HP ProBook 5330m Notebook PC

Maintenance and Service Guide

SUMMARY

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 2011 Hewlett-Packard Development Company, L.P.

Bluetooth is a trademark owned by its proprietor and used by Hewlett-Packard Company under license. Intel, Core, and Centrino are trademarks of Intel Corporation in the U.S. and other countries. Microsoft and Windows 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.

First Edition: May 2011

Document Part Number: 637952-001

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).

Table of contents

1 Product description 1

2 External component identification 6

Top 6

TouchPad 6

Lights 7

Buttons and fingerprint reader 8

Keys 10

Front 11

Right 12

Left 13

Display 14

Bottom 15

3 Illustrated parts catalog 16

Serial number label location 16

Computer major components 17

Display assembly components 21

Plastics Kit 22

Cable Kit 23

Mass storage devices 24

Miscellaneous parts 25

Sequential part number listing 26

4 Removal and replacement procedures 30

Preliminary replacement requirements 30

Tools required 30

Service considerations 30

Plastic parts 30

Cables and connectors 31

Drive handling 31

Grounding guidelines 32

Electrostatic discharge damage 32

Packaging and transporting guidelines 33

Workstation guidelines 33

Equipment guidelines 34

Component replacement procedures 35
Service tag 35
Battery 36
Service access cover 38
SIM 39
Memory module 40
WLAN module 41
WWAN module 44
Hard drive 47
Keyboard 50
Fan 53
Top cover 55
Power button board 59
Activity button board 60
Audio board 61
Bluetooth module 62
RTC battery 64
Speakers 65
System board 66
Heat sink 68
Power connector cable 70
Display panel 72
Display assembly 75

5 Computer Setup 80
Computer Setup in Windows 7 80
Starting Computer Setup 80
Using Computer Setup 80
Navigating and selecting in Computer Setup 80
Restoring factory settings in Computer Setup 81
Computer Setup menus 82
File menu 82
Security menu 83
System Configuration menu 83
Computer Setup in Windows Vista 87
Starting Computer Setup 87
Using Computer Setup 87
Navigating and selecting in Computer Setup 87
Restoring factory settings in Computer Setup 88
Computer Setup menus 89
File menu 89

Security menu 90
System Configuration menu 90
Computer Setup in Linux 94
Starting Computer Setup 94
Using Computer Setup 94
Navigating and selecting in Computer Setup 94
Restoring factory settings in Computer Setup 95
Computer Setup menus 95
File menu 95
Security menu 96
Diagnostics menu 96
System Configuration menu 97

6 Specifications 99
Computer specifications 99
33.8 cm (13.3 in) display specifications 100
Hard drive specifications 101

7 Backup and recovery 102
Windows 7 backup and recovery 102
Backing up your information 102
Performing a recovery 103
Using the Windows recovery tools 104
Using f11 104
Using a Windows 7 operating system DVD (purchased separately) 105
Windows Vista backup and recovery 105
Backing up your information 106
Performing a recovery 107
Using the Windows recovery tools 107
Using f11 recovery tools 108
Using a Windows Vista operating system DVD (purchased separately) 108
Linux backup and recovery 109

8 Power cord set requirements 110
Requirements for all countries and regions 110
Requirements for specific countries and regions 110

9 Recycling 112
Battery 112
Display 112

Index 118

1 Product description

Category	Description
Product Name	HP ProBook 5330m Notebook PC
Processors	**Intel® Core™ processors**
	• Intel Core i3-2310M, Dual-Core, 2.10 GHz, 3 MB L3 cache, 4 threads (35 W)
	• Intel Core i5-2520M, Dual-Core, 2.50 GHz (Turbo up to 3.20 GHz), 3 MB L3 cache, 4 threads (35 W)
Chipset	Mobile Intel QM67
Graphics	Intel HD Graphics 3000 Universal Memory Architecture (UMA) graphics subsystem integrated with shared video memory (dynamically allocated)
Panels	All display panel assemblies support privacy filter
	LED backlight
	33.8 cm (13.3 in) High-Definition (HD) AntiGlare LED display (1280x800) with webcam
Memory	2 customer-accessible/upgradable SODIMM memory module slots
	Supports dual-channel memory
	Supports up to 8 GB of system memory
	DDR3 PC3-10600 SDRAM (1333 MHz)
	Supports the following configurations: • 8192-MB total system memory (4096-MB × 2, dual-channel) • 6144-MB total system memory (4096-MB + 2048-MB, dual channel) • 4096-MB total system memory (4096-MB × 1) • 4096-MB total system memory (2048-MB × 2, dual-channel) • 3072-MB total system memory (2048-MB + 1024-MB, dual-channel) • 2048-MB total system memory (2048-MB × 1)
Hard drives	Supports **9.5-mm or 7mm, 6.35 cm** (2.50 in) hard drives
	Customer-accessible
	Serial ATA (SATA)

Category	Description
	Supports the following hard drives: • 500 GB, 7200-rpm • 320 GB Self-Encrypting Drive (SED), 7200-rpm • 320 GB, 7200-rpm • 250 GB, 7200-rpm Supports the following solid-state drive: • 128 GB
	HP 3D DriveGuard (not available with Linux)
Audio/Visual	Beats audio
	Integrated microphone (dual-array)
	Two stereo speakers
	Integrated 720p webcam
Ethernet	10/100/1000 Ethernet network interface card (NIC)
	S3/S4/S5 wake on LAN (AC only mode)
Wireless	**Integrated WLAN options by way of wireless module**
	Support for the following WLAN formats: • Broadcom 43224 802.11a/b/g/n WiFi Adapter • Broadcom 4313 802.11b/g/n 1x1 WiFi Adapter • Intel Centrino® Advanced N 6205 802.11a/b/g/n, 2x2 WiFi Adapter
	2 WLAN antennas built into display assembly
	Support for no-WLAN option
	Integrated personal area network (PAN) options by way of Bluetooth® module:
	Support for no-WPAN option
	HP Integrated Module with Bluetooth 2.1 Wireless Technology
	Integrated WWAN options by way of WWAN module (not available with Linux)
	HP un2430 EV-DO/HSPA Mobile Broadband Module (select models only)
	HP hs2340 HSPA+ Mobile Broadband Module
	Support for no-WWAN option
	Subscriber identity module (SIM) security (customer-accessible in battery bay)
External media cards	Integrated SD flash media slot supporting Secure Digital (SD) and MultiMediaCard (MMC)
Ports	Audio in/Audio-out (stereo microphone/headphone)
	RJ-45 (Ethernet, includes link and activity lights)
	USB 2.0 (2), one with USB charging
	Combo eSATA/USB 2.0 (1)

Category	Description
	HDMI
	VGA (Dsub 15-pin) supporting 1600×1200 external resolution at 75 GHz (hot plug/unplug with auto-detect)
	Multi-pin AC power
Keyboard and pointing devices	Backlit keyboard with TouchPad
	TouchPad with 2 TouchPad buttons and vertical scrolling (taps and gestures enabled as default)
Power requirements	65-W AC adapter with localized cable plug support (3-wire plug with ground pin)
	4-cell, 41-Wh 2.8-Ah Li-ion battery
Security	Supports security lock
	Intel AT support
	Integrated fingerprint reader
	Full volume encryption
	TPM 100% attach
	HP face recognition
	Privacy filter
	Preboot authentication (password, smart card)
Operating systems	**Preinstalled operating systems:** • Windows Vista® Basic 32-bit with MS Basic (Japan only) • Windows® 7 Home Premium 32-bit with MS Basic (Japan only) • Windows 7 Home Premium 64-bit with MS Basic (Japan only) • Windows 7 Professional 32-bit with MS Basic (Japan only) • Windows 7 Professional 64-bit with MS Basic (Japan only) • FreeDos • SuSE Linux (SLED11)

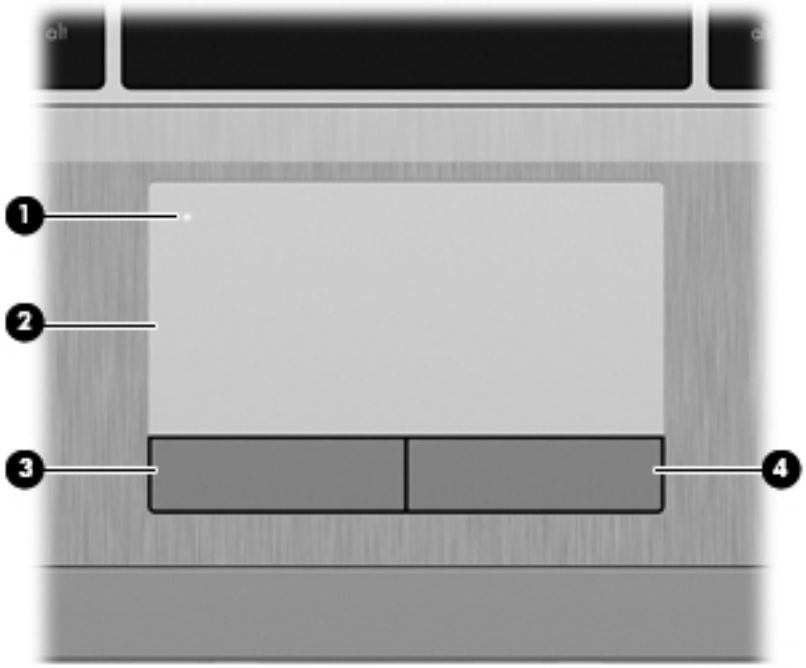
Category	Description
	Preinstalled Windows operating systems, plus Microsoft® Office: • Windows Vista Home Basic 32-bit with Office Starter (excludes Japan, selected localizations only) • Windows 7 Home Basic 32-bit with Office Starter (selected localizations only) • Windows 7 Home Basic 64-bit with Office Starter (selected localizations only) • Windows 7 Home Premium 32-bit with Office 2010 Starter (excludes Japan) • Windows 7 Home Premium 32-bit with Office 2010 Personal (Japan only) • Windows 7 Home Premium 32-bit with Office 2010 Home & Business (Japan only) • Windows 7 Home Premium 32-bit with Office 2010 Professional (Japan only) • Windows 7 Home Pemium 64-bit with Office 2010 Starter (excludes Japan) • Windows 7 Home Premium 64-bit with Office 2010 Personal (Japan only) • Windows 7 Home Premium 64-bit with Office 2010 Home & Business (Japan only) • Windows 7 Home Premium 64-bit with Office 2010 Professional (Japan only) • Windows 7 Professional 32-bit with Office 2010 Starter (excludes Japan) • Windows 7 Professional 32-bit with Office 2010 Personal (Japan only) • Windows 7 Professional 32-bit with Office 2010 Home & Business (Japan only) • Windows 7 Professional 32-bit with Office 2010 Professional (Japan only) • Windows 7 Professional 64-bit with Office 2010 Starter (excludes Japan) • Windows 7 Professional 64-bit with Office 2010 Personal (Japan only) • Windows 7 Professional 64-bit with Office 2010 Home & Business (Japan only) • Windows 7 Professional 64-bit with Office 2010 Professional (Japan only)
	Restore media: • Windows 7 Home Basic 32-bit • Windows 7 Home Basic 64-bit • Windows 7 Home Premium 32-bit • Windows 7 Home Premium 64-bit • Windows 7 Professional 32-bit • Windows 7 Professional 64-bit • DRDVD Windows 7
	Certified: • Microsoft WHQL • SuSE Linux/Novell

Category	Description
	Web-only support: • Windows XP Professional 32-bit • Windows 7 Enterprise 32/64 • Windows 7 Ultimate
Serviceability	**End-user replaceable parts:** • Battery (system) • Memory module • WLAN module • WWAN module • Hard drive • Keyboard

2 External component identification

Top

TouchPad

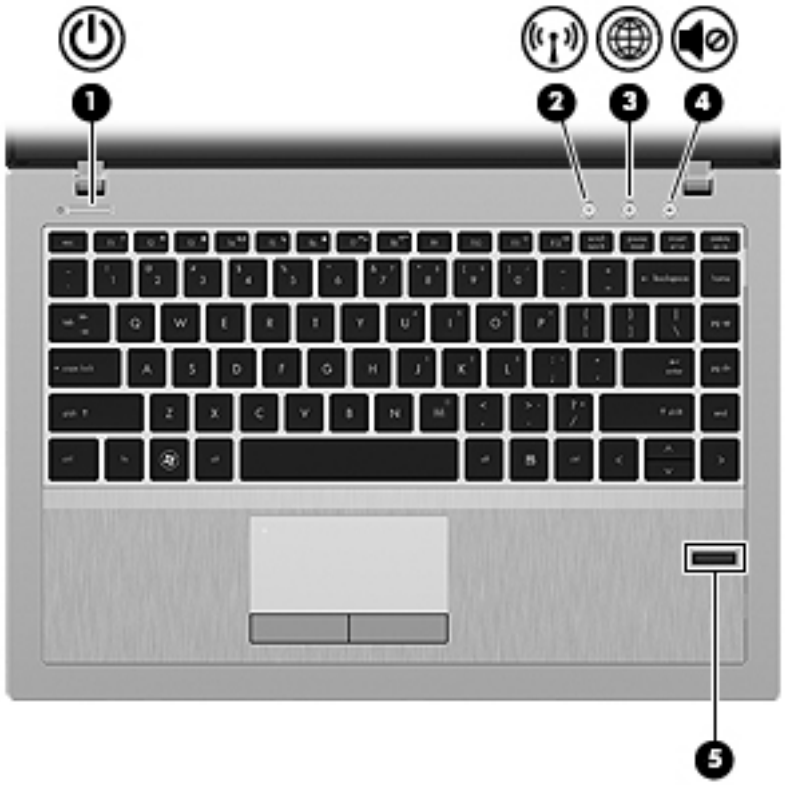


Component		Description
(1)	TouchPad on/off button	Turns the TouchPad on and off.
(2)	TouchPad	Moves the pointer and selects or activates items on the screen.
(3)	Left TouchPad button	Functions like the left button on an external mouse.
(4)	Right TouchPad button	Functions like the right button on an external mouse.

Lights

Component			Description
(1)		Power light	• On: The computer is on. • Blinking: The computer is in the Sleep (*Suspend* in Linux) state. • Off: The computer is off or in Hibernation.
(2)		Wireless light	• White: An integrated wireless device, such as a wireless local area network (WLAN) device and/or a Bluetooth® device, is on. • Amber: All wireless devices are off.
(3)		QuickWeb light	• On: The computer is on. • Blinking (in Linux): The Web browser is loading. • Off: The computer is off or in Hibernation. **NOTE:** For more Windows information, refer to the HP QuickWeb software Help.
(4)		Mute light	• Amber: Computer sound is off. • Off: Computer sound is on.
(5)		Caps lock light	On: Caps lock is on.
(6)		TouchPad light	• Amber: The TouchPad is off. • Off: The TouchPad is on.

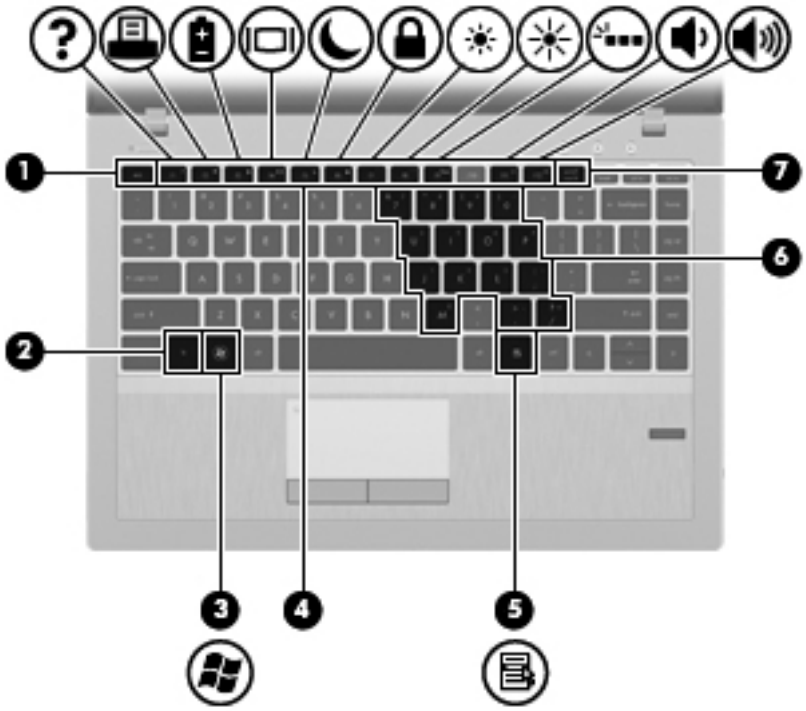
Buttons and fingerprint reader



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 briefly to initiate Sleep (*Suspend* in Linux). • When the computer is in the Sleep (*Suspend* in Linux) state, press the button briefly to exit Sleep (Suspend). • When the computer is in Hibernation, press the button briefly to exit Hibernation. If the computer has stopped responding and operating system shutdown procedures are ineffective, press and hold the power button for at least 5 seconds to turn off the computer. To learn more about your power settings: • **Windows 7**—Select **Start > Control Panel > System and Security > Power Options**. – or – **Windows Vista**—Select **Start > Control Panel > System and Maintenance > Power Options**. • Refer to the *HP Notebook Reference Guide*. – or – **Linux**—Select **Computer > Control Center**. In the left pane, click **System**, and then click **Power Management** in the right pane.

Component			Description
(2)		Wireless button	Turns the wireless feature on or off but does not establish a wireless connection.
(3)		QuickWeb button	In Windows: • When the computer is off or in Hibernation, press the button to open HP QuickWeb. • When the computer is in Microsoft Windows, press the button to open the default Web browser. • When the computer is in HP QuickWeb, press the button to open the default Web browser. **NOTE:** For more information, refer to the HP QuickWeb software Help. If your computer does not have HP QuickWeb software, the button does not perform any action or function. In Linux: • When the computer is on, press the button to open the default Web browser. **NOTE:** Pressing the QuickWeb button a second time opens a second browser window. • When the computer is off, in the Suspend state, or in Hibernation, the button does not perform any action or function.
(4)		Volume mute button	Mutes and restores speaker sound.
(5)		Fingerprint reader	Allows a fingerprint logon to the operating system, instead of a password logon.

Keys

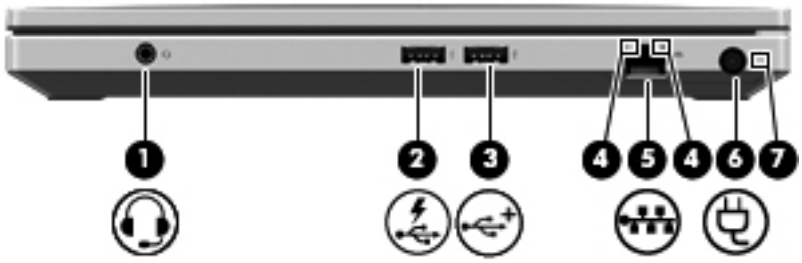


Component			Description
(1)		esc key	In Windows, displays system information when pressed in combination with the fn key.
(2)		fn key	In Windows, executes frequently used system functions when pressed in combination with a function key, the num lk key, or the esc key. In Linux, executes frequently used system functions when pressed in combination with a function key.
(3)		Windows logo key	In Windows, displays the Windows Start menu.
(4)		Function keys	Execute frequently used system functions when pressed in combination with the fn key.
(5)		Windows applications key	In Windows, displays a shortcut menu for items beneath the pointer.
(6)		Embedded numeric keypad	When the keypad is turned on, it can be used like an external numeric keypad. Each key on the keypad performs the function indicated by the icon in the upper-right corner of the key.
(7)		num lk key	Turns the embedded numeric keypad on and off when pressed in combination with the fn key.

Front

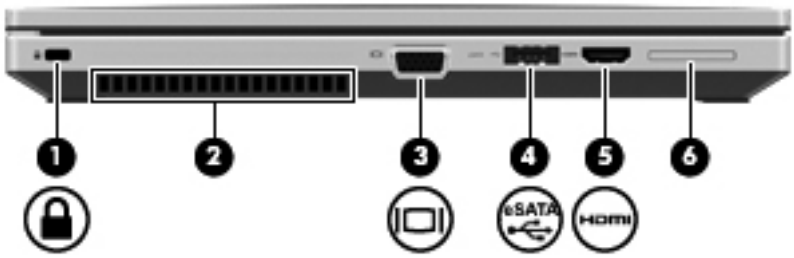
Component			Description
(1)		Power light	• On: The computer is on. • Blinking: The computer is in the Sleep (*Suspend* in Linux) state. • Off: The computer is off or in Hibernation.
(2)		Hard drive light	• Blinking white: The hard drive is being accessed. • Amber: HP 3D DriveGuard has temporarily parked the hard drive. **NOTE:** For information on HP 3D DriveGuard, refer to the *HP Notebook Reference Guide*.
(3)		Speakers (2)	Produce sound.

Right



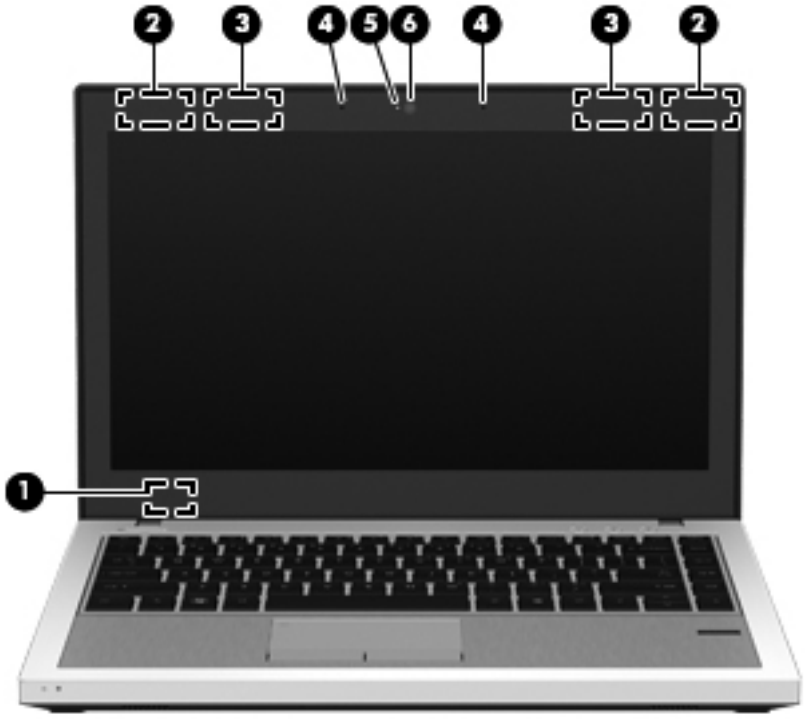
Component			Description
(1)		Audio-out (headphone) jack/Audio in (microphone) jack	Connects optional powered stereo speakers, headphones, earbuds, a headset, or television audio. Also connects an optional headset microphone. **WARNING!** To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, refer to the *Regulatory, Safety, and Environmental Notices*. **NOTE:** When a device is connected to the jack, the computer speakers are disabled. **NOTE:** Be sure that the device cable has a 4-conductor connector that supports both audio-out (headphone) and audio in (microphone).
(2)		Charging USB port	Connects an optional USB device and can also charge select models of cell phones and MP3 players, even when the computer is off.
(3)		Powered USB port	Connects a optional USB device and provides more current (up to 3 A) than a standard USB port (only up to 500mA).
(4)		RJ-45 (network) lights (2)	• Green (left): The network is connected. • Amber (right): The network is showing activity.
(5)		RJ-45 (network) jack	Connects a network cable.
(6)		Power connector	Connects an AC adapter.
(7)		Battery light	• Amber: The computer is connected to external power and the battery is charged from 0 to 90 percent. • White: The computer is connected to external power and the battery is charged from 90 to 99 percent. • 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: The battery is fully charged.

Left



Component		Description
(1)	Security cable slot	Attaches an optional security cable to the computer. **NOTE:** The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.
(2)	Vent	Enables airflow to cool internal components. **NOTE:** 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.
(3)	External monitor port	Connects an external VGA monitor or projector.
(4)	eSATA/USB port	Connects a high-performance eSATA component, such as an eSATA external hard drive, or connects an optional USB device.
(5)	HDMI port	Connects an optional video or audio device, such as a high-definition television, or any compatible digital or audio component.
(6)	Media Card Reader	Supports the following digital card formats: • MultiMediaCard • Secure Digital (SD) Memory Card

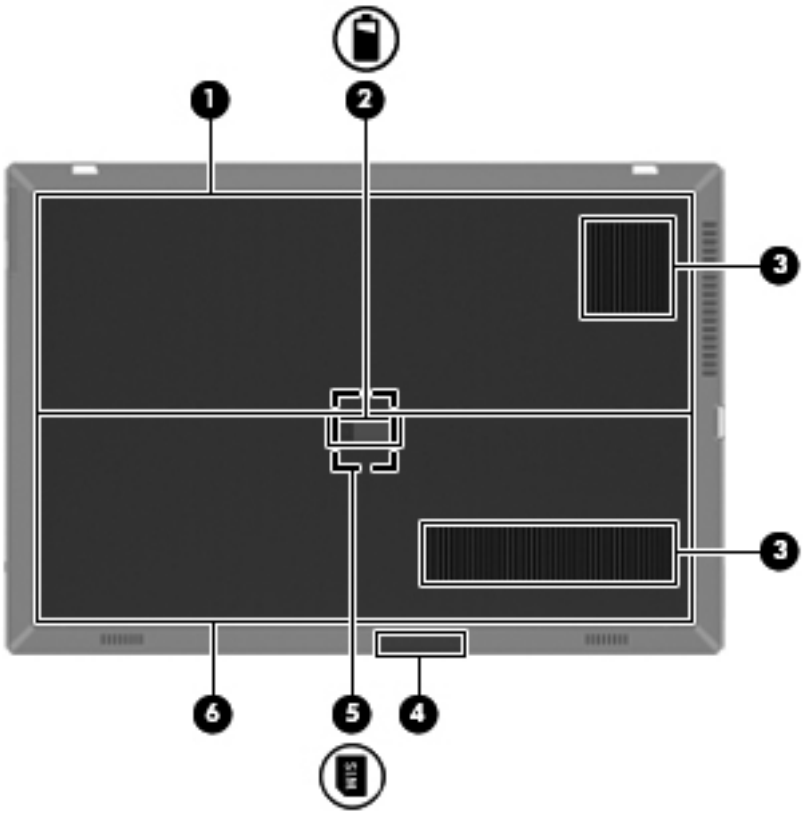
Display



Component		Description
(1)	Internal display switch	Turns off the display or initiates Sleep (*Suspend* in Linux) if the display is closed while the power is on. **NOTE:** The display switch is not visible from the outside of the computer.
(2)	WLAN antennas (2)*	Send and receive wireless signals to communicate with wireless local area networks (WLAN).
(3)	WWAN antennas (2)*	Send and receive wireless signals to communicate with wireless wide-area networks (WWAN).
(4)	Internal microphones (2)	Record sound.
(5)	Webcam light	On: The webcam is in use.
(6)	Webcam	Records video and captures still photographs.
		To use the webcam: • In Windows, select **Start > All Programs > HP > HP Webcam**. • In Linux, select **Computer > More Applications > Cheese**.

*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.

Bottom

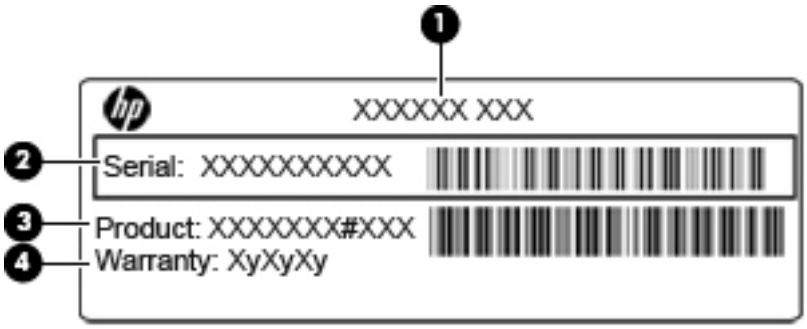


Component			Description
(1)		Battery bay	Holds the battery.
(2)		Battery cover release latch	Releases the battery cover over the battery bay.
(3)		Vents (2)	Enable airflow to cool internal components. **NOTE:** The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(4)		Bluetooth compartment	Contains a Bluetooth device.
(5)		SIM slot	Supports a wireless subscriber identity module (SIM). The SIM slot is located inside the battery bay.
(6)		Hard drive bay and wireless and memory module compartments	Holds the hard drive, the WLAN module slot, the WWAN module slot, and the memory module slots. **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.

3 Illustrated parts catalog

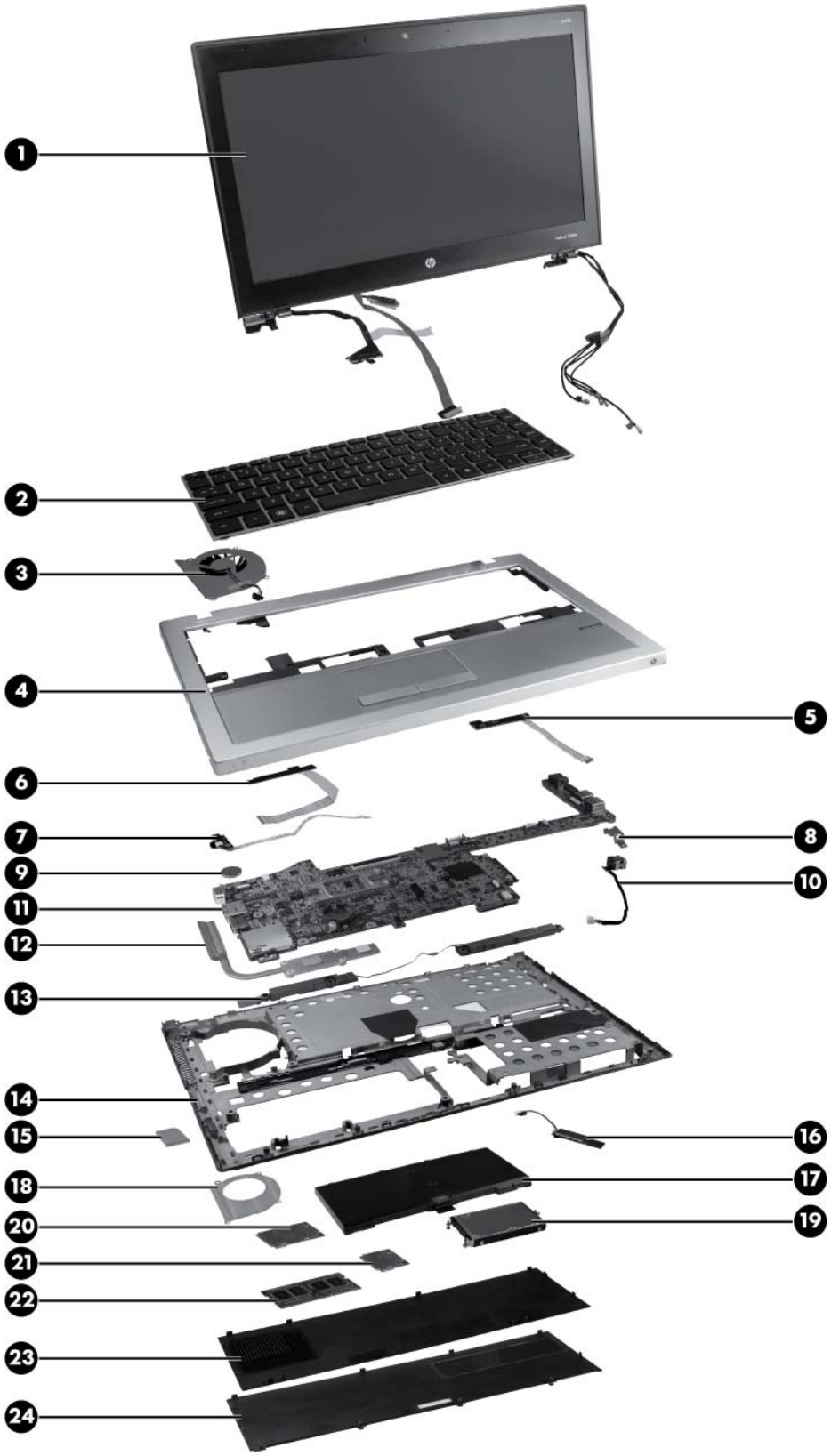
Serial number label location

When you order parts or request information, the serial number label, located inside the battery bay, provides important information that you may need when contacting technical support.



	Component	Description
(1)	Product name	The product name affixed to the front of your computer.
(2)	Serial number	An alphanumeric identifier that is unique to each product.
(3)	Product part number	The identifier that 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 duration of the warranty period for this computer.

Computer major components



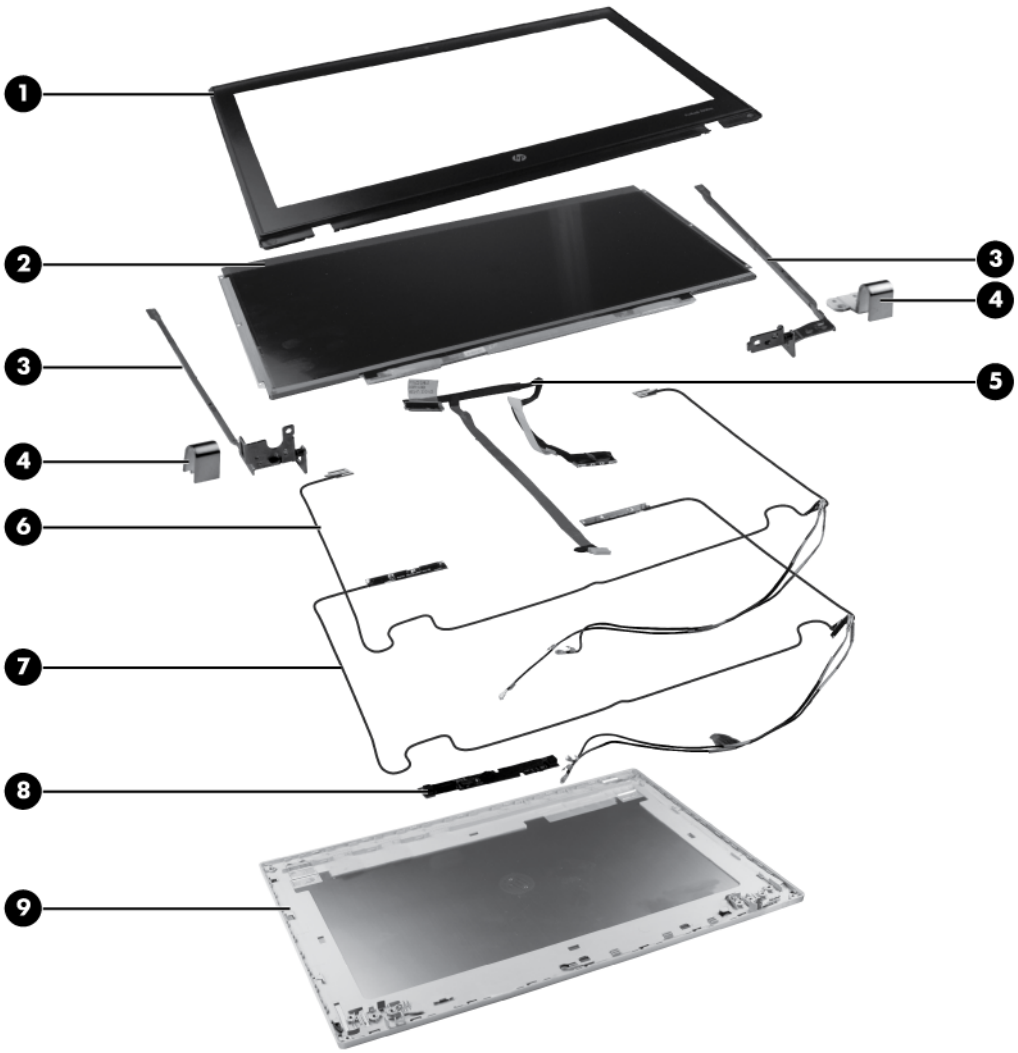
Item	Description	Spare part number
(1)	**33.8 cm (13.3 in) HD AntiGlare LED display** (1280x800) **NOTE:** The WLAN antennas and cables and the WWAN antennas and cables are included in the Antenna Kit, spare part number 650365-001.	650397-001
(2)	**Keyboard**	
	• For use in Adriatic countries	650377-BA1
	• For use in Africa–French/Arabic	650377-DW1
	• For use in Belgium	650377-A41
	• For use in Bulgaria	650377-261
	• For use in the Czech Republic and Slovakia	650377-A81
	• For use in Denmark	650377-081
	• For use in France	650377-051
	• For use in French Canada	650377-121
	• For use in Germany	650377-041
	• For use in Greece	650377-DJ1
	• For use in Hungary	650377-211
	• For use in Iceland	650377-DD1
	• For International use	650377-B31
	• For use in Israel	650377-BB1
	• For use in Italy	650377-061
	• For use in Japan	650377-291
	• For use in Latin America	650377-161
	• For use in Norway	650377-091
	• For use in Portugal	650377-131
	• For use in Russia	650377-251
	• For use in Saudi Arabia	650377-171
	• For use in South Korea	650377-AD1
	• For use in Spain	650377-071
	• For use in Sweden and Finland	650377-B71
	• For use in Switzerland	650377-BG1
	• For use in Taiwan	650377-AB1
	• For use in Thailand	650377-281
	• For use in Turkey	650377-141
	• For use in the United Kingdom	650377-031
	• For use in the United States	650377-001
(3)	**Fan**	650371-001

Item	Description	Spare part number
(4)	**Top cover**	
	• With fingerprint reader	651761-001
	• Without fingerprint reader	650404-001
(5)	**Power button board** (includes cable)	650392-001
(6)	**Activity button board** (includes cable)	650393-001
(7)	**Audio board** (includes cable)	650394-001
(8)	**Power connector bracket** (included with the power connector cable)	
(9)	**RTC battery**	650398-001
(10)	**Power connector cable** **NOTE:** The power connector cable is included in the Cable Kit, spare part number 650369-001. See Cable Kit on page 23 for more Cable Kit spare part information.	
(11)	**System board** (includes processor and replacement thermal material)	
	• Includes Intel Core i3-2310M, Dual-Core, 2.10 GHz, 3 MB L3 cache, 4 threads (35 W)—for all countries except Russia and the People's Republic of China	650402-001
	• Includes Intel Core i5-2520M, Dual-Core, 2.50 GHz (Turbo up to 3.20 GHz), 3 MB L3 cache, 4 threads (35 W)—for all countries except Russia and the People's Republic of China	650403-001
	• Includes Intel Core i3-2310M, Dual-Core, 2.10 GHz, 3 MB L3 cache, 4 threads (35 W)—for Russia and the People's Republic of China only	656796-001
	• Includes Intel Core i5-2520M, Dual-Core, 2.50 GHz (Turbo up to 3.20 GHz), 3 MB L3 cache, 4 threads (35 W)—for Russia and the People's Republic of China only	656797-001
(12)	**Heat sink**	650372-001
(13)	**Speakers**	650400-001
(14)	**Base enclosure**	650367-001
(15)	**SD Card blank** **NOTE:** The SD Card blank is included in the Plastics Kit, spare part number 650395-001. See Plastics Kit on page 22 for more Plastics Kit spare part information.	
(16)	**Bluetooth module** (select models only) **NOTE:** The Bluetooth module spare part kit does not include a Bluetooth module cable. The Bluetooth module cable is included in the Cable Kit, spare part number 650369-001. See Cable Kit on page 23 for more Cable Kit spare part information.	537921-001
(17)	**Battery** (4-cell, 41 Wh, 2.8 Ah, Li-on)	635146-001
(18)	**Fan plate** **NOTE:** The fan plate is included with the fan kit, spare part number 650371-001.	
(19)	**SATA 6.35 cm (2.50 in) hard drive** **NOTE:** The hard drive bracket is included in the Hard Drive Hardware Kit, spare part number 650373-001.	
	9.5 mm hard drives	
	• 500 GB, 7200-rpm	634925-001
	• 320 GB, 7200-rpm, Self Encrypting	626978-001

Item	Description	Spare part number
	• 320 GB, 7200-rpm	641672-001
	• 250 GB, 7200-rpm	635225-001
	7-mm hard drives	
	• 320 GB, 7200-rpm Self Encrypting	641674-001
	• 320 GB, 7200-rpm	634862-001
	• 250 GB, 7200-rpm	634861-001
	Solid-state drive	
	• 128 GB	650401-001
(20)	**WWAN module** (not available with Linux)	
	HP hs2340 HSPA+ Mobile Broadband Module	632155-001
	HP un2430 EV-DO/HSPA Mobile Broadband Module	634400-001
(21)	**WLAN module**	
	Broadcom 4313 802.11b/g/n 1x1 WiFi Adapter for use in Australia, Bangladesh, Bhutan, Brunei, Cambodia, East Timor, Fiji, Hong Kong, India, Indonesia, Japan, Kiribati, Laos, Malaysia, Maldives, Marshall Islands, Micronesia, Nauru, Nepal, New Zealand, Pakistan, Palau, Papua New Guinea, the People's Republic of China, the Philippines, Samoa, Singapore, Solomon Islands, South Korea, Sri Lanka, Taiwan, Thailand, Tonga, Tuvalu, and Vietnam	593836-001
	Broadcom 43224 802.11a/b/g/n WiFi Adapter for use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States	582564-001
	Broadcom 43224 802.11a/b/g/n WiFi Adapter for use in Albania, Algeria, Angola, Argentina, Australia, Austria, Bahrain, Bangladesh, Belarus, Belgium, Benin, Bolivia, Botswana, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, Colombia, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, Dominican Republic, Ecuador, Egypt, El Salvador, Equitorial Guinea, Estonia, Finland, France, Gabon, Gambia, Germany, Ghana, Gibraltar, Greece, Guinea, Guinea-Bissau, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Italy, the Ivory Coast, Japan, Grenada, Guatemala, Guyana, Honduras, Jordan, Kenya, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Liberia, Liechtenstein, Lithuania, Luxembourg, Madagascar, Malaysia, Mali, Mauritania, Mauritius, Mexico, Morocco, Mozambique, Namibia, Nepal, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Panama, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Puerto Rico, Qatar, Romania, Russia, Rwanda, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia and Montenegro, Sierra Leone, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sri Lanka, Suriname, Sweden, Switzerland, Taiwan, Tanzania, Thailand, Togo, Tunisia, Turkey, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Venezuela, Vietnam, Yemen, and Zimbabwe	582564-002
	Intel Centrino® Advanced N 6205 802.11a/b/g/n, 2x2 WiFi Adapter	631954-001
(22)	**Memory module** (DDR3 PC3-10600 SDRAM, 1333 MHz, shared)	
	4096 MB	621568-001
	2048 MB	581096-001
	1024 MB	639736-001

Item	Description	Spare part number
(23)	**Service access cover** **NOTE:** The service access cover is included in the Plastics Kit, spare part number 650395-001. See Plastics Kit on page 22 for more Plastics Kit spare part information.	
(24)	**Battery cover** **NOTE:** The battery cover is included in the Plastics Kit, spare part number 650395-001. See Plastics Kit on page 22 for more Plastics Kit spare part information.	

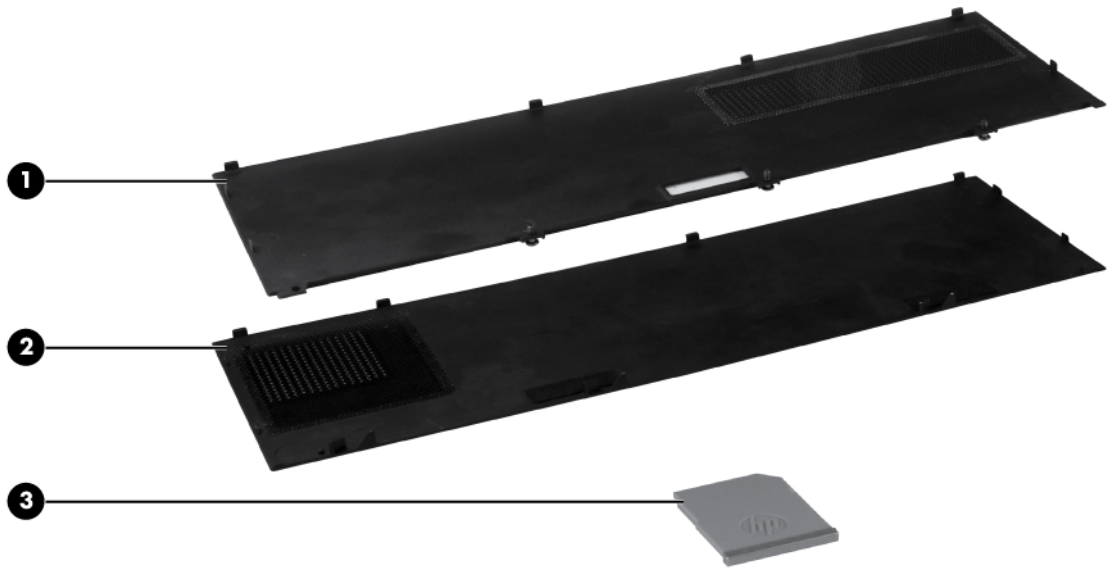
Display assembly components



Item	Description	Spare part number
(1)	**Display bezel**	650368-001
(2)	**33.8 cm (13.3 in) HD AntiGlare LED display** (1280x800)	650397-001
(3)	**Display Hinge Kit** (includes left and right display hinges)	650374-001

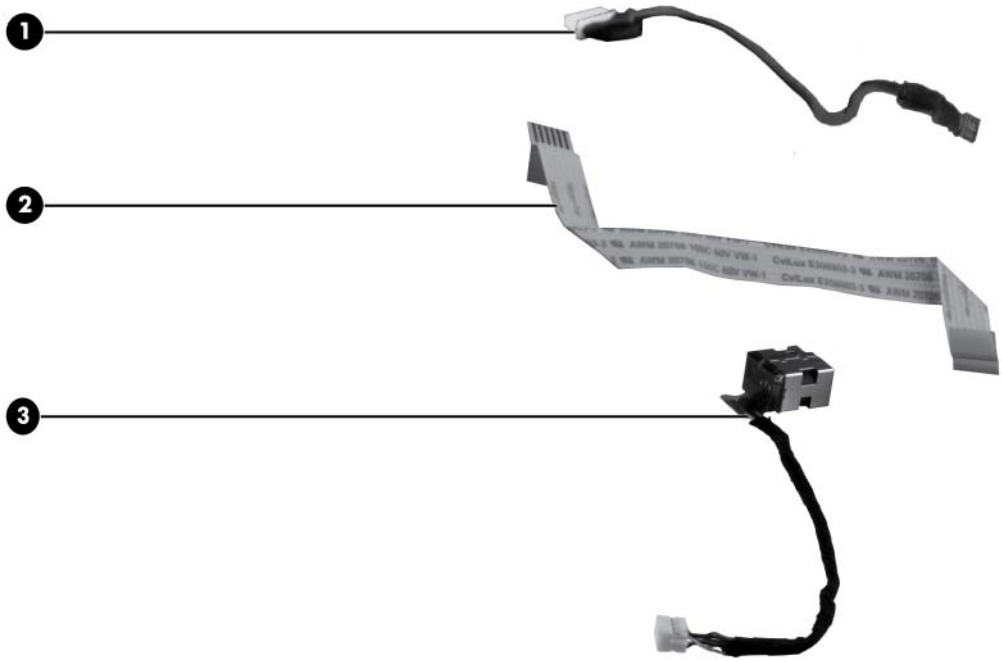
Item	Description	Spare part number
(4)	**Hinge covers**	650376-001
(5)	**Display cable** (includes microphone and webcam connector)	650370-001
(6)	**WLAN antennas and cables** (included with the Antenna Kit, spare part number 650365-001)	
(7)	**WWAN antennas and cables** (included with the Antenna Kit, spare part number 650365-001)	
(8)	**Webcam module**	650405-001
(9)	**Display back cover**	650366-001

Plastics Kit



Item	Description	Spare part number
	Plastics Kit:	650395-001
(1)	Service access cover	
(2)	Battery cover	
(3)	SD Card blank	

Cable Kit



Item	Description	Spare part number
	Cable Kit:	650369-001
(1)	Bluetooth cable	
(2)	TouchPad cable	
(3)	Power cable	

Mass storage devices

Item	Description	Spare part number
(1)	**Hard drive bracket** **NOTE:** The hard drive bracket is included in the Hard Drive Hardware Kit, spare part number 650373-001.	
(2)	**Solid-state drive** (128 GB)	650401-001
(3)	**SATA 6.35-cm (2.5 in) hard drive**	
	9.5 mm hard drives	
	• 500 GB, 7200-rpm	634925-001
	• 320 GB, 7200-rpm, Self Encrypting	626978-001
	• 320 GB, 7200-rpm,	641672-001
	• 250 GB, 7200-rpm	635225-001
	7-mm hard drives	
	• 320 GB, 7200-rpm, Self Encrypting	641674-001
	• 320 GB, 7200-rpm	634862-001
	• 250 GB, 7200-rpm	634861-001

Miscellaneous parts

Description	Spare part number
AC adapters	
65 W, 3-pin Smart AC Adapter (for use in all countries and regions except Australia, Bangladesh, Brunei, Cambodia, Hong Kong, India, Indonesia, Japan, Laos, Malaysia, Nepal, New Zealand, Pakistan, the People's Republic of China, the Philippines, Singapore, South Korea, Sri Lanka, Taiwan, Thailand, Vietnam)	609939-001
65 W, 3-pin Slim AC Adapter (for use in only Australia, Bangladesh, Brunei, Cambodia, Hong Kong, India, Indonesia, Japan, Laos, Malaysia, Nepal, New Zealand, Pakistan, the People's Republic of China, the Philippines, Singapore, South Korea, Sri Lanka, Taiwan, Thailand, Vietnam)	609948-001
Power cords (AC power, 3-pin, black, **1.83-m**)	
• For use in Australia	490371-011
• For use in Argentina	490371-D01
• 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 the People's Republic of China	490371-AA1
• 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 Thailand	490371-201
• For use in the United Kingdom and Singapore	490371-031
Screw Kit–includes:	650399-001
• Phillips M2.0x5.0	
• Phillips M2.5x2.0	
• Phillips M2.5x3.0	
• Phillips M2.5x4.0	
• Phillips M3.0x3.5	

Sequential part number listing

Spare part number	Description
490371-001	Power cord (AC power, 3-pin, black, **1.83-m**), for use in North America
490371-011	Power cord (AC power, 3-pin, black, **1.83-m**), for use in Australia
490371-021	Power cord (AC power, 3-pin, black, **1.83-m**), for use in Europe
490371-031	Power cord (AC power, 3-pin, black, **1.83-m**), for use in the United Kingdom and Singapore
490371-061	Power cord (AC power, 3-pin, black, **1.83-m**), for use in Italy
490371-081	Power cord (AC power, 3-pin, black, **1.83-m**), for use in Denmark
490371-111	Power cord (AC power, 3-pin, black, **1.83-m**), for use in Switzerland
490371-201	Power cord (AC power, 3-pin, black, **1.83-m**), for use in Thailand
490371-291	Power cord (AC power, 3-pin, black,**1.83-m**), for use in Japan
490371-AA1	Power cord (AC power, 3-pin, black, **1.83-m**), for use in the People's Republic of China
490371-AB1	Power cord (AC power, 3-pin, black, **1.83-m**), for use in Taiwan
490371-AD1	Power cord (AC power, 3-pin, black,**1.83-m**), for use in South Korea
490371-AR1	Power cord (AC power, 3-pin, black,**1.83-m**), for use in South Africa
490371-BB1	Power cord (AC power, 3-pin, black,**1.83-m**), for use in Israel
490371-D01	Power cord (AC power, 3-pin, black,**1.83-m**), for use in Argentina
490371-D61	Power cord (AC power, 3-pin, black, **1.83-m**), for use in India
537921-001	Bluetooth module (without cable). The Bluetooth cable is included in the Cable Kit, spare part number 650369-001.
581096-001	Memory module (DDR3 PC3-10600 SDRAM, 1333 MHz, shared), 2048-MB
582564-001	Broadcom 43224 802.11a/b/g/n WiFi Adapter for use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States
582564-002	Broadcom 43224 802.11a/b/g/n WiFi Adapter for use inAlbania, Algeria, Angola, Argentina, Australia, Austria, Bahrain, Bangladesh, Belarus, Belgium, Benin, Bolivia, Botswana, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, Colombia, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, Dominican Republic, Ecuador, Egypt, El Salvador, Equitorial Guinea, Estonia, Finland, France, Gabon, Gambia, Germany, Ghana, Gibraltar, Greece, Guinea, Guinea-Bissau, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Italy, the Ivory Coast, Japan, Grenada, Guatemala, Guyana, Honduras, Jordan, Kenya, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Liberia, Liechtenstein, Lithuania, Luxembourg, Madagascar, Malaysia, Mali, Mauritania, Mauritius, Mexico, Morocco, Mozambique, Namibia, Nepal, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Panama, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Puerto Rico, Qatar, Romania, Russia, Rwanda, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia and Montenegro, Sierra Leone, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sri Lanka, Suriname, Sweden, Switzerland, Taiwan, Tanzania, Thailand, Togo, Tunisia, Turkey, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Venezuela, Vietnam, Yemen, and Zimbabwe

Spare part number	Description
593836-001	Broadcom 4313 802.11b/g/n 1x1 WiFi Adapter for use in Australia, Bangladesh, Bhutan, Brunei, Cambodia, East Timor, Fiji, Hong Kong, India, Indonesia, Japan, Kiribati, Laos, Malaysia, Maldives, Marshall Islands, Micronesia, Nauru, Nepal, New Zealand, Pakistan, Palau, Papua New Guinea, the People's Republic of China, the Philippines, Samoa, Singapore, Solomon Islands, South Korea, Sri Lanka, Taiwan, Thailand, Tonga, Tuvalu, and Vietnam
609939-001	65 W, 3-pin Smart AC Adapter (for use in all countries and regions except Australia, Bangladesh, Brunei, Cambodia, Hong Kong, India, Indonesia, Japan, Laos, Malaysia, Nepal, New Zealand, Pakistan, the People's Republic of China, the Philippines, Singapore, South Korea, Sri Lanka, Taiwan, Thailand, Vietnam)
609948-001	65 W, 3-pin Slim AC Adapter (for use in only Australia, Bangladesh, Brunei, Cambodia, Hong Kong, India, Indonesia, Japan, Laos, Malaysia, Nepal, New Zealand, Pakistan, the People's Republic of China, the Philippines, Singapore, South Korea, Sri Lanka, Taiwan, Thailand, Vietnam)
621568-001	Memory module (DDR3 PC3-10600 SDRAM, 1333 MHz, shared), 4096-MB
626978-001	9.5 mm hard drive, 320 GB, 7200-rpm, Self-Encrypting
631954-001	Intel Centrino® Advanced N 6205 802.11a/b/g/n, 2x2 WiFi Adapter
632155-001	HP hs2340 HSPA+ Mobile Broadband Module
634400-001	HP un2430 EV-DO/HSPA Mobile Broadband Module (select models only)
634861-001	7 mm hard drive, 250 GB, 7200-rpm
634862-001	7 mm hard drive, 320 GB, 7200-rpm
634925-001	9.5 mm hard drive, 500 GB, 7200-rpm
635146-001	Battery, 4-cell, 41-Wh (2.8-Ah) Li-ion
635225-001	9.5 mm hard drive, 250 GB, 7200-rpm
639736-001	Memory module (DDR3 PC3-10600 SDRAM, 1333 MHz, shared), 1024-MB
641672-001	9.5 mm hard drive, 320 GB, 7200-rpm
641674-001	7-mm hard drive, 320 GB, 7200-rpm, Self Encrypting
650365-001	Antenna Kit
650366-001	Display back cover
650367-001	Base enclosure
650368-001	Display bezel
650369-001	Cable Kit (See Cable Kit on page 23 for more Cable Kit spare part information.)
650370-001	Display cable (includes microphone and webcam connector)
650371-001	Fan
650372-001	Heat sink
650373-001	Hard Drive Hardware Kit
650374-001	Display Hinge Kit (includes left and right display hinges)
650376-001	Display hinge covers
650377-001	Keyboard for use in the United States
650377-031	Keyboard for use in the United Kingdom

Spare part number	Description
650377-041	Keyboard for use in Germany
650377-051	Keyboard for use in France
650377-061	Keyboard for use in Italy
650377-071	Keyboard for use in Spain
650377-081	Keyboard for use in Denmark
650377-091	Keyboard for use in Norway
650377-121	Keyboard for use in French Canada
650377-131	Keyboard for use in Portugal
650377-141	Keyboard for use in Turkey
650377-161	Keyboard for use in Latin America
650377-171	Keyboard for use in Saudi Arabia
650377-211	Keyboard for use in Hungary
650377-251	Keyboard for use in Russia
650377-261	Keyboard for use in Bulgaria
650377-281	Keyboard for use in Thailand
650377-291	Keyboard for use in Japan
650377-A41	Keyboard for use in Belgium
650377-A81	Keyboard for use in the Czech Republic and Slovakia
650377-AB1	Keyboard for use in Taiwan
650377-AD1	Keyboard for use in South Korea
650377-B31	Keyboard for International use
650377-B71	Keyboard for use in Sweden and Finland
650377-BA1	Keyboard for use in Adriatic countries
650377-BB1	Keyboard for use in Israel
650377-BG1	Keyboard for use in Switzerland
650377-DD1	Keyboard for use in Iceland
650377-DJ1	Keyboard for use in Greece
650377-DW1	Keyboard for use in Africa–French/Arabic
650392-001	Power button board with cable
650393-001	Activity button board with cable
650394-001	Audio board (includes cable)
650395-001	Plastics Kit (includes service access cover, battery cover, and SD Card blank)
650397-001	**33.8 cm** (13.3 in) HD AntiGlare LED display (1280x800)
650398-001	RTC battery

Spare part number	Description
650399-001	Screw Kit (See Miscellaneous parts on page 25 for more Screw Kit spare part information.)
650400-001	Speaker assembly
650401-001	Solid-state drive, **6.35 cm** (2.5 in), 128 GB
650402-001	System board (includes Intel Core i3-2310M, Dual-Core, 2.10 GHz, 3 MB L3 cache, 4 threads (35 W) and replacement thermal material)—for all countries except Russia and the People's Republic of China
650403-001	System board (includes Intel Core i5-2520M, Dual-Core, 2.50 GHz (Turbo up to 3.20 GHz), 3 MB L3 cache, 4 threads (35 W) and replacement thermal material)—for all countries except Russia and the People's Republic of China
650404-001	Top cover without fingerprint reader (includes TouchPad assembly)
650405-001	Webcam module
651761-001	Top cover with fingerprint reader (includes TouchPad assembly)
656796-001	System board (includes Intel Core i3-2310M, Dual-Core, 2.10 GHz, 3 MB L3 cache, 4 threads (35 W) and replacement thermal material)—for Russia and the People's Republic of China only
656797-001	System board (includes Intel Core i5-2520M, Dual-Core, 2.50 GHz (Turbo up to 3.20 GHz), 3 MB L3 cache, 4 threads (35 W) and replacement thermal material)—for Russia and the People's Republic of China only

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
- P0 and P1 screwdrivers

Service considerations

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

NOTE: 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, 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 the parts arrive at static-free workstations.
- Place items on a grounded surface before removing items 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 grounding workstation 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

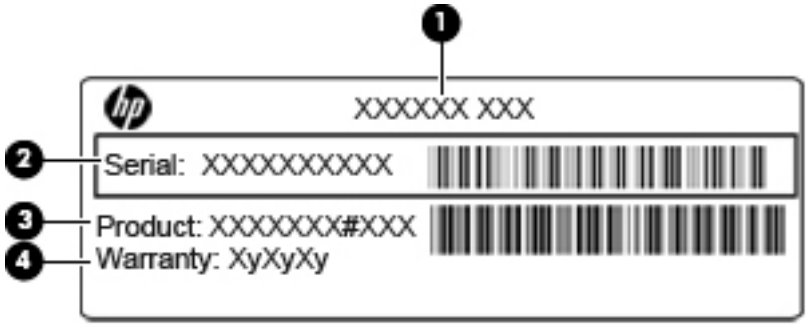
Component replacement procedures

This section provides removal and replacement procedures.

There are as many as 65 screws, in 6 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 you order parts or request information, provide the computer serial number and model number provided on the service tag, located inside the battery bay.



	Component	Description
(1)	Product name	The product name affixed to the front of the computer.
(2)	Serial number	An alphanumeric identifier that is unique to each product.
(3)	Product part number	The identifier that 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 duration of the warranty period for this computer.

Battery

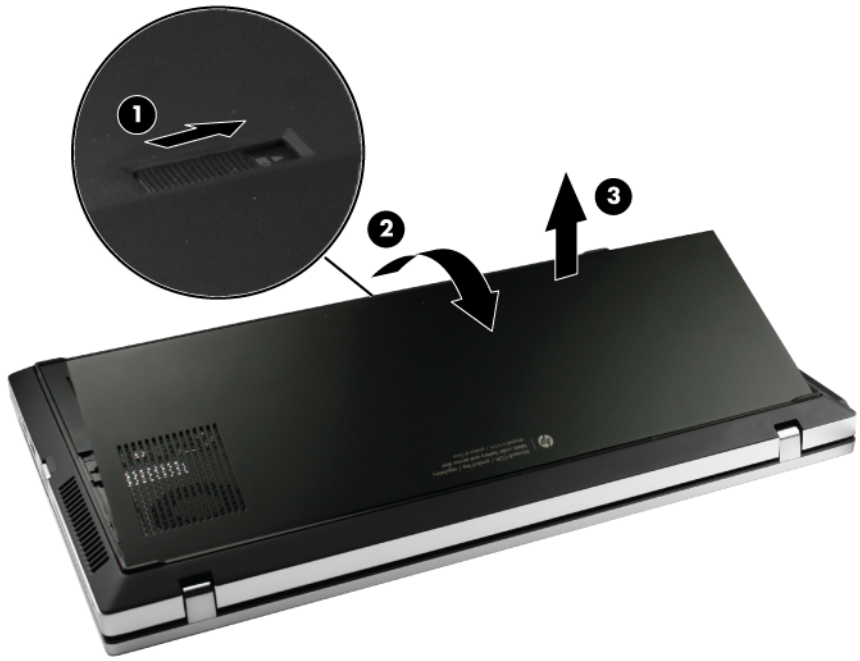
Description	Spare part number
4-cell, 41-Wh (2.8-Ah) Li-on battery	635146-001

Before removing the 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.

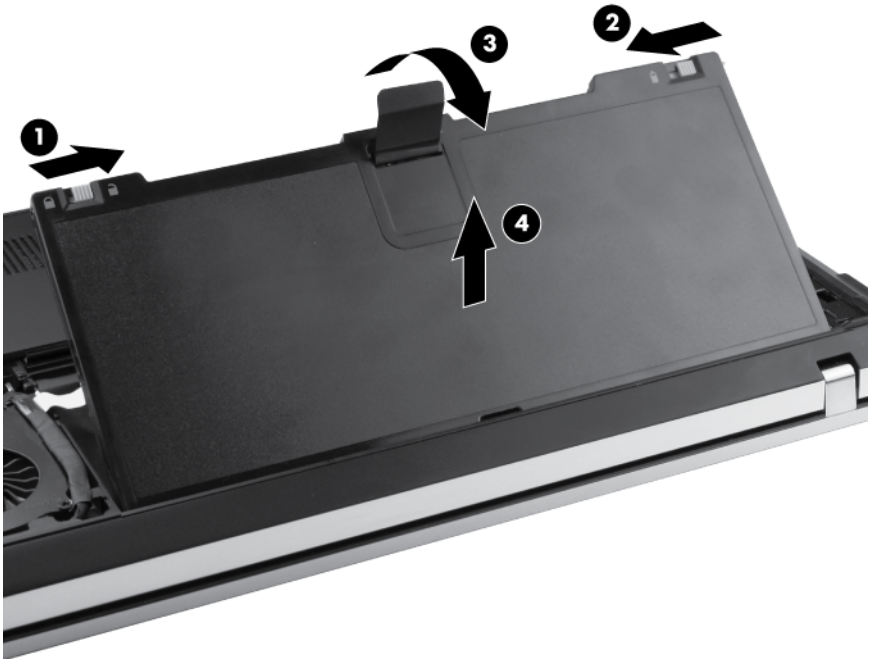
Remove the battery:

1. Position the computer upside down on a flat surface with the front toward you.
2. Slide the battery cover release latch **(1)**, and then rotate the edge **(2)** of the cover upward until the tabs on the opposite edge disengage from the chassis.
3. Remove the cover **(3)**.



4. Slide the battery lock latch **(1)** inward. The latch opening is marked red to indicate that the latch is unlocked.
5. Slide the battery release latch **(2)** inward and hold it in place as you rotate the edge of the battery **(3)** upward.

6. Then remove the battery from the battery bay **(4)**.



Reverse this procedure to install the battery.

Service access cover

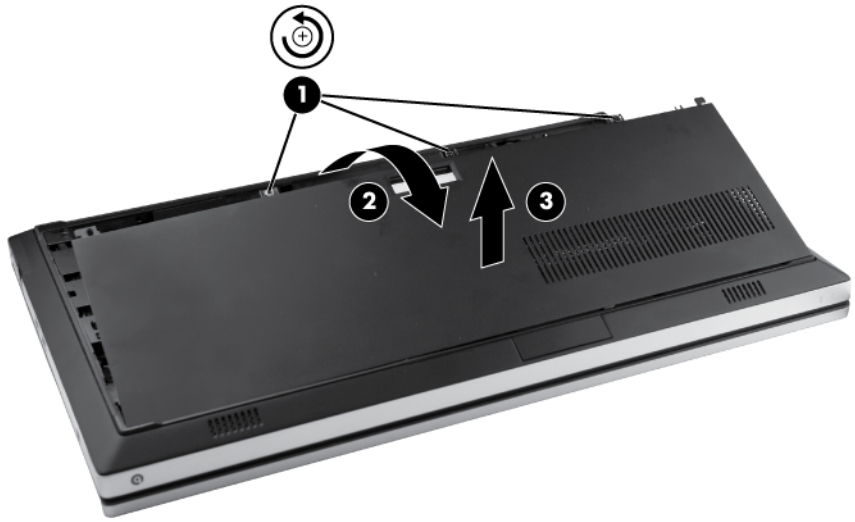
NOTE: The service access cover is included in the Plastics Kit, spare part number 650395-001.

Before removing the service access 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 36).

Remove the service access cover:

1. Position the computer upside down, with the service access cover toward you.
2. Loosen the three captive Phillips M6.0 x 2.5 screws **(1)** on the service access cover.
3. Then rotate the edge **(2)** of the cover upward, and remove the cover **(3)**.



Reverse this procedure to install the service access cover.

SIM

NOTE: This section applies only to select models with WWAN capability.

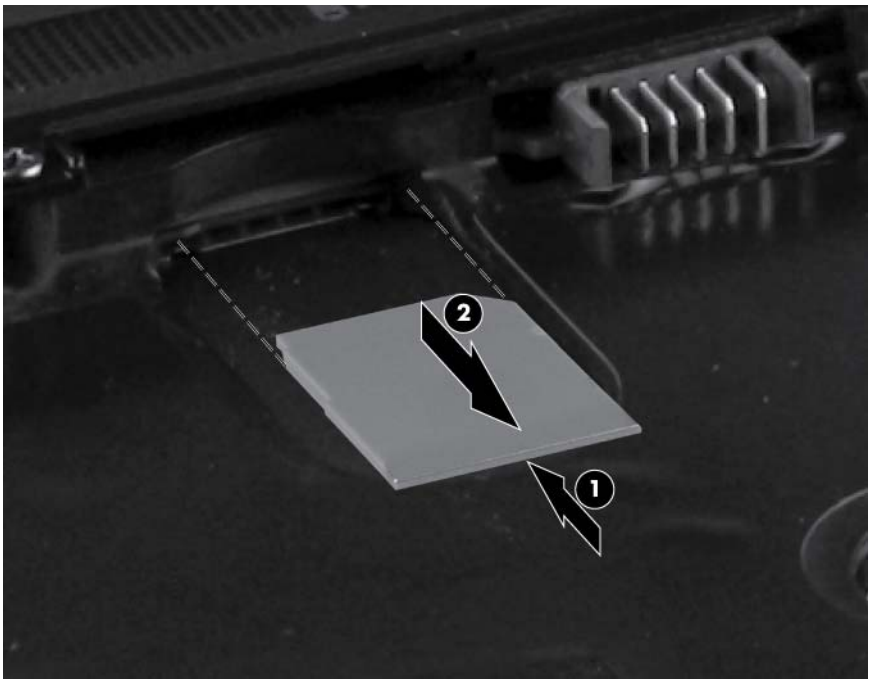
NOTE: If there is a SIM inserted in the SIM slot, it must be removed before disassembling the computer. Be sure that the SIM is reinserted in the SIM slot after reassembling the computer.

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 36).

Remove the SIM:

1. Position the computer upside down with the front of the computer toward you.
2. Press in on the SIM **(1)** to release it from the SIM slot.
3. Remove the SIM from the slot **(2)**.



Reverse this procedure to install the SIM.

Memory module

Description	Spare part number
Memory module (DDR3 PC3-10600 SDRAM, 1333 MHz, shared)	
1024-MB	639736-001
2048-MB	581096-001
4096-MB	621568-001

Before removing the 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 36).
5. Remove the service access cover (see Service access cover on page 38).

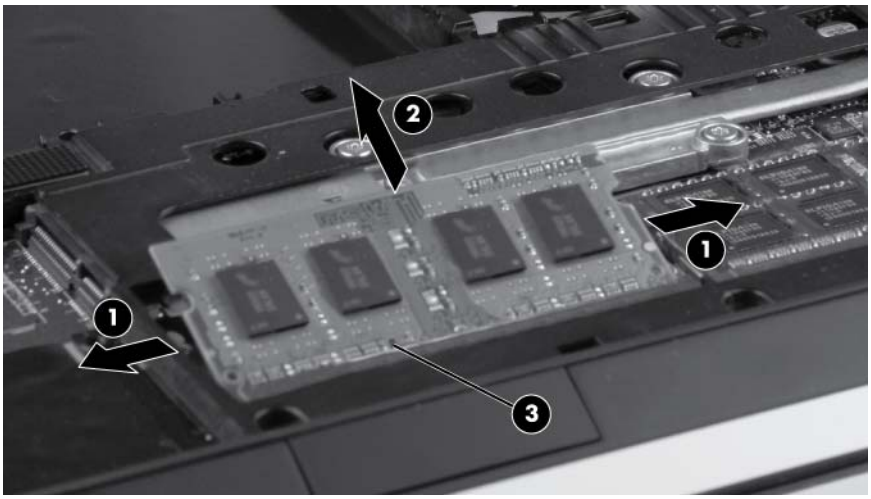
Remove the memory module:

1. Position the computer upside down with the front toward you.
2. Pull away the retention clips **(1)** on each side of the memory module to release the memory module. (The memory module tilts up.)

CAUTION: To prevent damage to the memory module, hold it by the edges only. Do not touch the components on the memory module.

3. Remove the memory module **(2)** by pulling the module away from the slot at an angle.

NOTE: Memory modules are designed with a notch **(3)** to prevent incorrect insertion.



Reverse this procedure to install a memory module.

WLAN module

Description	Spare part number
Broadcom 4313 802.11b/g/n 1x1 WiFi Adapter for use in Australia, Bangladesh, Bhutan, Brunei, Cambodia, East Timor, Fiji, Hong Kong, India, Indonesia, Japan, Kiribati, Laos, Malaysia, Maldives, Marshall Islands, Micronesia, Nauru, Nepal, New Zealand, Pakistan, Palau, Papua New Guinea, the People's Republic of China, the Philippines, Samoa, Singapore, Solomon Islands, South Korea, Sri Lanka, Taiwan, Thailand, Tonga, Tuvalu, and Vietnam	593836-001
Broadcom 43224 802.11a/b/g/n WiFi Adapter for use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States	582564-001
Broadcom 43224 802.11a/b/g/n WiFi Adapter for use in Albania, Algeria, Angola, Argentina, Australia, Austria, Bahrain, Bangladesh, Belarus, Belgium, Benin, Bolivia, Botswana, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, Colombia, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, Dominican Republic, Ecuador, Egypt, El Salvador, Equitorial Guinea, Estonia, Finland, France, Gabon, Gambia, Germany, Ghana, Gibraltar, Greece, Guinea, Guinea-Bissau, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Italy, the Ivory Coast, Japan, Grenada, Guatemala, Guyana, Honduras, Jordan, Kenya, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Liberia, Liechtenstein, Lithuania, Luxembourg, Madagascar, Malaysia, Mali, Mauritania, Mauritius, Mexico, Morocco, Mozambique, Namibia, Nepal, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Panama, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Puerto Rico, Qatar, Romania, Russia, Rwanda, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia and Montenegro, Sierra Leone, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sri Lanka, Suriname, Sweden, Switzerland, Taiwan, Tanzania, Thailand, Togo, Tunisia, Turkey, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Venezuela, Vietnam, Yemen, and Zimbabwe	582564-002
Intel Centrino® Advanced N 6205 802.11a/b/g/n, 2x2 WiFi Adapter	631954-001

⚠ **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.

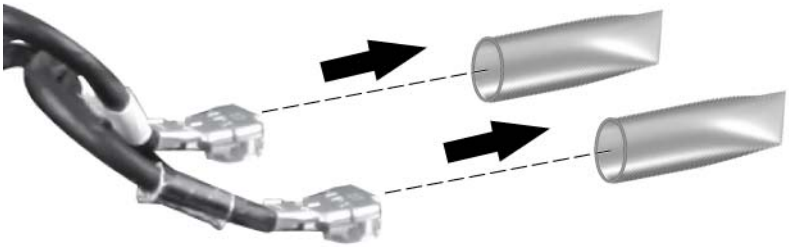
Before removing the WLAN module, follow these steps:

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 36).
5. Remove the service access cover (see Service access cover on page 38).

Remove the WLAN module:

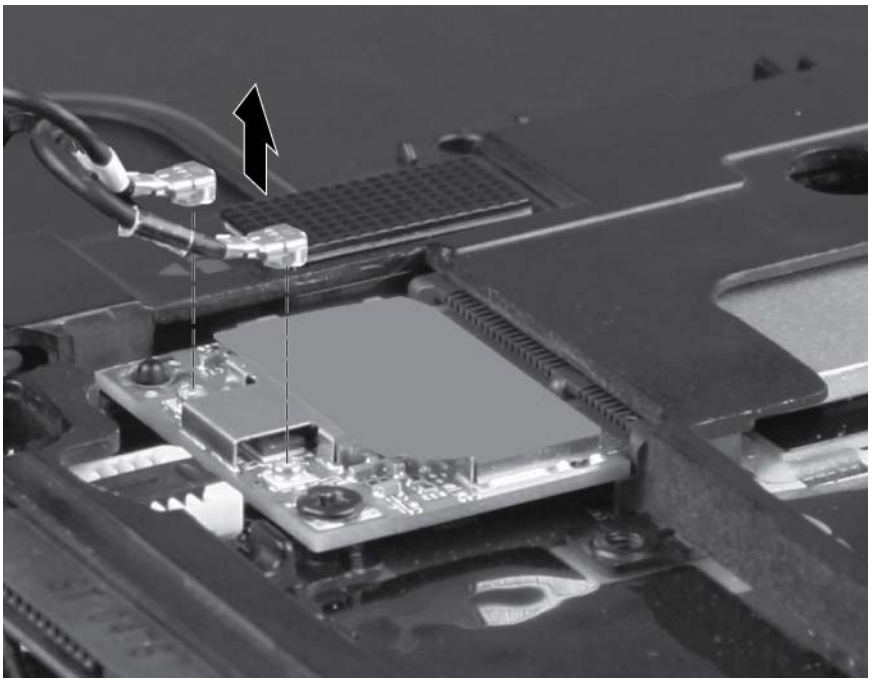
1. Position the computer upside down with the front toward you.

2. Remove the protective sleeves from the WLAN antennas.

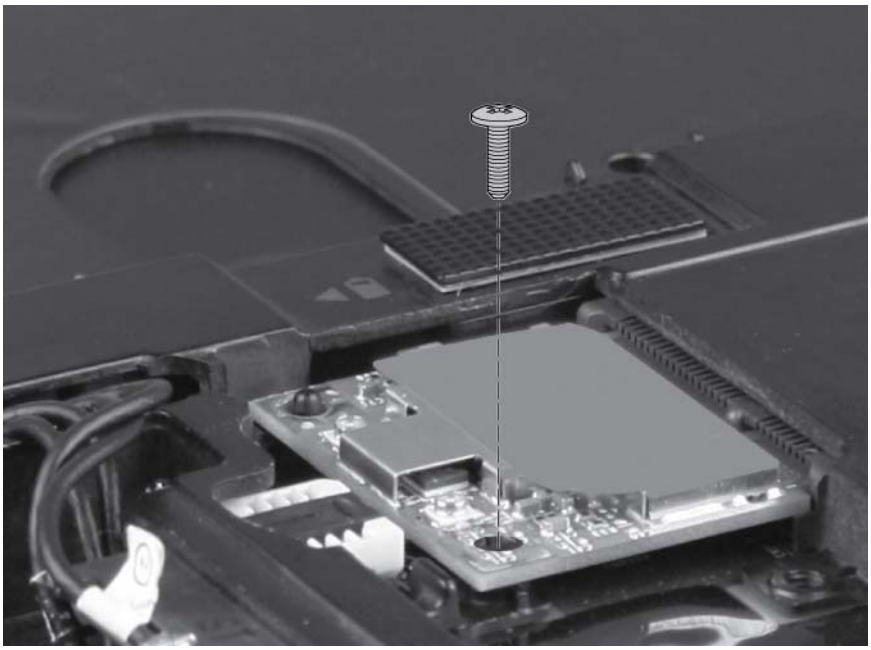


3. Disconnect the WLAN antenna cables from the terminals on the WLAN module.

NOTE: The black WLAN antenna cable is connected to the WLAN module “Main” terminal. The white WLAN antenna cable is connected to the WLAN module “Aux” terminal.

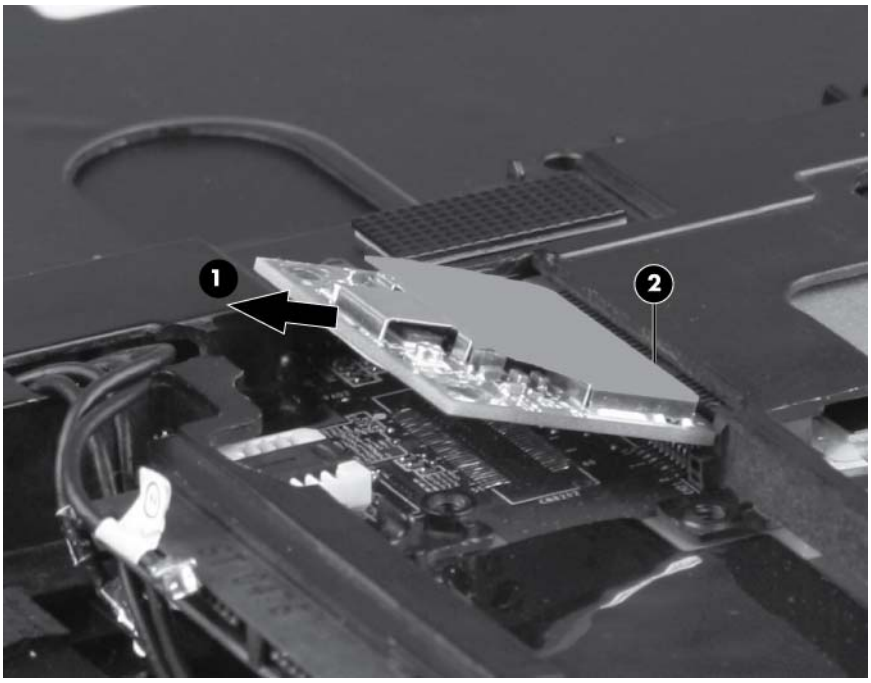


4. Remove the Phillips M2.0×3.0 screw that secures the WLAN module to the system board. (The WLAN module tilts up.)



5. Remove the WLAN module **(1)** by pulling the module away from the slot at an angle.

NOTE: WLAN modules are designed with a notch **(2)** to prevent incorrect insertion.



Reverse this procedure to install the WLAN module.

WWAN module

NOTE: Only select models include a WWAN module (see Product description on page 1).

Description	Spare part number
HP hs2340 HSPA+ Mobile Broadband Module	632155-001
HP un2430 EV-DO/HSPA Mobile Broadband Module	634400-001

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.

Before removing the WWAN module, follow these steps:

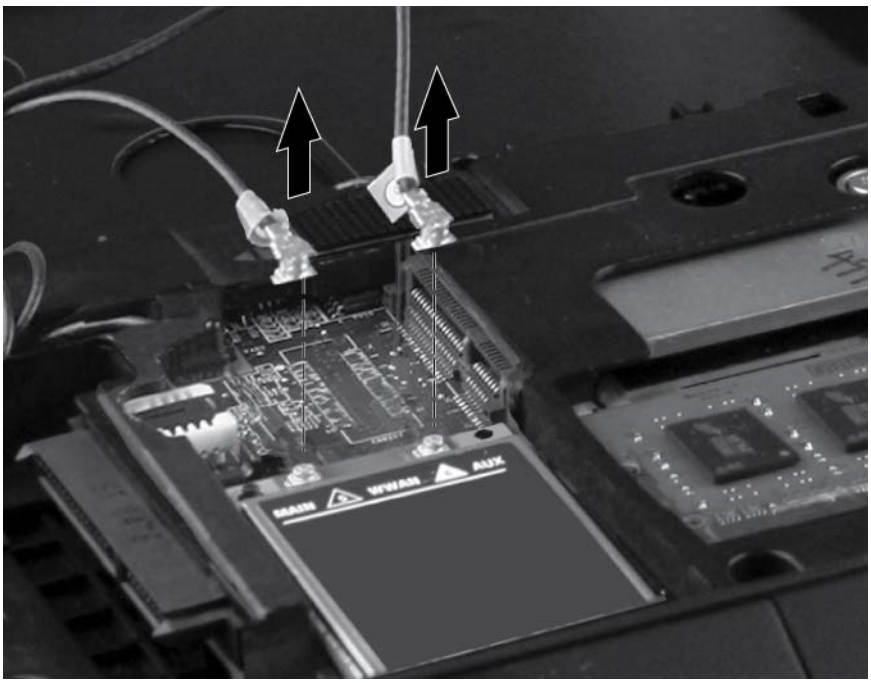
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see Battery on page 36).
5. Remove the service access cover (see Service access cover on page 38).

Remove the WWAN module:

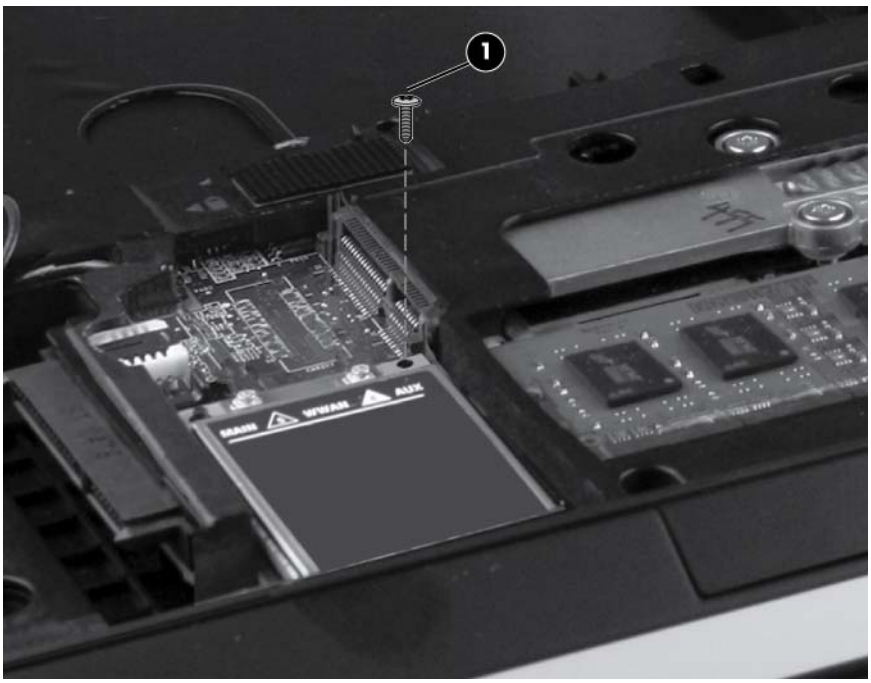
1. Position the computer upside down with the front toward you.

2. Disconnect the WWAN antenna cables from the terminals on the WWAN module.

NOTE: The red WWAN antenna cable is connected to the WLAN module “Main” terminal. The blue WWAN antenna cable is connected to the WWAN module “Aux” terminal.

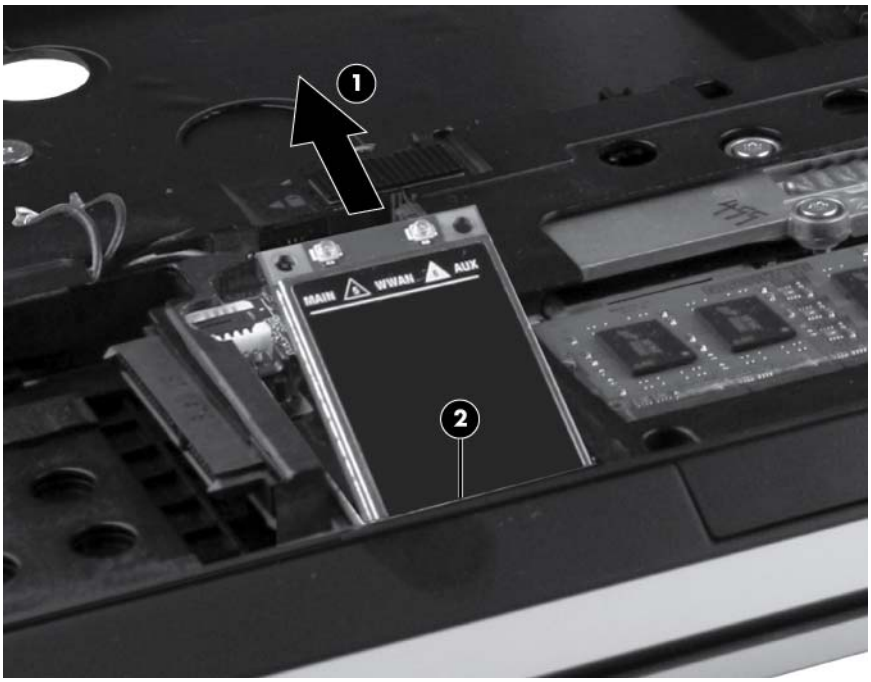


3. Remove the Phillips M2.0×3.0 screw **(1)** that secures the WWAN module to the system board. (The WWAN module tilts up.)



4. Remove the WWAN module **(1)** by pulling the module away from the slot at an angle.

NOTE: WWAN modules are designed with a notch **(2)** to prevent incorrect insertion.



Reverse this procedure to install the WWAN module.

Hard drive

NOTE: The hard drive bracket is included in the Hard Drive Hardware Kit, spare part number 650373-001.

Description	Spare part number
9.5 mm, 6.35 cm (2.5 in) hard drives:	
500 GB 7200-rpm	634925-001
320 GB 7200-rpm, Self Encrypting	626978-001
320 GB 7200-rpm	641672-001
250 GB 7200-rpm	635225-001
7-mm, 6.35 cm (2.5 in) hard drives:	
320 GB 7200-rpm, Self Encrypting	641674-001
320 GB 7200-rpm	634862-001
250 GB, 7200-rpm	634861-001
6.35 cm (2.5 in) solid-state drive:	
128 GB	650401-001

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 36).
5. Remove the service access cover (see Service access cover on page 38).

Remove the hard drive:

1. Position the computer upside down with the front toward you.

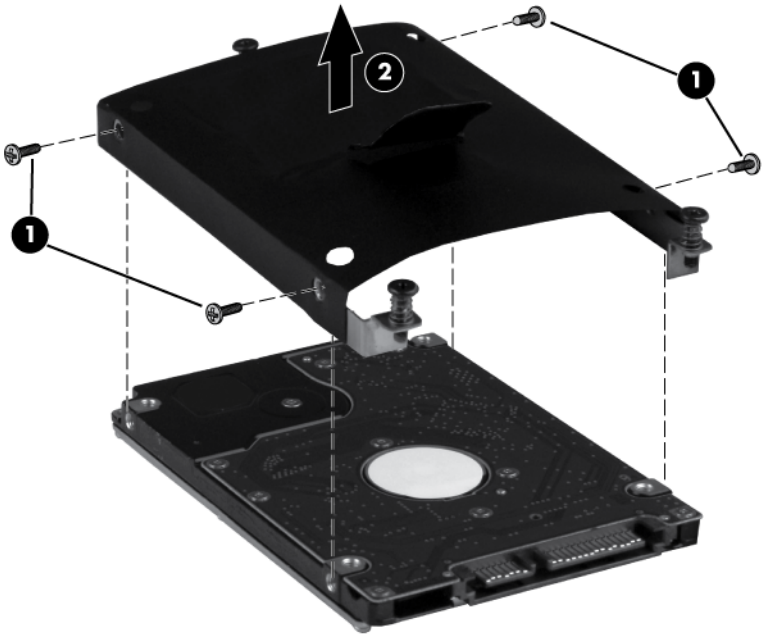
2. Loosen the three Phillips M10.0x2.5 captive screws that secure the hard drive to the computer.

3. Grasp the tab **(1)** on the hard drive, pull the hard drive to the left, and then remove the hard drive **(2)** at an angle.

4. If it is necessary to replace the hard drive bracket, follow these steps:

   a. Remove the four Phillips M3.0×3.0 hard drive bracket screws **(1)** from the sides of the hard drive.

b. Lift the bracket **(2)** straight up to remove it from the hard drive.



Reverse this procedure to reassemble and install the hard drive.

Keyboard

NOTE: The keyboard spare part kit includes a keyboard cable.

Description	Spare part number
Keyboard	
For use in Adriatic countries	650377-BA1
For use in Africa–French/Arabic	650377-DW1
For use in Belgium	650377-A41
For use in Bulgaria	650377-261
For use in the Czech Republic and Slovakia	650377-A81
For use in Denmark	650377-081
For use in France	650377-051
For use in French Canada	650377-121
For use in Germany	650377-041
For use in Greece	650377-DJ1
For use in Hungary	650377-211
For use in Iceland	650377-DD1
For International use	650377-B31
For use in Israel	650377-BB1
For use in Italy	650377-061
For use in Japan	650377-291
For use in Latin America	650377-161
For use in Norway	650377-091
For use in Portugal	650377-131
For use in Russia	650377-251
For use in Saudi Arabia	650377-171
For use in South Korea	650377-AD1
For use in Spain	650377-071
For use in Sweden and Finland	650377-B71
For use in Switzerland	650377-BG1
For use in Taiwan	650377-AB1
For use in Thailand	650377-281
For use in Turkey	650377-141
For use in the United Kingdom	650377-031
For use in the United States	650377-001

Before removing the keyboard, follow these steps:

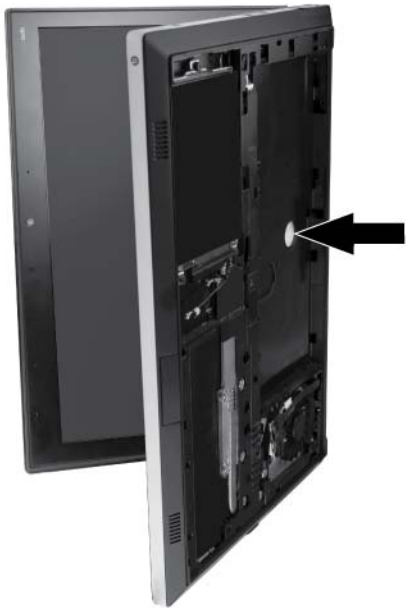
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see Battery on page 36).

Remove the keyboard:

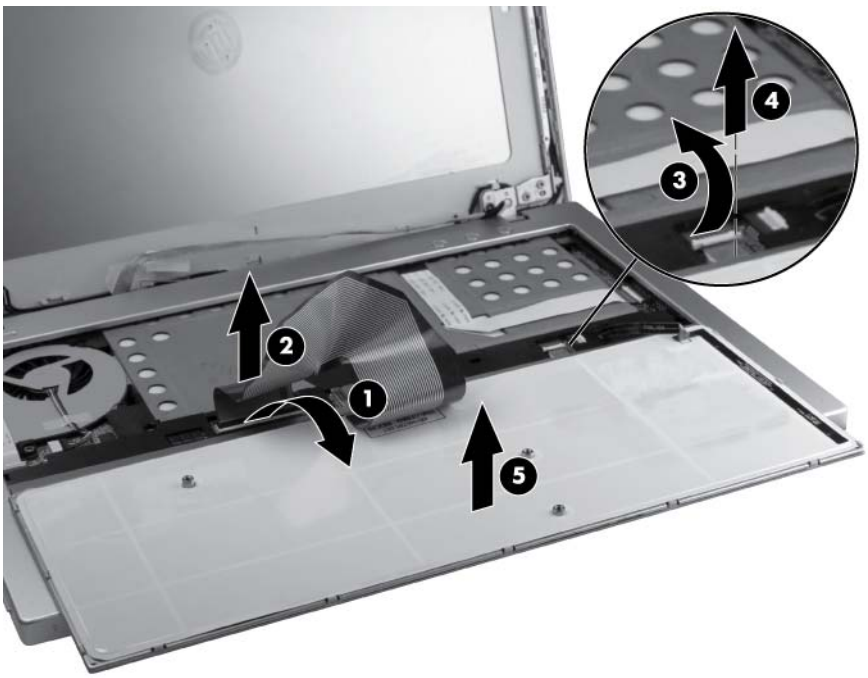
1. Position the computer upside down with the front toward you.
2. Remove the two Phillips M2.0x2.5 screws **(1)** in the battery bay and one T8 4.0x2.5 screw **(2)** in the fan compartment.

3. Turn the computer right-side up, and then open the display.

4. Carefully position the open computer on its left side, and then insert a finger into the finger hole in the battery bay, and press on the keyboard until it disengages from the base enclosure.



5. Turn the computer right-side up, with the front toward you.
6. Rotate the keyboard forward until it rests upside down on the palm rest **(1)**.
7. Open the keyboard cable zero insertion force (ZIF) connector **(2)**.
8. Open the keyboard backlight cable ZIF connector **(3)** and remove the cable **(4)**.
9. Remove the keyboard **(5)**.



Reverse this procedure to install the keyboard.

Fan

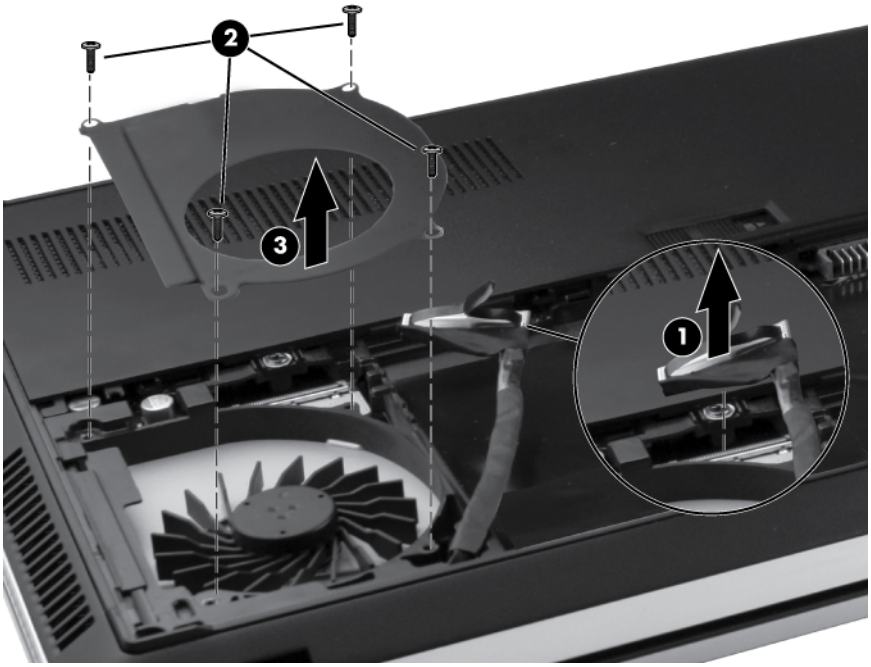
Description	Spare part number
Fan	650371-001

Before removing the fan, 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 36).
5. Remove the service access cover (see Service access cover on page 38).
6. Remove the keyboard (see Keyboard on page 50).

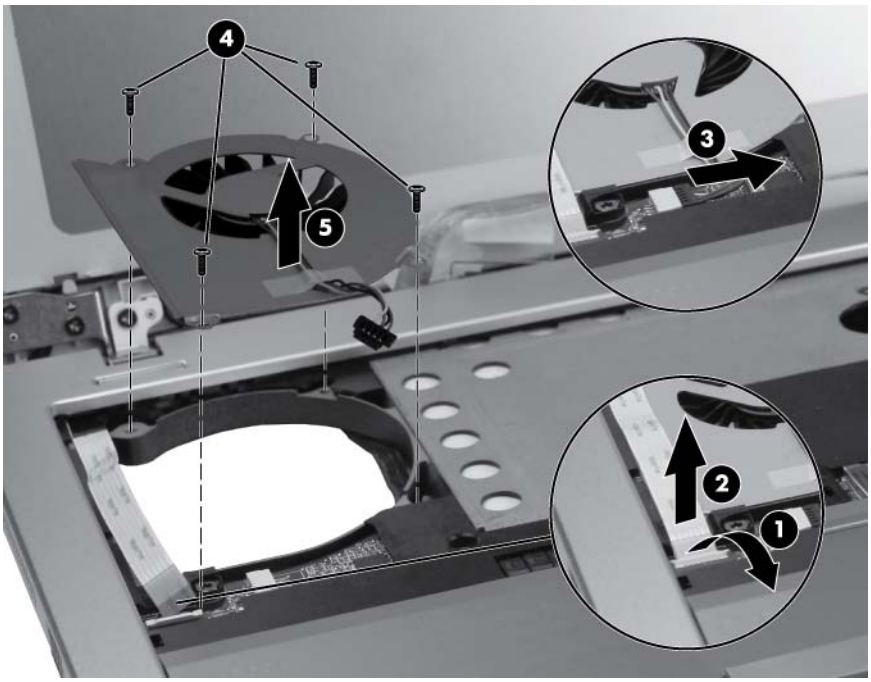
Remove the fan:

1. Position the computer upside down on a flat surface.
2. Disconnect the display cable **(1)**, remove the four T8 2.5x3.0 screws **(2)**, and then remove the fan plate **(3)**.



3. Position the computer right-side up, and open the display panel.
4. Open the power button cable ZIF connector **(1)** and remove the cable **(2)**.
5. Disconnect the fan cable **(3)** from the system board.

6. Remove the four T8 2.5x3.0 screws **(4)** from the fan assembly, and then remove the fan assembly **(5)** from the base enclosure.



Reverse this procedure to install the fan assembly.

Top cover

Description	Spare part number
Top cover **NOTE:** The top cover kit includes the TouchPad assembly.	
With fingerprint reader	651761-001
Without fingerprint reader	650404-001

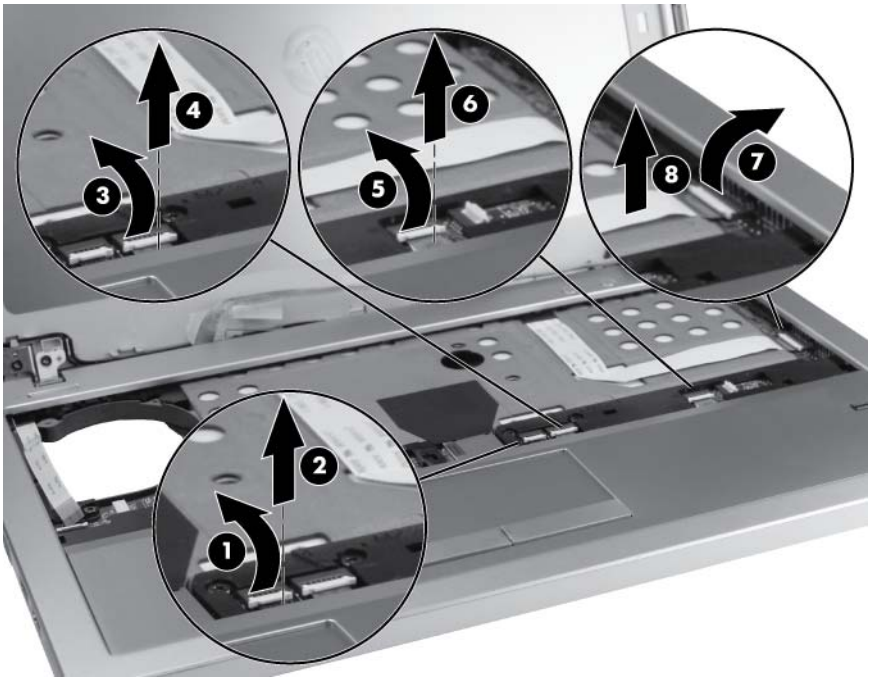
Before removing the top cover, follow these steps:

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 36).
5. Remove the keyboard (see Keyboard on page 50).
6. Remove the fan (see Fan on page 53).

Remove the top cover:

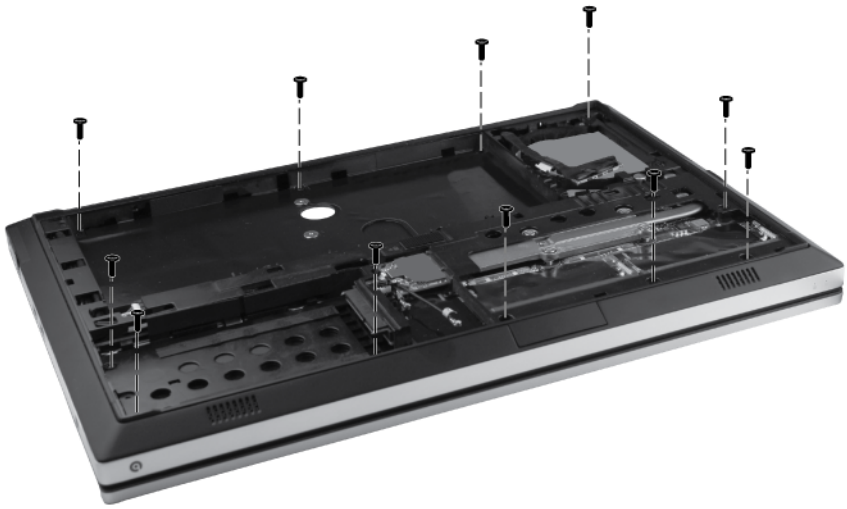
1. Position the computer right-side up, with the display open.
2. Open the TouchPad cable ZIF connector **(1)** and disconnect the cable **(2)**.
3. Open the TouchPad button cable ZIF connector **(3)** and disconnect the TouchPad button cable **(4)**.
4. Open the fingerprint reader cable ZIF connector **(5)** and disconnect the cable **(6)**.

5. Open the activity button cable ZIF connector **(7)** and disconnect the cable **(8)**.



6. Remove the three T8 2.5x4.0 screws under the keyboard front edge.

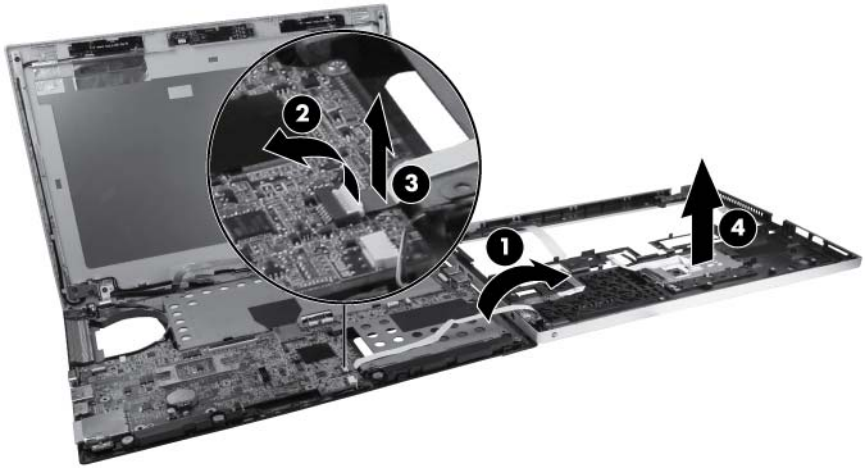
7. Turn the computer over and remove the four T8 2.5x3.0 screws from the rear of the computer, three T8 2.5x3.0 screws from the hard drive bay, and four T8 2.0x4.0 screws from the front edge of the computer.



8. Turn the computer right-side up, open the display, and then disengage the top cover from the base enclosure by lifting along the left and front edges and prying up the inside right edge.

9. Rotate the top cover **(1)** to the right, open the audio board cable ZIF connector **(2)**, and disconnect the cable **(3)**.

10. Remove the top cover **(4)**.



Reverse this procedure to install the top cover.

Power button board

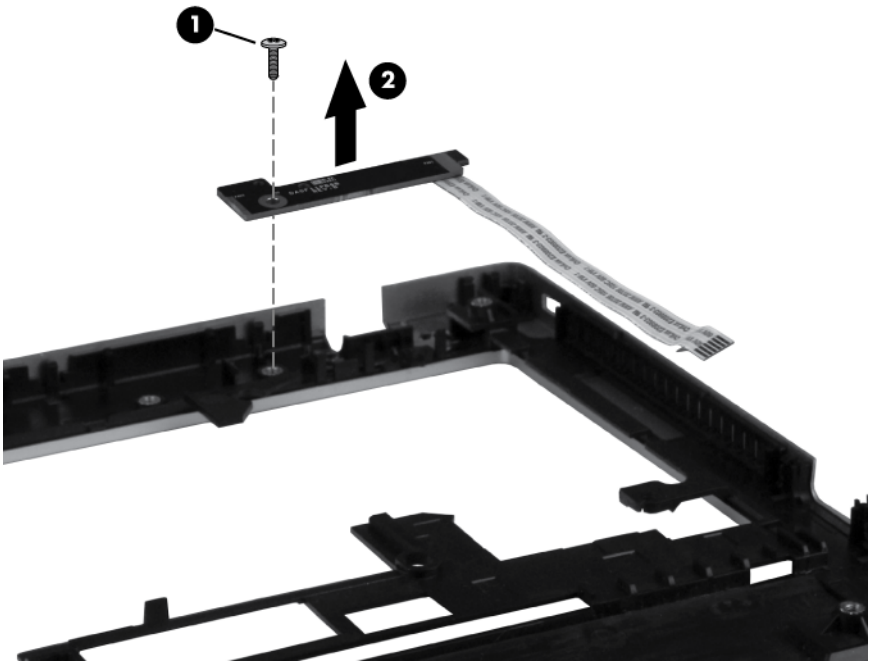
Description	Spare part number
Power button board (includes cable)	650392-001

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 36).
5. Remove the service access cover (see Service access cover on page 38).
6. Remove the keyboard (see Keyboard on page 50).
7. Remove the fan (see Fan on page 53).
8. Remove the top cover (see Top cover on page 55).

Remove the power button board:

1. Position the top cover upside down on a flat surface, with the front toward you. The power button board is located in the top right corner of the top cover.
2. Remove the T8 2.5x4.0 screw **(1)** and lift the power button board **(2)** straight up from the top cover.



Reverse this procedure to install the power button board.

Activity button board

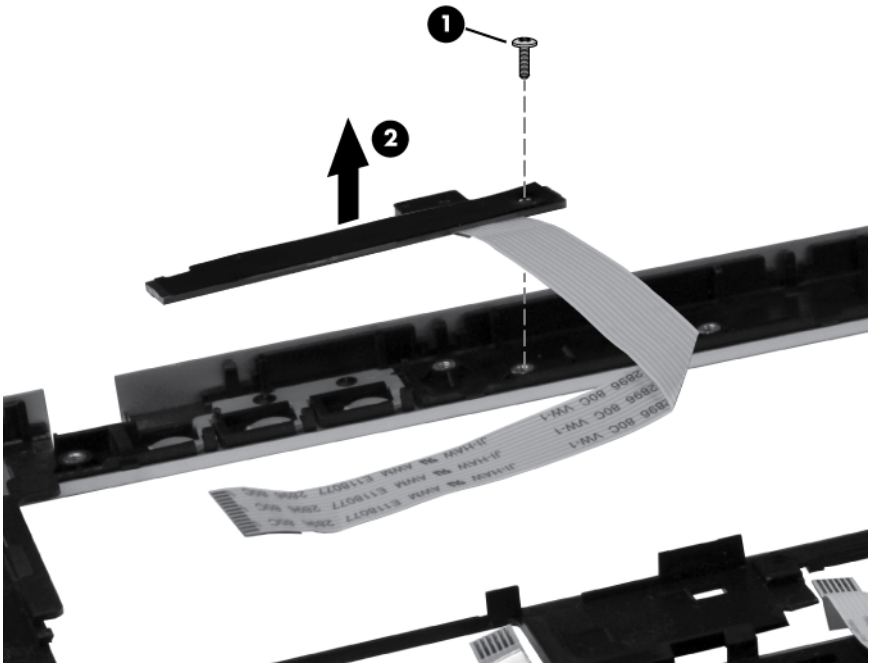
Description	Spare part number
Activity button board (includes cable)	650393-001

Before removing the activity 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 36).
5. Remove the service access cover (see Service access cover on page 38).
6. Remove the keyboard (see Keyboard on page 50).
7. Remove the fan (see Fan on page 53).
8. Remove the top cover (see Top cover on page 55).

Remove the activity button board:

1. Position the top cover upside down on a flat surface, with the front toward you. The activity button board is located at the top left of the top cover.
2. Remove the T8 2.5x4.0 screw **(1)** and lift the activity button board **(2)** straight up from the top cover.



Reverse this procedure to install the activity button board.

Audio board

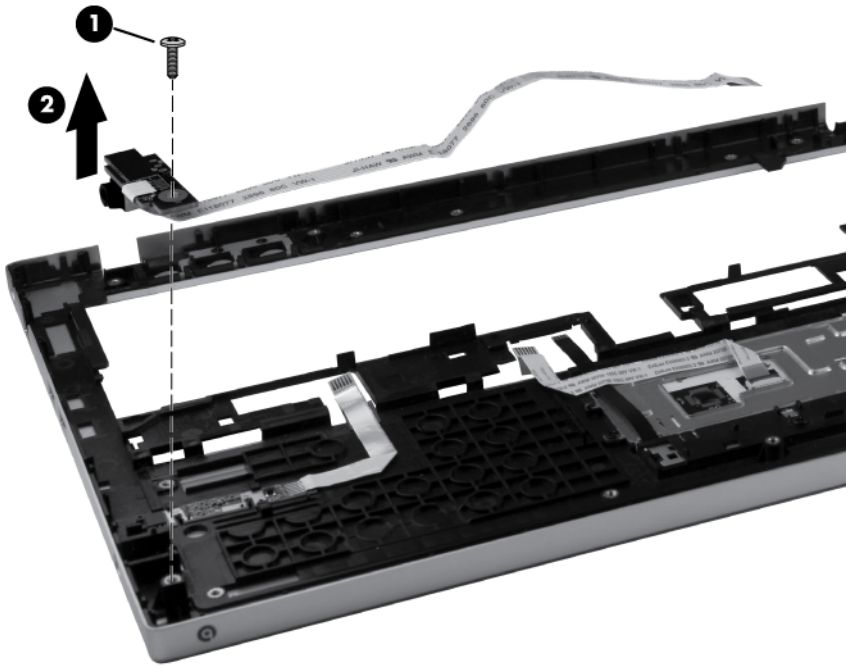
Description	Spare part number
Audio board (includes cable)	650394-001

Before removing the audio 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 36).
5. Remove the service access cover (see Service access cover on page 38).
6. Remove the keyboard (see Keyboard on page 50).
7. Remove the fan (see Fan on page 53).
8. Remove the top cover (see Top cover on page 55).

Remove the audio board:

1. Position the top cover upside down on a flat surface, with the front toward you. The audio board is located at the front left of the top cover.
2. Remove the T8 2.5x4.0 screw **(1)** and lift the audio board **(2)** straight up from the top cover.



Reverse this procedure to install the audio board.

Bluetooth module

Description	Spare part number
Bluetooth module	537921-001
NOTE: The Bluetooth module spare part kit does not include a Bluetooth module cable. The Bluetooth module cable is included in the Cable Kit, spare part number 650369-001. See Cable Kit on page 23) for more Cable Kit spare part information.	

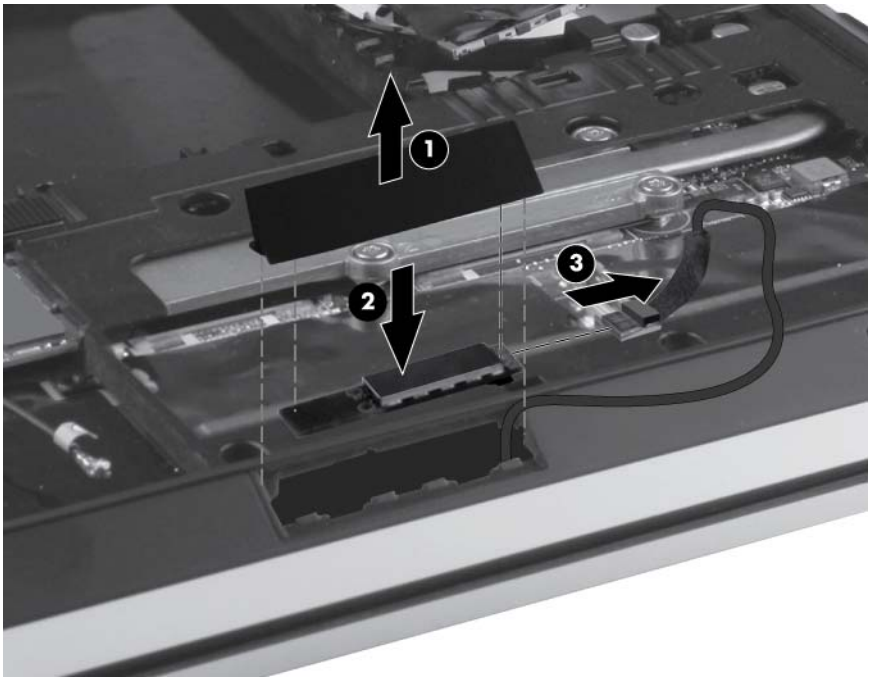
Before removing the Bluetooth module, follow these steps:

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 36).
5. Remove the service access cover (see Service access cover on page 38).
6. Remove the keyboard (see Keyboard on page 50).
7. Remove the fan (see Fan on page 53).
8. Remove the top cover (see Top cover on page 55).

Remove the Bluetooth module:

1. Position the computer right-side up, with the front toward you.
2. Remove the Bluetooth module bezel **(1)** from the base enclosure.
3. Remove the Bluetooth module **(2)** from the Bluetooth module bezel.

4. Disconnect the Bluetooth cable **(3)** from the Bluetooth module.



Reverse this procedure to install the Bluetooth module.

RTC battery

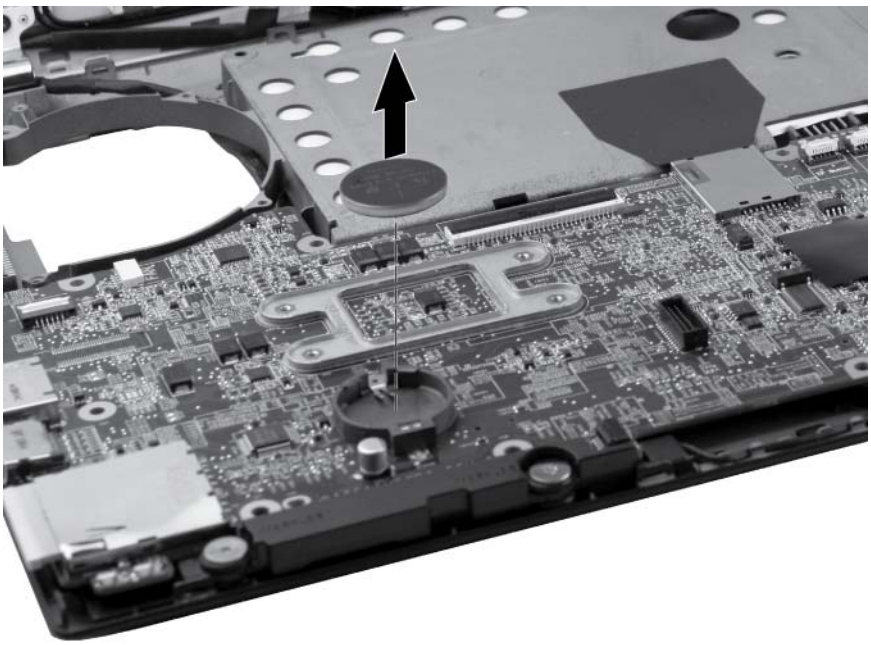
Description	Spare part number
RTC battery	650398-001

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 36).
5. Remove the service access cover (see Service access cover on page 38).
6. Remove the keyboard (see Keyboard on page 50).
7. Remove the fan (see Fan on page 53).
8. Remove the top cover (see Top cover on page 55).

Remove the RTC battery:

1. Position the computer right-side up, with the front toward you.
2. Use a thin, nonconductive tool to release the clip that secures the battery to the system board.
3. Remove the battery.



To install the RTC battery, press it down into the socket until it is seated.

Speakers

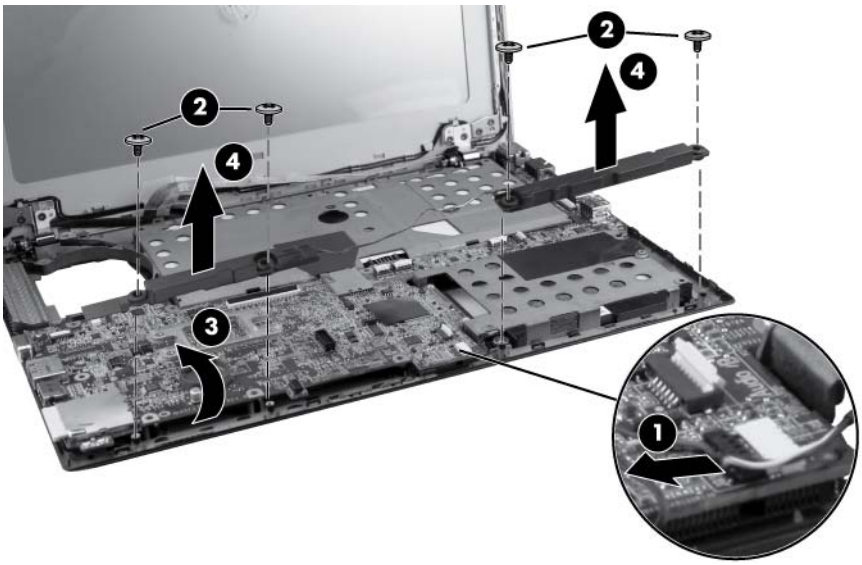
Description	Spare part number
Speakers	650400-001

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 36).
5. Remove the service access cover (see Service access cover on page 38).
6. Remove the keyboard (see Keyboard on page 50).
7. Remove the fan (see Fan on page 53).
8. Remove the top cover (see Top cover on page 55).

Remove the speakers:

1. Position the computer right-side up, with the front toward you.
2. Disconnect the speaker cable **(1)** from the system board.
3. Remove the four Phillips M2.5x2.5 screws **(2)** that secure the speakers to the base enclosure.
4. Gently lift up on the edge of the system board above the left speaker **(3)**, and then lift the speakers straight up from the base enclosure **(4)**.



Reverse this procedure to install the speakers.

System board

Description	Spare part number
System board (includes replacement thermal material)	
• Includes Intel Core i3-2310M, Dual-Core, 2.10 GHz, 3 MB L3 cache, 4 threads (35 W)—for all countries except Russia and the People's Republic of China	650402-001
• Includes Intel Core i5-2520M, Dual-Core, 2.50 GHz (Turbo up to 3.20 GHz), 3 MB L3 cache, 4 threads (35 W)—for all countries except Russia and the People's Republic of China	650403-001
• Includes Intel Core i3-2310M, Dual-Core, 2.10 GHz, 3 MB L3 cache, 4 threads (35 W)--for Russia and the People's Republic of China only	656796-001
• Includes Intel Core i5-2520M, Dual-Core, 2.50 GHz (Turbo up to 3.20 GHz), 3 MB L3 cache, 4 threads (35 W) --for Russia and the People's Republic of China only	656797-001

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 36).
5. Remove the service access cover (see Service access cover on page 38).
6. Remove the keyboard (see Keyboard on page 50).
7. Remove the fan (see Fan on page 53).
8. Remove the top cover (see Top cover on page 55).
9. Remove the speakers (see Speakers on page 65).

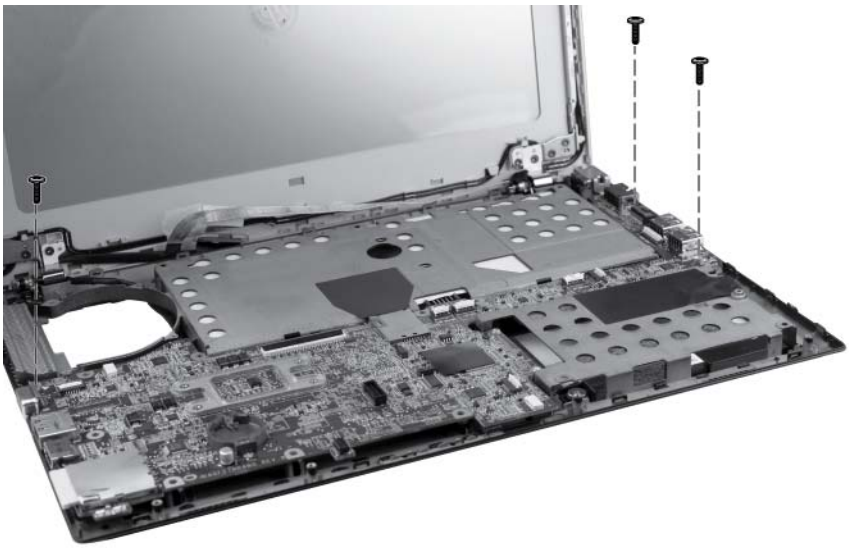
When replacing the system board, be sure that the following components are removed from the defective system board and installed on the replacement system board:

- Memory module (see Memory module on page 40)
- WLAN module (see WLAN module on page 41)
- WWAN module (see WWAN module on page 44)
- SIM (see SIM on page 39)
- Fan (see Fan on page 53)
- RTC battery (see RTC battery on page 64)

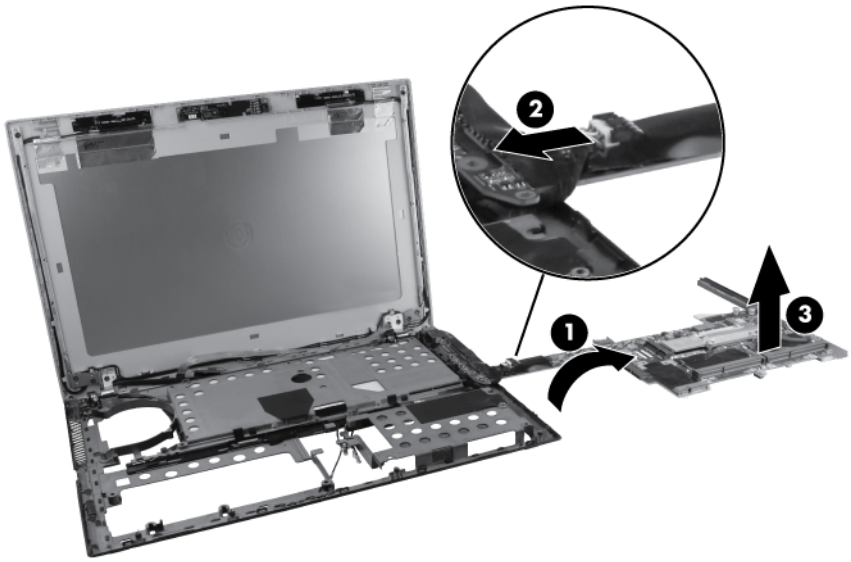
Remove the system board:

1. Position the computer right-side up, with the front toward you.

2. Remove the three T8 2.5x4.0 screws (marked with triangles) that secure the system board to the base enclosure.



3. Rotate the system board to the right **(1)**.
4. Disconnect the power cable **(2)** from the system board, and then remove the system board **(3)**.



Reverse this procedure to install the system board.

Heat sink

Description	Spare part number
Heat sink (includes replacement thermal material)	650372-001

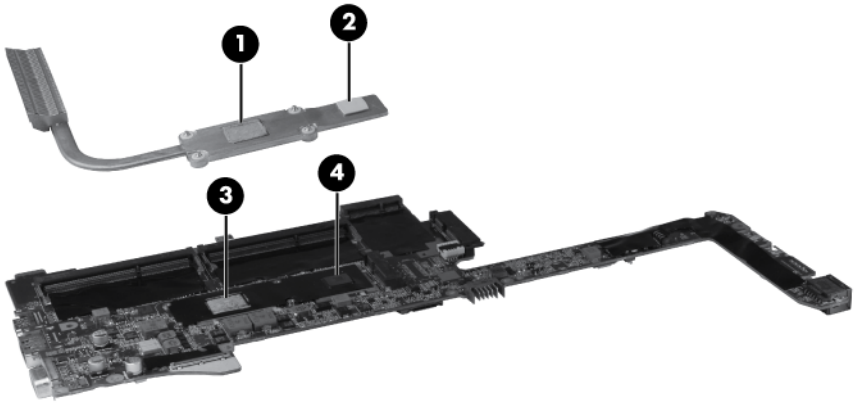
Before removing the heat sink, follow these steps:

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 36).
5. Remove the service access cover (see Service access cover on page 38).
6. Remove the keyboard (see Keyboard on page 50).
7. Remove the fan (see Fan on page 53).
8. Remove the top cover (see Top cover on page 55).
9. Remove the speakers (see Speakers on page 65).
10. Remove the system board (see System board on page 66).

Remove the heat sink:

1. Position the system board upside down on a flat surface.
2. Loosen the four captive screws **(1)** that secure the heat sink to the system board.
3. Lift the heat sink straight up **(2)** and remove it from the system board.

NOTE: The thermal material must be thoroughly cleaned from the surfaces of the heat sink components **(1)** and **(2)**, and the system board components **(3)** and **(4)**, each time the heat sink is removed. Replacement thermal material is included with all heat sink and system board spare part kits.



Reverse this procedure to install the heat sink.

Power connector cable

NOTE: The power connector cable is included in the Cable Kit, spare part number 650369-001. For more Cable Kit spare part information, see Cable Kit on page 23.

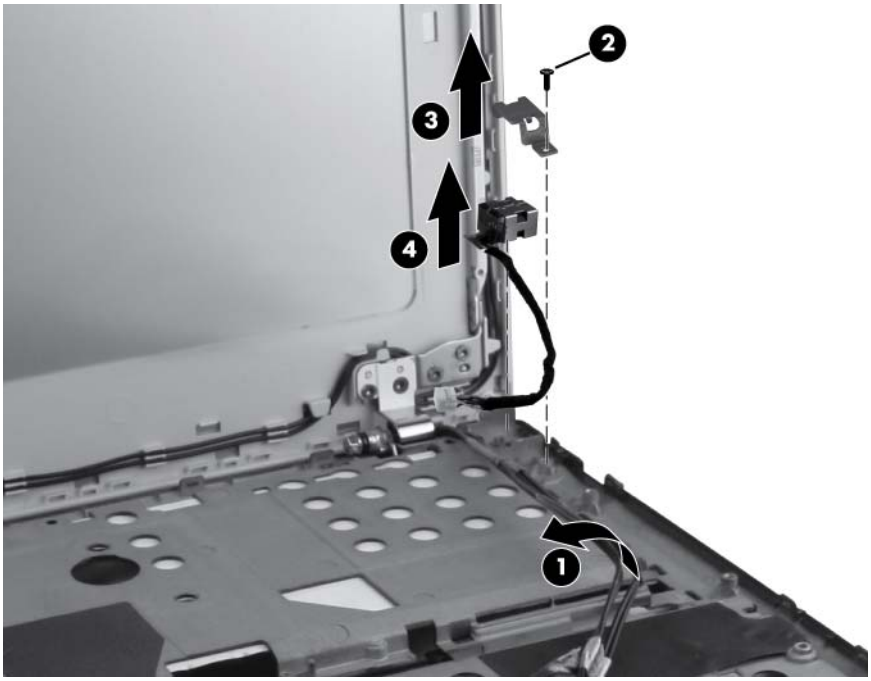
Before removing the power connector cable, follow these steps:

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 36).
5. Remove the service access cover (see Service access cover on page 38).
6. Remove the keyboard (see Keyboard on page 50).
7. Remove the fan (see Fan on page 53).
8. Remove the top cover (see Top cover on page 55).
9. Remove the speakers (see Speakers on page 65).
10. Remove the system board (see System board on page 66).

Remove the power connector cable:

1. Position the computer right-side up, with the front toward you.
2. Remove the WWAN and WLAN cables **(1)** from the routing channels in the base enclosure.
3. Remove the T8 2.5x3.0 screw **(2)** that secures the power connector bracket to the base enclosure.
4. Remove the power connector bracket **(3)** from the base enclosure.

5. Remove the power connector and cable **(4)** by lifting them straight up from the base enclosure.



Reverse this procedure to install the power connector cable.

Display panel

Description	Spare part number
Display bezel	650368-001
33.8 cm (13.3 in) High-Definition (HD) AntiGlare LED display (1280x800)	650397-001

NOTE: If you need to remove only the display panel, not the complete display assembly, follow the steps in this section. To remove the complete display assembly, omit this section and follow the procedures in Display assembly on page 75.

Before removing the display panel, follow these steps:

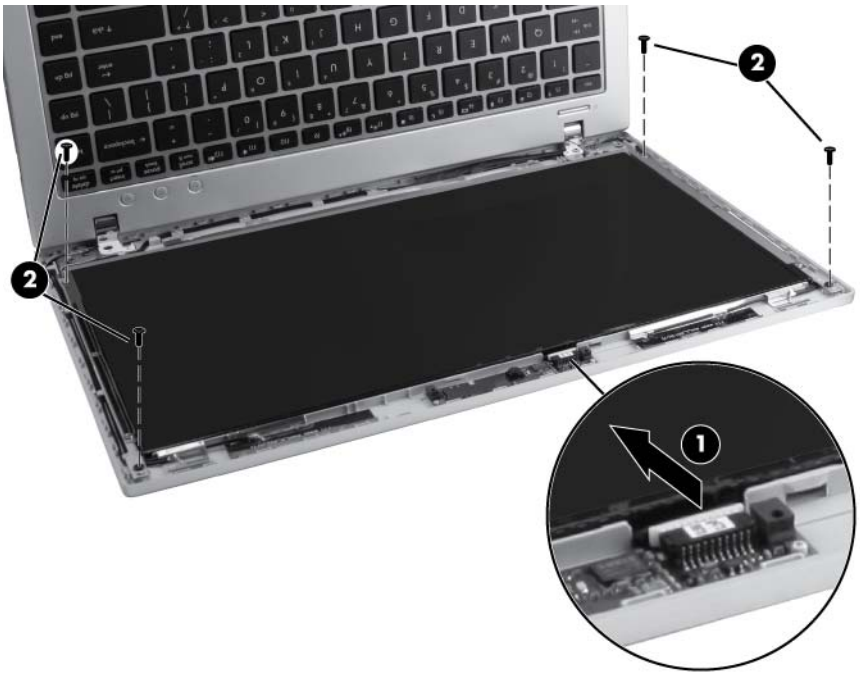
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see Battery on page 36).

Remove the display panel:

1. Position the computer right-side up on a flat surface, with the display open.
2. Flex the top **(1)** of the bezel from the inside edge until it disengages from the display back cover.
3. Flex the inside edge of the left side and the right side **(2)** of the bezel until they disengage from the display back cover.
4. Flex the bottom **(3)** of the bezel from the inside edge until it disengages from the display back cover.

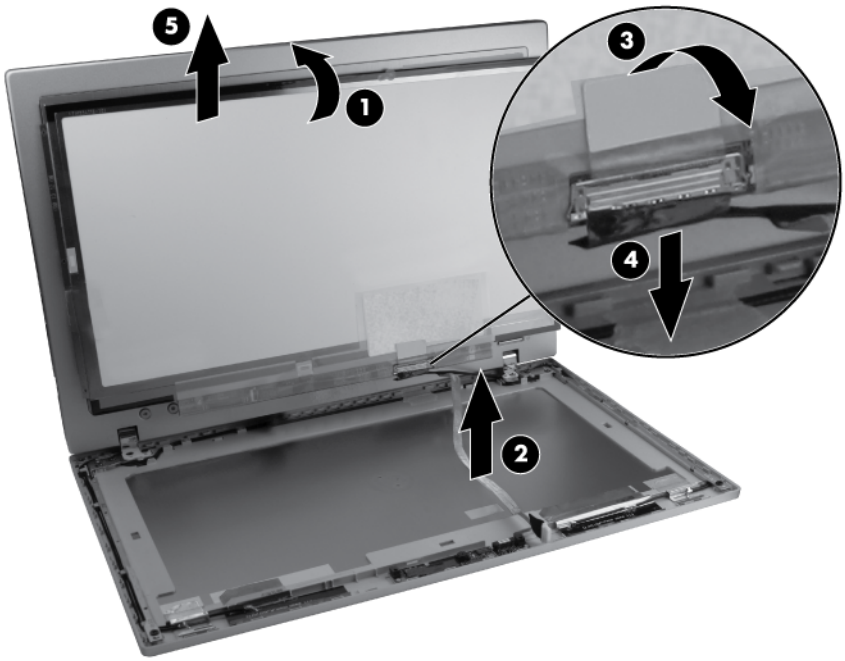
5. Remove the display bezel from the display back cover **(4)**.

6. Position the computer with the display assembly on a flat surface and the keyboard open at a 90-degree angle.
7. Disconnect the webcam cable **(1)** and remove the four Phillips M2.0x3.0 screws **(2)** that secure the display panel to the hinge brackets.



8. Lift the display panel **(1)** toward the keyboard, and then peel the webcam cable **(2)** from the back of the display panel.

9. Peel the adhesive from the back of the display panel **(3)**, disconnect the display cable **(4)**, and then remove the display panel **(5)**.



Reverse this procedure to install the display panel.

Display assembly

Description	Spare part number
Display bezel	650368-001
Webcam module	650405-001
Display Hinge Kit (includes left and right display hinges)	650374-001
Display hinge covers	650376-001
WLAN antennas and cables (included in the Antenna Kit, spare part number 650365-001)	
WWAN antennas and cables (included in the Antenna Kit, spare part number 650365-001)	
Display back cover	650366-001

NOTE: Removing the display panel is not required to remove the display assembly. If it is necessary to remove the wecam module, WLAN module, or WWAN module, remove the display bezel for access to those components. For display bezel removal instructions, see Display panel on page 72.

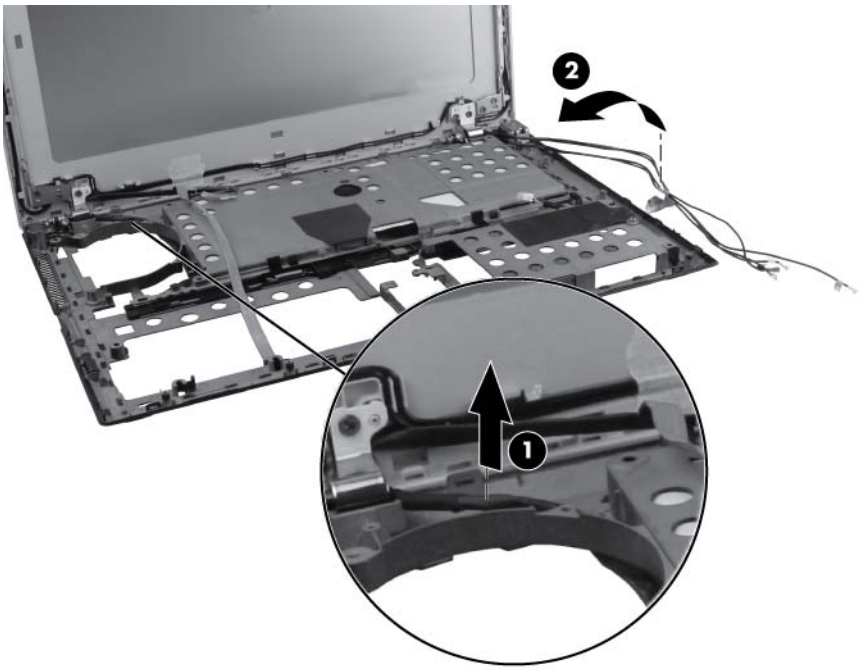
Before removing the display assembly, follow these steps:

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 36).
5. (Optional) Remove the display panel (see Display panel on page 72).
6. Remove the service access cover (see Service access cover on page 38).
7. Remove the keyboard (see Keyboard on page 50).
8. Remove the fan (see Fan on page 53).
9. Remove the top cover (see Top cover on page 55).
10. Remove the speakers (see Speakers on page 65).
11. Remove the system board (see System board on page 66).
12. Remove the power connector cable (see Power connector cable on page 70).

Remove the display assembly:

1. Position the computer right-side up, with the front toward you.

2. Feed the display cable **(1)** through the bottom of the base enclosure, and then remove the WLAN and WWAN cables **(2)** from the base enclosure routing channels.

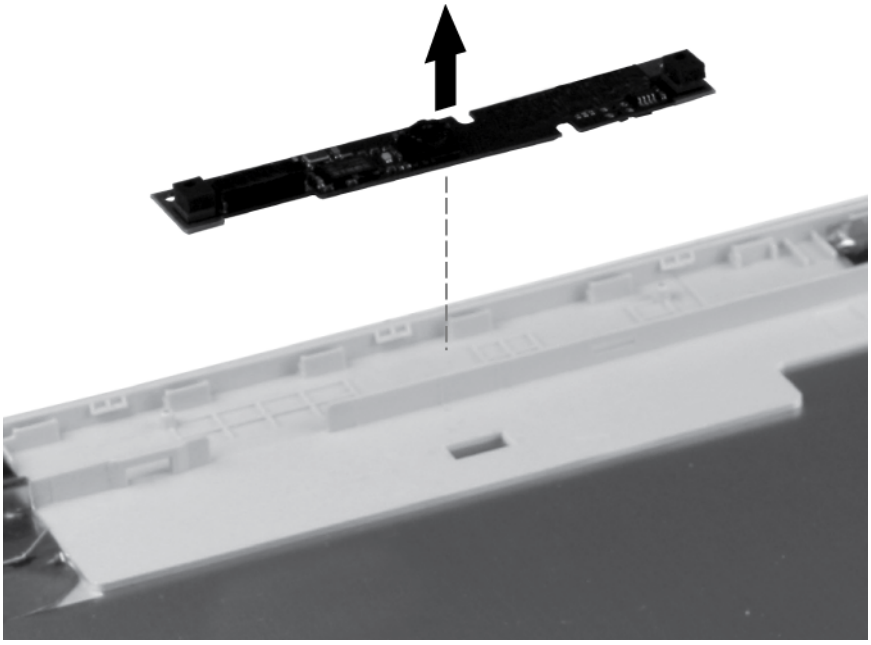


CAUTION: Support the display assembly when removing the display screws in the following steps. Failure to support the display assembly can result in damage to the assembly and other components.

3. Remove the four T8 2.5x4.0 screws **(1)** that secure the display assembly hinges to the base enclosure.

4. Lift the display assembly **(2)** straight up and remove it from the base enclosure.

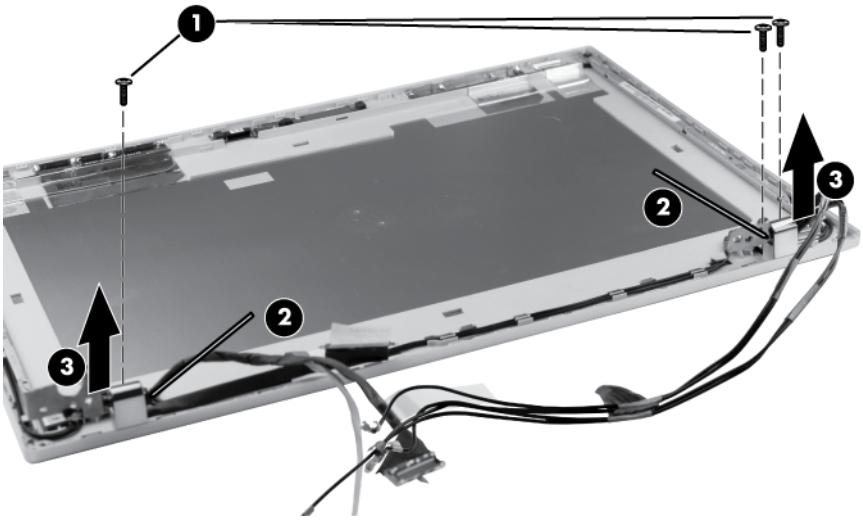
5. If it is necessary to replace the webcam module, position the display assembly on a flat surface. Gently pull the webcam module away from the double-sided tape on the display back cover and remove the webcam.



6. If it is necessary to replace the display hinges, remove the three T8 2.5x3.0 screws **(1)** that secure the hinge covers to the display back cover.

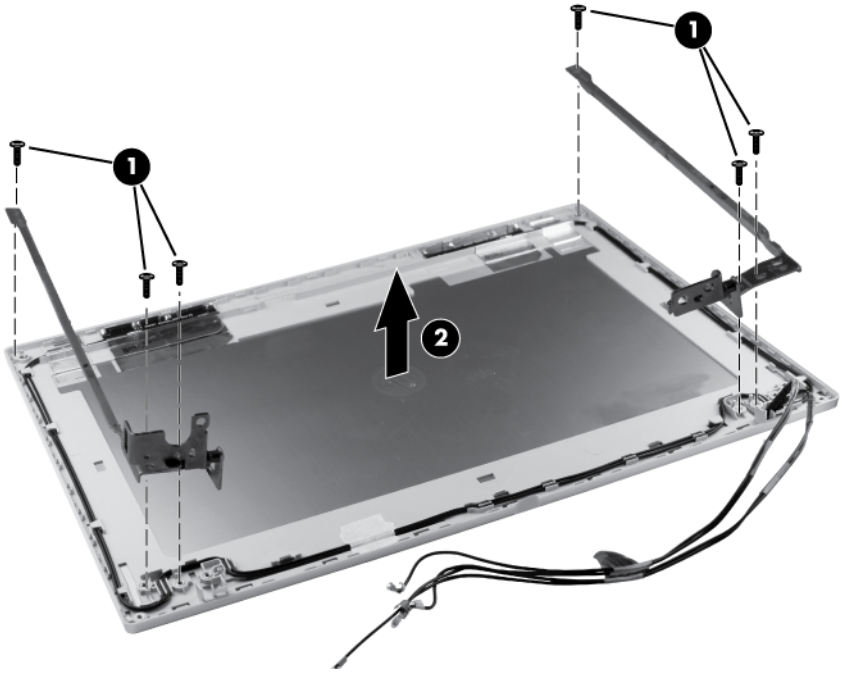
7. Insert a small tool **(2)** under each hinge cover, and then apply upward pressure to disengage the hinge cover **(3)**.

NOTE: Be careful not to scratch the silver paint when removing the display hinge covers.

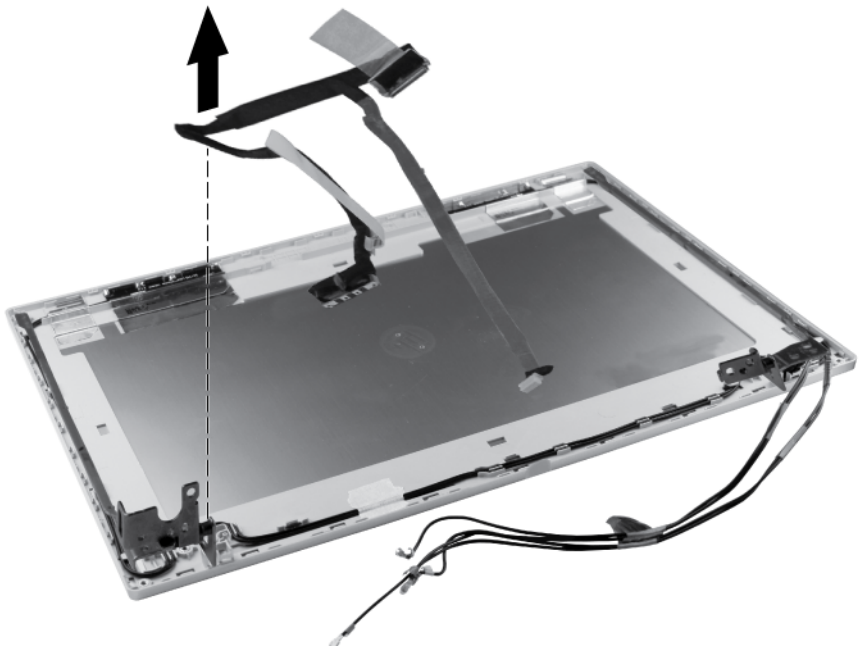


8. Remove the four T8 2.5x4.0 screws on the bottom corners and the two T8 2.5x3.0 screws **(1)** on the upper corners of the display hinges that secure the display hinges to the display assembly back cover.

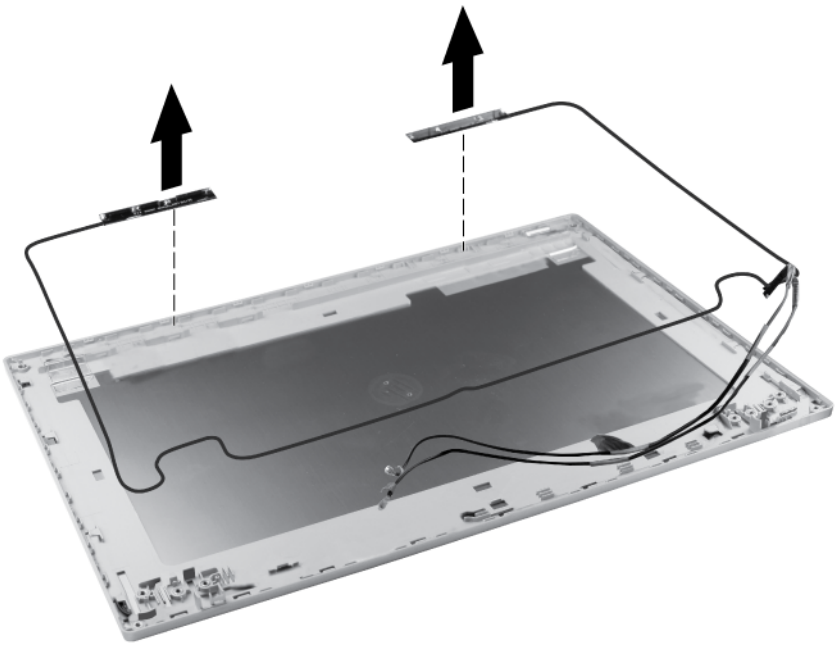
9. Remove the display hinges from the display back cover **(2)**.



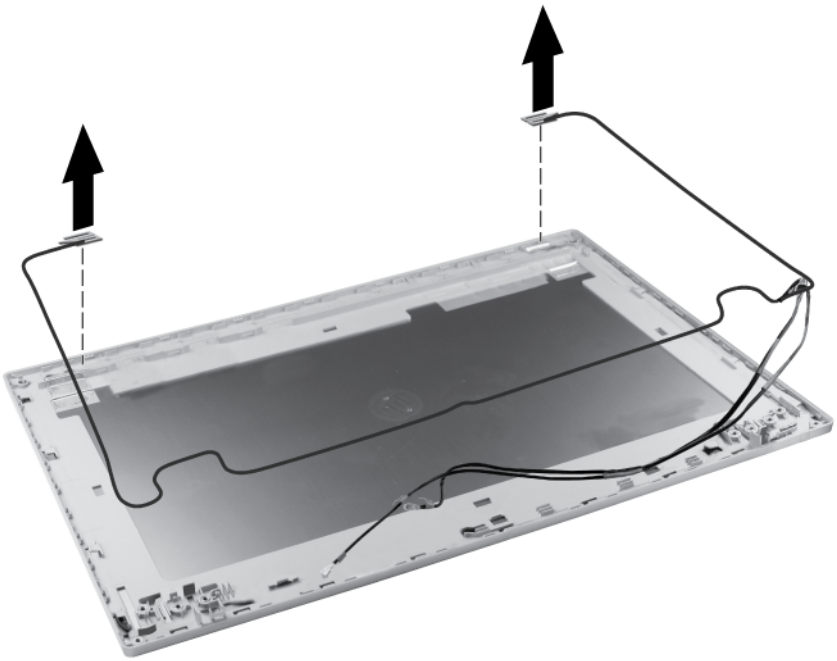
10. If it is necessary to replace the display webcam cable, lift it straight up from the display back cover.



11. If it is necessary to replace the WWAN antenna cables, detach the WWAN antenna transceivers from the adhesive on the back cover, remove the cables from the clips that secure them to the display back cover, and then remove the WWAN antenna cables.



12. If it is necessary to replace the WLAN antenna cables, detach the WLAN antenna transceivers from the adhesive on the back cover, remove the cables from the clips that secure them, and then remove the WLAN antenna cables.



Reverse this procedure to reassemble and install the display assembly.

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.

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

NOTE: 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.

   NOTE: 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

NOTE: Restoring defaults will not change the hard drive mode.

To return all settings in Computer Setup to the values that were set 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.

NOTE: 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.

NOTE: 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, memory size, system ROM, video revision, keyboard controller version, and wireless identification numbers.
Set System Date and Time	Set or change the date and time on the computer.
System Diagnostic	Display 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	Resets password to the factory default in case of a forgotten password.
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

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

Select	To do this
Setup BIOS Administrator Password	Set up a BIOS administrator password.
User Management (requires a BIOS administrator password)	• Create a new BIOS user account. • View a list of HP 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).
Anti Theft (select models only)	Enable/disable anti-theft protection.
Fingerprint Reset on Reboot (If Present)	Reset/clear the fingerprint reader ownership (disabled by default).
Allow reset of HP ProtectTools security keys	Enable/disable reset of HP ProtectTools security keys.
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.
DriveLock Passwords	• Enable/disable DriveLock on any computer hard drive (enabled by default). • Change a DriveLock user password or master password. **NOTE:** DriveLock settings are accessible only when you enter Computer Setup by turning on (not restarting) the computer.
Automatic DriveLock	Enable/disable Automatic DriveLock support.
Disk Sanitizer	Run Disk Sanitizer to destroy all existing data on the primary hard drive. **CAUTION:** 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

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

Select	To do this
Language	Change the Computer Setup language.

Select	To do this
Boot Options	• Set a Startup Menu delay (in seconds). • Set the MultiBoot 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 Express Boot Popup delay in seconds. • Set the 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 external optical drive connected by a USB port to the computer. • Enable/disable fan always on while connected to an AC outlet (enabled by default). • Enable/disable Data Execution Prevention. When enabled, the processor can disable some virus code execution, which helps to improve computer security. • Enable/disable LAN Power Save (select models only). When enabled, saves power by turning off the LAN when not in use (enabled by default). • SATA (Serial Advanced Technology Attachment) device mode. The following options are available: ◦ AHCI (Advanced Host Controller Interface) ◦ IDE (Integrated Drive Electronics)

Select	To do this
	NOTE: Availability of the options above varies by computer model. • Enable/disable HP DayStarter (enabled by default). • Enable/disable HP QuickLook (enabled by default). • Enable/disable Preboot Authentication on HP QuickLook Boot (disabled by default). • Enable/disable Virtualization Technology (select models only; disabled by default). • Enable/disable HP QuickWeb (enabled by default). • Enable/disable HP QuickWeb write protect (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 Unified Extensible Firmware Interface (UEFI) mode (disabled by default). • Turn the Numlock state at boot on or off.

Select	To do this
Built-in Device Options	• Enable/disable the wireless button state (enabled by default). • Enable/disable the embedded WLAN device (enabled by default). • Enable/disable embedded WWAN device radio (select models only; enabled by default). • Enable/disable 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 (set by default) ◦ Follow Boot Order • Enable/disable the fingerprint device (enabled by default). • Enable/disable a modem device (enabled by default). • Enable the ambient light sensor (enabled by default). • Enable/disable the Notebook MultiBay device (enabled by default). • Enable/disable the integrated camera (select models only; enabled by default). • Enable/disable the power monitor circuit (enabled by default). • Enable/disable the audio device (enabled by default). • Enable/disable optical disc drive (enabled by default). • Enable/disable internal microphone (enabled by default). • Enable/disable the internal speakers (enabled by default).
Port Options (all are enabled by default)	**NOTE:** All port options are enabled by default. • Enable/disable the smart card slot. • Enable/disable the flash media reader. • Enable/disable the USB port. **CAUTION:** Disabling the USB port also disables MultiBay devices on the advanced port replicator. • Enable/disable the 1394 port. • Enable/disable the eSATA port.
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.

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

NOTE: 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.

   NOTE: 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

NOTE: Restoring defaults will not change the hard drive mode.

To return all settings in Computer Setup to the values that were set 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.

NOTE: 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.

NOTE: 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, memory size, system ROM, video revision, keyboard controller version, and wireless identification numbers.
Set System Date and Time	Set or change the date and time on the computer.
System Diagnostic	Display 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	Resets password to the factory default in case of a forgotten password.
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

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

Select	To do this
Setup BIOS Administrator Password	Set up a BIOS administrator password.
User Management (requires a BIOS administrator password)	• Create a new BIOS user account. • View a list of HP 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).
Anti Theft (select models only)	Enable/disable anti-theft protection.
Fingerprint Reset on Reboot (If Present)	Reset/clear the fingerprint reader ownership (disabled by default).
Allow reset of HP ProtectTools security keys	Enable/disable reset of HP ProtectTools security keys.
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.
DriveLock Passwords	• Enable/disable DriveLock on any computer hard drive (enabled by default). • Change a DriveLock user password or master password. **NOTE:** DriveLock settings are accessible only when you enter Computer Setup by turning on (not restarting) the computer.
Automatic DriveLock	Enable/disable Automatic DriveLock support.
Disk Sanitizer	Run Disk Sanitizer to destroy all existing data on the primary hard drive. **CAUTION:** 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

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

Select	To do this
Language	Change the Computer Setup language.

Select	To do this
Boot Options	• Set a Startup Menu delay (in seconds). • Set the MultiBoot 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 Express Boot Popup delay in seconds. • Set the 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 external optical drive connected by a USB port to the computer. • Enable/disable fan always on while connected to an AC outlet (enabled by default). • Enable/disable Data Execution Prevention. When enabled, the processor can disable some virus code execution, which helps to improve computer security. • Enable/disable LAN Power Save (select models only). When enabled, saves power by turning off the LAN when not in use (enabled by default). • SATA (Serial Advanced Technology Attachment) device mode. The following options are available: ◦ AHCI (Advanced Host Controller Interface) ◦ IDE (Integrated Drive Electronics)

Select	To do this
	NOTE: Availability of the options above varies by computer model. • Enable/disable HP DayStarter (enabled by default). • Enable/disable HP QuickLook (enabled by default). • Enable/disable Preboot Authentication on HP QuickLook Boot (disabled by default). • Enable/disable Virtualization Technology (select models only; disabled by default). • Enable/disable HP QuickWeb (enabled by default). • Enable/disable HP QuickWeb write protect (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 Unified Extensible Firmware Interface (UEFI) mode (disabled by default). • Turn the Numlock state at boot on or off.

Select	To do this
Built in Device Options	• Enable/disable the wireless button state (enabled by default). • Enable/disable the embedded WLAN device (enabled by default). • Enable/disable embedded WWAN device radio (select models only; enabled by default). • Enable/disable 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 (set by default) ◦ Follow Boot Order • Enable/disable the fingerprint device (enabled by default). • Enable/disable a modem device (enabled by default). • Enable the ambient light sensor (enabled by default). • Enable/disable the Notebook MultiBay device (enabled by default). • Enable/disable the integrated camera (select models only; enabled by default). • Enable/disable the power monitor circuit (enabled by default). • Enable/disable the audio device (enabled by default). • Enable/disable optical disc drive (enabled by default).. • Enable/disable internal microphone (enabled by default). • Enable/disable the internal speakers (enabled by default).
Port Options (all are enabled by default)	**NOTE:** All port options are enabled by default. • Enable/disable the smart card slot. • Enable/disable the flash media reader. • Enable/disable the USB port. **CAUTION:** Disabling the USB port also disables MultiBay devices on the advanced port replicator. • Enable/disable the 1394 port. • Enable/disable the eSATA port.

Select	To do this
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 Linux

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.

NOTE: Some of the Computer Setup menu items listed in this guide may not be supported by your computer or your operating system.

NOTE: Pointing devices are not supported in Computer Setup. You must use the keyboard to navigate and make selections.

NOTE: An external keyboard connected by USB 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.
2. Before your operating system opens and while the “F10=ROM Based Setup” message is displayed in the lower-left corner of the screen, press f10.

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.

1. Open Computer Setup by turning on or restarting the computer, and then pressing f10 while the "F10 = ROM Based Setup" message is displayed in the lower-left corner of the screen.

   Because Computer Setup is not operating system based, it does not support the TouchPad. Navigation and selection are by keystroke:

   - To choose a menu or a menu item, use the arrow keys.
   - To select an item, press enter.
   - To close open dialog boxes and return to the main Computer Setup screen, press esc.

- To view navigation information, press f1.
- To change the language, press f2.

2. Select the **File**, **Security**, **Diagnostics**, or **System Configuration** menu.
3. To exit Computer Setup, choose one of the following methods:
   - To exit Computer Setup without saving your preferences, use the arrow keys to select **File > Ignore Changes And Exit**. Then follow the instructions on the screen.
   - To save your preferences and exit Computer Setup, use the arrow keys to select **File > Save Changes And Exit**. Then follow the instructions on the screen.

Your preferences go into effect when the computer restarts.

Restoring factory settings in Computer Setup

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

1. Open Computer Setup by turning on or restarting the computer, and then pressing f10 while the "F10 = ROM Based Setup" message is displayed in the lower-left corner of the screen.
2. Use the arrow keys to select **File > Restore Defaults**, and then press enter.
3. When the confirmation dialog box opens, press f10.
4. To save your preferences and exit Computer Setup, use the arrow keys to select **File > Save Changes And Exit**. Then follow the instructions on the screen.

Your preferences go into effect when the computer restarts.

NOTE: 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.

NOTE: Some of the Computer Setup menu items listed in this guide may not be supported by your computer or your operating system.

File menu

NOTE: Some of the menu items listed in this section may not be supported by your computer or your operating system.

Select	To do this
System information	• View identification information for the computer. • View specification information for the processor, cache and memory size, and system ROM.
Restore Defaults	Replace the configuration settings in Computer Setup with the original factory settings. (Password settings and security settings are not changed when you restore the factory settings.)

Select	To do this
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

NOTE: Some of the menu items listed in this section may not be supported by your computer or your operating system.

Select	To do this
Setup Password	Enter, change, or delete a setup password.
Password Options	• Enable/disable stringent security. • Enable/disable the password requirement on computer restart.
DriveLock Passwords	• Enable/disable DriveLock on any computer hard drive. • Enter, change, or disable DriveLock on an optional MultiBay hard drive. **NOTE:** DriveLock settings are accessible only when you enter Computer Setup by turning on (not restarting) the computer.
System IDs	Enter a user-defined computer asset tracking number and ownership tag.
Disk Sanitizer	Run Disk Sanitizer to destroy all existing data on the primary hard drive. The following options are available: • Fast: Runs the Disk Sanitizer erase cycle once. • Optimum: Runs the Disk Sanitizer erase cycle 3 times. • Custom: Allows you to select the desired number of Disk Sanitizer erase cycles from a list. **CAUTION:** If you run Disk Sanitizer, the data on the primary hard drive is destroyed permanently.

Diagnostics menu

NOTE: Some of the menu items listed in this section may not be supported by your computer or your operating system.

Select	To do this
HDD Self-Test Options	Run a comprehensive self-test on any hard drive in the system or on any optional MultiBay hard drive.
Memory Check	Run a comprehensive check on system memory.

System Configuration menu

NOTE: Some of the menu items listed in this section may not be supported by your computer or your operating system.

Select	To do this
Language	Change the Computer Setup language.
Boot options	• Set an f9, f10, and f12 delay when starting up. • Enable/disable CD-ROM boot. • Enable/disable floppy boot. • Enable/disable internal network adapter boot. • Enable/disable MultiBoot, which sets a boot order that can include most boot devices in the system. • Set the Express Boot Popup delay in seconds. • Set the boot order. ◦ 1st boot device: USB CD-ROM ◦ 2nd boot device: USB floppy ◦ 3rd boot device: USB SuperDisk ◦ 4th boot device: Notebook hard drive ◦ 5th boot device: USB hard disk ◦ 6th boot device: Network controller
Device Configurations	• Swap the functions of the fn key and left ctrl key. • Enable/disable USB legacy support. When enabled, USB legacy support allows the following: ◦ Use of a USB keyboard in Computer Setup even when a your 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. • Enable/disable BIOS DMA data transfers. • Enable/disable fan always on while connected to an AC outlet. • Enable/disable data execution prevention. • Enable/disable LAN power saving mode. • Enable/disable SATA Native Mode. • Enable/disable Dual Core CPU. • Enable/disable HDD translation mode.

Select	To do this
Built in device options	• Enable/disable embedded WLAN Device Radio. • Enable/disable embedded Bluetooth Device Radio. • Enable/disable Network Interface Controller (NIC) • Enable/disable LAN/WLAN Switching. • Enable/disable Wake on LAN. • Enable/disable the integrated camera (webcam)
Port options	• Enable/disable USB port. • Enable/disable ExpressCard slot.

6 Specifications

Computer specifications

Dimensions	
Depth	**22.5 cm** (8.8 in)
Width	**32.8 cm** (12.9 in)
Height (front to rear)	**25.2 mm** (0.99 in)
Weight	
Computer equipped with a 4-cell battery, 128 MB solid-state drive, one memory module, and **33.8 cm** (13.3 in) display panel	**1.81 kg** (3.99 lbs)
Input power	
Operating voltage	18.5 V dc @ 4.74 A – 90 W
Operating current	4.74 A
Temperature	
Operating	**5°C to 35°C** (41°F to 95°F)
Nonoperating	**-20°C to 60°C** (-4°F to 140°F)
Relative humidity (non-condensing)	
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
NOTE: Applicable product safety standards specify thermal limits for plastic surfaces. The computer operates well within this range of temperatures.	

33.8 cm (13.3 in) display specifications

Dimensions	
Height	**16.3 cm** (6.4 in)
Width	**26.1 cm** (10.3 in)
Diagonal	**33.8 cm** (13.3 in)
Number of colors	Up to 16.8 million
Contrast ratio	300:1 (typical)
Brightness	200 nits (typical)
Pixel resolution	
Pitch	0.204 × 0.204 mm
Format	SD: 1280×800
Configuration	RGB vertical stripe
Backlight	LED
Character display	80 × 25
Total power consumption	4.0 W
Viewing angle	±30° horizontal, ±10° vertical (minimum)

Hard drive specifications

	500 GB*	320 GB*	250 GB*	128 GB SSD*
Dimensions				
Height	9.5 mm	9.5 mm	9.5 mm	6.35 mm
Width	70 mm	70 mm	70 mm	70 mm
Weight	115 g	115 g	115 g	86 g
Interface type	SATA	SATA	SATA	SATA
Transfer rate	100 MB/sec	100 MB/sec	100 MB/sec	100 MB/sec
Security	ATA security	ATA security	ATA security	ATA security
Seek times (typical read, including setting)				
Single track	2.0 ms	2.0 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	976,773,168	625,142,448	488,397,168	156,301,488
Disc rotational speed	7200 rpm	7200 rpm	7200 rpm	
Operating temperature	**0°C to 60°C** (32°F to 140°F)	**0°C to 60°C** (32°F to 140°F)	**0°C to 60°C** (32°F to 140°F)	**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.

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

7 Backup and recovery

Windows 7 backup and recovery

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

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

NOTE: 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 external optical drive attached to your computer.

NOTE: 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 external optical drive attached to your computer.

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

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

NOTE: 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**.
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).

NOTE: 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 Windows 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.

NOTE: 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**.
2. Follow the on-screen instructions to recover your system settings, your computer (select models only), or your files.

NOTE: 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 Windows 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, select **Start**, right-click **Computer**, click **Manage**, and then click **Disk Management**.

   NOTE: If the Windows partition and the HP Recovery partition are 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.

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

Using f11

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.

NOTE: 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: select **Start**, right-click **Computer**, click **Manage**, and then click **Disk Management**.

NOTE: 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. Make 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 then 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. 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 7 operating system DVD, follow these steps:

NOTE: This process takes several minutes. Before rebooting, make sure you have changed the legacy boot order in the F10 utility so that the USB CD-ROM drive is the first choice.

1. If possible, back up all personal files.
2. Restart the computer, and then insert the Windows 7 operating system DVD into the external 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.

Windows Vista backup and recovery

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), 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.

The Backup and Restore Center provides the following options:

- Creating a system repair disc (select models only)
- 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

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

NOTE: 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 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 external optical drive connected to your computer.

NOTE: 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 external optical drive.

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

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

NOTE: 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).

NOTE: 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.

NOTE: 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 Vista operating system DVD to reboot the computer and repair the operating system. For additional information, refer to the “Using a Vista 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 system settings, your computer (select models only), or your files.

NOTE: 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**.

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

NOTE: 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.

NOTE: 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**.

   NOTE: If the HP Recovery partition is not listed, you must recover your operating system and programs using the Windows Vista operating system DVD and the *Driver Recovery* disc (both purchased separately). For additional information, refer to the "Using a Windows Vista operating system DVD (purchased separately)" section in this guide.
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 boot (start up) your computer, you must purchase a Windows Vista operating system DVD to reboot the computer and repair the operating system. Make 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:

NOTE: 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.

Linux backup and recovery

Use the instructions in this section if SUSE Linux SLED 11 is installed on your computer.

To protect your information, back up your files and folders. Then if the system fails, you can restore your important files from copies. You can also use the options listed in this section to restore the operating system and programs that were installed at the factory.

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 original operating system and HP programs and drivers that were installed at the factory. Software, drivers, and updates not installed by HP must be manually 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. Restart the computer, and then press f11 while the “Press <F11> for recovery” message is displayed on the screen.
3. Follow the on-screen instructions.

8 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 requirements listed below 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

Country/region	Accredited agency	Applicable note number
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.

9 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. Exercise caution 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.

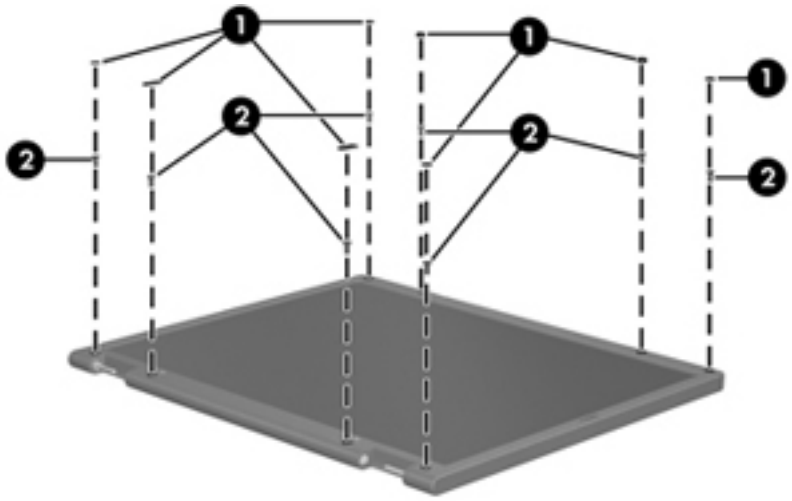
NOTE: **Materials Disposal**. This HP product contains mercury in the backlight in the display assembly that might require special handling at end-of-life. Disposal of mercury may be regulated because of environmental considerations. For disposal or recycling information, contact your local authorities, 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 **(1)** and the liquid crystal display (LCD) panel **(2)**.

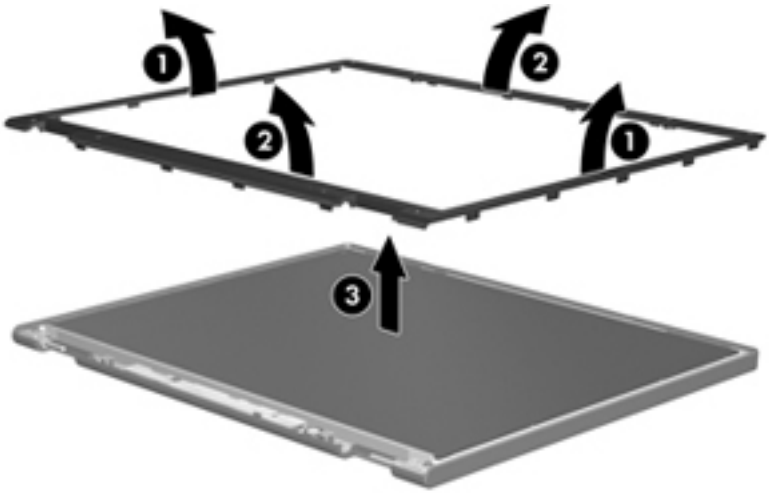
NOTE: The procedures provided in this chapter are general disassembly instructions. Specific details, such as screw sizes, quantities, and locations, and component shapes and sizes, can vary from one computer model to another.

Perform the following steps to disassemble the display assembly:

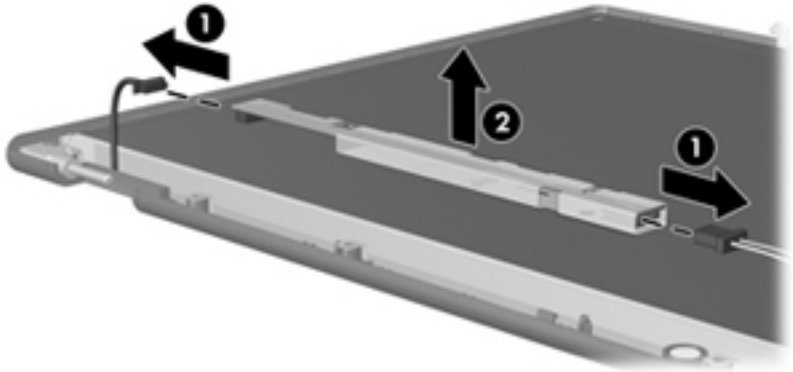
1. Remove all screw covers **(1)** and screws **(2)** that secure the display bezel to the display assembly.



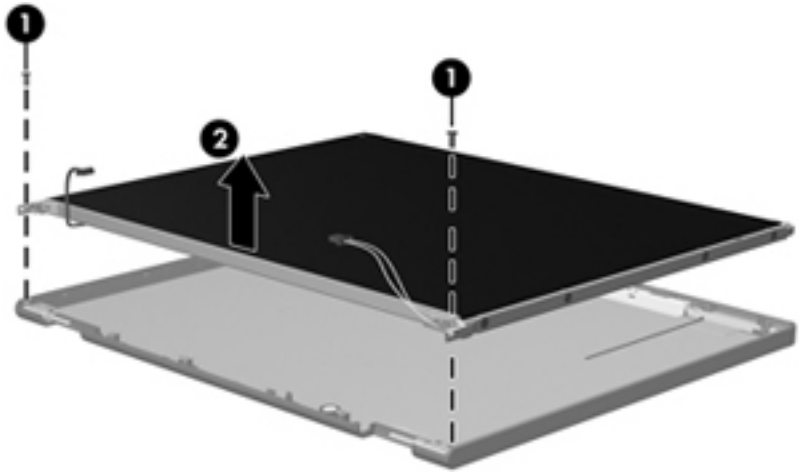
2. Lift up and out on the left and right inside edges **(1)** and the top and bottom inside edges **(2)** of the display bezel until the bezel disengages from the display assembly.
3. Remove the display bezel **(3)**.



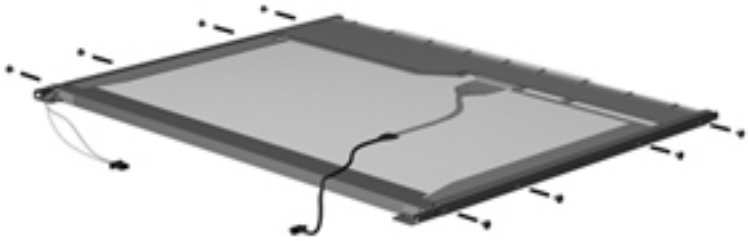
4. Disconnect all display panel cables **(1)** from the display inverter and remove the inverter **(2)**.



5. Remove all screws **(1)** that secure the display panel assembly to the display enclosure.
6. Remove the display panel assembly **(2)** from the display enclosure.

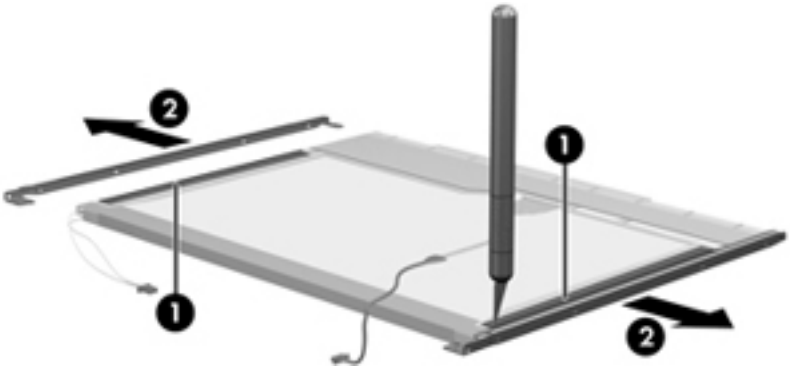


7. Turn the display panel assembly upside down.
8. Remove all screws that secure the display panel frame to the display panel.

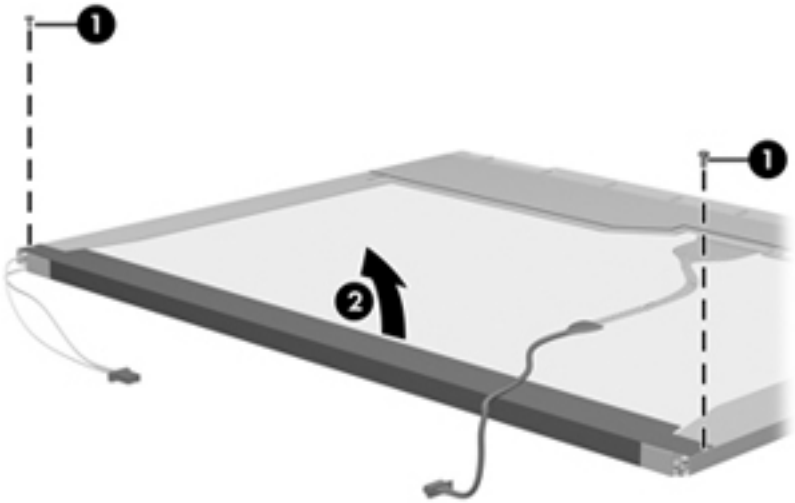


9. Use a sharp-edged tool to cut the tape **(1)** that secures the sides of the display panel to the display panel frame.

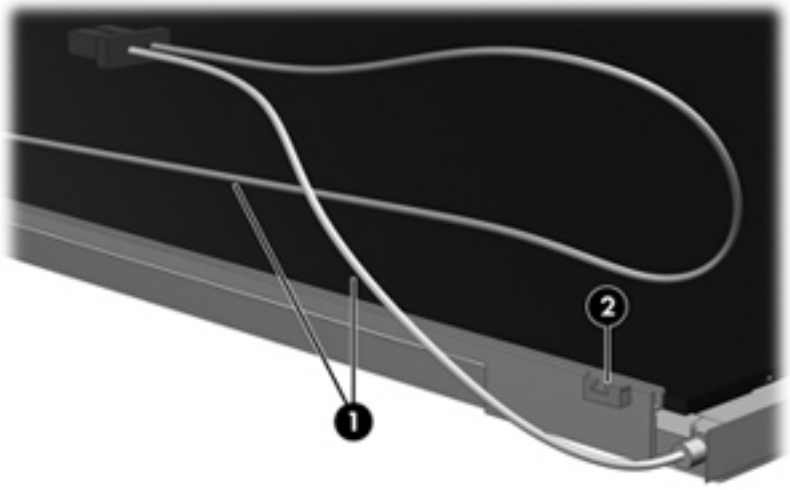
10. Remove the display panel frame **(2)** from the display panel.



11. Remove the screws **(1)** that secure the backlight cover to the display panel.
12. Lift the top edge of the backlight cover **(2)** and swing it outward.



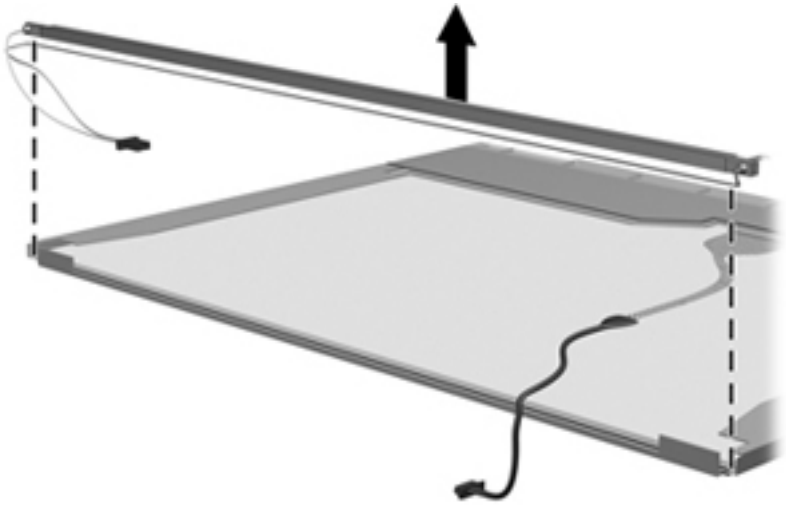
13. Remove the backlight cover.
14. Turn the display panel right-side up.
15. Remove the backlight cables **(1)** from the clip **(2)** in the display panel.



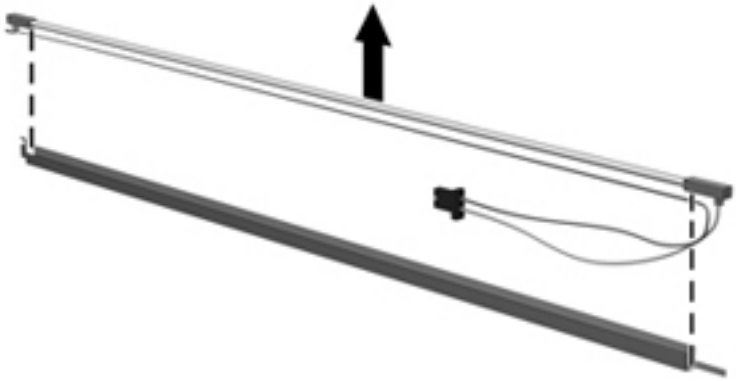
16. Turn the display panel upside down.

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

17. Remove the backlight frame from the display panel.

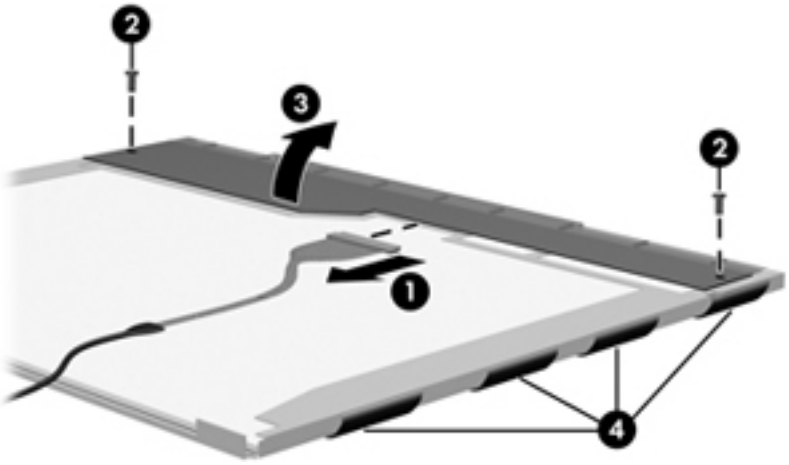


18. Remove the backlight from the backlight frame.

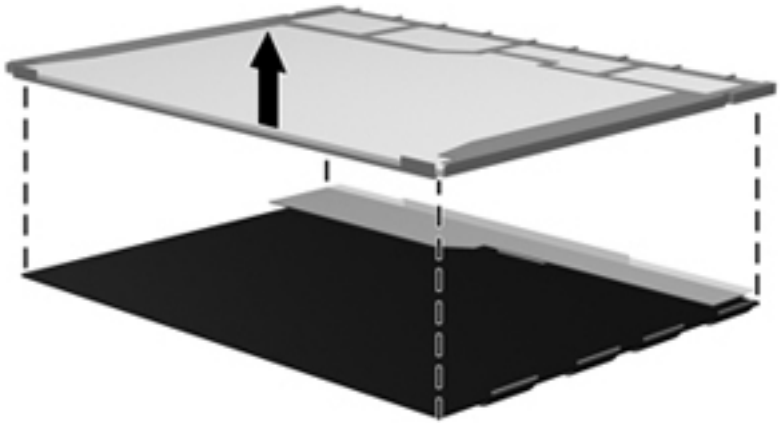


19. Disconnect the display panel cable **(1)** from the LCD panel.
20. Remove the screws **(2)** that secure the LCD panel to the display rear panel.
21. Release the LCD panel **(3)** from the display rear panel.

22. Release the tape **(4)** that secures the LCD panel to the display rear panel.



23. Remove the LCD panel.



24. Recycle the LCD panel and backlight.

Index

A
AC adapter
  spare part number 25
activity button board
  location 19
  removal 60
  spare part number 19, 60
antennas, disconnecting 42, 45
audio board
  location 19
  removal 61
  spare part number 19, 28, 61
audio in (microphone) jack, identifying 12
audio, product description 2
audio-out (headphone) jack, identifying 12
Automatic DriveLock 83, 90

B
backing up
  Linux 109
  Windows 7 102
  Windows Vista 105
Backup and Restore 102, 103
Backup and Restore Center 105, 107
base enclosure, spare part number 19
battery
  removal 36
  spare part number 19, 36
battery bay, identifying 15
battery cover
  illustrated 22
  spare part number 21
battery cover release latch 15
battery light 12
BIOS administrator password 83, 90
BIOS reset 82, 89
Bluetooth module
  location 19
  removal 62
  spare part number 19, 62
Bluetooth module cable 23, 62
boot options 84, 91, 97
boot order 84, 91, 97
built in device
  ambient light sensor 86, 93
  Bluetooth device radio 86, 93
  embedded WLAN 86, 93
  fingerprint reader 86, 93
  integrated camera 86, 93
  LAN/WLAN switching 86, 93
  modem 86, 93
  Network Interface Controller (LAN) 86, 93
  Notebook MultiBay 86, 93
  Wake on LAN 86, 93
  wireless hotkey 86, 93
  WWAN device radio 86, 93
built in device options 86, 93
buttons
  left TouchPad 6
  power 8
  right TouchPad 6

C
Cable Kit
  contents 23
  spare part number 23
cables, service considerations 31
caps lock light, identifying 7
chipset, product description 1
component recycling
  battery 112
  display 112
components
  bottom 15
  display 14
  front 11
  left side 13
  right side 12
  top 6
Computer Setup 80, 87
  Diagnostic menu 96
  File menu 82, 89, 95
  navigating and selecting 80, 87, 94
  restoring factory settings 81, 88, 95
  Security menu 83, 90, 96
  System Configuration menu 83, 90, 97
computer specifications 99
connector, power 12
connectors, service considerations 31
creating a backup 102

D
device configurations 84, 91
Diagnostic menu 96
Disk Sanitizer 83, 90
diskette drive, precautions 31
display assembly
  removal 75
  spare part number 75
display back cover, spare part number 22, 27, 75
display bezel
  location 21
  spare part number 21
display cable, spare part number 22, 27
display hinge kit
  location 21
  spare part number 21, 27
display hinge kit, spare part number 75
display panel
  location 18
  removal 72
  spare part number 18, 72
display specifications 100
DriveLock password 83, 90
drives
  boot order 84, 91, 97
  preventing damage 31
Dual-Core CPU 85, 92
DVD±RW Double-Layer Drive
  precautions 31

E
electrostatic discharge 32
embedded numeric keypad, identifying 10
error log 82, 89
eSATA port 13
esc key, identifying 10
Ethernet, product description 2
Execution Disable 84, 91
external media cards, product description 2
external monitor port 13

F
f11 recovery 104, 108
fan
location 18
removal 53
spare part number 18, 53
fan plate, location 19
File menu 82, 89, 95
fingerprint reader, identifying 9
fn key, identifying 10
function keys, identifying 10

G
graphics, product description 1
grounding equipment and methods 34

H
hard disk test 82, 89
hard drive
precautions 31
product description 1
removal 47
spare part number 19, 24, 47
hard drive bay, identifying 15
hard drive light 11
hard drive recovery 104, 108
hard drive specifications 101
HDMI port, identifying 13
headphone (audio-out) jack 12
heat sink
location 19
removal 68
spare part number 19, 68
hinge covers, part number 22
HP DayStarter 85, 92
HP QuickLook 85, 92
HP QuickWeb 85, 92
HP SpareKey enrollment 83, 90

I
integrated webcam light, identifying 14
internal display switch 14
internal microphones, identifying 14

J
jacks
audio in (microphone) 12
audio-out (headphone) 12
network 12
RJ-45 (network) 12

K
keyboard
location 18
product description 3
removal 50
spare part number 18, 50
keypad
embedded numeric 10
keys
esc 10
fn 10
function 10
Windows applications 10
Windows logo 10

L
LAN Power Save 84, 91
language, changing in Computer Setup 83, 90
latch, battery cover release 15
legacy support, USB 80, 84, 87, 91, 94, 97
lights
battery 12
caps lock 7
hard drive 11
power 7, 11
TouchPad 7
webcam 14
wireless 7

M
mass storage devices, spare part number 24
Media Card Reader, identifying 13
memory module
product description 1
removal 40
spare part number 20, 40
memory module compartment, identifying 15
microphone (audio in) jack, identifying 12
model name 1

N
network jack, identifying 12
Numlock state 85, 92

O
operating system, product description 3
optical drive, precautions 31

P
packing guidelines 33
panels, product description 1
passwords 83, 90, 96
plastic parts 30
Plastics Kit
contents 22
spare part number 22
pointing devices, product description 3
port options 86, 93
1394 port 86, 93
eSATA port 86, 93
flash media reader 86, 93
smart card slot 86, 93
USB port 86, 93
ports
external monitor 13
HDMI 13
product description 2
USB 12, 13
power button board
location 19
removal 59
spare part number 19, 59, 60
power button, identifying 8
power cable, illustrated 23
power connector bracket, location 19

power connector cable
location 19
removal 70
power connector, identifying 12
power cord
spare part number 25
power cord set requirements 110
power lights 7, 11
power requirements, product description 3
processor, product description 1
product description
audio 2
chipset 1
Ethernet 2
external media cards 2
graphics 1
hard drives 1
keyboard 3
memory module 1
operating system 3
panels 1
pointing devices 3
ports 2
power requirements 3
processors 1
product name 1
security 3
serviceability 5
visual 2
wireless 2
product name 1

R
recovery 103
recovery partition 104, 108
recycling, display components. *See* component recycling
removal/replacement
preliminaries 30
procedures 35
restore factory settings 81, 82, 88, 89
restore hard drive 104, 108
restore security defaults 86, 94
RJ-45 (network) jack, identifying 12
RTC battery
location 19
removal 64
spare part number 19, 64
run in test 82, 89

S
SATA (Serial Advanced Technology Attachment) devices 84, 91
AHCI (Advanced Host Controller Interface) 84, 91
IDE (Integrated Drive Electronics) 84, 91
Screw Kit, spare part number 25
SD Card blank, location 19
security cable slot, identifying 13
security defaults, restore 86, 94
security level 86, 94
Security menu 83, 90, 96
allow reset of HP ProtectTools security keys 83, 90
always prompt for HP SpareKey enrollment 83, 90
Anti Theft 83, 90
Automatic DriveLock 83, 90
change password 83, 90
Disk Sanitizer 83, 90
DriveLock 83, 90
fingerprint reader reset 83, 90
HP SpareKey 83, 90
HP SpareKey enrollment 83, 90
password policy 83, 90
set up BIOS administrator password 83, 90
System IDs 83, 90
user management 83, 90
security, product description 3
service access cover
illustrated 22
removal 38
spare part number 21
service considerations 30
Service tag 35
serviceability, product description 5
setup utility
Diagnostic menu 96
File menu 82, 89, 95
navigating and selecting 80, 87, 94
restoring factory settings 81, 88, 95
Security menu 83, 90, 96
System Configuration menu 83, 90, 97
SIM
removal 39
spare part number 39
SIM slot, identifying 15
slots
security cable 13
SIM 15
solid-state drive, spare part number 24
speakers
identifying 11
location 19
removal 65
spare part number 19, 65
specifications
computer 99
display 100
hard drive 101
start-up test 82, 89
static-shielding materials 34
stringent security 96
system board
location 19
removal 66
spare part number 19, 66
System Configuration menu 83, 90, 97
system date and time 82, 89
system diagnostic 82, 89
system fan 84, 91, 97
system IDs 83, 90
system information 82, 89, 95

T
tools required 30
top cover
location 19
removal 55
spare part number 19, 55
TouchPad
buttons 6
identifying 6
TouchPad cable
illustrated 23
TouchPad light, identifying 7

transporting guidelines 33

U
Unified Extensible Firmware Interface (UEFI) mode 85, 92
USB legacy support 80, 84, 87, 91, 94, 97
USB ports, identifying 12, 13

V
vents, identifying 13, 15
Virtualization Technology 85, 92
visual, product description 2

W
webcam light, identifying 14
webcam module, spare part number 22
webcam, identifying 14
Windows 7 operating system DVD 105
Windows applications key, identifying 10
Windows logo key, identifying 10
Windows Vista operating system DVD 108
wireless antennas
disconnecting 42, 45
identifying 14
wireless compartment, identifying 15
wireless light 7
wireless, product description 2
WLAN antennas
identifying 14
location 22
WLAN module
location 20
removal 41
spare part number 20, 41
workstation guidelines 33
WWAN antennas
identifying 14
location 22
WWAN module
location 20
removal 44
spare part number 20, 44