HP EliteBook 8440p Notebook PC and HP EliteBook 8440w Mobile Workstation

Maintenance and Service Guide

Document Part Number: 592258-002

March 2011

This guide is a troubleshooting reference used for maintaining and servicing the computer. It provides comprehensive information on identifying computer features, components, and spare parts; troubleshooting computer problems; and performing computer disassembly procedures.

© Copyright 2010, 2011 Hewlett-Packard Development Company, L.P.

Bluetooth is a trademark owned by its proprietor and used by Hewlett-Packard Company under license. Intel and Core are trademarks of Intel Corporation in the U.S. and other countries. Java is a U.S. trademark of Sun Microsystems, Inc. Microsoft, Windows, and Windows Vista are U.S. registered trademarks of Microsoft Corporation. SD Logo is a trademark of its proprietor.

The information contained herein is subject to change without notice. The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

Second Edition: March 2011
First Edition: January 2010
Document Part Number: 592258-002

Safety warning notice

WARNING: To reduce the possibility of heat-related injuries or of overheating the computer, do not place the computer directly on your lap or obstruct the computer air vents. Use the computer only on a hard, flat surface. Do not allow another hard surface, such as an adjoining optional printer, or a soft surface, such as pillows or rugs or clothing, to block airflow. Also, do not allow the AC adapter to contact the skin or a soft surface, such as pillows or rugs or clothing, during operation. The computer and the AC adapter comply with the user-accessible surface temperature limits defined by the International Standard for Safety of Information Technology Equipment (IEC 60950).

Contents

1 Product description

2 External component identification

Identifying hardware 2–1
Top components 2–2
Display components 2–2
Wireless antennas (select models only) 2–3
Buttons, switches, and fingerprint reader 2–4
Keys 2–6
Pointing devices 2–7
Lights 2–8
Front components 2–10
Rear components 2–11
Right-side components 2–12
Left-side components 2–12
Bottom components 2–13

3 Illustrated parts catalog

Serial number location 3–1
Computer major components 3–2
Display assembly subcomponents 3–8
Cable kit 3–10
Plastics kit 3–11
Mass storage devices 3–12
Miscellaneous parts 3–13
Sequential part number listing 3–14

4 Removal and replacement procedures

Preliminary replacement requirements 4–1
Tools required 4–1
Service considerations 4–1
Grounding guidelines 4–2
Component replacement procedures 4–5
Service tag 4–5
Computer feet 4–6
Battery 4–7
SIM 4–8
Hard drive 4–9
WLAN module 4–11
WWAN module 4–14
Memory module 4–16

Optical drive 4–20
Keyboard and switch cover 4–22
Power button board 4–26
Display assembly 4–27
Fan and heat sink 4–35
RTC battery 4–39
Processor 4–40
Top cover 4–42
Audio/ExpressCard board 4–44
Speakers 4–45
Bluetooth module and cable 4–46
Modem module 4–49
System board 4–50
Modem module cable 4–52

5 Computer Setup

Computer Setup in Windows 7 5–1
Starting Computer Setup 5–1
Using Computer Setup 5–1
Computer Setup menus 5–2
Computer Setup in Windows Vista 5–8
Starting Computer Setup 5–8
Using Computer Setup 5–8
Computer Setup menus 5–9
Computer Setup in Windows XP 5–14
Starting Computer Setup 5–14
Using Computer Setup 5–14
Computer Setup menus 5–15

6 Specifications

Computer specifications 6–1
14.0-in SVA eDP display specifications 6–2
Hard drive specifications 6–3
Solid state drive specifications 6–4
Blu-ray R/RE DVD±RW SuperMulti Drive specifications 6–5
Blu-ray ROM with LightScribe DVD±RW SuperMulti DL Drive specifications 6–6
DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe 6–7
DVD-ROM Drive specifications 6–8
System resource specifications 6–9

7 Backup and recovery

Backup and recovery in Windows 7 7–1
Overview 7–1
Backing up your information 7–1
Performing a recovery 7–2
Backup and recovery in Windows Vista 7–5
Overview 7–5
Backing up your information 7–5
Performing a recovery 7–6
Backup and recovery in Windows XP 7–9

Overview 7–9
Backing up your information 7–9
Performing a recovery 7–10

8 Connector pin assignments

Audio-out (headphone) 8–1
Audio-in (microphone) 8–1
1394a 8–2
External monitor 8–2
DisplayPort 8–3
RJ-11 (modem) 8–4
RJ-45 (network) 8–4
Universal Serial Bus 8–5
eSATA/USB 8–6

9 Power cord set requirements

Requirements for all countries and regions 9–1
Requirements for specific countries and regions 9–2

10 Recycling

Battery 10–1
Display 10–1

Index

1

Product description

Category	Description	HP EliteBook 8440p Notebook PC UMA	HP EliteBook 8440p Notebook PC Discrete	HP EliteBook 8440w Mobile Workstation
Product Name	**HP EliteBook 8440p Notebook PC**	✓	✓	
	HP EliteBook 8440w Mobile Workstation			✓
Processors	**Intel® Core™ i5 dual-core processors:**			
	i5-520M, 2.4-GHz processor (Turbo up to 2.93 GHz), 3-MB L3 cache, 4 threads (35W)	✓	✓	✓
	i5-540M, 2.53-GHz processor (Turbo up to 3.06 GHz), 3-MB L3 cache, 4 threads (35W)	✓	✓	✓
	Intel® Core™ i7 dual-core processors:			
	i7-620M, 2.66-GHz processor (Turbo up to 3.33GHz), 4-MB L3 cache, 4 threads (35W)	✓	✓	✓
	Intel® Core™ i7 quad-core, processors:			
	i7-720QM, 1.6-GHz processor (Turbo up to 2.8 GHz),		✓	✓
	i7-820QM, 1.73-GHz processor (Turbo up to 3.06 GHz), 8-MB L3 cache, 8 threads (45W)			✓
Chipset	Intel® PCH QM57 - Enhanced	✓	✓	✓
Graphics	Intel® Unified Memory Architecture (UMA) graphics subsystem integrated with shared system memory (dynamically allocated; Intel® Graphics Media Accelerator HD)	✓		
	Nvidia N10M-NS discrete graphics card with 512 MB of GDDR3 800 MHz graphics subsystem memory		✓	
	Nvidia N10M-GLM NS discrete graphics card with 512 MB GDDR3 800 MHz (64 MB x 16 x 4) graphics subsystem memory			✓
Panel	All display assemblies include three wireless local area network (WLAN) antennas and two wide-area network antennas (WWAN)	✓	✓	✓
	14.0-in 16:9 HD (1366 x 768) AntiGlare LED display	✓	✓	✓
	14.0-in 16:9 HD (1366 x 768) AntiGlare LED display with webcam	✓	✓	✓
	14.0-in 16:9 HD+ (1600 x 900) AntiGlare LED display	✓	✓	✓

(Continued)

Category	Description	HP EliteBook 8440p Notebook PC UMA	HP EliteBook 8440p Notebook PC Discrete	HP EliteBook 8440w Mobile Workstation
	14.0-in 16:9 HD+ (1600 x 900) AntiGlare LED display with webcam	✓	✓	✓
	Support privacy filter	✓	✓	✓
Memory	Two customer-accessible/upgradable memory module slots	✓	✓	✓
	Supports dual-channel memory	✓	✓	✓
	DDR3 PC3-10600 1333-MHz memory			
	Supports the following configurations: ■ 8192-MB total system memory (4096 x 2) ■ 4096-MB total system memory (4096 x 1) ■ 4096-MB total system memory (2048 x 2)* ■ 3072-MB total system memory (2048 + 1024)* ■ 2048-MB total system memory (2048 x 1)* ■ 2048-MB total system memory (1024 x 2)* ■ 1024-MB total system memory (1024 x 1)* *Brazil 1333-MHz memory configuration	✓	✓	✓
Hard drives	Supports **9.5-mm**, **6.35-cm** (2.5-in) hard drives	✓	✓	✓
	Customer-accessible	✓	✓	✓
	Serial ATA	✓	✓	✓
	Supports the following drives: ■ 500 GB, 7200 rpm ■ 320 GB, 7200 rpm ■ 250 GB, 7200 rpm	✓	✓	✓
	Supports the following solid-state drives: ■ 256 GB ■ 160 GB	✓	✓	✓
	HP 3D DriveGuard	✓	✓	✓
	RAID 0/1 Support	✓	✓	✓
Optical drives	Fixed (removal of 1 screw required)	✓	✓	✓
	Customer-accessible	✓	✓	✓
	Serial ATA	✓	✓	✓
	12.7-mm (0.50-in) drive tray	✓	✓	✓
	Supports the following drives: ■ Blu-ray R/RE DVD±RW SuperMulti Drive ■ Blu-ray ROM with LightScribe DVD±RW SuperMulti DL Drive ■ DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe ■ DVD-ROM Drive	✓	✓	✓

(Continued)

Category	Description	HP EliteBook 8440p Notebook PC UMA	HP EliteBook 8440p Notebook PC Discrete	HP EliteBook 8440w Mobile Workstation
Upgrade drive bay	**9.5-mm**, **6.35-cm** (2.50-in) HDDs	✓	✓	✓
	500 GB 7200 rpm	✓	✓	✓
	Supports "No Drive" option	✓	✓	✓
Diskette drive	Supports external USB diskette drive only	✓	✓	✓
Microphone	Integrated dual-array microphone	✓	✓	✓
Audio	HD audio	✓	✓	✓
	Two stereo speakers	✓	✓	✓
Webcam	Integrated 2.0-megapixel webcam	✓	✓	✓
Modem	High-speed 56k modem	✓	✓	✓
	Modem cable not included	✓	✓	✓
	Support for No-Modem option in the Asia Pacific, Japan, and Latin America regions	✓	✓	✓
Ethernet	Intel 10/100/1000 network interface card (NIC) with iAMT	✓	✓	✓
	S3/S4/S5 wake on LAN	✓	✓	✓
	NIC power down technology	✓	✓	✓
	Ethernet cable not included	✓	✓	✓
Wireless	**Integrated wireless local-area network (WLAN) options by way of WLAN module:**			
	Three WLAN antennas built into display assembly	✓	✓	✓
	Support for no WLAN option	✓	✓	✓
	Support for the following WLAN formats: • Broadcom b/g • Intel 802.11a/b/g • Intel 802.11a/g/n 2×2 • Intel 802.11a/g/n 3×3	✓	✓	✓
	Integrated wireless wide-area network (WWAN) options by way of WWAN module:			
	Two five-band WWAN antennas built into display assembly	✓	✓	✓
	Subscriber identity module (SIM) security (customer-accessible in battery bay)	✓	✓	✓
	Support for the following WWAN formats: ■ Qualcomm WW evolution-data optimized (EVDO), high-speed downlink packet access (HSDPA) ■ Ericsson HSDPA	✓	✓	✓
	Supports WWAN after-market options	✓	✓	✓
	Integrated personal area network (PAN) options by way of Bluetooth® module	✓	✓	✓
	Support for no PAN option	✓	✓	✓

(Continued)

Category	Description	HP EliteBook 8440p Notebook PC UMA	HP EliteBook 8440p Notebook PC Discrete	HP EliteBook 8440w Mobile Workstation
Digital card	One ExpressCard/54 slot	✓	✓	✓
	Integrated secure digital (SD)/ MultiMedia card (MMC) card reader	✓	✓	✓
Ports	Audio-in (stereo microphone)	✓	✓	✓
	Audio-out (stereo headphone)	✓	✓	✓
	DisplayPort digital display interface	✓	✓	✓
	RJ-11; modem	✓	✓	✓
	RJ-45; Ethernet, with link and activity lights	✓	✓	✓
	USB 2.0 (3)	✓	✓	✓
	USB 2.0/eSATA combo (1)	✓	✓	✓
	VGA (D-sub 15) supporting 1600 × 1200 external monitor at 75-Hz (hot plug/unplug with auto-detect)	✓	✓	✓
	1394a	✓	✓	✓
	Multi-pin AC port	✓	✓	✓
Docking	HP docking station	✓	✓	✓
	HP advanced docking station	✓	✓	✓
Keyboard/pointing devices	11.97-in keyboard with embedded numeric keypad	✓	✓	✓
	Spill-resistant keyboard	✓	✓	✓
	Dura-Keys	✓	✓	✓
	Vertical and horizontal scrolling, taps enabled as default	✓	✓	✓
	Dual point (pointing stick and TouchPad) with 2 pointing stick buttons and 2 TouchPad buttons and vertical scrolling (taps enabled as default)	✓	✓	✓
Power requirements	Supports the following AC adapter with localized cable plug (3-wire plug with ground pin and 3-pin DC connector):			
	• 65-W “Smart” adapter	✓		
	• 90-W “Smart” adapter		✓	✓
	9 cell Li-ion battery (100 Wh) 3.0 Ah (does not support HP Fast Charge)	✓	✓	✓
	6 cell Li-ion battery (55 Wh) 2.55 Ah	✓	✓	✓
	6 cell 1000-cycle battery (51 Wh) 2.55 Ah	✓	✓	✓
	4 cell Li-ion battery (37 Wh) 2.55 Ah	✓	✓	
	Support for 8-cell Li-ion Extended Life battery	✓	✓	✓
	Support for 12-cell Ultra Capacity battery	✓	✓	✓

(Continued)

Category	Description	HP EliteBook 8440p Notebook PC UMA	HP EliteBook 8440p Notebook PC Discrete	HP EliteBook 8440w Mobile Workstation
Security	Integrated HP Fingerprint sensor (select models only)	✓	✓	✓
	Integrated smart card reader	✓	✓	✓
	Security cable slot	✓	✓	✓
	Trusted platform module (TPM) V.1.2	✓	✓	✓
	Full volume encryption	✓	✓	✓
	Preboot authentication (password, smart card, biometric)	✓	✓	✓
Operating system	**Preinstalled:**			
	Vista Basic 32 with Microsoft Basics	✓	✓	✓
	Windows XP Professional SP3 (EN, FR, JP) with Microsoft Basics	✓	✓	✓
	Windows Vista Business SP1 32 with Microsoft Basics	✓	✓	✓
	Windows 7 Home Premium 32 with Microsoft Basics (Japan only)	✓	✓	✓
	Windows 7 Home Premium 64 with Microsoft Basics (Japan only)	✓	✓	✓
	Windows 7 Professional 32 with Microsoft Basics (Japan only)	✓	✓	✓
	Windows 7 Professional 64 with Microsoft Basics (Japan only)	✓	✓	✓
	XP Professional SP3 with Microsoft Basics (with Windows 7 Professional COA; Japan only)	✓	✓	✓
	FreeDOS	✓	✓	✓
	Preinstalled with Office:			
	Vista Basic 32 with Office 2007 Ready (not available for Japan)	✓	✓	✓
	Vista Basic 32 with Office 2007 Personal (Japan only)	✓	✓	✓
	Vista Basic 32 with Office 2007 Personal with PowerPoint (Japan only)	✓	✓	✓
	Vista Basic 32 with Office Professional (Japan only)	✓	✓	✓
	Windows Vista Business 32 with Office Ready (not available for Japan)	✓	✓	✓
	Windows Vista Business 32 with Personal (Japan only)	✓	✓	✓
	Windows Vista Business 32 with Personal and PowerPoint (Japan only)	✓	✓	✓
	Windows Vista Business 32 with Professional (Japan only)	✓	✓	✓

(Continued)

Category	Description	HP EliteBook 8440p Notebook PC UMA	HP EliteBook 8440p Notebook PC Discrete	HP EliteBook 8440w Mobile Workstation
	Windows 7 Home Basic 32 with Office 2007 Ready (not available for Japan)	✓	✓	✓
	Windows 7 Home Premium 32 with Office 2007 Ready (not available for Japan)	✓	✓	✓
	Windows 7 Home Premium 32 with Office 2007 Personal (Japan only)	✓	✓	✓
	Windows 7 Home Premium 32 with Office 2007 Personal with PowerPoint (Japan only)	✓	✓	✓
	Windows 7 Home Premium 32 with Office 2007 Professional (Japan only)	✓	✓	✓
	Windows 7 Home Premium 64 with Office 2007 Ready (not available for Japan)	✓	✓	✓
	Windows 7 Home Premium 64 with Office 2007 Personal (Japan only)	✓	✓	✓
	Windows 7 Home Premium 64 with Office 2007 Personal with PowerPoint (Japan only)	✓	✓	✓
	Windows 7 Home Premium 64 with Office 2007 Professional (Japan only)	✓	✓	✓
	Windows 7 Pro 32 with Office 2007 Ready (not available for Japan)	✓	✓	✓
	Windows 7 Pro 32 with Office 2007 Personal (Japan only)	✓	✓	✓
	Windows 7 Pro 32 with Office 2007 Personal with PowerPoint (Japan only)	✓	✓	✓
	Windows 7 Pro 32 with Office Professional (Japan only)	✓	✓	✓
	Windows 7 Pro 64 with Office 2007 Ready (not available for Japan)	✓	✓	✓
	Windows 7 Pro 64 with Office 2007 Personal (Japan only)	✓	✓	✓
	Windows 7 Pro 64 with Office 2007 Personal with PowerPoint (Japan only)	✓	✓	✓
	Windows 7 Pro 64 with Office Professional (Japan only)	✓	✓	✓
	Windows XP Pro (with Windows 7 Pro COA) with Office Ready (not available for Japan)	✓	✓	✓
	Windows XP Pro (with Windows 7 Pro COA) with Personal (Japan only)	✓	✓	✓
	Windows XP Pro (with Windows 7 Pro COA) with Personal and PowerPoint (Japan only)	✓	✓	✓
	Windows XP Pro (with Windows 7 Pro COA) with Professional (Japan only)	✓	✓	✓

(Continued)

Category	Description	HP EliteBook 8440p Notebook PC UMA	HP EliteBook 8440p Notebook PC Discrete	HP EliteBook 8440w Mobile Workstation
	Restore Media:			
	Windows Vista Ultimate 32	✓	✓	✓
	Windows Vista Business 32/64	✓	✓	✓
	Windows Vista Home Basic 32	✓	✓	✓
	Windows XP Professional	✓	✓	✓
	DRDVD Windows XP	✓	✓	✓
	DRDVD Windows Vista	✓	✓	✓
	DRDVD Windows 7	✓	✓	✓
	DRDVD Windows 7 with WinDVD	✓	✓	✓
	Windows XP Professional	✓	✓	✓
	Windows Vista Business 32	✓	✓	✓
	Windows Vista Business 64	✓	✓	✓
	Windows 7 Home Basic 32	✓	✓	✓
	Windows 7 Home Premium 32	✓	✓	✓
	Windows 7 Home Premium 64	✓	✓	✓
	Windows 7 Pro 32	✓	✓	✓
	Windows 7 Pro 64	✓	✓	✓
	Certified:			
	SUSE Linux Enterprise Desktop	✓	✓	✓
	Web-only Support:			
	Windows XP Pro 64	✓	✓	✓
	Windows Vista Business 64	✓	✓	✓
	Windows Vista Enterprise 32	✓	✓	✓
	Windows Vista Enterprise 64	✓	✓	✓
Serviceability	**Customer replaceable parts:**			
	AC adapter	✓	✓	✓
	Battery (system)	✓	✓	✓
	Hard drive	✓	✓	✓
	Solid-state drive	✓	✓	✓
	Memory module	✓	✓	✓
	Optical drive	✓	✓	✓
	Mini-PCI components	✓	✓	✓

2

External component identification

Identifying hardware

Components included with the computer may vary by region and model. The illustrations in this chapter identify the standard features on most computer models.

To see a list of hardware installed in the computer, follow these steps:

In Windows® 7:

» Select **Start > Control Panel > System and Security > Device Manager**.

You can also add hardware or modify device configurations using Device Manager.

Windows includes the User Account Control feature to improve the security of your computer. You may be prompted for your permission or password for tasks such as installing software, running utilities, or changing Windows settings. Refer to Help and Support for more information.

In Windows Vista®:

1. Select **Start > Computer > System Properties**.
2. In the left pane, click **Device Manager**.

You can also add hardware or modify device configurations using Device Manager.

Windows includes the User Account Control feature to improve the security of your computer. You may be prompted for your permission or password for tasks such as installing software, running utilities, or changing Windows settings. Refer to Help and Support for more information.

In Windows XP:

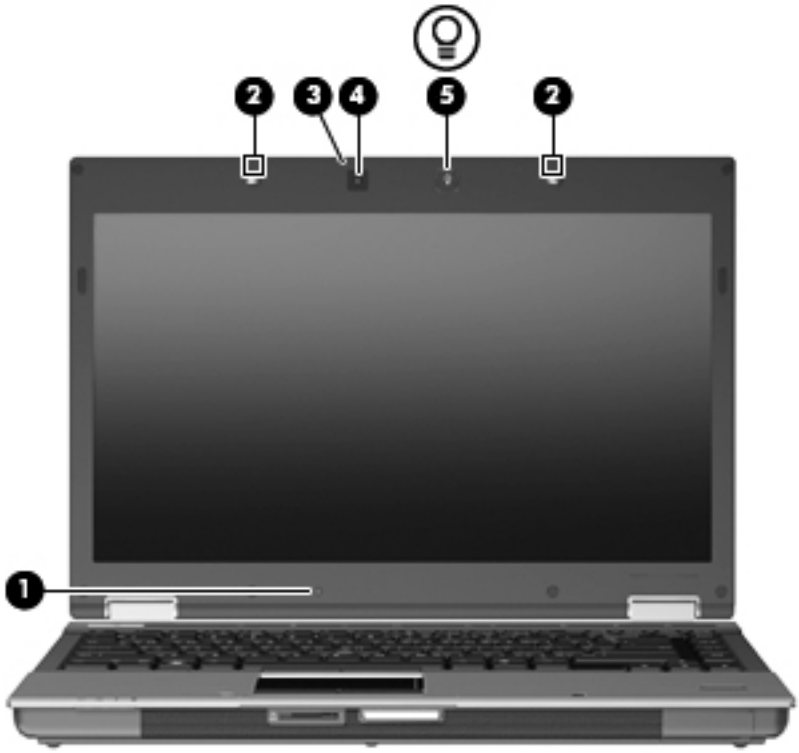
1. Select **Start > My Computer**.
2. In the left pane of the System Tasks window, select **View system information**.
3. Select **Hardware** tab **> Device Manager**.

You can also add hardware or modify device configurations using Device Manager.

Top components

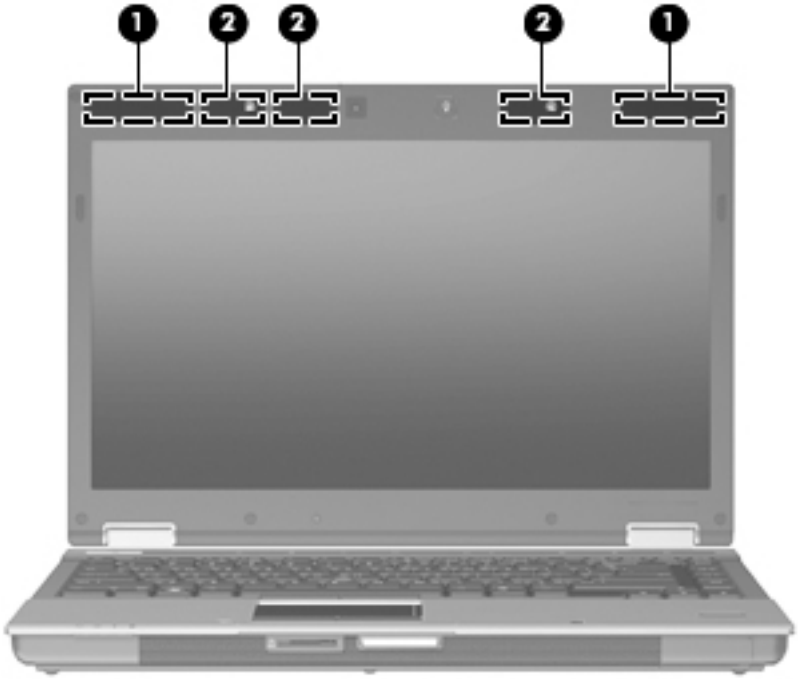
Display components

The computer may look slightly different from the illustration in this section.



Item	Component	Description
(1)	Internal display switch	Turns off the display and initiates Sleep (Windows 7 and Windows Vista) or Standby (Windows XP) if the display is closed while the power is on.
(2)	Internal microphones (2)	Record sound. If there is a microphone icon next to each microphone opening, the computer has internal microphones.
(3)	Webcam light	On: The webcam is in use.
(4)	Webcam	Records video and captures still photographs.
(5)	Keyboard light	Illuminates the keyboard in low-light conditions. The keyboard light is embedded in a push/push switch. You push the keyboard light cover to open and turn the light on. Push again to close and turn the light off.

Wireless antennas (select models only)



Item	Component	Description
(1)	WWAN antennas (2)* (select models only)	Send and receive wireless signals to communicate with wireless wide-area networks (WWANs).
(2)	WLAN antennas (3)* (select models only)	Send and receive wireless signals to communicate with wireless local area networks (WLANs).

*The antennas are not visible from the outside of the computer. For optimal transmission, keep the areas immediately around the antennas free from obstructions.

To see wireless regulatory notices, refer to the section of the *Regulatory, Safety and Environmental Notices* that applies to your country or region. These notices are located in Help and Support.

Buttons, switches, and fingerprint reader

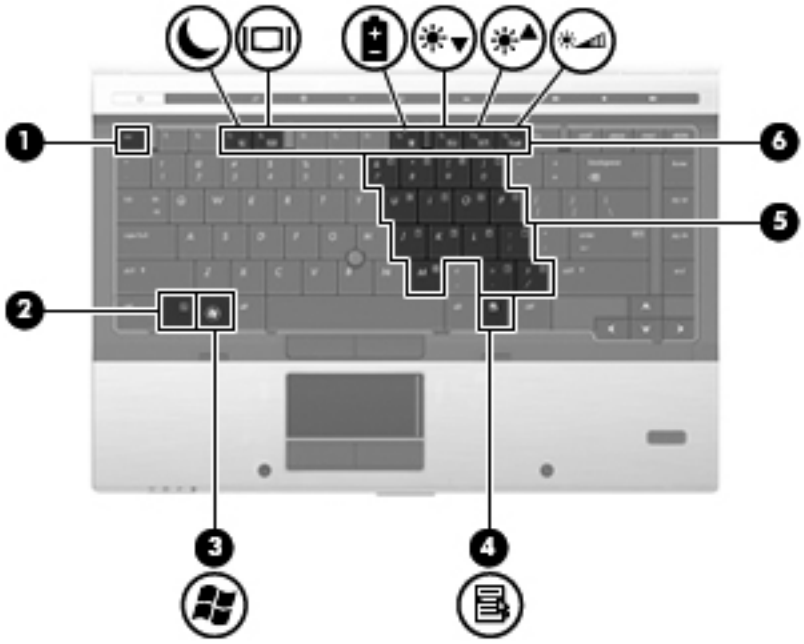
Item	Component	Description
(1)	Power button	■ When the computer is off, press the button to turn on the computer. ■ When the computer is on, press the button to shut down the computer. ✎ Although you can shut down the computer with the power button, the recommended procedure is to use the Windows Shut Down command. ■ When the computer is in the Sleep state (Windows 7 and Windows Vista) or Standby (Windows XP), press the button briefly to exit the Sleep state (Windows 7 and Windows Vista) or Standby (Windows XP). ■ When the computer is in Hibernation, press the button briefly to exit Hibernation. If the computer has stopped responding and Windows shutdown procedures are ineffective, press and hold the power button for at least 5 seconds to turn off the computer. To learn more about power settings: ■ In Windows 7: Select **Start > Control Panel > System and Security > Power Options**. ■ In Windows Vista: Select **Start > Control Panel > System and Maintenance > Power Options**. ■ In Windows XP: Select **Start > Control Panel > Performance and Maintenance > Power Options**.
(2)	Internal display switch	Turns off the display if the display is closed while the power is on.
(3)	QuickLook button	Allows you to save calendar, contact, inbox, and task information from Microsoft Outlook to the hard drive of the computer. When the computer is off or in Hibernation, press the QuickLook button to view this information without waiting for the operating system to restart.
(4)	QuickWeb button	Opens the Web browser.
(5)	Wireless button	Turns the wireless feature on or off but does not establish a wireless connection

(Continued)

Item	Component	Description
(6)	TouchPad button	Turns the TouchPad on or off.
(7)	Caps lock button	Turns caps lock on or off.
(8)	Num lock button	Turns num lock on or off.
(9)	Volume mute button	Mutes and restores speaker sound.
(10)	Volume down button	Decreases speaker volume.
(11)	Volume up button	Increases speaker volume.
(12)	Fingerprint reader (select models only)	Allows a fingerprint logon to Windows, instead of a password logon.

Keys

The computer may look slightly different from the illustration in this section.



Item	Component	Description
(1)	**esc** key	Displays system information when pressed in combination with the **fn** key.
(2)	**fn** key	Executes frequently used system functions when pressed in combination with a function key or the **esc** key.
(3)	Windows logo key	Displays the Windows Start menu.
(4)	Windows applications key	Displays a shortcut menu for items beneath the pointer.
(5)	Embedded numeric keypad keys	Use like an external numeric keypad when you enable the num lock function by pressing the **fn** key in combination with the **num lk** key.
(6)	Function keys	Execute frequently used system functions when pressed in combination with the **fn** key. ■ Display system information. **fn+esc** ■ Initiate Standby or Sleep. **fn+f3** ■ Switch the screen image. **fn+f4** ■ Display battery information. **fn+f8** ■ Decrease screen brightness. **fn+f9** ■ Increase screen brightness. **fn+f10** ■ Activate the ambient light sensor. **fn+f11**

Pointing devices

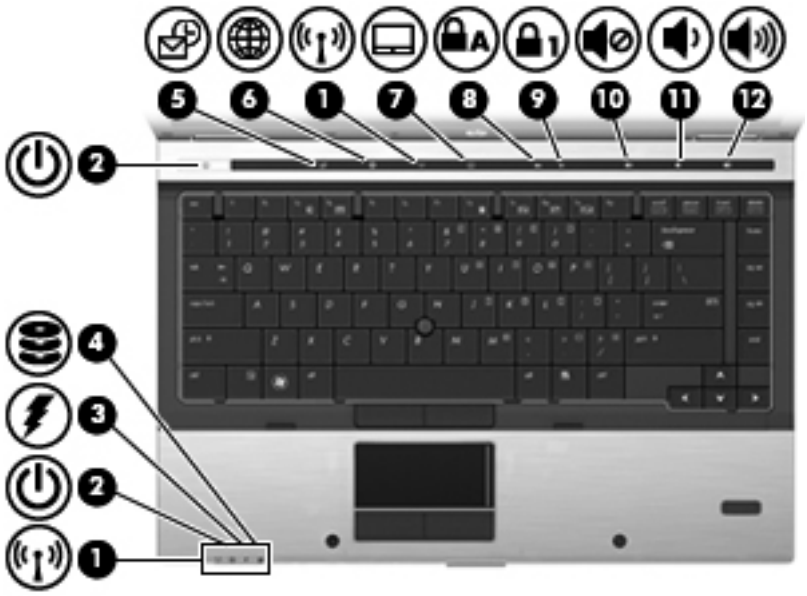
Item	Component	Description
(1)	Pointing stick	Moves the pointer and selects or activates items on the screen.
(2)	Left pointing stick button	Functions like the left button on an external mouse.
(3)	TouchPad*	Moves the pointer and selects or activates items on the screen.
(4)	Left TouchPad button*	Functions like the left button on an external mouse.
(5)	Right pointing stick button	Functions like the right button on an external mouse.
(6)	TouchPad scroll zone*	Scrolls up or down.
(7)	Right TouchPad button*	Functions like the right button on an external mouse.

*This table describes factory settings. To view or change pointing device preferences:

- In Windows 7: Select **Start > Devices and Printers**. Then, right-click the device representing the computer, and select **Mouse settings**.
- In Windows Vista: Select **Start > Control Panel > Hardware and Sound > Mouse**.
- In Windows XP: Select **Start > Control Panel > Printers and Other Hardware > Mouse**.

Lights

The computer may look slightly different from the illustration in this section.



Item	Component	Description
(1)	Wireless lights (2)*	■ Blue: An integrated wireless device, such as a WLAN device, the HP Mobile Broadband Module (select models only), and/or a Bluetooth® device, is on. ■ Amber: All wireless devices are off.
(2)	Power lights (2)†	■ On: The computer is on. ■ Blinking: The computer is in the Sleep state (Windows 7 and Windows Vista) or Standby (Windows XP). ■ Blinking rapidly: An AC adapter with a higher power rating should be connected. ■ Off: The computer is off or in Hibernation.
(3)	Battery light	■ Amber: A battery is charging. ■ Turquoise: A battery is close to full charge capacity. ■ Blinking amber: A battery that is the only available power source has reached a low battery level. When the battery reaches a critical battery level, the battery light begins blinking rapidly. ■ Off: If the computer is plugged into an external power source, the light turns off when all batteries in the computer are fully charged. If the computer is not plugged into an external power source, the light stays off until the battery reaches a low battery level.
(4)	Drive light	■ Blinking turquoise: The hard drive or optical drive is being accessed. ■ Amber: HP 3D DriveGuard has temporarily parked the internal hard drive, and if present, the hard drive in the upgrade bay.
(5)	QuickLook light	Turns on briefly when the QuickLook button is pressed.
(6)	QuickWeb light	Turns on briefly when the QuickWeb button is pressed.
(7)	TouchPad light	■ Turquoise: The TouchPad is on. ■ Amber: The TouchPad is off.

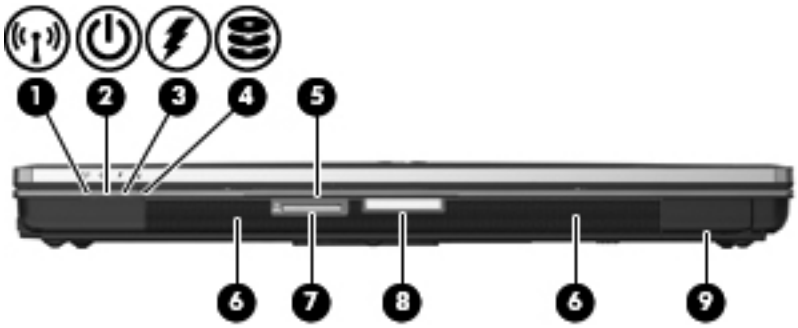
(Continued)

Item	Component	Description
(8)	Caps lock light	On: Caps lock is on.
(9)	Num lock light	On: Num lock is on or the embedded numeric keypad is enabled.
(10)	Volume mute light	■ On: Computer sound is on. ■ Amber: Computer sound is off.
(11)	Volume down light	Blinking: The volume down button is being used to decrease the speaker volume.
(12)	Volume up light	Blinking: The volume up button is being used to increase the speaker volume.

*The 2 wireless lights display the same information. The light on the wireless button is visible only when the computer is open. The wireless light on the front of the computer is visible whether the computer is open or closed.

†The 2 power lights display the same information. The light on the power button is visible only when the computer is open. The power light on the front of the computer is visible whether the computer is open or closed.

Front components

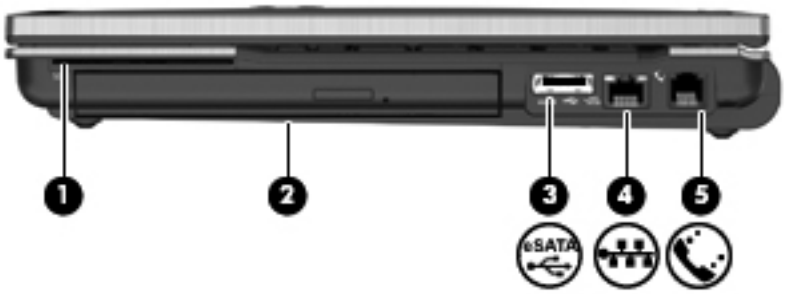


Item	Component	Description
(1)	Wireless light	■ Blue: An integrated wireless device, such as a wireless local area network (WLAN) device, the HP Mobile Broadband Module, and/ or a Bluetooth® device, is on. ■ Amber: All wireless devices are off.
(2)	Power light	■ On: The computer is on. ■ Blinking: The computer is in the Sleep state (Windows 7 and Windows Vista) or Standby (Windows XP). ■ Blinking rapidly: An AC adapter with a higher power rating should be connected. ■ Off: The computer is off or in Hibernation.
(3)	Battery light	■ Amber: A battery is charging. ■ Turquoise: A battery is close to full charge capacity. ■ Blinking amber: A battery that is the only available power source has reached a low battery level. When the battery reaches a critical battery level, the battery light begins blinking rapidly. ■ Off: If the computer is plugged into an external power source, the light turns off when all batteries in the computer are fully charged. If the computer is not plugged into an external power source, the light stays off until the battery reaches a low battery level.
(4)	Drive light	■ Blinking turquoise: The hard drive or an external optical drive is being accessed. ■ Amber: HP 3D DriveGuard has temporarily parked the hard drive, and if present, the hard drive in the upgrade bay.
(5)	Business card slot	Holds a business card in position so that the webcam (select models only) can capture an image.
(6)	SD Card Reader	Supports the optional Secure Digital (SD) Memory Card and MultiMediaCard (MMC) digital card formats.
(7)	Display release button	Opens the computer.
(8)	Speakers (2)	Produce sound.
(9)	Bluetooth compartment	Contains a Bluetooth module.

Rear components

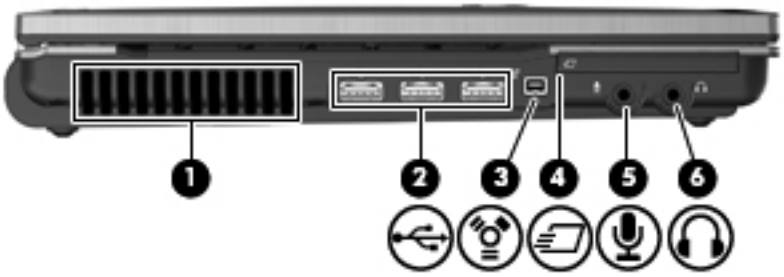
Item	Component	Description
(1)	Security cable slot	Attaches an optional security cable to the computer. ✎ The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.
(2)	Power connector	Connects an AC adapter.
(3)	DisplayPort	Connects an optional digital display device such as a high-performance monitor or projector.
(4)	External monitor port	Connects an external VGA monitor or projector.

Right-side components



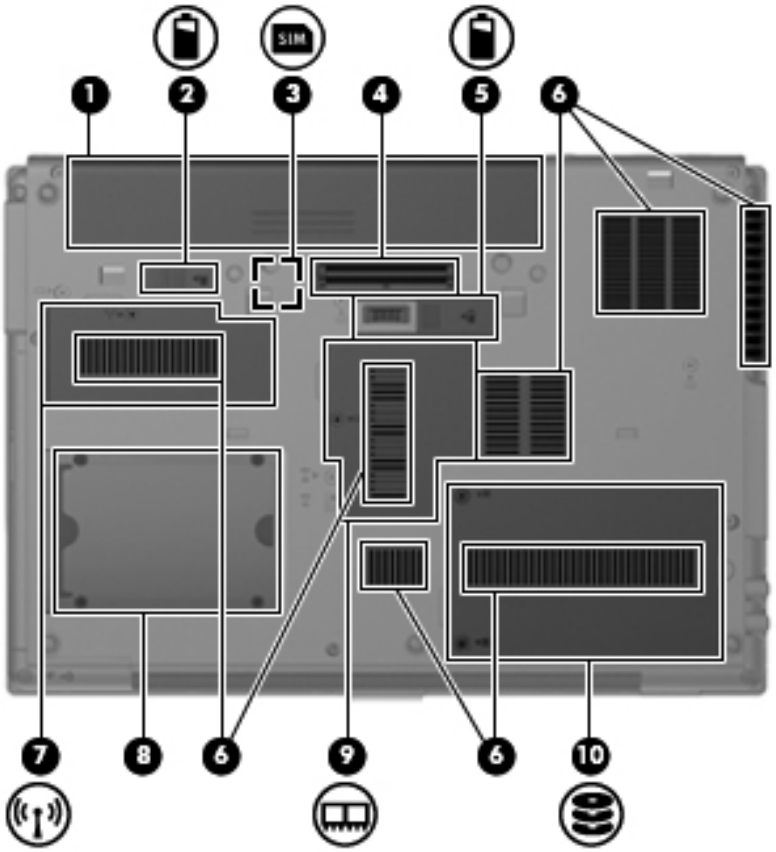
Item	Component	Description
(1)	Smart card reader	Supports optional smart cards and Java™ cards.
(2)	Upgrade drive bay	Supports an optical drive or a hard drive.
(3)	eSATA/USB combo port	Connects an optional high-performance eSATA component, such as a external mass-storage device, or connects an optional USB device.
(4)	RJ-45 (network) jack	Connects a network cable.
(5)	RJ-11 (modem) jack	Connects a modem cable.

Left-side components



Item	Component	Description
(1)	Vent	Enables airflow to cool internal components. ✎ The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(2)	USB ports (3)	Connects an optional USB devices.
(3)	1394 port	Connects an optional IEEE 1394 or 1394a audio/visual device, such as a camcorder.
(4)	ExpressCard slot	Supports optional ExpressCard/54 cards.
(5)	Audio-in (microphone) jack	Connects an optional computer headset microphone, stereo array microphone, or monaural microphone.
(6)	Audio-out (headphone) jack	Produces sound when connected to optional powered stereo speakers, headphones, ear buds, a headset, or television audio ✎ When a device is connected to the headphone jack, the computer speakers are disabled.

Bottom components



Item	Component	Description
(1)	Battery bay	Holds the battery.
(2)	Battery release latch	Releases the battery from the battery bay.
(3)	SIM slot (select models only)	Contains a wireless subscriber identity module (SIM). The SIM slot is located inside the battery bay.
(4)	Docking connector	Connects an optional docking device.
(5)	Accessory battery connector	Connects an optional accessory battery.
(6)	Vents (7)	Enable airflow to cool internal components. ✎ The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(7)	Wireless module compartment	Contains a WWAN module (select models only) and/or WLAN module. △ To prevent an unresponsive system, replace the wireless module only with a wireless module authorized for use in the computer by the governmental agency that regulates wireless devices in your country or region. If you replace the module and then receive a warning message, remove the module to restore computer functionality, and then contact technical support through Help and Support.
(8)	Business card holder	Holds a business card.
(9)	Memory module compartment	Contains the expansion memory module slot.
(10)	Hard drive bay	Secures the hard drive.

3

Illustrated parts catalog

Serial number location

When ordering parts or requesting information, provide the computer serial number and model number located on the bottom of the computer.

Service tag color varies on select models.

The service tag provides the following information:

(1) Product name: This is the product name affixed to the front of the computer.

(2) Serial: This is an alphanumeric identifier that is unique to each product.

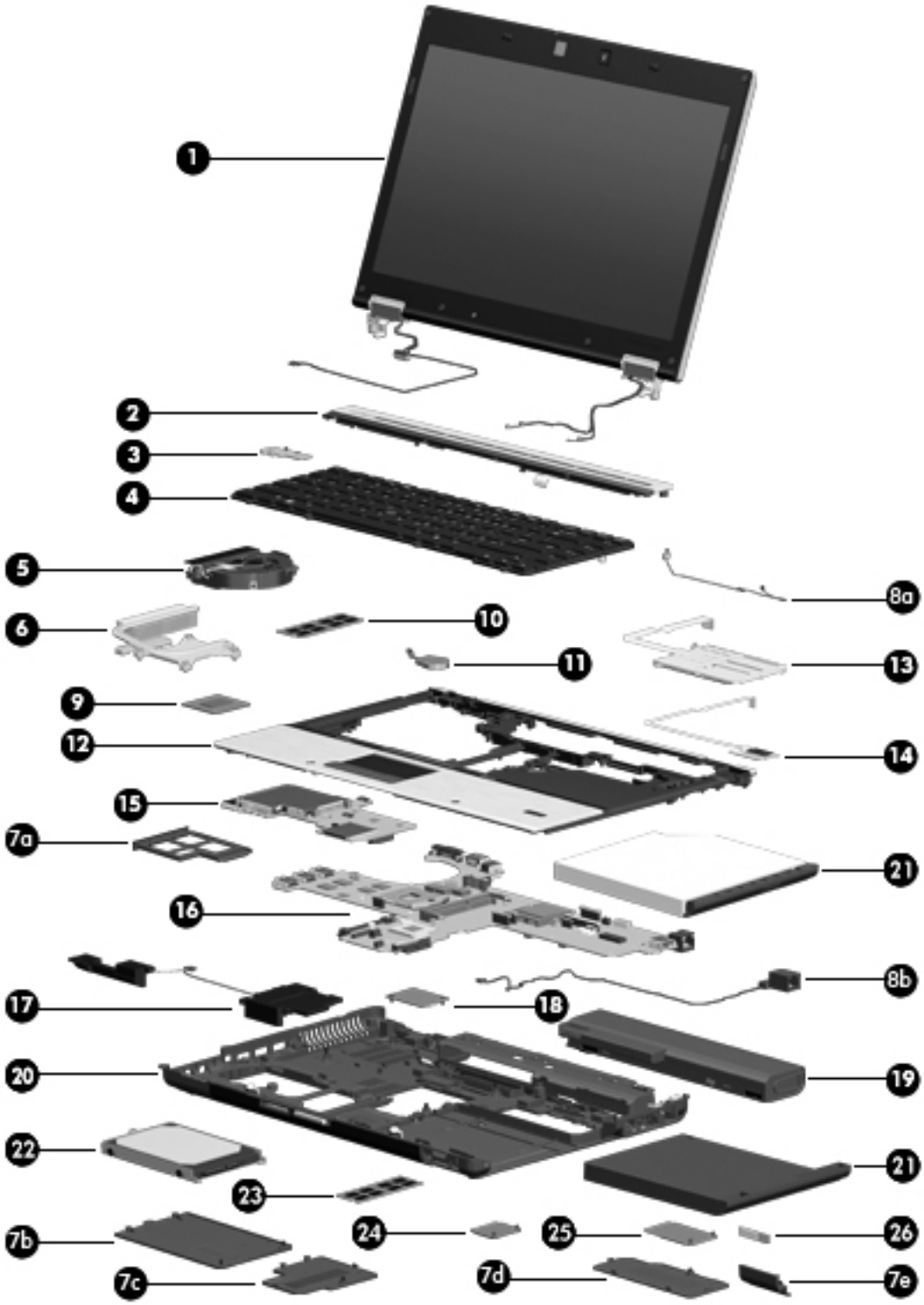
(3) Product: This number provides specific information about the product's hardware components. The part number helps a service technician to determine what components and parts are needed.

(4) Warranty: The number describes the duration of the warranty period for the computer.

(5) Model: This is the number used to locate documents, drivers, and support for the computer.

Warranty and Model fields are excluded from the service tag on select models.

Computer major components



Item	Description	Spare part number
(1)	**Display assembly** - 14.0-in, antiglare display for use with computer models equipped with WLAN and WWAN capability (includes 3 transmit/receive WLAN antenna, 2 transmit/receive WWAN antenna, and cables):	
	14.0-in HD AntiGlare LED SVA (1366x768) for use with HP EliteBook 8440p	594087-001
	14.0-in HD AntiGlare LED SVA (1366x768) with webcam for use with HP EliteBook 8440p	594088-001
	14.0-in HD+ AntiGlare LED SVA (1600x900) for use with HP EliteBook 8440p	594089-001
	14.0-in HD+ AntiGlare LED SVA (1600x900) with webcam for use with HP EliteBook 8440p	594090-001
	14.0-in HD AntiGlare LED SVA (1366x768) for use with HP EliteBook 8440w	598210-001
	14.0-in HD AntiGlare LED SVA (1366x768) with webcam for use with HP EliteBook 8440w	598211-001
	14.0-in HD+ AntiGlare LED SVA (1600x900) for use with HP EliteBook 8440w	598212-001
	14.0-in HD+ AntiGlare LED SVA (1600x900) with webcam for use with HP EliteBook 8440w	598213-001
	Display assembly subcomponents - See "Display assembly subcomponents" on page 3-8 for more display assembly subcomponent information.	
	Display cable	594037-001
	Ambient light sensor/connector board	594029-001
	Display hinge/bracket (left and right)	594039-001
	Display hinge cover (left and right) for use with HP EliteBook 8440p	594038-001
	Display hinge cover (left and right) for use with HP EliteBook 8440w	594223-001
	Display bezel without webcam lens for HP EliteBook 8440p	594035-001
	Display bezel with webcam lens for HP EliteBook 8440p	594036-001
	Display bezel without webcam lens for HP EliteBook 8440w	594756-001
	Display bezel with webcam lens for HP EliteBook 8440w	594757-001
	Display back cover with webcam for use with HP EliteBook 8440p	594031-001
	Display back cover with webcam for use with HP EliteBook 8440w	594032-001
	Display back cover without webcam for use with HP EliteBook 8440p	594033-001
	Display back cover without webcam for use with HP EliteBook 8440w	594034-001
(2)	**Switch cover**	
	Switch cover with LED board for use with HP EliteBook 8440p	594095-001
	Switch cover with LED board for use with HP EliteBook 8440w	594096-001
(3)	**Power button board** with cable	594025-001
(4)	**Keyboards** (include keyboard cable)	
	For use in Brazil	594052-201
	For use in Bulgaria	594052-261
	For use in Czech Republic	594052-221
	For use in Denmark	594052-081
	For use in Europe	594052-B31
	For use in Europe A4	594052-A41
	For use in France	594052-051
	For use in French Canada	594052-121

(Continued)

Item	Description	Spare part number
	For use in Germany	594052-041
	For use in Greece	594052-DJ1
	For use in Hungry	594052-211
	For use in Iceland	594052-DD1
	For use in Israel	594052-BB1
	For use in Italy	594052-061
	For use in Japan	594052-291
	For use in Latin America	594052-161
	For use in Norway	594052-091
	For use in Portugal	594052-131
	For use in Russia	594052-251
	For use in Saudi Arabia	594052-171
	For use in Slovakia	594052-231
	For use in Slovenia	594052-BA1
	For use in South Korea	594052-AD1
	For use in Spain	594052-071
	For use in Sweden/Finland	594052-B71
	For use in Switzerland	594052-BG1
	For use in Taiwan	594052-AB1
	For use in Thailand	594052-281
	For use in Turkey	594052-141
	For use in United Kingdom	594052-031
	For use in United States	594052-001
(5)	**Fan**	594049-001
(6)	**Heat sink**	
	For use with discrete graphics subsystem	594050-001
	For use with Unified Memory Architecture (UMA) graphics subsystem	594051-001
	Plastics kit with plastic screw covers, ExpressCard blank, RJ11 plug, and fingerprint reader plug not illustrated. See "Plastics kit" on page 3-11 for more Plastics kit information.	594091-001
(7a)	ExpressCard slot bezel	
(7b)	Hard drive bay cover	
(7c)	Memory module compartment cover	
(7d)	WLAN and WWAN module compartment cover	
(7e)	Bluetooth module compartment cover	
	Cable kit (includes Bluetooth cable and modem cable with RJ11 connector)	594030-001
(8a)	Bluetooth module cable. See "Cable kit" on page 3-10 for more Cable kit information.	
(8b)	Modem module cable with RJ-11 jack. See "Cable kit" on page 3-10 for more Cable kit information.	

(Continued)

Item	Description	Spare part number
(9)	**Processors** (include replacement thermal material)	
	Intel® Core™ i5 dual-core processor:	
	i5-520M, 2.4-GHz processor (Turbo up to 2.93 GHz) 3-MB L3 cache, 4 threads (35W)	594187-001
	i5-540M, 2.53-GHz processor (Turbo up to 3.06 GHz) 3-MB L3 cache, 4 threads (35W)	594188-001
	Intel® Core™ i7 quad-core, processor:	
	i7-620M, 2.66-GHz processor (Turbo up to 3.33 GHz) 6-MB L3 cache, 8 threads (45W)	587259-001
	Intel® Core™ i7 quad-core, processor:	
	i7-720QM, 1.6-GHz processor (Turbo up to 2.8 GHz), 6-MB L3 cache, 8 threads (45W)	586170-001
	i7-820QM, 1.73-GHz processor (Turbo up to 3.06 GHz), 8-MB L3 cache, 8 threads (45W)	583053-001
(10)	**Primary memory modules** (PC3-10600 DDR3 1333-MHz)	
	1024-MB	598859-001
	2048-MB	598856-001
	4096-MB	599092-001
(11)	**RTC battery** (includes cable and double-sided tape)	581075-001
(12)	**Top cover** with Touchpad, cable, and bracket	
	Top cover with smart card reader **(13)** and fingerprint reader **(14)** for HP EliteBook 8440p	594098-001
	Top cover with smart card reader **(13)** and fingerprint reader **(14)** for HP EliteBook 8440w	594099-001
	Top cover with smart card reader **(13)** without fingerprint reader for HP EliteBook 8440w (Plastics kit includes fingerprint reader plug)	594100-001
(15)	**Audio/ExpressCard board**	594024-001
(16)	**System board** with replacement thermal material	
	System board for use with HP EliteBook 8440p discrete graphics subsystem	594026-001
	System board for use with HP EliteBook 8440w discrete graphics subsystem	594027-001
	System board for use with HP EliteBook 8440p UMA graphics subsystem	594028-001
(17)	**Speaker assembly**	594094-001
(18)	**Modem module** (without cable) The modem module cable is included in the Cable kit, spare part number 594030-001. See "Cable kit" on page 3-10 for more Cable kit information.	
	High-speed 56K modem for use in all countries and regions except Australia and New Zealand	510099-001
	High-speed 56K modem for use in Australia and New Zealand	510099-011
(19)	**Battery**	
	4 cell, 2.55-Ah (37-Wh) Li-ion battery	489961-001
	6 cell, 2.55-Ah (55-Wh) Li-ion battery	486296-001
	6 cell, 2.55-Ah (51-Wh) 1000-cycle battery	593578-001
	9 cell, 3.0-Ah (100-Wh) Li-ion battery	593579-001
(20)	**Base enclosure**	
	Base enclosure for use with HP EliteBook 8440p	594021-001
	Base enclosure for use with HP EliteBook 8440w	594022-001

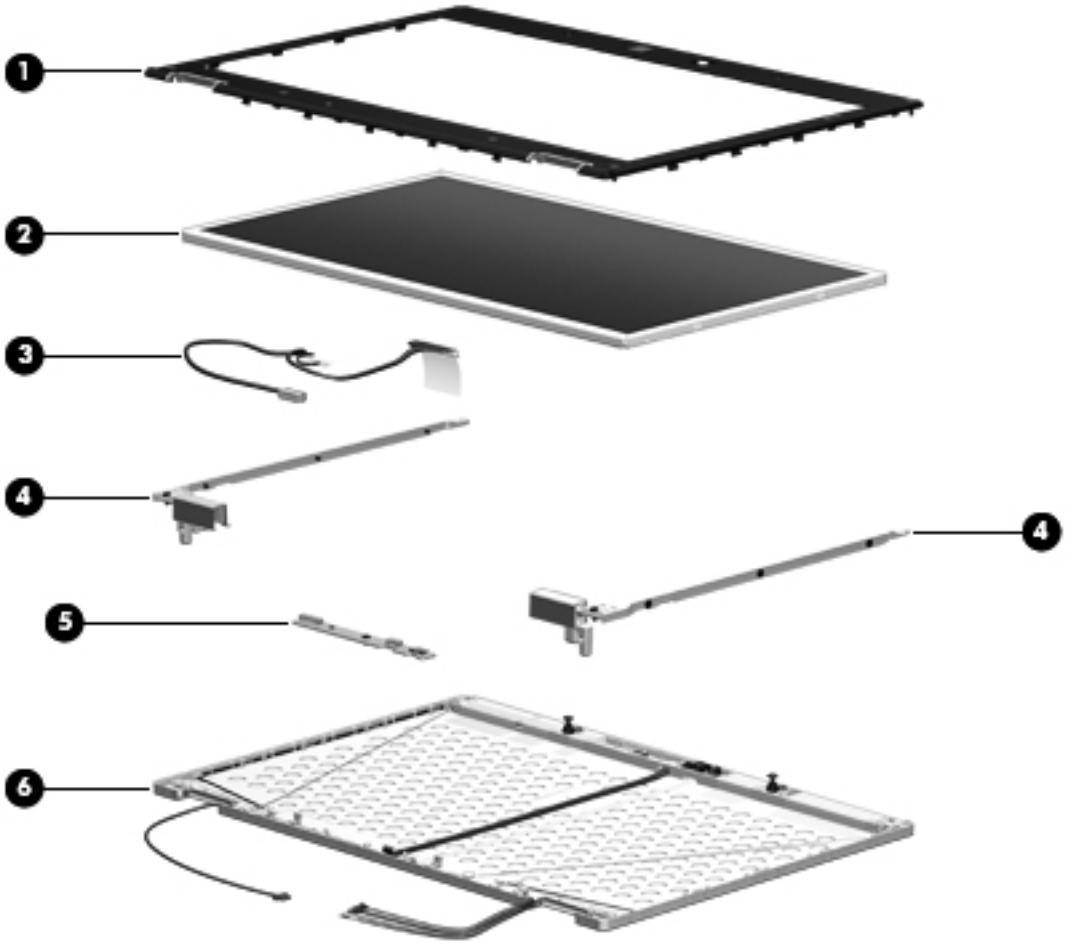
(Continued)

Item	Description	Spare part number
(21)	**Optical drives** (12.7mm SATA**)** with optical drive bezel and bracket or optional upgrade hard drive	
	Blu-ray ROM DVD±RW SuperMulti DL Drive	594040-001
	Blu-ray R/RE DVD±RW SuperMulti Drive	594041-001
	DVD-ROM Drive	594042-001
	DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe	594043-001
(22)	**Mass storage devices** with bracket	
	250-GB 7200-rpm SATA hard drive	594044-001
	320-GB 7200-rpm SATA hard drive	594045-001
	500-GB 7200-rpm SATA hard drive (also used for optional upgrade bay hard drive)	594046-001
	160-GB solid-state drive	594047-001
	256-GB solid-state drive	594048-001
(23)	**Expansion memory modules** (PC3-10600 DDR3 1333-MHz)	
	1024-MB	598859-001
	2048-MB	598856-001
	4096-MB	599092-001
(24)	**WLAN modules**	
	Intel a/g/n (2x2) for use in all countries and regions	572509-001
	Intel a/g/n (3x3) for use in all countries and regions	572511-001
	Intel a/b/g for use in Russia	572510-001
	Broadcom BCM4312 802.11b/g WLAN module for use in Canada, the Cayman Islands, Guam, Puerto Rico, the United States, and the U.S. Virgin Islands	504593-003

(Continued)

Item	Description	Spare part number
	Broadcom BCM4312 802.11b/g WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Syria, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	504593-004
(25)	**WWAN Modules**	
	Qualcomm EV-DO HSPA minicard	531993-001
	Ericsson F3607 SDG 900 HSPA minicard	574249-001
(26)	**Bluetooth module** (without cable) ✎ The Bluetooth module cable is included in the Cable kit, spare part number 594030-001. See “Cable kit” on page 3-10 for more Cable kit information.	537921-001

Display assembly subcomponents



Item	Description	Spare part number
(1)	**Display bezel**	
	Bezel with webcam lens for HP EliteBook 8440w Mobile Workstation	594757-001
	Bezel without webcam lens for HP EliteBook 8440w Mobile Workstation	594756-001
	Bezel with webcam lens for HP EliteBook 8440p Notebook PC	594036-001
	Bezel without webcam lens for HP EliteBook 8440p Notebook PC	594035-001
(2)	**Display panel**	
(3)	**Display cable**	594037-001
(4)	**Display hinge/bracket (left and right)**	594039-001
	Hinge cap (left and right) for HP EliteBook 8440w Mobile Workstation	594223-001
	Hinge cap (left and right) for HP EliteBook 8440p Notebook PC	594038-001
(5)	**Ambient light sensor/connector board**	594029-001

(Continued)

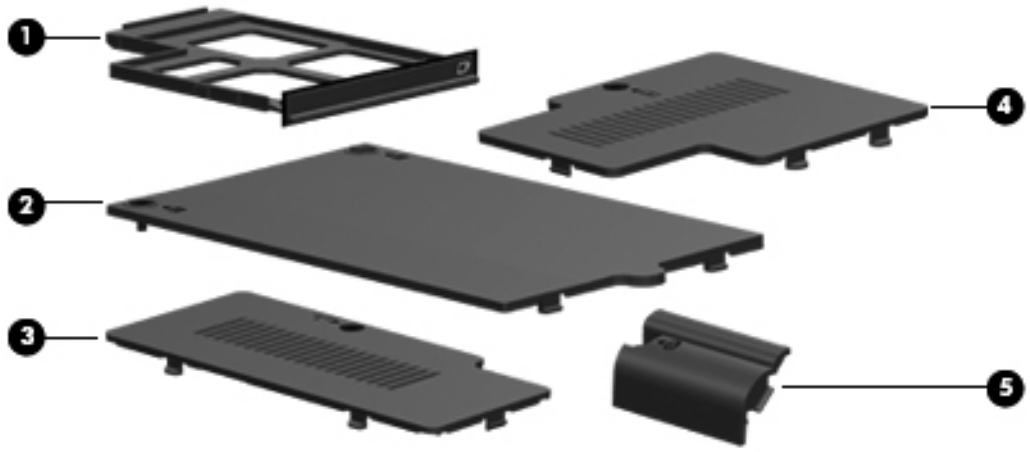
(6)	Back cover includes the dual-array microphone and cable, wireless antennas and cables	
	Back cover with webcam for HP EliteBook 8440w Mobile Workstation	594032-001
	Back cover without webcam for HP EliteBook 8440w Mobile Workstation	594034-001
	Back cover with webcam for HP EliteBook 8440p Notebook PC	594031-001
	Back cover without webcam for HP EliteBook 8440p Notebook PC	594033-001

Cable kit

Item	Description	Spare part number
	Cable kit:	594030-001
(1)	Modem module cable (includes RJ-11 jack)	
(2)	Bluetooth module cable	

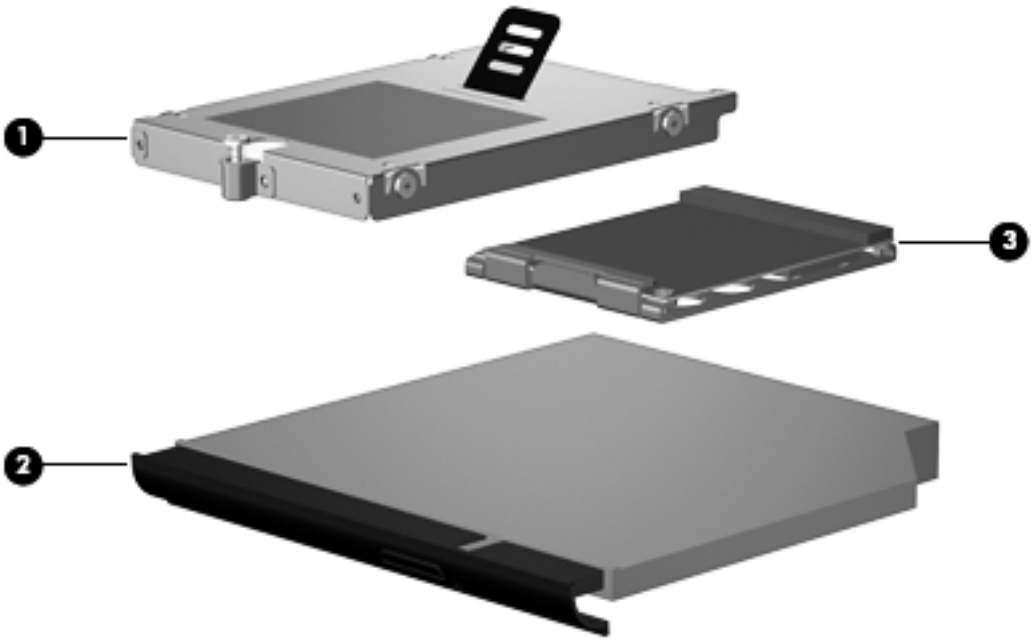
Plastics kit

CAUTION: Using excessive force during disassembly and reassembly can damage plastic parts. Use care when handling the plastic parts. Apply pressure only at the points designated in the maintenance instructions.



Item	Description	Spare part number
	Plastics kit:	594091-001
(1)	ExpressCard slot bezel	
(2)	Hard drive bay cover (includes one captive screw, secured by a C-clip)	
(3)	Wireless module compartment cover (includes one captive screw)	
(4)	Expansion memory compartment cover	
(5)	Bluetooth module compartment cover	

Mass storage devices



Item	Description	Spare part number
(1)	**Hard drives** (includes bracket, screws, and sponge material)	
	250-GB 7200-rpm SATA hard drive	594044-001
	320-GB 7200-rpm SATA hard drive	594045-001
	500-GB 7200-rpm SATA hard drive	594046-001
(2)	**Optical drives** (includes drive bezel, bracket, and rubber covers)	
	Blu-ray ROM with LightScribe DVD±RW SuperMulti DL Drive	594040-001
	Blu-ray R/RE DVD±RW SuperMulti Drive	594041-001
	DVD-ROM Drive	594042-001
	DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe	594043-001
(3)	**Solid-state drives**	
	160-GB solid-state drive	594047-001
	256-GB solid-state drive	594048-001

Miscellaneous parts

Description	Spare part number
Rubber kit with rubber screw covers for upgrade-bay, top cover back, display screw covers, base enclosure screw covers, and rubber feet	594092-001
AC adapter	
90W AC adapter	463955-001
90W AC adapter for use in India	535593-001
65W AC adapter	463958-001
65W AC adapter for use in India	577170-001
Power cords:	
For use in Argentina	490371-D01
For use in Australia	490371-011
For use in Brazil	490371-202
For use in Denmark	490371-081
For use in Europe	490371-021
For use in India	490371-D61
For use in Israel	490371-BB1
For use in Italy	490371-061
For use in Japan	490371-291
For use in North America	490371-001
For use in South Africa	490371-AR1
For use in South Korea	490371-AD1
For use in Switzerland	490371-111
For use in Taiwan	490371-AB1
For use in the People's Republic of China	490371-AA1
For use in the United Kingdom and Singapore	490371-031
Thermal heatshield (includes thermal support items)	594097-001
CPU Mylar (processor support item)	598214-001
Screw kit (includes 15 of each of the following screws) Phillips PM2.0×2.0×7.0 (broad-head) Phillips PM2.0×3.0×4.5 Phillips PM2.0×4.0×4.5 Phillips PM2.5×3.0×4.5 Phillips PM2.5×4.0×4.5 Phillips PM 2.5×5.0×4.5 Torx T8 M 2.5×6.0×5.0 Phillips PM2.8×4.0×5.0 Phillips PM3.0×3.0×5.0	594093-001

Sequential part number listing

Spare part number	Description
463955-001	90W AC adapter
463958-001	65W AC adapter
486296-001	Battery 6 cell, 2.55-Ah (55-Wh) Li-ion
489961-001	Battery 4 cell, 2.55-Ah (37-Wh) Li-ion
490371-001	Power cord for use in North America
490371-011	Power cord for use in Australia
490371-021	Power cord for use in Europe
490371-031	Power cord for use in the United Kingdom and Singapore
490371-061	Power cord for use in Italy
490371-081	Power cord for use in Denmark
490371-111	Power cord for use in Switzerland
490371-202	Power cord for use in Brazil
490371-291	Power cord for use in Japan
490371-AA1	Power cord for use in the People's Republic of China
490371-AB1	Power cord for use in Taiwan
490371-AD1	Power cord for use in South Korea
490371-AR1	Power cord for use in South Africa
490371-BB1	Power cord for use in Israel
490371-D01	Power cord for use in Argentina
490371-D61	Power cord for use in India
504593-003	Broadcom BCM4312 802.11b/g WLAN module for use in Canada, the Cayman Islands, Guam, Puerto Rico, the United States, and the U.S. Virgin Islands

(Continued)

504593-004	Broadcom BCM4312 802.11b/g WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Syria, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe
510099-001	High-speed 56K modem for use in all countries and regions except Australia and New Zealand
510099-011	High-speed 56K modem for use in Australia and New Zealand
531993-001	Qualcomm EV-DO HSPA WWAN module
535593-001	90W AC adapter for use in India
537921-001	Bluetooth module without cable
572509-001	Intel a/g/n (2 x 2) WLAN module
572510-001	Intel a/b/g WLAN module for use in Europe, Middle-East, and Africa
572511-001	Intel a/g/n (3 x 3) WLAN module
574249-001	Ericsson F3607 SDG 900 HSPA WWAN module
577170-001	65W AC adapter for use in India
581075-001	RTC battery
583053-001	i7-820QM, 1.73-GHz Intel® Core™ i7 quad-core processor Turbo up to 3.06 GHz), 8-MB L3 cache, 8 threads (45W)
586170-001	i7-720QM, 1.6-GHz Intel® Core™ i7 quad-core processor (Turbo up to 2.8 GHz), 6-MB L3 cache, 8 threads (45W)
587259-001	i7-620M, 2.66-GHz Intel® Core™ i7 quad-core processor (Turbo up to 3.33 GHz), 6-MB L3 cache, 8 threads (45W)
593578-001	6 cell, 2.55-Ah (51-Wh) 1000-cycle battery
593579-001	9 cell, 3.0-Ah (100-Wh) Li-ion battery
594021-001	Base enclosure for use with HP EliteBook 8440p
594022-001	Base enclosure for use with HP EliteBook 8440w
594024-001	Audio/ExpressCard board

(Continued)

594025-001	Power button board with cable
594026-001	System board for use with HP EliteBook 8440p discrete graphics subsystem
594027-001	System board for use with HP EliteBook 8440w discrete graphics subsystem
594028-001	System board for use with HP EliteBook 8440p UMA graphics subsystem
594029-001	Ambient light sensor/connector board
594030-001	Cable kit (includes Bluetooth cable and modem cable with RJ11 connector)
594031-001	Display back cover with webcam for use with HP EliteBook 8440p
594032-001	Display back cover with webcam for use with HP EliteBook 8440w
594033-001	Display back cover without webcam for use with HP EliteBook 8440p
594034-001	Display back cover without webcam for use with HP EliteBook 8440w
594035-001	Display bezel without webcam lens for HP EliteBook 8440p
594036-001	Display bezel with webcam lens for HP EliteBook 8440p
594037-001	Display cable
594038-001	Display hinge cover (left and right) for use with HP EliteBook 8440p
594039-001	Display hinge/bracket (left and right)
594040-001	Blu-ray ROM with LightScribe DVD±RW SuperMulti DL Drive (12.7mm SATA) with bezel and bracket
594041-001	Blu-ray R/RE DVD±RW SuperMulti Drive (12.7mm SATA) with bezel and bracket
594042-001	DVD-ROM Drive (12.7mm SATA) with bezel and bracket
594043-001	DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe (12.7mm SATA) with bezel and bracket
594044-001	250-GB 7200-rpm SATA hard drive
594045-001	320-GB 7200-rpm SATA hard drive
594046-001	500-GB 7200-rpm SATA hard drive
594047-001	160-GB solid-state drive
594048-001	256-GB solid-state drive
594049-001	Fan
594050-001	Heat sink for use with discrete graphics subsystem
594051-001	Heat sink for use with Unified Memory Architecture (UMA) graphics subsystem
594052-001	Keyboard for use in United States
594052-031	Keyboard for use in United Kingdom
594052-041	Keyboard for use in Germany
594052-051	Keyboard for use in France
594052-061	Keyboard for use in Italy
594052-071	Keyboard for use in Spain
594052-081	Keyboard for use in Denmark
594052-091	Keyboard for use in Norway
594052-121	Keyboard for use in French Canada
594052-131	Keyboard for use in Portugal
594052-141	Keyboard for use in Turkey

(Continued)

594052-161	Keyboard for use in Latin America
594052-171	Keyboard for use in Saudi Arabia
594052-201	Keyboard for use in Brazil
594052-211	Keyboard for use in Hungry
594052-221	Keyboard for use in Czech Republic
594052-231	Keyboard for use in Slovakia
594052-251	Keyboard for use in Russia
594052-261	Keyboard for use in Bulgaria
594052-281	Keyboard for use in Thailand
594052-291	Keyboard for use in Japan
594052-A41	Keyboard for use in Europe A4
594052-AB1	Keyboard for use in Taiwan
594052-AD1	Keyboard for use in South Korea
594052-B31	Keyboard for use in Europe
594052-B71	Keyboard for use in Sweden/Finland
594052-BA1	Keyboard for use in Slovenia
594052-BB1	Keyboard for use in Israel
594052-BG1	Keyboard for use in Switzerland
594052-DD1	Keyboard for use in Iceland
594052-DJ1	Keyboard for use in Greece
594087-001	Display assembly, 14.0-in, HD AntiGlare LED SVA (1366 x 768)
594088-001	Display assembly, 14.0-in, HD AntiGlare LED SVA (1366 x 768) with webcam
594089-001	Display assembly, 14.0-in, HD+ AntiGlare LED SVA (1600 x 900)
594090-001	Display assembly, 14.0-in, HD+ AntiGlare LED SVA (1600 x 900) with webcam
594091-001	Plastics kit with plastic screw covers, ExpressCard blank, RJ11 plug, and fingerprint reader plug
594092-001	Rubber kit with rubber screw covers for upgrade-bay, top cover back, LCD screw covers, base enslosure, and rubber feet
594093-001	Screw kit (includes 15 of each of the following screws) Phillips PM2.0×2.0×7.0 (broad-head) Phillips PM2.0×3.0×4.5 Phillips PM2.0×4.0×4.5 Phillips PM2.5×3.0×4.5 Phillips PM2.5×4.0×4.5 Phillips PM2.5×5.0×4.5 Torx T8 M2.5×6.0×5.0 Phillips PM2.8×4.0×5.0 Phillips PM3.0×3.0×5.0
594094-001	Speaker assembly
594095-001	Switch cover with LEB board for use with HP EliteBook 8440p
594096-001	Switch cover with LED board for use with HP EliteBook 8440w
594097-001	Thermal heatshield (includes thermal support items)

(Continued)

594098-001	Top cover with integrated Touchpad, smart card reader, and fingerprint reader for use with HP EliteBook 8440p
594099-001	Top cover with integrated Touchpad, smart card reader, and fingerprint reader for use with HP EliteBook 8440w
594100-001	Top cover with integrated Touchpad, smart card reader, and without fingerprint reader for use with HP EliteBook 8440w
594187-001	i5-520M, 2.4-GHz Intel® Core™ i5 dual-core processor, (Turbo up to 2.93 GHz), 3-MB L3 cache, 4 threads (35W)
594188-001	i5-540M, 2.53-GHz Intel® Core™ i5 dual-core processor, (Turbo up to 3.06 GHz), 3-MB L3 cache, 4 threads (35W)
594223-001	Display hinge cover (left and right) for use with HP EliteBook 8440w
594756-001	Display bezel without webcam lens for HP EliteBook 8440w
594757-001	Display bezel with webcam lens for HP EliteBook 8440w
598210-001	14.0 HD AntiGlare LED SVA (1366x768) or use with HP EliteBook 8440w
598211-001	14.0 HD AntiGlare LED SVA (1366x768) with webcam or use with HP EliteBook 8440w
598212-001	14.0 HD+ AntiGlare LED SVA (1600x900) or use with HP EliteBook 8440w
598213-001	14.0 HD+ AntiGlare LED SVA (1600x900) with webcam or use with HP EliteBook 8440w
598214-001	CPU Mylar (processor support item)
598859-001	1024-MB memory module (PC3-10600 DDR3 1333-MHz)
598856-001	2048-MB memory module (PC3-10600 DDR3 1333-MHz)
599092-001	4096-MB memory module (PC3-10600 DDR3 1333-MHz)

4

Removal and replacement procedures

Preliminary replacement requirements

Tools required

You will need the following tools to complete the removal and replacement procedures:

- Flat-bladed screwdriver
- Phillips P0
- Phillips P1 screwdriver
- Torx T8 screwdriver

Service considerations

The following sections include some of the considerations that you must keep in mind during disassembly and assembly procedures.

As you remove each subassembly from the computer, place the subassembly (and all accompanying screws) away from the work area to prevent damage.

Plastic parts

CAUTION: Using excessive force during disassembly and reassembly can damage plastic parts. Use care when handling the plastic parts. Apply pressure only at the points designated in the maintenance instructions.

Cables and connectors

CAUTION: When servicing the computer, be sure that cables are placed in their proper locations during the reassembly process. Improper cable placement can damage the computer.

Cables must be handled with extreme care to avoid damage. Apply only the tension required to unseat or seat the cables during removal and insertion. Handle cables by the connector whenever possible. In all cases, avoid bending, twisting, or tearing cables. Be sure that cables are routed in such a way that they cannot be caught or snagged by parts being removed or replaced. Handle flex cables with extreme care; these cables tear easily.

Drive handling

CAUTION: Drives are fragile components that must be handled with care. To prevent damage to the computer, damage to a drive, or loss of information, observe these precautions:

- Before removing or inserting a hard drive, shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
- Before handling a drive, be sure that you are discharged of static electricity. While handling a drive, avoid touching the connector.
- Before removing a diskette drive or optical drive, be sure that a diskette or disc is not in the drive and be sure that the optical drive tray is closed.
- Handle drives on surfaces covered with at least one inch of shock-proof foam.
- Avoid dropping drives from any height onto any surface.
- After removing a hard drive, an optical drive, or a diskette drive, place it in a static-proof bag.
- Avoid exposing a hard drive to products that have magnetic fields, such as monitors or speakers.
- Avoid exposing a drive to temperature extremes or liquids.
- If a drive must be mailed, place the drive in a bubble pack mailer or other suitable form of protective packaging and label the package "FRAGILE."

Grounding guidelines

Electrostatic discharge damage

Electronic components are sensitive to electrostatic discharge (ESD). Circuitry design and structure determine the degree of sensitivity. Networks built into many integrated circuits provide some protection, but in many cases, ESD contains enough power to alter device parameters or melt silicon junctions.

A discharge of static electricity from a finger or other conductor can destroy static-sensitive devices or microcircuitry. Even if the spark is neither felt nor heard, damage may have occurred.

An electronic device exposed to ESD may not be affected at all and can work perfectly throughout a normal cycle. Or, the device may function normally for a while, and then degrade in the internal layers, reducing its life expectancy.

CAUTION: To prevent damage to the computer when you are removing or installing internal components, observe these precautions:

- Keep components in their electrostatic-safe containers until you are ready to install them.
- Use nonmagnetic tools.
- Before touching an electronic component, discharge static electricity by using the guidelines described in this section.
- Avoid touching pins, leads, and circuitry. Handle electronic components as little as possible.
- If you remove a component, place it in an electrostatic-safe container.

The following table shows how humidity affects the electrostatic voltage levels generated by different activities.

CAUTION: A product can be degraded by as little as 700 V.

Typical electrostatic voltage levels

	Relative humidity		
Event	**10%**	**40%**	**55%**
Walking across carpet	35,000 V	15,000 V	7,500 V
Walking across vinyl floor	12,000 V	5,000 V	3,000 V
Motions of bench worker	6,000 V	800 V	400 V
Removing DIPS from plastic tube	2,000 V	700 V	400 V
Removing DIPS from vinyl tray	11,500 V	4,000 V	2,000 V
Removing DIPS from Styrofoam	14,500 V	5,000 V	3,500 V
Removing bubble pack from PCB	26,500 V	20,000 V	7,000 V
Packing PCBs in foam-lined box	21,000 V	11,000 V	5,000 V

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

- To avoid hand contact, transport products in static-safe tubes, bags, or boxes.
- Protect ESD-sensitive parts and assemblies with conductive or approved containers or packaging.
- Keep ESD-sensitive parts in their containers until they arrive at static-free workstations.
- Place items on a grounded surface before them from their containers.
- Always be properly grounded when touching a component or assembly.
- Store reusable ESD-sensitive parts from assemblies in protective packaging or nonconductive foam.
- Use transporters and conveyors made of antistatic belts and roller bushings. Be sure that mechanized equipment used for moving materials is wired to ground, and that proper materials are selected to avoid static charging. When grounding is not possible, use an ionizer to dissipate electric charges.

Workstation guidelines

Follow these workstation grounding guidelines:

- Cover the workstation with approved static-shielding material.
- Use a wrist strap connected to a properly grounded work surface, and use properly grounded tools and equipment.
- Use conductive field service tools, such as cutters, screwdrivers, and vacuums.
- When fixtures must directly contact dissipative surfaces, use fixtures made only of static-safe materials.
- Keep the work area free of nonconductive materials, such as ordinary plastic assembly aids and Styrofoam.
- Handle ESD-sensitive components, parts, and assemblies by the case or PCM laminate. Handle these items only at static-free workstations.
- Avoid contact with pins, leads, or circuitry.
- Turn off power and input signals before inserting or removing connectors or test equipment.

Equipment guidelines

Grounding equipment must include either a wrist strap or a foot strap at a grounded workstation.

- When seated, wear a wrist strap connected to a grounded system. Wrist straps are flexible straps with a minimum of one megohm ±10% resistance in the ground cords. To provide proper ground, wear a strap snugly against the skin at all times. On grounded mats with banana-plug connectors, use alligator clips to connect a wrist strap.
- When standing, use foot straps and a grounded floor mat. Foot straps (heel, toe, or boot straps) can be used at standing workstations and are compatible with most types of shoes or boots. On conductive floors or dissipative floor mats, use foot straps on both feet with a minimum of one megohm resistance between the operator and ground. To be effective, the conductive strips must be worn in contact with the skin.

The following grounding equipment is recommended to prevent electrostatic damage:

- Antistatic tape
- Antistatic smocks, aprons, and sleeve protectors
- Conductive bins and other assembly or soldering aids
- Nonconductive foam
- Conductive tabletop workstations with ground cords of one megohm resistance
- Static-dissipative tables or floor mats with hard ties to the ground
- Field service kits
- Static awareness labels
- Material-handling packages
- Nonconductive plastic bags, tubes, or boxes
- Metal tote boxes
- Electrostatic voltage levels and protective materials

The following table lists the shielding protection provided by antistatic bags and floor mats.

Material	Use	Voltage protection level
Antistatic plastic	Bags	1,500 V
Carbon-loaded plastic	Floor mats	7,500 V
Metallized laminate	Floor mats	5,000 V

Component replacement procedures

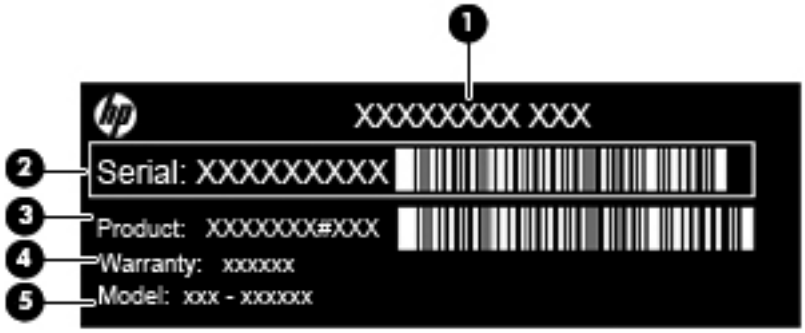
This chapter provides removal and replacement procedures.

There are as many as 67 screws, in 9 different sizes, that must be removed, replaced, or loosened when servicing the computer. Make special note of each screw size and location during removal and replacement.

Service tag

When ordering parts or requesting information, provide the computer serial number and model number provided on the service tag (see Serial number location).

Service tag color varies on select models.

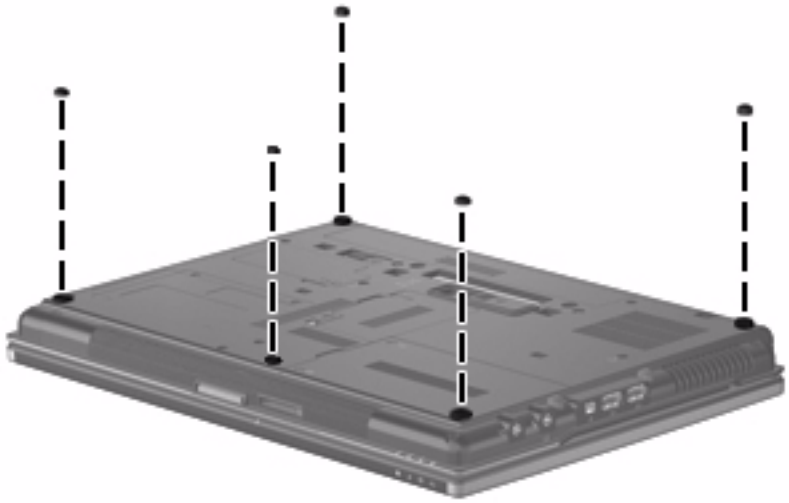


Item	Field	Description
(1)	Product name	This is the product name affixed to the front of the computer.
(2)	Serial	This is an alphanumeric identifier that is unique to each product.
(3)	Product	This number provides specific information about the product's hardware components. The product number, or part number, helps a service technician determine what components and parts are needed.
(4)	Warranty	This number describes the duration of the warranty period for the computer.
(5)	Model	This is the alphanumeric identifier used to locate documents, drivers, and support for the computer.

Warranty and Model fields are excluded from the service tag on select models.

Computer feet

The computer feet are part of the base enclosure. The feet are included in the Rubber Kit, spare part number 594092-001. There are 5 rubber feet that attach to the base enclosure in the locations shown in the following illustration.



Battery

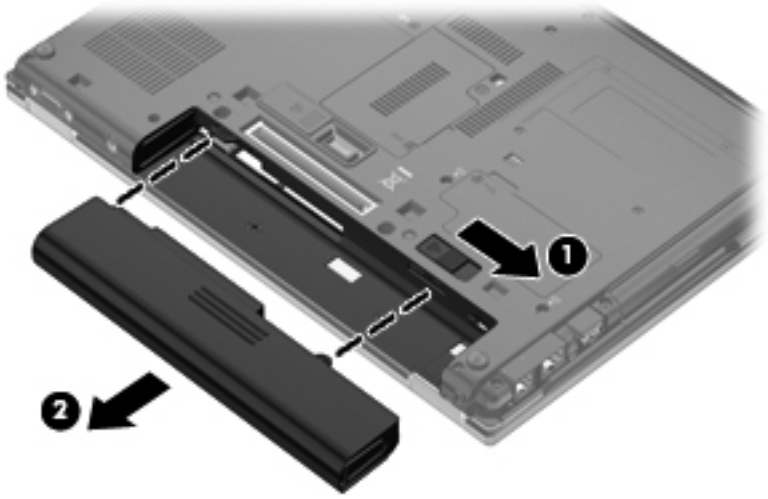
Description	Spare part number
4 cell, 2.55-Ah (37-Wh) Li-ion battery	489961-001
6 cell, 2.55-Ah (55-Wh) Li-ion battery	486296-001
6 cell, 2.55-Ah (51-Wh) 1000-cycle battery	593578-001
9 cell, 3.0-Ah (100-Wh) Li-ion battery	593579-001

Before removing the battery, follow these steps:

» Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.

Remove the battery:

1. Turn the computer upside down on a flat surface, with the battery bay toward you.
2. Slide the battery release latch ❶ to release the battery.
3. Remove the battery ❷.



Install the battery by inserting it into the battery bay until you hear a click.

SIM

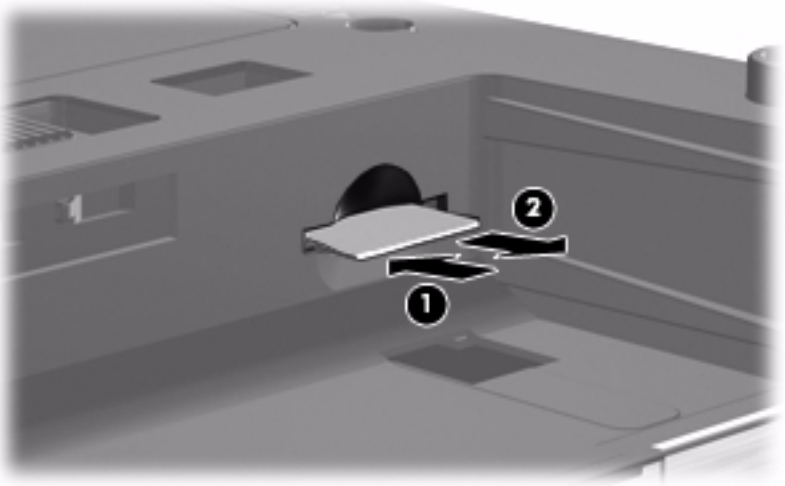
The end user supplies the SIM, which stores the service-subscriber key to identify the subscriber on a wireless wide-area network (WWAN). The SIM should be removed, stored in static-safe container, and replaced when reassembling the computer.

Before removing the SIM, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).

Remove the SIM:

1. Push on the SIM ❶ to release it from the SIM slot.
2. Remove the SIM ❷ from the computer.



Install the SIM by inserting it into the SIM slot and pushing until you hear a click.

CAUTION: When inserting a SIM, position the card with the slanted corner as shown in the illustration. If a SIM is inserted backwards or upside down, the battery may not snap into place properly and could damage the SIM and the SIM connector.

To prevent damage to the connectors, use minimal force when inserting a SIM.

Hard drive

The hard drive spare part kit includes drive bracket, screws, and sponge material.

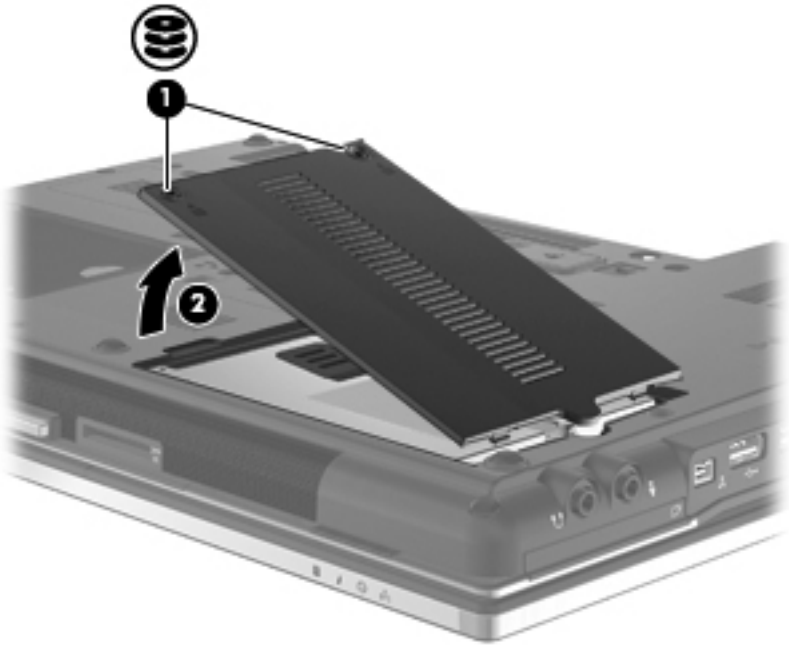
Description	Spare part number
250-GB 7200-rpm SATA hard drive	594044-001
320-GB 7200-rpm SATA hard drive	594045-001
500-GB 7200-rpm SATA hard drive	594046-001
160-GB solid-state drive	594047-001
256-GB solid-state drive	594048-001

Before removing the hard drive, follow these steps:

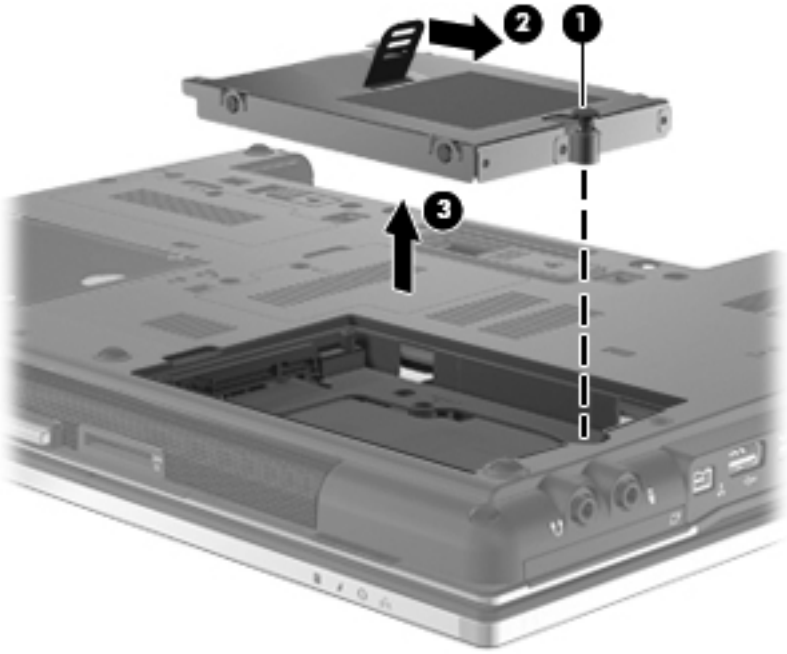
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).

Remove the hard drive:

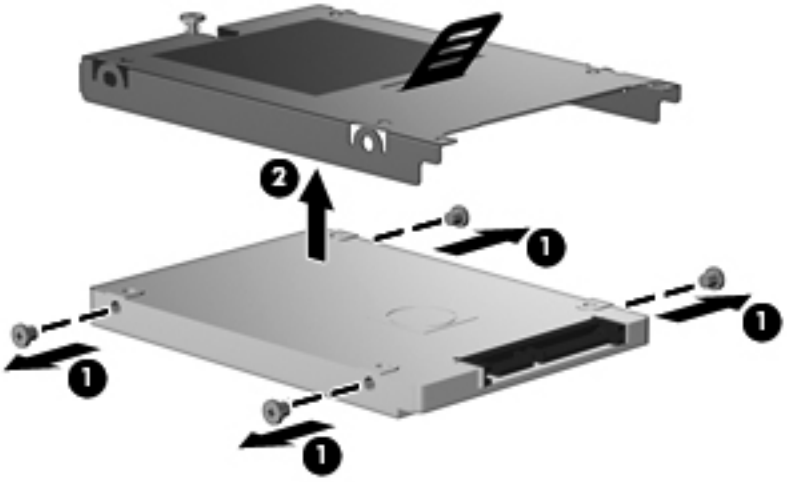
1. Position the computer with the front toward you.
2. Loosen the 2 Phillips PM2.0×5.0 captive screws ❶ that secure the hard drive cover to the computer.
3. Lift the left side ❷ of the hard drive bay cover to detach it from the computer.
4. Remove the hard drive bay cover. The cover is included in the Plastics Kit, spare part number 594091-001.



5. Loosen the Phillips PM2.5×10.0 captive screw ❶ that secures the hard drive to the computer.
6. Grasp the Mylar tab ❷ on the top of the hard drive, and then lift it up and to the right to disconnect the hard drive from the hard drive connector on the system board.
7. Remove the hard drive ❸ from the hard drive bay.



8. To replace the hard drive bracket, follow these steps:
   a. Remove the 4 Phillips PM3.0×3.0 screws ❶ that secure the hard drive bracket to the hard drive.
   b. Lift the bracket straight up ❷ to remove it from the hard drive.



Reverse this procedure to reassemble and install the hard drive.

WLAN module

Description	Spare part number
Broadcom BCM4312 802.11b/g WLAN module for use in Canada, the Cayman Islands, Guam, Puerto Rico, the United States, and the U.S. Virgin Islands	504593-003
Broadcom BCM4312 802.11b/g WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Syria, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	504593-004
Intel a/g/n (2x2) for use in all countries and regions	572509-001
Intel a/g/n (3x3) for use in all countries and regions	572511-001
Intel a/b/g for use in Russia	572510-001

Before removing the WLAN module, follow these steps:

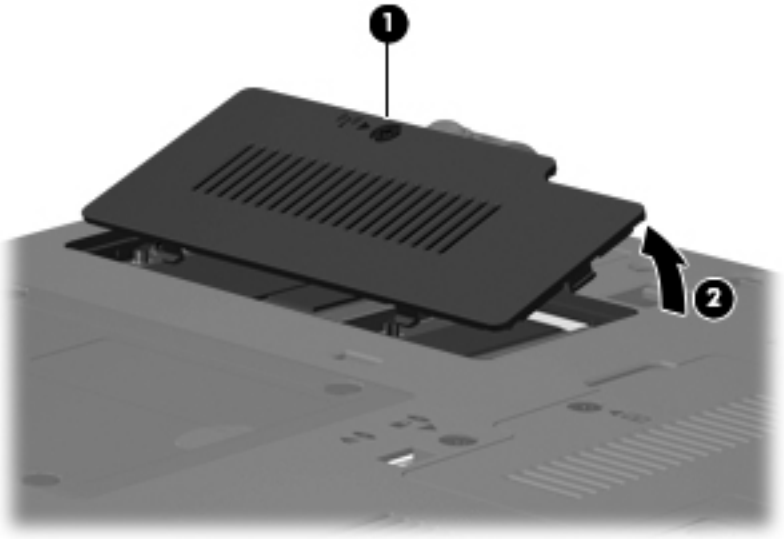
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).

Remove the WLAN module:

CAUTION: To prevent an unresponsive system, replace the wireless module only with a wireless module authorized for use in the computer by the governmental agency that regulates wireless devices in your country or region. If you replace the module and then receive a warning message, remove the module to restore computer functionality, and then contact technical support through Help and Support.

1. Position the computer upside down, with the front toward you.
2. Loosen the Phillips PM2.0×5.0 captive screw ❶ that secures the wireless module compartment cover to the computer.
3. Lift the left side of the cover ❷ to remove it from the computer.

   The wireless module compartment cover is included in the Plastics Kit, spare part number 594091-001.

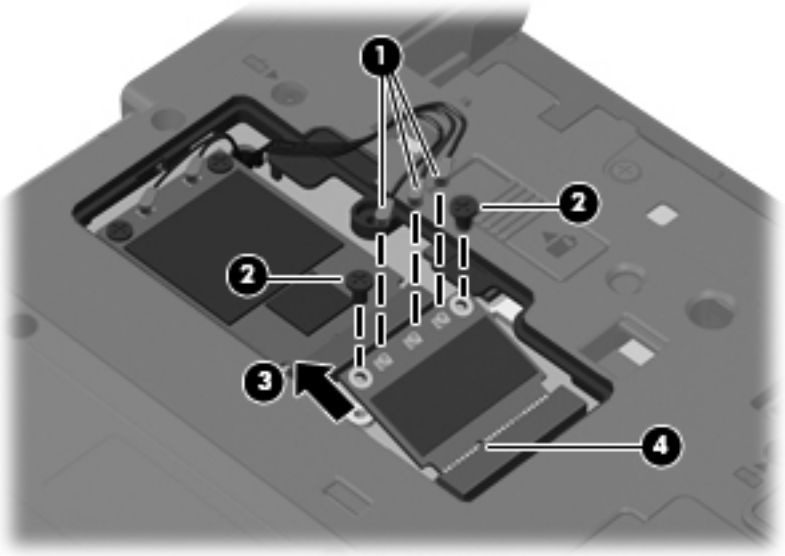


4. Disconnect the WLAN antenna cables ❶ from the terminals on the WLAN module.

   ✎ The antenna cables are labeled: 1 - black, 2 - white, and 3 - yellow. Connect the antenna cables to the matching transmit/receive connector on the WLAN module.

5. Remove the 2 Phillips PM2.5×4.0 screws ❷ that secure the WLAN module to the computer.
6. Remove the WLAN module ❸ by pulling it away from the slot at an angle.

   ✎ WLAN modules are designed with a notch ❹ to prevent incorrect insertion of the WLAN module into the WLAN module slot.



Reverse this procedure to install the WLAN module.

WWAN module

Description	Spare part number
Ericsson F3607 SDG 900 HSPA minicard	574249-001
Qualcomm Evolution-Data only (EVDO)/High-speed packet access (HSPA) minicard	531993-001

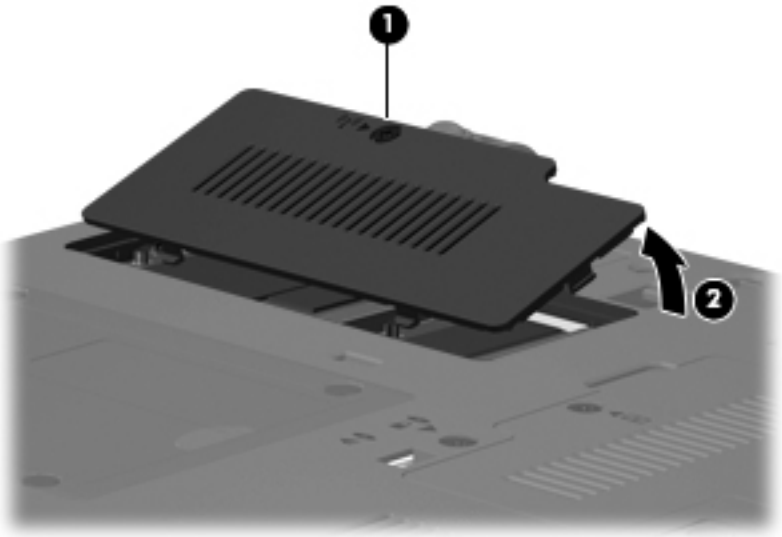
Before removing the WWAN module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).

Remove the wireless module compartment cover.

1. Position the computer upside down, with the front toward you.
2. Loosen the Phillips PM2.0×5.0 captive screw ❶ that secures the wireless module compartment cover to the computer.
3. Lift the left side of the cover ❷ to remove it from the computer.

   The wireless module compartment cover is included in the Plastics Kit, spare part number 594091-001.



Remove the WWAN module:

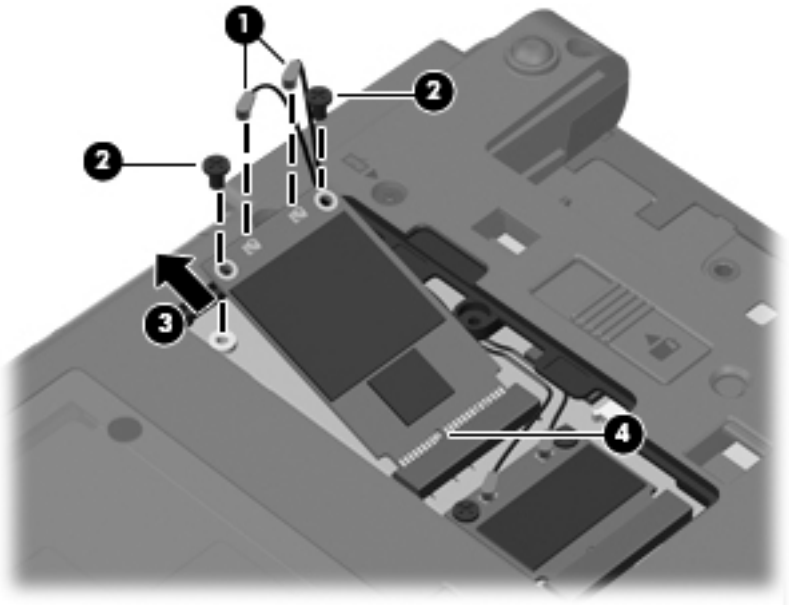
CAUTION: To prevent an unresponsive system, replace the wireless module only with a wireless module authorized for use in the computer by the governmental agency that regulates wireless devices in your country or region. If you replace the module and then receive a warning message, remove the module to restore computer functionality, and then contact technical support through Help and Support.

1. Position the computer upside down, with the front toward you.
2. Disconnect the WWAN antenna cables ❶ from the terminals on the WWAN module.

   ✎ The WWAN antenna cables are labeled: 5 - red, and 6 - blue. Connect the antenna cables to the matching transmit/receive connector on the WWAN module.

3. Remove the 2 Phillips PM2.5×4.0 screws ❷ that secure the WWAN module to the computer. The WWAN module tilts up with the screws removed.
4. Remove the WWAN module ❸ by pulling it away from the slot at an angle.

   ✎ WWAN modules are designed with a notch ❹ to prevent incorrect insertion of the WWAN module into the WWAN module slot.



Reverse this procedure to install the WWAN module.

Memory module

Description	Spare part number
4096-MB memory module (PC3-10600 DDR3 1333-MHz)	599092-001
2048-MB memory module (PC3-10600 DDR3 1333-MHz)	598856-001
1024-MB memory module (PC3-10600 DDR3 1333-MHz)	598859-001

Expansion memory module

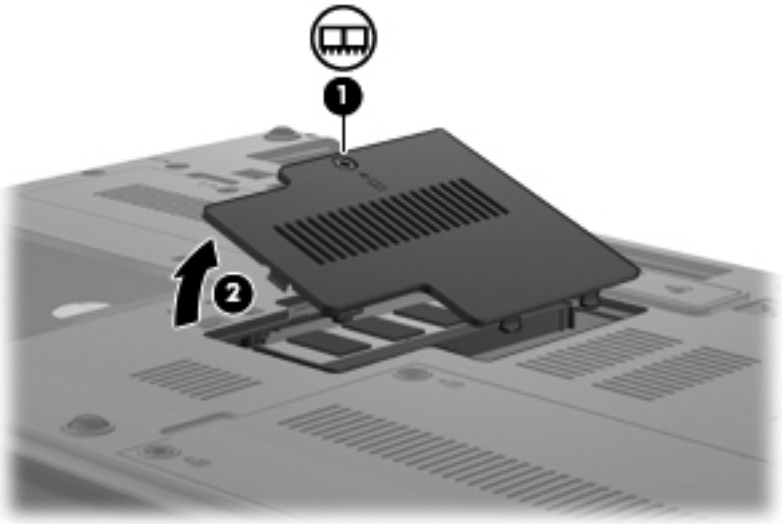
Before removing the expansion memory module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).

Remove the expansion memory module compartment cover.

1. Position the computer upside down, with the front toward you.
2. Loosen the Phillips PM2.0×5.0 captive screw ❶ that secures the memory compartment cover to the computer.
3. Lift the left side of the cover ❷ to remove it from the computer.

   The memory module compartment cover is included in the plastics kit, spare part number 594091-001.



Remove the expansion memory module:

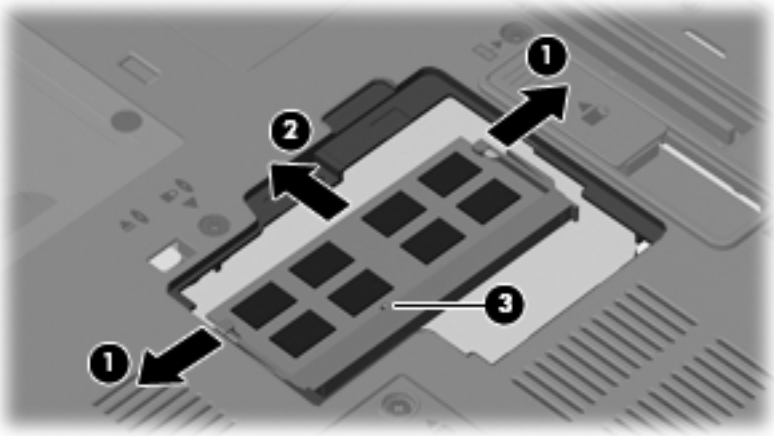
The expansion memory module is accessed from the bottom of the computer; the primary memory module is under the keyboard.

1. Pull away the retention clips ❶ on each side of the memory module to release the memory module. (The memory module tilts up.)

CAUTION: The memory module is electrostatic sensitive. To prevent damage to the memory module, hold it by the card edge, do not touch components, and follow "Workstation guidelines" on page 4-4.

2. Grasp the edge of the memory module ❷, and then remove it from the memory module slot.

   Memory modules are designed with a notch ❸ to prevent incorrect insertion into the memory module slot.



Reverse this procedure to install an expansion memory module.

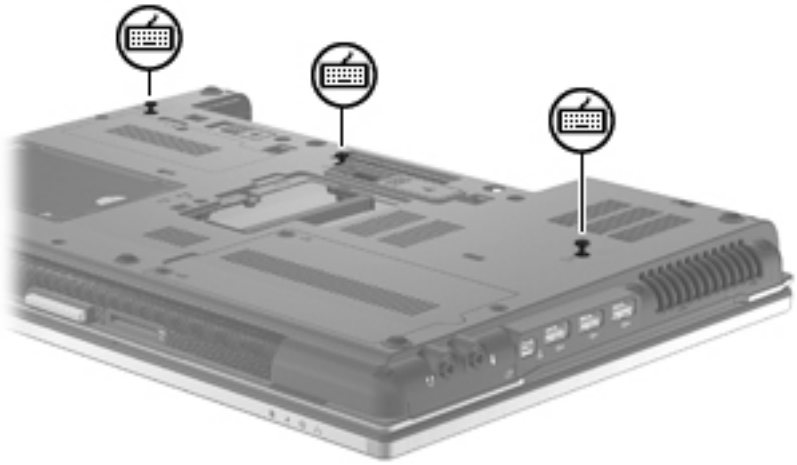
Primary memory module

Before removing the primary memory module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).

Open the keyboard:

1. Position the computer upside down, with the front toward you.
2. Loosen the 3 Phillips PM2.5×10.0 captive screws that secure the keyboard to the computer.



3. Turn the computer right-side up, with the front toward you.
4. Open the computer as far as possible.
5. Release the 4 keyboard latches.

6. Lift the rear edge of the keyboard and slide the keyboard back until it rests on the switch cover and display.

Remove the primary memory module:

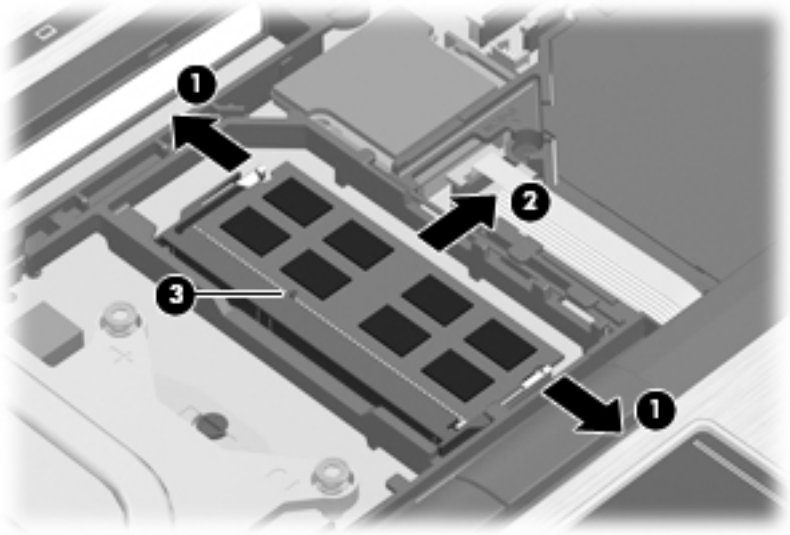
Primary memory is under the keyboard. Expansion memory is in the expansion memory compartment on the bottom of the computer.

1. Pull away the retention clips ❶ on each side of the memory module to release the memory module. (The memory module tilts up.)

CAUTION: The memory module is electrostatic sensitive. To prevent damage to the memory module, hold it by the card edge, do not touch components, and follow "Workstation guidelines" on page 4-4.

2. Grasp the edge of the memory module ❷, and then remove it from the memory module slot.

   Memory modules are designed with a notch ❸ to prevent incorrect insertion into the memory module slot.



Reverse this procedure to install a primary memory module.

Optical drive

The optical drive spare part kit includes an optical drive bezel, bracket, and rubber covers.

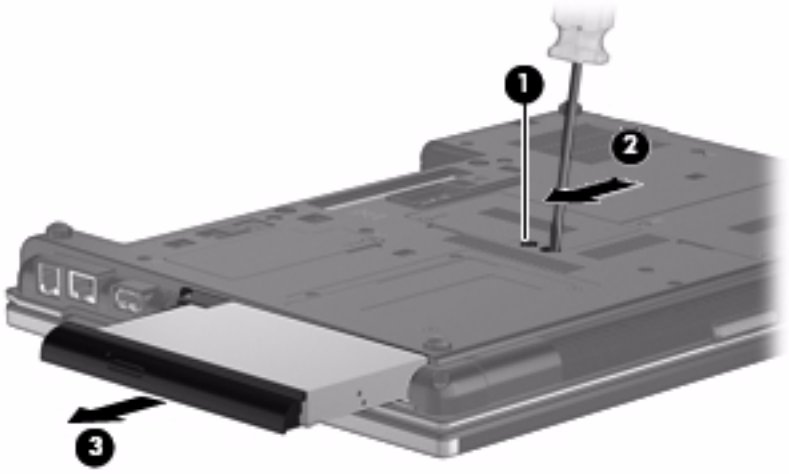
Description	Spare part number
Blu-ray R/RE DVD±RW SuperMulti Drive	594041-001
Blu-ray ROM with LightScribe DVD±RW SuperMulti DL Drive	594040-001
DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe	594043-001
DVD-ROM Drive	594042-001

Before removing the optical drive, follow these steps:

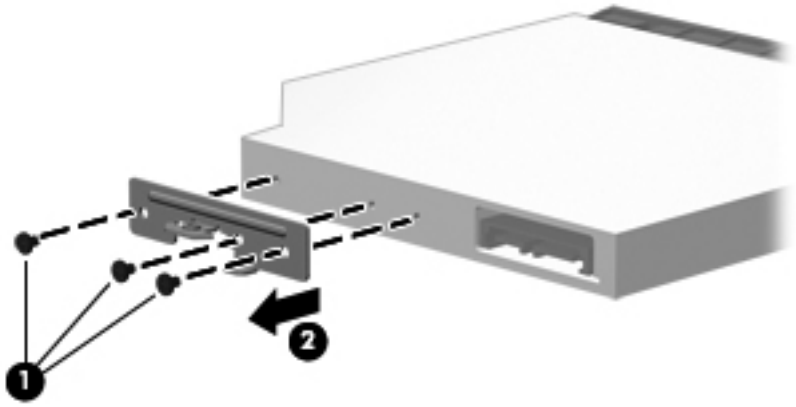
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).

Remove the optical drive:

1. Remove the Phillips PM2.5×10.0 screw ❶ that secures the optical drive to the computer.
2. Insert a flat-bladed screwdriver or similar tool into the optical drive tab access ❷, and then press the tab to the left to release the optical drive from the computer.
3. Remove the optical drive ❸ from the optical drive bay.



4. If it is necessary to replace the optical drive bracket, follow these steps:
   a. Position the optical drive with the rear toward you.
   b. Remove the 3 Phillips PM2.0×4.0 screws ❶ that secure the optical drive bracket to the optical drive.
   c. Remove the optical drive bracket ❷.



Reverse this procedure to reassemble and install an optical drive.

Keyboard and switch cover

The switch cover spare part kit includes an LED board and cable.

Description	Spare part number
Switch cover for use with HP EliteBook 8440p	594095-001
Switch cover for use with HP EliteBook 8440w	594096-001

The keyboard spare part kit includes a keyboard cable.

Keyboard for use in country or region:	Spare part number	Keyboard for use in country or region:	Spare part number
Brazil	594052-201	Norway	594052-091
Bulgaria	594052-261	Portugal	594052-131
Czech Republic	594052-221	Russia	594052-251
Denmark	594052-081	Saudi Arabia	594052-171
Europe	594052-B31	Slovakia	594052-231
Europe A4	594052-A41	Slovenia	594052-BA1
France	594052-051	South Korea	594052-AD1
French Canada	594052-121	Spain	594052-071
Germany	594052-041	Sweden/Finland	594052-B71
Greece	594052-DJ1	Switzerland	594052-BG1
Hungry	594052-211	Taiwan	594052-AB1
Iceland	594052-DD1	Thailand	594052-281
Israel	594052-BB1	Turkey	594052-141
Italy	594052-061	United Kingdom	594052-031
Japan	594052-291	United States	594052-001
Latin America	594052-161		

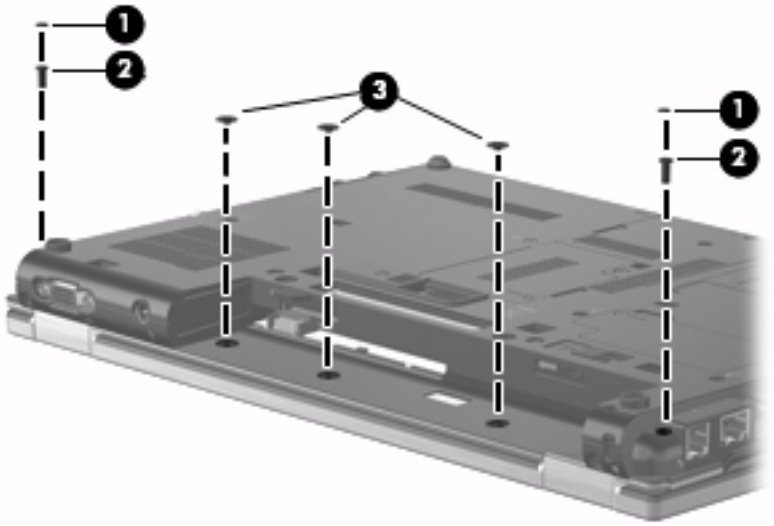
Before removing the keyboard and switch cover, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).

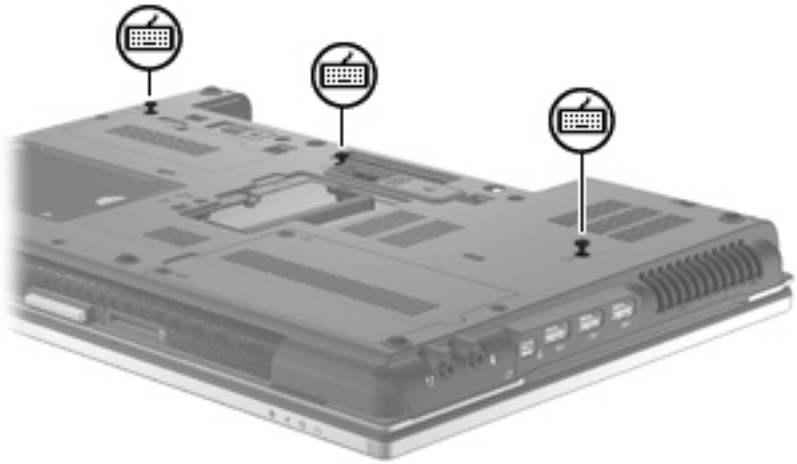
Remove the keyboard and switch cover:

1. Position the computer with the front toward you.
2. Remove the following:
   - ❏ Two rubber screw covers ❶ and 2 Torx T8 M2.5×6.0 screws ❷ that secure the switch cover to the computer
   - ❏ Three Phillips PM2.0×2.0 broadhead screws ❸ that secure the switch cover to the computer in the battery bay

     ✎ Use the Phillips P0 screwdriver to remove the PM2.0×2.0 broadhead screws.

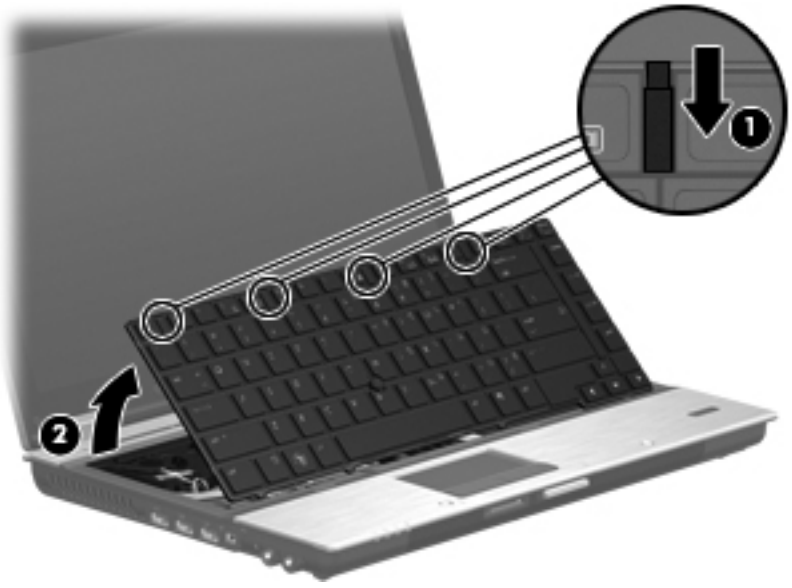


   - ❏ Three PM2.5×10.0 captive screws that secure the keyboard to the computer

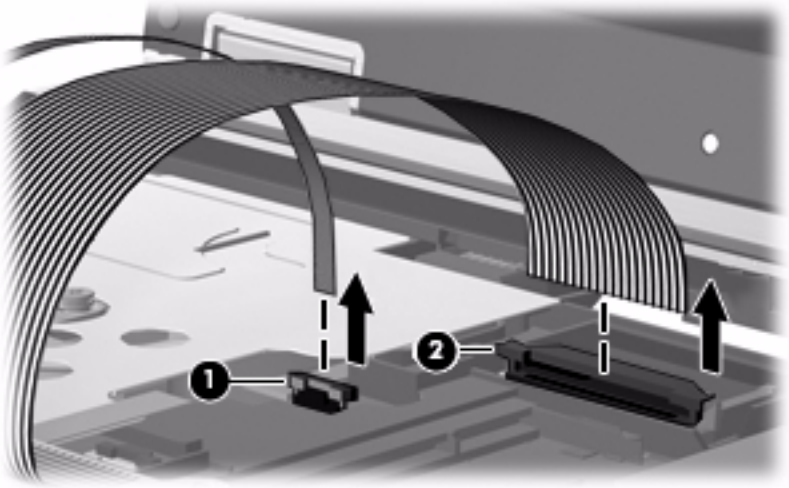


3. Turn the computer right-side up, with the front toward you.
4. Open the computer as far as possible.

5. Release the 4 keyboard latches ❶.
6. Lift the rear edge ❷ of the keyboard until it rests at an angle, and then turn the keyboard over until it rests on the front of the top cover.

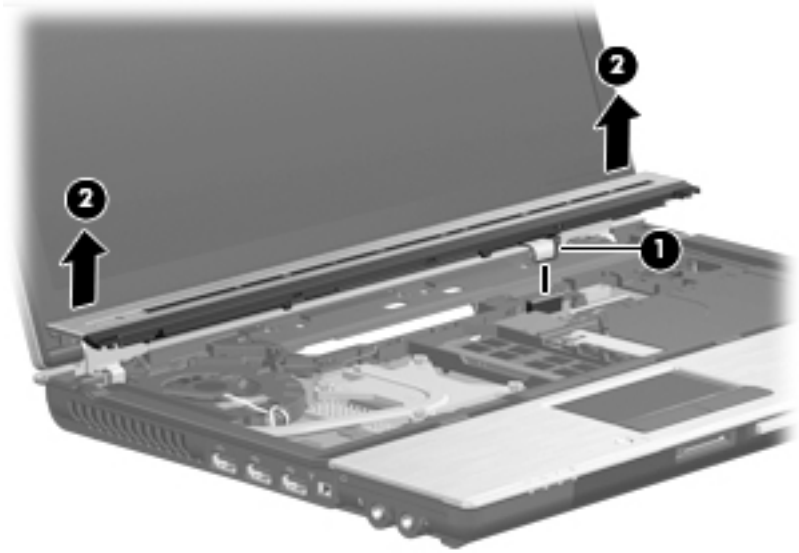


7. Release the zero insertion force (ZIF) connectors to which the pointing stick cable ❶ and the keyboard cable ❷ is attached, and then disconnect the cables from the system board.



8. Remove the keyboard.

9. Release the ZIF connector to which the LED board cable ❶ is attached, and then disconnect the LED board cable from the system board.
10. Lift the back edge of the switch cover ❷ and release it from the computer.



11. Remove the switch cover.

Reverse this procedure to install the keyboard and switch cover.

Power button board

The power button board spare part kit includes the cable.

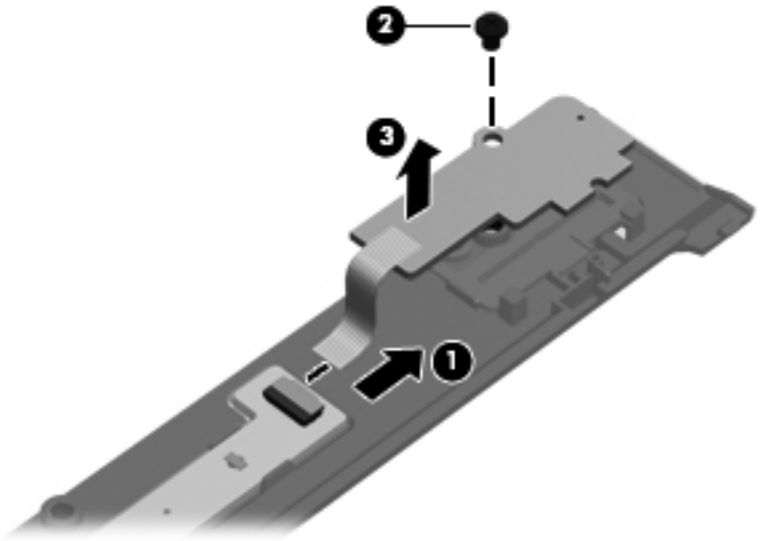
Description	Spare part number
Power button board	594025-001

Before removing the power button board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Remove the following components:
   d. Keyboard and switch cover (see "Keyboard and switch cover" on page 4-22)

Remove the power button board:

1. Turn the switch cover over, with the front toward you.
2. Release the ZIF connector to which the power button board cable ❶ connects to the LED board, and then disconnect the cable from the LED board.
3. Remove the Phillips PM2.0×3.0 ❷ screw from the power button board.
4. Remove the power button board and cable ❸.



Reverse this procedure to install the power button board.

Display assembly

The display assembly spare part kit includes 3 transmit/receive WLAN antennas, 2 transmit/receive WWAN antennas, the cables, and the nameplate.

Description	Spare part number
14.0-in LED display assembly for use with WLAN and WWAN (includes 3 transmit/receive WLAN antennas, 2 transmit/receive WWAN antennas, and the cables):	
■ 14.0-in HD Antiglare LED SVA (1366 x 768 resolution) for use with HP EliteBook 8440p	594087-001
■ 14.0-in HD Antiglare LED SVA (1366 x 768) with webcam for use with HP EliteBook 8440p	594088-001
■ 14.0-in HD+ Antiglare LED SVA (1600 x 900) for use with HP EliteBook 8440p	594089-001
■ 14.0-in HD+ Antiglare LED SVA (1600 x 900) with webcam for use with HP EliteBook 8440p	594090-001
■ 14.0-in HD AntiGlare LED SVA (1366 x 768) for use with HP EliteBook 8440w	598210-001
■ 14.0-in HD AntiGlare LED SVA (1366 x 768) with webcam for use with HP EliteBook 8440w	598211-001
■ 14.0-in HD+ AntiGlare LED SVA (1600 x 900) for use with HP EliteBook 8440w	598212-001
■ 14.0-in HD+ AntiGlare LED SVA (1600 x 900) with webcam for use with HP EliteBook 8440w	598213-001
Display assembly subcomponents	
■ Display cable	594037-001
■ Ambient light sensor/connector board	594029-001
■ Display hinge/bracket	594039-001
■ Display hinge covers for use with HP EliteBook 8440p	594038-001
■ Display hinge covers for use with HP EliteBook 8440w	594223-001
Display bezel	
■ Display bezel without webcam lens for HP EliteBook 8440p	594035-001
■ Display bezel with webcam lens for HP EliteBook 8440p	594036-001
■ Display bezel without webcam lens for HP EliteBook 8440w	594756-001
■ Display bezel with webcam lens for HP EliteBook 8440w	594757-001
Display back cover	
The display back cover includes the dual-array microphone, wireless antennas, and associated cables, and on models that use a webcam, the webcam and webcam cable.	
■ Display back cover with webcam for HP EliteBook 8440p	594031-001
■ Display back cover with webcam for HP EliteBook 8440w	594032-001
■ Display back cover without webcam for HP EliteBook 8440p	594033-001
■ Display back cover without webcam for HP EliteBook 8440w	594034-001
■ Display back cover without webcam for HP EliteBook 8440w	577188-001

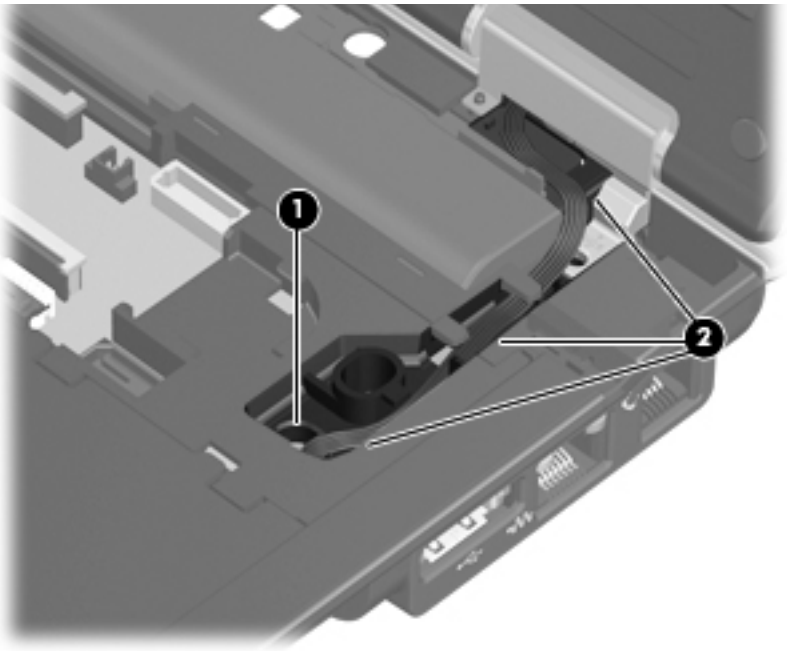
Before removing the display assembly, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Disconnect the wireless antenna cables from the WLAN module (see "WLAN module" on page 4-11) and WWAN module (see "WWAN module" on page 4-14).
6. Remove the keyboard and switch cover (see "Keyboard and switch cover" on page 4-22).

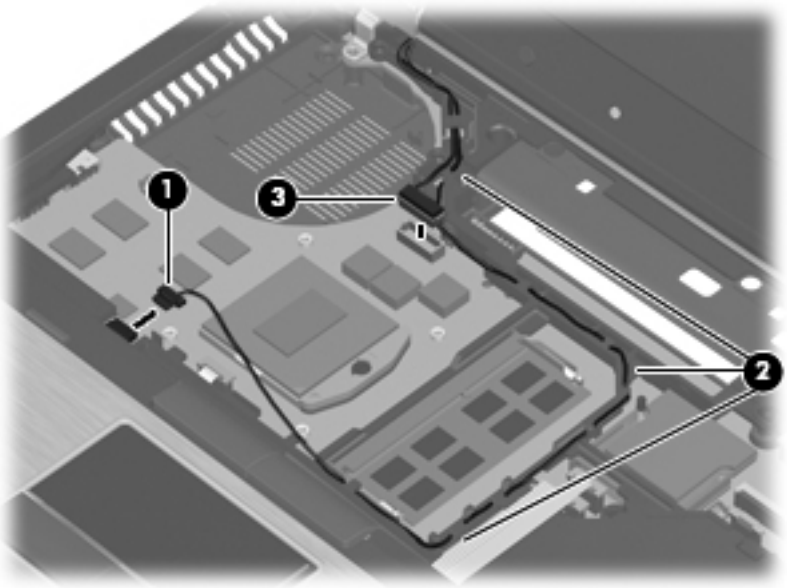
Remove the display assembly:

1. Turn the computer right side up, with the front toward you.
2. Open the computer.
3. Remove the wireless antenna cables ❶ from the opening, clips, and routing channel ❷ on the top cover.

✎ When installing the display assembly, be sure to route the wireless antenna cables through the cable channel. The wireless antenna cables have exposed shields that contact a grounding pad on the top cover. Failure to make proper contact can result in degraded performance.

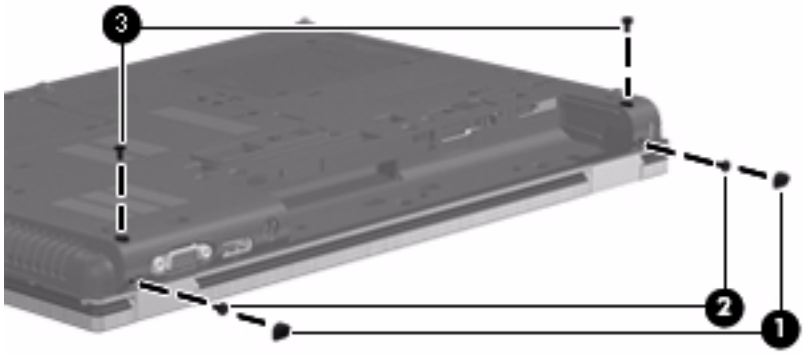


4. Disconnect to microphone cable ❶ from the system board.
5. Remove the microphone cable from the clips and channel ❷ built into the top cover.
6. Disconnect the display cable ❸ from the system board, and then remove the display cable.

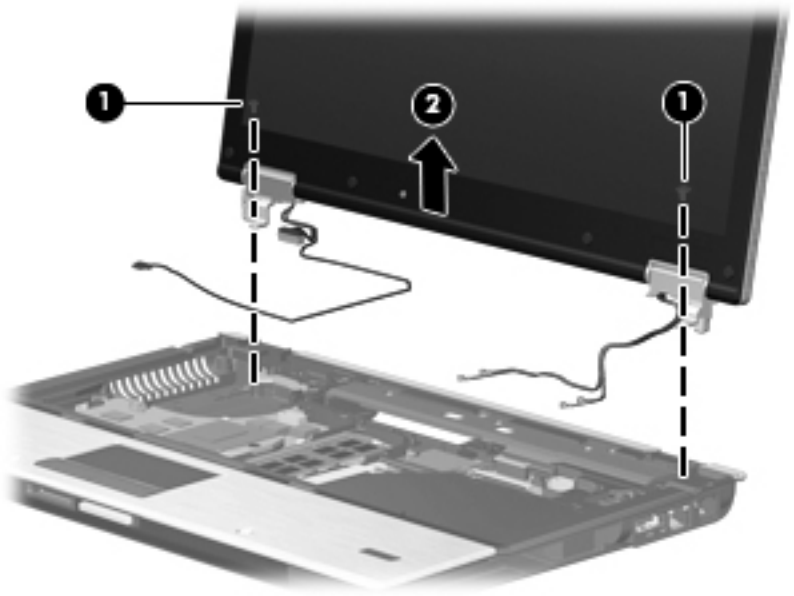


CAUTION: Support the display assembly when removing the following screws. Failure to support the display assembly can result in damage to the display assembly and other computer components.

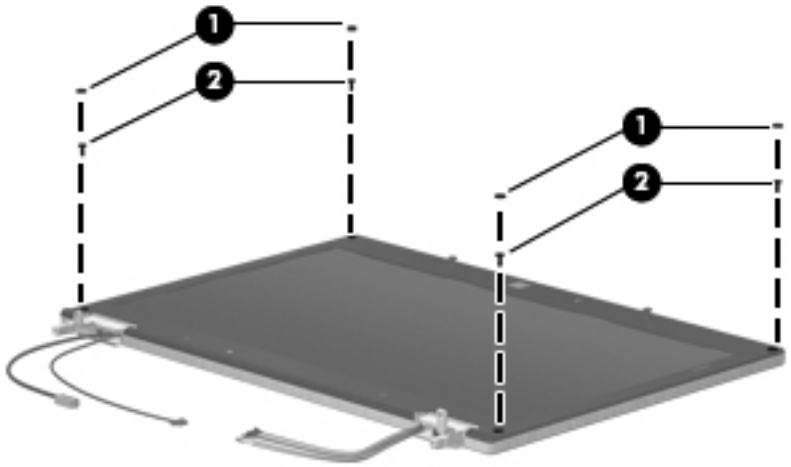
7. Remove the two rubber screw covers ❶ and two Torx T8M2.5×6.0 screws ❷ that secure the display assembly to the back of the computer.
8. Remove the two Torx T8M2.5×6.0 screws ❸ that secure the display assembly to the bottom of the computer.



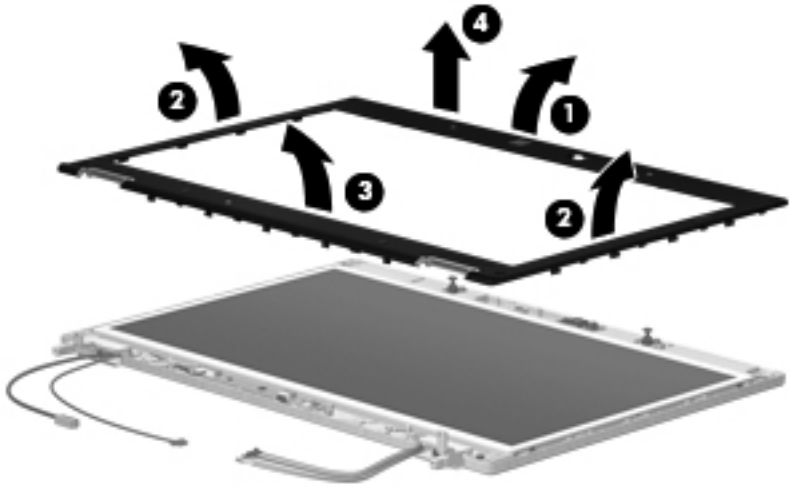
9. Turn the computer right-side up and open the display.
10. Remove the two Torx T8M2.5×6.0 screws ❶ that secure the display assembly hinges to the base enclosure.
11. Lift the display assembly ❷ straight up and remove it.



12. If it is necessary to replace the display bezel or any of the display assembly subcomponents, follow these steps:
    a. Remove the four rubber screw covers ❶ and the four Torx T8M2.5×6.0 screws ❷ that secure the display bezel to the display assembly.

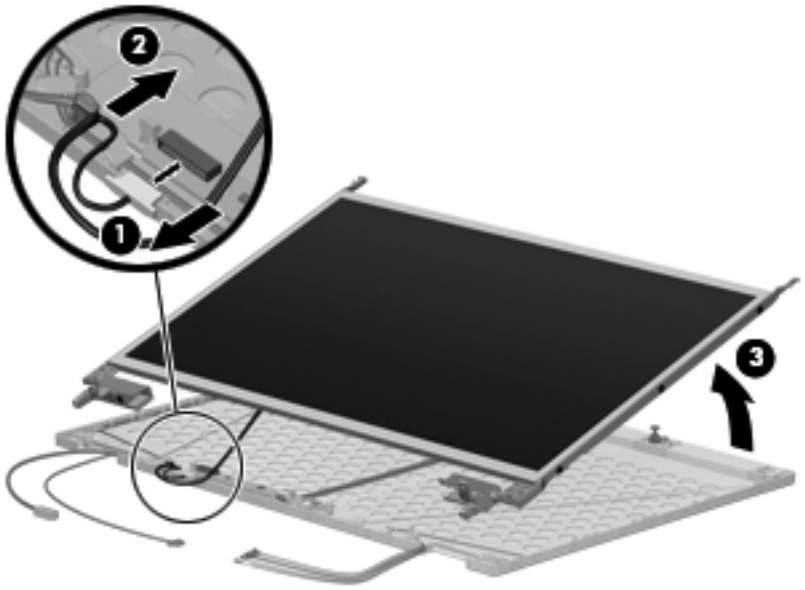


    b. Flex the top inside edge ❶, the left and right inside edges ❷, and the bottom inside edge ❸ of the display bezel until the bezel disengages from the display enclosure.
    c. Remove the display bezel ❹. The display bezel is available using the following spare part numbers:
        - 594036-001 - Display bezel for use on HP EliteBook 8440p equipped with a webcam
        - 594035-001 - Display bezel for use on HP EliteBook 8440p not equipped with webcam
        - 594757-001 - Display bezel for use on HP EliteBook 8440w equipped with a webcam
        - 594756-001 - Display bezel for use on HP EliteBook 8440w not equipped with webcam



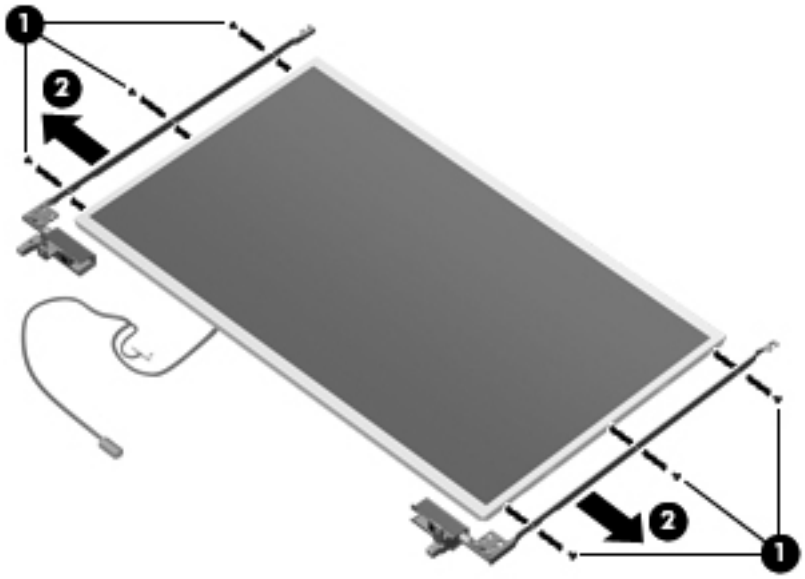
13. If it is necessary to replace the display hinges:
    a. Remove the four Phillips PM2.5×5.0 screws that secure the display panel to the display back cover.

    b. Remove the display panel cable ❶ from the ambient light sensor/connector board and clips ❷ in the display back cover.
    c. Remove the display panel ❸.



d. Remove 6 Phillips PM2.5×3.0 screws ❶ that secure the display hinges to the display panel. The display hinge set is available as spare part number 594039-001.

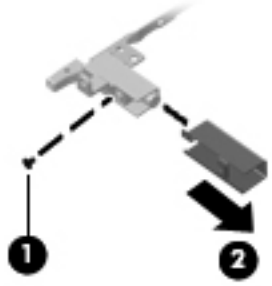
e. Remove the display hinges ❷.

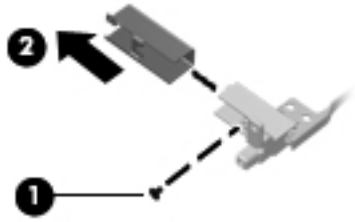


14. If it is necessary to replace the display hinge covers:

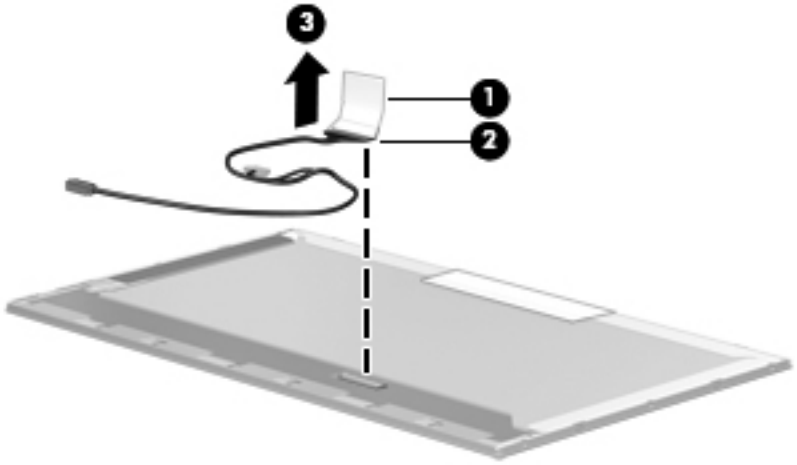
a. Loosen the PM2.5×3.0 screws ❶ that hold the display hinge covers in place.

b. Slide the display hinge covers off ❷ the display hinges.



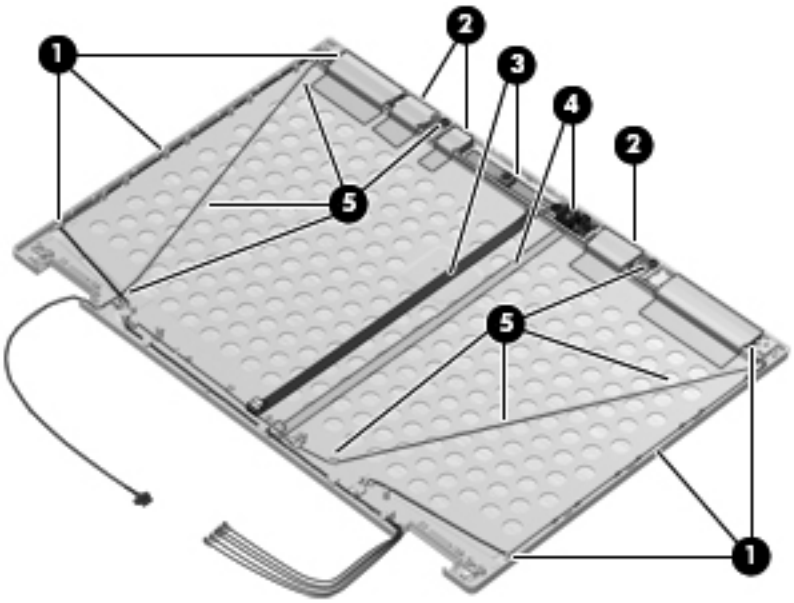


15. If it is necessary to replace the display cable:
    a. Turn the display panel upside down, with the top edge toward you.
    b. Fold back the adhesive strip ❶ that covers the display cable connector.
    c. Release the support bar ❷ that secures the display cable to the display panel.
    d. Disconnect the display cable ❸ from display panel connector. The display cable is available using spare part number 594037-001.



16. If necessary to replace the webcam module and cables, the dual-array microphone and microphone cable, or the wireless antennas and cables, replace the display back cover using the following part numbers:
    - ❏ 594031-001 - Display back cover for use on EliteBook 8440p equipped with a webcam
    - ❏ 594032-001 - Display back cover for use on EliteBook 8440w equipped with a webcam
    - ❏ 594033-001 - Display back cover for use on EliteBook 8440p not equipped with a webcam
    - ❏ 594034-001 - Display back cover for use on EliteBook 8440w not equipped with a webcam

    ✎ The back cover spares that come with or without the webcam include the WLAN and WWAN antenna cables ❶, WLAN and WWAN antenna ❷, webcam cable ❸ (with webcam), keyboard light and cable ❹, and the dual-array microphone and cable ❺.



Reverse this procedure to install the display assembly.

Fan and heat sink

The fan and heat sink spare part kits include replacement thermal material.

Description	Spare part number
Fan	594049-001
Heat sink for use on computer models equipped with a graphics subsystem using discrete memory	594050-001
Heat sink for use on computer models equipped with a graphics subsystem using UMA memory	594051-001

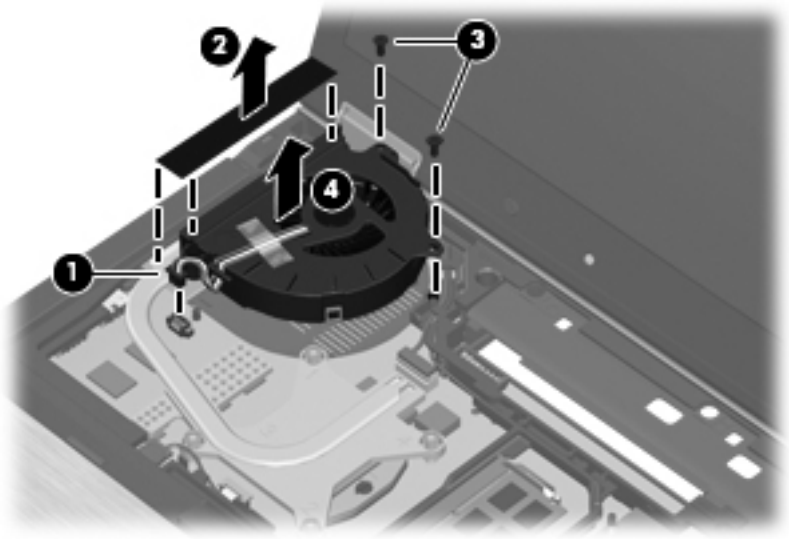
To properly ventilate the computer, allow at least **7.6 cm** (3 in) of clearance on the left side of the computer. The computer uses an electric fan for ventilation. The fan is controlled by a temperature sensor and is designed to turn on when high temperature conditions exist. These conditions are affected by high external temperatures, system power consumption, power management/battery conservation configurations, battery fast charging, and software requirements. Exhaust air is displaced through the ventilation grill located on the left side of the computer.

Before removing the fan and heat sink, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Remove the keyboard and switch cover (see "Keyboard and switch cover" on page 4-22).

Remove the fan:

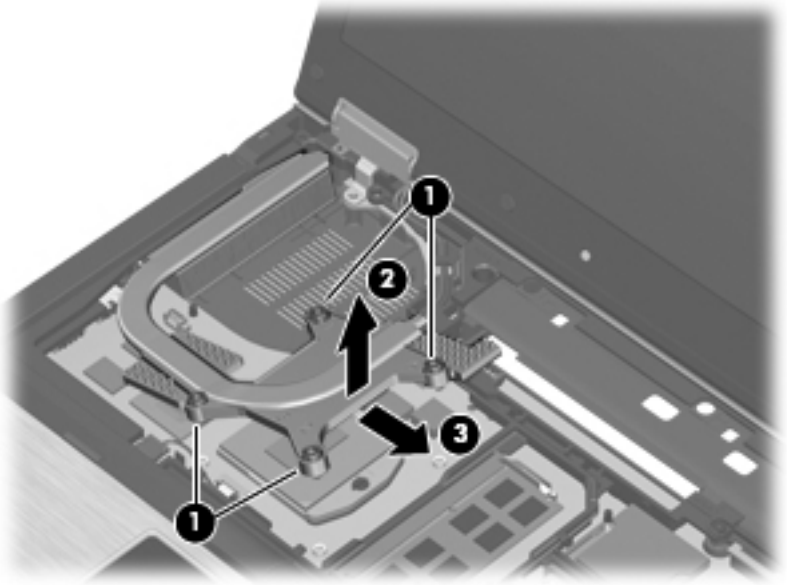
1. Disconnect the fan cable ❶ from the system board.
2. Remove the Mylar strip ❷ taped between the fan and the heat sink.
3. Remove the two Torx T8M2.5×6.0 screws ❸ that secure the fan to the system board.
4. Lift straight up to remove the fan assembly ❹.

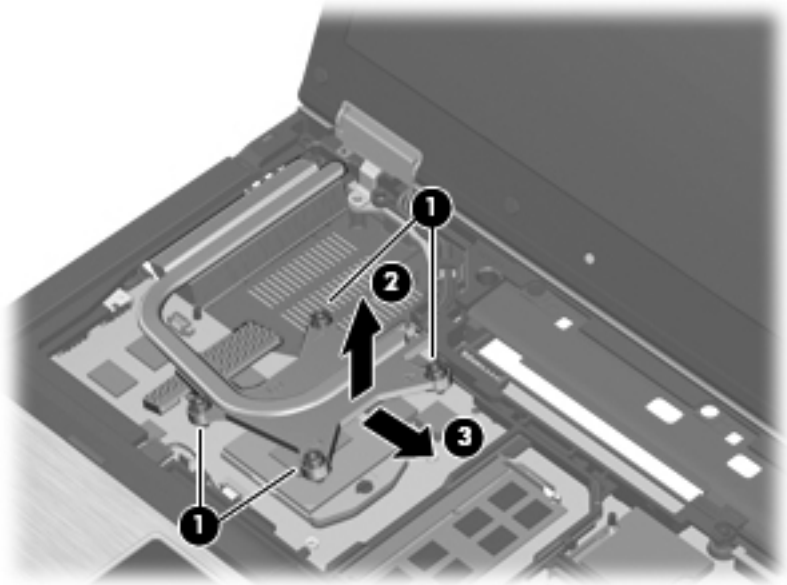


Remove the heat sink:

1. Following the 1, 2, 3, 4 sequence stamped into the heat sink, loosen the 4 Phillips PM2.5×10.0 spring-loaded captive screws ❶ that secure the heat sink to the system board.
2. Pull the heat sink up ❷ and away ❸ from the ventilation grill. If necessary, move the heat sink side-to-side to release the heat sink from the thermal material.

✎ The first illustration below shows the heat sink on computer models that use the discrete graphics subsystem. The second illustration shows the heat sink on computer models that use the UMA graphics subsystem.





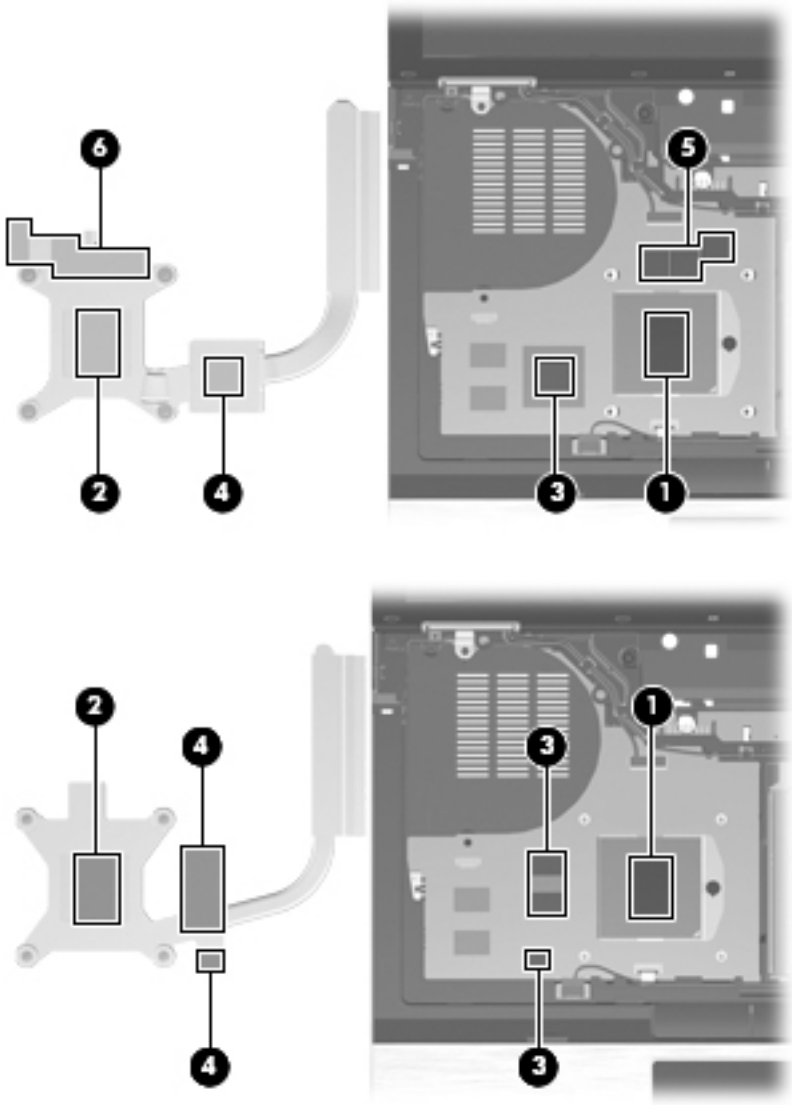
3. Remove the heat sink assembly.

Replace the thermal material:

The thermal material must be cleaned from the surfaces of the heat sink and the system board each time the heat sink is removed. Replacement thermal material is included with fan, heat sink, and heat shield spare parts.

- Thermal paste is used between the processor ❶ and the heat sink section ❷ that services it.
- Thermal pads are used between the system board capacitors ❸ and the heat sink section ❹ that services it.
- Thermal pads are used on the graphics subsystem memory module ❺ and the heat sink section ❻ that services it.

✎ The first illustration shows thermal material locations on computer models that use the discrete graphics subsystem. The second illustration shows the thermal material locations on computer models that use the UMA graphics subsystem.



Reverse this procedure to install the fan and heat sink.

RTC battery

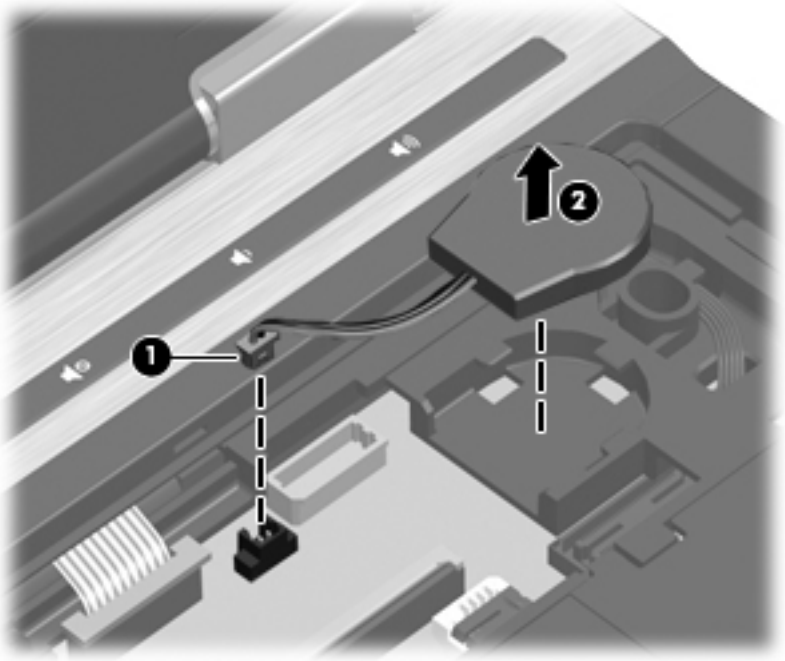
Description	Spare part number
RTC battery	581075-001

Before removing the RTC battery, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Remove the keyboard and switch cover (see "Keyboard and switch cover" on page 4-22).

Remove the RTC battery:

1. Disconnect the RTC battery cable ❶ from the system board.
2. Detach the RTC battery ❷ from the top cover. The RTC battery is attached to the top cover with double-sided tape.



Reverse this procedure to install the RTC battery.

Processor

The processor spare part kit includes replacement thermal material.

Description	Spare part number
Intel® Core™ i5 dual-core processors (3-MB L3 cache, 4 threads, 35W):	
■ i5-520M, 2.4-GHz processor (Turbo up to 2.93 GHz)	594187-001
■ i5-540M, 2.53-GHz processor (Turbo up to 3.06 GHz)	594188-001
Intel® Core™ i7 quad-core, processor (6-MB L3 cache, 8 threads, 45W):	
■ i7-620M, 2.66-GHz processor (Turbo up to 3.33GHz)	587259-001
Intel® Core™ i7 quad-core, processors:	
■ i7-720QM, 1.6-GHz processor (Turbo up to 2.8 GHz, 6-MB L3 cache, 8 threads, 45W)	586170-001
■ i7-820QM, 1.73-GHz processor (Turbo up to 3.06 GHz, 8-MB L3 cache, 8 threads, 45W)	583053-001

Before removing the processor, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Remove the following components:
   a. Keyboard and switch cover (see "Keyboard and switch cover" on page 4-22)
   b. Fan and heat sink (see "Fan and heat sink" on page 4-35)

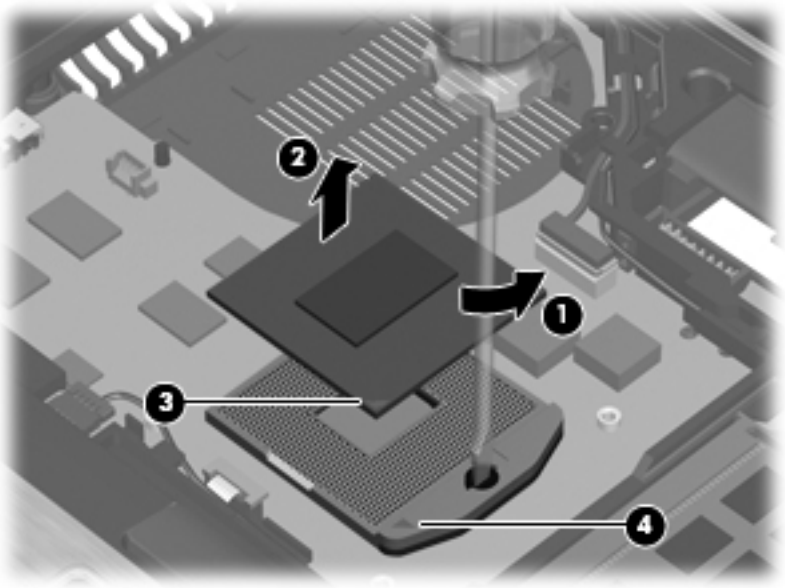
Remove the processor:

1. Use a flat-bladed screwdriver to turn the processor locking screw ❶ one-half turn counterclockwise, until you hear a click.

   ✎ Unlocking and locking directions are embossed on the processor socket.

2. Lift the processor ❷ straight up and remove it.

   ✎ When you install the processor, align the gold triangle ❸ etched on top of the processor with the triangle embossed on the processor socket ❹.



Clean and replace any thermal material, and then reverse this procedure to install the processor.

Top cover

The top cover spare part kit includes TouchPad assembly, cable, and bracket; the ESD boards; the smart card reader; and on some models, a fingerprint reader and bracket.

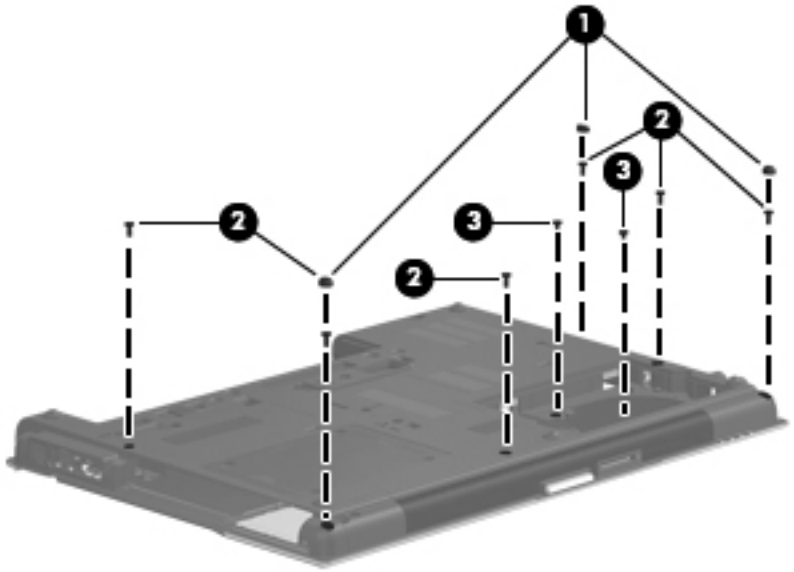
Description	Spare part number
Top cover with integrated smart card reader and fingerprint reader for use on HP EliteBook 8440p	594098-001
Top cover with integrated smart card reader and fingerprint reader for use on HP EliteBook 8440w	594099-001
Top cover with integrated smart card reader without fingerprint reader for use on HP EliteBook 8440w (Plastics Kit includes fingerprint reader plug)	594100-001

Before removing the top cover, follow these steps:

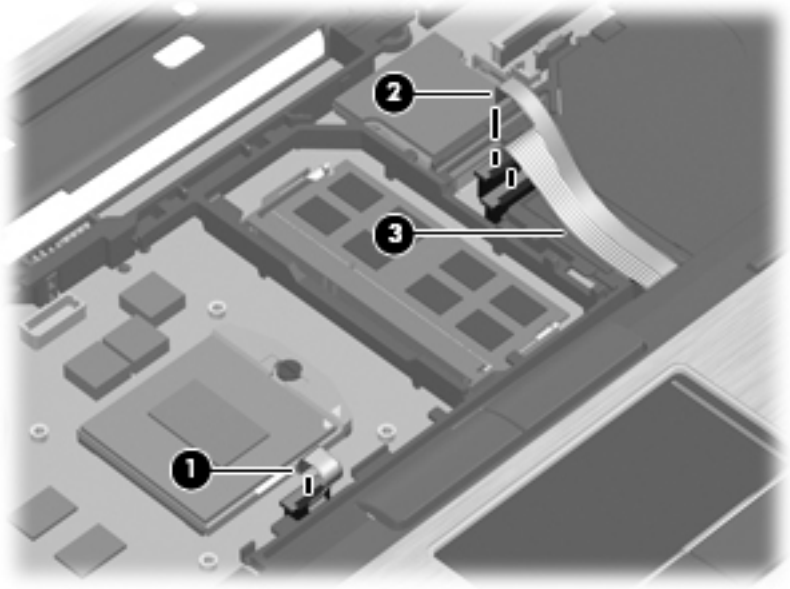
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Remove the following components:
   a. Hard drive (see "Hard drive" on page 4-9)
   b. Wireless modules antenna cables (see "WLAN module" on page 4-11 and "WWAN module" on page 4-14)
   c. Optical drive (see "Optical drive" on page 4-20)
   d. Keyboard and switch cover (see "Keyboard and switch cover" on page 4-22)
   e. Display assembly (see "Display assembly" on page 4-27)
   f. RTC battery (see "RTC battery" on page 4-39)

Remove the top cover:

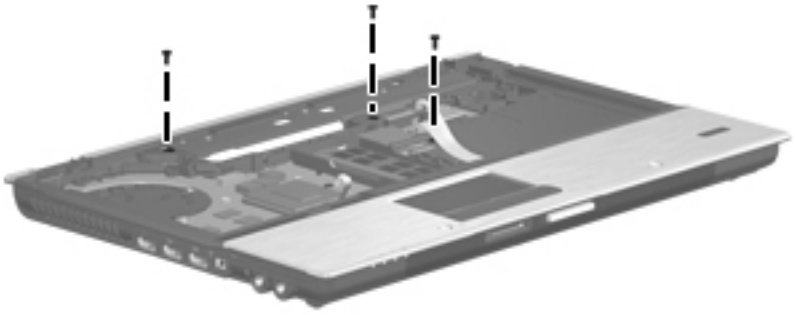
1. Turn the computer upside down, with the front toward you.
2. Remove the 3 rubber screw covers ❶, the 6 Torx T8M2.5×6.0 screws ❷, and the 2 Phillips PM2.5×3.0 screws ❸ in the hard drive bay that secure the top cover to the base enclosure.



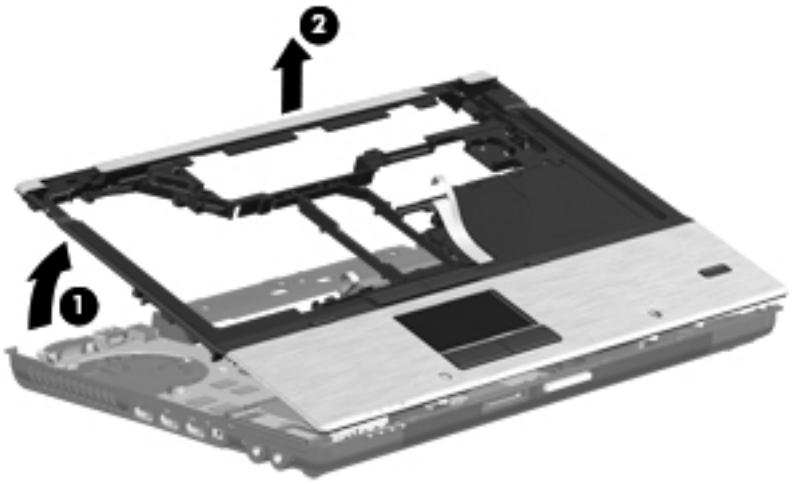
3. Turn the computer right-side up, with the front toward you.
4. Disconnect the touch pad cable ❶, the fingerprint reader cable ❷, and the ExpressCard reader cable ❸ from the system board.



5. Remove the three Torx T8M2.5×6.0 screws that secure the top cover to the base enclosure.



6. Lift the rear edge ❶ of the top cover until it detaches from the base enclosure.
7. Remove the top cover ❷ by lifting it straight up.



Reverse this procedure to install the top cover.

Audio/ExpressCard board

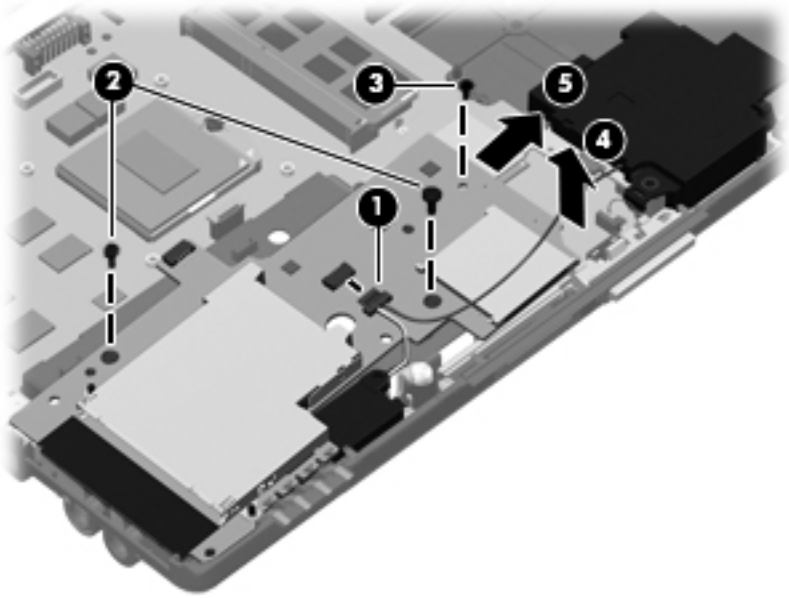
Description	Spare part number
Audio/ExpressCard board	594024-001

Before removing the Audio/ExpressCard board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Remove the following components:
   a. Hard drive (see "Hard drive" on page 4-9)
   b. Wireless modules antenna cables (see "WLAN module" on page 4-11 and "WWAN module" on page 4-14)
   c. Optical drive (see "Optical drive" on page 4-20)
   d. Keyboard and switch cover (see "Keyboard and switch cover" on page 4-22)
   e. Display assembly (see "Display assembly" on page 4-27)
   f. RTC battery (see "RTC battery" on page 4-39)
   g. Top cover (see "Top cover" on page 4-42)

Remove the Audio/ExpressCard board:

1. Release the speaker cable from the connector ❶ on the Audio/ExpressCard board.
2. Remove the two Phillips PM2.0×4.0×7.0 broadhead screws ❷ and the Phillips PM2.0×4.0 ❸ screw from the Audio/ExpressCard board.
3. Lift the right edge of the Audio/ExpressCard board ❹ up.
4. Slide the Audio/ExpressCard board ❺ to the right to clear the audio connectors from the base enclosure.



5. Remove the Audio/ExpressCard board.

Reverse this procedure to install the Audio/ExpressCard board.

Speakers

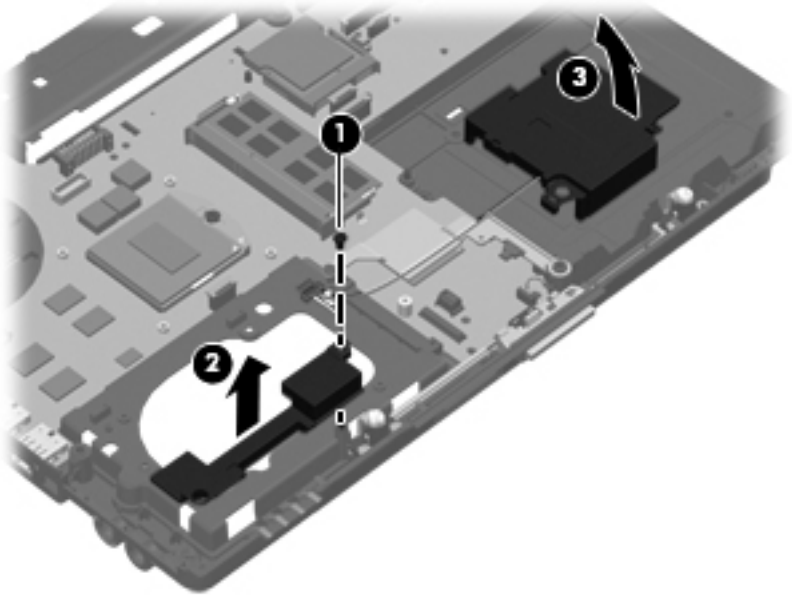
Description	Spare part number
Speakers (include cables)	594094-001

Before removing the speakers, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Remove the following components:
   a. Hard drive (see "Hard drive" on page 4-9)
   b. Wireless modules antenna cables (see "WLAN module" on page 4-11 and "WWAN module" on page 4-14)
   c. Optical drive (see "Optical drive" on page 4-20)
   d. Keyboard and switch cover (see "Keyboard and switch cover" on page 4-22)
   e. Display assembly (see "Display assembly" on page 4-27)
   f. RTC battery (see "RTC battery" on page 4-39)
   g. Top cover (see "Top cover" on page 4-42)
   h. Audio/ExpressCard (see "Audio/ExpressCard board" on page 4-44)

Remove the speakers:

1. Remove the Phillips PM2.5×4.0 screw ❶ that secures the left speaker to the base enclosure.
2. Lift the left speaker straight up ❷ to remove the left speaker.
3. Lift the right speaker up and to the left ❸ to remove the right speaker.



Reverse this procedure to install the speakers.

Bluetooth module and cable

The Bluetooth module spare part does not include the Bluetooth module cable. The Bluetooth module cable is included in the Cable Kit, spare part number 594030-001.

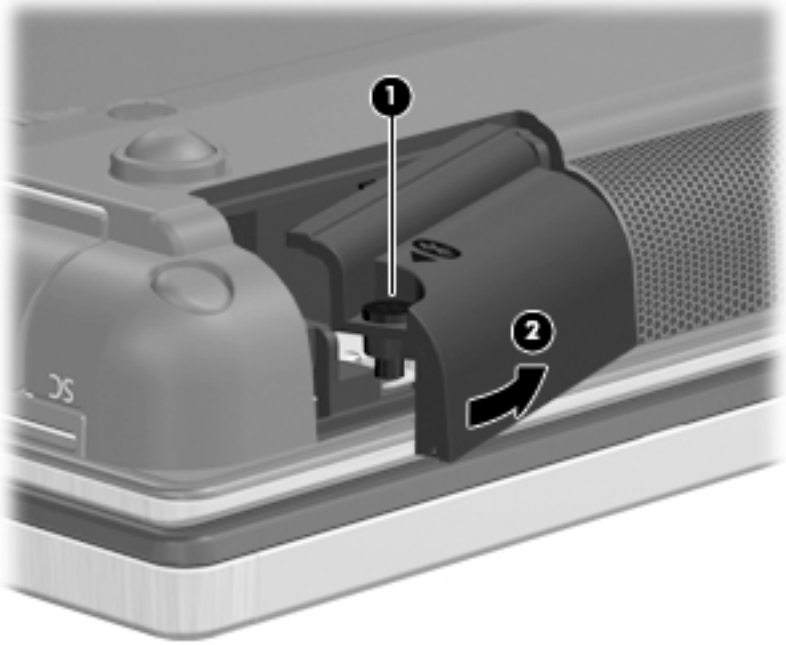
Description	Spare part number
Bluetooth module	594030-001

Before removing the Bluetooth module, follow these steps:

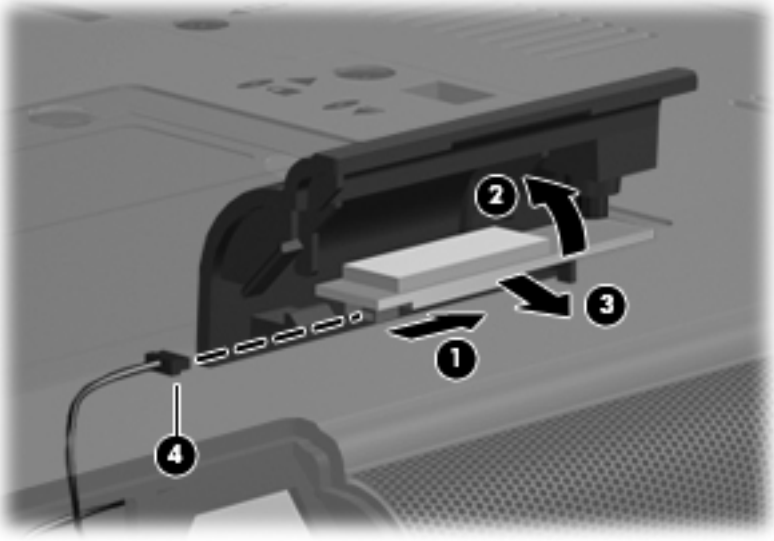
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Remove the following components:
   a. Hard drive (see "Hard drive" on page 4-9)
   b. Wireless modules antenna cables (see "WLAN module" on page 4-11 and "WWAN module" on page 4-14)
   c. Optical drive (see "Optical drive" on page 4-20)
   d. Keyboard and switch cover (see "Keyboard and switch cover" on page 4-22)
   e. Display assembly (see "Display assembly" on page 4-27)
   f. RTC battery (see "RTC battery" on page 4-39)
   g. Top cover (see "Top cover" on page 4-42)
   h. Audio/ExpressCard (see "Audio/ExpressCard board" on page 4-44)
   i. Speakers (see "Speakers" on page 4-45)

Remove the Bluetooth module and cable:

1. Loosen the Phillips PM2.0×4.0 captive screw ❶.
2. Swing the Bluetooth compartment cover open ❷ to the right.



3. Shift the Bluetooth module right ❶ and lift it up ❷ until it clears the clips built into the Bluetooth module compartment cover.
4. Remove the Bluetooth module ❸ from the Bluetooth module compartment cover.
5. Disconnect the Bluetooth module cable ❹ from the Bluetooth module.

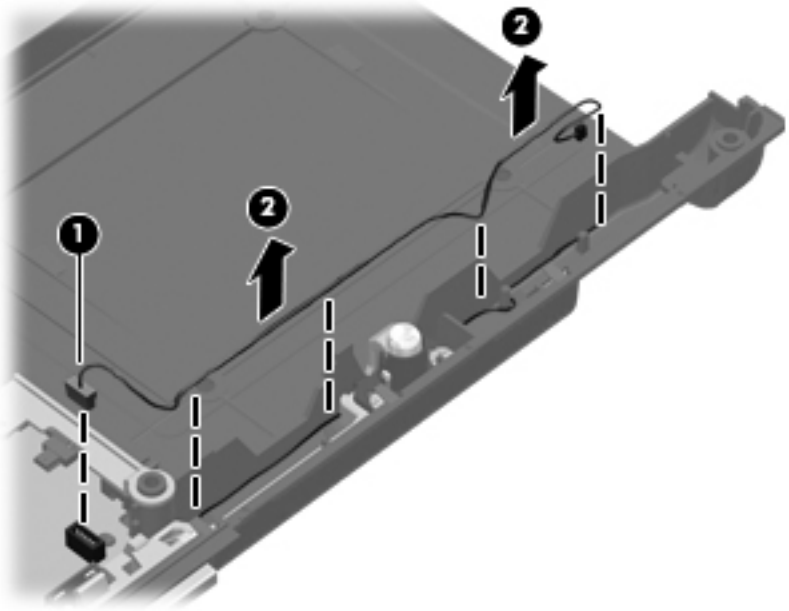


6. Remove the Bluetooth module.

7. If it is necessary to replace the Bluetooth module cable:

   ✎ The Bluetooth module cable is included in the Cable Kit, spare part number 594030-001.

   a. Disconnect the Bluetooth module cable ❶ from the system board.
   b. Remove the Bluetooth module cable ❷ from the cable routing channel in the base enclosure.



Reverse this procedure to install the Bluetooth module and cable.

Modem module

The modem module cable is included in the Cable kit, spare part number 594030-001.

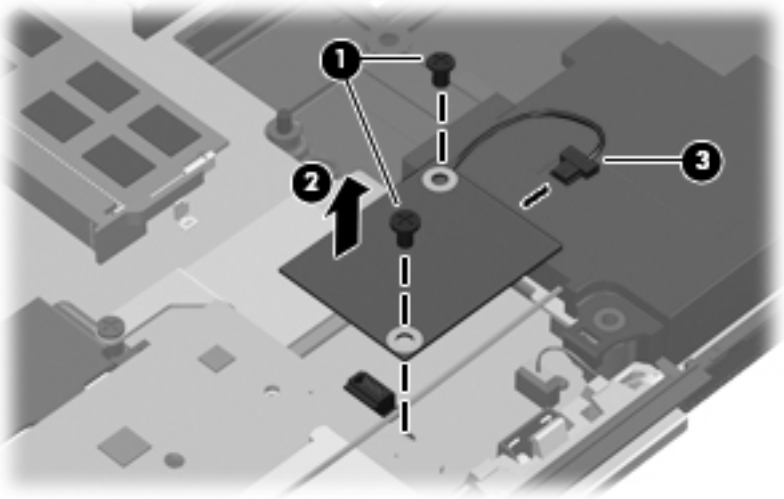
Description	Spare part number
High-speed 56k modem for use in all countries and regions except Australia and New Zealand	510099-001
High-speed 56k modem for use only in Australia and New Zealand	510099-011

Before removing the modem module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Remove the following components:
   a. Hard drive (see "Hard drive" on page 4-9)
   b. Wireless modules antenna cables (see "WLAN module" on page 4-11 and "WWAN module" on page 4-14)
   c. Optical drive (see "Optical drive" on page 4-20)
   d. Keyboard and switch cover (see "Keyboard and switch cover" on page 4-22)
   e. Display assembly (see "Display assembly" on page 4-27)
   f. RTC battery (see "RTC battery" on page 4-39)
   g. Top cover (see "Top cover" on page 4-42)
   h. Audio/ExpressCard (see "Audio/ExpressCard board" on page 4-44)
   i. Speakers (see "Speakers" on page 4-45)

Remove the modem module:

1. Remove the 2 Phillips PM2.0×4.0 screws ❶ that secure the modem module to the system board.
2. Lift the modem module ❷ away from the system board.
3. Disconnect the modem module cable ❸ to remove the modem module.



Reverse this procedure to install the modem module.

System board

The system board spare part kit includes replacement thermal material.

Description	Spare part number
System board for use with HP EliteBook 8440p discrete graphics subsystem	594026-001
System board for use with HP EliteBook 8440w discrete graphics subsystem	594027-001
System board for use with HP EliteBook 8440p UMA graphics subsystem	594028-001

Before removing the system board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Remove the following components:
   a. Hard drive (see "Hard drive" on page 4-9)
   b. Wireless modules antenna cables (see "WLAN module" on page 4-11 and "WWAN module" on page 4-14)
   c. Optical drive (see "Optical drive" on page 4-20)
   d. Keyboard and switch cover (see "Keyboard and switch cover" on page 4-22)
   e. Display assembly (see "Display assembly" on page 4-27)
   f. RTC battery (see "RTC battery" on page 4-39)
   g. Top cover (see "Top cover" on page 4-42)
   h. Audio/ExpressCard (see "Audio/ExpressCard board" on page 4-44)
   i. Speakers (see "Speakers" on page 4-45)
   j. Modem (see "Modem module" on page 4-49)

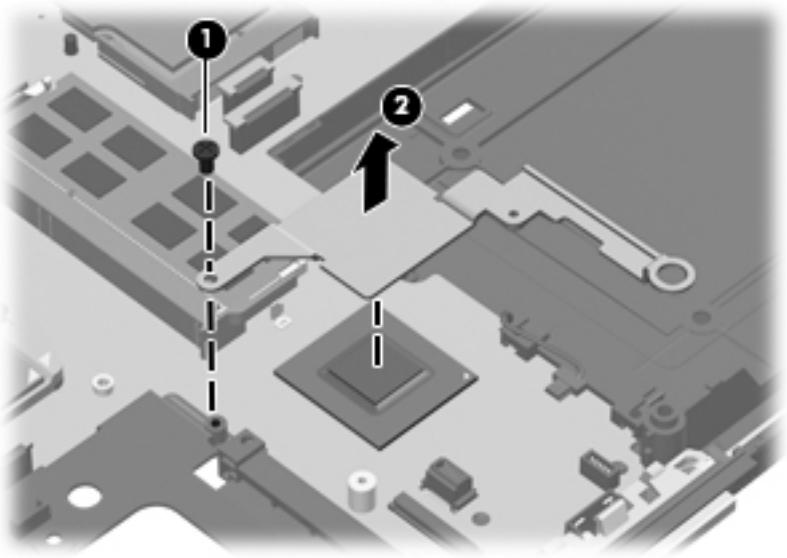
When replacing the system board, be sure that the following additional components are removed from the defective system board and installed on the replacement system board:

- SIM (see "SIM" on page 4-8)
- WLAN module (see "WLAN module" on page 4-11)
- Memory modules (see "Memory module" on page 4-16)
- WWAN module (see "WWAN module" on page 4-14)
- Modem module (see "Modem module" on page 4-49)
- Fan and heat sink (see "Fan and heat sink" on page 4-35)
- RTC battery (see "RTC battery" on page 4-39)
- Processor (see "Processor" on page 4-40)

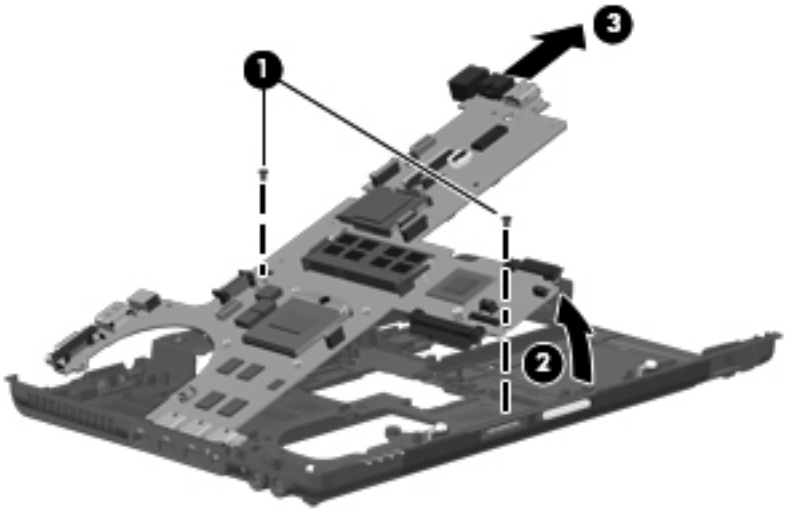
Remove the system board:

1. Remove the Phillips PM2.0×4.0 screw ❶ that secures the thermal heat shield to the base enclosure and compresses the thermal material to the platform controller hub (PCH) chip on the system board.
2. Lift the thermal shield straight up ❷ to remove it.

✎ The thermal shield and system board spare parts include replacement thermal material. Clean and install new thermal material when replacing the thermal shield.



3. Remove the 2 Phillips PM2.5×4.0 screws ❶ that secure the system board to the base enclosure.
4. Use the optical drive connector ❷ to lift the system board away from the base enclosure.
5. Remove the system board ❸ by lifting it to the right at an angle until the connectors clear the base enclosure.



Reverse this procedure to install the system board.

Modem module cable

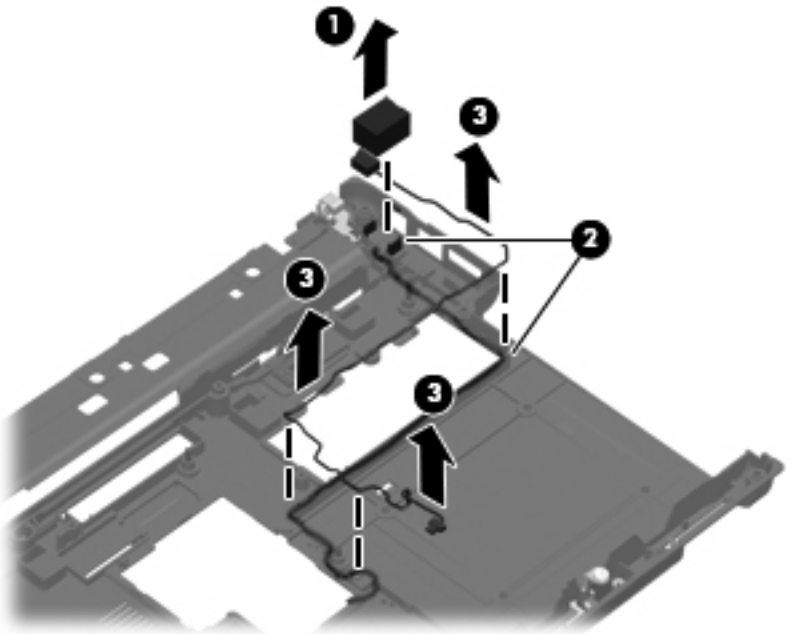
The modem module cable is included in the Cable kit, spare part number 594030-001.

Before removing the modem module cable, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Remove the following components:
   a. Hard drive (see "Hard drive" on page 4-9)
   b. Wireless modules antenna cables (see "WLAN module" on page 4-11 and "WWAN module" on page 4-14)
   c. Optical drive (see "Optical drive" on page 4-20)
   d. Keyboard and switch cover (see "Keyboard and switch cover" on page 4-22)
   e. Display assembly (see "Display assembly" on page 4-27)
   f. RTC battery (see "RTC battery" on page 4-39)
   g. Top cover (see "Top cover" on page 4-42)
   h. Audio/ExpressCard (see "Audio/ExpressCard board" on page 4-44)
   i. Speakers (see "Speakers" on page 4-45)
   j. Modem module ("Modem module" on page 4-49)
   k. System board ("System board" on page 4-50)

Remove the modem module cable:

1. Release the RJ-11 connector ❶ from the clip built into the base enclosure.
2. Remove the modem module cable ❷ from the clips and the cable channel ❸ built into the base enclosure.



Reverse this procedure to install the modem module cable.

5

Computer Setup

Computer Setup in Windows 7

Starting Computer Setup

Computer Setup is a preinstalled, ROM-based utility that can be used even when the operating system is not working or will not load.

Some of the Computer Setup menu items listed in this guide may not be supported by your computer.

An external keyboard or mouse connected to a USB port can be used with Computer Setup only if USB legacy support is enabled.

To start Computer Setup, follow these steps:

1. Turn on or restart the computer, and then press **esc** while the "Press the ESC key for Startup Menu" message is displayed at the bottom of the screen.
2. Press **f10** to enter BIOS Setup.

Using Computer Setup

Navigating and selecting in Computer Setup

The information and settings in Computer Setup are accessed from the File, Security, Diagnostics, and System Configuration menus.

To navigate and select in Computer Setup, follow these steps:

1. Turn on or restart the computer, and then press **esc** while the "Press the ESC key for Startup Menu" message is displayed at the bottom of the screen.
   - ❏ To select a menu or a menu item, use the **tab** key and the keyboard arrow keys and then press **enter**, or use a pointing device to click the item.
   - ❏ To scroll up and down, click the up arrow or the down arrow in the upper-right corner of the screen, or use the up arrow key or the down arrow key.
   - ❏ To close open dialog boxes and return to the main Computer Setup screen, press **esc**, and then follow the on-screen instructions.

   You can use either a pointing device (TouchPad, pointing stick, or USB mouse) or the keyboard to navigate and make selections in Computer Setup.

2. Press **f10** to enter BIOS Setup.
3. Select the **File**, **Security**, **Diagnostics**, or **System Configuration** menu.

To exit Computer Setup menus, choose one of the following methods:

- To exit Computer Setup menus without saving your changes, click the **Exit** icon in the lower-left corner of the screen, and then follow the on-screen instructions.

  – or –

  Use the **tab** key and the arrow keys to select **File > Ignore Changes and Exit**, and then press **enter**.

  – or –

- To save your changes and exit Computer Setup menus, click the **Save** icon in the lower-left corner of the screen, and then follow the on-screen instructions.

  – or –

  Use the **tab** key and the arrow keys to select **File > Save Changes and Exit**, and then press **enter**.

Your changes go into effect when the computer restarts.

Restoring factory settings in Computer Setup

Restoring defaults will not change the hard drive mode.

To return all settings in Computer Setup to the values configured at the factory, follow these steps:

1. Turn on or restart the computer, and then press **esc** while the "Press the ESC key for Startup Menu" message is displayed at the bottom of the screen.
2. Press **f10** to enter BIOS Setup.
3. Use a pointing device or the arrow keys to select **File > Restore Defaults**.
4. Follow the on-screen instructions.
5. To save your changes and exit, click the **Save** icon in the lower-left corner of the screen, and then follow the on-screen instructions.

   – or –

   Use the arrow keys to select **File > Save Changes and Exit**, and then press **enter**.

Your changes go into effect when the computer restarts.

Your password settings and security settings are not changed when you restore the factory settings.

Computer Setup menus

The menu tables in this section provide an overview of Computer Setup options.

Some of the Computer Setup menu items listed in this chapter may not be supported by your computer.

File menu

Select	To do this
System Information	■ View identification information for the computer and the batteries in the system. ■ View specification information for the processor, cache and memory size, system ROM, video revision, and keyboard controller version.
Set System Date and Time	Set or change the date and time on the computer.
System Diagnostics	Displays the following information: ■ System Information ❒ Identification information for the computer and the batteries in the system. ❒ Specification information for the processor, cache and memory size, system ROM, video revision, and keyboard controller version. ■ Start-up Test—Verifies the system components needed for starting the computer. ■ Run-In Test—Runs a comprehensive check on system memory. ■ Hard Disk Test—Runs a comprehensive self-test on any hard drive in the system. ■ Memory Test—Runs a comprehensive test on any memory installed in the computer. ■ Battery Test—Runs a comprehensive test on any batteries installed in the computer. ■ Error Log—Displays a log file if any errors have occurred.
Restore Defaults	Replace the configuration settings in Computer Setup with the original factory settings. (Hard drive mode, password settings, and security settings are not changed when you restore the factory settings.
Reset BIOS security to factory default	Restore the BIOS security settings to the factory default.
Ignore Changes and Exit	Cancel any changes entered during the current session. Then exit and restart the computer.
Save Changes and Exit	Save any changes entered during the current session. Then exit and restart the computer. Your changes go into effect when the computer restarts.

Security menu

Some of the menu items listed in this section may not be supported by your computer.

Select	To do this
Administrator Tools	
Setup BIOS Administrator Password	Set up a BIOS administrator password.
User Management (requires a BIOS administrator password)	
Create New BIOS User Account	■ Select from a list of BIOS users. ■ Select from a list of ProtectTools users.

(Continued)

Select	To do this
Security menu *(continued)*	
Password Policy (requires a BIOS administrator password)	Revise password policy criteria.
HP SpareKey	Enable/disable HP SpareKey (enabled by default).
Always Prompt for HP SpareKey Enrollment	Enable/disable HP SpareKey enrollment (enabled by default).
Fingerprint Reset on Reboot (If Present)	Reset/clear the fingerprint reader ownership (select models only; disabled by default).
User Tools	
Change Password	Enter, change, or delete a BIOS administrator password.
HP SpareKey Enrollment	Enroll or reset HP SpareKey, which is a set of security questions and answers used if you forget your password.
Anti Theft	
AT-P	Enable/disable Anti-Theft Protection.
DriveLock Passwords	■ Enable/disable DriveLock on any computer hard drive (enabled by default). ■ Change a DriveLock user password or master password. ✎ DriveLock settings are accessible only when you enter Computer Setup by turning on (not restarting) the computer.
Automatic DriveLock	Enable/disable Automatic DriveLock support.
TPM Embedded Security	Enable/disable support for Trusted Platform Module (TPM) Embedded Security, which protects the computer from unauthorized access to owner functions available in Embedded Security for ProtectTools. For more information, refer to the ProtectTools software Help. ✎ You must have a setup password to change this setting.
Disk Sanitizer	Run Disk Sanitizer to destroy all existing data on the primary hard drive or the drive in the upgrade bay. △ If you run Disk Sanitizer, the data on the selected drive is destroyed permanently.
System IDs	Enter a user-defined computer asset tracking number and ownership tag.

System Configuration menu

Some of the listed System Configuration options may not be supported by your computer.

Select	To do this
Language	Change the Computer Setup language.
Boot Options	■ Set a Startup Menu delay (in seconds). ■ Set the MultiBook Express Boot Popup delay in seconds. ■ Enable/disable Custom Logo (disabled by default). ■ Enable/disable Display Diagnostic URL (enabled by default). ■ Enable/disable CD-ROM boot (enabled by default). ■ Enable/disable SD Card boot (enabled by default). ■ Enable/disable floppy boot (enabled by default). ■ Enable/disable PXE Internal NIC boot (enabled by default). ■ Enable/Disable Unified Extensible Firmware Interface (UEFI) Boot Mode (disabled by default). ■ Set the Legacy Boot Order.
Device Configurations	■ Enable/disable USB legacy support (enabled by default). When enabled, USB legacy support allows the following: ❒ Use of a USB keyboard in Computer Setup even when a Windows® operating system is not running ❒ Startup from bootable USB devices, including a hard drive, diskette drive, or optical drive connected by a USB port to the computer ■ Select a parallel port mode: ECP (Enhanced Capabilities Port), standard, bidirectional, or EPP (Enhanced Parallel Port). ■ Enable/disable fan always on while connected to an AC outlet (enabled by default). ■ Enable/disable Data Execution Prevention (select models only). When enabled, the processor can disable some virus code execution, which helps to improve computer security (disabled by default). ■ Set the SATA (Serial Advanced Technology Attachment) device mode. The following options are available: ❒ AHCI (Advanced Host Controller Interface) ❒ IDE (Integrated Drive Electronics) ❒ RAID (select models only) Availability of these options varies by computer model. ■ Enable/disable secondary battery fast charge (enabled by default). ■ Enable/disable HP QuickLook (enabled by default). ■ Enable/disable Preboot Authentication on HP QuickLook Boot (enabled by default). ■ Enable/disable HP QuickWeb (enabled by default). ■ Enable/disable HP QuickWeb Write Protect (disabled by default). ■ Enable/disable Virtualization Technology (select models only; disabled by default).

(Continued)

Select	To do this
System Configuration menu *(continued)*	
Device Configurations *(continued)*	■ Enable/disable TXT (Intel Trusted Execution Technology) (select models only; disabled by default). ■ Enable/disable Multi Core CPU (enabled by default). ■ Enable/disable Intel HT Technology (enabled by default). ■ Enable/disable Wake on USB (enabled by default). ■ Enable/disable Num lock state at boot (disabled by default).
Built-In Device Options	■ Enable/disable the wireless button state (enabled by default). ■ Enable/disable embedded WLAN device radio (select models only; enabled by default). ■ Enable/disable the embedded Bluetooth® device radio (enabled by default). ■ Enable/disable the Network Interface Controller (LAN) (enabled by default). ■ Enable/disable LAN/WLAN switching (disabled by default). ■ Set the wake on LAN state. Options include the following: ❒ Disabled ❒ Boot to Network ❒ Follow Boot Order ■ Enable/disable the Ambient Light Sensor. ■ Enable/disable the Notebook Upgrade Bay device (enabled by default). ■ Enable/disable the fingerprint device (enabled by default). ■ Enable/disable the integrated camera (enabled by default). ■ Enable/disable the Power Monitor Circuit (enabled by default). ■ Enable/disable the audio device (enabled by default). ■ Enable/disable a modem device (enabled by default). ■ Enable/disable the microphone (enabled by default). ■ Enable/disable the internal speakers (enabled by default).
Port Options (all are enabled by default)	✎ All port options are enabled by default. ■ Enable/disable the serial port. ■ Enable/disable the parallel port. ■ Enable/disable the flash media reader. ■ Enable/disable the USB port. △ Disabling the USB port also disables MultiBay devices and ExpressCard devices on the advanced port replicator. ■ Enable/disable the 1394 port. ■ Enable/disable the ExpressCard slot. ■ Enable/disable the Smart Card slot. ■ Enable/disable the eSATA port

(Continued)

Select	To do this
System Configuration menu *(continued)*	
AMT Options	■ Enable/disable Firmware Verbosity. ■ Enable/disable AMT Setup Prompt (Ctrl-P). ■ Enable/disable USB Key Provisioning Support. ■ Enable/disable Unconfigure AMT on next boot. ■ Select Terminal Emulation Mode. ❒ ANSI ❒ VT100 ■ Enable/disable Firmware Progress Event Support. ■ Enable/disable Initiate Intel CIRA.
Set Security Level	Change, view, or hide security levels for all BIOS menu items.
Restore Security Defaults	Restore the default security settings.

Computer Setup in Windows Vista

Starting Computer Setup

Computer Setup is a preinstalled, ROM-based utility that can be used even when the operating system is not working or will not load.

Some of the Computer Setup menu items listed in this guide may not be supported by your computer.

An external keyboard or mouse connected to a USB port can be used with Computer Setup only if USB legacy support is enabled.

To start Computer Setup, follow these steps:

1. Turn on or restart the computer, and then press **esc** while the "Press the ESC key for Startup Menu" message is displayed at the bottom of the screen.
2. Press **f10** to enter BIOS Setup.

Using Computer Setup

Navigating and selecting in Computer Setup

The information and settings in Computer Setup are accessed from the File, Security, Diagnostics, and System Configuration menus.

To navigate and select in Computer Setup, follow these steps:

1. Turn on or restart the computer, and then press **esc** while the "Press the ESC key for Startup Menu" message is displayed at the bottom of the screen.
   - ❏ To select a menu or a menu item, use the **tab** key and the keyboard arrow keys and then press **enter**, or use a pointing device to click the item.
   - ❏ To scroll up and down, click the up arrow or the down arrow in the upper-right corner of the screen, or use the up arrow key or the down arrow key.
   - ❏ To close open dialog boxes and return to the main Computer Setup screen, press **esc**, and then follow the on-screen instructions.

     You can use either a pointing device (TouchPad, pointing stick, or USB mouse) or the keyboard to navigate and make selections in Computer Setup.

2. Press **f10** to enter BIOS Setup.
3. Select the **File**, **Security**, **Diagnostics**, or **System Configuration** menu.

To exit Computer Setup menus, choose one of the following methods:

- To exit Computer Setup menus without saving your changes, click the **Exit** icon in the lower-left corner of the screen, and then follow the on-screen instructions.

  – or –

  Use the **tab** key and the arrow keys to select **File > Ignore Changes and Exit**, and then press **enter**.

  – or –

- To save your changes and exit Computer Setup menus, click the **Save** icon in the lower-left corner of the screen, and then follow the on-screen instructions.

  – or –

  Use the **tab** key and the arrow keys to select **File > Save Changes and Exit**, and then press **enter**.

Your changes go into effect when the computer restarts.

Restoring factory settings in Computer Setup

Restoring defaults will not change the hard drive mode.

To return all settings in Computer Setup to the values configured at the factory, follow these steps:

1. Turn on or restart the computer, and then press **esc** while the "Press the ESC key for Startup Menu" message is displayed at the bottom of the screen.
2. Press **f10** to enter BIOS Setup.
3. Use a pointing device or the arrow keys to select **File > Restore Defaults**.
4. Follow the on-screen instructions.
5. To save your changes and exit, click the **Save** icon in the lower-left corner of the screen, and then follow the on-screen instructions.

   – or –

   Use the arrow keys to select **File > Save Changes and Exit**, and then press **enter**.

Your changes go into effect when the computer restarts.

Your password settings and security settings are not changed when you restore the factory settings.

Computer Setup menus

The menu tables in this section provide an overview of Computer Setup options.

Some of the Computer Setup menu items listed in this chapter may not be supported by your computer.

File menu

Select	To do this
System Information	■ View identification information for the computer and the batteries in the system. ■ View specification information for the processor, cache and memory size, system ROM, video revision, and keyboard controller version.
Set System Data and Time	■ Set or change the date and time on the computer.
System Diagnostics	■ System Information ❒ Identification information for the computer and the batteries in the system. ❒ Specification information for the processor, cache and memory size, system ROM, video revision, and keyboard controller version. ■ Start-up Test—Verifies the system components needed for starting the computer. ■ Run-In Test—Runs a comprehensive check on system memory. ■ Hard Disk Test—Runs a comprehensive self-test on any hard drive in the system.

(Continued)

Select	To do this
File menu *(continued)*	
System Diagnostics *(continued)*	■ Memory Test—Runs a comprehensive test on any memory installed in the computer. ■ Battery Test—Runs a comprehensive test on any batteries installed in the computer. ■ Error Log—Displays a log file if any errors have occurred.
Restore Defaults	Replace the configuration settings in Computer Setup with the original factory settings. (Hard drive mode, password settings, and security settings are not changed when you restore the factory settings.)
Reset BIOS security to factory default	Restore the BIOS security settings to the factory default.
Ignore Changes and Exit	Cancel any changes entered during the current session. Then exit and restart the computer.
Save Changes and Exit	Save any changes entered during the current session. Then exit and restart the computer. Your changes go into effect when the computer restarts.

Security menu

✎ Some of the menu items listed in this section may not be supported by your computer.

Select	To do this
Administrator Tools	
Setup BIOS Administrator Password	Set up a BIOS administrator password.
User Management (requires a BIOS administrator password)	
Create New BIOS User Account	■ Select from a list of BIOS users. ■ Select from a list of ProtectTools users.
Password Policy (requires a BIOS administrator password)	Revise password policy criteria.
HP SpareKey	Enable/disable HP SpareKey (enabled by default).
Always Prompt for HP SpareKey Enrollment	Enable/disable HP SpareKey enrollment (enabled by default).
Fingerprint Reset on Reboot (If Present)	Reset/clear the fingerprint reader ownership (select models only; disabled by default).
User Tools	
Change Password	Enter, change, or delete a BIOS administrator password.
HP SpareKey Enrollment	Enroll or reset HP SpareKey, which is a set of security questions and answers used if you forget your password.
Anti Theft	
AT-P	Enable/disable Anti-Theft Protection.
DriveLock Passwords	■ Enable/disable DriveLock on any computer hard drive (enabled by default). ■ Change a DriveLock user password or master password. ✎ DriveLock settings are accessible only when you enter Computer Setup by turning on (not restarting) the computer.

(Continued)

Select	To do this
Security menu *(continued)*	
Automatic DriveLock	Enable/disable Automatic DriveLock support.
TPM Embedded Security	Enable/disable support for Trusted Platform Module (TPM) Embedded Security, which protects the computer from unauthorized access to owner functions available in Embedded Security for ProtectTools. For more information, refer to the ProtectTools software Help. ✎ You must have a setup password to change this setting.
Disk Sanitizer	Run Disk Sanitizer to destroy all existing data on the primary hard drive or the drive in the upgrade bay. ⚠ If you run Disk Sanitizer, the data on the selected drive is destroyed permanently.
System IDs	Enter a user-defined computer asset tracking number and ownership tag.

System Configuration menu

✎ Some of the listed System Configuration options may not be supported by your computer.

Select	To do this
Language	Change the Computer Setup language.
Boot Options	■ Set a Startup Menu delay (in seconds). ■ Set the MultiBook Express Boot Popup delay in seconds. ■ Enable/disable Custom Logo (disabled by default). ■ Enable/disable Display Diagnostic URL (enabled by default). ■ Enable/disable CD-ROM boot (enabled by default). ■ Enable/disable SD Card boot (enabled by default). ■ Enable/disable floppy boot (enabled by default). ■ Enable/disable PXE Internal NIC boot (enabled by default). ■ Enable/Disable Unified Extensible Firmware Interface (UEFI) Boot Mode (disabled by default). ■ Set the Legacy Boot Order.
Device Configurations	■ Enable/disable USB legacy support (enabled by default). When enabled, USB legacy support allows the following: ❒ Use of a USB keyboard in Computer Setup even when a Windows® operating system is not running ❒ Startup from bootable USB devices, including a hard drive, diskette drive, or optical drive connected by a USB port to the computer ■ Select a parallel port mode: ECP (Enhanced Capabilities Port), standard, bidirectional, or EPP (Enhanced Parallel Port). ■ Enable/disable fan always on while connected to an AC outlet (enabled by default).

(Continued)

Select	To do this
System Configuration menu *(continued)*	
Device Configurations *(continued)*	■ Enable/disable Data Execution Prevention (select models only). When enabled, the processor can disable some virus code execution, which helps to improve computer security (disabled by default). ■ Set the SATA (Serial Advanced Technology Attachment) device mode. The following options are available: ❒ AHCI (Advanced Host Controller Interface) ❒ IDE (Integrated Drive Electronics) ❒ RAID (select models only) ✎ Availability of these options varies by computer model. ■ Enable/disable secondary battery fast charge (enabled by default). ■ Enable/disable HP QuickLook (enabled by default). ■ Enable/disable Preboot Authentication on HP QuickLook Boot (enabled by default). ■ Enable/disable HP QuickWeb (enabled by default). ■ Enable/disable HP QuickWeb Write Protect (disabled by default). ■ Enable/disable Virtualization Technology (select models only; disabled by default). ■ Enable/disable TXT (Intel Trusted Execution Technology) (select models only; disabled by default). ■ Enable/disable Multi Core CPU (enabled by default). ■ Enable/disable Intel HT Technology (enabled by default). ■ Enable/disable Wake on USB (enabled by default). ■ Enable/disable Num lock state at boot (disabled by default).
Built-In Device Options	■ Enable/disable the wireless button state (enabled by default). ■ Enable/disable embedded WLAN device radio (select models only; enabled by default). ■ Enable/disable the embedded Bluetooth® device radio (enabled by default). ■ Enable/disable the Network Interface Controller (LAN) (enabled by default). ■ Enable/disable LAN/WLAN switching (disabled by default). ■ Set the wake on LAN state. Options include the following: ❒ Disabled ❒ Boot to Network ❒ Follow Boot Order ■ Enable/disable the Ambient Light Sensor. ■ Enable/disable the Notebook Upgrade Bay device (enabled by default). ■ Enable/disable the fingerprint device (enabled by default). ■ Enable/disable the integrated camera (enabled by default). ■ Enable/disable the Power Monitor Circuit (enabled by default). ■ Enable/disable the audio device (enabled by default).

(Continued)

Select	To do this
System Configuration menu *(continued)*	
Built-In Device Options *(continued)*	■ Enable/disable a modem device (enabled by default). ■ Enable/disable the microphone (enabled by default). ■ Enable/disable the internal speakers (enabled by default).
Port Options (all are enabled by default)	✎ All port options are enabled by default. ■ Enable/disable the serial port. ■ Enable/disable the parallel port. ■ Enable/disable the flash media reader. ■ Enable/disable the USB port. △ Disabling the USB port also disables MultiBay devices and ExpressCard devices on the advanced port replicator. ■ Enable/disable the 1394 port. ■ Enable/disable the ExpressCard slot. ■ Enable/disable the Smart Card slot. ■ Enable/disable the eSATA port
AMT Options	■ Enable/disable Firmware Verbosity. ■ Enable/disable AMT Setup Prompt (Ctrl-P). ■ Enable/disable USB Key Provisioning Support. ■ Enable/disable Unconfigure AMT on next boot. ■ Select Terminal Emulation Mode. ❒ ANSI ❒ VT100 ■ Enable/disable Firmware Progress Event Support. ■ Enable/disable Initiate Intel CIRA.
Set Security Level	Change, view, or hide security levels for all BIOS menu items.
Restore Security Defaults	Restore the default security settings.

Computer Setup in Windows XP

Starting Computer Setup

Computer Setup is a preinstalled, ROM-based utility that can be used even when the operating system is not working or will not load.

Some of the Computer Setup menu items listed in this guide may not be supported by your computer.

An external keyboard or mouse connected to a USB port can be used with Computer Setup only if USB legacy support is enabled.

To start Computer Setup, follow these steps:

1. Turn on or restart the computer, and then press **esc** while the "Press the ESC key for Startup Menu" message is displayed at the bottom of the screen.
2. Press **f10** to enter BIOS Setup.

Using Computer Setup

Navigating and selecting in Computer Setup

The information and settings in Computer Setup are accessed from the File, Security, Diagnostics, and System Configuration menus.

To navigate and select in Computer Setup, follow these steps:

1. Turn on or restart the computer, and then press **esc** while the "Press the ESC key for Startup Menu" message is displayed at the bottom of the screen.
   - ❏ To select a menu or a menu item, use the **tab** key and the keyboard arrow keys and then press **enter**, or use a pointing device to click the item.
   - ❏ To scroll up and down, click the up arrow or the down arrow in the upper-right corner of the screen, or use the up arrow key or the down arrow key.
   - ❏ To close open dialog boxes and return to the main Computer Setup screen, press **esc**, and then follow the on-screen instructions.

   You can use either a pointing device (TouchPad, pointing stick, or USB mouse) or the keyboard to navigate and make selections in Computer Setup.

2. Press **f10** to enter BIOS Setup.
3. Select the **File**, **Security**, **Diagnostics**, or **System Configuration** menu.

To exit Computer Setup menus, choose one of the following methods:

- To exit Computer Setup menus without saving your changes, click the **Exit** icon in the lower-left corner of the screen, and then follow the on-screen instructions.

  – or –

  Use the **tab** key and the arrow keys to select **File > Ignore Changes and Exit**, and then press **enter**.

  – or –

- To save your changes and exit Computer Setup menus, click the **Save** icon in the lower-left corner of the screen, and then follow the on-screen instructions.

  – or –

  Use the **tab** key and the arrow keys to select **File > Save Changes and Exit**, and then press **enter**.

Your changes go into effect when the computer restarts.

Restoring factory settings in Computer Setup

Restoring defaults will not change the hard drive mode.

To return all settings in Computer Setup to the values configured at the factory, follow these steps:

1. Turn on or restart the computer, and then press **esc** while the "Press the ESC key for Startup Menu" message is displayed at the bottom of the screen.
2. Press **f10** to enter BIOS Setup.
3. Use a pointing device or the arrow keys to select **File > Restore Defaults**.
4. Follow the on-screen instructions.
5. To save your changes and exit, click the **Save** icon in the lower-left corner of the screen, and then follow the on-screen instructions.

   – or –

   Use the arrow keys to select **File > Save Changes and Exit**, and then press **enter**.

Your changes go into effect when the computer restarts.

Your password settings and security settings are not changed when you restore the factory settings.

Computer Setup menus

The menu tables in this section provide an overview of Computer Setup options.

Some of the Computer Setup menu items listed in this chapter may not be supported by your computer.

File menu

Select	To do this
System Information	■ View identification information for the computer and the batteries in the system. ■ View specification information for the processor, cache and memory size, system ROM, video revision, and keyboard controller version.
Set System Data and Time	■ Set or change the date and time on the computer.
System Diagnostics	■ System Information ❒ Identification information for the computer and the batteries in the system. ❒ Specification information for the processor, cache and memory size, system ROM, video revision, and keyboard controller version. ■ Start-up Test—Verifies the system components needed for starting the computer. ■ Run-In Test—Runs a comprehensive check on system memory. ■ Hard Disk Test—Runs a comprehensive self-test on any hard drive in the system.

(Continued)

Select	To do this
File menu *(continued)*	
System Diagnostics *(continued)*	■ Memory Test—Runs a comprehensive test on any memory installed in the computer. ■ Battery Test—Runs a comprehensive test on any batteries installed in the computer. ■ Error Log—Displays a log file if any errors have occurred.
Restore Defaults	Replace the configuration settings in Computer Setup with the original factory settings. (Hard drive mode, password settings, and security settings are not changed when you restore the factory settings.)
Reset BIOS security to factory default	Restore the BIOS security settings to the factory default.
Ignore Changes and Exit	Cancel any changes entered during the current session. Then exit and restart the computer.
Save Changes and Exit	Save any changes entered during the current session. Then exit and restart the computer. Your changes go into effect when the computer restarts.

Security menu

✎ Some of the menu items listed in this section may not be supported by your computer.

Select	To do this
Administrator Tools	
Setup BIOS Administrator Password	Set up a BIOS administrator password.
User Management (requires a BIOS administrator password)	
Create New BIOS User Account	■ Select from a list of BIOS users. ■ Select from a list of ProtectTools users.
Password Policy (requires a BIOS administrator password)	Revise password policy criteria.
HP SpareKey	Enable/disable HP SpareKey (enabled by default).
Always Prompt for HP SpareKey Enrollment	Enable/disable HP SpareKey enrollment (enabled by default).
Fingerprint Reset on Reboot (If Present)	Reset/clear the fingerprint reader ownership (select models only; disabled by default).
User Tools	
Change Password	Enter, change, or delete a BIOS administrator password.
HP SpareKey Enrollment	Enroll or reset HP SpareKey, which is a set of security questions and answers used if you forget your password.
Anti Theft	
AT-P	Enable/disable Anti-Theft Protection.
DriveLock Passwords	■ Enable/disable DriveLock on any computer hard drive (enabled by default). ■ Change a DriveLock user password or master password. ✎ DriveLock settings are accessible only when you enter Computer Setup by turning on (not restarting) the computer.

(Continued)

Select	To do this
Security menu *(continued)*	
Automatic DriveLock	Enable/disable Automatic DriveLock support.
TPM Embedded Security	Enable/disable support for Trusted Platform Module (TPM) Embedded Security, which protects the computer from unauthorized access to owner functions available in Embedded Security for ProtectTools. For more information, refer to the ProtectTools software Help. ✎ You must have a setup password to change this setting.
Disk Sanitizer	Run Disk Sanitizer to destroy all existing data on the primary hard drive or the drive in the upgrade bay. ⚠ If you run Disk Sanitizer, the data on the selected drive is destroyed permanently.
System IDs	Enter a user-defined computer asset tracking number and ownership tag.

System Configuration menu

✎ Some of the listed System Configuration options may not be supported by your computer.

Select	To do this
Language	Change the Computer Setup language.
Boot Options	■ Set a Startup Menu delay (in seconds). ■ Set the MultiBook Express Boot Popup delay in seconds. ■ Enable/disable Custom Logo (disabled by default). ■ Enable/disable Display Diagnostic URL (enabled by default). ■ Enable/disable CD-ROM boot (enabled by default). ■ Enable/disable SD Card boot (enabled by default). ■ Enable/disable floppy boot (enabled by default). ■ Enable/disable PXE Internal NIC boot (enabled by default). ■ Enable/Disable Unified Extensible Firmware Interface (UEFI) Boot Mode (disabled by default). ■ Set the Legacy Boot Order.
Device Configurations	■ Enable/disable USB legacy support (enabled by default). When enabled, USB legacy support allows the following: ❒ Use of a USB keyboard in Computer Setup even when a Windows® operating system is not running ❒ Startup from bootable USB devices, including a hard drive, diskette drive, or optical drive connected by a USB port to the computer ■ Select a parallel port mode: ECP (Enhanced Capabilities Port), standard, bidirectional, or EPP (Enhanced Parallel Port). ■ Enable/disable fan always on while connected to an AC outlet (enabled by default).

(Continued)

Select	To do this
System Configuration menu *(continued)*	
Device Configurations *(continued)*	■ Enable/disable Data Execution Prevention (select models only). When enabled, the processor can disable some virus code execution, which helps to improve computer security (disabled by default). ■ Set the SATA (Serial Advanced Technology Attachment) device mode. The following options are available: ❒ AHCI (Advanced Host Controller Interface) ❒ IDE (Integrated Drive Electronics) ❒ RAID (select models only) ✎ Availability of these options varies by computer model. ■ Enable/disable secondary battery fast charge (enabled by default). ■ Enable/disable HP QuickLook (enabled by default). ■ Enable/disable Preboot Authentication on HP QuickLook Boot (enabled by default). ■ Enable/disable HP QuickWeb (enabled by default). ■ Enable/disable HP QuickWeb Write Protect (disabled by default). ❒ Enable/disable Virtualization Technology (select models only; disabled by default). ■ Enable/disable TXT (Intel Trusted Execution Technology) (select models only; disabled by default). ■ Enable/disable Multi Core CPU (enabled by default). ■ Enable/disable Intel HT Technology (enabled by default). ■ Enable/disable Wake on USB (enabled by default). ■ Enable/disable Num lock state at boot (disabled by default).
Built-In Device Options	■ Enable/disable the wireless button state (enabled by default). ■ Enable/disable embedded WLAN device radio (select models only; enabled by default). ■ Enable/disable the embedded Bluetooth® device radio (enabled by default). ■ Enable/disable the Network Interface Controller (LAN) (enabled by default). ■ Enable/disable LAN/WLAN switching (disabled by default). ■ Set the wake on LAN state. Options include the following: ❒ Disabled ❒ Boot to Network ❒ Follow Boot Order ■ Enable/disable the Ambient Light Sensor. ■ Enable/disable the Notebook Upgrade Bay device (enabled by default). ■ Enable/disable the fingerprint device (enabled by default). ■ Enable/disable the integrated camera (enabled by default). ■ Enable/disable the Power Monitor Circuit (enabled by default). ■ Enable/disable the audio device (enabled by default). ■ Enable/disable a modem device (enabled by default).

(Continued)

Select	To do this
System Configuration menu *(continued)*	
Built-In Device Options *(continued)*	■ Enable/disable the microphone (enabled by default). ■ Enable/disable the internal speakers (enabled by default).
Port Options (all are enabled by default)	✎ All port options are enabled by default. ■ Enable/disable the serial port. ■ Enable/disable the parallel port. ■ Enable/disable the flash media reader. ■ Enable/disable the USB port. △ Disabling the USB port also disables MultiBay devices and ExpressCard devices on the advanced port replicator. ■ Enable/disable the 1394 port. ■ Enable/disable the ExpressCard slot. ■ Enable/disable the Smart Card slot. ■ Enable/disable the eSATA port
AMT Options	■ Enable/disable Firmware Verbosity. ■ Enable/disable AMT Setup Prompt (Ctrl-P). ■ Enable/disable USB Key Provisioning Support. ■ Enable/disable Unconfigure AMT on next boot. ■ Select Terminal Emulation Mode. ❒ ANSI ❒ VT100 ■ Enable/disable Firmware Progress Event Support. ■ Enable/disable Initiate Intel CIRA.
Set Security Level	Change, view, or hide security levels for all BIOS menu items.
Restore Security Defaults	Restore the default security settings.

6

Specifications

Computer specifications

	Metric	U.S.
Dimensions		
Depth	**23.62 cm**	9.30 in
Width	**33.56 cm**	13.21 in
Height (front to back)	**3.13 to 3.49 cm**	1.23 to 1.37 in
Weight		
With 14-in SVA display assembly, UMA graphics, 4-cell battery,1 512 MB SODIMM, WLAN card and antennas, WWAN minicard connector, SIM connector, and WWAN antennas, universal wideband antenna, no optical disk drive, no Bluetooth module	**2.12 kg**	4.68 lb
Input power		
Operating voltage	19.5 V dc±5% @ 3.33 A - 65 W 19.5 V dc±5% @ 4.62 A - 90 W	
Operating current (max load)	3.33 A or 4.62 A	
Temperature		
Operating (not writing to optical disc)	**0°C to 35°C**	32°F to 95°F
Operating (writing to optical disc)	**5°C to 35°C**	41°F to 95°F
Nonoperating	**-20°C to 60°C**	-4°F to 140°F
Relative humidity		
Operating	10% to 90%	
Nonoperating	5% to 95%	
Maximum altitude (unpressurized)		
Operating	**-15 m to 3,048 m**	-50 ft to 10,000 ft
Nonoperating	**-15 m to 12,192 m**	-50 ft to 40,000 ft
Shock		
Operating	125 g, 2 ms, half-sine	
Nonoperating	200 g, 2 ms, half-sine	
Random vibration		
Operating	0.75 g zero-to-peak, 10 Hz to 500 Hz, 0.25 oct/min sweep rate	
Nonoperating	1.50 g zero-to-peak, 10 Hz to 500 Hz, 0.5 oct/min sweep rate	

✎ Applicable product safety standards specify thermal limits for plastic surfaces. The computer operates well within this range of temperatures.

14.0-in SVA eDP display specifications

	Metric	U.S.
Dimensions		
Height	**17.74 cm**	6.9 in
Width	**31.30 cm**	12.3 in
Diagonal	**35.56 cm**	14.0 in
Number of colors	Up to 16.8 million	
Contrast ratio	250:1 (typical)	
Brightness	200 nits (typical)	
Aspect ratio	16:9	
Pixel resolution		
Pitch	0.279 × 0.279 mm	
Format	1366 × 768 - HD 1600 × 900 - HD+	
Configuration	RGB vertical stripe	
Backlight	LED	
Character display	80 × 25	
Total power consumption	4.0 W	
Viewing angle	±40° horizontal, +120°/-40° vertical (typical)	

Hard drive specifications

	500-GB*	320-GB*	250-GB*
Dimensions			
Height	**9.5 mm** (0.37 in)	**9.5 mm** (0.37 in)	**9.5 mm** (0.37 in)
Width	**70 mm** (2.76 in)	**70 mm** (2.76 in)	**70 mm** (2.76 in)
Weight	**101 g** (3.56 oz)	**101 g** (3.56 oz)	**101 g** (3.56 oz)
Interface type	SATA	SATA	SATA
Transfer rate	100 MB/sec	100 MB/sec	100 MB/sec
Security	ATA security	ATA security	ATA security
Seek times (typical read, including setting)			
Single track	1.5 ms	1.5 ms	2.0 ms
Average	12.0 ms	12.0 ms	12.0 ms
Maximum	22.0 ms	22.0 ms	22.0 ms
Logical blocks	976,785,075	625,142,448	488,397,168
Disc rotational speed	7200 rpm	7200 rpm	7200 rpm
Operating temperature	**5°C to 55°C** (41°F to 131°F)		

*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less. Actual drive specifications may differ slightly.

Certain restrictions and exclusions apply. Contact technical support for details.

Solid state drive specifications

	256-GB*	160-GB*
Dimensions		
Height	**9.5 mm** (0.37-in)	**7.0 mm** (0.28-in)
Length	**100 mm** (3.94-in)	**100 mm** (3.94-in)
Width	**70 mm** (2.76)	**70 mm** (2.76)
Weight	**80 g** (2.82 oz)	**76 g** (2.68 oz)
Interface type	SATA	SATA
Read/Write bandwidth		
Sequential read	220 MB/sec	250 MB/sec
Sequential write	200 MB/sec	70 MB/sec
Security	ATA security	ATA security
User Addressable Sectors	500,118,192	312,581,80
Operating temperature	**0°C to 70°C** (32°F to 158°F)	

*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less. Actual drive specifications may differ slightly.

Certain restrictions and exclusions apply. Contact technical support for details.

Blu-ray R/RE DVD±RW SuperMulti Drive specifications

Applicable disc	
Read	CD-DA, CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, mixed-mode CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-Extra, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW. DVD-RAM, BD-ROM, BD-R, BD-RE
Write	CD-R, CD-RW, DVD+R, DVD+R(9), DVD+RW, DVD-R, DVD-R(9), DVD-RW, DVD-RAM, BD-R, BD-RE
Random Access time	
BD	< 230 ms
DVD	< 180 ms
CD	< 180 ms
Max media capacity	
Read	50 GB
Write	50 GB
Cache buffer	2 MB
Data transfer rate	
24X CD-ROM	3600 KB/sec
8X DVD-ROM	10,800 KB/sec
2X BD-ROM	9000 KB/sec
24X CD-R	3600 KB/sec
16X CD-RW	2400 KB/sec
8X DVD+R	10800 KB/sec
6X DVD+RW	8100 KB/sec
8X DVD-R	10800 KB/sec
6X DVD-RW	8100 KB/sec
4X DVD+R Dual Layer	5400 KB/sec
4X DVD-R Dual Layer	5400 KB/sec
5X DVD-RAM	6750 KB/sec
2X BD-R	9000 KB/sec
2X BD-RE	9000 KB/sec
2X BD-RAM	9 MB/sec

Blu-ray ROM with LightScribe DVD±RW SuperMulti DL Drive specifications

Applicable disc	
Read	CD-DA, CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, Mixed-Mode CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW. DVD-RAM, BD-ROM, BD-R, BD-RE
Write	CD-R, CD-RW, DVD+R, DVD+R(9), DVD+RW, DVD-R, DVD-R(9), DVD-RW, DVD-RAM, LightScribe
Random Access time	
BD	< 230 ms
DVD	< 190 ms
CD	< 190 ms
Max media capacity	
Read	50 GB
Write	8.5 GB
Cache buffer	4.5 MB
Data transfer rate	
24X CD-ROM	3600 KB/s
8X DVD-ROM	10,800 KB/s
4X BD-ROM	18000 KB/s
16X CD-R	1200 KB/s
10X CD-RW	1500 KB/s
8X DVD+R	10800 KB/s
8X DVD+RW	10800 KB/s
8X DVD-R	10800 KB/s
6X DVD-RW	8100 KB/s
4X DVD+R Dual Layer	5400 KB/s
4X DVD-R Dual Layer	5400 KB/s
5X DVD-RAM	6750 KB/s

DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe

Applicable disc	
Read	CD-DA, CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, Mixed-Mode CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW. DVD-RAM
Write	CD-R, CD-RW, DVD+R, DVD+RW, DVD-R, DVD-RW, DVD-RAM, LightScribe
Random Access time	
CD	< 150 ms
DVD	< 160 ms
Max media capacity	
Read	8.5 GB
Write	8.5 GB
Cache buffer	2.5 MB
Data transfer rate	
24X CD-ROM	3600 KB/s
8X DVD-ROM	10,800 KB/s
24X CD-R	3600 KB/s
16X CD-RW	2400 KB/s
8X DVD+R	10,800 KB/s
8X DVD+RW	10800 KB/s
8X DVD-R	10,800 KB/s
6X DVD-RW	8100 KB/s
4X DVD+R Dual Layer	5400 KB/s
4X DVD-R Dual Layer	5400 KB/s
5X DVD-RAM	6750 KB/s

DVD-ROM Drive specifications

Applicable disc	
Read:	CD-DA, CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, Mixed-Mode CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW, DVD-RAM
Random Access time	
CD	< 140 ms
DVD	< 160 ms
Max media capacity	
Read	8.5 GB
Cache buffer	2 MB
Data transfer rate	
24X CD-ROM	3,600 KB/sec
8X DVD	10,800 KB/sec

System resource specifications

You can use Device Manager to get a graphical view of the system resources that control how the devices work on the computer. System resources you can access from Device Manager are direct memory access (DMA) channels, input/output (I/O) ports, interrupt request (IRQ) lines, and memory addresses.

If two devices require the same resource and create a device conflict, you can manually change the resource settings in Device Manager to be sure each setting is unique.

CAUTION: Improperly changing resource settings can disable your hardware and cause your computer to malfunction or become inoperable. Only users who have expert knowledge of computer hardware and hardware configurations should change resource settings.

To view resource settings in Windows 7 and Windows Vista:

1. Select **Start > Computer**.
2. Click **System properties** near the top of the Computer folder.
3. On the left, click **Device Manager**.
4. On the **View** menu, click one of the following:
   - ❏ **Resources by type**
   - ❏ **Resources by connection**

To view resource settings in Windows XP:

1. Select **Start** > **My Computer**, or double-click **My Computer** on the desktop.
2. Under System Tasks, click **View system information**.
3. In the System Properties window, select the **Hardware** tab.
4. Click **Device Manager**.
5. On the **View** menu, click one of the following:
   - ❏ **Resources by type**
   - ❏ **Resources by connection**

7

Backup and recovery

Backup and recovery in Windows 7

Overview

To protect your information, use Windows® Backup and Restore to back up individual files and folders, back up your entire hard drive (select models only), create system repair discs (select models only), or create system restore points. In case of system failure, you can use the backup files to restore the contents of your computer.

Windows Backup and Restore provides the following options:

- Creating a system repair disc (select models only)
- Backing up individual files and folders
- Creating a system image (select models only)
- Scheduling automatic backups (select models only)
- Creating system restore points
- Recovering individual files
- Restoring the computer to a previous state
- Recovering information using recovery tools

For detailed instructions, perform a search for these topics in Help and Support.

In case of system instability, HP recommends that you print the recovery procedures and save them for later use.

Backing up your information

Recovery after a system failure is as complete as your most current backup. You should create system repair discs (select models only) and your initial backup immediately after software setup. As you add new software and data files, you should continue to back up your system on a regular basis to maintain a reasonably current backup. The system repair discs (select models only) are used to start up (boot) the computer and repair the operating system in case of system instability or failure. Your initial and subsequent backups allow you to restore your data and settings if a failure occurs.

You can back up your information to an optional external hard drive, a network drive, or discs.

Note the following when backing up:

- Store personal files in the Documents library, and back it up regularly.
- Back up templates that are stored in their associated programs.
- Save customized settings that appear in a window, toolbar, or menu bar by taking a screen shot of your settings. The screen shot can be a time-saver if you have to reset your preferences.

  To create a screen shot:

  1. Display the screen you want to save.

2. Copy the screen image:

   To copy only the active window, press **alt+fn+prt sc**.

   To copy the entire screen, press **fn+prt sc**.

3. Open a word-processing document, and then select **Edit > Paste**.

   The screen image is added to the document.

4. Save the document.

- When backing up to discs, use any of the following types of discs (purchased separately): CD-R, CD-RW, DVD+R, DVD+R DL, DVD-R, DVD-R DL, or DVD±RW. The discs you use will depend on the type of optical drive installed in your computer.

  ✎ DVDs and DVDs with double-layer (DL) support store more information than CDs, so using them for backup reduces the number of recovery discs required.

- When backing up to discs, number each disc before inserting it into the optical drive of the computer.

To create a backup using Backup and Restore Center, follow these steps:

✎ Be sure that the computer is connected to AC power before you start the backup process.

The backup process may take over an hour, depending on file size and the speed of the computer.

1. Select **Start > All Programs > Maintenance > Backup and Restore Center**.
2. Follow the on-screen instructions to set up your backup, create a system image (select models only), or create a system repair disc (select models only).

✎ Windows® includes the User Account Control feature to improve the security of your computer. You may be prompted for your permission or password for tasks such as installing software, running utilities, or changing Windows settings. Refer to Help and Support for more information.

Performing a recovery

In case of system failure or instability, the computer provides the following tools to recover your files:

- Windows recovery tools: You can use Windows Backup and Restore to recover information you have previously backed up. You can also use Windows Startup Repair to fix problems that might prevent Windows from starting correctly.
- **f11** recovery tools: You can use the **f11** recovery tools to recover your original hard drive image. The image includes the Windows operating system and software programs installed at the factory.

✎ If you are unable to boot (start up) your computer and you cannot use the system repair discs you previously created (select models only), you must purchase a Windows 7 operating system DVD to reboot the computer and repair the operating system. For additional information, refer to the "Using a Windows 7 operating system DVD (purchased separately)" section in this guide.

Using the Windows recovery tools

To recover information you previously backed up, follow these steps:

1. Select **Start > All Programs > Maintenance > Backup and Restore Center**.
2. Follow the on-screen instructions to recover your entire computer (select models only) or your files.

Windows includes the User Account Control feature to improve the security of your computer. You may be prompted for your permission or password for tasks such as installing software, running utilities, or changing Windows settings. Refer to Help and Support for more information.

To recover your information using Startup Repair, follow these steps:

CAUTION: Using Startup Repair completely erases hard drive contents and reformats the hard drive. All files you have created and any software installed on the computer are permanently removed. When reformatting is complete, the recovery process restores the operating system, as well as the drivers, software, and utilities from the backup used for recovery.

1. If possible, back up all personal files.
2. If possible, check for the presence of the Windows partition and the HP Recovery partition.

   To check for the Windows partition, select **Start > Computer**.

   To check for the HP Recovery partition, click **Start**, right-click **Computer**, click **Manage**, and then click **Disk Management**.

   If the Windows partition or the HP Recovery partition is not listed, you must recover your operating system and programs using the Windows 7 operating system DVD and the Driver Recovery disc (both purchased separately). For additional information, refer to the "Using a Windows 7 operating system DVD (purchased separately)" section in this guide.

3. If the Windows partition and the HP Recovery partition are listed, restart the computer, and then press **f8** before the Windows operating system loads.
4. Select **Startup Repair**.
5. Follow the on-screen instructions.

For additional information on recovering information using the Windows tools, perform a search for these topics in Help and Support.

Using f11 recovery tools

CAUTION: Using **f11** completely erases hard drive contents and reformats the hard drive. All files you have created and any software installed on the computer are permanently removed. The **f11** recovery tool reinstalls the operating system and HP programs and drivers that were installed at the factory. Software not installed at the factory must be reinstalled. Personal files must be restored from a backup.

To recover the original hard drive image using **f11**, follow these steps:

1. If possible, back up all personal files.
2. If possible, check for the presence of the HP Recovery partition: click **Start**, right-click **Computer**, click **Manage**, and then click **Disk Management**.

   If the HP Recovery partition is not listed, you must recover your operating system and programs using the Windows 7 operating system DVD and the Driver Recovery disc (both purchased separately). For additional information, refer to the "Using a Windows 7 operating system DVD (purchased separately)" section in this guide.

3. If the HP Recovery partition is listed, restart the computer, and then press **esc** while the "Press the ESC key for Startup Menu" message is displayed at the bottom of the screen.
4. Press **f11** while the "Press <F11> for recovery" message is displayed on the screen.
5. Follow the on-screen instructions.

Using a Windows 7 operating system DVD (purchased separately)

If you are unable to boot (start up) your computer and you cannot use the system repair discs you previously created (select models only), you must purchase a Windows 7 operating system DVD to reboot the computer and repair the operating system. Be sure that your most recent backup (stored on discs or on an external drive) is easily accessible. To order a Windows 7 operating system DVD, go to http://www.hp.com/support, select your country or region, and follow the on-screen instructions. You can also order the DVD by calling technical support. For contact information, refer to the *Worldwide Telephone Numbers* booklet included with the computer.

CAUTION: Using a Windows 7 operating system DVD completely erases hard drive contents and reformats the hard drive. All files you have created and any software installed on the computer are permanently removed. The recovery process reinstalls the original operating system, software, and drivers. Software, drivers, and updates not installed by HP must be manually reinstalled.

To initiate recovery using a Windows 7 operating system DVD, follow these steps:

This process takes several minutes.

1. If possible, back up all personal files.
2. Restart the computer, and then insert the Windows 7 operating system DVD into the optical drive before the Windows operating system loads.
3. When prompted, press any keyboard key.
4. Follow the on-screen instructions.
5. Click Next.
6. Select **Repair your computer**.
7. Follow the on-screen instructions.

Backup and recovery in Windows Vista

Overview

To protect your information, use the Backup and Restore Center to back up individual files and folders, back up your entire hard drive (select models only), or create system restore points. In case of system failure, you can use the backup files to restore the contents of your computer.

The Backup and Restore Center provides the following options:

- Backing up individual files and folders
- Backing up the entire hard drive (select models only)
- Scheduling automatic backups (select models only)
- Creating system restore points
- Recovering individual files
- Restoring the computer to a previous state
- Recovering information using recovery tools

For detailed instructions, perform a search for these topics in Help and Support.

In case of system instability, HP recommends that you print the recovery procedures and save them for later use.

Backing up your information

Recovery after a system failure is as complete as your most current backup. You should create your initial backup immediately after software setup. As you add new software and data files, you should continue to back up your system on a regular basis to maintain a reasonably current backup. You can back up your information to an optional external hard drive, a network drive, or discs.

Note the following when backing up:

- Store personal files in the Documents folder, and back it up regularly.
- Back up templates that are stored in their associated programs.
- Save customized settings that appear in a window, toolbar, or menu bar by taking a screen shot of your settings. The screen shot can be a time-saver if you have to reset your preferences.

  To create a screen shot:

  1. Display the screen you want to save.
  2. Copy the screen image:

     To copy only the active window, press **alt+fn+prt sc**.

     To copy the entire screen, press **fn+prt sc**.
  3. Open a word-processing document, and then select **Edit > Paste**.

     The screen image is added to the document.
  4. Save the document.

- When backing up to discs, use any of the following types of discs (purchased separately): CD-R, CD-RW, DVD+R, DVD+R DL, DVD-R, DVD-R DL, or DVD±RW. The discs you use will depend on the type of optical drive installed in your computer.

  ✎ DVDs and DVDs with double-layer (DL) support store more information than CDs, so using them for backup reduces the number of recovery discs required.

- When backing up to discs, number each disc before inserting it into the optical drive of the computer.

To create a backup using Backup and Restore Center, follow these steps:

✎ Be sure that the computer is connected to AC power before you start the backup process.

✎ The backup process may take over an hour, depending on file size and the speed of the computer.

1. Select **Start > All Programs > Maintenance > Backup and Restore Center**.
2. Follow the on-screen instructions to back up your entire computer (select models only) or your files.

✎ Windows includes the User Account Control feature to improve the security of your computer. You may be prompted for your permission or password for tasks such as installing software, running utilities, or changing Windows settings. Refer to Help and Support for more information.

Performing a recovery

In case of system failure or instability, the computer provides the following tools to recover your files:

- Windows recovery tools: You can use the Backup and Restore Center to recover information you have previously backed up. You can also use Windows Startup Repair to fix problems that might prevent Windows from starting correctly.
- **f11** recovery tools: You can use the **f11** recovery tools to recover your original hard drive image. The image includes the Windows operating system and software programs installed at the factory.

✎ If you are unable to startup the computer, you must purchase a Windows Vista operating system DVD to restart the computer and repair the operating system. For additional information, refer to the "Using a Windows Vista operating system DVD (purchased separately)" section in this chapter.

Using the Windows recovery tools

To recover information you previously backed up, follow these steps:

1. Select **Start > All Programs > Maintenance > Backup and Restore Center**.
2. Follow the on-screen instructions to recover your entire computer (select models only) or your files.

✎ Windows includes the User Account Control feature to improve the security of your computer. You may be prompted for your permission or password for tasks such as installing software, running utilities, or changing Windows settings. Refer to Help and Support for more information.

To recover your information using Startup Repair, follow these steps:

CAUTION: Using Startup Repair completely erases hard drive contents and reformats the hard drive. All files you have created and any software installed on the computer are permanently removed. When reformatting is complete, the recovery process restores the operating system, as well as the drivers, software, and utilities from the backup used for recovery.

1. If possible, back up all personal files.
2. If possible, check for the presence of the Windows partition and the HP Recovery partition. To find the partitions, select **Start > Computer**.

   If the Windows partition and the HP Recovery partition have been deleted, you must recover your operating system and programs using the Windows Vista operating system DVD and the *Driver Recovery* software (both purchased separately). For additional information, refer to the "Using a Windows Vista operating system DVD (purchased separately)" section in this chapter.

3. Restart the computer, and then press **f8** before the Windows operating system loads.
4. Select **Repair your computer**.
5. Follow the on-screen instructions.

For additional information on recovering information using the Windows tools, perform a search for these topics in Help and Support.

Using f11 recovery tools

CAUTION: Using **f11** completely erases hard drive contents and reformats the hard drive. All files you have created and any software installed on the computer are permanently removed. The **f11** recovery tool reinstalls the operating system and HP programs and drivers that were installed at the factory. Software not installed at the factory must be reinstalled. Personal files must be restored from a backup.

If your computer includes a solid-state drive (SSD), you may not have a recovery partition. Recovery discs have been included for computers that do not have a partition. Use these discs to recover your operating system and software. To check for the presence of a recovery partition, select **Start > Computer**. If the partition is present, an HP Recovery drive is listed in the Hard Disk Drives section of the window.

To recover the original hard drive image using **f11**, follow these steps:

1. If possible, back up all personal files.
2. If possible, check for the presence of the HP Recovery partition. To find the partition, select **Start > Computer**.

   If the HP Recovery partition has been deleted, you must recover your operating system and programs using the Windows Vista operating system DVD and the *Driver Recovery* software (both purchased separately). For additional information, refer to the "Using a Windows Vista operating system DVD (purchased separately)" section in this chapter.

3. Turn on or restart the computer, and then press **esc** while the "Press the ESC key for Startup Menu" message is displayed at the bottom of the screen.
4. Press **f11** while the "Press <F11> for recovery" message is displayed on the screen.
5. Follow the on-screen instructions.

Using a Windows Vista operating system DVD (purchased separately)

If you are unable to startup your computer, you must purchase a Windows Vista operating system DVD to restart the computer and repair the operating system. Be sure that your most recent backup (stored on discs or on an external drive) is easily accessible. To order a Windows Vista operating system DVD, go to http://www.hp.com/support, select your country or region, and follow the on-screen instructions. You can also order the DVD by calling technical support. For contact information, refer to the *Worldwide Telephone Numbers* booklet included with the computer.

CAUTION: Using a Windows Vista operating system DVD completely erases hard drive contents and reformats the hard drive. All files you have created and any software installed on the computer are permanently removed. When reformatting is complete, the recovery process helps you restore the operating system, as well as drivers, software, and utilities.

To initiate recovery using a Windows Vista operating system DVD, follow these steps:

This process takes several minutes.

1. If possible, back up all personal files.
2. Restart the computer, and then insert the Windows Vista operating system DVD into the optical drive before the Windows operating system loads.
3. When prompted, press any keyboard key.
4. Follow the on-screen instructions.
5. Click **Next**.
6. Select **Repair your computer**.
7. Follow the on-screen instructions.

Backup and recovery in Windows XP

Overview

To protect your information, use the Windows Backup utility (select models only) to back up files and folders or create recovery points. In case of system failure, you can use the backup files to restore your computer.

Windows provides the following options:

- Backing up individual files and folders
- Backing up all files and folders
- Scheduling automatic backups
- Creating recovery points
- Recovering information

For detailed instructions, perform a search for these topics in Help and Support.

In case of system instability, HP recommends that you print the recovery procedures and save them for later use.

Backing up your information

Recovery after a system failure is as complete as your most current backup. You should create your initial backup immediately after software setup. As you add new software and data files, you should continue to back up your system on a regular basis to maintain a reasonably current backup. You can back up individual files or folders to an optional external hard drive or to a network drive.

Note the following when backing up:

- Store personal files in the My Documents folder, and back it up periodically.
- Back up templates stored in their associated programs.
- Save customized settings that appear in a window, toolbar, or menu bar by taking a screen shot of your settings. The screen shot can be a time saver if you have to reset your preferences.

  To copy the screen and paste it into a word-processing document:

  a. Display the screen you want to save.

  b. Copy the screen image:

     To copy only the active window, press **alt+fn+prt sc**.

     To copy the entire screen, press **fn+prt sc**.

  c. Open a word-processing document, and then select **Edit > Paste**.

     The screen image is added to the document.

  d. Save the document.

To create a backup using the Windows Backup utility (select models only), follow these steps:

Be sure that the computer is connected to AC power before you start the backup process.

The backup process may take over an hour, depending on file size and the speed of the computer.

1. Select **Start > All Programs > Accessories > System Tools > Backup**.

2. Follow the on-screen instructions.

Performing a recovery

In case of system failure or instability, the computer provides the following tools to recover your files:

- Windows recovery tools (select models only): You can use the Windows Backup utility to recover information you have previously backed up.
- *Operating System* and *Driver Recovery* discs (included with your computer): You can use the discs to recover your operating system and programs installed at the factory.

Recovering your information

To recover information you previously backed up, follow these steps:

1. If possible, back up all personal files.
2. Select **Start > All Programs > Accessories > System Tools > Backup**.

   The Backup or Restore Wizard opens.
3. Select **Restore files and settings**, and then select **Next**.
4. Follow the on-screen instructions.

For additional information on initiating a recovery in Windows, perform a search for this topic in Help and Support.

Recovering the operating system and programs

CAUTION: The recovery process reformats and completely erases the hard drive. All files you have created and any software installed on the computer are permanently removed. The recovery process reinstalls the original operating system as well as software and drivers. Software, drivers, and updates not installed by HP must be manually reinstalled. Personal files must be restored from a backup.

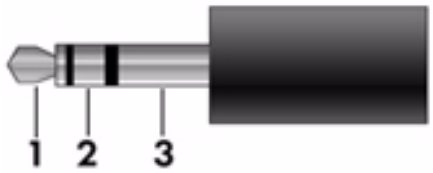
To recover your operating system and programs, follow these steps:

1. If possible, back up all personal files.
2. Insert the *Operating System* disc into the optical drive.
3. Shut down the computer.
4. Turn on the computer.
5. Follow the on-screen instructions to install the operating system.
6. After the operating system is installed, remove the *Operating System* disc and insert the *Driver Recovery* disc.
7. Follow the on-screen instructions to install the drivers and programs.

8

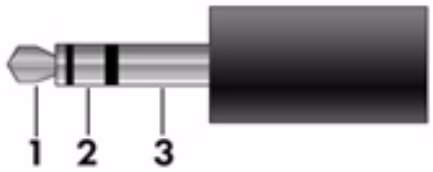
Connector pin assignments

Audio-out (headphone)



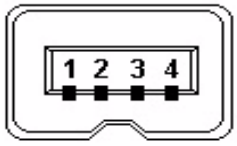
Pin	Signal
1	Audio out, left channel
2	Audio out, right channel
3	Ground

Audio-in (microphone)



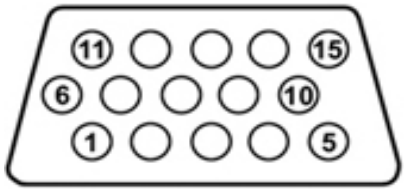
Pin	Signal
1	Audio signal in
2	Audio signal in
3	Ground

1394a



Pin	Signal
1	Send data, twisted pair B-
2	Send, twisted pair B+
3	Receive data, twisted pair A-
4	Receive, twisted pair A+

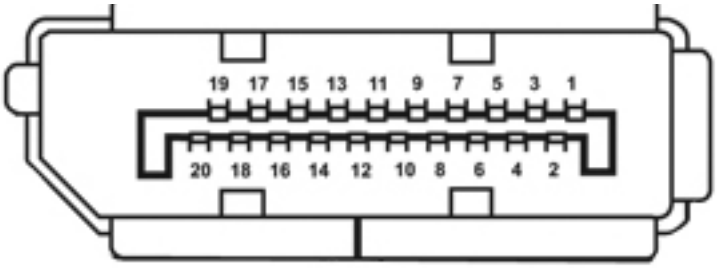
External monitor



Pin	Signal
1	Red analog
2	Green analog
3	Blue analog
4	Not connected
5	Ground
6	Ground analog
7	Ground analog
8	Ground analog
9	+5 VDC
10	Ground
11	Monitor detect
12	DDC 2B data
13	Horizontal sync
14	Vertical sync
15	DDC 2B clock

DisplayPort

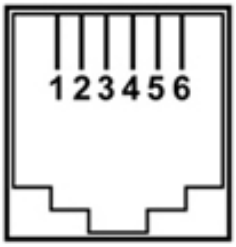
This is the pinout for the source-side connector; the sink-side connector pinout has lanes 0-3 reversed in order, that is, lane 3 will be on pin 1 and 3 while lane 0 will be on pin 10 and 12.



Pin	Signal
1	Lane 0 -
2	Ground
3	Lane 0 +
4	Lane 1 +
5	Ground
6	Lane 1 -
7	Lane 2 +
8	Ground
9	Lane 2 -
10	Lane 3 +
11	Ground
12	Lane 3 -
13	CONFIG1 connected to ground*
14	CONFIG2 connected to ground*
15	Auxiliary Channel +
16	Ground
17	Auxiliary channel -
18	Hot plug detect
19	Return for power
20	Power

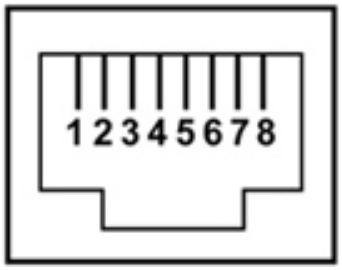
*Pins 13 and 14 may either be directly connected to ground or connected to ground through a pulldown device.

RJ-11 (modem)



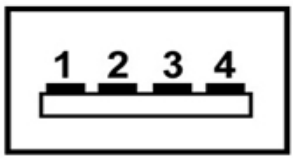
Pin	Signal
1	Unused
2	Tip
3	Ring
4	Unused
5	Unused
6	Unused

RJ-45 (network)



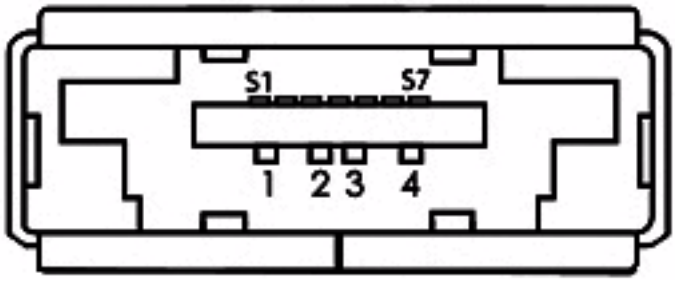
Pin	Signal
1	Transmit +
2	Transmit
3	Receive +
4	Unused
5	Unused
6	Receive -
7	Unused
8	Unused

Universal Serial Bus



Pin	Signal
1	+5 VDC
2	Data
3	Data +
4	Ground

eSATA/USB



Pin	Signal
1	USB +5 VDC
2	USB Data -
3	USB Data +
4	USB Ground
S1	eSATA Ground
S2	eSATA Transmit Data A+
S3	eSATA Transmit Data A-
S4	eSATA Ground
S5	eSATA Receive Data B-
S6	eSATA Transmit Data B+
S7	eSATA Ground

9

Power cord set requirements

The wide-range input feature of the computer permits it to operate from any line voltage from 100 to 120 volts AC, or from 220 to 240 volts AC.

The 3-conductor power cord set included with the computer meets the requirements for use in the country or region where the equipment is purchased.

Power cord sets for use in other countries and regions must meet the requirements of the country or region where the computer is used.

Requirements for all countries and regions

The following requirements are applicable to all countries and regions:

- The length of the power cord set must be at least **1.5 m** (5.0 ft) and no more than **2.0 m** (6.5 ft).
- All power cord sets must be approved by an acceptable accredited agency responsible for evaluation in the country or region where the power cord set will be used.
- The power cord sets must have a minimum current capacity of 10 amps and a nominal voltage rating of 125 or 250 V AC, as required by the power system of each country or region.
- The appliance coupler must meet the mechanical configuration of an EN 60 320/IEC 320 Standard Sheet C13 connector for mating with the appliance inlet on the back of the computer.

Requirements for specific countries and regions

Country/region	Accredited agency	Applicable note number
Australia	EANSW	1
Austria	OVE	1
Belgium	CEBC	1
Canada	CSA	2
Denmark	DEMKO	1
Finland	FIMKO	1
France	UTE	1
Germany	VDE	1
Italy	IMQ	1
Japan	METI	3
The Netherlands	KEMA	1
Norway	NEMKO	1
The People's Republic of China	CCC	5
South Korea	EK	4
Sweden	SEMKO	1
Switzerland	SEV	1
Taiwan	BSMI	4
The United Kingdom	BSI	1
The United States	UL	2

1. The flexible cord must be Type HO5VV-F, 3-conductor, 1.0-mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.
2. The flexible cord must be Type SPT-3 or equivalent, No. 18 AWG, 3-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15 A, 125 V) or NEMA 6-15P (15 A, 250 V) configuration.
3. The appliance coupler, flexible cord, and wall plug must bear a “T” mark and registration number in accordance with the Japanese Dentori Law. The flexible cord must be Type VCT or VCTF, 3-conductor, 1.00-mm² conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V) configuration.
4. The flexible cord must be Type RVV, 3-conductor, 0.75-mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.
5. The flexible cord must be Type VCTF, 3-conductor, 0.75-mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.

10

Recycling

Battery

When a battery has reached the end of its useful life, do not dispose of the battery in general household waste. Follow the local laws and regulations in your area for computer battery disposal.

Display

WARNING: The backlight contains mercury. Caution must be exercised when removing and handling the backlight to avoid damaging this component and causing exposure to the mercury.

CAUTION: The procedures in this chapter can result in damage to display components. The only components intended for recycling purposes are the liquid crystal display (LCD) panel and the backlight. When you remove these components, handle them carefully.

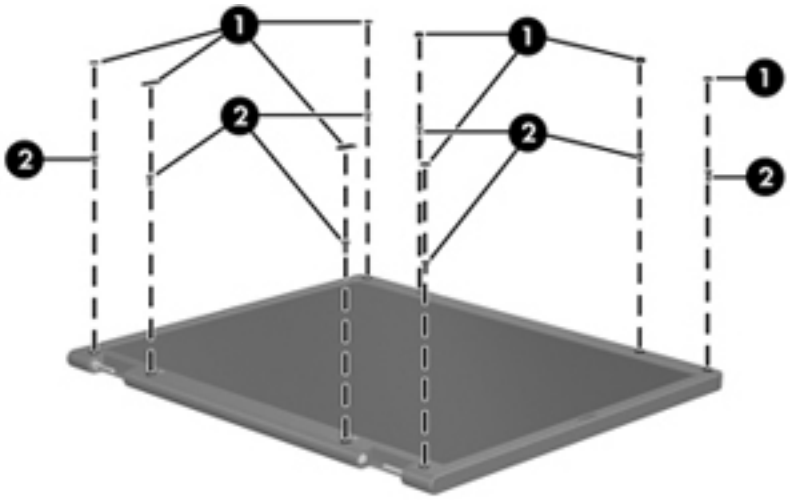
Materials Disposal. This HP product contains mercury in the backlight in the display assembly that might require special handling at end-of-life. Disposal of mercury may be regulated because of environmental considerations. For disposal or recycling information, contact your local authorities, or see the Electronic Industries Alliance (EIA) Web site at http://www.eiae.org.

This section provides disassembly instructions for the display assembly. The display assembly must be disassembled to gain access to the backlight ❶ and the liquid crystal display (LCD) panel ❷.

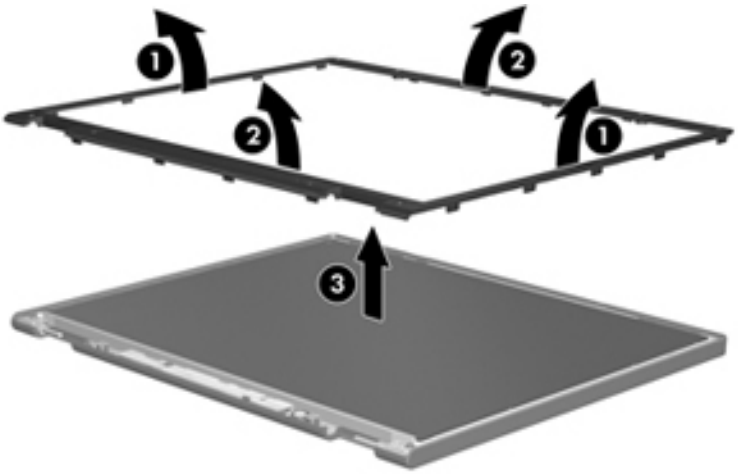
The procedures provided in this chapter are general disassembly instructions. Specific details, such as screw sizes, quantities, and locations, and component shapes and sizes, can vary from one computer model to another.

Perform the following steps to disassemble the display assembly:

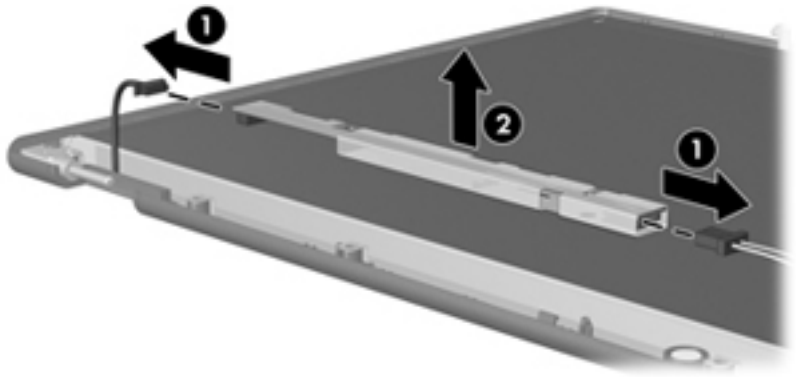
1. Remove all screw covers ❶ and screws ❷ that secure the display bezel to the display assembly.



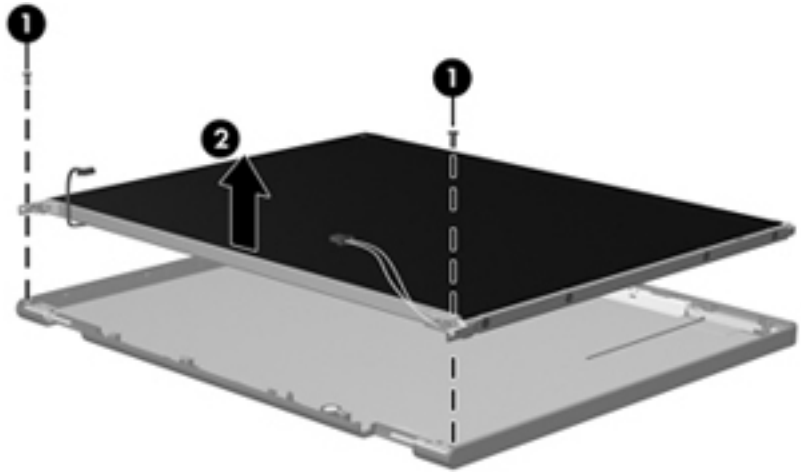
2. Lift up and out on the left and right inside edges ❶ and the top and bottom inside edges ❷ of the display bezel until the bezel disengages from the display assembly.
3. Remove the display bezel ❸.



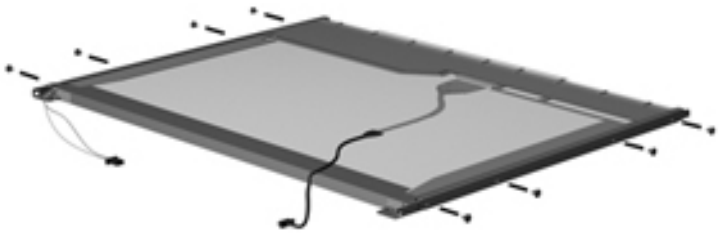
4. Disconnect all display panel cables ❶ from the display inverter and remove the inverter ❷.



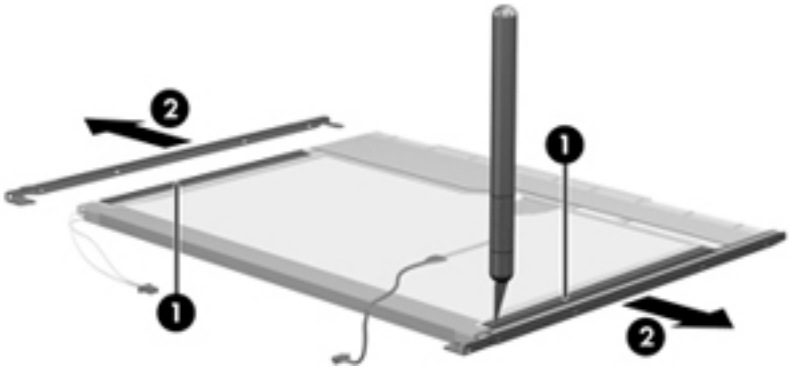
5. Remove all screws ❶ that secure the display panel assembly to the display enclosure.
6. Remove the display panel assembly ❷ from the display enclosure.



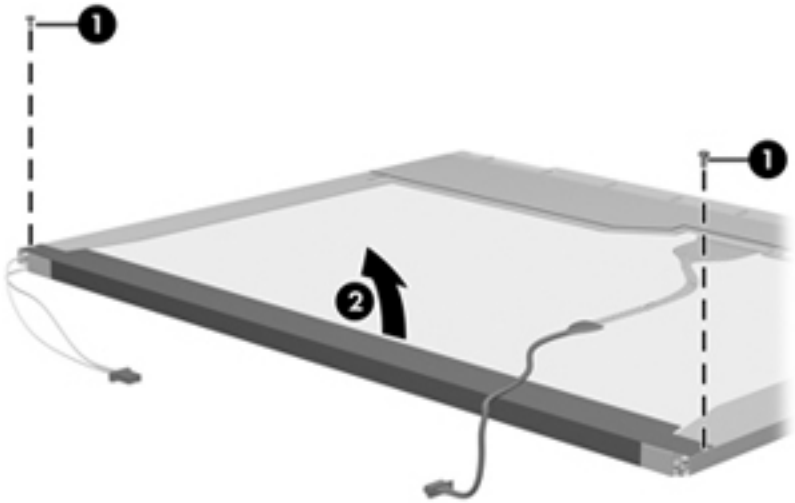
7. Turn the display panel assembly upside down.
8. Remove all screws that secure the display panel frame to the display panel.



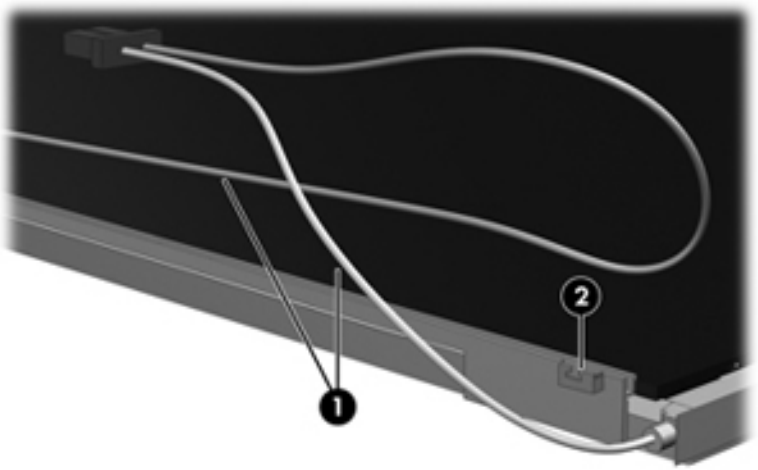
9. Use a sharp-edged tool to cut the tape ❶ that secures the sides of the display panel to the display panel frame.
10. Remove the display panel frame ❷ from the display panel.



11. Remove the screws ❶ that secure the backlight cover to the display panel.
12. Lift the top edge of the backlight cover ❷ and swing it outward.

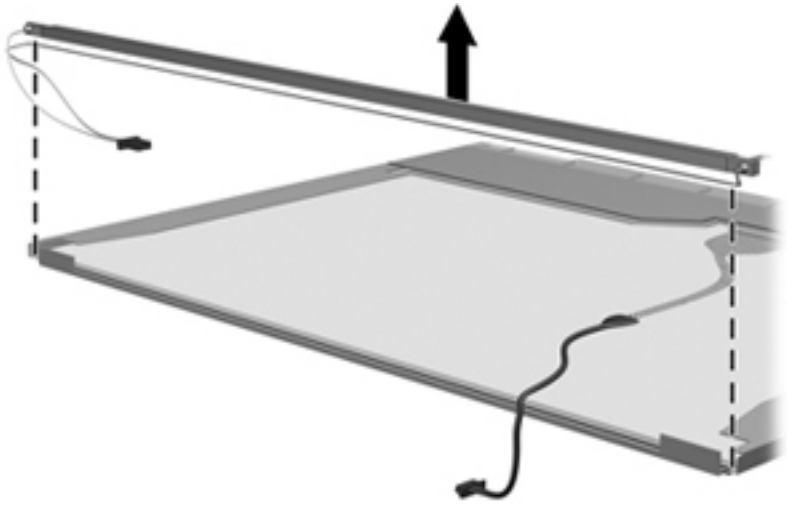


13. Remove the backlight cover.
14. Turn the display panel right-side up.
15. Remove the backlight cables ❶ from the clip ❷ in the display panel.

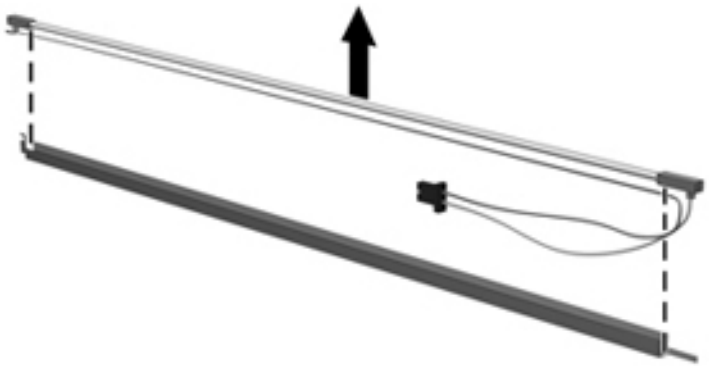


16. Turn the display panel upside down.
17. Remove the backlight frame from the display panel.

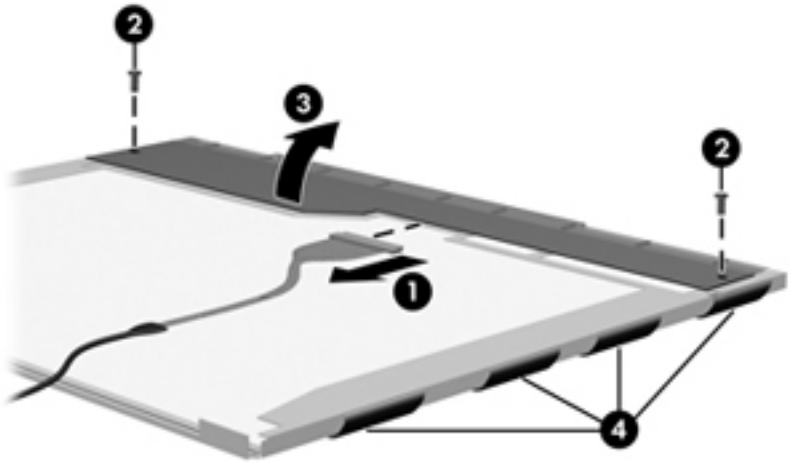
WARNING: The backlight contains mercury. Exercise caution when removing and handling the backlight to avoid damaging this component and causing exposure to the mercury.



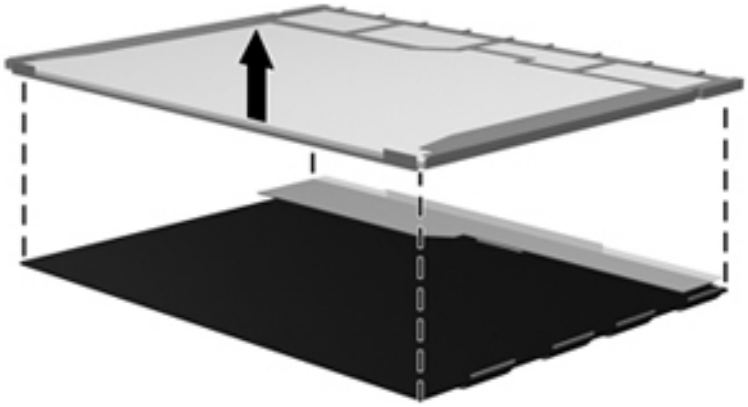
18. Remove the backlight from the backlight frame.



19. Disconnect the display cable ❶ from the LCD panel.
20. Remove the screws ❷ that secure the LCD panel to the display rear panel.
21. Release the LCD panel ❸ from the display rear panel.
22. Release the tape ❹ that secures the LCD panel to the display rear panel.



23. Remove the LCD panel.



24. Recycle the LCD panel and backlight.

Index

1394a port
  location 2–12
  pin assignments 8–2
A
AC adapter, spare part number 3–13
accessory battery connector 2–13
ambient light sensor/connector board
  illustrated 3–8
  spare part number 3–3, 3–8, 4–27
AMT options 5–7, 5–13, 5–19
antenna
  disconnecting 4–13, 4–15
  location 2–3
  removal 4–34
  spare part number 4–27
  WLAN product description 1–3
  WWAN product description 1–3
Anti-Theft Protection 5–4, 5–10, 5–16
audio, product description 1–4
Audio/ExpressCard board
  removal 4–44
  spare part number 3–5, 4–44
audio-in jack
  location 2–12
  pin assignments 8–1
audio-out jack
  location 2–12
  pin assignments 8–1
B
base enclosure, spare part number 3–5
battery
  bay 2–13
  light 2–8, 2–10
  release latch 2–13
  removal 4–7
  spare part number 3–5, 4–7
bays
  battery 2–13
  hard drive 2–13
  upgrade drive 1–3, 2–12, 3–6
BIOS administrator password 5–3, 5–10, 5–16
Bluetooth module
  compartment 2–10
  removal 4–46
  spare part number 3–7, 4–46
Bluetooth module cable
  illustrated 3–10
  removal 4–48
  spare part number 3–4
Bluetooth module compartment cover
  illustrated 3–11
  removal 4–47
  spare part number 3–4
Blu-ray R/RE DVD±RW SuperMulti Drive
  precautions 4–2
  removal 4–20
  spare part number 3–6, 3–12, 4–20
  specifications 6–5
Blu-ray ROM with LightScribe DVD±RW Super-Multi DL Drive
  precautions 4–2
  removal 4–20
  spare part number 3–6, 3–12, 4–20
  specifications 6–6
boot options 5–5, 5–11, 5–17
boot order 5–5, 5–11, 5–17
bottom components 2–13
built-in device options 5–6, 5–12, 5–13, 5–18, 5–19
business card holder 2–13
buttons
  Caps lock 2–5
  display release 2–10
  Num lock 2–5
  pointing stick 2–7
  power 2–4
  QuickLook 2–4
  QuickWeb 2–4
  TouchPad 2–5, 2–7
  volume down 2–5
  volume mute 2–5
  volume up 2–5

wireless 2–4
C
cable kit
contents 3–10
spare part number 3–4
cables, service considerations 4–1
Caps lock
button 2–5
light 2–9
compartments
memory module 2–13
wireless modules 2–13
components
bottom 2–13
buttons 2–4
display 2–2, 2–3
fingerprint reader 2–4
front 2–10
keys 2–6
left-side 2–12
lights 2–8
pointing device 2–7
rear 2–11
right-side 2–12
switches 2–4
computer feet
locations 4–6
spare part number 4–6
Computer Setup
File menu 5–3, 5–9, 5–15
Security menu 5–3, 5–10, 5–16
System Configuration menu 5–5, 5–11, 5–17
computer, specifications 6–1
connectors
1394a 2–12
accessory battery 2–13
audio in 2–12
audio out 2–12
DisplayPort 2–11
docking 2–13
eSATA 2–12
monitor 2–11
power 2–11
RJ-11 (modem) 2–12
RJ-45 (network) 2–12
service considerations 4–1
USB 2–12
D
device configurations 5–5, 5–6, 5–11, 5–12, 5–17, 5–18
digital card 1–4
Disk Sanitizer 5–4, 5–11, 5–17
diskette drive, product description 1–3
display
removal 4–27
spare part number 3–3, 4–27
specifications 6–2
display back cover
illustrated 3–9
spare part number 3–3, 3–9, 4–27, 4–34
display bezel
illustrated 3–8
removal 4–31
spare part number 3–3, 3–8, 4–27, 4–31
display cable
illustrated 3–8
removal 4–34
spare part number 3–3, 3–8, 4–27, 4–34
display components
illustrated 2–2, 2–3
recycling 10–1
display hinge covers
removal 4–33
spare part number 3–3, 4–27
display hinges
illustrated 3–8
removal 4–32
spare part number 3–3, 3–8, 4–27, 4–33
display inverter, removal 10–3
display panel
illustrated 3–8
removal 4–32
display release button 2–10
display switch, location 2–2
DisplayPort
location 2–11
pin assignments 8–3
docking connector 2–13
drive light 2–8, 2–10
DriveLock
automatic 5–4, 5–11, 5–17
password 5–4, 5–10, 5–16
drives, boot order 5–5, 5–11, 5–17
DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe
precautions 4–2
removal 4–20
spare part number 3–6, 3–12, 4–20

specifications 6–7
DVD-ROM Drive
precautions 4–2
removal 4–20
spare part number 3–6, 3–12, 4–20
specifications 6–8
E
electrostatic discharge 4–2
equipment guidelines 4–4
eSATA/USB
connector 2–12
pin assignments 8–6
esc key 2–6
Ethernet, product description 1–3
expansion memory compartment cover, illustrated 3–11
expansion memory module 4–16
removal 4–16
spare part number 3–6
ExpressCard slot 2–12
ExpressCard slot bezel, illustrated 3–11
external monitor port
location 2–11
pin assignments 8–2
F
fan
removal 4–35
spare part number 3–4, 4–35
feet
locations 4–6
spare part number 4–6
File menu 5–3, 5–9, 5–15
Fingerprint reader 2–5
fn key 2–6
front components 2–10
function keys 2–6
G
graphics subsystem, product description 1–1
grounding equipment and methods 4–2
H
hard drive
illustrated 3–12
precautions 4–2
product description 1–2
removal 4–9
spare part number 3–6, 4–9
specifications 6–3
upgrade bay 3–6
hard drive bay 2–13
hard drive bay cover
illustrated 3–11
removal 4–9
spare part number 3–4
hard drive bracket, removal 4–10
headphone jack, location 2–12
heat sink
removal 4–35
spare part number 3–4, 4–35
hinge covers
removal 4–33
spare part number 3–3, 4–27
hinges
removal 4–32
spare part number 3–3, 4–27, 4–33
HP SpareKey Enrollment 5–4, 5–10, 5–16
I
internal display switch 2–4
J
jacks
audio out 2–12
audio-in 2–12
audio-out 2–12
headphone 2–12
microphone 2–12
modem 2–12
network 2–12
RJ-11 (modem) 2–12
RJ-45 (network) 2–12
K
key components 2–6
keyboard
product description 1–4
removal 4–22
spare part number 3–3, 4–22
keyboard light button, location 2–2
keyboard light, location 2–2
keys
esc 2–6
fn 2–6
function 2–6
numeric keypad 2–6
Windows applications 2–6
Windows logo 2–6
L
language, changing in Computer Setup 5–5, 5–11, 5–17
left-side components 2–12
light components 2–8

lights
battery 2–8, 2–10
Caps lock 2–9
drive 2–8, 2–10
Num lock 2–9
power 2–8, 2–10
QuickLook 2–8
QuickWeb 2–8
TouchPad 2–8
volume down 2–9
volume mute 2–9
volume up 2–9
wireless 2–8, 2–10
M
mass storage devices
illustrated 3–12
spare part number 3–6
memory module
product description 1–2
removal 4–16
spare part number 4–16
memory module compartment 2–13
memory module compartment cover
removal 4–16
spare part number 3–4
microphone
locations 2–2
product description 1–3
removal 4–34
spare part number 3–9, 4–27
microphone jack
location 2–12
pin assignments 8–1
model name 4–5
model number 3–1
modem jack, location 2–12
modem module
product description 1–3
removal 4–49
spare part number 3–5, 4–49
modem module cable
illustrated 3–10
removal 4–52
spare part number 3–4
monitor port
location 2–11
pin assignments 8–2
N
network jack
location 2–12
pin assignments 8–4
Num lock
button 2–5
light 2–9
numeric keypad keys 2–6
O
optical drive
illustrated 3–12
precautions 4–2
product description 1–2
removal 4–20
spare part number 3–6, 4–20
specifications 6–6, 6–7, 6–8
optical drive bracket, removal 4–21
optical drive kit 3–6
P
packing guidelines 4–3
passwords 5–3, 5–10, 5–16
pin assignments
audio-in 8–1
audio-out 8–1
headphone 8–1
microphone 8–1
modem 8–4
monitor port 8–2
network 8–4
RJ-11 (modem) 8–4
RJ-45 (network) 8–4
Universal Serial Bus (USB) port 8–4
plastic parts 4–1
plastics kit
content 3–11
contents 3–11
spare part number 3–4
pointing device
components 2–7
illustrated 2–7
product description 1–4
pointing stick 2–7
pointing stick button 2–7
port options 5–6, 5–13, 5–19
ports
1394a 2–12
DisplayPort 2–11
external monitor 2–11
USB 2–12
power
button 2–4

light 2–8
power button board
removal 4–26
spare part number 3–3, 4–26
power connector 2–11
power cord
requirements 9–1
spare part number 3–13
power light, front 2–10
power requirements, product description 1–4
primary memory module
removal 4–18
spare part number 3–5
processor
product description 3–5, 4–40
removal 4–40
spare part number 3–5, 4–40
product description
audio 1–3
diskette drive 1–3
display panel 1–1
docking 1–4
external media card 1–4
hard drives 1–2
keyboard 1–4
memory 1–2
microphone 1–3
modem 1–3
operating system 1–5
optical drives 1–2
pointing devices 1–4
ports 1–4
power requirements 1–4
processor 1–1
security 1–5
serviceability 1–7
upgrade hard drive bay 1–3
webcam 1–3
wireless 1–3
product name 1–1, 4–5
Q
QuickLook
button 2–4
light 2–8
QuickWeb
button 2–4
light 2–8
R
rear components 2–11
recovery, system 7–1
recycling
battery 10–1
display components 10–1
removal/replacement
preliminaries 4–1
procedures 4–5
restoring factory settings 5–3, 5–10, 5–16
restoring security defaults 5–7, 5–13, 5–19
right-side components 2–12
RJ-11 (modem) jack
location 2–12
pin assignments 8–4
spare part number 3–4, 3–10
RJ-45 (network) jack
location 2–12
pin assignments 8–4
RTC battery
removal 4–39
spare part number 3–5, 4–39
rubber kit, spare part number 3–13, 4–6
S
screw kit
contents 3–13
spare part number 3–13
screw location
Phillips
M2.0 × 2.0 broadhead 4–23
M2.0 × 3.0 4–26
M2.0 × 4.0 4–21, 4–44, 4–47, 4–49, 4–51
M2.0 × 4.0 broadhead 4–44
M2.0 × 5.0 4–9, 4–12, 4–14
M2.0 × 5.0 captive 4–16
M2.5 × 10.0 4–20
M2.5 × 10.0 captive 4–10, 4–18, 4–23, 4–37
M2.5 × 3.0 4–33, 4–42
M2.5 × 4.0 4–13, 4–15, 4–45, 4–51
M2.5 × 5.0 4–32
M3.0 × 3.0 4–10
Torx
T8 M2.5 × 6.0 4–23, 4–42
SD Card Reader 2–10
security cable slot 2–11
security level, setting 5–7, 5–13, 5–19
Security menu 5–3, 5–10, 5–16
always prompt for HP SpareKey enrollment 5–4, 5–10, 5–16
Anti-Theft Protection 5–4, 5–10, 5–16

Automatic DriveLock 5–4, 5–11, 5–17
change password 5–4, 5–10, 5–16
Disk Sanitizer 5–4, 5–11, 5–17
DriveLock 5–4, 5–10, 5–16
fingerprint reader ownership reset 5–4, 5–10, 5–16
HP SpareKey 5–4, 5–10, 5–16
HP SpareKey enrollment 5–4, 5–10, 5–16
password policy 5–4, 5–10, 5–16
set up BIOS administrator password 5–3, 5–10, 5–16
System IDs 5–4, 5–11, 5–17
TPM embedded security 5–4, 5–11, 5–17
user management 5–3, 5–10, 5–16
security, product description 1–5
serial number 3–1
service considerations 4–1
service tag
location 4–5
part number 4–5
serial number 4–5
serviceability, product description 1–7
SIM slot 2–13
SIM, removal 4–8
smartcard reader 2–12
solid state drive
illustrated 3–12
spare part number 3–6
specifications 6–4
spare part numbers, sequential listing 3–14
speakers 2–10
removal 4–45
spare part number 3–5, 4–45
specifications
Blu-ray R/RE DVD±RW SuperMulti Drive 6–5
Blu-ray ROM with LightScribe DVD±RW SuperMulti DL Drive 6–6
computer 6–1
display 6–2
DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe 6–7
DVD-ROM Drive 6–8
hard drive 6–3
IRQ, DMA, I/O, and memory addresses 6–9
optical drive 6–6, 6–7, 6–8
solid state drive 6–4
system resources 6–9
switch cover
removal 4–22
spare part number 3–3, 4–22
switch, internal display 2–4
system board
removal 4–50
spare part number 3–5, 4–50
System Configuration menu 5–5, 5–11, 5–17
system IDs 5–4, 5–11, 5–17
system recovery 7–1
T
tag, service 4–5
thermal heatshield, spare part number 3–13
thermal material 3–5
tools required 4–1
top cover
removal 4–42
spare part number 3–5, 4–42
TouchPad 2–7
button 2–5
light 2–8
TouchPad buttons 2–7
TouchPad scroll zone 2–7
TPM embedded security 5–4, 5–11, 5–17
U
Universal Serial Bus (USB) port
location 2–12
pin assignments 8–5
upgrade bay, hard drive option 3–6
upgrade drive bay 2–12
V
vents 2–12, 2–13
volume down button 2–5
volume down light 2–9
volume mute button 2–5
volume mute light 2–9
volume up button 2–5
volume up light 2–9
W
warranty period 4–5
webcam light, location 2–2
webcam module
removal 4–34
spare part number 4–34
webcam, location 2–2
Windows applications key 2–6
Windows logo key 2–6
wireless
antenna

disconnecting 4–13, 4–15
location 2–3
product description 1–1, 1–3
removal 4–34
spare part number 3–9
button 2–4
light 2–8, 2–10
module compartment 2–13
module compartment cover
illustrated 3–11
removal 4–12, 4–14
spare part number 3–4
WLAN module
illustrated 3–6
removal 4–11
spare part number 3–6, 4–11
WLAN module compartment cover
removal 4–14
spare part number 3–4
workstation guidelines 4–4
WWAN module
removal 4–14
spare part number 3–7, 4–14
WWAN module compartment cover
removal 4–14
spare part number 3–4