



HP ProBook 4740s Notebook PC

Maintenance and Service Guide

© Copyright 2012 Hewlett-Packard
Development Company, L.P.

Bluetooth is a trademark owned by its proprietor and used by Hewlett-Packard Company under license. Intel and Core are trademarks or registered trademarks of Intel Corporation in the United States and other countries. Microsoft, Windows, and Windows Vista are either trademarks or registered trademarks of Microsoft Corporation in the United States and/or other countries. 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: October 2012

Document Part Number: 702223-001

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	7
Display	7
Display - SUSE Linux models	9
Top	10
TouchPad	10
Lights	11
Buttons and fingerprint reader (select models only)	12
Keys	14
Keys - SUSE Linux models	15
Front	16
Left	17
Right	18
Bottom	19
3 Illustrated parts catalog	20
Service tag and PCID label	20
Service tag	20
PCID label	21
Computer major components	22
Display components	26
Plastics Kit	26
Cable Kit	27
Mass storage devices	28
Miscellaneous parts	29
Sequential part number listing	30
4 Removal and replacement procedures	35
Preliminary replacement requirements	35
Tools required	35

Service considerations	35
Plastic parts	35
Cables and connectors	36
Drive handling	36
Grounding guidelines	37
Electrostatic discharge damage	37
Packaging and transporting guidelines	38
Workstation guidelines	38
Equipment guidelines	39
Component replacement procedures	40
Battery	40
Bottom door	41
Using the optional security screw	42
Optical drive	43
Hard drive	45
Memory modules	48
WLAN/Bluetooth combo card	50
Keyboard	52
Top cover	54
Fingerprint reader board	59
Function board/Power button board assembly	61
USB connector assembly	62
Fan	64
Speaker assembly	65
Audio board	67
Power cable	68
Battery cable	69
System board	70
RTC battery	73
Optical drive extension board	75
Hard drive extension board	77
Heat sink	79
Processor	80
Latch assembly	83
Display assembly	85
5 Computer Setup (BIOS) and Advanced System Diagnostics	93
Windows 7 – Computer Setup (BIOS) and Advanced System Diagnostics	93
Using Computer Setup	93
Starting Computer Setup	93
Navigating and selecting in Computer Setup	93

Restoring factory settings in Computer Setup	94
Updating the BIOS	95
Downloading SoftPaqs to update the BIOS	95
BIOS management using system diagnostics	95
Using f10 setup to update the BIOS	95
Determining the BIOS version	96
Downloading a BIOS update	97
BIOS Setup Menu	97
Main menu	98
Security menu	98
Diagnostics menu	98
Using Advanced System Diagnostics	98
Windows 8 – Computer Setup (BIOS) and Advanced System Diagnostics	100
Using Computer Setup	100
Starting Computer Setup	100
Navigating and selecting in Computer Setup	100
Restoring factory settings in Computer Setup	101
Updating the BIOS	102
Determining the BIOS version	102
Downloading a BIOS update	102
Using Advanced System Diagnostics	103
SUSE Linux – Computer Setup (BIOS) and Advanced System Diagnostics	104
Starting Computer Setup	104
Using Computer Setup	104
Navigating and selecting in Computer Setup	104
Restoring factory settings in Computer Setup	105
Updating the BIOS	105
Determining the BIOS version	106
Downloading a BIOS update	106
Using Advanced System Diagnostics	107
6 Specifications	108
Computer specifications	108
43.9-cm (17.3-in), HD+ display specifications	109
Hard drive specifications	110
DVD±RW and CD-RW SuperMulti DL Combo Drive specifications	111
Blu-ray Disc ROM with SuperMulti DVD±R/RW DL Drive	112
Specification information in Device Manager	113
7 Backup and recovery	114
Windows 7 – Backup and recovery	114

Creating recovery media with HP Recovery Disc Creator	115
Creating recovery media	115
Backing up your information	115
Performing a system recovery	116
Using the Windows recovery tools	116
Using f11 recovery tools	117
Using a Windows 7 operating system DVD (purchased separately)	118
Windows 8 – Backup and recovery	119
Backing up your information	119
Performing a system recovery	120
Using the Windows recovery tools	120
Using f11 recovery tools	121
Using Windows 8 operating system media (purchased separately)	121
Using Windows Refresh for quick and easy recovery	122
Remove everything and reinstall Windows	122
Using HP Software Setup	123
SUSE Linux – Backup and recovery	124
Creating backups	124
Backing up your information	124
Performing a system recovery	125
USB Recovery option (select models only)	125
Remove everything and reinstall SLED	127
8 Power cord set requirements	128
Requirements for all countries and regions	128
Requirements for specific countries and regions	129
9 Recycling	131
Battery	131
Display	131
Index	137

1 Product description

Category	Description
Product Name	HP ProBook 4740s Notebook PC
Processors	Intel® Core™ i7 processor, Quad Core (6-GB L3 cache, 35W)
	3632QM, 2.20-GHz processor
	3612QM, 2.10-GHz processor
	Intel® Core i5 processors, Dual Core (3-GB L3 cache, 35W)
	3380M, 2.90-GHz processor
	3360M, 2.80-GHz processor
	3340M, 2.70-GHz processor
	3320M, 2.60-GHz processor
	3230M, 2.60-GHz processor
	3210M, 2.50-GHz processor
	2450M, 2.50-GHz processor
	Intel Core i3 processors, Dual Core, 3rd generation (3-GB L3 cache, 35W)
	3120M, 2.50-GHz processor
	3110M, 2.40-GHz processor
	Intel Core i3 processors, Dual Core, 2nd generation (3-GB L3 cache, 35W)
	2370M, 2.40-GHz processor
	2350M, 2.30-GHz processor
	Intel Pentium processor, Dual Core (2-GB L3 cache, 35W)
	2020M, 2.40-GHz processor
	B980, 2.40-GHz processor
	B970, 2.30-GHz processor
	Intel Celeron processor (2-GB L3 cache, 35W)
	840, 1.90-GHz processor
Chipset	Mobile Intel HM76 chipset
Graphics	AMD Radeon™ HD 7650M, 1-GB or 2-GB (discrete)

Category	Description
Panel	All display assemblies include 2 wireless local area network (WLAN) antennas
	All displays are LED backlit
	43.9-cm (17.3-inch) HD+, 1600x900, includes camera
Memory	Two customer-accessible/upgradeable memory module slots supporting up to 8 GB of RAM
	Supports dual-channel memory
	PC3-10600, 1333-MHz, DDR3
	Supports the following configurations:
	<ul style="list-style-type: none"> • 8192 (4096 × 2) • 6144 (4096 + 2048) • 4096 (2048 × 2) • 4096 (4096 × 1) • 2048 (2048 × 1)
Hard drives	Supports 7-mm/9.5-mm/12.7-mm, 2.5-in SATA hard drives with HP 3D DriveGuard
	Customer-accessible
	Supports the following drives:
	<ul style="list-style-type: none"> • 750-GB, 7200-rpm and 5400-rpm • 640-GB, 5400-rpm • 500-GB, 7200-rpm • 320-GB, 7200-rpm
Fixed optical drives	Supports the following 12.7-mm SATA optical drives:
	<ul style="list-style-type: none"> • DVD-ROM • DVD+/-RW SuperMulti DL • Blu-ray ROM DVD+/-RW SuperMulti DL
	Supports no optical drive option
Audio/Visual	Integrated dual-array microphone (webcam models only)
	Stereo speakers (2)
	Integrated webcam (720p HD)
	Headphone and microphone jacks
	IDT 92HD87
Ethernet	Realtek RTL8151EH-CG 10/100/1000
	S3/S4/S5 wake on LAN (AC mode only)
	Ethernet cable not included
Wireless	Integrated WLAN options by way of wireless module:

Category	Description
	Two WLAN antennas built into display assembly
	Supports “no WLAN” option
	Supports the following WLAN formats: <ul style="list-style-type: none"> • Atheros 9485GN 802.11b/g/n 1x1 WiFi and 3012 Bluetooth 4.0 Combo Adapter • Broadcom 4313GN 802.11b/g/n 1x1 WiFi and 20702 Bluetooth 4.0 Combo Adapter • Intel Centrino Wireless-N 2230 • Intel Centrino Advanced-N 6235 • Ralink WLAN Ralink Ripple3 RT5390F_802.11 b/g/n 1x1 PCIe HMC • Atheros AR9485 802.11b/g/n 1x1 WiFi Adapter • Atheros AR9565 802.11bgn 1x1 WiFi + BT4.0 combo Adapter • Ralink RT3290LE 802.11bgn 1x1 Wi-Fi and Bluetooth 4.0 Combo Adapter • Ralink RT5390R 802.11bgn 1x1 Wi-Fi Adapter
	Integrated personal area network (PAN) options by way of Bluetooth® module:
	Bluetooth 4.0 only supported by combo card
External media card	6-in-1 Digital Media Reader Slot
Ports	Audio-in (stereo microphone)
	Audio-out (stereo headphone)
	RJ-45 (Ethernet, includes link and activity lights)
	USB 3.0 (2)
	USB 2.0 (2)
	VGA (Dsub 15-pin) supporting 1600 × 1200 external resolution at 75-GHz (hot plug/unplug with auto-detect)
	HDMI
	Multi-pin AC port
Keyboard/pointing devices	Full-sized keyboard with numeric keypad
	Touchpad includes: supports 2-way scroll with legend, taps enabled by default, 2-finger scrolling and zoom enabled by default
Power requirements	90-W Smart AC adapter with localized cable plug support (3-wire plug with ground pin):
	In-line cavity, 8-cell, 73-Wh Li-ion battery
Security	Integrated fingerprint reader
	Intel AT support
	Support Kensington security lock
	Support no fingerprint reader option
Operating system	Preinstalled:

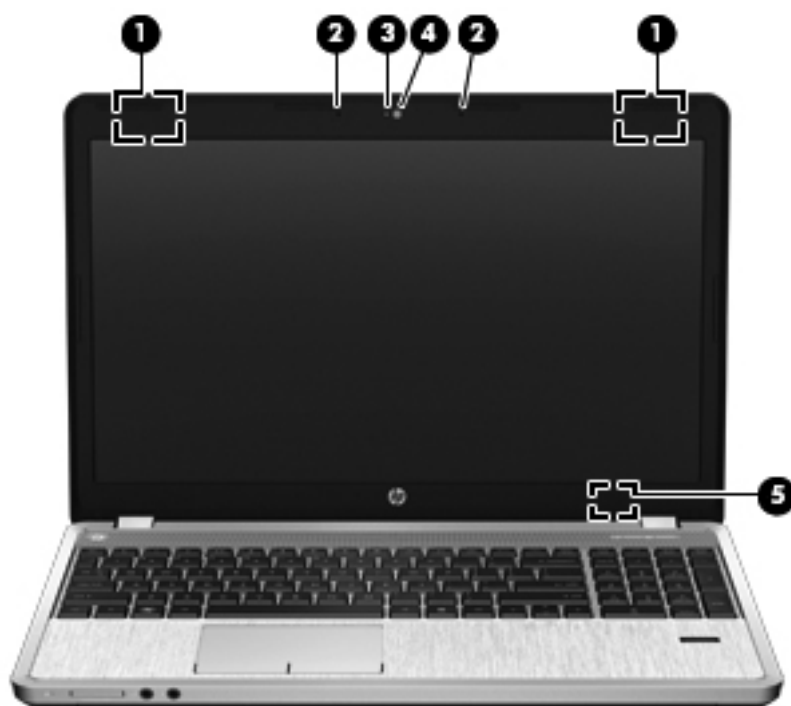
Category	Description
	Windows 7 Professional 64 with Microsoft Basics
	Windows 7 Professional 32 with Microsoft Basics (Japan only)
	Windows 7 Home Premium 64 with Microsoft Basics
	Windows 8 Professional 64-bit Digital Product Key (DPK) with Windows 7 Professional 64 Microsoft Basics
	Windows 8 Professional 64-bit Digital Product Key with Windows 7 Professional 32 Microsoft Basics (Japan only)
	Windows 8 Multi-language (ML) 64-bit with Microsoft Basics
	Windows 8 Professional 64-bit with Microsoft Basics
	Novell™: SuSE Linux™ – SLED 11, 64-bit, SP2
	FreeDOS
	Preinstalled with Microsoft Office:
	Windows 7 Home Basic 64 with Microsoft Office 2010 Starter (not for Japan)
	Windows 7 Home Basic 64 with Microsoft Office 2010 Starter – EDGI
	Windows 7 Professional 64 with Microsoft Office 2010 Starter MSNA
	Windows 7 Professional 64 with Microsoft Office 2010 Starter EDGI
	Windows 7 Professional 64 with Microsoft Office 2010 Starter (not for Japan)
	Windows 7 Professional 64 with Microsoft Office 2010 Personal (Japan only)
	Windows 7 Professional 64 with Microsoft Office 2010 Home & Business (Japan only)
	Windows 7 Professional 64 with Microsoft Office 2010 Professional (Japan only)
	Windows 7 Professional 32 with Microsoft Office 2010 Personal (Japan only)
	Windows 7 Professional 32 with Microsoft Office 2010 Home & Business (Japan only)
	Windows 7 Professional 32 with Microsoft Office 2010 Professional (Japan only)
	Windows 7 Home Premium 64 with Microsoft Office 2010 Starter EDGI
	Windows 7 Home Premium 64 with Microsoft Office 2010 Starter
	Windows 7 Home Premium 64 with Microsoft Office 2010 Personal (Japan only)
	Windows 7 Home Premium 64 with Microsoft Office 2010 Home & Business (Japan only)
	Windows 7 Home Premium 64 with Microsoft Office 2010 Professional (Japan only)
	Restore Media:
	Windows 7 Professional 64
	Windows 7 Professional 32
	Windows 7 Home Premium 64
	Windows 7 Home Basic 64
	Windows 8 Professional Digital Product Key (DPK) 64-bit with Windows 7 Professional 32 Image and Office 2010 Personal (Japan only)

Category	Description
	Windows 8 Professional Digital Product Key 64-bit with Windows 7 Professional 32 Image and Office 2010 Home & Business (Japan only)
	Windows 8 Professional Digital Product Key 64-bit with Windows 7 Professional 32 Image Digital Product Key and Office 2010 Home & Business (Japan only)
	Windows 8 Professional Digital Product Key 64-bit with Windows 7 Professional 64 Image and Office 2010 Starter (not available in Japan, the People's Republic of China, or Asia)
	Windows 8 Professional Digital Product Key 64-bit with Windows 7 Professional 64 Image and Office 2010 Personal (Japan only)
	Windows 8 Professional Digital Product Key 64-bit with Windows 7 Professional 64 Image and Office 2010 Home & Business (Japan only)
	Windows 8 Professional Digital Product Key 64-bit with Windows 7 Professional 64 Image and Office 2010 Professional (Japan only)
	Windows 8 Multi-language (ML) 64-bit with Office 2010 Transition OEM Preinstallation Kit (OPK) (not available in Japan)
	Windows 8 Emerging Markets (EM) 64-bit with Office 2010 Transition OEM Preinstallation Kit (not available in Japan)
	Windows 8 Chinese Market (CH) 64-bit with Office 2010 Transition OEM Preinstallation Kit (People's Republic of China only)
	Windows 8 Multi-language 64-bit with Office 2010 Personal (Japan only)
	Windows 8 Multi-language 64-bit with Office 2010 Home & Business (Japan only)
	Windows 8 Multi-language 64-bit with Office 2010 Professional (Japan only)
	Windows 8 Professional 64-bit with Office 2010 Transition OEM Preinstallation Kit (not available in Japan)
	Windows 8 Professional 64-bit with Office 2010 Personal (Japan only)
	Windows 8 Professional 64-bit with Office 2010 Home & Business (Japan only)
	Windows 8 Professional 64-bit with Office 2010 Professional (Japan only)
	DRDVD Windows 7
	Web-only support:
	Windows XP Professional (Discrete graphic drive not supported)
	Windows 7 Home Basic 32
	Windows 7 Home Premium 32
	Windows 7 Professional 32
	Windows 8 Professional 64
	Certified:
	Microsoft WHQL
Serviceability	End-user replaceable parts:
	AC adapter
	Battery (system)

Category	Description
	Hard drive
	Memory module
	Optical drive
	WLAN module
	Keyboard

2 External component identification


Display

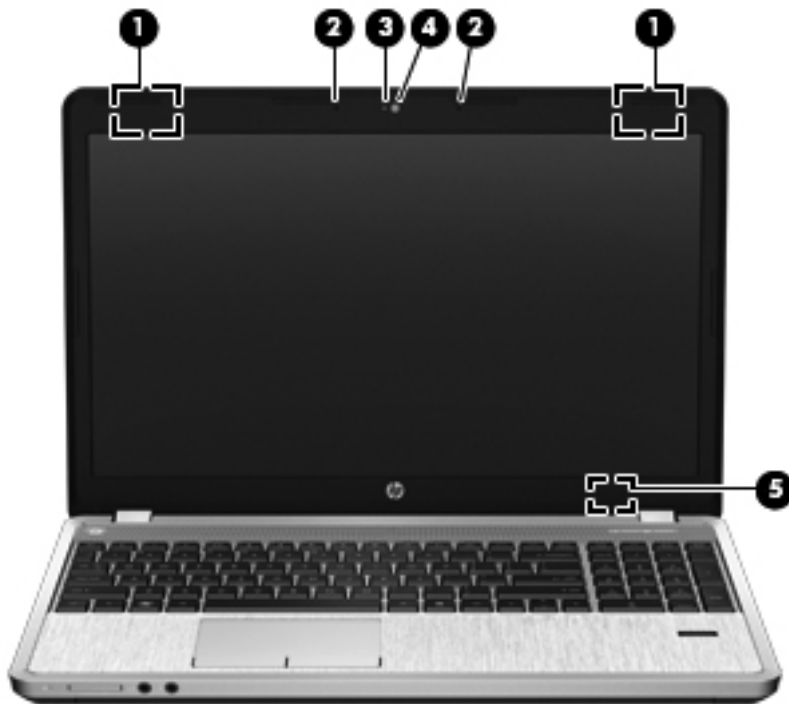


Component	Description
(1) WLAN antennas (2)*	Send and receive wireless signals to communicate with wireless local area networks (WLAN).
(2) Internal microphone(s) (1 or 2 depending on model)	Record sound.
(3) Webcam light (select models only)	On: The webcam is in use.
(4) Webcam (select models only)	Records video and captures still photographs. To use the webcam, select Start > All Programs > ArcSoft TotalMedia Suite > WebCam Companion .

Component	Description
(5) Internal display switch	<p data-bbox="801 214 1445 283">Turns off the display or initiates Sleep if the display is closed while the power is on.</p> <p data-bbox="801 294 1445 352">NOTE: The display switch is not visible from the outside of the computer.</p>
<p data-bbox="240 361 1445 514">*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 <i>Regulatory, Safety, and Environmental Notices</i> that applies to your country or region. These notices are located in Help and Support. To access this guide in Windows 8, select the HP Support Assistant app on the Start screen, select My computer, and then select the User guides.</p>	

Display - SUSE Linux models

 **NOTE:** Refer to the illustration that most closely matches your computer.



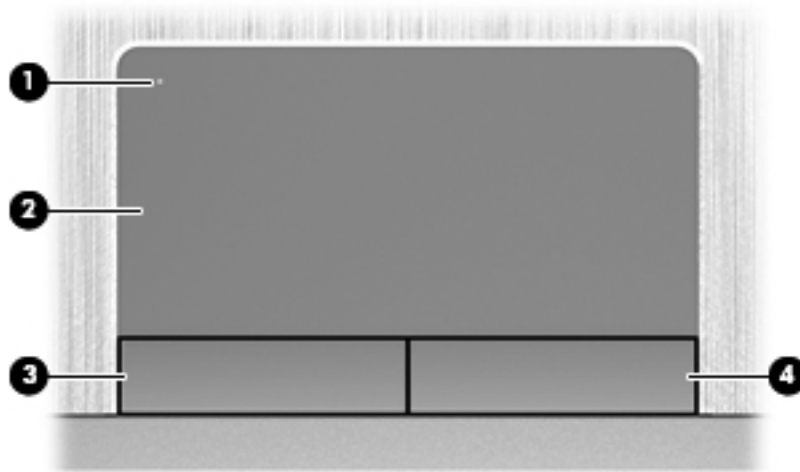
Component		Description
(1)	WLAN antennas (2)*	Send and receive wireless signals to communicate with wireless local area networks (WLAN).
(2)	Internal microphones (1 or 2 depending on model)	Record sound.
(3)	Webcam light (select models only)	On: The webcam is in use.
(4)	Webcam (select models only)	Records video and captures still photographs.
(5)	Internal display switch	Turns off the display or initiates Suspend if the display is closed while the power is on.

NOTE: The display switch is not visible from the outside of the computer.

*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.

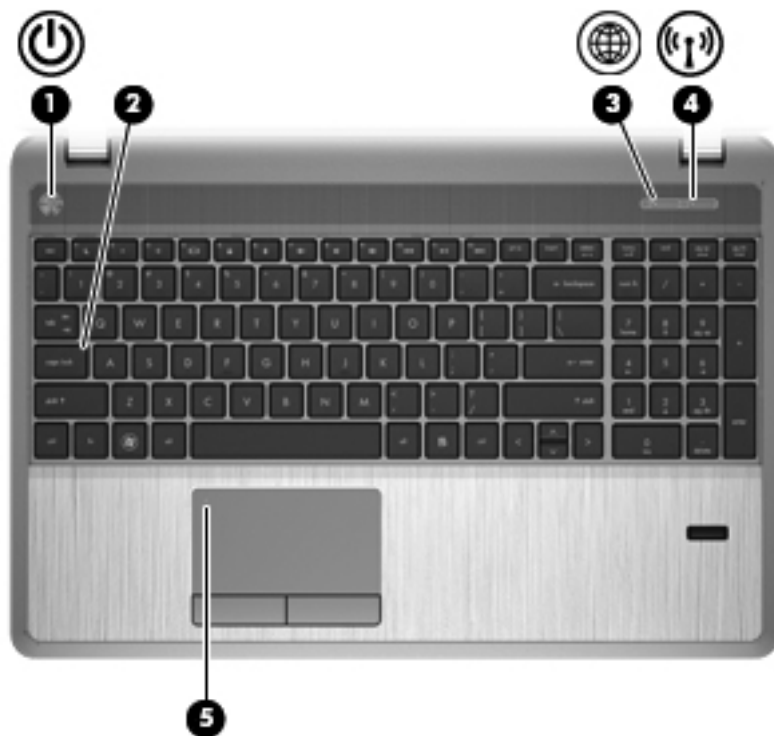
Top




TouchPad



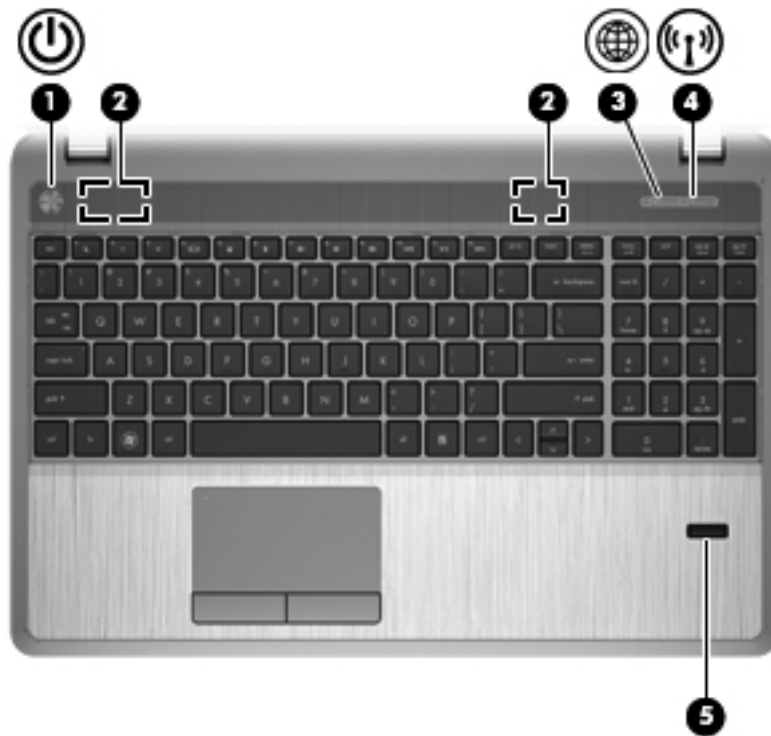
Component		Description
(1)	TouchPad on/off button	Turns the TouchPad on and off.
(2)	TouchPad zone	Moves the pointer and selects or activates items on the screen.
(3)	Left TouchPad button	Functions like the left button on an external mouse.
(4)	Right TouchPad button	Functions like the right button on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




Lights



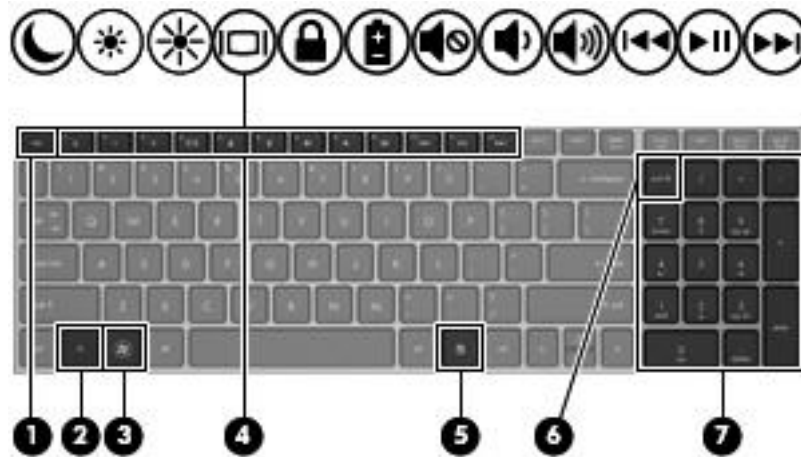
Components	Description
(1)  Power light	<ul style="list-style-type: none"> On: The computer is on. Blinking: The computer is in the Sleep state. Off: The computer is off or in Hibernation.
(2) Caps lock light	On: Caps lock is on.
(3)  Web browser light	<ul style="list-style-type: none"> On: The computer is on. Off: The computer is off, in Suspend mode, or in Hibernation. <p>In SUSE Linux: Off: The computer is off, in the Suspend state, or in Hibernation.</p>
(4)  Wireless light	<ul style="list-style-type: none"> 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.
(5) TouchPad light	<ul style="list-style-type: none"> Amber: The TouchPad is off. Off: TouchPad is on.





Buttons and fingerprint reader (select models only)



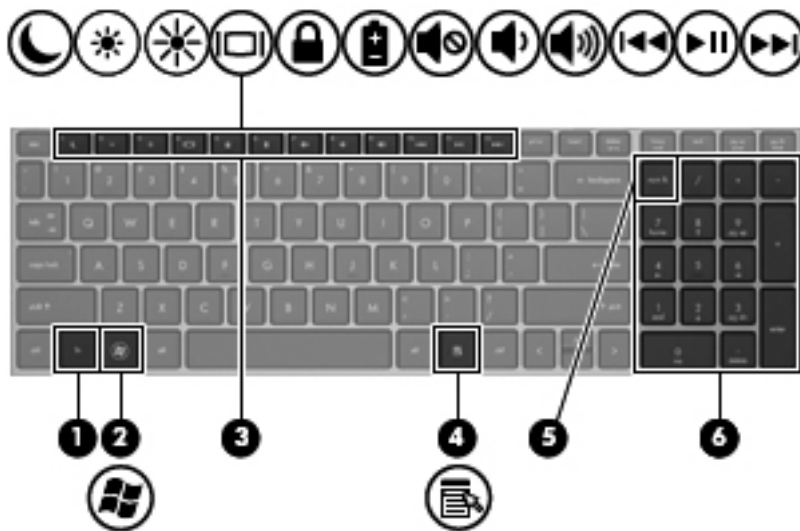
Component	Description
(1)  Power button	<ul style="list-style-type: none"> • When the computer is off, press the button to turn on the computer. • When the computer is on, press the button briefly to initiate Sleep/Suspend. • When the computer is in the Sleep state, press the button briefly to exit Sleep/Suspend. • When the computer is in Hibernation, press the button briefly to exit Hibernation. <p>If the computer has stopped responding and operating system shutdown procedures are ineffective, press and hold the power button down for at least 5 seconds to turn off the computer.</p> <p>CAUTION: Pressing and holding down the power button will result in the loss of unsaved information.</p> <p>To learn more about your power settings:</p> <p>In Windows 7:</p> <ul style="list-style-type: none"> • Select Start > Control Panel > System and Security > Power Options. <p>In Windows 8:</p> <ul style="list-style-type: none"> • From the Start screen, type <code>power options</code>. Click Settings, and then select Power Options from the options displayed. <p>In SUSE Linux:</p> <ol style="list-style-type: none"> 1. Select Computer > Control Center. 2. In the left pane, click System, and then click Power Management in the right pane.
(2) Speakers (2)	Produce sound.
(3)  Web browser button	Opens the default Web browser.
(4)  Wireless button	<p>Turns the wireless feature on or off but does not establish a wireless connection.</p> <p>NOTE: A wireless connection may be established if one has been previously configured.</p>
(5) Fingerprint reader (select models only)	Allows a fingerprint logon to Windows, instead of a password logon.



Keys



Component		Description
(1)	esc key	Displays system information when pressed in combination with the fn key.
(2)	fn key	Executes frequently used system functions when pressed in combination with a function key, the num lk key, the esc key, or other keys.
(3)	 Windows 7 logo key <hr/>  Windows 8 logo key	Displays the Windows Start menu.
(4)	Function keys	Execute frequently used system functions when pressed in combination with the fn key.
(5)	 Windows 7 applications key <hr/>  Windows 8 applications key	Windows 7: Displays a shortcut menu for items beneath the cursor. <hr/> Windows 8: Displays the App bar and a shortcut menu for items beneath the cursor.
(6)	num lk key	Alternates between the navigational and numeric functions on the integrated numeric keypad.
(7)	Integrated numeric keypad	Can be used like an external numeric keypad.




Keys - SUSE Linux models



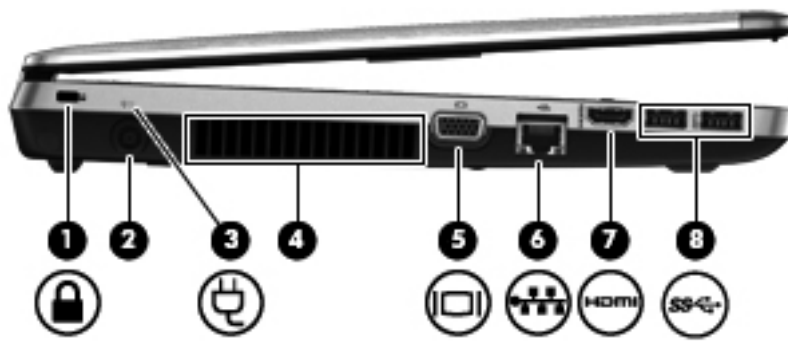
Component		Description
(1)	fn key	Executes frequently used system functions when pressed in combination with a function key.
(2)	 Operating system logo key	Displays the operating system menu.
(3)	Function keys	Execute frequently used system functions when pressed in combination with the fn key.
(4)	 Operating system applications key	Displays a shortcut menu for items beneath the cursor.
(5)	num lk key	Alternates between the navigational and numeric functions on the integrated numeric keypad.
(6)	Integrated numeric keypad	Can be used like an external numeric keypad.







Front



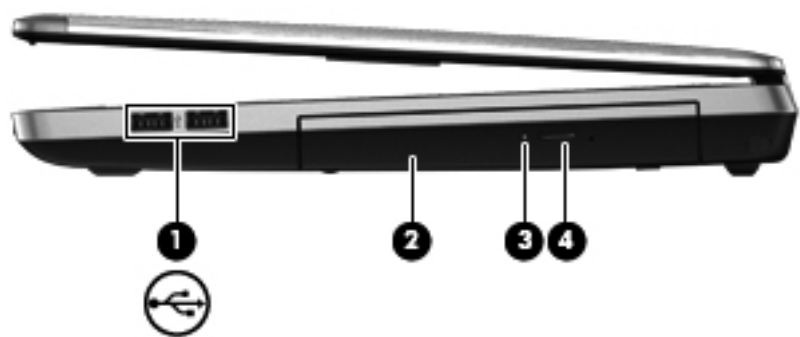
Component		Description
(1)	 Drive light	<ul style="list-style-type: none">• Blinking white: The hard drive is being accessed.• Amber: HP 3D DriveGuard has temporarily parked the hard drive.
(2)	Media Card Reader	<p>Supports the following digital card formats:</p> <ul style="list-style-type: none">• Memory Stick PRO• Memory Stick PRO Duo (needs an adapter)• MultiMediaCard (MMC)• MultiMediaCardplus (MMC+)• Secure Digital (SD) Card• Secure Digital High Capacity (SDHC) Card• Secure Digital Extra Capacity (SDXC) Card
(3)	 Audio-out (headphone) jack	<p>Connects optional powered stereo speakers, headphones, earbuds, a headset, or a television audio cable.</p> <p>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 <i>Regulatory, Safety, and Environmental Notices</i></p> <p>NOTE: When a device is connected to the jack, the computer speakers are disabled.</p>
(4)	 Audio-in (microphone) jack	<p>Connects an optional computer headset microphone, stereo array microphone, or monaural microphone.</p>


Left



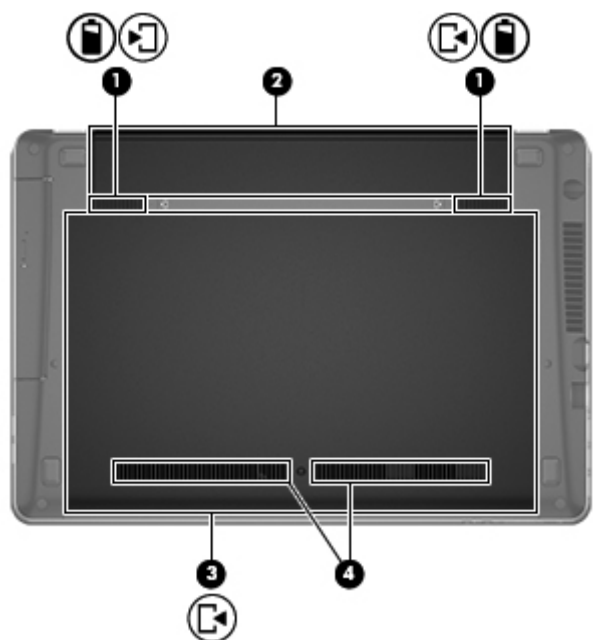
Component	Description
(1)  Security cable slot	Attaches an optional security cable to the computer. NOTE: The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.
(2) Power connector	Connects an AC adapter.
(3)  AC adapter/battery light	<ul style="list-style-type: none"> • White: The computer is connected to external power and the battery is charged from 90 to 99 percent. • Amber: The computer is connected to external power and the battery is charged from 0 to 90 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.
(4) 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.
(5)  External monitor port	Connects an external VGA monitor or projector.
(6)  RJ-45 (network) jack	Connects a network cable.
(7)  HDMI port	Connects an optional video or audio device, such as a high-definition television, or any compatible digital or audio device.
(8)  USB 3.0 ports (2)	Connect optional USB devices.



Right



Component		Description
(1)	 USB 2.0 ports (2)	Connect optional USB devices.
(2)	Optical drive (select models only)	Reads an optical disc. NOTE: On select models, the optical drive also writes to an optical disc.
(3)	Optical drive light (select models only)	<ul style="list-style-type: none">• On: The optical drive is being accessed.• Off: The optical drive is idle.
(4)	Optical drive eject button (select models only)	Releases the optical drive disc tray.

Bottom



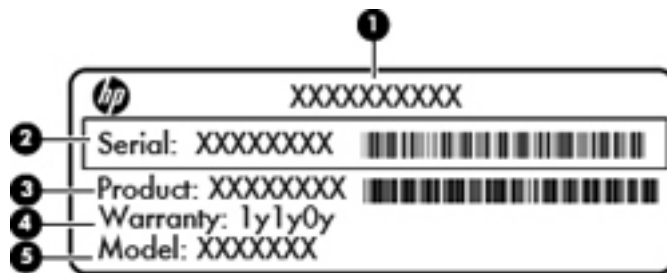
Component		Description
(1)		Battery and service door release latches <ul style="list-style-type: none">Releases the battery from the battery bay by sliding the release latches one time.When the battery has been removed from the battery bay, releases the service door from the computer by sliding the release latches a second time.
(2)		Battery bayHolds the battery.
(3)		Service doorProtects the hard drive bay, the wireless LAN (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 through Help and Support. On Windows 7 models, contact technical support through Help and Support. On Windows 8 models, from the Start screen, type <code>help</code> , and then select Help and Support .
(4)		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.

3 Illustrated parts catalog

Service tag and PCID label

Service tag


When ordering parts or requesting information, provide the computer serial number and model description provided on the service tag.



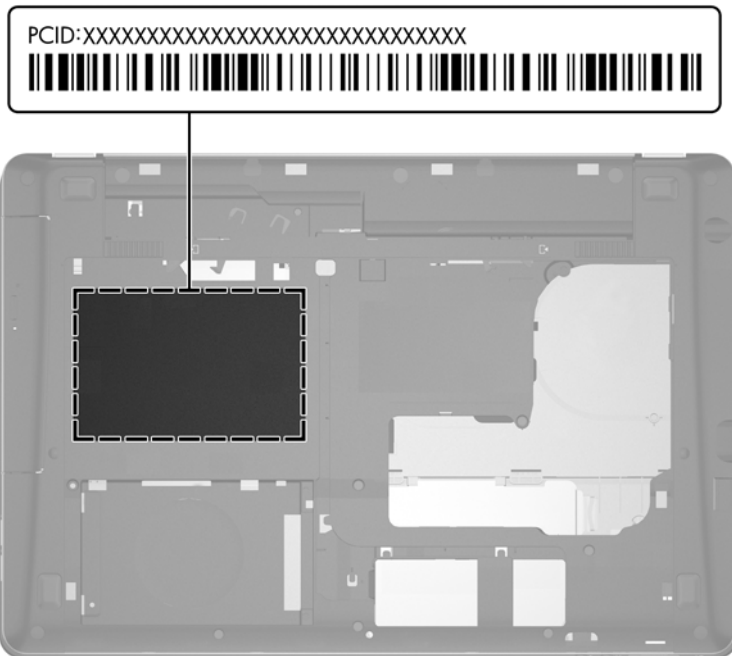
- Product name **(1)**. This is the product name affixed to the front of the computer.
- Serial number (s/n) **(2)**. This is an alphanumeric identifier that is unique to each product.
- Part number/Product number (p/n) **(3)**. This number provides specific information about the product's hardware components. The part number helps a service technician to determine what components and parts are needed.
- Warranty period **(4)**. This number describes the duration (in years) of the warranty period for the computer.
- Model description (select models only) **(5)**. This is the alphanumeric identifier used to locate documents, drivers, and support for the computer.

PCID label

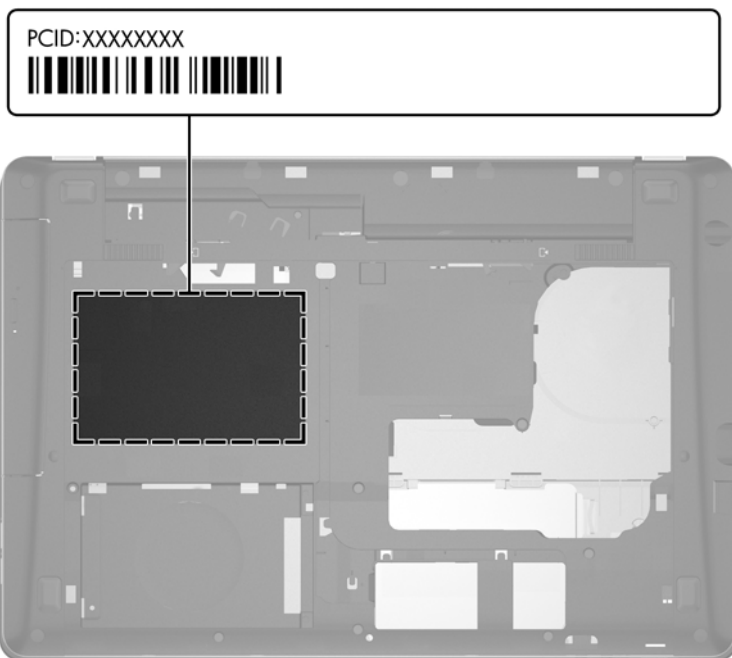
The PCID label provides the information required to properly reset the notebook firmware (BIOS) back to factory shipped specifications when replacing the system board. The label may have a different number of characters depending on the operating system on the computer.

 **NOTE:** Computer details may vary from images.

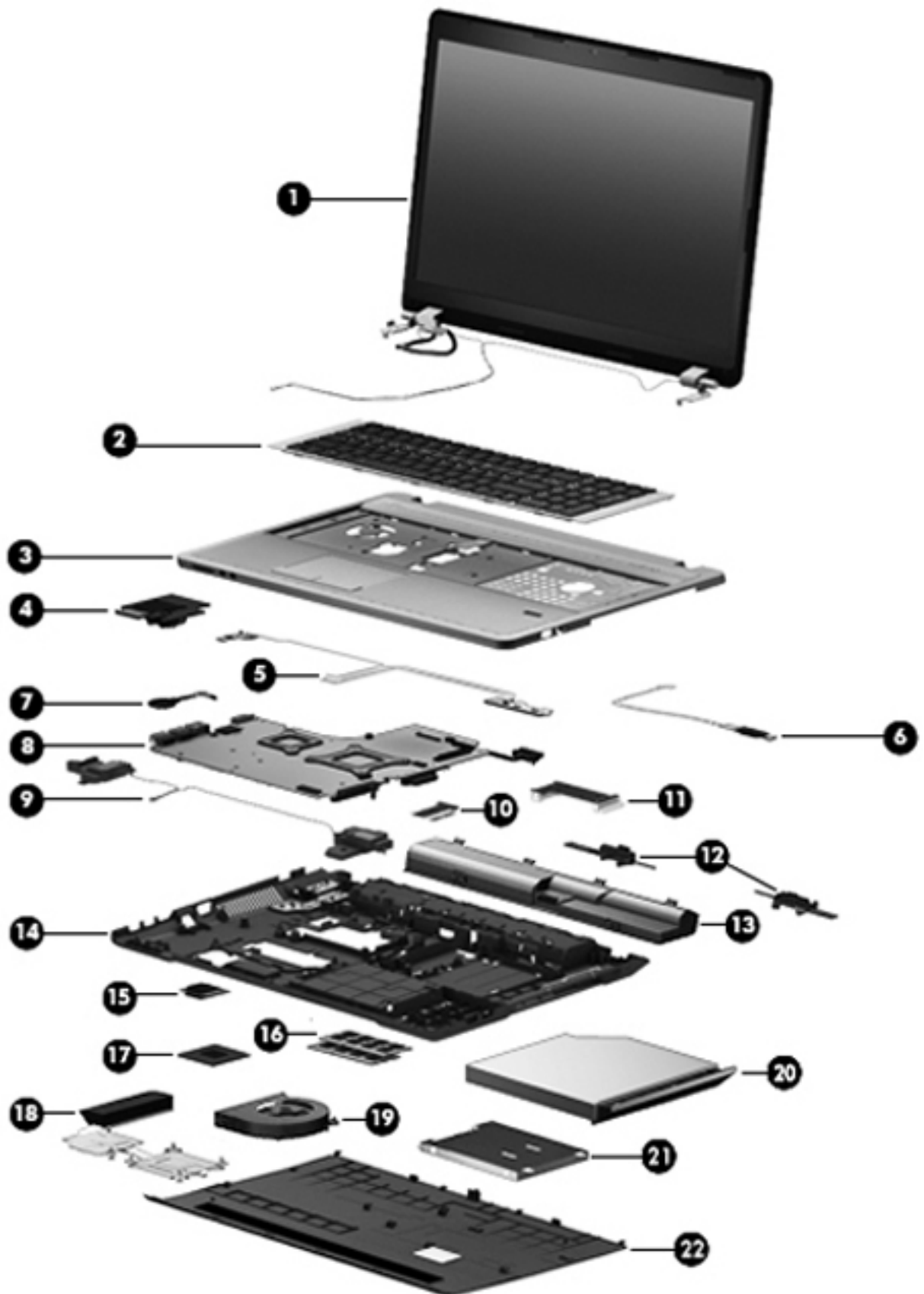
Windows 8 models



Non-Windows 8 models



Computer major components



Item	Description	Spare part number
(1)	Display panel , 43.9-cm (17.3-inch), HD+, anti-glare, with webcam	684631-001
(2)	Keyboard (includes cable) NOTE: For a detailed list of available keyboards, see Sequential part number listing on page 30 .	
	For use in models without Windows 8	684632-xxx
	For use in Windows 8 models	701982-xxx
(3)	Top cover (includes touchpad assembly)	
	With a fingerprint reader (includes fingerprint reader assembly)	684616-001
	Without a fingerprint reader	684617-001
(4)	Audio board	683475-001
(5)	Function board/Power button board assembly (includes cables)	684613-001
(6)	Fingerprint reader assembly (includes cable, bracket, and screw)	684610-001
(7)	RTC battery	683502-001
(8)	System board (includes replacement thermal material)	
	For use in models without Windows 8:	
	• 1-GB discrete graphics memory	683493-001
	• 1-GB discrete graphics memory for use in Japan	696336-001
	• 2-GB discrete graphics memory	683494-001
	For use in Windows 8 models:	
	• Windows 8 Standard and 1-GB discrete graphics memory	683493-501
	• Windows 8 Professional and 1-GB discrete graphics memory	683493-601
	• Windows 8 Standard and 1-GB discrete graphics memory for use in Japan	696336-501
	• Windows 8 Professional and 1-GB discrete graphics memory for use in Japan	696336-601
	• Windows 8 Standard and 2-GB discrete graphics memory	683494-501
	• Windows 8 Professional and 2-GB discrete graphics memory	683494-601
(9)	Speaker assembly	684615-001
(10)	Hard drive extension board	689655-001
(11)	Optical drive extension board	689656-001
(12)	Latch Kit (includes left and right latches, knob, and spring)	684635-001
(13)	Battery, Li-ion , 8-cell (73 WHr, 2.55 Ah)	633807-001
(14)	Base enclosure	684608-001
(15)	WLAN module	
	Atheros 9485GN 802.11b/g/n 1x1 WiFi and 3012 Bluetooth 4.0 Combo Adapter	655795-001
	Broadcom 4313GN 802.11b/g/n 1x1 WiFi and 20702 Bluetooth 4.0 Combo Adapter	657325-001

Item	Description	Spare part number
	Intel Centrino Wireless-N 2230	670290-001
	Intel Centrino Advanced-N 6235	670292-001
	Ralink WLAN Ralink Ripple3 RT5390F_802.11 b/g/n 1x1 PCIe HMC	670691-001
	Atheros AR9485 802.11b/g/n 1x1 WiFi Adapter	675794-001
	Atheros AR9565 802.11bgn 1x1 WiFi + BT4.0 combo Adapter	690019-001
	Ralink RT3290LE 802.11bgn 1x1 Wi-Fi and Bluetooth 4.0 Combo Adapter	690020-001
	Ralink RT5390R 802.11bgn 1x1 Wi-Fi Adapter	691415-001
(16)	Memory modules (PC3-12800, 1600-MHz, DDR3)	
	4-GB	641369-001
	2-GB	652972-001
(17)	Processor (includes thermal material)	
	Intel Core i7 processor, Quad Core	
	3632QM, 2.2-GHz processor with 6-MB L3 cache	701658-001
	3612QM, 2.1-GHz processor with 6-MB L3 cache	680647-001
	Intel Core i5 processors, Dual Core	
	3360M, 2.8-GHz processor with 3-MB L3 cache (includes thermal grease)	681953-001
	3320M, 2.6-GHz processor with 3-MB L3 cache (includes thermal grease)	681952-001
	3210M, 2.5-GHz processor with 3-MB L3 cache (includes thermal grease)	680645-001
	Intel Core i3 processors, Dual Core	
	3120M, 2.5-GHz processor with 3-MB L3 cache (includes thermal grease)	700627-001
	3110M, 2.3-GHz processor with 3-MB L3 cache (includes thermal grease)	682417-001
	2450M, 2.5-GHz processor with 3-MB L3 cache (includes thermal grease)	676359-001
	2370M, 2.4-GHz processor with 3-MB L3 cache (includes thermal grease)	677152-001
	2350M, 2.3-GHz processor with 3-MB L3 cache (includes thermal grease)	653340-001
	Intel Pentium processor, Dual Core	
	2020M, 2.4-GHz, with 2-MB L3 cache	700628-001
	B980, 2.4-GHz, with 2-MB L3 cache	692428-001
	B970, 2.3-GHz, with 2-MB L3 cache	676785-001
	Intel Celeron processor	
	B840, 1.9-GHz, with 2-MB L3 cache	664663-001
(18)	Heat sink (includes replacement thermal material)	689657-001
(19)	Fan	689658-001
(20)	Optical drive (includes bracket, bezel, and screws)	
	DVD±RW Double-Layer Drive	684629-001

Item	Description	Spare part number
	Blu-ray ROM DVD±RW SuperMulti DL Drive	684630-001
(21)	Hard drive	
	750-GB, 7200-rpm	633252-001
	750-GB, 5400-rpm	634250-001
	640-GB, 5400-rpm	669300-001
	500-GB, 7200-rpm,	634925-001
	320-GB, 7200-rpm	641672-001
(22)	Bottom door	684634-001

Display components



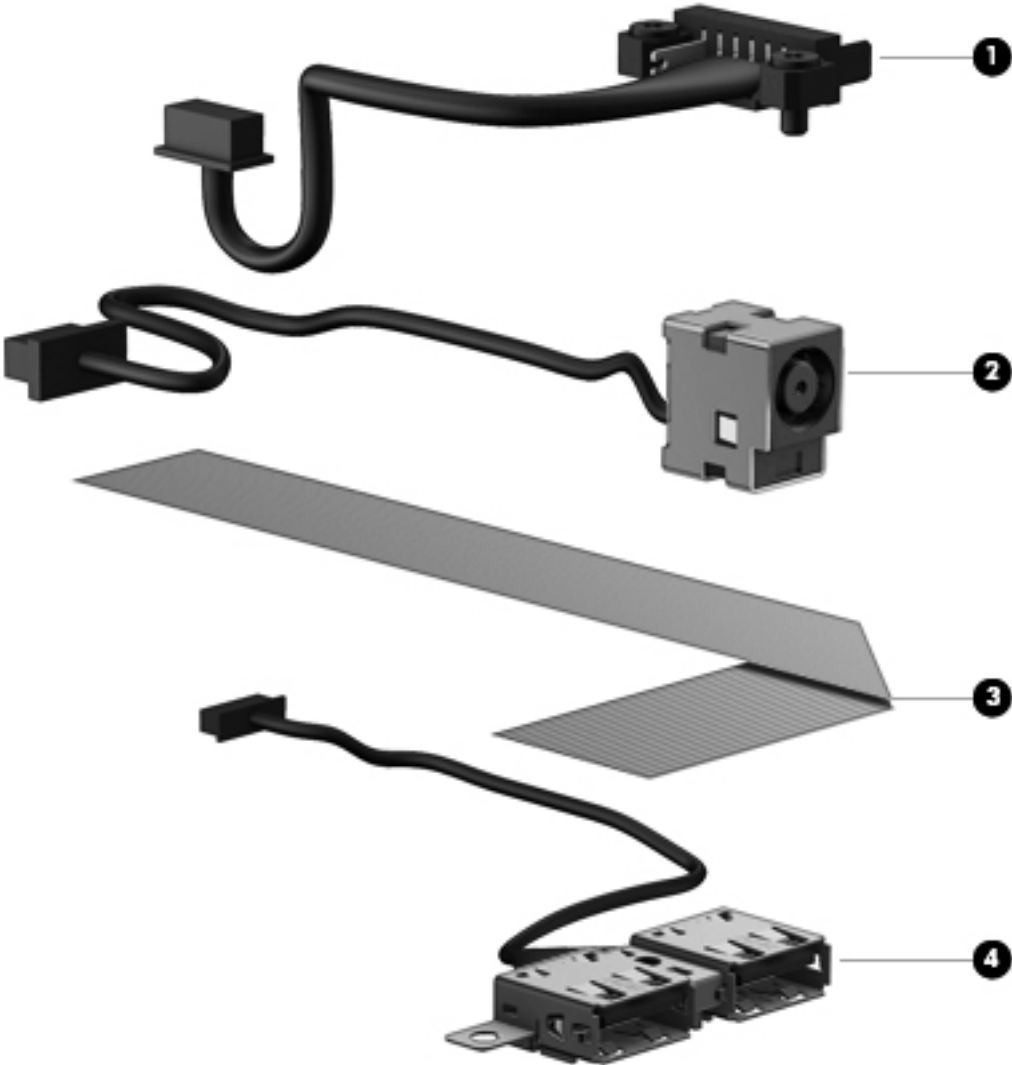
Item	Description	Spare part number
(1)	Display bezel	684609-001
(2)	Webcam module for use in all models	683508-001
Display Hinge Kit		684612-001
(3)	<ul style="list-style-type: none">• Display hinges	
(4)	<ul style="list-style-type: none">• Display hinge covers• Screw covers (not illustrated)	

Plastics Kit



Item	Description	Spare part number
Plastics Kit		684614-001
(1)	Optical drive protective insert	
(2)	Secure Digital card protective insert	

Cable Kit



Item	Description	Spare part number
	Cable Kit	684633-001
(1)	Battery connector cable	
(2)	Power connector cable	
(3)	Audio cable	
(4)	USB connector cable	

Mass storage devices



	Description	Spare part number
(1)	Hard drives	
	750-GB, 7200-rpm	633252-001
	750-GB, 5400-rpm	634925-001
	640-GB, 5400-rpm	669300-001
	500-GB, 7200-rpm	634925-001
	320-GB, 7200-rpm	641672-001
	Hard Drive Hardware Kit (includes hard drive bracket and screws; not illustrated)	683488-001
(2)	Optical drives (include bezel, bracket, and screws)	
	DVD±RW Double-Layer Drive	684629-001
	Blu-ray ROM DVD±RW SuperMulti DL Drive	684630-001

Miscellaneous parts

Description	Spare part number
AC adapters	
90-W AC adapter	609940-001
90-W AC adapter for use in India	609947-001
Power cords:	
For use in Australia and New Zealand	490371-011
For use in the People's Republic of China	490371-AA1
For use in Europe, the Middle East, and Africa	490371-021
For use in India	490371-D61
For use in Israel	490371-BB1
For use in Japan	490371-291
For use in South Africa	490371-AR1
For use in South Korea	490371-AD1
For use in Switzerland	490371-111
For use in Taiwan	490371-AB1
For use in the United Kingdom	490371-031
For use in the United States	490371-001
Rubber Kit (includes feet and display bezel screw covers)	684627-001
Screw Kit	684628-001
Mouse , optical, 2-button	390632-001
Notebook combination lock	591699-001
HP keyed cable lock	626729-001
HP optical travel mouse	434594-001
Professional slim, top load case	592923-001
Basic messenger bag	501505-001

Sequential part number listing

CSR flag designations:

A = Mandatory

B = Optional

C = Service technician recommended

N = Non-user replaceable

Spare part number	CSR flag	Description
390632-001	A	Mouse, optical, 2-button
434594-001	A	HP optical travel mouse
490371-001	A	Power cord for use in North America
490371-011	A	Power cord for use in Australia and New Zealand
490371-021	A	Power cord for use in Europe, the Middle East, and Africa
490371-031	A	Power cord for use in the United Kingdom
490371-111	A	Power cord for use in Switzerland
490371-291	A	Power cord for use in Japan
490371-AA1	A	Power cord for use in the People's Republic of China
490371-AB1	A	Power cord for use in Taiwan
490371-AD1	A	Power cord for use in South Korea
490371-AR1	A	Power cord for use in South Africa
490371-BB1	A	Power cord for use in Israel
490371-D61	A	Power cord for use in India
501505-001	A	Basic messenger bag
591699-001	A	Notebook combination lock
592923-001	A	Professional slim, top load case
609940-001	A	90-W AC adapter
609947-001	A	90-W AC adapter for use in India
626729-001	A	HP keyed cable lock
633252-001	A	750-GB, 7200-rpm hard drive
633807-001	A	8-cell, 73 WHr, 2.8 Ah Li-ion battery
634250-001	A	750-GB, 5400-rpm hard drive
634925-001	A	500-GB, 7200-rpm hard drive
641369-001	A	4-GB memory module (PC3-12800, 1600-MHz, DDR3)
641672-001	A	320-GB, 7200-rpm hard drive

Spare part number	CSR flag	Description
652972-001	A	2-GB memory module (PC3-12800, 1600-MHz, DDR3)
653340-001	N	Intel Core i3 processor, 2350M, 2.3-GHz processor, 3-MB L3 cache (includes thermal material)
655795-001	A	Atheros 9485GN 802.11b/g/n 1x1 WiFi and 3012 Bluetooth 4.0 Combo Adapter
657325-001	A	Broadcom 4313GN 802.11b/g/n 1x1 WiFi and 20702 Bluetooth 4.0 Combo Adapter
664663-001	N	Intel Celeron B840 processor, 1.9-GHz processor, 3-MB L3 cache (includes thermal material)
669300-001	A	640-GB, 5400-rpm hard drive
670290-001	A	Intel Centrino Wireless-N 2230 WLAN card
670292-001	A	Intel Centrino Advanced-N 6235 WLAN card
670691-001	A	Ralink WLAN Ralink Ripple3 RT5390F_802.11 b/g/n 1x1 PCIe HMC
675794-001	A	Atheros AR9485 802.11b/g/n 1x1 WiFi Adapter
676359-001	N	Intel Core i3 processor, 2450M, 2.5-GHz, 3-MB L3 cache (includes thermal material)
676785-001	N	Intel Pentium B970 processor, 2.3-GHz, 2-MB L3 cache (includes thermal material)
677152-001	N	Intel Core i3 processor, 2370M, 2.4-GHz, 3-MB L3 cache (includes thermal material)
680645-001	N	Intel Core i5 processor, 3210M, 2.5-GHz, 3-MB L3 cache (includes thermal material)
680647-001	N	Intel Core i7 processor, 3612QM, 2.1-GHz, 6-MB L3 cache (include thermal material)
681952-001	N	Intel Core i5 processor, 3320M, 2.6-GHz, 3-MB L3 cache (include thermal material)
681953-001	N	Intel Core i5 processor, 3360M, 2.8-GHz, 3-MB L3 cache (include thermal material)
682417-001	N	Intel Core i3 processor, 3110M, 2.3-GHz, 3-MB L3 cache (include thermal material)
683475-001	N	Audio board
683488-001	A	Hard Drive Hardware Kit (includes bracket and screws)
683493-001	N	System board for use in models without Windows 8 with 1-GB discrete graphics (includes thermal material)
683493-501	N	System board for use in Windows 8 Standard models with 1-GB discrete graphics (includes thermal material)
683493-601	N	System board for use in Windows 8 Professional models with 1-GB discrete graphics (includes thermal material)
683494-001	N	System board for use in models without Windows 8 with 2-GB discrete graphics (includes thermal material)
683494-501	N	System board for use in Windows 8 Standard models with 2-GB discrete graphics (includes thermal material)
683494-601	N	System board for use in Windows 8 Professional models with 2-GB discrete graphics (includes thermal material)
683502-001	A	RTC battery
683508-001	N	Webcam module
684608-001	N	Base enclosure
684609-001	N	Display bezel for use in models with a webcam

Spare part number	CSR flag	Description
684610-001	N	Fingerprint reader assembly (includes cable, bracket, and screws)
684612-001	N	Display Hinge Kit (includes left and right hinges, hinge covers, and screws)
684613-001	N	Function board/power button board assembly (includes cable)
684614-001	N	Plastics Kit (includes optical drive protective insert and Secure Digital card protective insert)
684615-001	N	Speaker assembly
684616-001	N	Top cover for use in models with a fingerprint reader (includes fingerprint reader board and touchpad assembly)
684617-001	N	Top cover for use in models without a fingerprint reader (includes touchpad assembly)
684627-001	N	Rubber Kit (includes feet and display bezel screw covers)
684628-001	N	Screw Kit
684629-001	A	DVD±RW Double-Layer Drive (includes bezel, bracket, and screws)
684630-001	A	Blu-ray ROM DVD±RW SuperMulti DL Drive (includes bezel, bracket, and screws)
684631-001	N	43.9-cm (17.3-inch) display assembly, HD+ anti-glare, with webcam
684632-001	A	Keyboard for use in the United States
684632-031	A	Keyboard for use in models without Windows 8 in the United Kingdom
684632-041	A	Keyboard for use in models without Windows 8 in Germany
684632-051	A	Keyboard for use in models without Windows 8 in France
684632-061	A	Keyboard for use in models without Windows 8 in Italy
684632-071	A	Keyboard for use in models without Windows 8 in Spain
684632-131	A	Keyboard for use in models without Windows 8 in Portugal
684632-141	A	Keyboard for use in models without Windows 8 in Turkey
684632-151	A	Keyboard for use in models without Windows 8 in Greece
684632-171	A	Keyboard for use in models without Windows 8 in Saudi Arabia
684632-211	A	Keyboard for use in models without Windows 8 in Hungary
684632-251	A	Keyboard for use in models without Windows 8 in Russia
684632-261	A	Keyboard for use in models without Windows 8 in Bulgaria
684632-271	A	Keyboard for use in models without Windows 8 in Romania
684632-281	A	Keyboard for use in models without Windows 8 in Thailand
684632-291	A	Keyboard for use in models without Windows 8 in Japan
684632-A41	A	Keyboard for use in models without Windows 8 in Belgium
684632-AB1	A	Keyboard for use in models without Windows 8 in Taiwan
684632-AD1	A	Keyboard for use in models without Windows 8 in South Korea
684632-B31	A	Keyboard for use in models without Windows 8 in the Netherlands and Europe
684632-BA1	A	Keyboard for use in models without Windows 8 in Slovakia

Spare part number	CSR flag	Description
684632-BB1	A	Keyboard for use in models without Windows 8 in Israel
684632-BG1	A	Keyboard for use in models without Windows 8 in Switzerland
684632-D61	A	Keyboard for use in models without Windows 8 in India
684632-DD1	A	Keyboard for use in models without Windows 8 in Iceland
684632-DH1	A	Keyboard for use in models without Windows 8 in the Netherlands
684632-FL1	A	Keyboard for use in models without Windows 8 in the Czech Republic
684632-FP1	A	Keyboard for use in models without Windows 8 in the northern Africa
684633-001	A	Cable Kit (see Cable Kit on page 27 for more Cable Kit spare part information)
684634-001	A	Bottom door
684635-001	N	Latch Kit
689655-001	N	Hard drive connector
689656-001	N	Optical drive connector
689657-001	N	Heat sink (includes thermal material)
689658-001	N	Fan
690019-001	A	Atheros AR9565 802.11bgn 1x1 WiFi + BT4.0 combo Adapter
690020-001	A	Ralink RT3290LE 802.11bgn 1x1 Wi-Fi and Bluetooth 4.0 Combo Adapter
691415-001	A	Ralink RT5390R 802.11bgn 1x1 Wi-Fi Adapter
692428-001	N	Intel Pentium B980 processor, 2.4-GHz, with 2-MB L3 cache
696336-001	N	System board for use in models without Windows 8 with 1-GB discrete graphics for use in Japan (includes thermal material)
696336-501	N	System board for use in Windows 8 Standard models with 1-GB discrete graphics for use in Japan (includes thermal material)
696336-601	N	System board for use in Windows 8 Professional models with 1-GB discrete graphics for use in Japan (includes thermal material)
700627-001	N	Intel Core i3 processor, 3120M, 2.5-GHz, 3-MB L3 cache (includes thermal material)
700628-001	N	Intel Pentium 2020M processor, 2.4-GHz, 2-MB L3 cache (includes thermal material)
701658-001	N	Intel Core i7 processor, 3632QM, 2.2-GHz, 6-MB L3 cache (include thermal material)
701982-001	A	Keyboard for use in Windows 8 models in the United States
701982-031	A	Keyboard for use in Windows 8 models in the United Kingdom
701982-041	A	Keyboard for use in Windows 8 models in Germany
701982-051	A	Keyboard for use in Windows 8 models in France
701982-061	A	Keyboard for use in Windows 8 models in Italy
701982-071	A	Keyboard for use in Windows 8 models in Spain
701982-131	A	Keyboard for use in Windows 8 models in Portugal
701982-141	A	Keyboard for use in Windows 8 models in Turkey

Spare part number	CSR flag	Description
701982-151	A	Keyboard for use in Windows 8 models in Greece
701982-171	A	Keyboard for use in Windows 8 models in Saudi Arabia
701982-211	A	Keyboard for use in Windows 8 models in Hungary
701982-251	A	Keyboard for use in Windows 8 models in Russia
701982-261	A	Keyboard for use in Windows 8 models in Bulgaria
701982-271	A	Keyboard for use in Windows 8 models in Romania
701982-281	A	Keyboard for use in Windows 8 models in Thailand
701982-291	A	Keyboard for use in Windows 8 models in Japan
701982-A41	A	Keyboard for use in Windows 8 models in Belgium
701982-AB1	A	Keyboard for use in Windows 8 models in Taiwan
701982-AD1	A	Keyboard for use in Windows 8 models in South Korea
701982-B31	A	Keyboard for use in Windows 8 models in the Netherlands and Europe
701982-BA1	A	Keyboard for use in Windows 8 models in Slovakia
701982-BB1	A	Keyboard for use in Windows 8 models in Israel
701982-BG1	A	Keyboard for use in Windows 8 models in Switzerland
701982-D61	A	Keyboard for use in Windows 8 models in India
701982-DD1	A	Keyboard for use in Windows 8 models in Iceland
701982-DH1	A	Keyboard for use in Windows 8 models in the Netherlands
701982-FL1	A	Keyboard for use in Windows 8 models in the Czech Republic
701982-FP1	A	Keyboard for use in Windows 8 models in northern Africa

4 Removal and replacement procedures

Preliminary replacement requirements

Tools required

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

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

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, and then degrade in the internal layers, reducing its life expectancy.

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

Keep components in their electrostatic-safe containers until you are ready to install them.


Use nonmagnetic tools.

Before touching an electronic component, discharge static electricity by using the guidelines described in this section.

Avoid touching pins, leads, and circuitry. Handle electronic components as little as possible.

If you remove a component, place it in an electrostatic-safe container.

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

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

Typical electrostatic voltage levels			
Event	Relative humidity		
	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 $\pm 10\%$ 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 tapes
- Antistatic smocks, aprons, and sleeve protectors
- Conductive bins and other assembly or soldering aids
- Nonconductive foam
- Conductive tabletop workstations with ground cords of one megohm resistance
- Static-dissipative tables or floor mats with hard ties to the ground
- Field service kits
- Static awareness labels
- Material-handling packages
- Nonconductive plastic bags, tubes, or boxes
- Metal tote boxes
- Electrostatic voltage levels and protective materials

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

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

Component replacement procedures

This chapter provides removal and replacement procedures.

There are as many as 95 screws and screw locks, in 15 different sizes, that must be removed, replaced, or loosened when servicing the computer. Make special note of each screw and screw lock size and location during removal and replacement.

Battery


Description	Spare part number
8-cell, 73 WHr, 2.8 Ah Li-ion battery	633807-001

Before disassembling the computer, 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.
2. Slide the battery release latches **(1)** to release the battery.

 **NOTE:** You can slide the battery release latches simultaneously or one at a time.

3. Tilt the battery upward to remove it from the battery bay **(2)**.



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

Bottom door

Description	Spare part number
Bottom door	684634-001

Before disassembling the computer, 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 40](#)).

Remove the bottom door:

1. Position the computer upside-down on a flat surface with the battery bay toward you.
2. Remove the locking screw (if installed) **(1)** and slide the bottom door release latches **(2)** to release the door.
3. Slide the door toward the front of the computer **(3)**, and then lift the door off the computer **(4)**.



Reverse the removal procedures to install the bottom door.

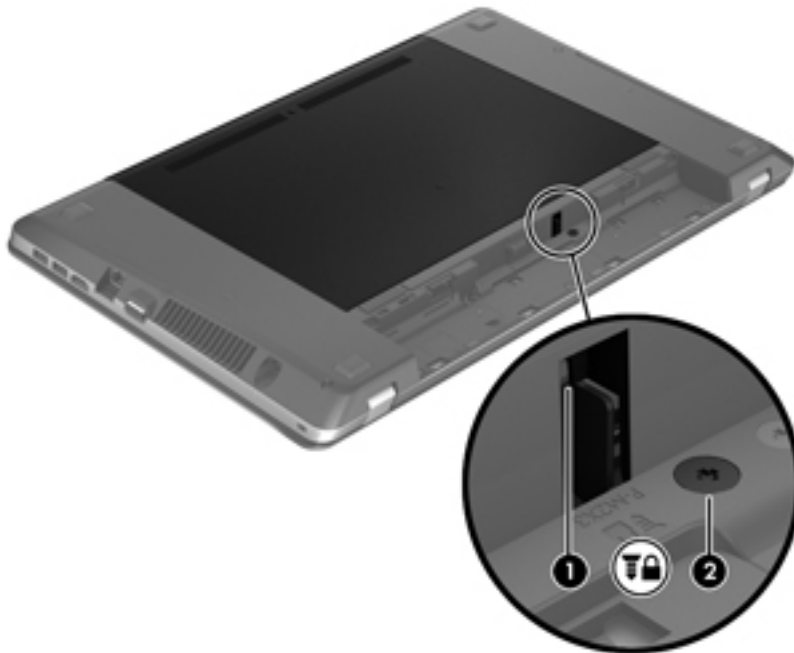
Using the optional security screw

Use the optional security screw to lock the service door to the bottom of the computer. When not in use the security screw can be stored inside the battery bay.

Remove the battery:

To use the security screw:

1. Remove the battery.
2. Remove the security screw from inside the battery bay **(1)** and insert it **(2)** to lock the service door in place.



Optical drive



NOTE: All optical drive spare part kits include an optical drive bezel, bracket, and screws.

Description	Spare part number
DVD±RW Double-Layer Drive	684629-001
Blu-ray ROM DVD±RW SuperMulti DL Drive	684630-001

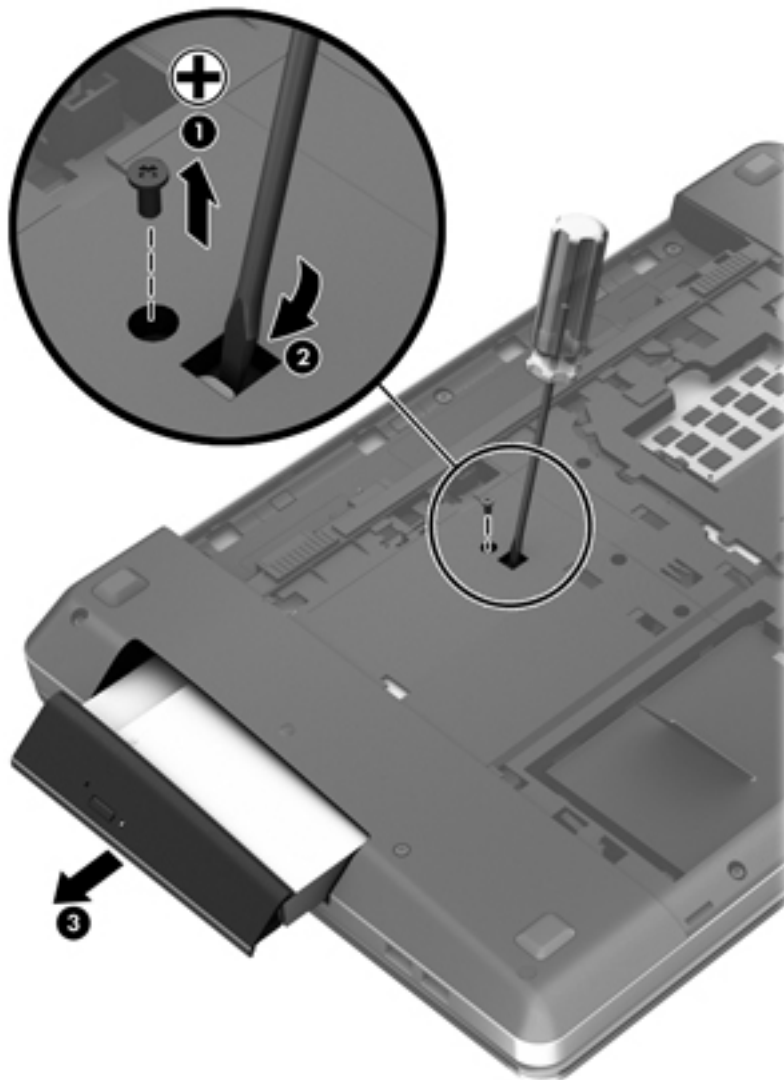
Before removing the optical drive, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 40](#)).
5. Remove the bottom door (see [Bottom door on page 41](#)).

Remove the optical drive:

1. Position the computer upside-down.
2. Remove the Phillips PM2.5×5.0 screw **(1)** that secures the optical drive to the computer.
3. Push the optical drive tab **(2)** to release the optical drive from the computer.

4. Remove the optical drive **(3)** from the computer.



Reverse this procedure to install an optical drive.

Hard drive

Description	Spare part number
750-GB, 7200-rpm hard drive	633252-001
750-GB, 5400-rpm hard drive	634250-001
640-GB, 5400-rpm hard drive	669300-001
500-GB, 7200-rpm hard drive	634925-001
320-GB, 7200-rpm hard drive	641672-001
Hard Drive Hardware Kit (includes hard drive bracket and screws)	683488-001

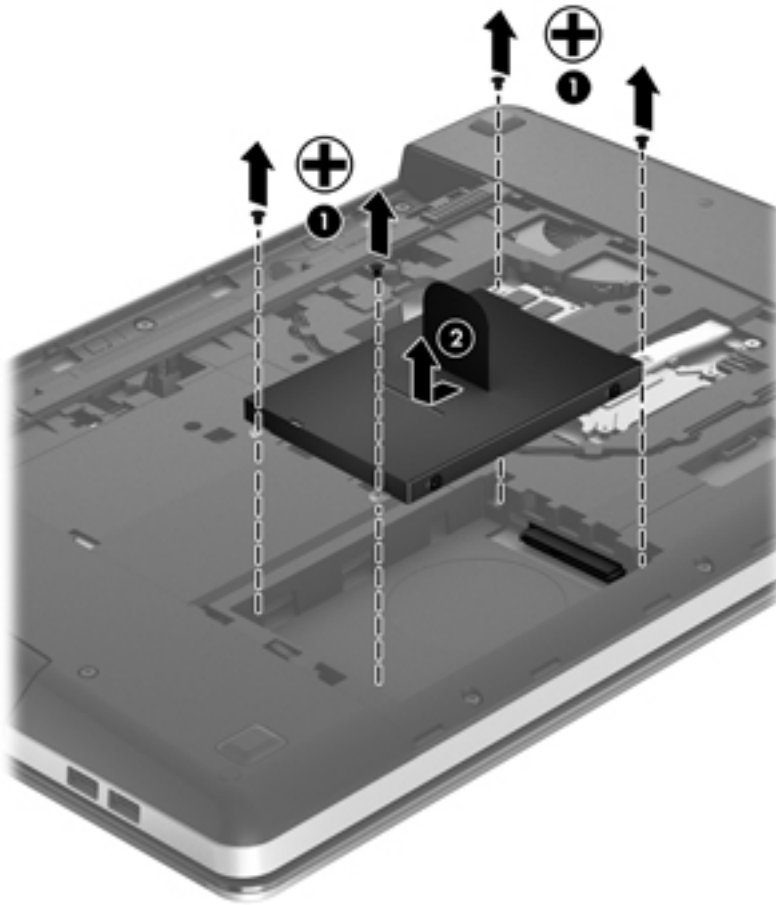
Before disassembling the computer, follow these steps:

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 40](#)).
5. Remove the bottom door (see [Bottom door on page 41](#)).

Remove the hard drive:

1. Position the computer upside-down with the front toward you.
2. Remove the four Phillips PM2.0×4.0 screws **(1)** that secure the hard drive to the computer.

3. Pull the plastic tab on the hard drive **(2)** towards the side of the computer to disengage the hard drive from the connector, and then lift the hard drive out of the hard drive bay.

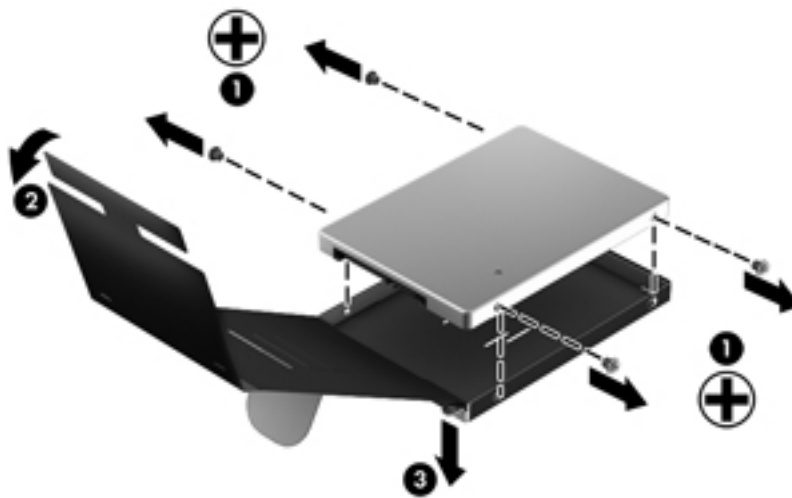


4. If it is necessary to replace the hard drive bracket, lift the Mylar tab on the Mylar cover to unlock it.



5. Remove the four Phillips PM3.0×3.0 hard drive bracket screws **(1)** that secure the bracket to the hard drive.

6. Lift the top of the Mylar cover (2) from the drive, and then remove the cover from the hard drive (3).



Reverse this procedure to reassemble and install the hard drive.

Memory modules



NOTE: Primary and expansion memory is installed in a stacked configuration in the bottom of the computer.

Description	Spare part number
2-GB (PC3-12800, 1600-MHz, DDR3)	652972-001
4-GB (PC3-12800, 1600-MHz, DDR3)	641369-001

Update BIOS before adding memory modules

Before adding new memory, make sure you update the computer to the latest BIOS.



CAUTION: Failure to update the computer to the latest BIOS prior to installing new memory may result in various system problems.

To update BIOS:

1. Navigate to www.hp.com.
2. Click **Support & Drivers** > click **Drivers & Software**.
3. In the **Enter a product name/number** box, type the computer model information, and then click **Search**.
4. Click the link for the computer model.
5. Select the operating system, and then click **Next**.
6. Under **Step 2: Select a Download**, click the **BIOS** link.
7. Click the link for the most recent BIOS.
8. Click the **Download** button, and then follow the on-screen instructions.


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 40](#)).
5. Remove the bottom door (see [Bottom door on page 41](#)).

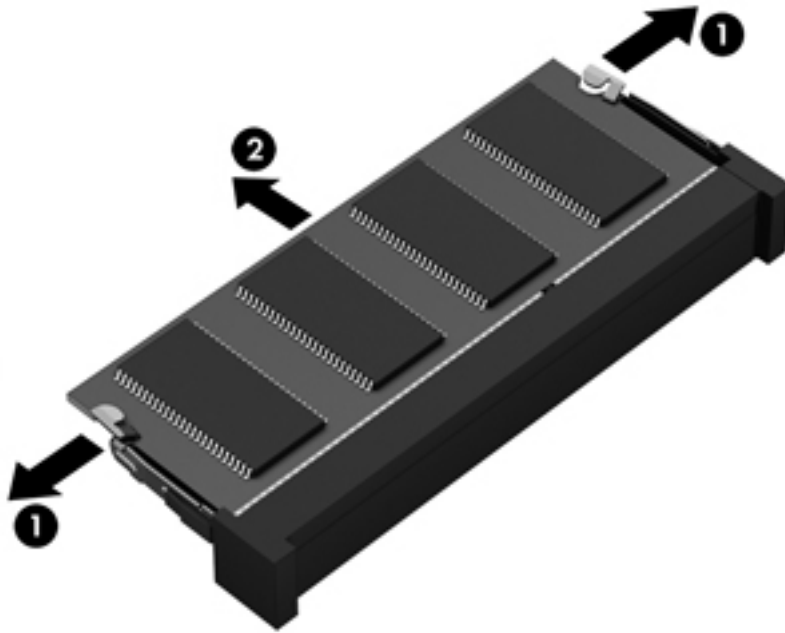
Remove the memory module:

1. Position the computer upside-down.
2. Spread the retaining tabs **(1)** on each side of the memory module slot to release the memory module. (The edge of the module opposite the slot rises away from the computer.)

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 to prevent incorrect insertion into the memory module slot.

 **NOTE:** The computer uses two memory sockets. The top socket houses the expansion memory module and the bottom socket houses the primary memory module. The removal procedure is the same for both memory sockets.



Reverse this procedure to install a memory module.

WLAN/Bluetooth combo card

The computer uses a card that provides both WLAN and Bluetooth functionality.


Description	Spare part number
Atheros 9485GN 802.11b/g/n 1x1 WiFi and 3012 Bluetooth 4.0 Combo Adapter	655795-001
Broadcom 4313GN 802.11b/g/n 1x1 WiFi and 20702 Bluetooth 4.0 Combo Adapter	657325-001
Intel Centrino Wireless-N 2230	670290-001
Intel Centrino Advanced-N 6235	670292-001
Ralink WLAN Ralink Ripple3 RT5390F_802.11 b/g/n 1x1 PCIe HMC	670691-001
Atheros AR9485 802.11b/g/n 1x1 WiFi Adapter	675794-001
Atheros AR9565 802.11bgn 1x1 WiFi + BT4.0 combo Adapter	690019-001
Ralink RT3290LE 802.11bgn 1x1 Wi-Fi and Bluetooth 4.0 Combo Adapter	690020-001
Ralink RT5390R 802.11bgn 1x1 Wi-Fi Adapter	691415-001

Before removing the WLAN module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 40](#)).
5. Remove the bottom door (see [Bottom door on page 41](#)).


Remove the WLAN module:

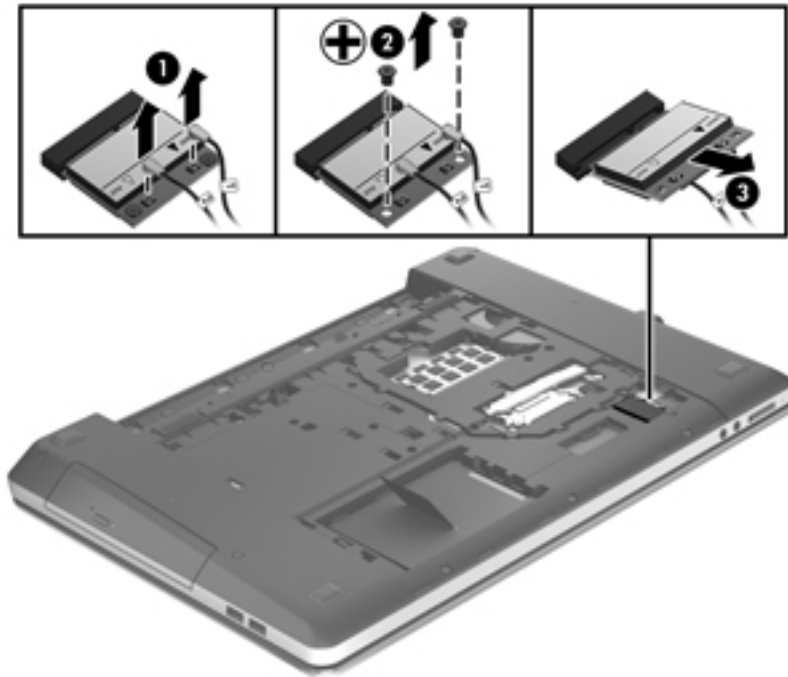
1. Position the computer upside-down.
2. Disconnect the WLAN antenna cables **(1)** from the terminals on the WLAN module.


 **NOTE:** The WLAN antenna cable labeled “1” connects to the WLAN module “Main” terminal labeled “1”. The WLAN antenna cable labeled “2” connects to the WLAN module “Aux” terminal labeled “2”. If the computer is equipped with an 802.11a/b/g/n WLAN module, the yellow WLAN antenna cable connects to the middle terminal on the WLAN module.

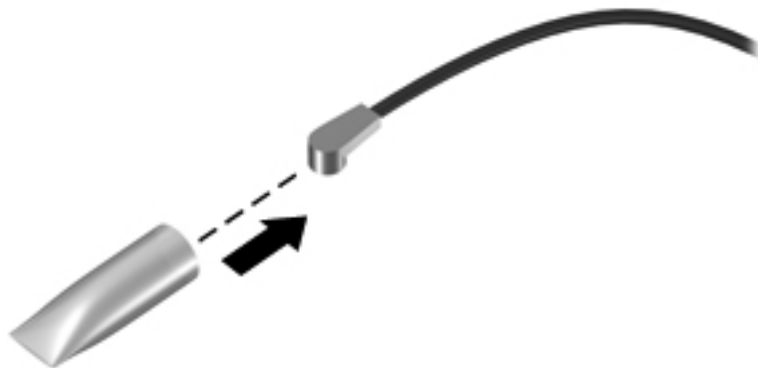
3. Remove the two Phillips PM2.0×3.0 screws **(2)** that secure the WLAN module to the computer. (The edge of the module opposite the slot rises away from the computer.)

4. Remove the WLAN module (3) by pulling the module away from the slot at an angle.

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



 **NOTE:** If the WLAN antennas are not connected to the terminals on the WLAN module, the protective sleeves must be installed on the antenna connectors, as shown in the following illustration.



Reverse this procedure to install the WLAN module.

Keyboard



NOTE: For a detailed list of available keyboards, see [Sequential part number listing on page 30](#).

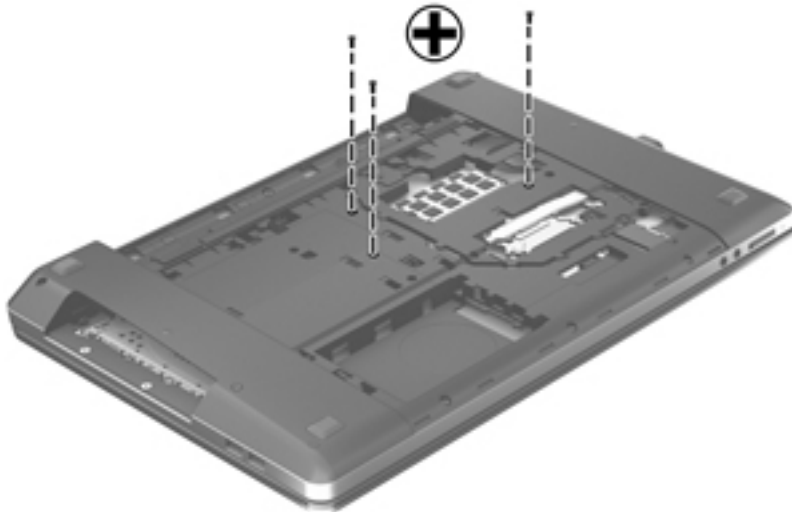
Description	Spare part number
Keyboard for use in models without Windows 8	684632-xxx
Keyboard for use in Windows 8 models	701982-xxx

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 40](#)).
5. Remove the bottom door (see [Bottom door on page 41](#)).


Remove the keyboard:

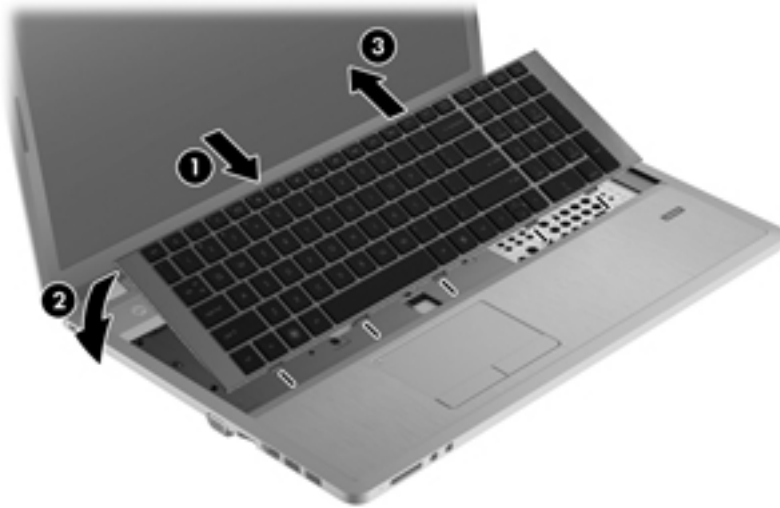
1. Position the computer upside-down with the front toward you.
2. Remove the three Phillips PM2.5×7.0 screws that secure the keyboard to the computer.



3. Position the computer upright with the front toward you.
4. Open the computer as far as possible.
5. Slide the keyboard downward toward the palm rest (1).

6. Lift the top of the keyboard at an angle (2), and then pull the keyboard up to remove it from the palm rest (3).

 **NOTE:** Only pull the keyboard up enough to release it from the computer and flip it over onto the palm rest. Under the keyboard, the cable is connected to the system board.



7. Rotate the keyboard until it rests on the palm rest (1), and then disconnect the keyboard cable by lifting the keyboard connector latch (2), and then disconnecting the keyboard cable from the system board (3).



8. Remove the keyboard.

Reverse this procedure to install the keyboard.

Top cover



NOTE: Top cover spare part kits include the touchpad assembly.

Description	Spare part number
Top cover with a fingerprint reader (includes fingerprint reader assembly)	684616-001
Top cover without a fingerprint reader	684617-001

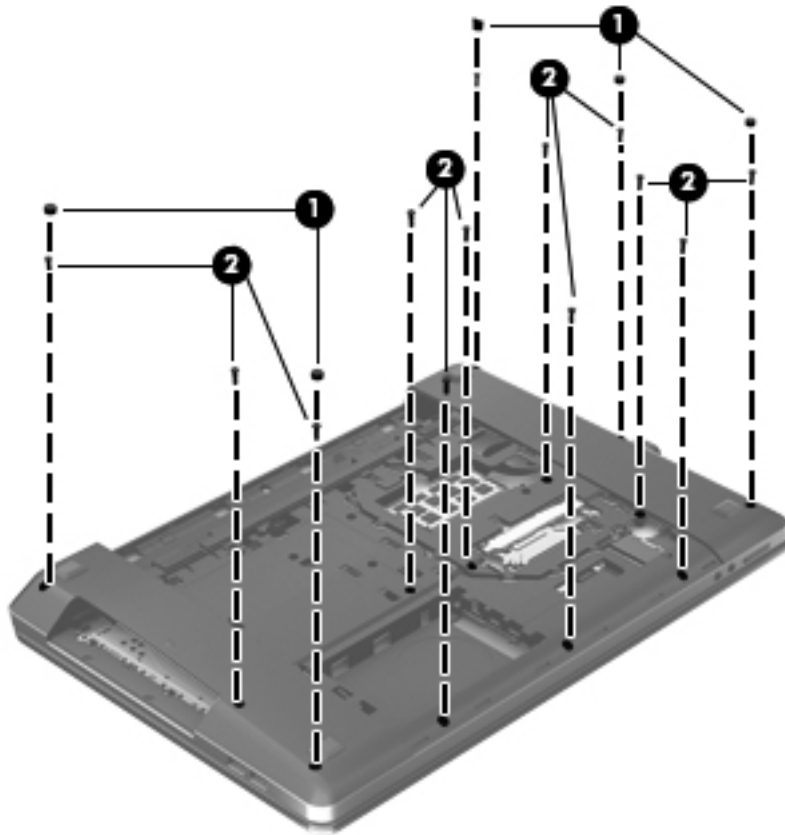
Before removing the top cover, follow these steps:

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 40](#)).
5. Remove the following components:
 - a. Bottom door (see [Bottom door on page 41](#)).
 - b. Memory modules (see [Memory modules on page 48](#))
 - c. Keyboard (see [Keyboard on page 52](#))

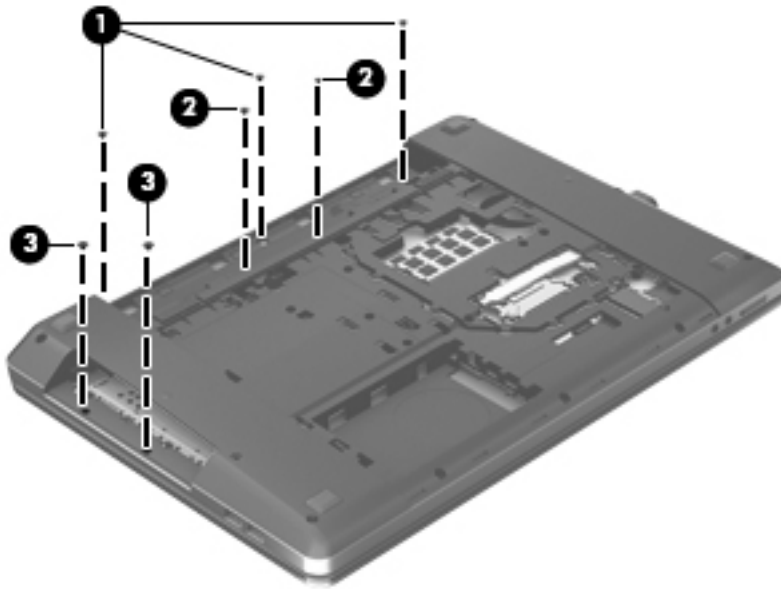
Remove the top cover:

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

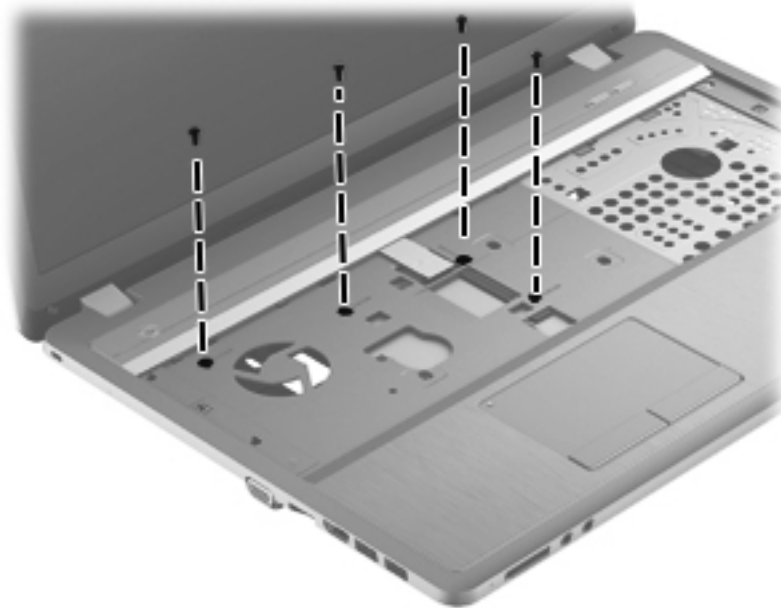
2. Remove the following covers and screws that secure the top cover to the computer:
- (1) 4 rubber screw covers
 - (2) 13 Torx T8M2.5×8.0 screws



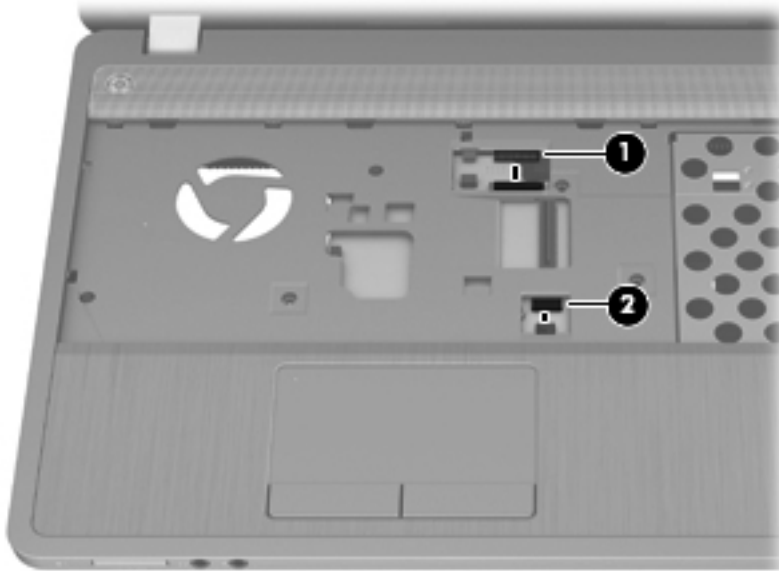
3. Remove the following screws that secure the top cover to the computer as follows:
- (1) 3 Phillips broadhead PM2.0×3.0 screws from the battery bay
 - (2) 5 Phillips PM2.0×3.0 screws from the battery bay and optical drive bay



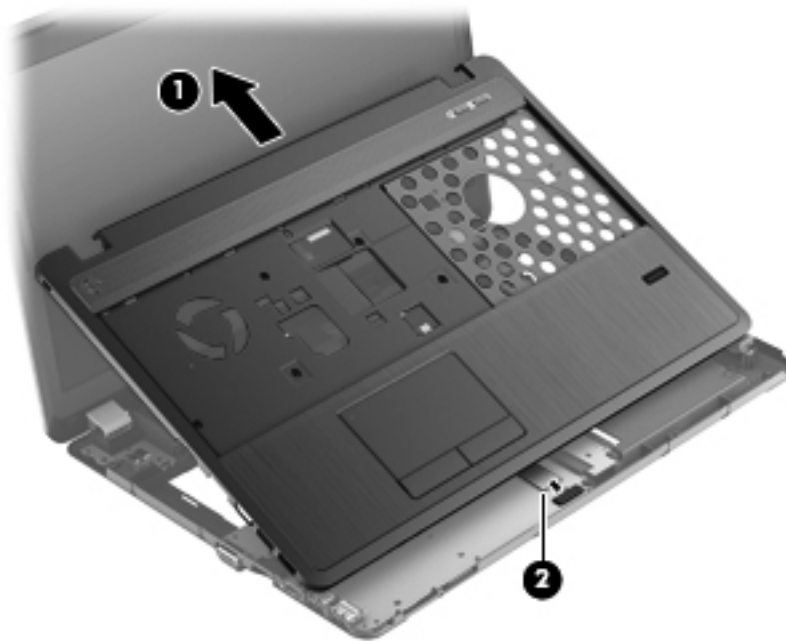
4. Position the computer upright and open it as far as possible.
5. Remove the four Torx T8M2.5×8.0 screws that secure the top cover to the computer.



6. Disconnect the power button board/function board cable (1) and the fingerprint reader board cable (2) from the system board.



7. Lift the front of the top cover slightly to gain access to the cable and connector underneath (1).
8. Disconnect the audio board cable (2) from the system board.



9. Lift the top of the top cover (1), and then remove the top cover from the computer (2).



Reverse this procedure to install the top cover.

Fingerprint reader board

Description	Spare part number
Fingerprint reader board (includes cable, bracket, and screws)	684610-001

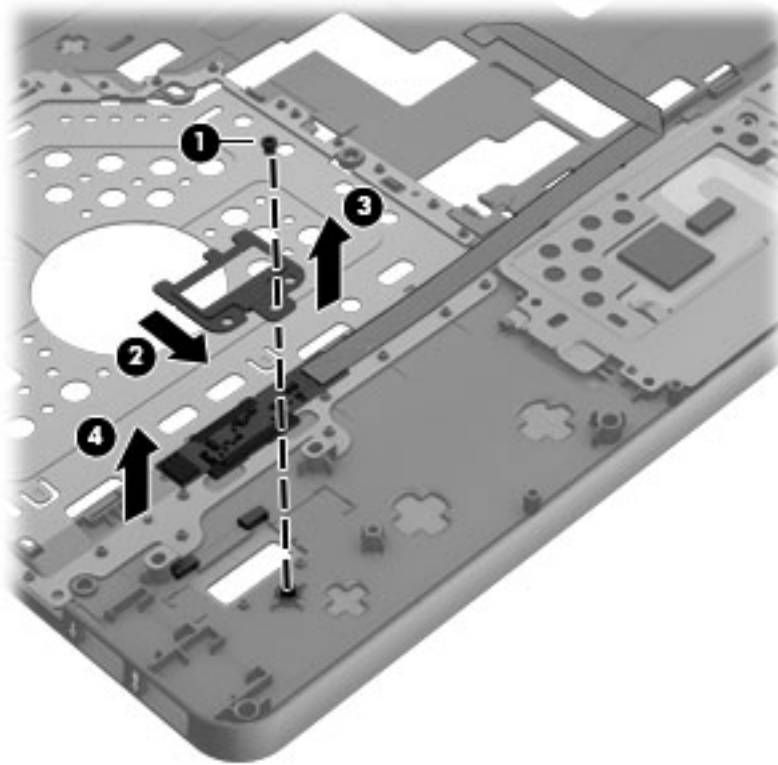
Before removing the fingerprint reader board, follow these steps:

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 40](#)).
5. Remove the following components:
 - a. Bottom door (see [Bottom door on page 41](#)).
 - b. Keyboard (see [Keyboard on page 52](#))
 - c. Top cover (see [Top cover on page 54](#))

Remove the fingerprint reader board:

1. Position the top cover upside-down with the front toward you.
2. Remove the Phillips PM2.0×3.0 screw **(1)** that secures the fingerprint reader board bracket to the top cover.
3. Slide the bracket toward the bottom of the top cover **(2)**, and then lift it off the top cover **(3)**.

4. Remove the fingerprint reader board and cable assembly from the top cover (4).



Reverse this procedure to install the fingerprint reader board.

Function board/Power button board assembly

Description	Spare part number
Function board/Power button board assembly (includes cable)	684613-001

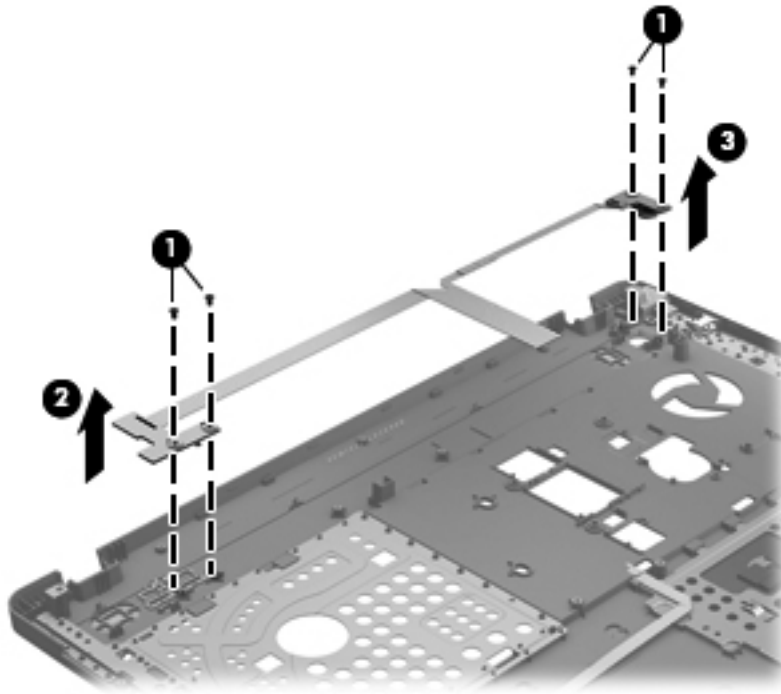
Before removing the function board and power button board, follow these steps:

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 40](#)).
5. Remove the following components:
 - a. Bottom door (see [Bottom door on page 41](#)).
 - b. Keyboard (see [Keyboard on page 52](#))
 - c. Top cover (see [Top cover on page 54](#))

Remove the function board/power button board assembly:

1. Position the top cover upside-down with the front toward you.
2. Remove the two Phillips PM2.0×3.0 screws **(1)** that secure the function (quick) board to the top cover and the two Phillips PM2.0×3.0 screws **(1)** that secure the power button board to the top cover.
3. Lift the function board from the top cover **(2)**.

4. Lift the power button board from the top cover (3).



Reverse this procedure to install the function board power button board assembly.

USB connector assembly

The USB connector assembly is included in the Cable Kit, spare part number 684633-001.

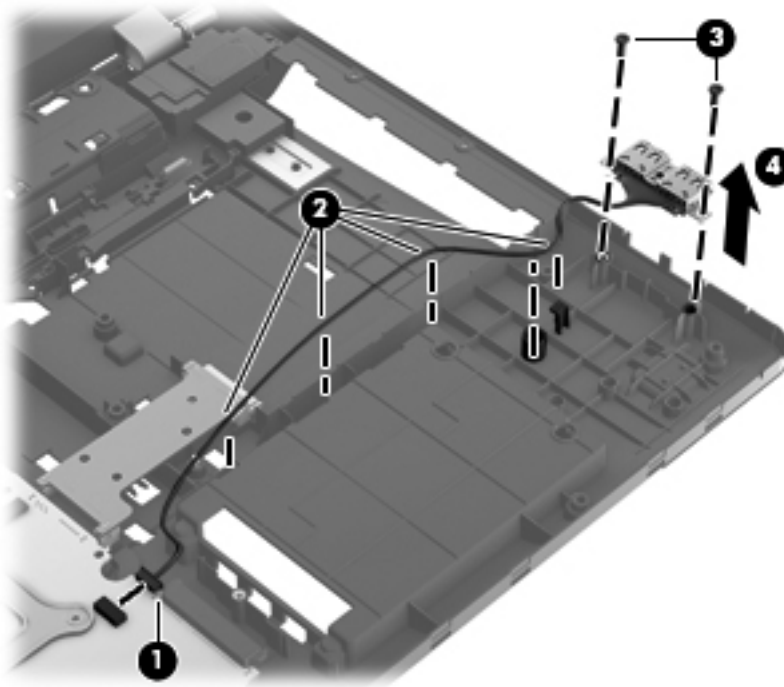
Before removing the USB connector assembly, follow these steps:

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 40](#)).
5. Remove the following components:
 - a. Bottom door (see [Bottom door on page 41](#)).
 - b. Keyboard (see [Keyboard on page 52](#))
 - c. Top cover (see [Top cover on page 54](#))

Remove the USB connector assembly:

1. Position the computer upright.
2. Disconnect the cable from the system board (1).
3. Remove the cables from the routing path (2).

4. Remove the two Phillips PM2.0×4.0 screws (3) that secure the USB connector to the computer.
5. Remove the USB connector assembly from the computer (4).



Reverse this procedure to install the USB connector assembly.

Fan

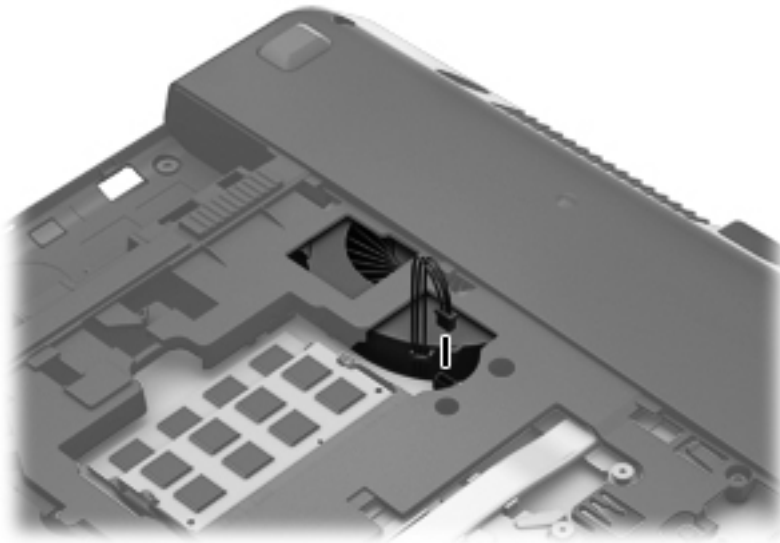
Description	Spare part number
Fan	689658-001

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 40](#)).
5. Remove the following components:
 - a. Bottom door (see [Bottom door on page 41](#)).
 - b. Keyboard (see [Keyboard on page 52](#))
 - c. Top cover (see [Top cover on page 54](#))

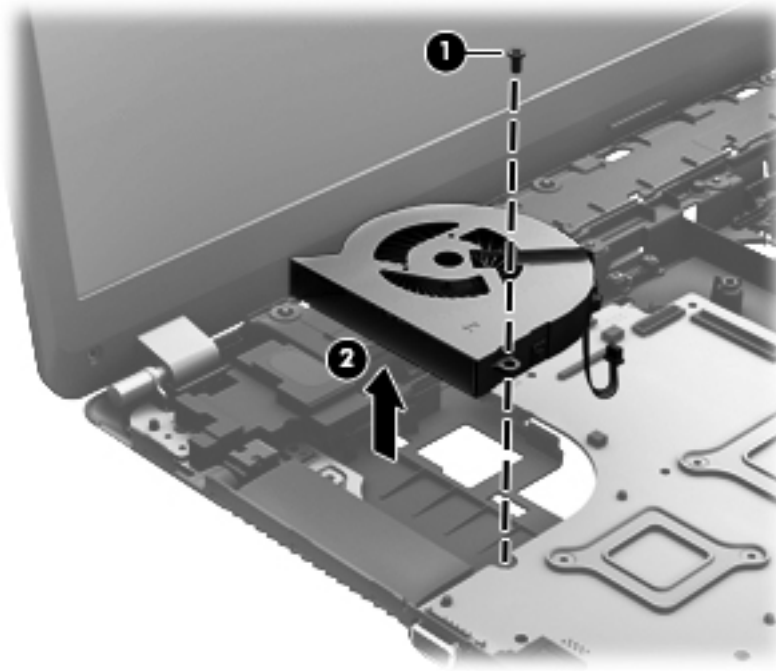
Remove the fan:

1. Position the computer upside down.
2. Disconnect the fan cable from the system board.




3. Position the computer upright.
4. Remove the Phillips PM2.0×4.0 screw (1) that secures the fan to the system board.

5. Remove the fan from the computer (2).




Reverse this procedure to install the fan.

 **NOTE:** To properly ventilate the computer, allow at least a 7.6-cm (3-in) clearance on the left side of the computer.

The computer uses an electric fan for ventilation. The fan is controlled by a temperature sensor and is designed to turn on automatically when high temperature conditions exist. These conditions are affected by high external temperatures, system power consumption, power management/battery conservation configurations, battery fast charging, and software requirements. Exhaust air is displaced through the ventilation grill located on the left side of the computer.

Speaker assembly

Description	Spare part number
Speaker assembly	684615-001

 **NOTE:** You must remove the speakers to access the screws that secure the display.

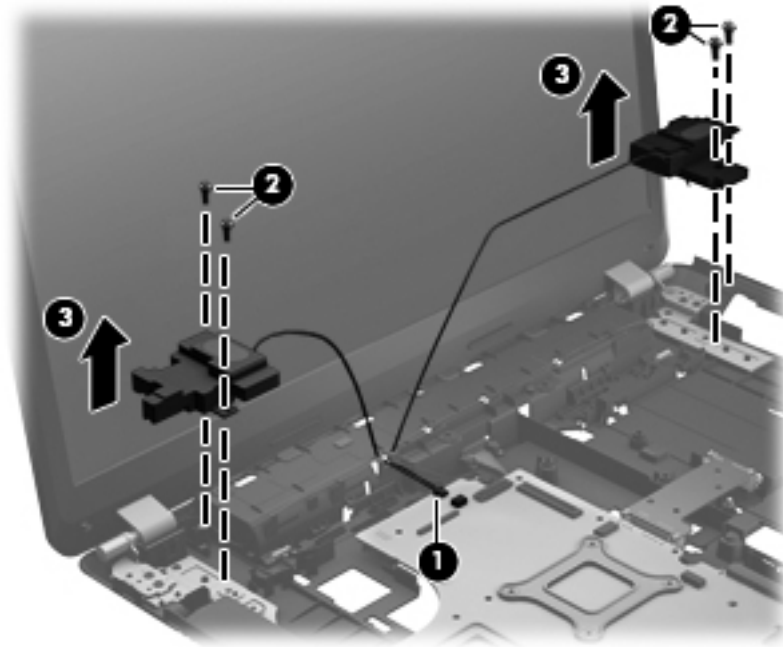
Before removing the speaker assembly, follow these steps:

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 40](#)).
5. Remove the following components:
 - a. Bottom door (see [Bottom door on page 41](#)).
 - b. Keyboard (see [Keyboard on page 52](#))
 - c. Top cover (see [Top cover on page 54](#))

Remove the speaker assembly:

1. Position the computer upright with the front toward you.
2. Open the computer as far as possible.
3. Disconnect the speaker cable from the system board (1).
4. Remove the four Phillips PM2.0×4.0 screws (2) that secure the speakers to the computer.
5. Remove the speakers from the computer (3).



Reverse this procedure to install the speaker assembly.

Audio board

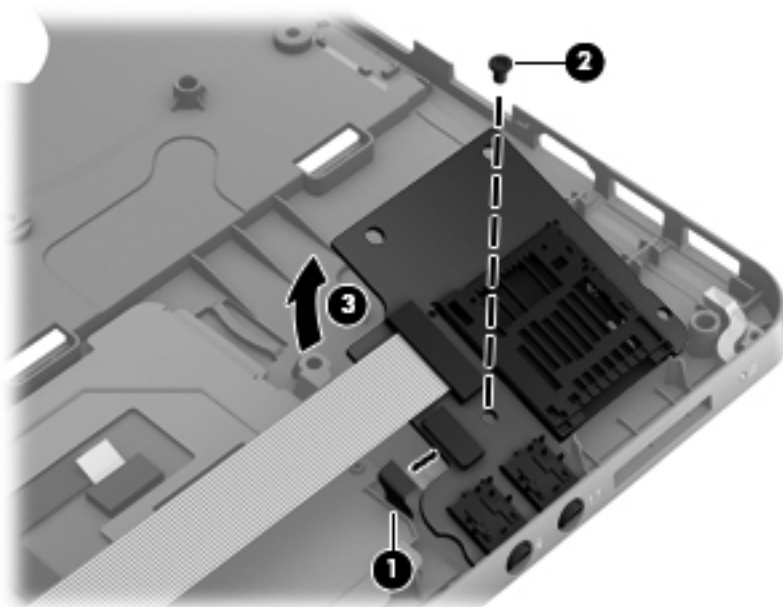
Description	Spare part number
Audio board	683475-001

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 40](#)).
5. Remove the following components:
 - a. Bottom door (see [Bottom door on page 41](#)).
 - b. Keyboard (see [Keyboard on page 52](#))
 - c. Top cover (see [Top cover on page 54](#))

Remove the audio board:

1. Position the computer upright with the front toward you.
2. Disconnect the smaller touchpad button cable (1).
3. Remove the Phillips PM2.0×3.0 screw (2) that secures the audio board to the computer.
4. Rotate the top of the board upward, pull the board away from the connectors (to remove them from top cover holes), and then lift the board off the top cover (3).



Reverse this procedure to install the audio board.

Power cable

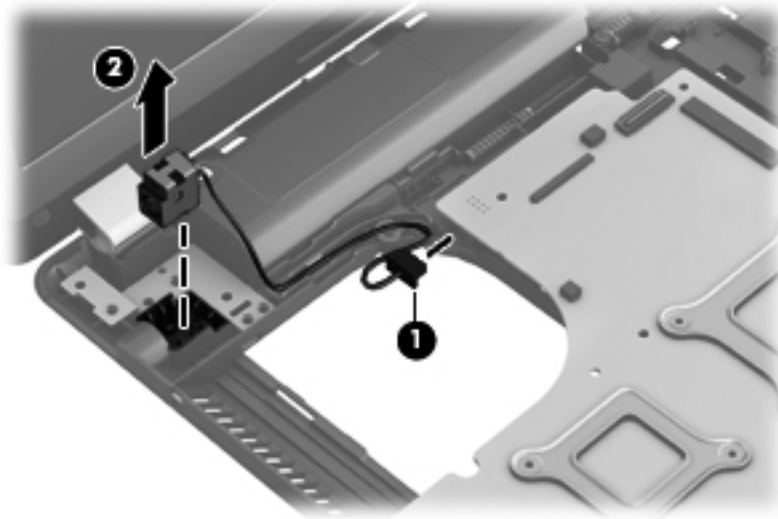
The power cable is included in the Cable Kit, spare part number 684633-001.

Before removing the power 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 40](#)).
5. Remove the following components:
 - a. Bottom door (see [Bottom door on page 41](#)).
 - b. Keyboard (see [Keyboard on page 52](#))
 - c. Top cover (see [Top cover on page 54](#))
 - d. Speaker (see [Speaker assembly on page 65](#))
 - e. Fan (see [Fan on page 64](#))

Remove the power cable:

1. Position the computer upright.
2. Disconnect the cable from the bottom of the system board (1).
3. Lift the power cable assembly from the computer (2).



Reverse this procedure to install the power cable.

Battery cable

The battery cable is included in the Cable Kit, spare part number 684633-001.

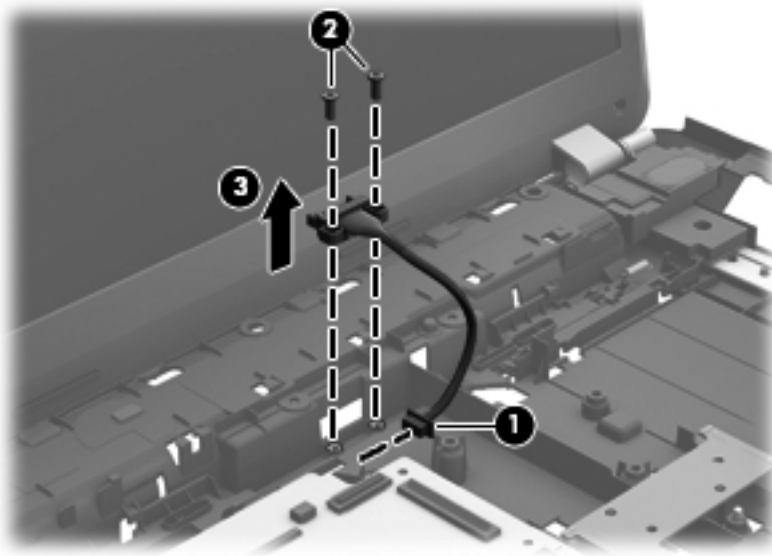
Before removing the battery cable, follow these steps:

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 40](#)).
5. Remove the following components:
 - a. Bottom door (see [Bottom door on page 41](#)).
 - b. Hard drive (see [Hard drive on page 45](#))
 - c. Optical drive (see [Optical drive on page 43](#))
 - d. WLAN/Bluetooth module (see [WLAN/Bluetooth combo card on page 50](#))
 - e. Keyboard (see [Keyboard on page 52](#))
 - f. Top cover (see [Top cover on page 54](#))
 - g. Fan (see [Fan on page 64](#))

Remove the battery cable:

1. Position the computer upright and open as far as possible.
2. Disconnect the cable from the system board connector **(1)**.
3. Remove the two Phillips PM2.0×4.0 screws that secure the battery cable to the computer **(2)**.

4. Lift the battery cable from the computer (3).



Reverse this procedure to install the battery cable.

System board



NOTE: All system board spare part kits include replacement thermal material.

Description	Spare part number
System board for use in models without Windows 8:	
1-GB of discrete graphics memory	683493-001
2-GB of discrete graphics memory	683494-001
1-GB of discrete graphics memory for use in Japan	696336-001
System boards for use in Windows 8 models:	
Windows 8 Standard models with 1-GB of discrete graphics memory	683493-501
Windows 8 Professional models with 1-GB of discrete graphics memory	683493-601
Windows 8 Standard models with 2-GB of discrete graphics memory	683494-501
Windows 8 Professional models with 2-GB of discrete graphics memory	683494-601
Windows 8 Standard models with 1-GB of discrete graphics memory for use in Japan	696336-501
Windows 8 Professional models with 1-GB of discrete graphics memory for use in Japan	696336-601

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 40](#)).
5. Remove the following components:
 - a. Bottom door (see [Bottom door on page 41](#)).
 - b. Hard drive (see [Hard drive on page 45](#))
 - c. Optical drive (see [Optical drive on page 43](#))
 - d. Keyboard (see [Keyboard on page 52](#))
 - e. Top cover (see [Top cover on page 54](#))
 - f. Fan (see [Fan on page 64](#))
 - g. Optical drive extension board (see [Optical drive extension board on page 75](#))
 - h. Hard drive extension board (see [Hard drive extension board on page 77](#))

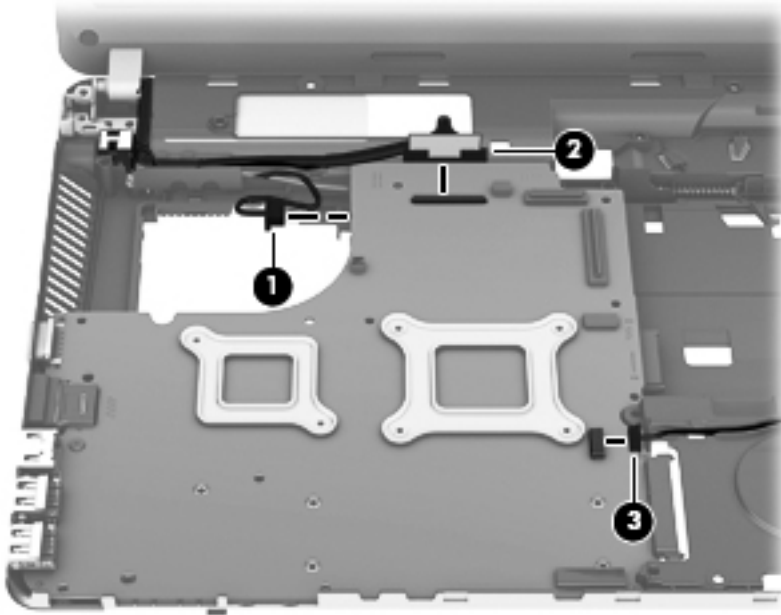
When replacing the system board, be sure to remove the following components from the defective system board and install on the replacement system board:

- Memory module (see [Memory modules on page 48](#))
- WLAN/Bluetooth module (see [WLAN/Bluetooth combo card on page 50](#))
- Processor (see [Processor on page 80](#))
- Optical drive extension board (see [Optical drive extension board on page 75](#))
- Hard drive extension board (see [Hard drive extension board on page 77](#))

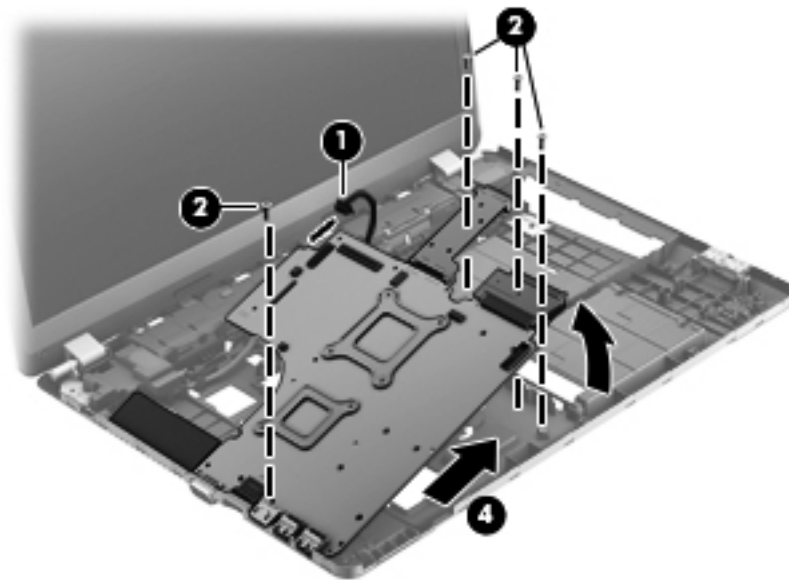
Remove the system board:

1. Position the computer upright with the front toward you.

2. Disconnect the power cable (1), display cable (2), and the USB connector cable (3) from the system board.



3. If necessary, disconnect the battery connector cable from the system board (1).
4. Remove the four Phillips PM2.5×4.0 screws (2) that secure the system board to the computer.
5. Lift the right side of the system board up at an angle (3).
6. Pull the system board up and toward the right to remove it from the computer (4).



Reverse this procedure to install the system board.

RTC battery

Description	Spare part number
RTC battery	683502-001

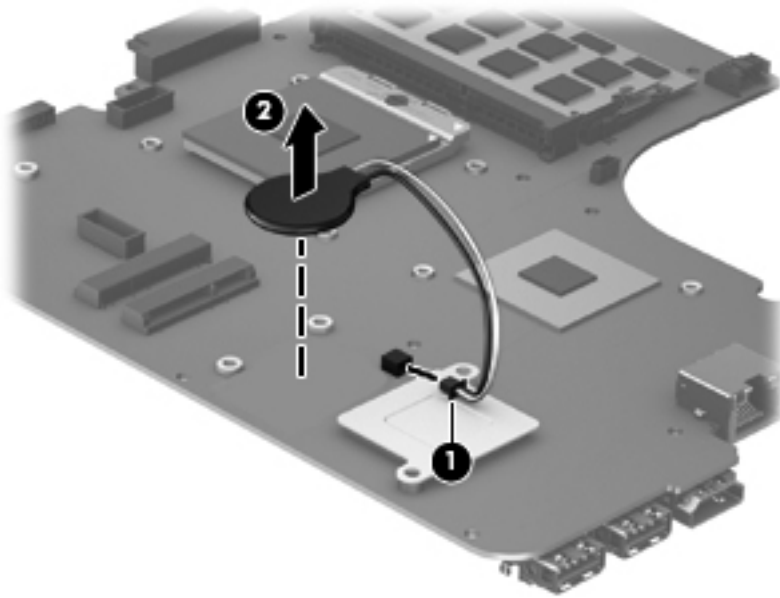
Before removing the RTC battery, follow these steps:

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 40](#)).
5. Remove the following components:
 - a. Bottom door (see [Bottom door on page 41](#)).
 - b. Hard drive (see [Hard drive on page 45](#))
 - c. Optical drive (see [Optical drive on page 43](#))
 - d. WLAN/Bluetooth module (see [WLAN/Bluetooth combo card on page 50](#))
 - e. Keyboard (see [Keyboard on page 52](#))
 - f. Top cover (see [Top cover on page 54](#))
 - g. Fan (see [Fan on page 64](#))
 - h. System board (see [System board on page 70](#))

Remove the RTC battery:

1. Position the computer upright and open as far as possible.
2. Disconnect the RTC battery connector from the system board **(1)**.

3. Lift the battery from the system board (2).



Reverse this procedure to install the RTC battery.

Optical drive extension board

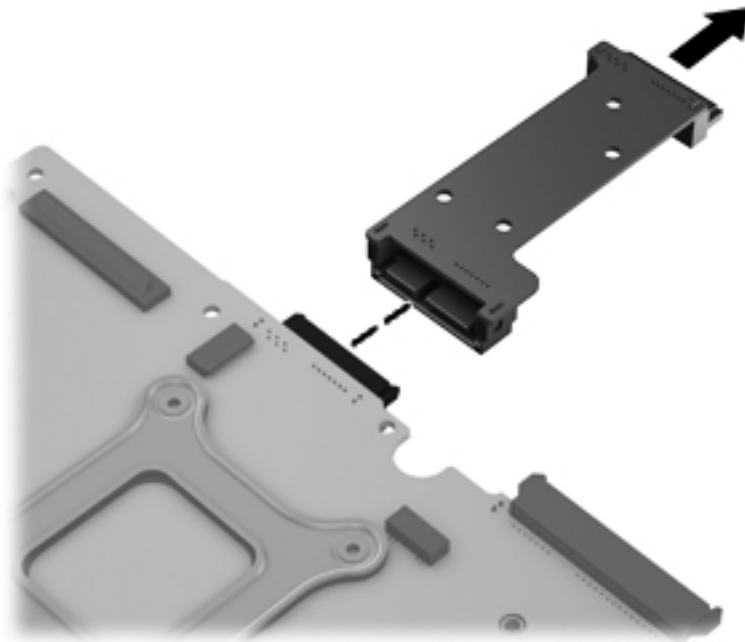
Description	Spare part number
Optical drive extension board	689656-001

Before removing the optical drive extension 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 40](#)).
5. Remove the following components:
 - a. Bottom door (see [Bottom door on page 41](#)).
 - b. Hard drive (see [Hard drive on page 45](#))
 - c. Optical drive (see [Optical drive on page 43](#))
 - d. WLAN/Bluetooth module (see [WLAN/Bluetooth combo card on page 50](#))
 - e. Keyboard (see [Keyboard on page 52](#))
 - f. Top cover (see [Top cover on page 54](#))
 - g. Fan (see [Fan on page 64](#))
 - h. System board (see [System board on page 70](#))

Remove the optical drive extension board:

- ▲ Pull the optical drive extension board straight away from the side of the system board.



Reverse this procedure to install the optical drive extension board.

Hard drive extension board

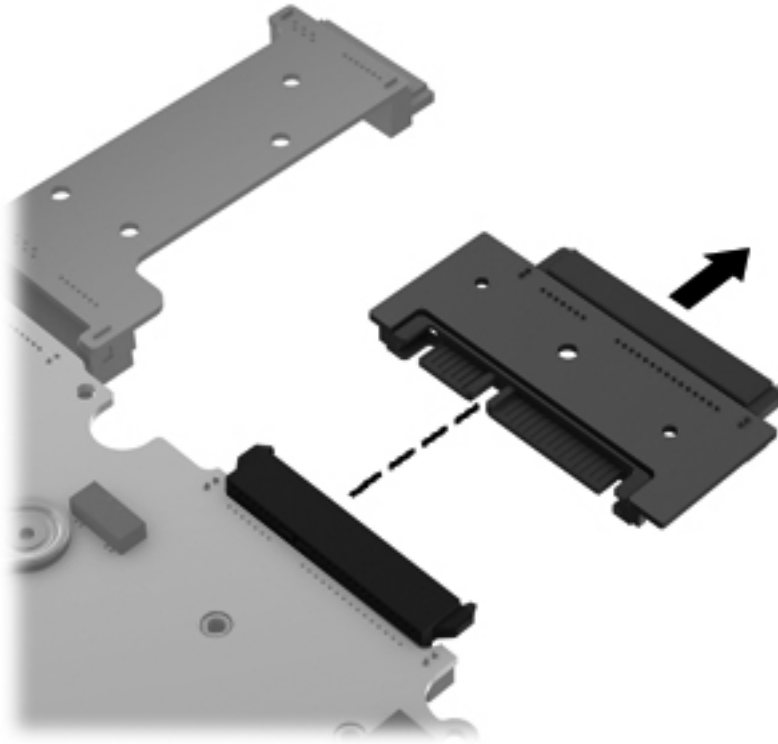
Description	Spare part number
Hard drive extension board	689655-001

Before removing the hard drive extension 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 40](#)).
5. Remove the following components:
 - a. Bottom door (see [Bottom door on page 41](#)).
 - b. Hard drive (see [Hard drive on page 45](#))
 - c. Optical drive (see [Optical drive on page 43](#))
 - d. WLAN/Bluetooth module (see [WLAN/Bluetooth combo card on page 50](#))
 - e. Keyboard (see [Keyboard on page 52](#))
 - f. Top cover (see [Top cover on page 54](#))
 - g. Fan (see [Fan on page 64](#))
 - h. System board (see [System board on page 70](#))

Remove the hard drive extension board:

- ▲ Pull the hard drive extension board straight away from the side of the system board.



Reverse this procedure to install the hard drive extension board.

Heat sink

All heat sink spare part kits include replacement thermal material.

Description	Spare part number
Heat sink	689657-001

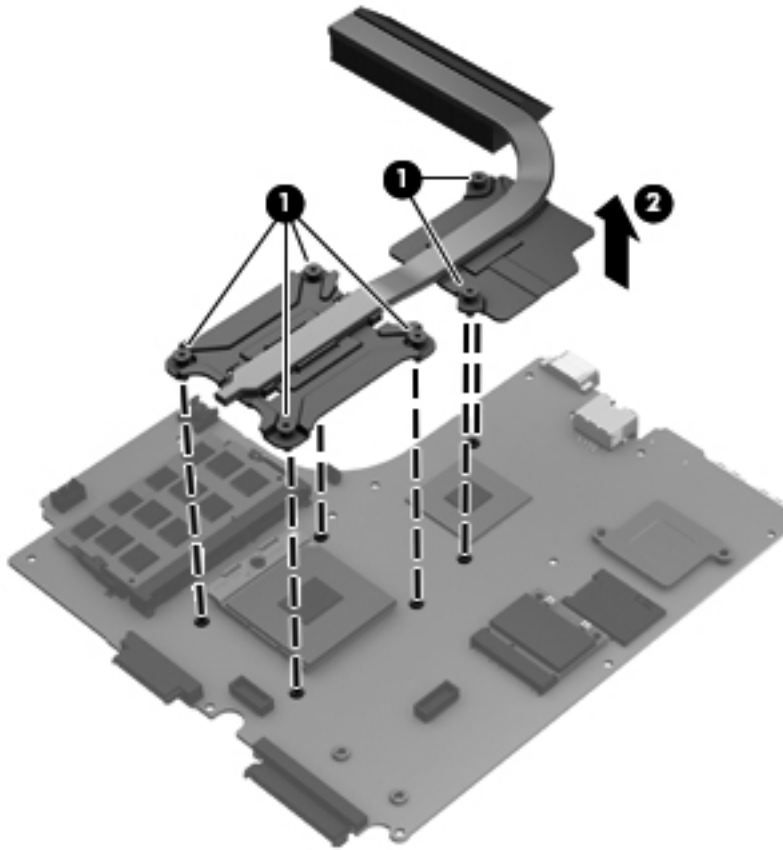
Before removing the heat sink, follow these steps:


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 40](#)).
5. Remove the following components:
 - a. Bottom door (see [Bottom door on page 41](#)).
 - b. Hard drive (see [Hard drive on page 45](#))
 - c. Optical drive (see [Optical drive on page 43](#))
 - d. WLAN/Bluetooth module (see [WLAN/Bluetooth combo card on page 50](#))
 - e. Keyboard (see [Keyboard on page 52](#))
 - f. Top cover (see [Top cover on page 54](#))
 - g. Fan (see [Fan on page 64](#))
 - h. System board (see [System board on page 70](#))

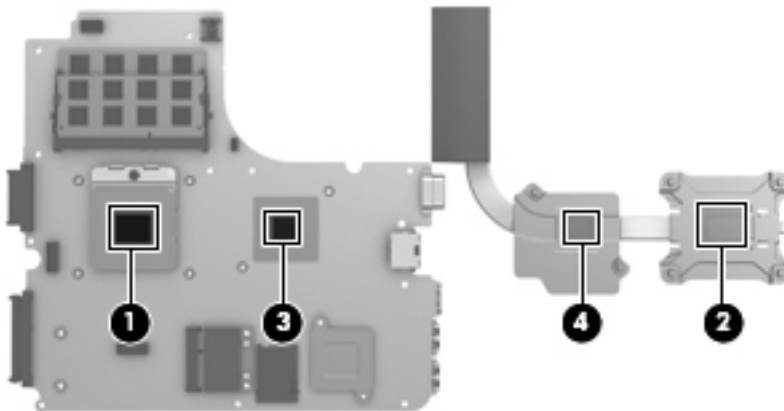
Remove the heat sink:

1. Position the system board upside-down.
2. To remove the heat sink, in the order indicated on the heat sink, loosen the six captive Phillips screws **(1)** that secure the heat sink to the system board.

3. Lift the heat sink from the system board (2).



 **NOTE:** Thoroughly clean thermal material from the surfaces of the system board components (1)(3) and the heat sink (2)(4) each time you remove the heat sink. All heat sink and processor spare part kits include thermal material.



Reverse this procedure to install the heat sink.

Processor

 **NOTE:** All processor spare part kits include replacement thermal material.

Description	Spare part number
Intel Core i7 processor, Quad Core	
3632QM, 2.2-GHz processor with 6-MB L3 cache	701658-001
3612QM, 2.1-GHz processor with 6-MB L3 cache	680647-001
Intel Core i5 processors, Dual Core	
3360M, 2.8-GHz processor with 3-MB L3 cache (includes thermal grease)	681953-001
3320M, 2.6-GHz processor with 3-MB L3 cache (includes thermal grease)	681952-001
3210M, 2.5-GHz processor with 3-MB L3 cache (includes thermal grease)	680645-001
Intel Core i3 processors, Dual Core	
3120M, 2.5-GHz processor with 3-MB L3 cache (includes thermal grease)	700627-001
3110M, 2.3-GHz processor with 3-MB L3 cache (includes thermal grease)	682417-001
2450M, 2.5-GHz processor with 3-MB L3 cache (includes thermal grease)	676359-001
2370M, 2.4-GHz processor with 3-MB L3 cache (includes thermal grease)	677152-001
2350M, 2.3-GHz processor with 3-MB L3 cache (includes thermal grease)	653340-001
Intel Pentium processor, Dual Core	
2020M, 2.4-GHz, with 2-MB L3 cache	700628-001
B980, 2.4-GHz, with 2-MB L3 cache	692428-001
B970, 2.3-GHz, with 2-MB L3 cache	676785-001
Intel Celeron processor	
B840, 1.9-GHz, with 2-MB L3 cache	664663-001


Before removing the processor, follow these steps:

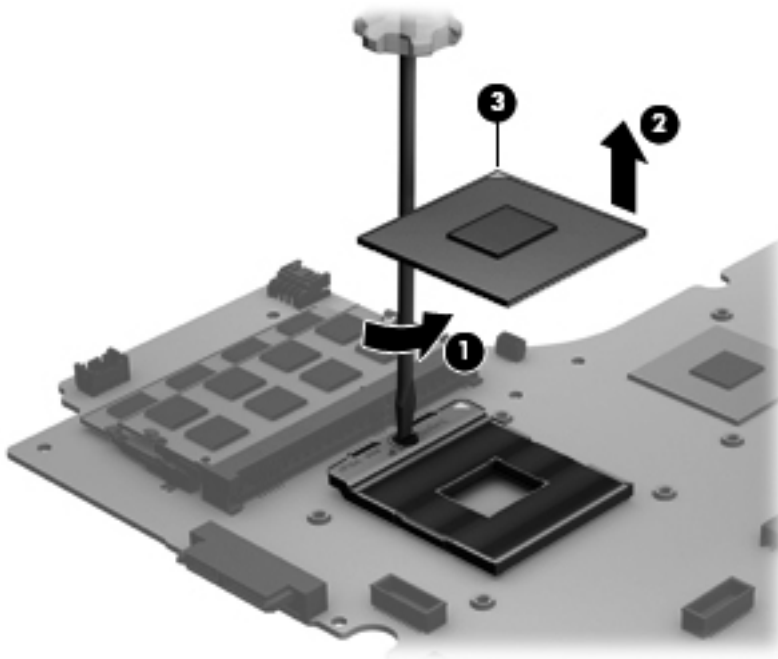
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 40](#)).
5. Remove the following components:
 - a. Bottom door (see [Bottom door on page 41](#)).
 - b. Hard drive (see [Hard drive on page 45](#))
 - c. Optical drive (see [Optical drive on page 43](#))
 - d. WLAN/Bluetooth module (see [WLAN/Bluetooth combo card on page 50](#))
 - e. Keyboard (see [Keyboard on page 52](#))

- f. Top cover (see [Top cover on page 54](#))
- g. Fan (see [Fan on page 64](#))
- h. System board (see [System board on page 70](#))
- i. Heat sink (see [Heat sink on page 79](#))

Remove the processor:

1. Position the system board upside-down.
2. Use a flat-bladed screwdriver to turn the processor locking screw **(1)** one-half turn counterclockwise until you hear a click.
3. Lift the processor **(2)** straight up and remove it.

 **NOTE:** The gold triangle **(3)** on the processor must be aligned with the triangle embossed on the processor slot when you install the processor.



Reverse this procedure to install the processor.

Latch assembly



NOTE: The Latch Kit includes the left and right latches, knob, screws, and spring.

Description	Spare part number
Latch Kit	684635-001

Before removing the latch 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 40](#)).
5. Remove the following components:
 - a. Bottom door (see [Bottom door on page 41](#)).
 - b. Hard drive (see [Hard drive on page 45](#))
 - c. Optical drive (see [Optical drive on page 43](#))
 - d. WLAN/Bluetooth module (see [WLAN/Bluetooth combo card on page 50](#))
 - e. Keyboard (see [Keyboard on page 52](#))
 - f. Top cover (see [Top cover on page 54](#))
 - g. Fan (see [Fan on page 64](#))
 - h. System board (see [System board on page 70](#))

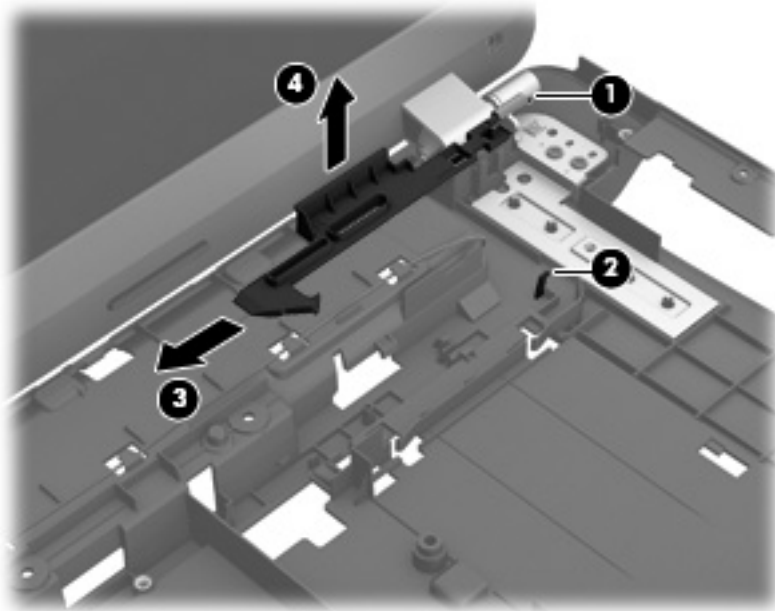


NOTE: The latch mechanism includes a small spring. Note the location of the spring.

Remove the latch assembly:

1. Position the computer upright and open as far as possible.
2. Remove the spring **(1)** from the tab on the base enclosure **(2)**.

3. Slide the latch mechanism toward the left **(3)**, and then lift it from the computer **(4)**.



Reverse this procedure to install the latch assembly.

Display assembly

All display assemblies include WLAN antenna transceivers and cables.

For a list of individual display spare parts, see [Display components on page 26](#).

Description	Spare part number
Display assembly, 43.9-cm (17.3-inch), HD+, anti-glare, with webcam	684631-001

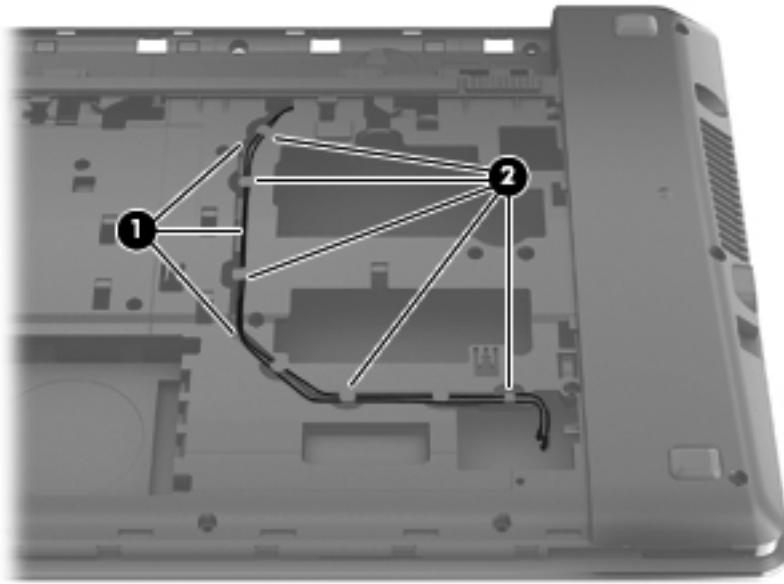
Before removing the display assembly, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 40](#)).
5. Remove the following components:
 - a. Bottom door (see [Bottom door on page 41](#)).
 - b. WLAN/Bluetooth module (see [WLAN/Bluetooth combo card on page 50](#))
 - c. Keyboard (see [Keyboard on page 52](#))
 - d. Top cover (see [Top cover on page 54](#))
 - e. Speaker assembly (see [Speaker assembly on page 65](#))

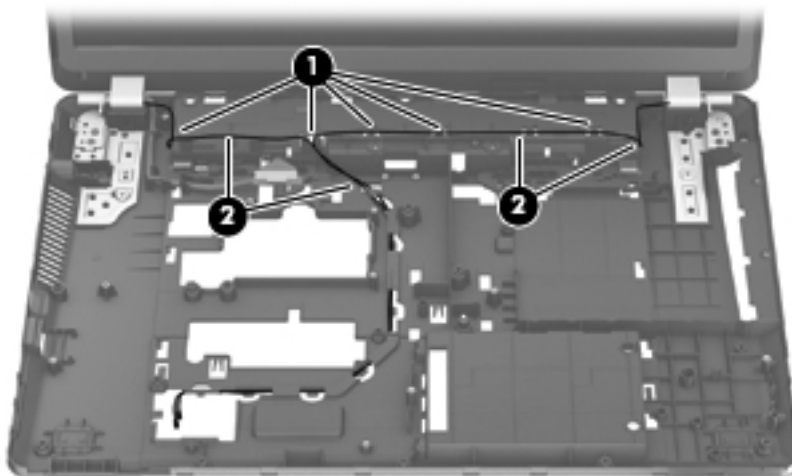
Remove the display assembly:

1. Position the computer upside down.

2. Remove the WLAN antennas from the routing path (1) and tabs (2) on the bottom of the computer.

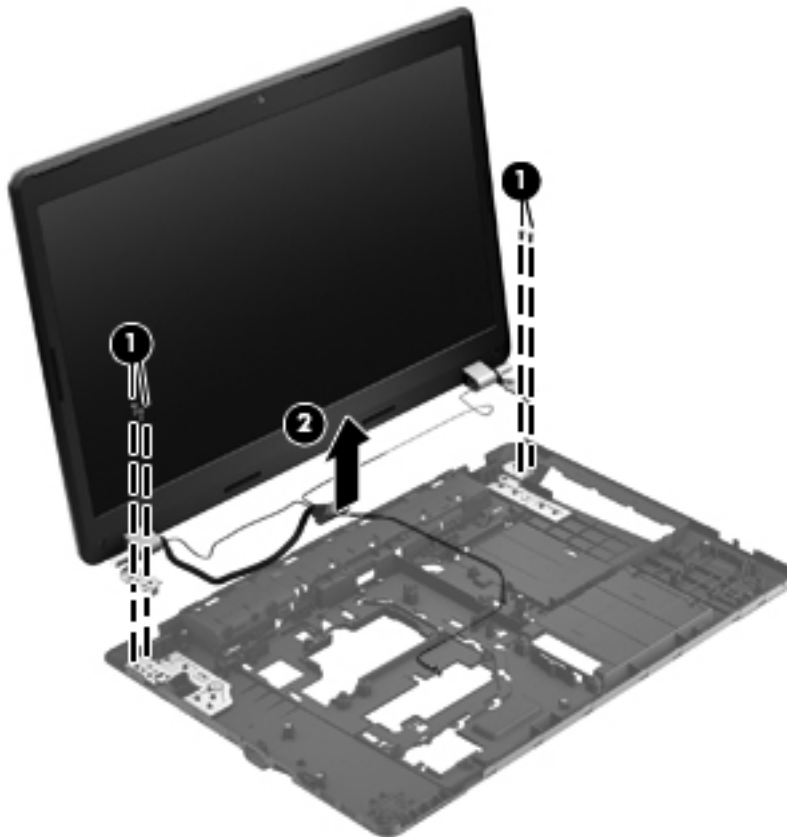


3. Place the computer upright and open as far as possible.
4. Pull the antennas through the hole that routes to the bottom of the computer.
5. Remove the WLAN antennas from the tabs (1) and the routing path (2) on the top of the computer.



6. Remove the four Torx T8M2.5×7.0 screws (1) from the display hinges.

7. Lift the display assembly straight up and remove it (2).



CAUTION: When installing the display assembly, be sure that the wireless antenna cables are routed and arranged properly.

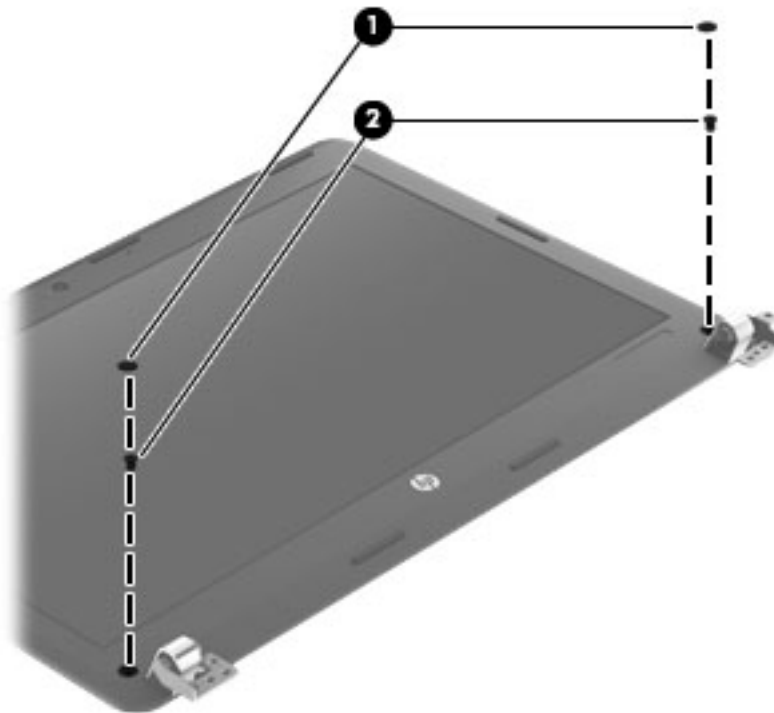
Failure to properly route the antennas can result in degradation of the computer's WLAN performance.

8. If you need to remove the hinge covers from the display hinges, pull the hinges straight up and off the display to remove them.

Display hinge covers are available in the Display Hinge Kit using spare part number 684612-001.



9. To replace the display bezel, remove the two rubber screw covers (1) and the two Phillips PM2.5×5.0 screws (2) in the bottom corners of the display bezel.



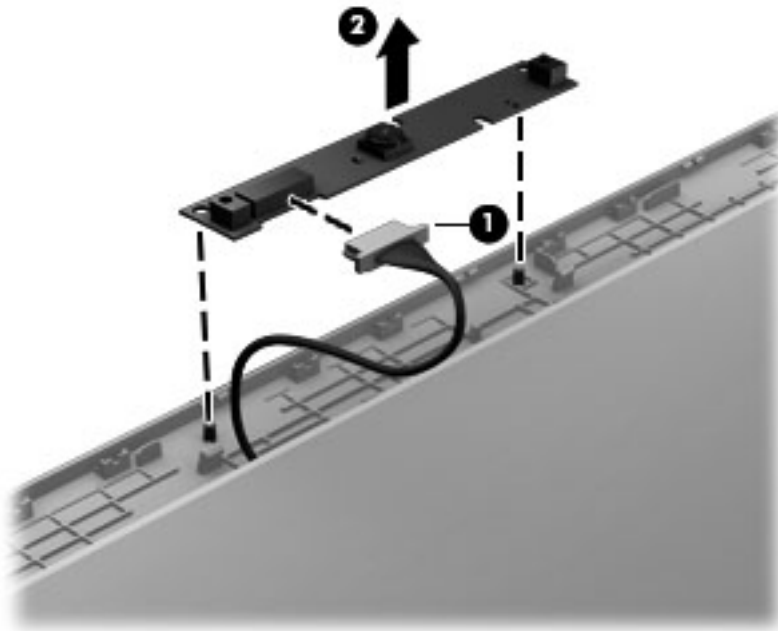
10. Flex the top (1) of the bezel, the inside edges of the left and right sides (2), and then the bottom (3) of the bezel until it disengages from the display enclosure.
11. Remove the display bezel (4).

The display bezel is available using spare part number 684609-001.

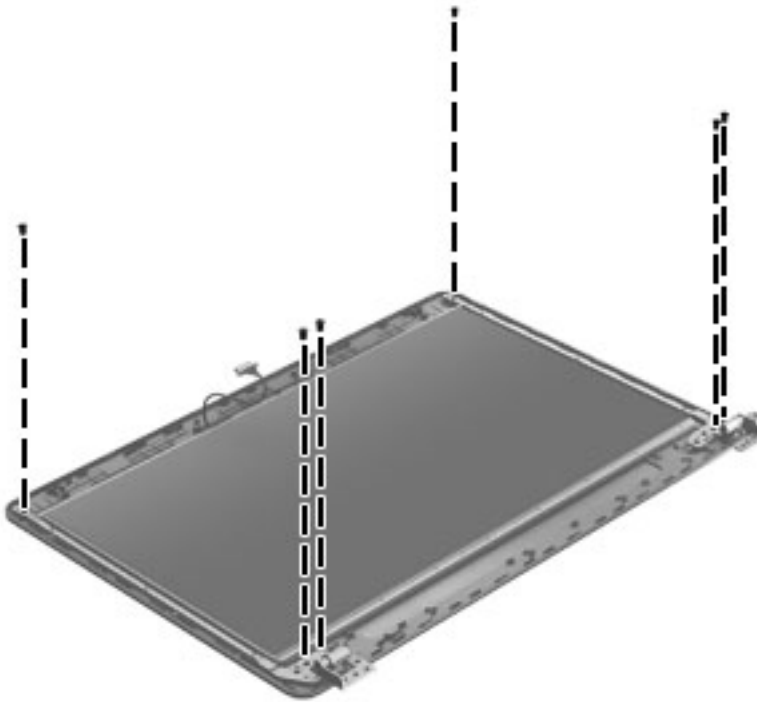


12. If it is necessary to replace the webcam module, disconnect the cable from the module (1), and then gently pull the module away from the double-sided tape on the display enclosure (2).

The webcam module is available using spare part number 683508-001.



13. If it is necessary to replace the display hinges, remove the six Phillips PM2.5×3.0 screws that secure the display hinges and panel to the display enclosure.



14. Remove the display hinges and panel from the display enclosure.

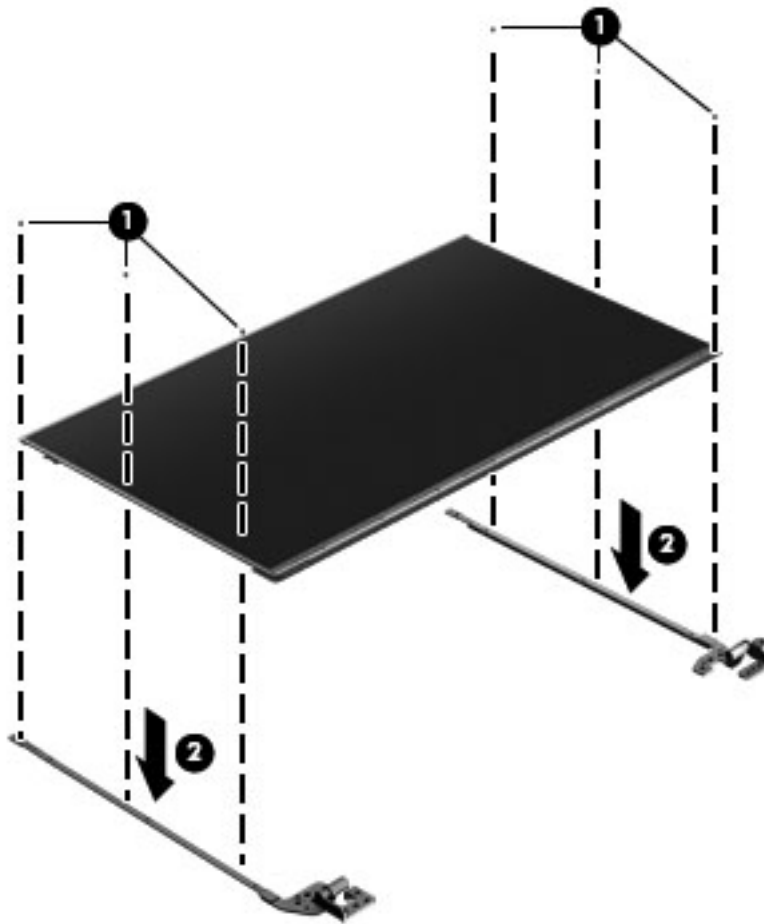
15. Disconnect the display panel cable by rotating the display enclosure (1), lifting the tape (2) that covers the connector, and disconnecting the cable from the panel (3).



16. Position the display panel and hinge assembly upright.
17. Remove the three Phillips PM1.5×2.0 screws (1) that secure each display hinge to the display panel.

18. Remove the display hinges (2).

Display hinges are available in the Display Hinge Kit using spare part number 684612-001.




Reverse this procedure to reassemble and install the display assembly.

5 Computer Setup (BIOS) and Advanced System Diagnostics


Windows 7 – Computer Setup (BIOS) and Advanced System Diagnostics

Using Computer Setup

Computer Setup, or Basic Input/Output System (BIOS), controls communication between all the input and output devices on the system (such as disk drives, display, keyboard, mouse, and printer). Computer Setup includes settings for the types of devices installed, the startup sequence of the computer, and the amount of system and extended memory.

 **NOTE:** Use extreme care when making changes in Computer Setup. Errors can prevent the computer from operating properly.

Starting Computer Setup

 **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 Computer Setup.

Navigating and selecting in Computer Setup

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 Computer Setup.

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**.
- 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 Computer 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.

Updating the BIOS

The next sections describe different ways of updating the BIOS.

Downloading *SoftPaqs* to update the BIOS

Most BIOS updates on the HP website are packaged in compressed files called *SoftPaqs*.

To install BIOS updates from the HP website, follow the steps below:

1. Download the *SoftPaq* from the HP website.
2. Click **Run**, and then follow the on-screen instructions to update the BIOS.



NOTE: Some download packages contain a file named Readme.txt, which contains information regarding installing and troubleshooting the file.

BIOS management using system diagnostics

1. Download the *SoftPaq* from the HP website.



NOTE: Verify that the UEFI system diagnostics is installed on your computer (or USB flash drive).

2. Click **Run**, and then click **Cancel** at the Update/USB bootable dialog box.
3. Navigate to the folder located in [c:\swsetup](#) that corresponds to your *SoftPaq* number.
4. Locate the .bin file in the ROMpaq folder (for example, 68CDD.bin) and then copy it to the Hewlett-Packard\BIOS\New\ folder in either the HP_Tools partition of the hard drive, or the USB flash drive.
5. Locate the .sig file in the ROM.cab file and rename it with the same prefix as the .bin file (for example, 68CDD.sig). Copy the renamed file to the Hewlett-Packard\BIOS\New\ folder in either the HP_Tools partition of the hard drive, or the USB flash drive.
6. 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.
7. Press [f2](#) to enter Computer Setup.
8. Click **BIOS Management** from the menu and then select **Update BIOS**.

Using [f10 setup](#) to update the BIOS

1. Download the *SoftPaq* from the HP website.



NOTE: Verify that the UEFI system diagnostics is installed on your computer (or USB flash drive).

2. Click **Run**, and then click **Cancel** at the Update/USB bootable dialog box.
3. Navigate to the folder located in [c:\swsetup](#) that corresponds to your *SoftPaq* number.
4. Locate the .bin file in the ROMpaq folder (for example, 68CDD.bin) and then copy it to the Hewlett-Packard\BIOS\New\ folder in either the HP_Tools partition of the hard drive, or the USB flash drive.

5. Locate the .sig file in the ROM.cab file and rename it with the same prefix as the .bin file (for example, 68CDD.sig). Copy the renamed file to the Hewlett-Packard\BIOS\New\ folder in either the HP_Tools partition of the hard drive, or the USB flash drive.
6. 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.
7. Press **f10** to enter Computer Setup.
8. Click **Update System BIOS**, and then click **Accept** to update the BIOS.

Determining the BIOS version

To determine whether available BIOS updates contain later BIOS versions than those currently installed on the computer, you need to know the version of the system BIOS currently installed.


BIOS version information (also known as *ROM date* and *System BIOS*) can be displayed by pressing **fn+esc** (if you are already in Windows) or by using Computer Setup.

1. Start Computer Setup.
2. Use a pointing device or the arrow keys to select **File > System Information**.
3. To exit Computer Setup 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**.

Downloading a BIOS update

 **CAUTION:** To reduce the risk of damage to the computer or an unsuccessful installation, download and install a BIOS update only when the computer is connected to reliable external power using the AC adapter. Do not download or install a BIOS update while the computer is running on battery power, docked in an optional docking device, or connected to an optional power source. During the download and installation, follow these instructions:


Do not disconnect power from the computer by unplugging the power cord from the AC outlet.

Do not shut down the computer or initiate Sleep or Hibernation.

Do not insert, remove, connect, or disconnect any device, cable, or cord.


1. Select **Start > Help and Support > Maintain**.
2. Follow the on-screen instructions to identify your computer and access the BIOS update you want to download.
3. At the download area, follow these steps:
 - a. Identify the BIOS update that is later than the BIOS version currently installed on your computer. Make a note of the date, name, or other identifier. You may need this information to locate the update later, after it has been downloaded to your hard drive.
 - b. Follow the on-screen instructions to download your selection to the hard drive.

Make a note of the path to the location on your hard drive where the BIOS update is downloaded. You will need to access this path when you are ready to install the update.

 **NOTE:** If you connect your computer to a network, consult the network administrator before installing any software updates, especially system BIOS updates.

BIOS installation procedures vary. Follow any instructions that are displayed on the screen after the download is complete. If no instructions are displayed, follow these steps:

1. Open Windows Explorer by selecting **Start > Computer**.
2. Double-click your hard drive designation. The hard drive designation is typically Local Disk (C:).
3. Using the hard drive path you recorded earlier, open the folder on your hard drive that contains the update.
4. Double-click the file that has an .exe extension (for example, *filename.exe*).
The BIOS installation begins.
5. Complete the installation by following the on-screen instructions.

 **NOTE:** After a message on the screen reports a successful installation, you can delete the downloaded file from your hard drive.

BIOS Setup Menu

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

Main menu

Select	To do this
System information	<ul style="list-style-type: none">• View and change the system time and date.• View identification information about your computer.• View specification information about the processor, memory size, and system BIOS.

Security menu

Select	To do this
Administrator password	Control access to Setup Utility.
Power-on password	Control access to your computer.

Diagnostics menu

Select	To do this
Primary Hard Disk Self Test	Run a quick or comprehensive self-test on the hard drive.
Memory Test	Run a diagnostic test on the system memory.

Using Advanced System Diagnostics

Advanced System Diagnostics allows you to run diagnostic tests to determine if the computer hardware is functioning properly. The following diagnostic tests are available in Advanced System Diagnostics:

- **Start-up test**—This test analyzes the main computer components that are required to start the computer.
- **Run-in test**—This test repeats the start-up test and checks for intermittent problems that the start-up test does not detect.
- **System Tune-Up**—This group of additional tests checks your computer to make sure that the main components are functioning correctly. System Tune-Up runs longer and more comprehensive tests on memory modules, hard drive SMART attributes, the hard drive surface, the battery (and battery calibration), video memory, and the WLAN module status.
- **Hard disk test**—This test analyzes the physical condition of the hard drive, and then checks all data in every sector of the hard drive. If the test detects a damaged sector, it attempts to move the data to a good sector.
- **Memory test**—This test analyzes the physical condition of the memory modules. If it reports an error, replace the memory modules immediately.
- **Battery test**—This test analyzes the condition of the battery and calibrates the battery if necessary. If the battery fails the test, contact support to report the issue and purchase a replacement battery.

You can view system information and error logs in the Advanced System Diagnostics window.

To start Advanced System Diagnostics:

1. Turn on or restart the computer. While the “Press the ESC key for Startup Menu” message is displayed in the lower-left corner of the screen, press **esc**. When the Startup Menu is displayed, press **f2**.
2. Click the diagnostic test you want to run, and then follow the on-screen instructions.



NOTE: If you need to stop a diagnostics test while it is running, press **esc**.

Windows 8 – Computer Setup (BIOS) and Advanced System Diagnostics

Using Computer Setup

Computer Setup, or Basic Input/Output System (BIOS), controls communication between all the input and output devices on the system (such as disk drives, display, keyboard, mouse, and printer). Computer Setup includes settings for the types of devices installed, the startup sequence of the computer, and the amount of system and extended memory.



NOTE: Use extreme care when making changes in Computer Setup. Errors can prevent the computer from operating properly.

Starting Computer Setup



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 Computer Setup.

Navigating and selecting in Computer Setup

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 Computer Setup.

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**.

- 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 Computer 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.

Updating the BIOS

Updated versions of the BIOS may be available on the HP website.

Most BIOS updates on the HP website are packaged in compressed files called *SoftPaqs*.

Some download packages contain a file named *Readme.txt*, which contains information regarding installing and troubleshooting the file.

Determining the BIOS version

To determine whether available BIOS updates contain later BIOS versions than those currently installed on the computer, you need to know the version of the system BIOS currently installed.


BIOS version information (also known as *ROM date* and *System BIOS*) can be displayed by pressing **fn+esc** (if you are already in Windows) or by using Computer Setup.

1. Start Computer Setup.
2. Use a pointing device or the arrow keys to select **File > System Information**.
3. To exit Computer Setup 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**.

Downloading a BIOS update

 **CAUTION:** To reduce the risk of damage to the computer or an unsuccessful installation, download and install a BIOS update only when the computer is connected to reliable external power using the AC adapter. Do not download or install a BIOS update while the computer is running on battery power, docked in an optional docking device, or connected to an optional power source. During the download and installation, follow these instructions:

Do not disconnect power on the computer by unplugging the power cord from the AC outlet.

Do not shut down the computer or initiate sleep.

Do not insert, remove, connect, or disconnect any device, cable, or cord.

1. From the Start screen, type **help** and then select **Help and Support**.
2. In the **Help and Support** search box, type **maintain**, and then follow the on-screen instructions to identify your computer and access the BIOS update you want to download.
3. At the download area, follow these steps:
 - a. Identify the BIOS update that is later than the BIOS version currently installed on your computer. Make a note of the date, name, or other identifier. You may need this information to locate the update later, after it has been downloaded to your hard drive.
 - b. Follow the on-screen instructions to download your selection to the hard drive.

Make a note of the path to the location on your hard drive where the BIOS update is downloaded. You will need to access this path when you are ready to install the update.



NOTE: If you connect your computer to a network, consult the network administrator before installing any software updates, especially system BIOS updates.

BIOS installation procedures vary. Follow any instructions that are displayed on the screen after the download is complete. If no instructions are displayed, follow these steps:

1. From the Start screen, type `windows`, and then click **Windows Explorer**.
2. Double-click your hard drive designation. The hard drive designation is typically Local Disk (C:).
3. Using the hard drive path you recorded earlier, open the folder on your hard drive that contains the update.
4. Double-click the file that has an `.exe` extension (for example, *filename.exe*).

The BIOS installation begins.

5. Complete the installation by following the on-screen instructions.



NOTE: After a message on the screen reports a successful installation, you can delete the downloaded file from your hard drive.

Using Advanced System Diagnostics

Advanced System Diagnostics allows you to run diagnostic tests to determine if the computer hardware is functioning properly. The following diagnostic tests are available in Advanced System Diagnostics:

- **System Tune-Up**—This group of additional tests checks your computer to make sure that the main components are functioning correctly. System Tune-Up runs longer and more comprehensive tests on memory modules, hard drive SMART attributes, the hard drive surface, the battery (and battery calibration), video memory, and the WLAN module status.
- **Start-up test**—This test analyzes the main computer components that are required to start the computer.
- **Run-in test**—This test repeats the start-up test and checks for intermittent problems that the start-up test does not detect.
- **Hard disk test**—This test analyzes the physical condition of the hard drive, and then checks all data in every sector of the hard drive. If the test detects a damaged sector, it attempts to move the data to a good sector.
- **Memory test**—This test analyzes the physical condition of the memory modules. If it reports an error, replace the memory modules immediately.
- **Battery test**—This test analyzes the condition of the battery and calibrates the battery if necessary. If the battery fails the test, contact HP support to report the issue and purchase a replacement battery.
- **BIOS Management**—You can update or rollback the version of the BIOS on the system. Do not shut down or remove external power during the process. You will be given a confirmation screen before your BIOS is modified. Select **BIOS update**, **BIOS Rollback**, or **Back to main menu**.

You can view system information and error logs or select languages in the Advanced System Diagnostics window.

To start Advanced System Diagnostics:

1. Turn on or restart the computer. While the “Press the ESC key for Startup Menu” message is displayed in the lower-left corner of the screen, press **esc**. When the Startup Menu is displayed, press **f2**.
2. Click the diagnostic test you want to run, and then follow the on-screen instructions.



NOTE: If you need to stop a diagnostics test while it is running, press **esc**.

SUSE Linux – Computer Setup (BIOS) and Advanced System Diagnostics

Computer Setup, or Basic Input/Output System (BIOS), controls communication between all the input and output devices on the system (such as disk drives, display, keyboard, mouse, and printer). Computer Setup includes settings for the types of peripherals installed, the startup sequence of the computer, and the amount of system and extended memory.



NOTE: Use extreme care when making changes in Computer Setup. Errors can prevent the computer from operating properly.

Starting Computer Setup



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 Computer Setup.

Using Computer Setup

Navigating and selecting in Computer Setup

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 Computer Setup.

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 Computer 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.

Updating the BIOS

Updated versions of the BIOS may be available on the HP Web site.

Most BIOS updates on the HP Web site are packaged in compressed files called *SoftPaqs*.

Some download packages contain a file named *Readme.txt*, which contains information regarding installing and troubleshooting the file.

Determining the BIOS version

To determine whether available BIOS updates contain later BIOS versions than those currently installed on the computer, you need to know the version of the system BIOS currently installed.

BIOS version information (also known as *ROM date* and *System BIOS*) can be displayed by starting Computer Setup.

1. Start Computer Setup.
2. Use a pointing device or the arrow keys to select **File > System Information**.
3. To exit Computer Setup 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**.



NOTE: You can also determine the BIOS version by turning on or restarting the computer, pressing the **esc** key while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen, and then pressing the **f1** key. Follow the on-screen instructions to exit this screen.

Downloading a BIOS update



CAUTION: To reduce the risk of damage to the computer or an unsuccessful installation, download and install a BIOS update only when the computer is connected to reliable external power using the AC adapter. Do not download or install a BIOS update while the computer is running on battery power, docked in an optional docking device, or connected to an optional power source. During the download and installation, follow these instructions:

Do not disconnect power from the computer by unplugging the power cord from the AC outlet.

Do not shut down the computer or initiate Suspend or Hibernation.

Do not insert, remove, connect, or disconnect any device, cable, or cord.

1. Open your Web browser, go to <http://www.hp.com/support>, and select your country or region. Access the page on the HP Web site that provides software for your computer. Follow the on-screen instructions to identify your computer and access the BIOS update you want to download.
2. Click the option for software and driver downloads, type your computer model number in the product box, and then press **enter**. Follow the on-screen instructions to identify your computer and access the BIOS update you want to download.
3. Click your specific product from the models listed.
4. Click the appropriate operating system.
5. Go to the BIOS section and download the BIOS software package.
6. Follow the installation instructions as provided with the downloaded BIOS software package.



NOTE: After a message on the screen reports a successful installation, you can delete the downloaded file from your hard drive.

Using Advanced System Diagnostics

Advanced System Diagnostics allows you to run diagnostic tests to determine if the computer hardware is functioning properly. The following diagnostic tests are available in Advanced System Diagnostics:

- **Start-up test**—This test analyzes the main computer components that are required to start the computer.
- **Run-in test**—This test repeats the start-up test and checks for intermittent problems that the start-up test does not detect.
- **Hard disk test**—This test analyzes the physical condition of the hard drive, and then checks all data in every sector of the hard drive. If the test detects a damaged sector, it attempts to move the data to a good sector.
- **Memory test**—This test analyzes the physical condition of the memory modules. If it reports an error, replace the memory modules immediately.
- **Battery test**—This test analyzes the condition of the battery and calibrates the battery if necessary. If the battery fails the test, contact HP Customer Support to report the issue and purchase a replacement battery.
- **System Tune-Up**—This group of additional tests checks your computer to make sure that the main components are functioning correctly. System Tune-Up runs longer and more comprehensive tests on memory modules, hard drive SMART attributes, the hard drive surface, the battery (and battery calibration), video memory, and the WLAN module status.

You can view system information and error logs in the Advanced System Diagnostics window.

To start Advanced System Diagnostics:

1. Turn on or restart the computer. While the “Press the ESC key for Startup Menu” message is displayed in the lower-left corner of the screen, press **esc**. When the Startup Menu is displayed, press **f2**.
2. Click the diagnostic test you want to run, and then follow the on-screen instructions.



NOTE: If you need to stop a diagnostics test while it is running, press **esc**.

6 Specifications

Computer specifications

	Metric	U.S.
Dimensions		
Length	28.0 cm	11.0 in
Width	41.4 cm	16.3 in
Height (front to rear)	2.9 to 3.6 cm	1.1 to 1.4 in
Weight (equipped with optical drive, 1 DIMM, hard drive, optical drive, WLAN module, 6 cell battery)	3.1 kg	6.7 lbs
Input power		
Operating voltage	19.0 V dc @ 4.74 A – 90 W or 18.5 V dc @ 3.5 A - 65 W	
Operating current	4.74 A or 3.5 A	
Temperature		
Operating (not writing to optical disc)	0°C to 35°C	32°F to 95°F
Operating (writing to optical disc)	5°C to 35°C	41°F to 95°F
Nonoperating	-20°C to 60°C	-4°F to 140°F
Relative humidity		
Operating	10% to 90%	
Nonoperating	5% to 95%	
Maximum altitude (unpressurized)		
Operating (14.7 to 10.1 psia)	-15 m to 3,048 m	50 ft to 10,000 ft
Nonoperating (14.7 to 4.4 psia)	-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	

	Metric	U.S.
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.		

43.9-cm (17.3-in), HD+ display specifications

	Metric	U.S.
Active diagonal size	43.9-cm	17.3-in
Resolution	1600x900 (HD+)	
Active area	382.08x214.92	
PPI	106	
Surface treatment	Anti-glare or BrightView	
Contrast ratio	300:1 (typical) – Anti-glare	
	500:1 – BrightView	
Response time	16 ms	
Brightness	200 nits (typical)	
Viewing angle	SVA	
Backlight	LED	
Luminance uniformity @ 13 points	1.4 (typ), 1.6 (max)	
Lifetime (1/2 luminance)	12,000 hours	
Color coordinate (white)	(0.313, 0.329)	
Color tolerance (White)	+/- 0.02	
Color tolerance (W, R, G, B)	+/- 0.03	
Color gamut	60% NTSC @ CIE 1931	

Hard drive specifications

	750-GB*	640-GB*	500-GB*	320-GB*
Dimensions				
Height	9.5 mm	9.5 mm	9.5 mm	9.5 mm
Width	70 mm	70 mm	70 mm	70 mm
Weight	115 g	101 g	101 g	101 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	1.5 ms	2 ms	3 ms	3 ms
Average	11 ms	12 ms	13 ms	13 ms
Maximum	14 ms	22 ms	24 ms	24 ms
Logical blocks	1,465,149,168	1,250,263,728	1,048,576,000	625,141,400
Disc rotational speed	7200 rpm or 5400 rpm			
Operating temperature	5°C to 55°C (41°F to 131°F)			
*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less. Actual drive specifications may differ slightly.				
NOTE: Certain restrictions and exclusions apply. Contact technical support for details.				

DVD±RW and CD-RW SuperMulti DL Combo Drive specifications

Applicable disc	Read:	Write:
	CD-DA, CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW, DVD-RAM	CD-R and CD-RW DVD+R, DVD+RW, DVD-R, DVD-RW, DVD-RAM
Center hole diameter	1.5 cm (0.59 in)	
Disc diameter		
Standard disc	12 cm (4.72 in)	
Mini disc	8 cm (3.15 in)	
Disc thickness	1.2 mm (0.047 in)	
Track pitch	0.74 µm	
Access time	CD	DVD
Random	< 175 ms	< 230 ms
Full stroke	< 285 ms	< 335 ms
Audio output level	Line-out, 0.7 Vrms	
Cache buffer	2 MB	
Data transfer rate		
24X CD-ROM	3,600 KB/sec	
8X DVD-ROM	10,800 KB/sec	
24X CD-R	3,600 KB/sec	
16X CD-RW	2,400 KB/sec	
8X DVD+R	10,800 KB/sec	
4X DVD+RW	5,400 KB/sec	
8X DVD-R	10,800 KB/sec	
4X DVD-RW	5,400 KB/sec	
2.4X DVD+R(9)	2,700 KB/sec	
5X DVD-RAM	6,750 KB/sec	
Transfer mode	Multiword DMA Mode	
Startup time	< 15 seconds	
Stop time	< 6 seconds	

Blu-ray Disc ROM with SuperMulti DVD±R/RW DL Drive

Applicable disc	Read:	Write:	
	CD-DA, CD+(E)G, CD-MIDI, CDTEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVDROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW, DVD-RAM, HD-ROM (Single Layer), HD-ROM (Dual Layer), HD DVD-R, HD DVD-R for Dual Layer, HD DVD-RW	CD-R and CD-RW DVD+R, DVD+R(9), DVD+RW, DVD-R, DVD-R(9),DVD-RW, DVD-RAM	
Access time	CD	DVD	HD
Random	170 ms	170 ms	230 ms
Cache buffer	8 MB		
Data transfer rate			
24X CD-ROM	3,600 KB/sec		
8X DVD	10,800 KB/sec		
24X CD-R	3,600 KB/sec		
16X CD-RW	2,400 KB/sec		
8X DVD+R	10,800 KB/sec		
4X DVD+RW	5,400 KB/sec		
8X DVD-R	10,800 KB/sec		
4X DVD-RW	5,400 KB/sec		
2.4X DVD+R(9)	2,700 KB/sec		
5X DVD-RAM	6,750 KB/sec		
1X BD-ROM	4,500 KB/sec		
1X BD-R read	4,500 KB/sec		
1X BD-RE read	4,500 KB/sec		
Transfer mode	Multiword DMA Mode		

Specification information in Device Manager

Device Manager allows you to view and control the hardware attached to the computer, as well as provides hardware specification information.

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



NOTE: Windows 7 and Windows Vista include 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.

After you open Device Manager, drill-down to a device and double-click it to access its properties.

To access Device Manager in Windows 8:

1. From the Start screen, type `control`, and then select **Control Panel**.
2. Select **System and Security**, and then in the System area, click **Device Manager**.

A list display all the devices installed in your computer.

To access Device Manager in Windows 7:

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

To access Device Manager in Windows Vista:

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

To access Device Manager in Windows XP:

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

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) with the installed optical drive (select models only) or an optional external optical drive, 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) by using the installed optical drive (select models only) or an optional external optical drive
- Backing up your information
- 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.

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



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. See Help and Support for more information.

Creating recovery media with HP Recovery Disc Creator

HP Recovery Disc Creator is a software program that offers an alternative way to create recovery media. After you successfully set up the computer, you can create recovery media using HP Recovery Disc Creator. This recovery media allows you to reinstall your original operating system as well as select drivers and applications if the hard drive becomes corrupted.

HP Recovery Disc Creator can create two kinds of recovery DVDs as follows:

- Windows DVD—Installs the operating system without additional drivers or applications.
- Driver DVD—Installs specific drivers and applications only, in the same way that the HP Software Setup utility installs drivers and applications.

Creating recovery media



NOTE: The Windows DVD can be created only once. Thereafter, the option to create that media will not be available.

1. Select **Start > All Programs > Productivity and Tools > HP Recovery Disc Creator**.
2. Select **Driver Disk** or **Windows Disk**.
3. From the drop-down menu, select the drive for burning the recovery media.
4. Click the **Create** button to start the burning process.

Backing up your information

Recovery after a system failure is as good as your most recent backup. Immediately after setting up the computer, you should create system repair discs (select models only) using the installed optical drive (select models only) or an optional external optical drive and back up your system. 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.
- When backing up to discs, use any of the following types of discs (purchased separately): CD-R, CD-RW, DVD+R, DVD+R DL, DVD-R, DVD-R DL, or DVD±RW. The discs you use will depend on the type of optical drive you are using.



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 drive.

To create a backup using Backup and Restore:



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).

Performing a system 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, see the Using a Windows 7 operating system DVD (purchased separately) section.

Using the Windows recovery tools

To recover information you previously backed up:

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.

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



CAUTION: Some Startup Repair options completely erase hard drive contents and reformat 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.


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

3. If the Windows partition is 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 recovery tools

 **CAUTION:** Using **f11** recovery tools 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.

To recover the original hard drive image using **f11**:

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




NOTE: If the HP Recovery partition has been deleted, the **f11** restore option will not function. You must recover your operating system and programs using the Windows 7 operating system DVD and the Driver Recovery disc (both purchased separately) if the Windows partition and the HP Recovery partition are not listed. For additional information, see the Using a Windows 7 operating system DVD (purchased separately) section.


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)

To order a Windows 7 operating system DVD, go to the HP website. For U.S. support, go to <http://www.hp.com/go/contactHP>. For worldwide support, go to http://welcome.hp.com/country/us/en/wwcontact_us.html. You can also order the DVD by calling support. For contact information, see 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:

 **NOTE:** This process takes several minutes.

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


After the repair is completed:

1. Eject the Windows 7 operating system DVD, and then insert the Driver Recovery disc.
2. Install the Hardware Enabling Drivers first, and then install Recommended Applications.


Windows 8 – Backup and recovery

To protect your information, use Windows backup and restore utilities to back up individual files and folders, back up your entire hard drive, create system repair media (select models only) by using the installed optical drive (select models only) or an optional external optical drive, or create system restore points. In case of system failure, you can use the backup files to restore the contents of your computer.

From the Start screen, type `restore`, click **Settings**, and then select from the list of displayed options.

 **NOTE:** For detailed instructions on various backup and restore options, perform a search for these topics in Help and Support. From the Start screen, type `h`, and then select **Help and Support**.

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

 **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. From the Start screen, type `h`, and then select **Help and Support**.

Backing up your information

Recovery after a system failure is as good as your most recent backup. You should create system repair media and your initial backup immediately after initial system 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 media (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.


On Start screen, type `backup`, click **Settings**, and then select **Save backup copies of your files with File History**.


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

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 backup using Backup and Restore:

 **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. From the Start screen, type `backup`, click **Settings**, and then select from the list of displayed options.
2. Follow the on-screen instructions to set up your backup, create a system image (select models only), or create system repair media (select models only).

Performing a system 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 media you previously created (select models only), you must purchase Windows 8 operating system media to reboot the computer and repair the operating system.

Using the Windows recovery tools

To recover information you previously backed up:

- ▲ From the Start screen, type **h**, and then select **Help and Support**.

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



CAUTION: Some Automatic Repair options will completely erase and reformat 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 HP Recovery partition and the Windows partition.

From the Start screen, type **e**, and then click **File Explorer**.

– or –

From the Start screen, type **c**, and then select **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 8 operating system DVD and the *Driver Recovery* media (both purchased separately). For additional information, see [Using Windows 8 operating system media \(purchased separately\) on page 121](#).

3. If the Windows partition and the HP Recovery partition are listed, restart the computer. After Windows has loaded, press and hold the **shift** key while clicking **Restart**.
4. Select **Troubleshoot**, select **Advanced Options**, and then select **Automatic 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. From the Start screen, type **h**, and then select **Help and Support**.

Using f11 recovery tools

 **CAUTION:** Using **f11** completely erases hard drive contents and reformats the hard drive. All files that you have created and any software that you have 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.

To recover the original hard drive image using **f11**:


1. If possible, back up all personal files.
2. If possible, check for the presence of the HP Recovery partition: From the Start screen, type **C**, and then select **Computer**.

 **NOTE:** If the HP Recovery partition is not listed, you must recover your operating system and programs using the Windows 8 operating system media and the *Driver Recovery* media (both purchased separately). For additional information, see [Using Windows 8 operating system media \(purchased separately\) on page 121](#).


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 Windows 8 operating system media (purchased separately)

To order a Windows 8 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 support. For contact information, see the *Worldwide Telephone Numbers* booklet included with the computer.

 **CAUTION:** Using a Windows 8 operating system media completely erases hard drive contents and reformats the hard drive. All files that you have created and any software that you have 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 8 operating system DVD:

 **NOTE:** This process takes several minutes.


1. If possible, back up all personal files.
2. Restart the computer, and then insert the Windows 8 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.


After the repair is completed:


1. Eject the Windows 8 operating system media and then insert the *Driver Recovery* media.
2. Install the Hardware Enabling Drivers first, and then install Recommended Applications.

Using Windows Refresh for quick and easy recovery

When your computer is not working properly and you need to regain system stability, the Windows Refresh option allows you to start fresh and keep what is important to you.

 **IMPORTANT:** Refresh removes any traditional applications that were not originally installed on the system at the factory.

 **NOTE:** During Refresh, a list of removed traditional applications will be saved so that you have a quick way to see what you might need to reinstall. See Help and Support for instructions on reinstalling traditional applications. From the Start screen, type **h**, and then select **Help and Support**.


 **NOTE:** You may be prompted for your permission or password when using Refresh. See Windows Help and Support for more information. From the Start screen, type **h**, and then select **Help and Support**.

To start Refresh:

1. On the Start screen, point to the far-right upper or lower corner of the screen to display the charms.
2. Click **Settings**.
3. Click **Change PC settings** in the bottom-right corner of the screen, and then select **General** from the PC settings screen.
4. Under **Refresh your PC without affecting your files**, select **Get started**, and follow the on-screen instructions.

Remove everything and reinstall Windows

Sometimes you want to perform detailed reformatting of your computer, or you want to remove personal information before you give away or recycle your computer. The process described in this section provides a speedy, simple way to return the computer to its original state. This option removes all personal data, apps, and settings from your computer, and reinstalls Windows.

 **IMPORTANT:** This option does not provide backups of your information. Before using this option, back up any personal information you wish to retain.

You can initiate this option by using the **f11** key or from the Start screen.

To use the **f11** key:

1. Press **f11** while the computer boots.
— or —
Press and hold **f11** as you press the power button.
2. Select **Troubleshoot** from the boot options menu.
3. Select **Reset your PC**, and follow the on-screen instructions.

To use the Start screen:

1. On the Start screen, point to the far-right upper or lower corner of the screen to display the charms.
2. Click **Settings**.

3. Click **Change PC settings** in the bottom-right corner of the screen, and then select **General** from the PC settings screen.
4. Under **Remove everything and reinstall Windows**, select **Get started**, and follow the on-screen instructions.

Using HP Software Setup

HP Software Setup can be used to reinstall drivers or select software that has been corrupted or deleted from the system.

1. From the Start screen, type `HP Software Setup`, and select **Apps**.
2. Open HP Software Setup.
3. Follow the on-screen directions to reinstall drivers or select software.

SUSE Linux – Backup and recovery

Recovery after a system failure is as good as your most recent backup. 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.

Your computer includes tools provided by HP to help you safeguard your information and retrieve it if ever needed.

Creating backups

1. Create restore media immediately after you set up the computer. For more information, see [Performing a system recovery on page 125](#).
2. As you add files, routinely create a backup of your system and personal information.

Backing up your information

You should back up your computer files on a regular schedule to maintain a current backup. You can manually back up your information to an optional external drive, a network drive, or discs. Back up your system at the following times:

- At regularly scheduled times
- Before the computer is repaired or restored
- Before you add or modify hardware or software

To back up your home directory files using **Backup Manager Settings**:

1. Select **Computer > More Applications > Tools > Backup Manager Settings**, and click **Backup my home directory**.
2. Click **Storage Destination Location**, and then select a location to back up your information.
3. Click **Schedule**, and then select a time schedule to perform backups at a regularly scheduled time.

To immediately back up your information, click the **Backup Now** check box.



NOTE: Before you back up your information, be sure you have designated a location to save the backup files.

4. Click **Save and Backup** to start the backup and to save the backup settings.

To restore backup files:

1. Select **Computer > More Applications > Tools > Backup Manager Restore**.
2. Click **Backup Source**, and then select the location of the backup files.
3. Click **Restore Destination**, and then select the destination to restore the files.
4. To restore all files from the selected location, click **Restore all files**. To restore select files only, click **Restore selected files**, click **Select Files** and then select the files to be restored.

5. Under **Restore Point**, click the time and date of the backup.



NOTE: If multiple backups have been performed, click **Use the latest version** to restore the latest version.

6. Click **Restore** to start restoring the files, or click **Cancel** to cancel the operation.

Performing a system recovery

Recovery allows you to repair or restore the computer to its original factory state. You can create an HP Factory Image Restore DVD, using an installed or an external DVD±RW optical drive.



CAUTION: Using Recovery completely erases hard drive contents and reformats the hard drive. All files you have created and any software installed on the computer are permanently removed. The recovery 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 restore the computer using the HP Factory Image Restore DVD, you must first create the recovery disc. To create the recovery disc:



NOTE: HP recommends that you create the HP Factory Image Restore DVD in the event of a system failure.

1. Select **Computer > More Applications**.
2. In the left pane, click **Tools**, and then click **Create HP Factory Image Restore DVD** in the right pane.
3. Follow the on-screen instructions to create an image file to burn a recovery disc.

To restore the computer from the recovery disc, follow these steps:

1. If possible, back up all personal files.
2. Insert the HP Factory Image Restore DVD into the optical drive and restart the computer.
3. As the computer is restarting, press **f9** to open the Computer Setup boot option menu.
4. Press the down arrow to select **Restore SLED HP-BNB preload image** from the **Linux boot** menu, and then press **enter**.
5. Using the arrow keys, select **Yes** when prompted: **Do you want to start the System-Restore?**
6. Follow the on-screen instructions.

USB Recovery option (select models only)

The USB Recovery Disk On Key (flash drive) option allows you to create a backup image of the SLED operating system installed on select HP Business Notebooks. This Disk On Key may be used to restore the system to the original factory state when the F11 recovery option is not available. This process should be done on first obtaining the computer.



CAUTION: The USB recovery option does not preserve data present on the computer's hard drive or on the Disk On Key used for the recovery process. Back up any data on the Disk on Key or the notebook that will be recovered before starting.



NOTE: HP recommends that you create the USB Recovery Disk in the event of a system failure. The Disk On Key used for this process should be 4 GB or larger.

Creating a USB Recovery Disk On Key

1. Connect the USB Disk On Key to a USB port on the computer.
2. Select **Computer > More applications > Tools > Create Recovery USB**.
3. Enter the root password when prompted.
4. Select **USB Disk On Key** from the list.
5. Click **OK**.
6. A question dialog will remind you that the data on the USB key will be destroyed. To continue, click **OK**. Otherwise, click **Cancel** and back up the contents of the Disk On Key on another computer.
7. The backup process will display a status dialog box while the backup is in progress.



NOTE: A file browser window with the Disk On Key Contents displayed will pop up when the key is mounted. You may close the file browser window if desired. Once the USB Recovery Key has been created, the status dialog will close. The USB Recovery Key is ready for use.

Recovering from a USB Recovery Disk On Key



CAUTION: Before starting the Recovery process, make sure any data on the system to be recovered has been backed up. The recovery process destroys all data on the system to be recovered.

1. Turn off the computer.
2. Connect the USB Disk On Key to a USB port on the computer.
3. Turn on the computer while holding down the **f9** key.
4. Once the system has booted, the **Boot Options** menu should appear.
5. Using the arrow keys, select **USB Disk On Key** and press **enter**.



NOTE: The description may vary from one USB key to another. Any entry other than Optical Disk Drive, Notebook Hard Drive or Notebook Ethernet should be the USB Recovery Disk On Key.

6. Once the USB Recovery Disk On Key has been selected, press **enter**. The USB Recovery Disk On Key will boot.
7. Once the USB Recovery Disk On Key has booted, a dialog box will prompt, "Do you want to start the System-Restore?" If data on the computer has not been backed up, use the tab key and select **No**. The system will reboot. Back up the system data and repeat the previous steps. If no data should be saved from the computer, use the **tab** key to select **Yes**. Press **enter** to begin the recovery process.
8. After the files are copied to the system, follow the on-screen instructions.

Remove everything and reinstall SLED

Sometimes you want to perform detailed reformatting of your computer, or you want to remove personal information before you give away or recycle your computer. The process described in this section provides a speedy, simple way to return the computer to its original state. This option removes all personal data, applications, and settings from your computer, and reinstalls the Linux operating system.



IMPORTANT: This option does not provide backups of your information. Before using this option, back up any personal information you wish to retain.

You can initiate this option by using the **f11** key.

To use the **f11** key:

Press **f11** while the computer boots.

– or –

Press and hold **f11** as you press the power button.

The following options are available:

- **Cancel/Reboot**—Reboots the system. No recovery or restore activity is performed.
- **Recover/Repair System**—This option repairs a system that is not working properly and preserves user data.
- **Restore Factory System**—This option restores the system back to the original factory state. User data is not preserved.

Select an option and 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 following requirements are applicable to all countries and regions:

- The length of the power cord set must be at least **1.5 m** (5.0 ft) and no more than **2.0 m** (6.5 ft).
- All power cord sets must be approved by an acceptable accredited agency responsible for evaluation in the country or region where the power cord set will be used.
- The power cord sets must have a minimum current capacity of 10 A 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
Argentina	IRAM	1
Australia	SAA	1
Austria	OVE	1
Belgium	CEBEC	1
Brazil	ABNT	1
Canada	CSA	2
Chile	IMQ	1
Denmark	DEMKO	1
Finland	FIMKO	1
France	UTE	1
Germany	VDE	1
India	ISI	1
Israel	SII	1
Italy	IMQ	1
Japan	JIS	3
The Netherlands	KEMA	1
New Zealand	SANZ	1
Norway	NEMKO	1
The People's Republic of China	CCC	4
Saudi Arabia	SASO	7
Singapore	PSB	1
South Africa	SABS	1
South Korea	KTL	5
Sweden	SEMKO	1
Switzerland	SEV	1
Taiwan	BSMI	6
Thailand	TISI	1
The United Kingdom	ASTA	1

Country/region	Accredited agency	Applicable note number
The United States	UL	2
<ol style="list-style-type: none"> 1. The flexible cord must be Type HO5VV-F, 3-conductor, 0.75mm² 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 SVT/SJT 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 ac) or NEMA 6-15P (15 A, 250 V ac) configuration. CSA or C-UL mark. UL file number must be on each element. 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 VCTF, 3-conductor, 0.75mm² or 1.25mm² conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V ac) configuration. 4. The flexible cord must be Type RVV, 3-conductor, 0.75mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the CCC certification mark. 5. The flexible cord must be Type H05VV-F 3X0.75mm² conductor size. KTL logo and individual approval number must be on each element. Corset approval number and logo must be printed on a flag label. 6. The flexible cord must be Type HVCTF 3X1.25mm² conductor size. Power cord set fittings (appliance coupler, cable, and wall plug) must bear the BSMI certification mark. 7. For 127 V ac, the flexible cord must be Type SVT or SJT 3 x 18 AWG, with plug NEMA 5-15P (15 A, 125 V ac), with UL and CSA or C-UL marks. For 240 V ac, the flexible cord must be Type H05VV-F 3X0.75/1.00mm² conductor size, with plug BS 1363/A with BSI or ASTA marks. 		


9 Recycling


Battery


When a non-rechargeable or rechargeable 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 battery disposal.

HP encourages customers to recycle used electronic hardware, HP original print cartridges, and rechargeable batteries. For more information about recycling programs, see the HP Web site at <http://www.hp.com/recycle>.

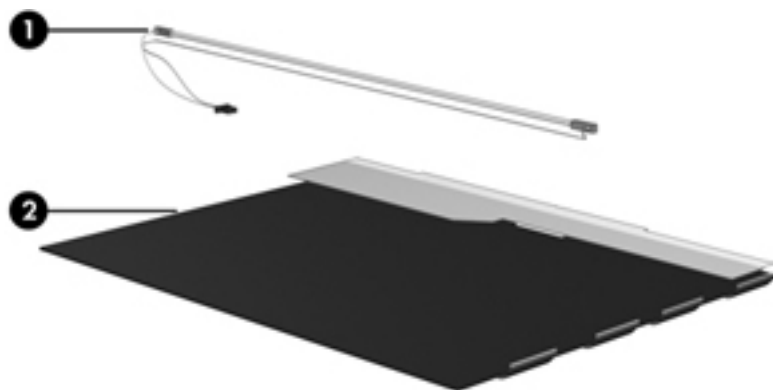
Display


 **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 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>.

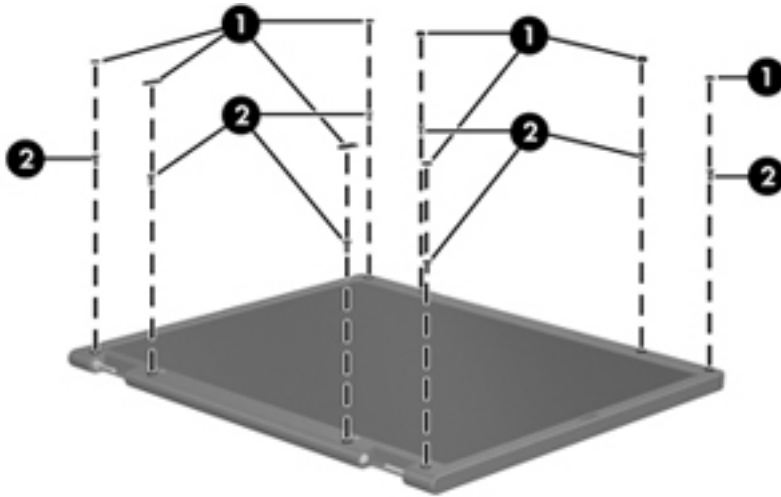
This section provides disassembly instructions for the display assembly. The display assembly must be disassembled to gain access to the backlight **(1)** and the liquid crystal display (LCD) panel **(2)**.



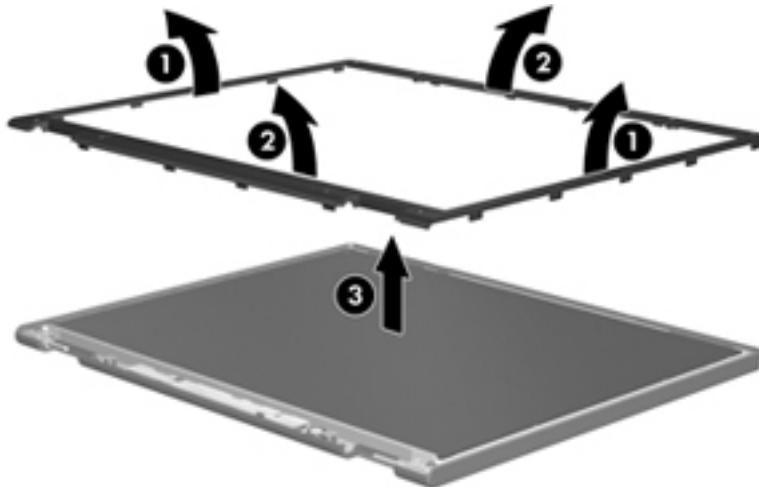
 **NOTE:** The procedures provided in this chapter are general disassembly instructions. Specific details, such as screw sizes, quantities, and locations, and component shapes and sizes, can vary from one computer model to another.

Perform the following steps to disassemble the display assembly:

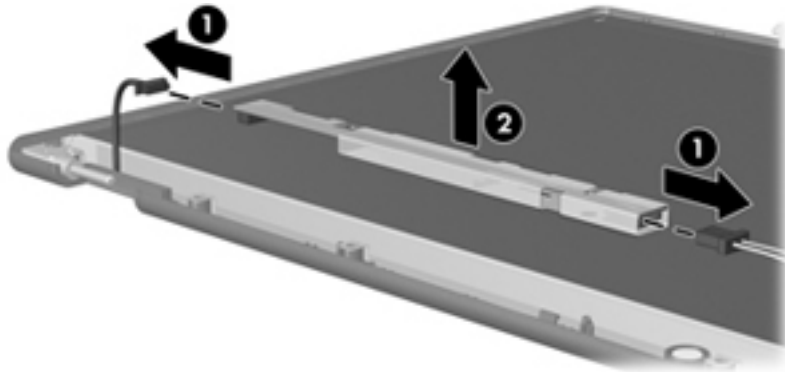
1. Remove all screw covers (1) and screws (2) that secure the display bezel to the display assembly.



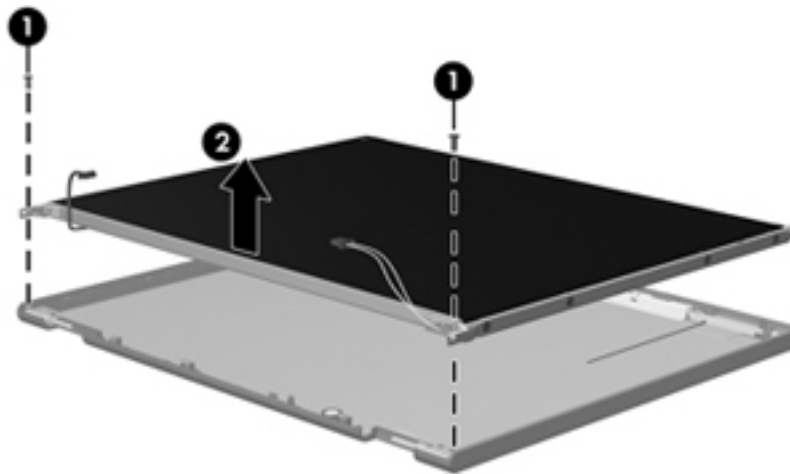
2. Lift up and out on the left and right inside edges (1) and the top and bottom inside edges (2) of the display bezel until the bezel disengages from the display assembly.
3. Remove the display bezel (3).



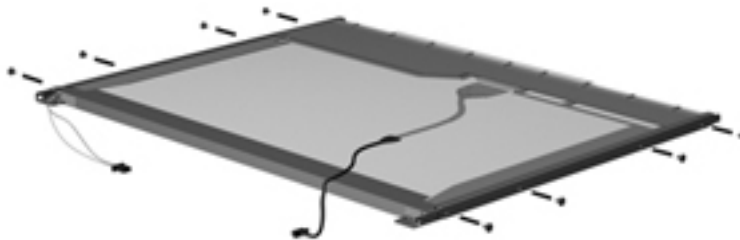
4. Disconnect all display panel cables (1) from the display inverter and remove the inverter (2).



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.

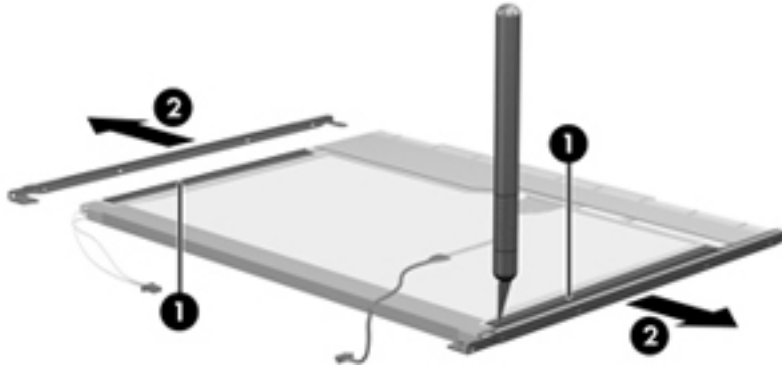


7. Position the display panel assembly upside-down.
8. Remove all screws that secure the display panel frame to the display panel.



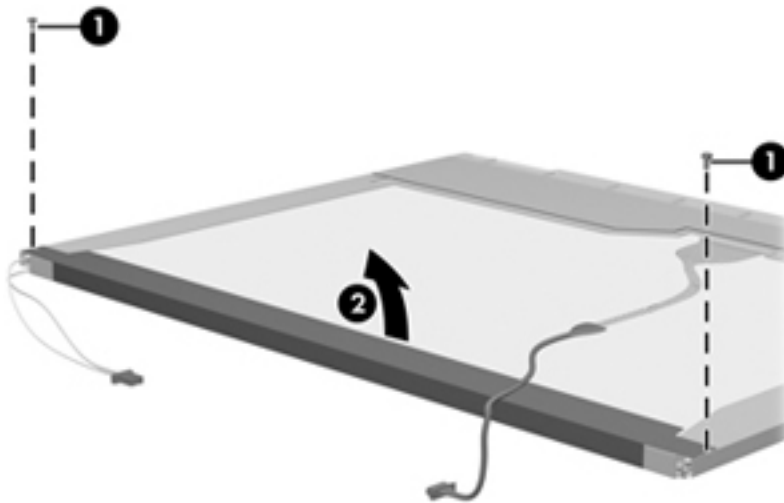
9. Use a sharp-edged tool to cut the tape (1) that secures the sides of the display panel to the display panel frame.

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.

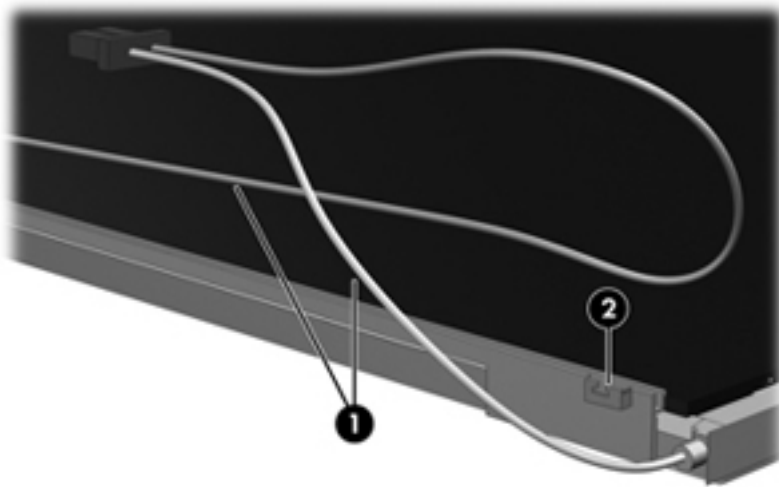
12. Lift the top edge of the backlight cover (2) and swing it outward.



13. Remove the backlight cover.

14. Position the display panel right-side up.

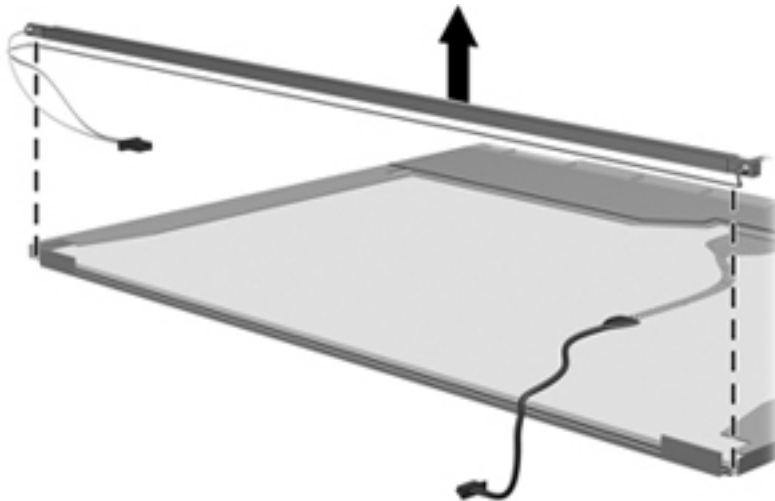
15. Remove the backlight cables (1) from the clip (2) in the display panel.



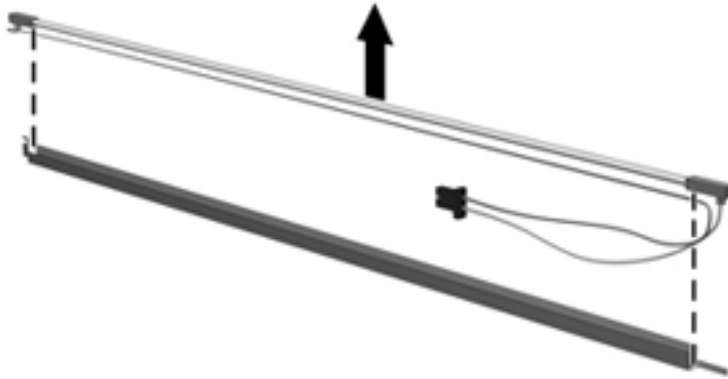
16. Position the display panel upside-down.

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

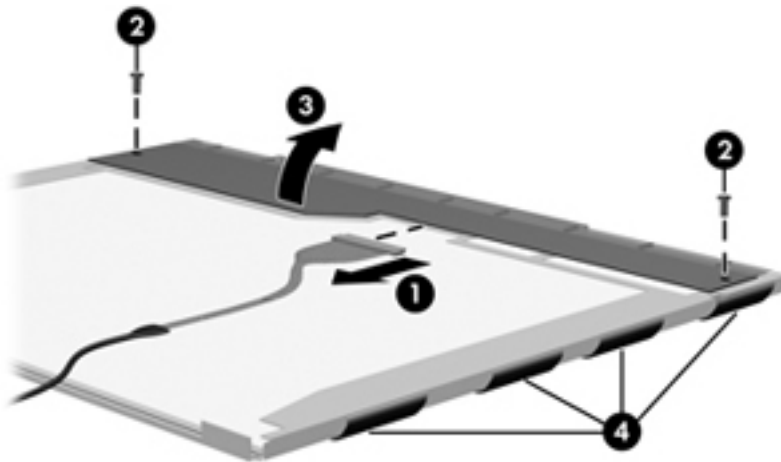
17. Remove the backlight frame from the display panel.



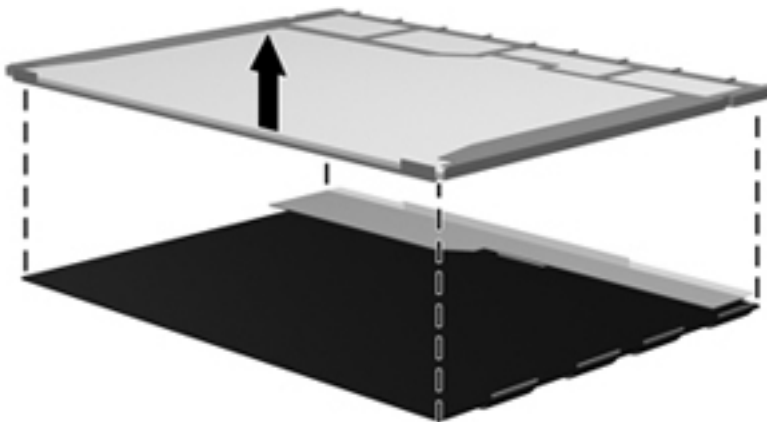
18. Remove the backlight from the backlight frame.



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 light 17
AC adapter, spare part numbers 29, 30
access cover release latches 19
advanced system diagnostics 98, 103
antennas
 disconnecting 50
audio board
 removal 67
 spare part number 23, 31, 67
audio cable
 illustrated 27
audio, product description 2
audio-in (microphone) jack 16
audio-out (headphone) jack 16

B

backup and recovery
 SUSE Linux 124
 Windows 7 114
 Windows 8 119
Backup and Restore 119
base enclosure, spare part number 23
battery
 removal 40
 spare part number 23, 40
battery bay 19
battery cable
 removal 69
 spare part number 69
battery connector cable,
 illustrated 27
battery release latches 19
BIOS
 determining version 96, 102, 106

 downloading an update 97, 102, 106
 updating 95, 102, 105
Blu-ray Disc ROM with SuperMulti DVD±R/RW DL Drive
 specifications 112
Blu-ray ROM DVD±RW SuperMulti DL Drive, spare part number 25, 28, 32, 43
Bluetooth card
 spare part number 50
bottom door
 removal 41
 spare part number 25, 41
buttons
 left TouchPad 10
 optical drive eject 18
 power 13
 right TouchPad 10
 TouchPad on/off 10
 Web browser 13
 wireless 13

C

Cable Kit
 contents 27
 spare part number 27
cables, service considerations 36
caps lock light, identifying 11
chipset, product description 1
components
 bottom 19
 display 7, 9
 front 16
 left side 17
 right side 18
 top 10
computer reset 122, 127

Computer Setup
 navigating and selecting 93, 100, 104
 restoring factory settings 94, 101, 105
 SUSE Linux 104
 Windows 7 93
 Windows 8 100
computer setup
 navigating and selecting 104
 restoring factory settings 105
computer specifications 108
connectors, service
 considerations 36

D

diskette drive
 precautions 36
display assembly
 removal 85
 spare part numbers 85
display bezel
 removal 88
 spare part numbers 26
display component recycling 131
display components, spare part numbers 26
display hinge
 removal 91
Display Hinge Kit
 spare part numbers 26
display panel
 product description 2
display specifications 109
drive light 16
drives
 optical 18
 preventing damage 36

- DVD-ROM Drive
 - precautions 36
- DVD±RW and CD-RW SuperMulti DL Combo Drive
 - precautions 36
- DVD±RW Double-Layer Drive
 - spare part number 24, 28, 32, 43

E

- electrostatic discharge 37
- esc key, identifying 14
- Ethernet, product description 2
- external media cards, product description 3
- external monitor port 17

F

- f11 recovery 121
- fan
 - removal 64
 - spare part number 24, 33, 64
- fingerprint reader assembly
 - spare part number 23, 32
- fingerprint reader board
 - removal 59
 - spare part number 59
- fingerprint reader, identifying 13
- fn key, identifying 14, 15
- function board/power button board assembly
 - removal 61
 - spare part number 23, 61
- function keys
 - identifying 14, 15

G

- graphics, product description 1
- grounding equipment and methods 39

H

- hard drive
 - precautions 36
 - product description 2
 - removal 45
 - spare part numbers 25, 28, 30, 31, 45
 - specifications 110
- hard drive connector
 - spare part number 33

- hard drive extension board
 - removal 77
 - spare part number 23, 77
- Hard Drive Hardware Kit, spare part number 28, 45
- hard drive recovery 121
- HDMI port, identifying 17
- heat sink
 - removal 79
 - spare part number 24, 79
- hinge
 - removal 91

I

- integrated numeric keypad, identifying 14, 15
- integrated webcam light, identifying 7, 9
- internal display switch 8, 9
- internal microphones, identifying 7, 9

J

- jacks
 - audio-in (microphone) 16
 - audio-out (headphone) 16
 - network 17
 - RJ-45 (network) 17

K

- keyboard
 - product description 3
 - removal 52
 - spare part numbers 23, 32, 33, 52
- keypad
 - integrated numeric 14
- keypad, integrated numeric 15
- keys
 - esc 14
 - fn 14, 15
 - function 14, 15
 - num lk 14, 15
 - operating system applications 15
 - operating system logo key 15
 - Windows applications 14
 - Windows logo 14

L

- latch assembly
 - removal 83
 - spare part number 23, 33, 83
- legacy support, USB 93, 100, 104
- lights
 - AC adapter 17
 - caps lock 11
 - drive 16
 - optical drive 18
 - power 11
 - TouchPad 11
 - Web browser 11
 - webcam 7, 9
 - wireless 11

M

- mass storage devices, spare part numbers 28
- Media Card Reader 16
- memory module
 - product description 2
 - removal 48
 - spare part numbers 24, 48
- microphone (audio-in) jack
 - product description 2
- model name 1

N

- network jack, identifying 17
- num lk key, identifying 14, 15

O

- operating system applications key, identifying 15
- operating system logo key, identifying 15
- operating system, product description 3
- optical drive
 - precautions 36
 - product description 2
 - removal 43
 - spare part numbers 24, 28, 43
 - specifications 111, 112
- optical drive connector
 - spare part number 33
- optical drive eject button 18

- optical drive extension board
 - removal 75
 - spare part number 23, 75
- optical drive light 18
- optical drive protective insert
 - illustrated 26
- optical drive, identifying 18

P

- packing guidelines 38
- PCID label 21
- plastic parts 35
- pointing device, product
 - description 3
- ports
 - external monitor 17
 - HDMI 17
 - product description 3
 - USB 17, 18
- power button, identifying 13
- power cable
 - removal 68
 - spare part number 68
- power connector cable,
 - illustrated 27
- power connector, identifying 17
- power cord
 - set requirements 128
 - spare part numbers 29, 30
- power light 11
- power requirements, product
 - description 3
- processor
 - product description 1
 - removal 80
 - spare part numbers 24, 80
- product description
 - audio 2
 - chipset 1
 - display panel 2
 - Ethernet 2
 - external media cards 3
 - graphics 1
 - hard drives 2
 - keyboard 3
 - memory module 2
 - microphone 2
 - operating system 3
 - optical drives 2
 - pointing devices 3

- ports 3
- power requirements 3
- processors 1
- product name 1
- security 3
- serviceability 5
- webcam 2
- wireless 2
- product name 1

R

- recovery 122
- recovery partition 121
- recycle
 - computer 122, 127
- refresh 122
- release latches
 - access cover 19
 - battery 19
- removal/replacement
 - preliminaries 35
 - procedures 40
- remove everything and reinstall
 - Windows 122, 127
- reset
 - computer 122, 127
 - steps 122, 127
- restoring the hard drive 121
- RJ-45 (network) jack, identifying 17
- RTC battery
 - removal 73
 - spare part number 23, 31, 73

S

- Screw Kit, spare part number 29
- Secure Digital card insert,
 - illustrated 26
- security cable slot 17
- security screw
 - removal 42
- security, product description 3
- service considerations 35
- service door, identifying 19
- service tag 20
- serviceability, product
 - description 5

- setup utility
 - navigating and selecting 93, 100
 - restoring factory settings 94, 101
- SUSE Linux 104
- Windows 7 93
- Windows 8 100

slots

- security cable 17
- speaker assembly
 - removal 65
 - spare part number 23, 65
- speakers, identifying 13
- specifications
 - Blu-ray Disc ROM with SuperMulti DVD±R/RW DL Drive 112
 - computer 108
 - display 109
 - DVD±RW and CD-RW SuperMulti DL Combo Drive 111
 - hard drive 110
 - optical drive 111, 112
- static-shielding materials 39
- SUSE Linux
 - Computer Setup 104
- SUSE Linux
 - backup and recovery 124
- system board
 - removal 70
 - spare part numbers 23, 70

T

- thermal material, replacement 80
- tools required 35
- top cover
 - removal 54
 - spare part number 23, 54
- TouchPad
 - buttons 10
- TouchPad light, identifying 11
- TouchPad on/off button 10
- TouchPad zone
 - identifying 10
- transporting guidelines 38

U

- USB connector assembly
 - removal 62
 - spare part number 62
- USB connector cable
 - illustrated 27
- USB legacy support 93, 100, 104
- USB ports, identifying 17, 18

- WLAN/Bluetooth combo card
 - removal 50
 - spare part number 50
- workstation guidelines 38

V

- vents, identifying 17, 19

W

- Web browser button, identifying 13
- Web browser light 11
- webcam 9
 - product description 2
 - spare part number 31
- webcam light, identifying 7, 9
- webcam module
 - removal 90
 - spare part number 26
- webcam, identifying 7, 9
- Windows
 - Refresh 122
 - reinstall 122, 127
 - remove everything and reinstall
 - option 122, 127
 - reset 122, 127
- Windows 7
 - backup and recovery 114
 - Computer Setup 93
- Windows 8
 - backup and recovery 119
 - Computer Setup 100
- Windows 8 operating system
 - DVD 121
- Windows applications key, identifying 14
- Windows logo key, identifying 14
- wireless antennas
 - disconnecting 50
- wireless button, identifying 13
- wireless light 11
- wireless, product description 2
- WLAN antennas, identifying 7, 9
- WLAN module
 - spare part numbers 23