

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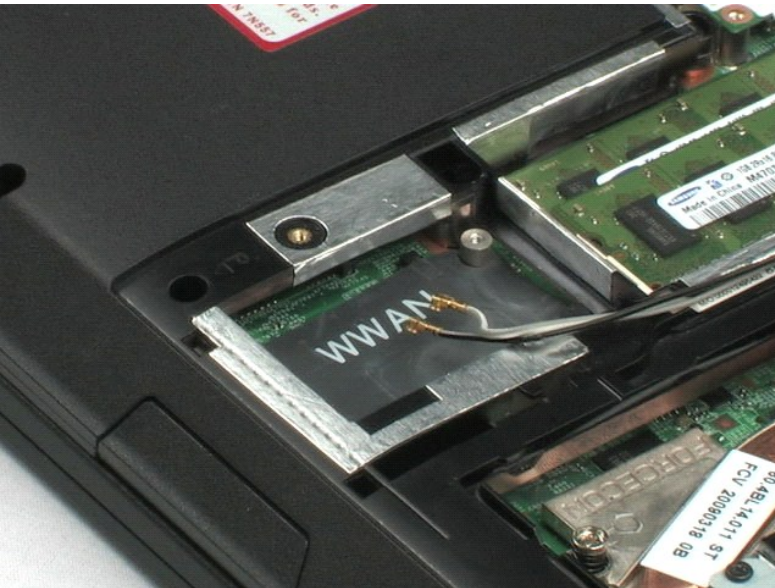
Removing the Modem

📝 **NOTE:** You may need to install Adobe Flash Player from **Adobe.com** in order to view the illustrations below.

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. Remove the access panel from the computer.
4. Disconnect the modem data cable from the modem.

5. Using the pull tab on the modem, disconnect the modem from the system board.

6. Remove the modem module from the computer.

Wireless Wide Area Network (WWAN) Card
Dell™ Latitude™ E5400 Discrete Service Manual

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Removing the WWAN Card

📝 **NOTE:** You may need to install Adobe Flash Player from **Adobe.com** in order to view the illustrations below.

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. Remove the access panel from the computer.
4. Disconnect the WWAN antenna cables from the WWAN card.

5. Remove the screw that secures the WWAN card to the computer.

6. Remove the WWAN card from the computer.

Heat Sink
Dell™ Latitude™ E5400 Discrete Service Manual

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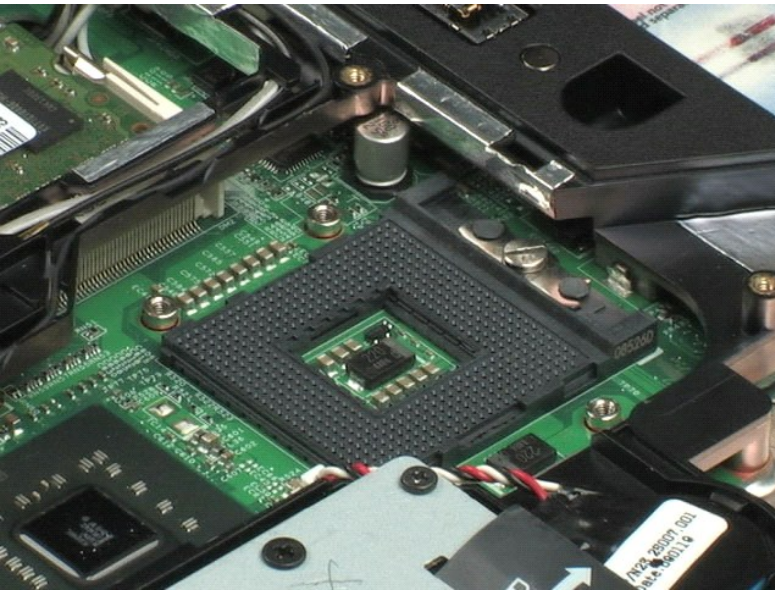
Removing the Heat Sink

📝 **NOTE:** You may need to install Adobe Flash Player from **Adobe.com** in order to view the illustrations below.

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. Remove the access panel from the computer.
4. Disconnect the fan cable from the system board.

5. Loosen the five captive screws that secure the heat sink to the computer.

6. Lift the heat sink and remove it from the computer.

Processor
Dell™ Latitude™ E5400 Discrete Service Manual

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Removing the Processor

📝 **NOTE:** You may need to install Adobe Flash Player from **Adobe.com** in order to view the illustrations below.

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. Remove the access panel from the computer.
4. Remove the heat sink from the computer.
5. Using a plastic scribe, rotate the processor cam lock counterclockwise.

6. Lifting straight up, remove the processor from the computer.

Hinge Cover
Dell™ Latitude™ E5400 Discrete Service Manual

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Removing the Hinge Cover

📝 **NOTE:** You may need to install Adobe Flash Player from **Adobe.com** in order to view the illustrations below.

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. On the right side of the computer, use a plastic scribe (inserted into the indent) to pry up the hinge cover.

4. Starting from the right and working towards the left, use your fingers to lift the hinge cover away from the computer.

Keyboard
Dell™ Latitude™ E5400 Discrete Service Manual

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Removing the Keyboard

📝 **NOTE:** You may need to install Adobe Flash Player from **Adobe.com** in order to view the illustrations below.

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. Remove the hinge cover from the computer.
4. Remove the two screws that secure the keyboard to the computer.

5. Pull on the keyboard tab gently to release the edges of the keyboard from the computer.

6. Slide the keyboard toward the back of the computer to disconnect the keyboard from the computer, then lift and remove the keyboard from the computer.

Optical Drive

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Removing the Optical Drive

📝 **NOTE:** You may need to install Adobe Flash Player from **Adobe.com** in order to view the illustrations below.

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. Remove the optical drive retention screw from the computer.

4. Insert a plastic scribe into the retention screw slot.

5. With the plastic scribe still inserted into the retention screw slot, firmly disengage the optical drive from its connector, sliding the drive about a quarter of an inch from the computer's media bay.

6. Remove the optical drive from the computer.

Display Assembly
Dell™ Latitude™ E5400 Discrete Service Manual

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Removing the Display Assembly

📝 **NOTE:** You may need to install Adobe Flash Player from **Adobe.com** in order to view the illustrations below.

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. Remove the access panel from the computer.
4. Remove the hinge cover from the computer.
5. Remove the keyboard from the computer.
6. Disconnect the wireless antennas and remove them from their routing paths.

7. Remove the two display assembly screws from the bottom of the computer.

8. Turn the computer upside-down and pivot the display into the fully-open position.

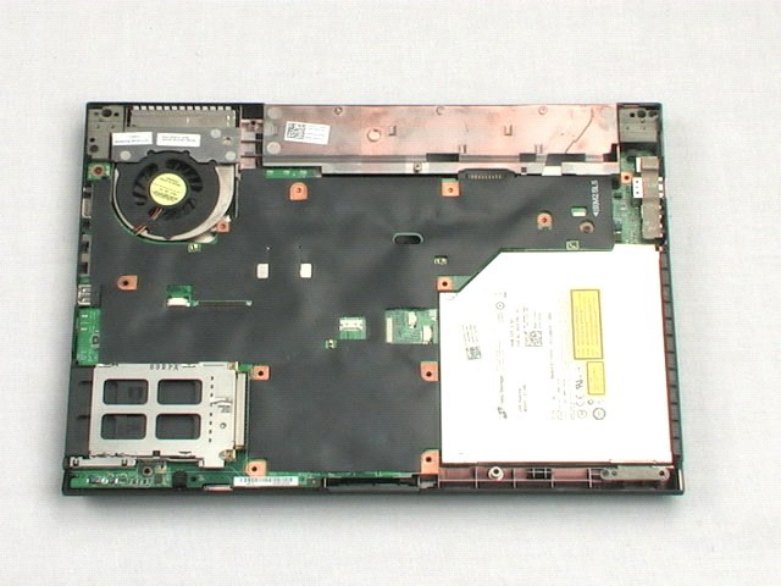9. Disconnect the camera cable from the system board.

10. Disconnect the display data cable from the system board.

11. Pull the wireless antennas through the hole in the chassis, then remove the antennas from their routing paths to either side of the computer.

12. Remove the four screws that secure the display assembly to the computer chassis.

13. Lifting straight up, remove the display assembly from the computer.

Palm Rest
Dell™ Latitude™ E5400 Discrete Service Manual

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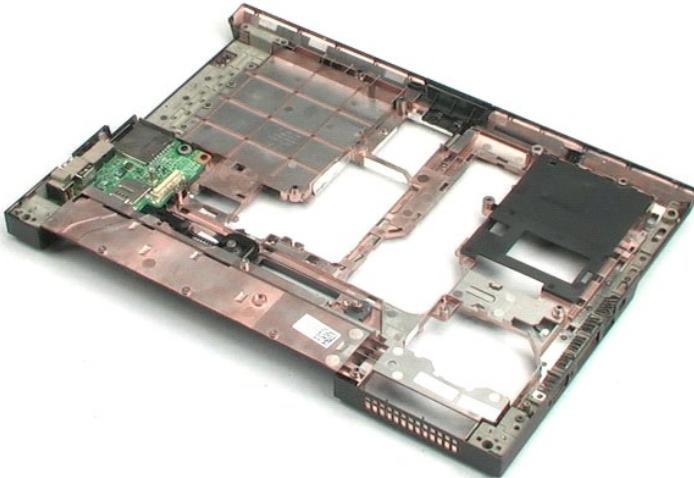
Removing the Palm Rest

NOTE: You may need to install Adobe Flash Player from **Adobe.com** in order to view the illustrations below.

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. Remove the access panel from the computer.
4. Remove the hinge cover from the computer.
5. Remove the keyboard from the computer.
6. Remove the display assembly from the computer.
7. Turn the computer upside-down and remove the twelve palm rest screws from the bottom of the computer.

8. Turn the computer right-side up and disconnect the fingerprint reader data cable from the system board.

9. Disconnect the touch pad data cable from the system board.

10. Disconnect the speaker cable from the system board.

11. Disconnect the display data cable from the system board.

12. Remove the three palm rest screws located along the top edge of the computer.

13. Remove the four remaining palm rest screws from the computer.

14. Starting in the back right corner of the palm rest, carefully release the palm rest from the bottom plastics of the computer. Work your way around the computer until the palm rest is completely free.

System Board
Dell™ Latitude™ E5400 Discrete Service Manual

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Removing the System Board

📝 **NOTE:** You may need to install Adobe Flash Player from **Adobe.com** in order to view the illustrations below.

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. Remove the access panel from the computer.
4. Remove the hinge cover from the computer.
5. Remove the keyboard from the computer.
6. Remove the display assembly from the computer.
7. Remove the palm rest from the computer.
8. Disconnect the modem data cable from the system board.

9. Turn the computer right-side up on the work surface.

10. Remove the two screws that secure the system board to the computer chassis.

11. Lift the left side of the system board to disengage it from the I/O board, then remove the system board from the computer and set it aside.
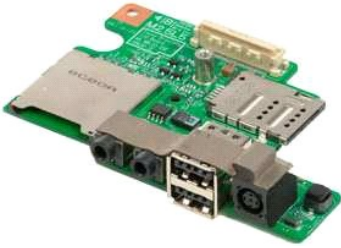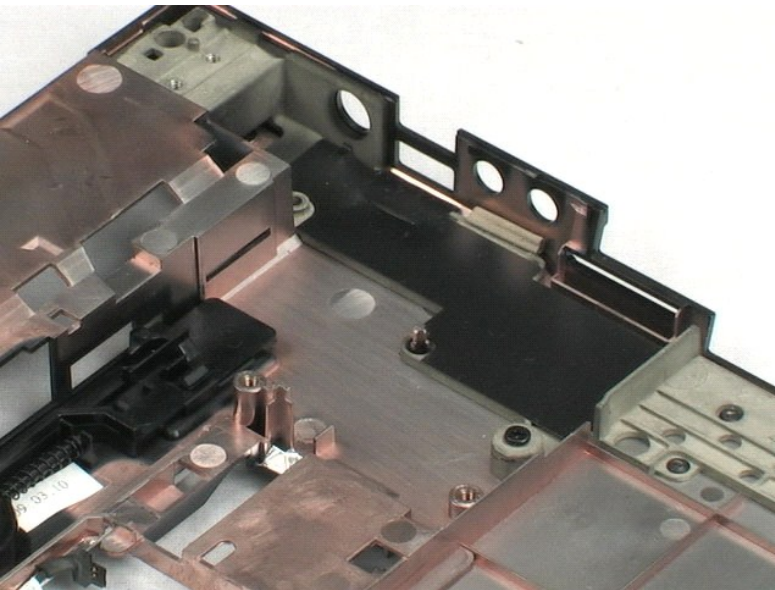
I/O Board
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Removing the I/O Board

📝 **NOTE:** You may need to install Adobe Flash Player from **Adobe.com** in order to view the illustrations below.

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. Remove the access panel from the computer.
4. Remove the hinge cover from the computer.
5. Remove the keyboard from the computer.
6. Remove the display assembly from the computer.
7. Remove the palm rest from the computer.
8. Remove the system board from the computer.
9. Remove the screw that secures the I/O board to the computer.

10. Lift up the left edge of the I/O board, and remove the I/O board from the computer.

Display Bezel
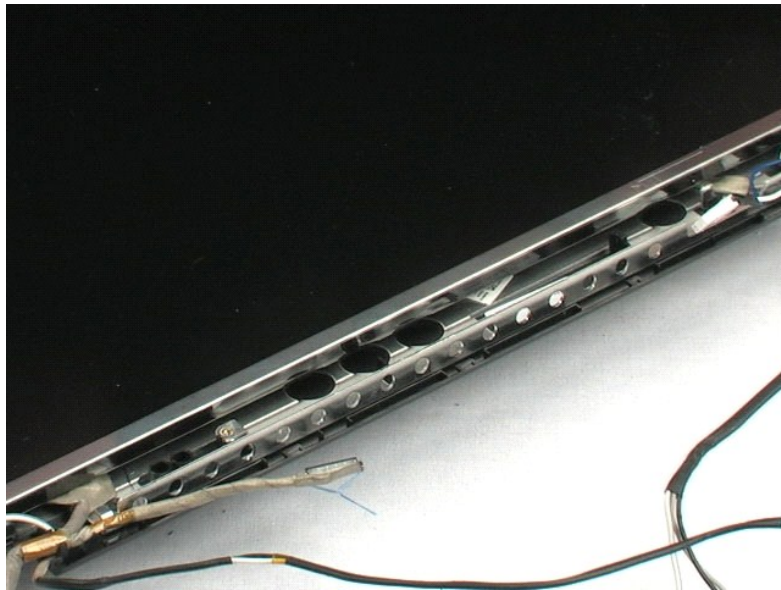**Dell™ Latitude™ E5400 Discrete Service Manual**

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Removing the Display Bezel

📝 **NOTE:** You may need to install Adobe Flash Player from **Adobe.com** in order to view the illustrations below.

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. Remove the access panel from the computer.
4. Remove the hinge cover from the computer.
5. Remove the keyboard from the computer.
6. Remove the display assembly from the computer.
7. Remove the palm rest from the computer.
8. Remove the system board from the computer.
9. Gently pry the display bezel from the display assembly by tucking your fingers under one edge of the bezel and working your way around the entire bezel until it is completely free.

10. Remove the display bezel from the computer.

Display Inverter
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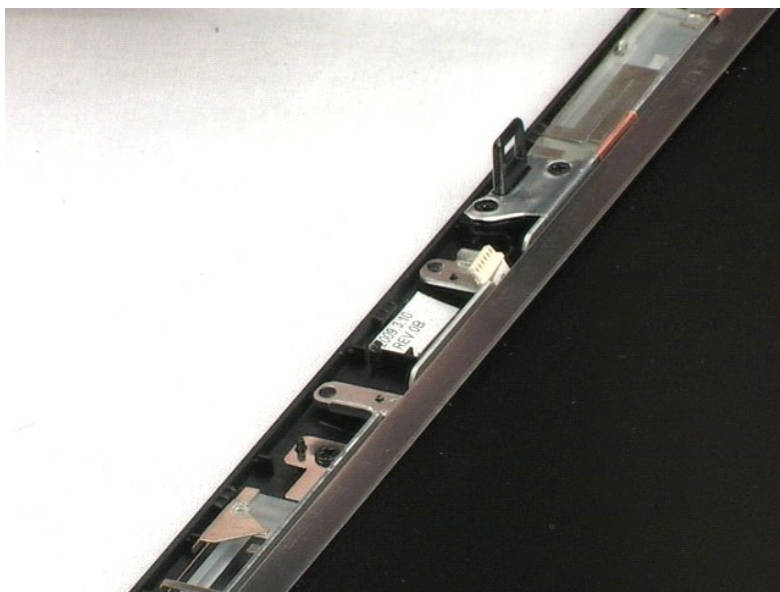
Removing the Display Inverter

📝 **NOTE:** You may need to install Adobe Flash Player from **Adobe.com** in order to view the illustrations below.

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. Remove the access panel from the computer.
4. Remove the hinge cover from the computer.
5. Remove the keyboard from the computer.
6. Remove the display assembly from the computer.
7. Remove the display bezel from the display assembly.
8. Remove the system board from the computer.
9. Remove the screw that secures the LCD inverter to the display assembly.

10. Flip over the display inverter so that you can access the power cable connector.

11. Disconnect the display inverter power cable.

12. Disconnect the display inverter data cable.

13. Remove the display inverter from the display assembly.

Camera

Dell™ Latitude™ E5400 Discrete Service Manual

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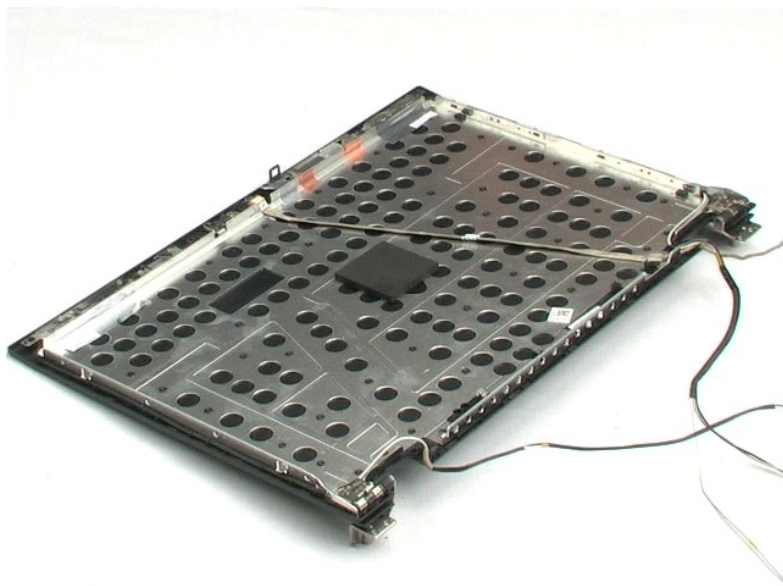
Removing the Camera

📝 **NOTE:** You may need to install Adobe Flash Player from **Adobe.com** in order to view the illustrations below.

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. Remove the access panel from the computer.
4. Remove the hinge cover from the computer.
5. Remove the keyboard from the computer.
6. Remove the display assembly from the computer.
7. Remove the display bezel from the display assembly.
8. Gently pry the retaining clip away from the camera and lift the camera from its socket.

9. Disconnect the camera data cable and remove the camera from the display assembly.

Display Panel

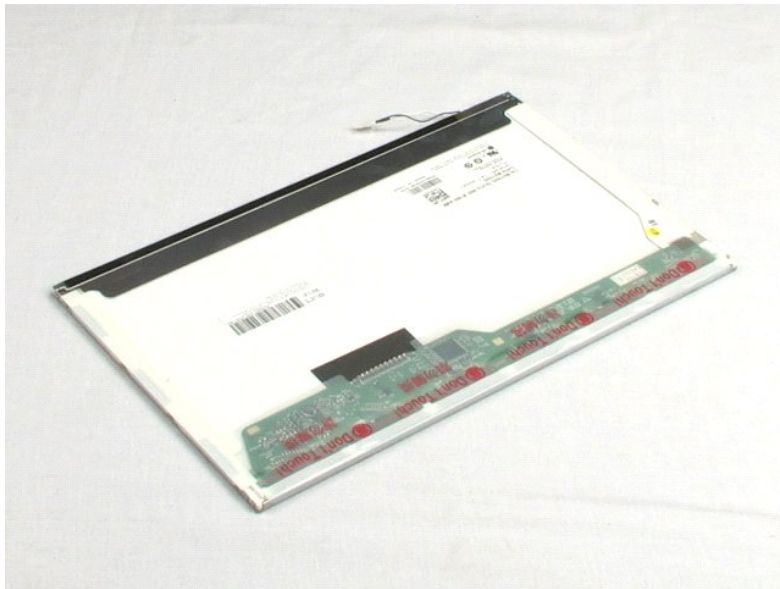**Dell™ Latitude™ E5400 Discrete Service Manual**

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Removing the Display Panel

✎ **NOTE:** You may need to install Adobe Flash Player from **Adobe.com** in order to view the illustrations below.

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. Remove the access panel from the computer.
4. Remove the keyboard from the computer.
5. Remove the display assembly from the computer.
6. Remove the display bezel from the display assembly.
7. Remove the eight screws that secure the display panel to the display assembly.

8. Lift the display panel from the display assembly.

Display Cable
Dell™ Latitude™ E5400 Discrete Service Manual

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Removing the Display Cable

📝 **NOTE:** You may need to install Adobe Flash Player from **Adobe.com** in order to view the illustrations below.

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. Remove the access panel from the computer.
4. Remove the keyboard from the computer.
5. Remove the display assembly from the computer.
6. Remove the display bezel from the display assembly.
7. Gently squeeze the release latches on either side of the display cable, then remove the display data cable from the display panel.

Hard Drive Bracket
Dell™ Latitude™ E5400 Discrete Service Manual

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Removing the Hard Drive Bracket

> 📝 **NOTE:** You may need to install Adobe Flash Player from **Adobe.com** in order to view the illustrations below.

1. Follow the procedures in Before Working Inside Your Computer.
2. Remove the battery from the computer.
3. Remove the access panel from the computer.
4. Remove the hard drive from the computer.
5. Remove the four screws that secure the hard drive to the hard drive bracket.

6. Remove the hard drive from the hard drive bracket.

Working on Your Computer

Dell™ Latitude™ E5400 Discrete Service Manual

- Before Working Inside Your Computer
- Recommended Tools
- Turning Off Your Computer
- After Working Inside Your Computer

Before Working Inside Your Computer

Use the following safety guidelines to help protect your computer from potential damage and to help to ensure your personal safety. Unless otherwise noted, each procedure included in this document assumes that the following conditions exist:

- You have performed the steps in Working on Your Computer.
- You have read the safety information that shipped with your computer.
- A component can be replaced or--if purchased separately--installed by performing the removal procedure in reverse order.

⚠ **WARNING: Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.**

⚠ **CAUTION: Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow the safety instructions that came with the product.**

⚠ **CAUTION: To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface, such as a connector on the back of the computer.**

⚠ **CAUTION: Handle components and cards with care. Do not touch the components or contacts on a card. Hold a card by its edges or by its metal mounting bracket. Hold a component such as a processor by its edges, not by its pins.**

⚠ **CAUTION: When you disconnect a cable, pull on its connector or on its pull-tab, not on the cable itself. Some cables have connectors with locking tabs; if you are disconnecting this type of cable, press in on the locking tabs before you disconnect the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before you connect a cable, ensure that both connectors are correctly oriented and aligned.**

📝 **NOTE:** The color of your computer and certain components may appear differently than shown in this document.

To avoid damaging your computer, perform the following steps before you begin working inside the computer.

1. Ensure that your work surface is flat and clean to prevent the computer cover from being scratched.
2. Turn off your computer (see Turning Off Your Computer).
3. If the computer is connected to a docking device (docked) such as the optional Media Base or Battery Slice, undock it.

⚠ **CAUTION: To disconnect a network cable, first unplug the cable from your computer and then unplug the cable from the network device.**

4. Disconnect all network cables from the computer.
5. Disconnect your computer and all attached devices from their electrical outlets.
6. Close the display and turn the computer upside-down on a flat work surface.

⚠ **CAUTION: To avoid damaging the system board, you must remove the main battery before you service the computer.**

7. Remove the main battery (see Removing the Battery).
8. Turn the computer top-side up.
9. Open the display.
10. Press the power button to ground the system board.

⚠ **CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before opening the display.**

⚠ **CAUTION: Before touching anything inside your computer, ground yourself by touching an unpainted metal surface, such as the metal at the back of the computer. While you work, periodically touch an unpainted metal surface to dissipate static electricity, which could harm internal components.**

11. Remove any installed ExpressCards or Smart Cards from the appropriate slots.
12. Remove the hard drive (see Removing the Hard Drive).

Recommended Tools

The procedures in this document may require the following tools:

- Small flat-blade screwdriver
- #0 Phillips screwdriver
- #1 Phillips screwdriver
- Small plastic scribe
- Flash BIOS update program CD

Turning Off Your Computer

⚠ **CAUTION: To avoid losing data, save and close all open files and exit all open programs before you turn off your computer.**

1. Shut down the operating system:

l **In Windows Vista®:**

Click **Start** , then click the arrow in the lower-right corner of the **Start** menu as shown below, and then click **Shut Down**.

l **In Windows® XP:**

Click **Start→ Turn Off Computer→ Turn Off**.

The computer turns off after the operating system shutdown process is complete.

2. Ensure that the computer and all attached devices are turned off. If your computer and attached devices did not automatically turn off when you shut down your operating system, press and hold the power button for about 4 seconds to turn them off.

After Working Inside Your Computer

After you complete any replacement procedure, ensure you connect any external devices, cards, and cables before turning on your computer.

⚠ **CAUTION: To avoid damage to the computer, use only the battery designed for this particular Dell computer. Do not use batteries designed for other Dell computers.**

1. Connect any external devices, such as a port replicator, battery slice, or media base, and replace any cards, such as an ExpressCard.
2. Connect any telephone or network cables to your computer.

⚠ **CAUTION: To connect a network cable, first plug the cable into the network device and then plug it into the computer.**

3. Replace the battery.
4. Connect your computer and all attached devices to their electrical outlets.
5. Turn on your computer.

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