



HP 2000 Notebook PC
Compaq Presario CQ58 Notebook PC

Maintenance and Service Guide

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Safety warning notice


 **WARNING!** To reduce the possibility of heat-related injuries or of overheating the device, do not place the device directly on your lap or obstruct the device air vents. Use the device 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 device 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).

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1 Product description

Category	Description	AMD models	Intel models
Product name	Compaq Presario CQ58 Notebook PC	√	
	HP 2000 Notebook PC	√	√
Processors	AMD processors (Not available on models with Windows 7 Starter 32)		
	E2-1800 1.70-GHz processor (1333-MHz memory speed, dual core, 18 W)	√	
	E1-1200 1.40-GHz processor (1066-MHz memory speed, dual core, 18 W)	√	
	Intel Core i3 processors (Not available on models with Windows 7 Starter 32)		
	3110M 2.40-GHz processor (1600-MHz memory speed, 3.0-MB L3 cache, dual core, 35 W)		√
	2370M 2.40-GHz processor (1333-MHz memory speed, 3.0-MB L3 cache, dual core, 35 W)		√
	2350M 2.30-GHz processor (1333-MHz memory speed, 3.0-MB L3 cache, dual core, 35 W)		√
	Intel Pentium processors (Not available on models with Windows 7 Starter 32)		
	B970 2.30-GHz processor (1333-MHz memory speed, 2.0-MB L3 cache, dual core, 35 W)		√
	B950 2.10-GHz processor (1333-MHz memory speed, 2.0-MB L3 cache, dual core, 35 W)		√
	Intel Celeron processor		
	B820 1.7-GHz processor (1333-MHz memory speed, 2.0-MB L3 cache, dual core, 35 W)		√
Chipset	AMD A68M fusion controller hub (FCH)	√	
	Intel HM75 Express Chipset (Core i5/i3 processors only)		√
	Intel HM70 Express Chipset (Pentium/Celeron processors only)		√
Graphics	UMA graphics:		
	AMD Radeon HD 7340 Graphics (on models with AMD E2-1800 processor; supports DirectX 11)	√	

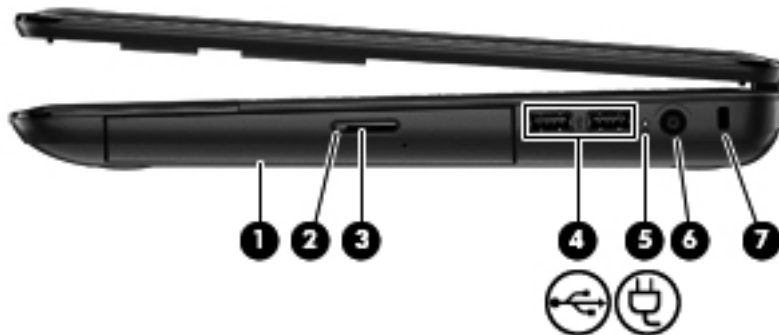
Category	Description	AMD models	Intel models
	AMD Radeon HD 7310 Graphics (on models with AMD E1-1200 processor; supports DirectX 11)	√	
	Intel HD Graphics 4000 (on models with Intel Core i5-3210M or i3-3110M processor; supports DirectX 11)		√
	Intel HD Graphics 3000 (on models with Intel Core i3-2370M or i3-2350M processor; supports DirectX 10)		√
	Intel HD Graphics (on models with Intel Pentium or Celeron processor; supports DirectX 10)		√
Panel	39.6-cm (15.6-inch), HD, LED, SVA BrightView (1366×768) display; typical brightness: 200 nits LVDS support	√	√
Memory	2 customer-accessible/upgradable memory module slots	√	√
	Supports dual-channel memory	√	√
	Supports up to 8192 GB of system RAM	√	√
	DDR3/1600-MHz		√
	DDR3/1333-MHz (DDR3/1600-MHz downgraded to DDR3/1333-MHz)	√	√
	DDR3/1066-MHz (DDR3/1600-MHz downgraded to DDR3/1066-MHz)	√	
	Supports the following configurations:	√	√
	<ul style="list-style-type: none"> 8192-MB total system memory (4096×2; not supported on a 32-bit operating system) 6144-MB total system memory (4096×1 + 2048×1; not supported on a 32-bit operating system) 4096-MB total system memory (4096×1 or 2048×2; not supported with Windows 7 Starter 32) 2048-MB total system memory (2048×1) 		
Hard drives	Supports 6.35-cm (2.5-in) hard drives in 9.5-mm (.37-in) and 7.0-mm (.28-in) thicknesses	√	√
	Customer-accessible	√	√
	Serial ATA	√	√
	Supports the following hard drives:	√	√
	<ul style="list-style-type: none"> 750-GB, 5400-rpm, 9.5-mm (not supported with Windows 7 Starter OS) 640-GB, 5400-rpm, 9.5-mm (not supported with Windows 7 Starter OS) 500-GB, 5400-rpm, 9.5-mm or 7.0-mm 320-GB, 5400-rpm, 9.5-mm or 7.0-mm 		
Optical drive	Fixed	√	√
	Serial ATA	√	√



Category	Description	AMD models	Intel models
	12.7-mm tray load	√	√
	DVD±RW and CD-RW Super Multi Double-Layer Combo Drive	√	√
Audio/video	Single digital microphone	√	√
	HD audio	√	√
	Altec Lansing speakers	√	√
	Supports Microsoft Premium requirements	√	√
	HP VGA webcam (fixed, no tilt with activity LED, 640×480 by 24 frames per second)	√	√
Ethernet	Integrated 10/100 network interface card (NIC)	√	√
Wireless	Integrated wireless local area network (WLAN) options by way of wireless module	√	√
	One or two WLAN antennas built into display assembly	√	√
	Support for the following WLAN formats:	√	√
	<ul style="list-style-type: none"> Atheros AR9485 802.11b/g/n 1x1 WiFi Adapter 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 Ralink WLAN Ralink Ripple3 RT5390F_802.11 b/g/n 1x1 PCIe HMC 		
External media card	HP Multi-Format Digital Media Reader supports the following digital card formats:	√	√
	<ul style="list-style-type: none"> Secure Digital (SD) Memory Card Secure Digital Extended Capacity (SDxC) Memory Card Secure Digital High Capacity (SDHC) Memory Card Ultra High Speed MultiMediaCard (UHS/MMC) 		
Ports	3-pin AC power	√	√
	Audio-in (microphone)	√	√
	Audio-out (headphone)	√	√
	HDMI version 1.4 supporting 1920 ×1200 @ 60Hz	√	√
	RJ-45 (Ethernet, includes link and activity lights)	√	√
	USB 2.0 (3 ports)	√	√
	VGA (Dsub 15 pin) supporting 2048×1536 external resolution @ 60 Hz, hot plug and unplug and auto-detection for correct output to wide-aspect vs. standard aspect video		√
	VGA (Dsub 15 pin) supporting 2048×1536 external resolution @ 75 Hz, hot plug and unplug and auto-detection for correct output to wide-aspect vs. standard aspect video	√	

Category	Description	AMD models	Intel models
Keyboard/ pointing devices	Full-size textured pocket keyboard	√	√
	TouchPad with multi-touch gestures, 2-finger scrolling, and pinch-zoom enabled	√	√
	Taps enabled by default	√	√
Power requirements	AC adapter		
	65-W RC V HP Smart AC adapter with localized cable plug support (3-wire plug with ground pin, supports 3-pin DC connector)	√	√
	Support for the following batteries: <ul style="list-style-type: none"> 6-cell, 47-Whr, 2.20-Ah Li-ion battery 	√	√
Security	Security cable slot	√	√
Operating system	Preinstalled:	√	√
	<ul style="list-style-type: none"> Windows 7 Home Premium (64-bit) 		
Serviceability	End-user replaceable parts:	√	√
	<ul style="list-style-type: none"> AC adapter 		
	<ul style="list-style-type: none"> Battery 		
	<ul style="list-style-type: none"> Hard drive 		
	<ul style="list-style-type: none"> Memory modules (2) 		
	<ul style="list-style-type: none"> Optical drive 		
	<ul style="list-style-type: none"> WLAN module 		

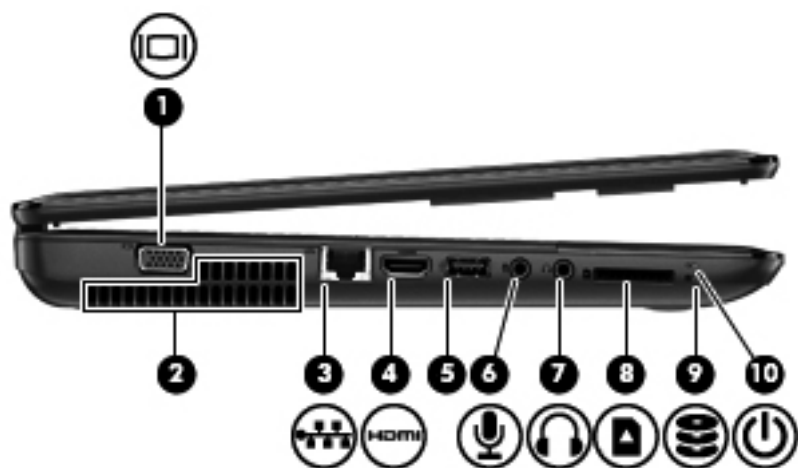
2 External component identification







Right side





Component		Description
(1)	Optical drive	Reads an optical disc. NOTE: On select models, the optical drive also writes to an optical disc.
(2)	Optical drive light	<ul style="list-style-type: none">Green: The optical drive is being accessed.Off: The optical drive is idle.
(3)	Optical drive eject button	Releases the disc tray.
(4)	 USB 2.0 ports (2)	Connect optional USB devices.
(5)	 AC adapter light	<ul style="list-style-type: none">White: The AC adapter is connected and the battery is charged.Amber: The AC adapter is connected and the battery is charging.Off: The computer is using DC power.
(6)	Power connector	Connects an AC adapter.
(7)	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.

Left side



Component		Description
(1)		External monitor port Connects an external VGA monitor or projector.
(2)		Vent Enables airflow to cool internal components. NOTE: The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(3)		RJ-45 (network) jack Connects a network cable.
(4)		HDMI port Connects an optional video or audio device, such as a high-definition television, or any compatible digital or audio device.
(5)		USB 2.0 port Connects an optional USB device.
(6)		Audio-in (microphone) jack Connects an optional computer headset microphone, stereo array microphone, or monaural microphone.
(7)		Audio-out (headphone) jack Connects optional powered stereo speakers, headphones, earbuds, a headset, or a television audio cable. WARNING! To reduce the risk of personal injury, adjust the volume before using headphones, earbuds, or a headset. For additional safety information, see the <i>Regulatory, Safety and Environmental Notices</i> . NOTE: When a device is connected to a headphone jack, the computer speakers are disabled.
(8)		Digital Media Slot Supports the following digital card formats: <ul style="list-style-type: none">Secure Digital (SD) Memory CardSecure Digital Extended Capacity (SDxC) Memory CardSecure Digital High Capacity (SDHC) Memory CardUltra High Speed MultiMediaCard (UHS/MMC)

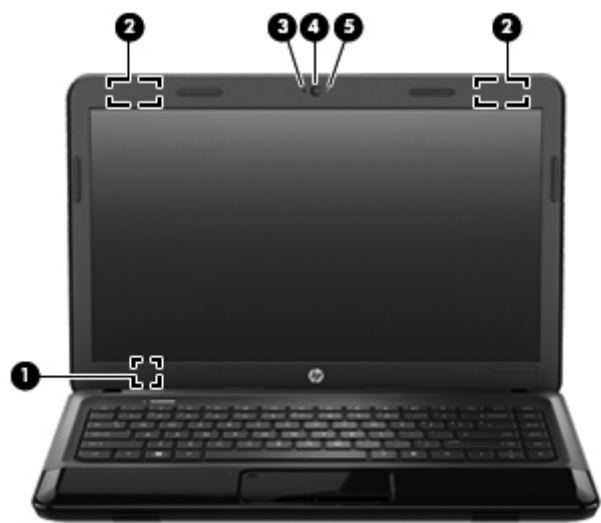
Component		Description
(9)		Hard drive light <ul style="list-style-type: none"> Blinking white: The hard drive is being accessed.
(10)		Power light <ul style="list-style-type: none"> White: The computer is on. Blinking white: The computer is in the Sleep state, which is an energy-saving mode. The computer shuts off power to the display and other unneeded components. Off: The computer is off or in Hibernation. Hibernation is an energy-saving mode that uses the least amount of power.

Front



Component	Description
Speakers (2)	Produce sound.

Display



Component		Description
(1)	Internal display switch	<p>Turns off the display and initiates Sleep if the display is closed while the power is on.</p> <p>NOTE: The internal display switch is not visible from the outside of the computer.</p>
(2)	WLAN antennas (2)*	Send and receive wireless signals to communicate with wireless local area networks (WLANs).
(3)	Internal microphone	Records sound.
(4)	Webcam	<p>Records video, captures still photographs, and allows video conferences and online chat by means of streaming video.</p> <p>To use the webcam, select Start > All Programs > Communication and Chat > CyberLink YouCam.</p>
(5)	Webcam light	On: The webcam is in use.

*The antennas are not visible from the outside of the computer. For optimal transmission, keep the areas immediately around the antennas free from obstructions. For wireless regulatory notices, see the section of the *Regulatory, Safety, and Environmental Notices* that applies to your country or region. These notices are located in Help and Support.

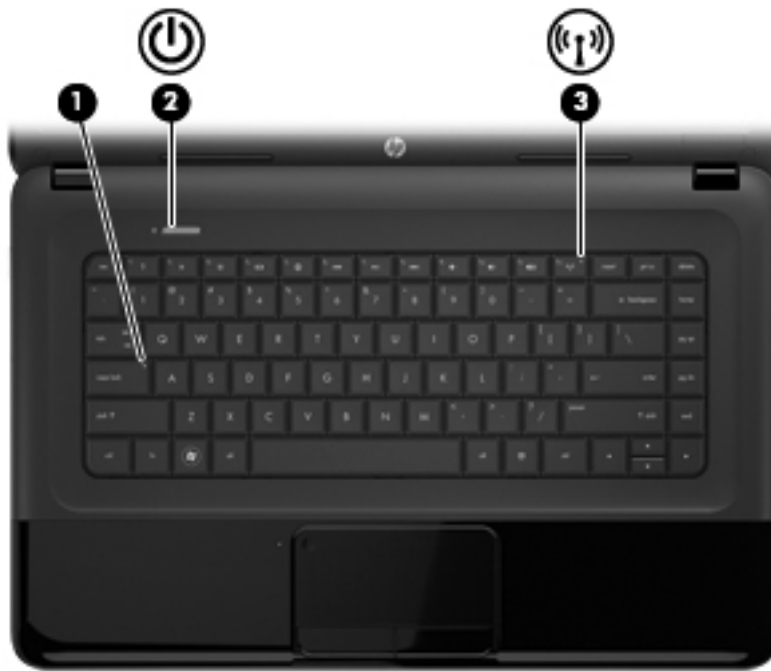
Top



TouchPad



Component		Description
(1)	TouchPad on/off button	Turns the TouchPad on or off.
(2)	TouchPad light	<ul style="list-style-type: none">• On: The TouchPad is off.• Off: The TouchPad is on.
(3)	TouchPad zone	Moves the on-screen pointer and selects or activates items on the screen.
(4)	Left TouchPad button	Functions like the left button on an external mouse.
(5)	Right TouchPad button	Functions like the right button on an external mouse.


Lights



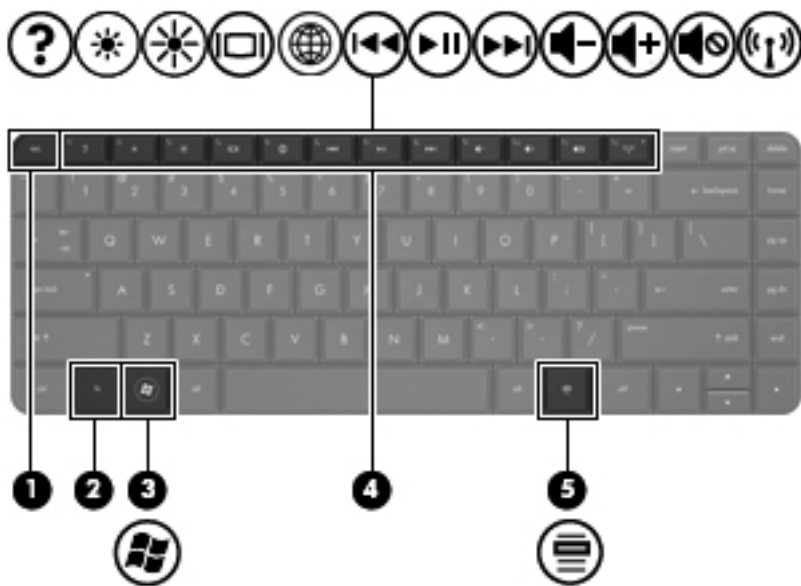
Component		Description
(1)	Caps lock light	On: Caps lock is on, which switches the keys to all capital letters.
(2)	 Power light	<ul style="list-style-type: none">• White: The computer is on.• Blinking white: The computer is in the Sleep state, which is an energy-saving mode. The computer shuts off power to the display and other unneeded components.• Off: The computer is off or in Hibernation. Hibernation is an energy-saving mode that uses the least amount of power.
(3)	 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.



Buttons



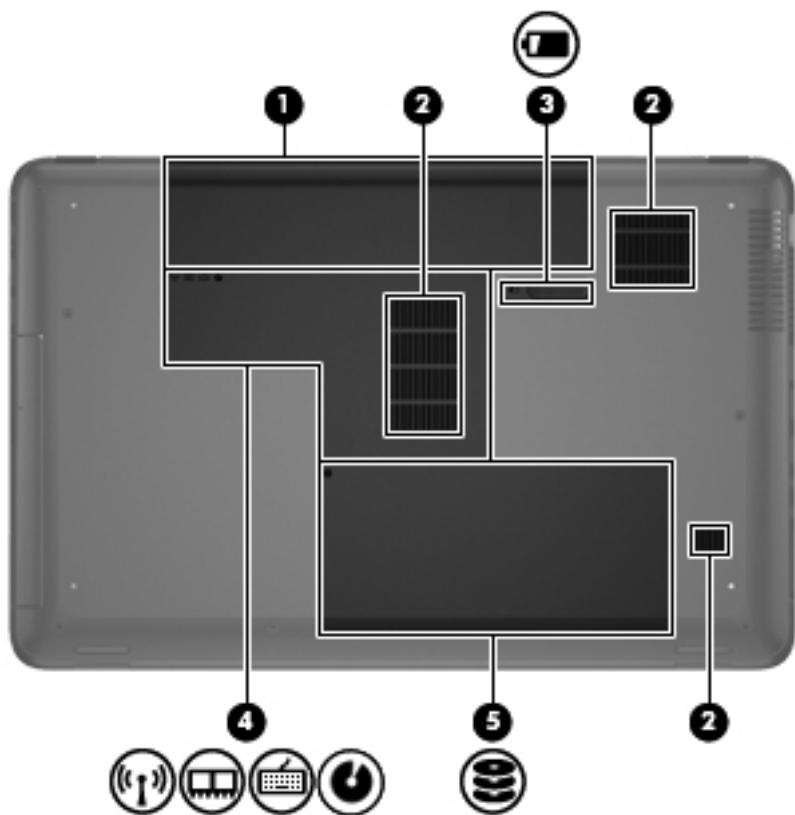
Component	Description
 Power button	<ul style="list-style-type: none">• When the computer is off, press the button to turn on the computer.• When the computer is on, press the button briefly to initiate Sleep.• When the computer is in the Sleep state, press the button briefly to exit Sleep.• When the computer is in Hibernation, press the button down briefly to exit Hibernation. <p>If the computer has stopped responding and Microsoft® Windows® 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, select Start > Control Panel > System and Security > Power Options, or refer to the user guides included with your computer.</p>






Keys



Component		Description
(1)	esc key	Displays system information when pressed in combination with the fn key.
(2)	fn key	Displays system information when pressed in combination with the esc key.
(3)	 Windows logo key	Displays the Windows Start menu.
(4)	Action keys	Execute frequently used system functions.
(5)	 Windows applications key	Displays a shortcut menu for items beneath the cursor.

Bottom

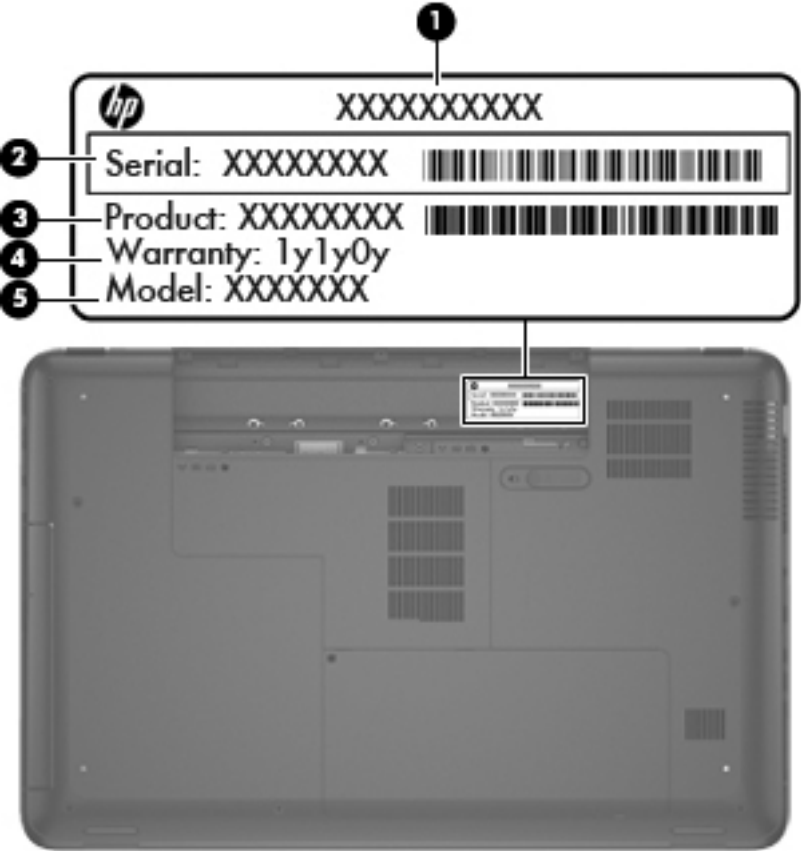


Component		Description
(1)	Battery bay	Holds the battery.
(2)	Vents (3)	Enable airflow to cool internal components. NOTE: The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(3)	 Battery release latch	Releases the battery from the battery bay.
(4)	   Wireless and memory module compartment	Contains the wireless and memory modules. 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 support through Help and Support.
(5)	 Hard drive bay	Contains the hard drive.

3 Illustrated parts catalog

Service tag

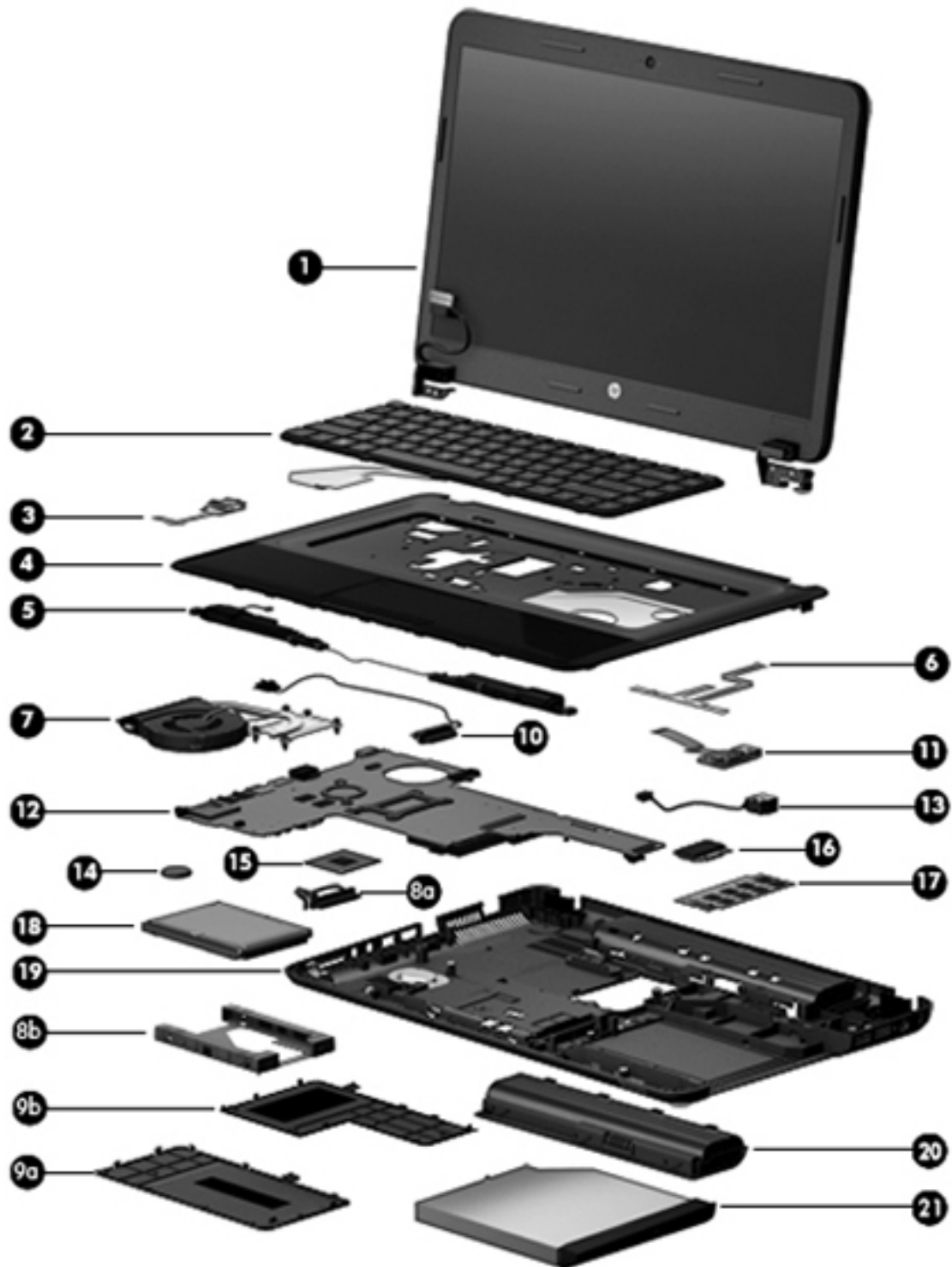
When ordering parts or requesting information, provide the computer serial number and model description provided on the service tag.



Item	Description	Function
(1)	Product name	This is the product name affixed to the front of the computer.
(2)	Serial number	This is an alphanumeric identifier that is unique to each product.
(3)	Product part number	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.

Item	Description	Function
(4)	Warranty period	This number describes the duration of the warranty period for the computer.
(5)	Model description (select models only)	This is the alphanumeric identifier used to locate documents, drivers, and support for the computer.

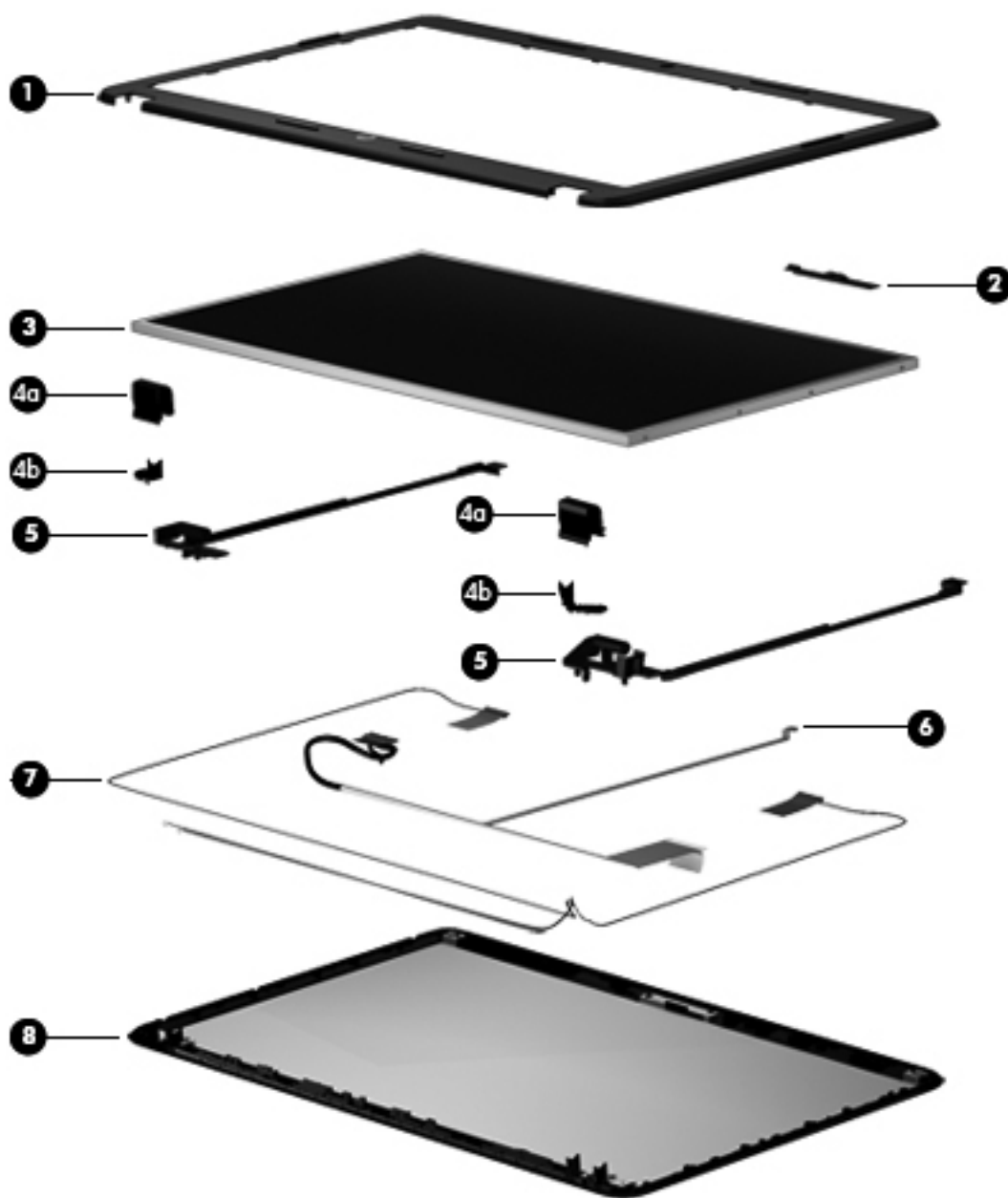
Computer major components



Item	Component	Spare part number
(1)	Display assembly (not spared) NOTE: For display assembly spare part information, see Display assembly subcomponents on page 19 .	
(2)	Keyboard (includes keyboard cable):	
	For use in French Canada	646125-121
	For use in the United States	646125-001
(3)	Power button board (includes cable)	689686-001
(4)	Top cover (includes TouchPad):	
	For use with Compaq models	689696-001
	For use with blue HP models	689694-001
	For use with black HP models	689695-001
(5)	Speakers (includes left and right speakers and cable)	689693-001
(6)	TouchPad button board (includes bracket and cables)	689688-001
(7)	Fan/heat sink assembly (includes replacement thermal materials):	
	For use only with computer models equipped with an AMD processor	688281-001
	For use only with computer models equipped with an Intel processor	685086-001
	Hard Drive Hardware Kit , includes:	685089-001
(8a)	Hard drive cable	
(8b)	Hard drive bracket	
	Plastics Kit , includes:	689689-001
(9a)	Hard drive compartment cover (includes one captive screw, secured by a C-clip)	
(9b)	Memory module/wireless module compartment cover (includes one captive screw, secured by a C-clip)	
	NOTE: See Plastics kit on page 22 for more plastics kit spare part information.	
(10)	Optical drive cable (includes cable bracket)	685084-001
(11)	USB board (includes cable)	689687-001
(12)	System board (includes replacement thermal materials):	
	For use only with models with an AMD E2-1800 processor	688277-001
	For use only with models with an AMD E1-1200 processor	688278-001
	For use only with models with an Intel Core i5 or i3 processor	685107-001
	For use only with models with an Intel Pentium or Celeron processor	685783-001
(13)	Power connector cable	689678-001
(14)	RTC battery	449137-001
(15)	Processor (includes replacement thermal materials): NOTE: Only valid on models with Intel processors. On AMD models, the processor comes with the system board and cannot be removed.	

Item	Component	Spare part number
	Intel Core i3-3110M 2.40-GHz processor (1600-MHz, 3.0-MB L3 cache)	682417-001
	Intel Core i3-2370M 2.40-GHz processor (1333-MHz, 3.0-MB L3 cache)	677152-001
	Intel Core i3-2350M 2.30-GHz processor (1333-MHz, 3.0-MB L3 cache)	653340-001
	Intel Pentium B970 2.30-GHz processor (1333-MHz, 2.0-MB L3 cache)	676785-001
	Intel Pentium B950 2.10-GHz processor (1333-MHz, 2.0-MB L3 cache)	653338-001
	Intel Celeron B820 1.7-GHz processor (1333-MHz, 2.0-MB L3 cache)	690537-001
(16)	WLAN module:	
	Atheros AR9485 802.11b/g/n 1x1 WiFi Adapter	675794-001
	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
	Ralink WLAN Ralink Ripple3 RT5390F_802.11 b/g/n 1x1 PCIe HMC	670691-001
(17)	Memory module (PC3, 12800, 1600-MHz):	
	4 GB	641369-001
	2 GB	652972-001
(18)	Hard drive (2.5-in, SATA; does not include hard drive cable or bracket):	
	NOTE: The hard drive cable and bracket are included in the Hard Drive Hardware Kit, spare part number 685089-001.	
	640-GB, 5400-rpm, 9.5-mm	669300-001
	500-GB, 5400-rpm, 9.5-mm	669299-001
	320-GB, 5400-rpm, 9.5-mm	622643-001
(19)	Base enclosure (for use with all models)	689674-001
(20)	Battery:	
	6-cell, 55-Whr, 2.55-Ah Li-ion battery	593554-001
	6-cell, 47-Whr, 2.20-Ah Li-ion battery	593553-001
(21)	Optical drive (DVD±RW and CD-RW Super Multi Double-Layer Combo Drive; includes rear optical drive bracket but does not include optical drive cable or cable bracket)	689685-001
	NOTE: The optical drive cable and cable bracket are included in the optical drive cable kit, spare part number 685084-001.	

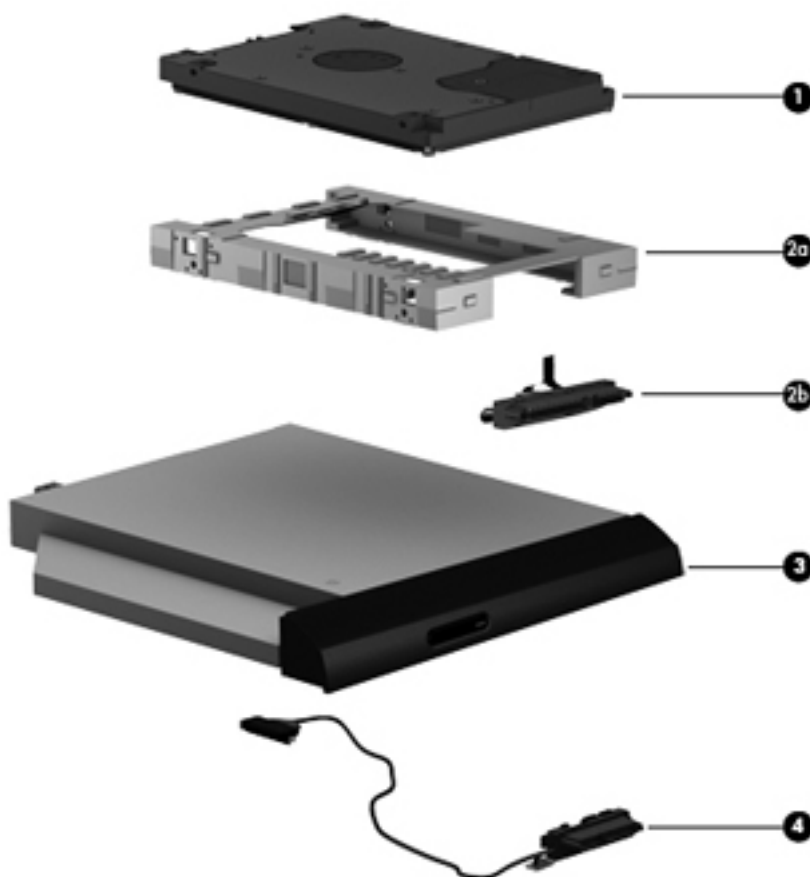
Display assembly subcomponents



Item	Component	Spare part number
(1)	Display bezel:	
	For use with Compaq models	689676-001
	For use with HP models	689675-001
(2)	Webcam/microphone module	685112-001
(3)	39.6-cm (15.6-inch), HD, LED, BrightView display panel	689690-001
(4a)	Top hinge covers	

Item	Component	Spare part number
(4b)	Side hinge covers	
(5)	Hinges (include hinges and left and right hinge covers)	689679-001
(6)	Display cable (includes display panel cable and webcam/microphone cable)	689677-001
(7)	Antennas (includes wireless antenna cables and transceivers)	689670-001
(8)	Display enclosure:	
	For use with Compaq models	689673-001
	For use with black HP models	689672-001
	For use with blue HP models	689671-001

Mass storage devices



Item	Component	Spare part number
(1)	Hard drive (2.5-in, SATA; does not include hard drive cable or bracket): NOTE: The hard drive cable and bracket are included in the Hard Drive Hardware Kit, spare part number 685089-001.	
	640-GB, 5400-rpm, 9.5-mm	669300-001
	500-GB, 5400-rpm, 9.5-mm	669299-001
	320-GB, 5400-rpm, 9.5-mm	622643-001
	Hard Drive Hardware Kit , includes:	685089-001
(2a)	Hard drive bracket	
(2b)	Hard drive cable	
(3)	Optical drive (DVD±RW and CD-RW Super Multi Double-Layer Combo Drive; includes rear optical drive bracket but does not include optical drive cable or cable bracket) NOTE: The optical drive cable and cable bracket are included in the optical drive cable kit, spare part number 685084-001.	689685-001
(4)	Optical drive cable (includes cable bracket)	685084-001

Plastics kit



Item	Component	Spare part number
	Plastics Kit , includes:	689689-001
(1)	Hard drive compartment cover (includes one captive screw, secured by a C-clip)	
(2)	Memory module/wireless module compartment cover (includes one captive screw, secured by a C-clip)	

Miscellaneous parts

Component	Spare part number
HP Smart AC adapter (65-W RC V)	693711-001
Power cord (3-pin, black, 1.83-m) for use in North America	490371-001
Rubber computer feet (includes computer feet and display rubber)	691221-001
Screw Kit	689691-001
Thermal pad (for use with all models)	651046-001

Sequential part number listing

Spare part number	Description
449137-001	RTC battery
490371-001	Power cord for use in North America (3-pin, black, 1.83-m)
593553-001	6-cell, 47-Whr, 2.20-Ah Li-ion battery
593554-001	6-cell, 55-Whr, 2.55-Ah Li-ion battery
622643-001	320-GB, 5400-rpm, 9.5-mm SATA hard drive (does not include hard drive cable or bracket)
641369-001	4-GB memory module (PC3, 12800, 1600-MHz)
646125-001	Keyboard for use in the United States (includes keyboard cable)
646125-121	Keyboard for use in French Canada (includes keyboard cable)
651046-001	Thermal pad (for use with all models)
652972-001	2-GB memory module (PC3, 12800, 1600-MHz)
653338-001	Intel Pentium B950 2.10-GHz processor (1333-MHz memory speed, 2.0-MB L3 cache, dual core, 35 W; includes replacement thermal materials)
653340-001	Intel Core i3-2350M 2.30-GHz processor (1333-MHz memory speed, 3.0-MB L3 cache, dual core, 35 W; includes replacement thermal materials)
655795-001	Atheros 9485GN 802.11b/g/n 1x1 WiFi and 3012 Bluetooth 4.0 Combo Adapter
657325-001	Broadcom 4313GN 802.11b/g/n 1x1 WiFi and 20702 Bluetooth 4.0 Combo Adapter
669299-001	500-GB, 5400-rpm, 9.5-mm SATA hard drive (does not include hard drive cable or bracket)
669300-001	640-GB, 5400-rpm, 9.5-mm SATA hard drive (does not include hard drive cable or bracket)
670691-001	Ralink WLAN Ralink Ripple3 RT5390F_802.11 b/g/n 1x1 PCIe HMC
675794-001	Atheros AR9485 802.11b/g/n 1x1 WiFi Adapter
676785-001	Intel Pentium B970 2.30-GHz processor (1333-MHz memory speed, 2.0-MB L3 cache, dual core, 35 W; includes replacement thermal materials)
677152-001	Intel Core i3-2370M 2.40-GHz processor (1333-MHz memory speed, 3.0-MB L3 cache, dual core, 35 W; includes replacement thermal materials)
682417-001	Intel Core i3-3110M 2.40-GHz processor (1600-MHz memory speed, 3.0-MB L3 cache, dual core, 35 W; includes replacement thermal materials)
685084-001	Optical drive cable (includes cable bracket)
685086-001	Fan/heat sink assembly for use only with computer models equipped with an Intel processor (includes replacement thermal materials)
685089-001	Hard Drive Hardware Kit (includes hard drive cable and bracket)
685107-001	System board for use only with models with an Intel Core i5 or i3 processor (includes replacement thermal materials)
685112-001	Webcam/microphone module
685783-001	System board for use only in models with an Intel Pentium or Celeron processor (includes replacement thermal materials)
688277-001	System board for use only with models with an AMD E2-1800 processor (includes replacement thermal materials)

Spare part number	Description
688278-001	System board for use only with models with an AMD E1-1200 processor (includes replacement thermal materials)
688281-001	Fan/heat sink assembly for use only with models with an AMD processor (includes replacement thermal materials)
689670-001	Antennas (includes wireless antenna cables and transceivers)
689671-001	Display enclosure for use with blue HP models
689672-001	Display enclosure for use with black HP models
689673-001	Display enclosure for use with Compaq models
689674-001	Base enclosure (for use with all models)
689675-001	Display bezel for use with HP models)
689676-001	Display bezel for use with Compaq models)
689677-001	Display cable (includes display panel cable and webcam/microphone cable)
689678-001	Power connector cable
689679-001	Hinges (includes hinges and left and right hinge covers)
689685-001	Optical drive (DVD±RW and CD-RW Super Multi Double-Layer Combo Drive; includes rear optical drive bracket but does not include optical drive cable or cable bracket)
689687-001	USB board (includes cable)
689686-001	Power button board (includes cable)
689688-001	TouchPad button board (includes bracket and cables)
689689-001	Plastics Kit (includes hard drive compartment cover, memory module/wireless module compartment cover, and captive screws secured by C-clips)
689690-001	39.6-cm (15.6-inch), HD, LED, BrightView display panel
689691-001	Screw Kit
689693-001	Speakers (includes left and right speakers and cable)
689694-001	Top cover for use with blue HP models (includes TouchPad)
689695-001	Top cover for use with black HP models (includes TouchPad)
689696-001	Top cover for use with Compaq models (includes TouchPad)
690537-001	Intel Celeron B820 1.7-GHz processor (1333-MHz memory speed, 2.0-MB L3 cache, dual core, 35 W; includes replacement thermal materials)
691221-001	Rubber computer feet (includes computer feet and display rubber)
693711-001	65-W RC V HP Smart AC adapter

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
- Magnetic screwdriver
- Phillips P0 and P1 screwdrivers

Service considerations


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

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

Plastic parts

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

Cables and connectors

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

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

Drive handling

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

Before removing or inserting a hard drive, shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.

Before handling a drive, be sure that you are discharged of static electricity. While handling a drive, avoid touching the connector.

Before removing a diskette drive or optical drive, be sure that a diskette or disc is not in the drive and be sure that the optical drive tray is closed.

Handle drives on surfaces covered with at least one inch of shock-proof foam.

Avoid dropping drives from any height onto any surface.

After removing a hard drive, an optical drive, or a diskette drive, place it in a static-proof bag.

Avoid exposing an internal hard drive to products that have magnetic fields, such as monitors or speakers.

Avoid exposing a drive to temperature extremes or liquids.

If a drive must be mailed, place the drive in a bubble pack mailer or other suitable form of protective packaging and label the package "FRAGILE."

Grounding guidelines

Electrostatic discharge damage

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

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

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

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


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

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 non-conductive 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 must be worn in contact with the skin.

The following grounding equipment is recommended to prevent electrostatic damage:

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

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

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

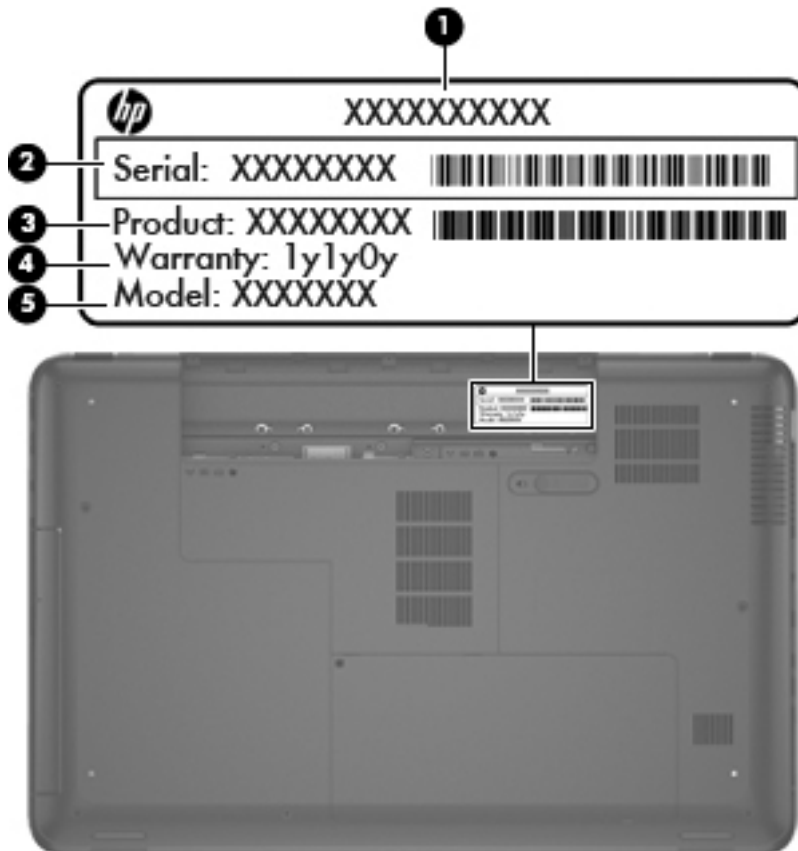
Component replacement procedures

This chapter provides removal and replacement procedures.

There are as many as 66 screws that must be removed, replaced, or loosened when servicing the computer. Make special note of each screw's size and location during removal and replacement.

Service tag

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

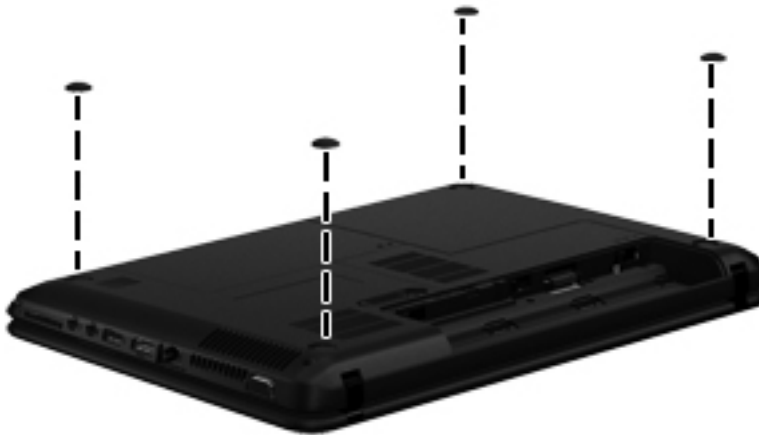


Item	Component	Description
(1)	Product name	This is the product name affixed to the front of the computer.
(2)	Serial number	This is an alphanumeric identifier that is unique to each product.
(3)	Product part number	This number provides specific information about the product's hardware components. The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

Computer feet

Description	Spare part number
Rubber computer feet (includes computer feet and display rubber)	691221-001

The computer feet are adhesive-backed rubber pads. There are 4 rubber feet that attach to the base enclosure in the locations illustrated below.



Battery


Description	Spare part number
6-cell, 55-Whr, 2.55-Ah Li-ion battery	593554-001
6-cell, 47-Whr, 2.20-Ah Li-ion battery	593553-001

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.

To remove the battery:

1. Turn the computer upside down on a flat surface.
2. Slide the battery release latch **(1)** to release the battery.

 **NOTE:** The battery release latch automatically returns to its original position.

3. Pivot the battery **(2)** upward and remove it **(3)** from the computer.



To insert the battery:

1. Align the tabs on the rear edge of the battery with the notches on the rear edge of the battery bay.
2. Pivot the front edge of the battery down into the battery bay until it is seated. (The battery release latch will automatically lock into place.)

Display subcomponents (bezel, webcam, panel)

This section describes removing display subcomponents that do not require that you remove the entire display assembly from the computer. You can remove the display bezel, webcam/microphone module, and display panel while the display assembly is still attached to the computer.

To remove the remaining display subcomponents, including the hinge covers, hinges, cable, antennas, and enclosure, you must remove the entire display assembly from the computer. See [Display assembly on page 69](#) for more information about removing the display assembly in its entirety.

Description	Spare part number
39.6-cm (15.6-inch), HD, LED, BrightView display panel	689690-001
Display bezel for use with Compaq models	689676-001
Display bezel for use with HP models	689675-001
Webcam/microphone module	685112-001

Before removing the display bezel, webcam/microphone module, and display panel while the display assembly is still attached to 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 32](#)).

To remove the display bezel, webcam/microphone module, and display panel while the display assembly is still attached to the computer:

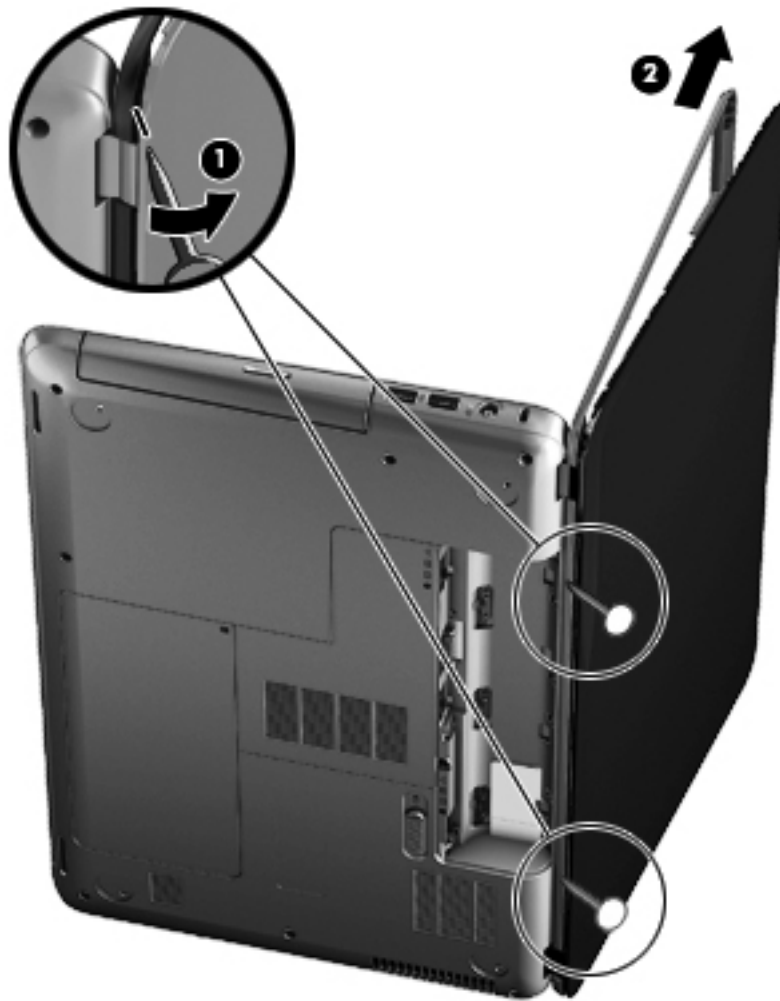
1. Remove the two Mylar screw covers **(1)** and the two Phillips PM2.5×4.0 screws **(2)** that secure the display bezel to the display assembly. The Mylar screw covers are included with the display bezel spare part kit.

2. Flex and disengage the inside edges of the bottom (3), left and right sides (4), and top (5) of the bezel.



3. Open the computer and position it on its side with the back and bottom facing you.

4. Use a tool to pry to bottom of the bezel from the display (1), and then remove the bezel from the display (2).



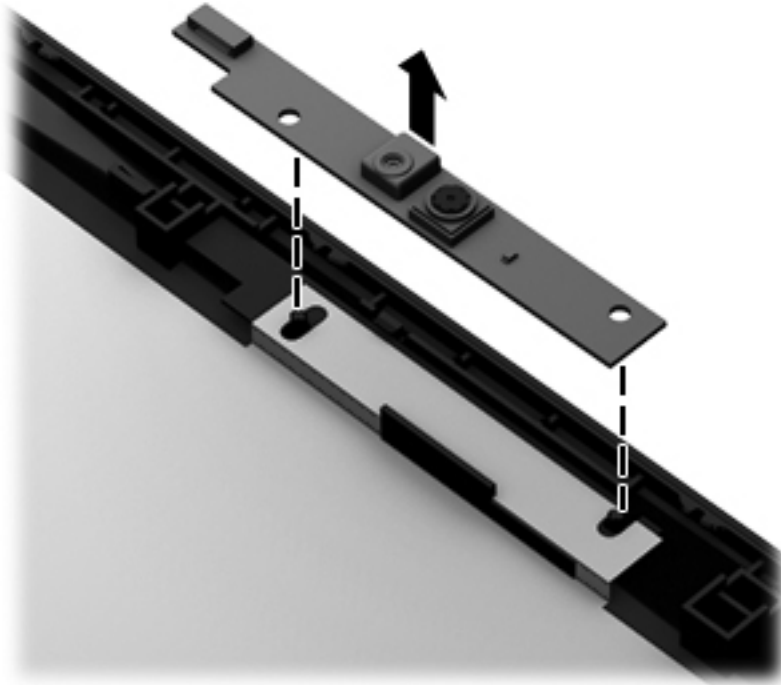
5. To remove the webcam/microphone module:
 - a. Remove the two broadhead Phillips PM2.5×2.5 screws (1) that secure the display panel and hinges to the enclosure, and then tilt the display panel (2) away from the enclosure as far as possible.



- b. Disconnect the webcam module cable from the module.



- c. Remove the webcam/microphone module. (The module is attached to the display enclosure with double-sided tape.)



6. To remove the display panel:

- a.** Remove the four Phillips PM2.0×3.0 screws **(1)** that secure the display hinges to the display panel, and then tilt the display panel down **(2)** until it rests on the computer.



- b.** Release the adhesive strip **(1)** that secures the display panel cable to the display panel, and then disconnect the display panel cable **(2)** from the display panel.


- c. Release the webcam/microphone module cable that is secured to the back of the display panel with adhesive material, and then remove the display panel **(3)**.



Reverse this procedure to reassemble and install the display bezel, webcam/microphone module, and display panel.

WLAN module

Description	Spare part number
Atheros AR9485 802.11b/g/n 1x1 WiFi Adapter	675794-001
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
Ralink WLAN Ralink Ripple3 RT5390F_802.11 b/g/n 1x1 PCIe HMC	670691-001

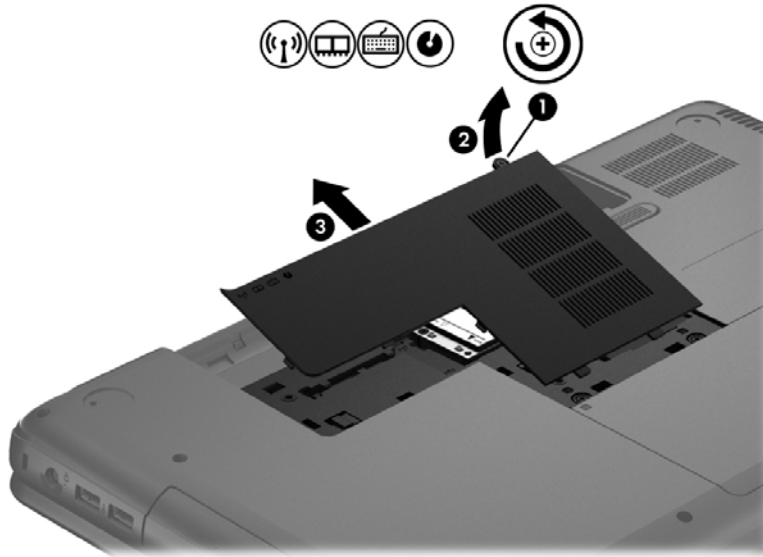
 **CAUTION:** To prevent an unresponsive system, replace the wireless module only with a wireless module authorized for use in the computer by the governmental agency that regulates wireless devices in your country or region. If you replace the module and then receive a warning message, remove the module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

Before removing the WLAN module, follow these steps:


1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 32](#)).

To remove the WLAN module:

1. Loosen the memory module/wireless module compartment cover screw (1), and then lift up on the tab (2) and remove the cover (3). The memory module/wireless module compartment cover is available in the plastics kit. For more information about the plastics kit, see [Plastics kit on page 22](#).

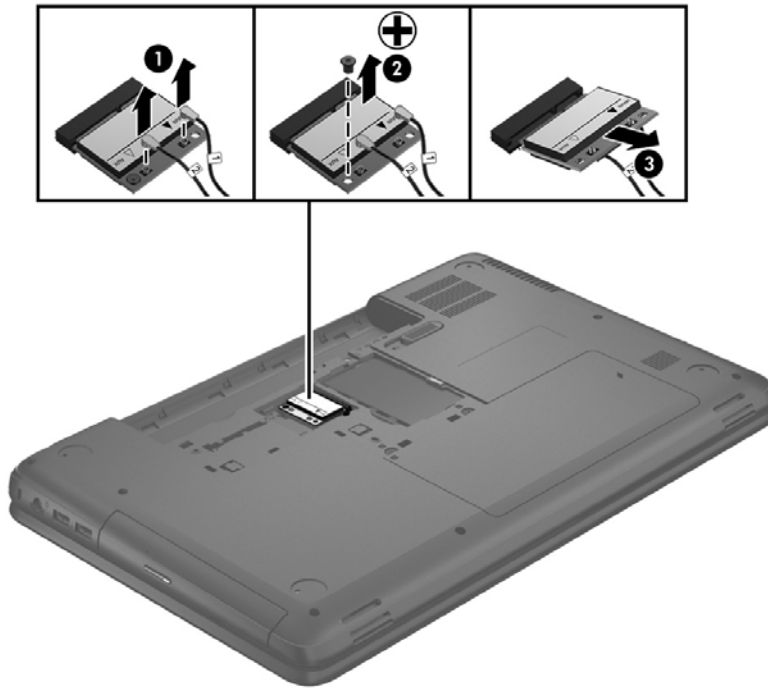



2. Disconnect the WLAN antenna cables (1) from the terminals on the WLAN module.

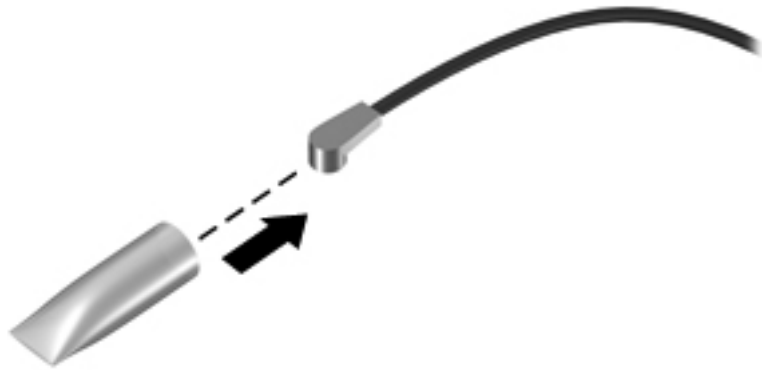
 **NOTE:** The #1 WLAN antenna cable is connected to the WLAN module Main terminal. The #2 WLAN antenna cable is connected to the WLAN module Aux terminal.

3. Remove the Phillips PM2.0×3.0 screw (2) that secures the WLAN module to the system board. (The WLAN module tilts up.)

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



 **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.

Memory module

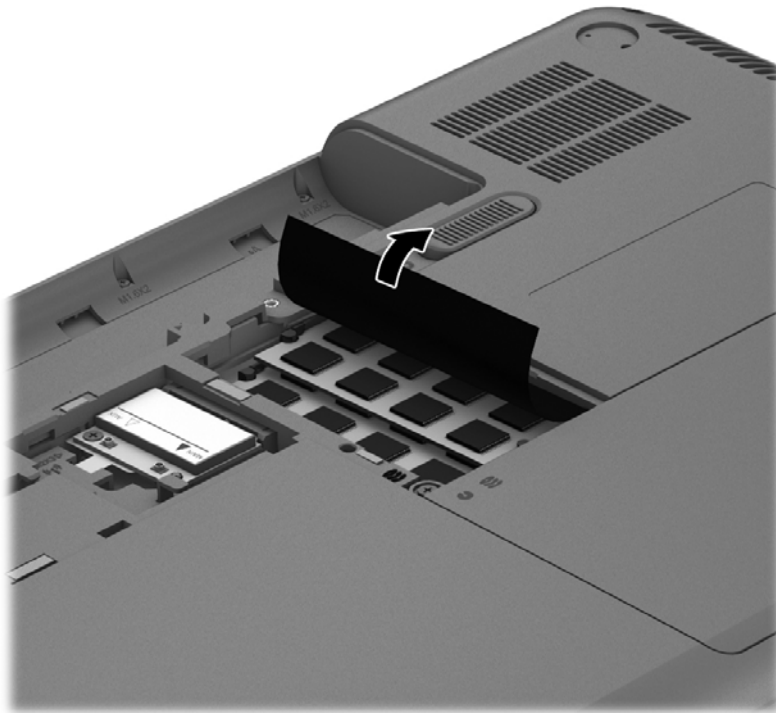
Description	Spare part number
4-GB (PC3, 12800, 1600-MHz)	641369-001
2-GB (PC3, 12800, 1600-MHz)	652972-001

Before removing a 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 32](#)).
5. Remove the memory module/wireless module compartment cover (see [WLAN module on page 41](#)).

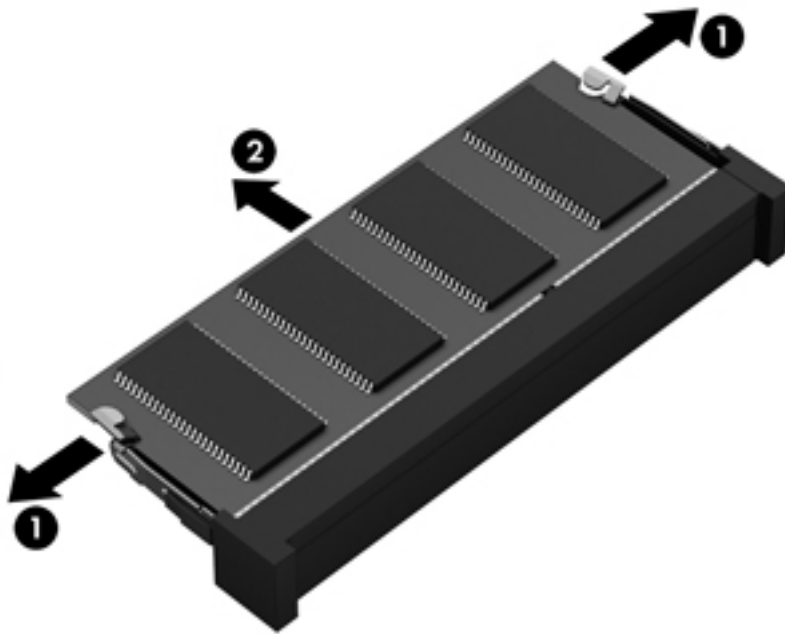
To remove a memory module:

1. Flip up the Mylar sheet protecting the memory module compartment.



2. Spread the retaining tabs **(1)** on each side of the memory module slot to release the memory module. (The memory module tilts up.)

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



Reverse this procedure to install a memory module.

Hard drive



NOTE: The hard drive spare part kit does not include the hard drive cable or bracket. The hard drive cable and bracket are included in the hard drive hardware kit.

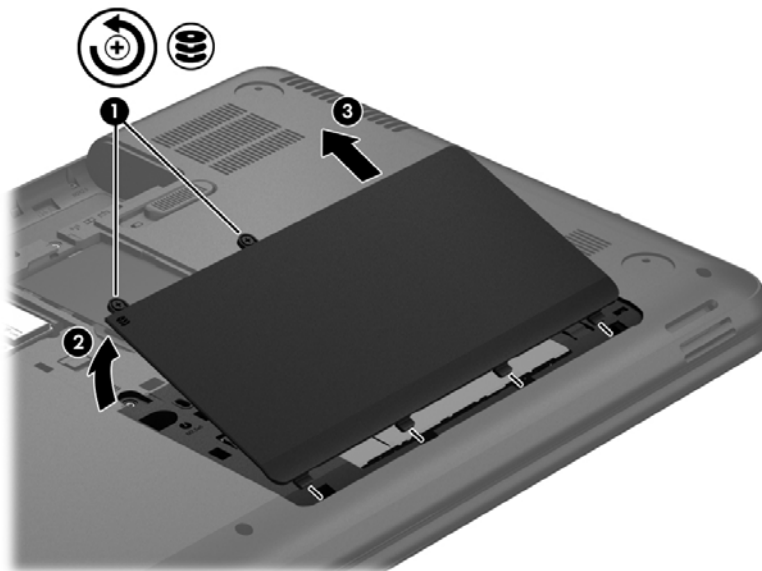
Description	Spare part number
640-GB, 5400-rpm, 9.5-mm	669300-001
500-GB, 5400-rpm, 9.5-mm	669299-001
320-GB, 5400-rpm, 9.5-mm	622643-001
Hard Drive Hardware Kit (includes hard drive cable and bracket)	685089-001

Before removing the hard drive, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 32](#)).
5. Remove the memory module/wireless module compartment cover (see [WLAN module on page 41](#)).

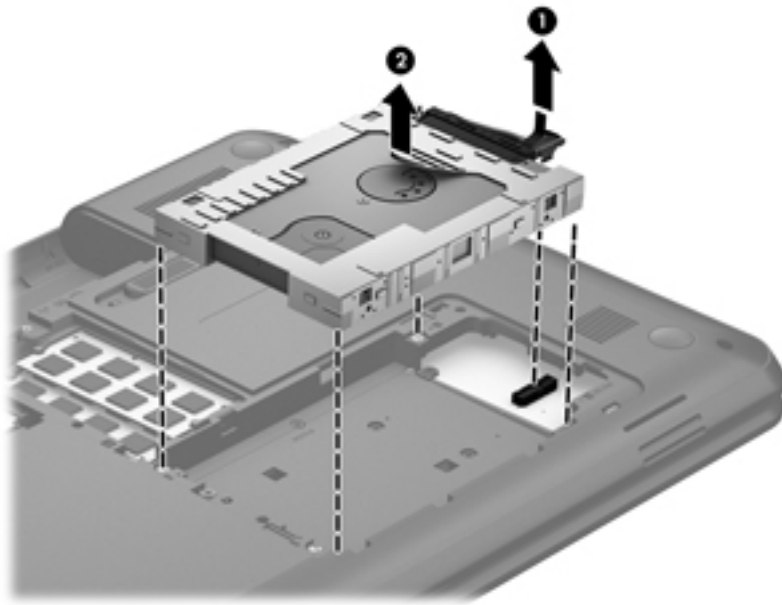
To remove the hard drive:

1. Loosen the two hard drive cover screws (1), and then lift up (2) and remove the cover (3). The hard drive compartment cover is available in the plastics kit. For more information about the plastics kit, see [Plastics kit on page 22](#).

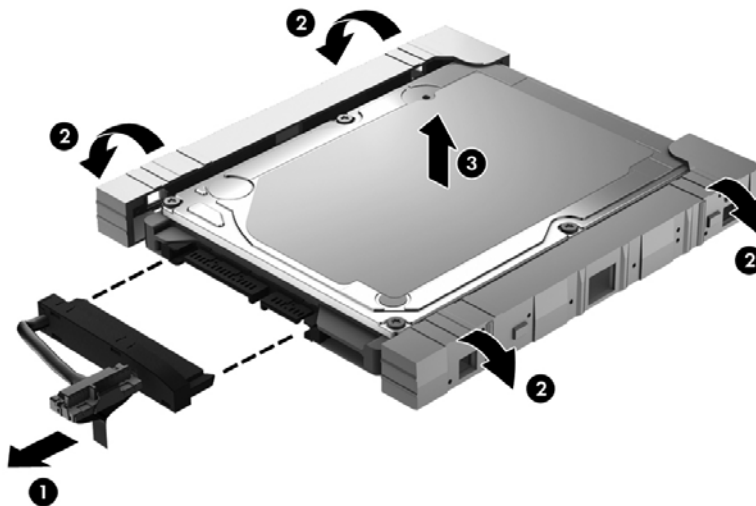


2. Disconnect the hard drive cable (1) from the system board.

3. Lift the hard drive **(2)** out of the hard drive bay.



4. Turn over the hard drive, then disconnect the hard drive cable **(1)** from the hard drive.
5. Pull the sides of the hard drive bracket **(2)** out and away from the hard drive.
6. Remove the hard drive **(3)** from the bracket.



Reverse this procedure to reassemble and install the hard drive.

RTC battery

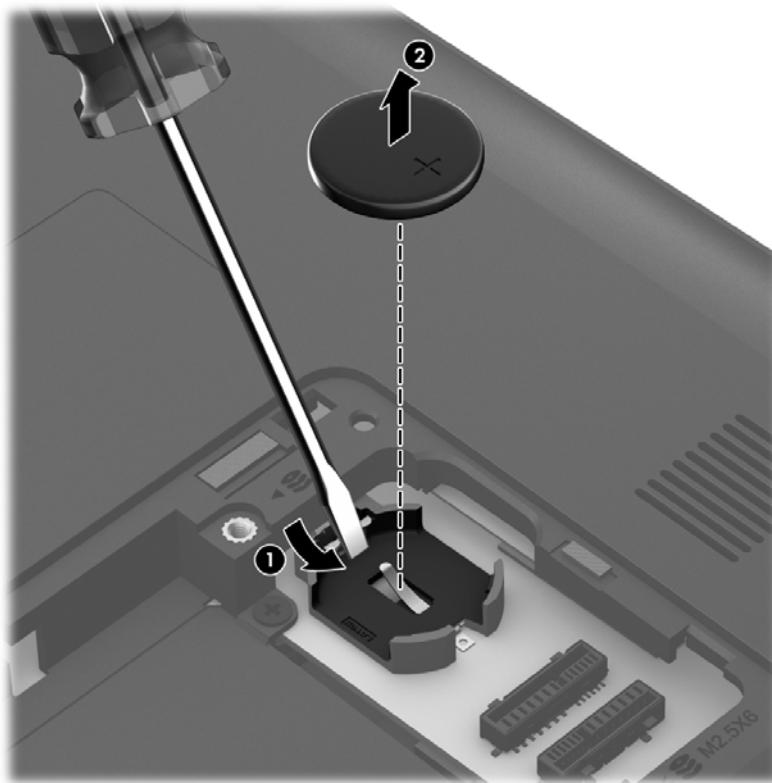
Description	Spare part number
RTC battery	449137-001

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 32](#)).
5. Remove the memory module/wireless module compartment cover (see [WLAN module on page 41](#)).
6. Remove the hard drive compartment cover (see [Hard drive on page 46](#)).

To remove the RTC battery:

- ▲ Insert a small tool between the battery and the clip that secures it (1), pry the battery up to disengage it from the socket, and then remove the battery (2) from the computer.



Reverse this procedure to install the RTC battery.

Optical drive



NOTE: The optical drive spare part kit includes the rear optical drive bracket but does not include the optical drive cable or cable bracket. The optical drive cable and cable bracket are included in the optical drive cable kit. See [Optical drive cable on page 81](#) for more information about the optical drive cable and cable bracket.

Description	Spare part number
DVD±RW and CD-RW Super Multi Double-Layer Combo Drive	689685-001

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 32](#)).
5. Remove the memory module/wireless module compartment cover (see [WLAN module on page 41](#)).
6. Remove the hard drive cover (see [Hard drive on page 46](#)).

To remove the optical drive:

1. Remove the Phillips PM2.5×5.0 screw **(1)** that secures the optical drive to the computer.
2. Insert a small screwdriver into the hole at the rear of the optical drive bay, and then push the optical drive **(2)** to release it from the bay.

3. Remove the optical drive **(3)** by sliding it out of the optical drive bay.



Reverse this procedure to reassemble and install the optical drive.

Keyboard



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

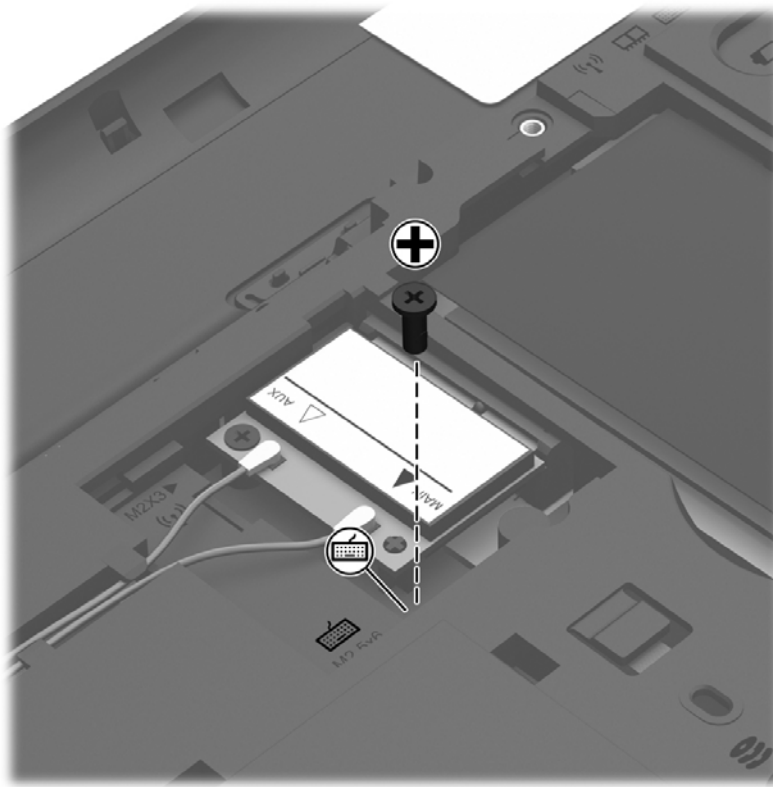
Description	Spare part number
Keyboard for use in French Canada	646125-121
Keyboard for use in the United States	646125-001

Before removing the keyboard, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 32](#)).
5. Remove the memory module/wireless module compartment cover (see [WLAN module on page 41](#)).
6. Remove the hard drive compartment cover (see [Hard drive on page 46](#)).

Remove the keyboard:

1. Remove the Phillips PM2.5×6.0 screw that secures the keyboard to the computer just below the WLAN module slot.



2. Rest and secure the computer on its left side, and then partially open the computer.
3. Using a screwdriver or similar tool, push the tabs of the three keyboard clips (1) that are visible inside the battery bay towards the rear of the computer to loosen the keyboard.

4. Insert a screwdriver or similar thin tool into the keyboard release hole **(2)**, and then press on the back of the keyboard until the keyboard disengages from the computer.



5. Turn the computer right-side up with the front toward you.
6. Lift the rear edge of the keyboard **(1)**, and then swing the keyboard up and forward **(2)** until it rests upside down on the palm rest.



7. Release the zero insertion force (ZIF) connector **(1)** to which the keyboard cable is attached, and then disconnect the keyboard cable **(2)** from the system board.
8. Remove the keyboard **(3)**.



Reverse this procedure to install the keyboard.

Top cover



NOTE: The top cover spare part kit includes the TouchPad but not the TouchPad cables. The TouchPad cables are included with the TouchPad button board. For more information about the TouchPad button board, see [TouchPad button board on page 61](#).

Description	Spare part number
Top cover for use with Compaq models	689696-001
Top cover for use with black HP models	689695-001
Top cover for use with blue HP models	689694-001

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 32](#)), and then remove the following components:
 - Memory module/wireless module compartment cover (see [WLAN module on page 41](#))
 - Hard drive (see [Hard drive on page 46](#))
 - Keyboard (see [Keyboard on page 51](#))



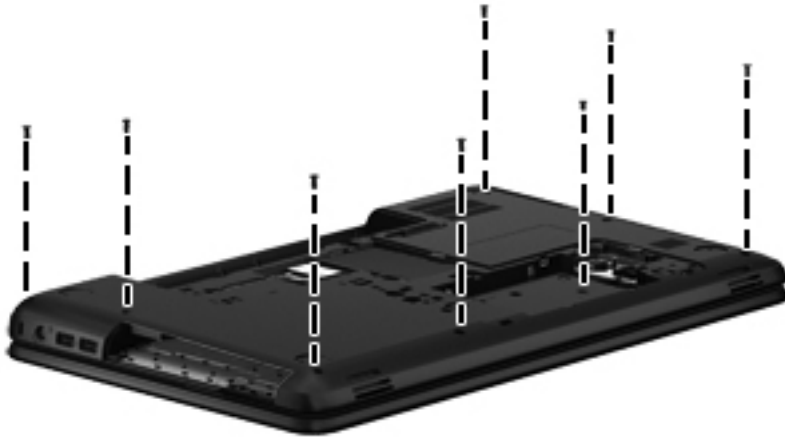
NOTE: When replacing the top cover, be sure that the following components are removed from the defective top cover and installed on the replacement top cover:

- Power button board and cable (see [Power button board on page 59](#))
- TouchPad button board and cables (see [TouchPad button board on page 61](#))

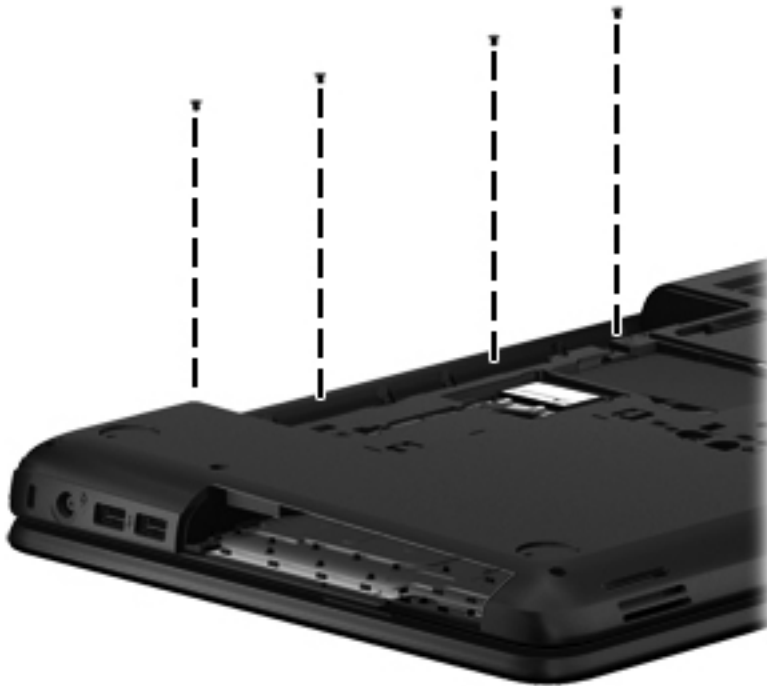
To remove the top cover:

1. Close the computer, and then turn the computer upside down with the front toward you.

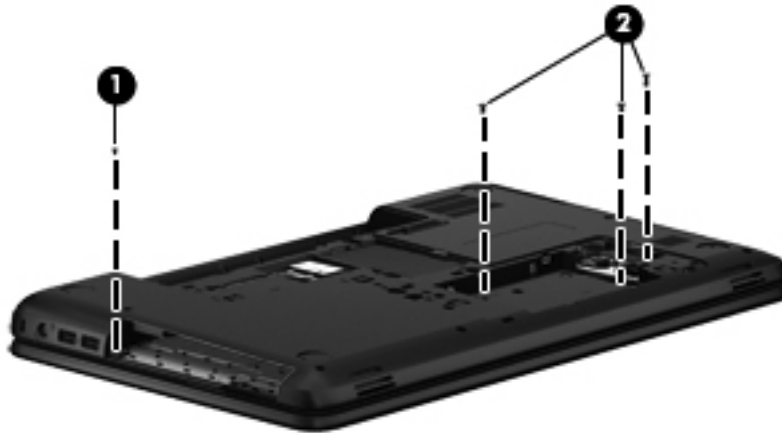
2. Remove the eight Phillips PM2.5×6.0 screws that secure the top cover to the computer.



3. Remove the four Phillips PM2.0×2.5 screws from the battery bay that secure the top cover to the computer.



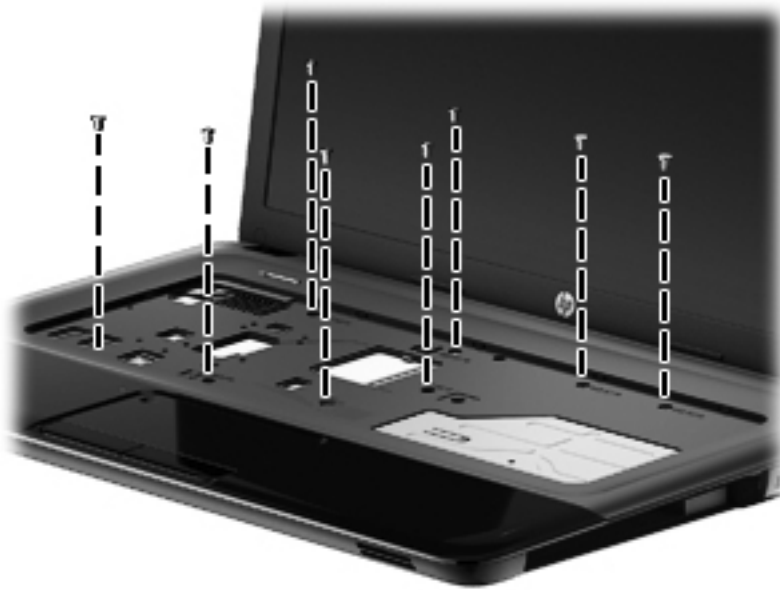
4. Remove the Phillips PM2.0×3.0 screw from the optical drive bay **(1)** and the three Phillips PM2.5×4.0 screws from the hard drive bay **(2)** that secure the top cover to the computer.



5. Turn the computer upright with the front toward you, and then open the computer.
6. Release the ZIF connectors to the power button board cable **(1)** and the TouchPad button board cable **(2)**, and then disconnect the cables from the system board.



7. Remove the eight Phillips PM2.0×4.0 screws that secure the top cover to the computer.



8. Lift the rear edge of the top cover (1) until the left and right sides disengage from the base enclosure.
9. Remove the top cover (2).



Reverse this procedure to install the top cover.

Power button board

Description	Spare part number
Power button board (includes cable)	689686-001

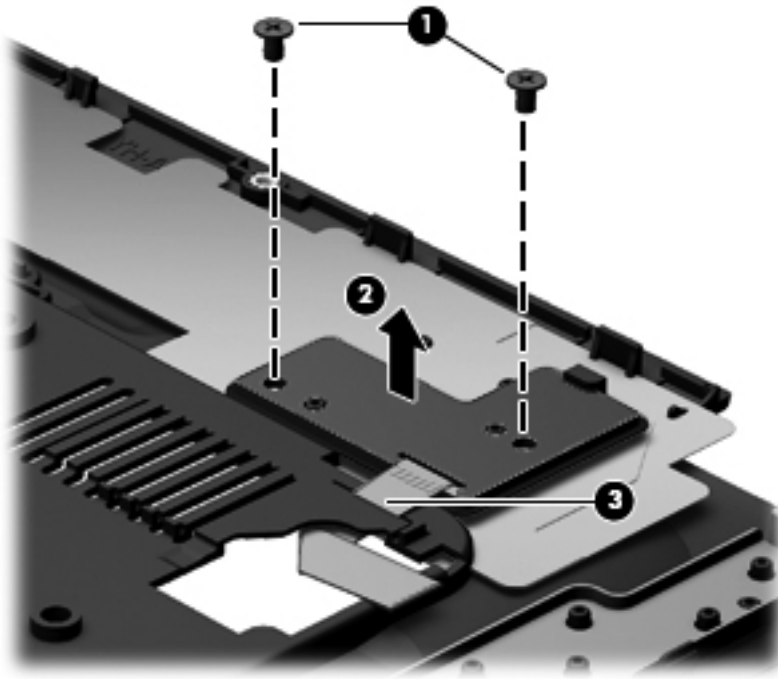
Before removing the power button board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 32](#)), and then remove the following components:
 - Memory module/wireless module compartment cover (see [WLAN module on page 41](#))
 - Hard drive (see [Hard drive on page 46](#))
 - Keyboard (see [Keyboard on page 51](#))
 - Top cover (see [Top cover on page 55](#))

To remove the power button board:

1. Position the top cover upright.
2. Remove the two Phillips PM2.0×3.0 screws **(1)** that secure the power button board to the top cover.

3. Remove the power button board (2) while pulling the cable through the hole in the top cover (3).



Reverse this procedure to install the power button board and cable.

TouchPad button board

Description	Spare part number
TouchPad button board (includes bracket and cables)	689688-001

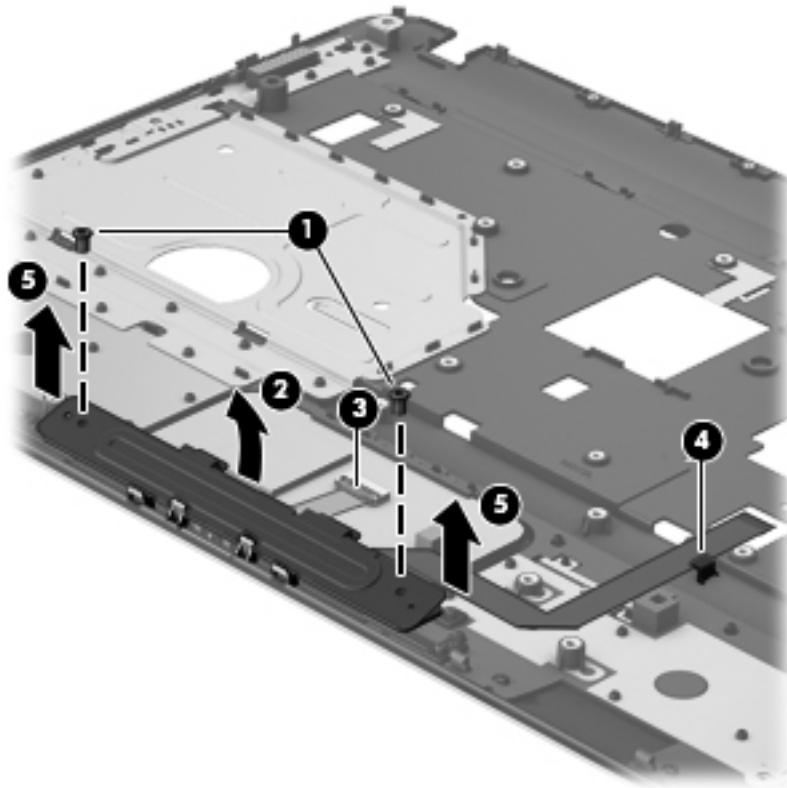
Before removing the TouchPad button board, follow these steps:

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 32](#)), and then remove the following components:
 - Memory module/wireless module compartment cover (see [WLAN module on page 41](#))
 - Hard drive (see [Hard drive on page 46](#))
 - Keyboard (see [Keyboard on page 51](#))
 - Top cover (see [Top cover on page 55](#))

To remove the TouchPad button board:

1. Position the top cover upside down.
2. Remove the two Phillips PM2.0×3.0 screws **(1)** that secure the TouchPad button board and bracket to the top cover.
3. Remove the bracket **(2)**.
4. Release the ZIF connector to the TouchPad board cable **(3)**, and then disconnect the cable from the TouchPad board. (The TouchPad board is attached to the top cover and cannot be removed.)

5. Remove the TouchPad button board cable (4) from the opening in the top cover, and then remove the TouchPad button board (5).



Reverse this procedure to install the TouchPad button board.

Speakers

Description	Spare part number
Speakers (includes left and right speakers and cable)	689693-001

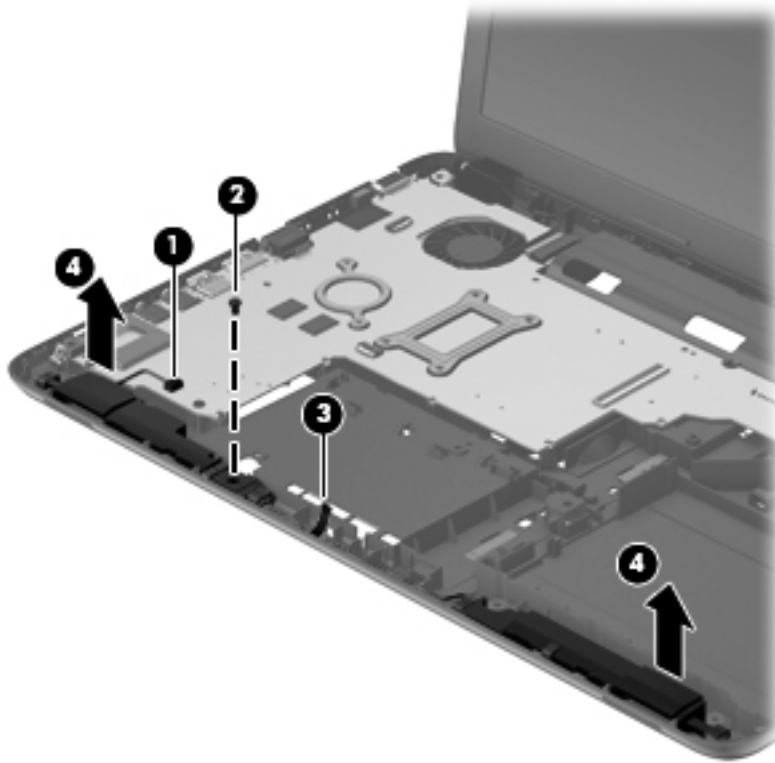
Before removing the speakers, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 32](#)), and then remove the following components:
 - Memory module/wireless module compartment cover (see [WLAN module on page 41](#))
 - Hard drive (see [Hard drive on page 46](#))
 - Keyboard (see [Keyboard on page 51](#))
 - Top cover (see [Top cover on page 55](#))

To remove the speakers:

1. Position the computer upright with the front toward you.
2. Disconnect the speaker cable **(1)** from the system board.
3. Remove the Phillips PM2.5×4.0 screw **(2)** that secures the speakers to the base enclosure.
4. Lift the tape **(3)** that secures the wire between the speakers.

5. Remove the speakers (4).



Reverse this procedure to install the speakers.

USB board

Description	Spare part number
USB board (includes cable)	689687-001

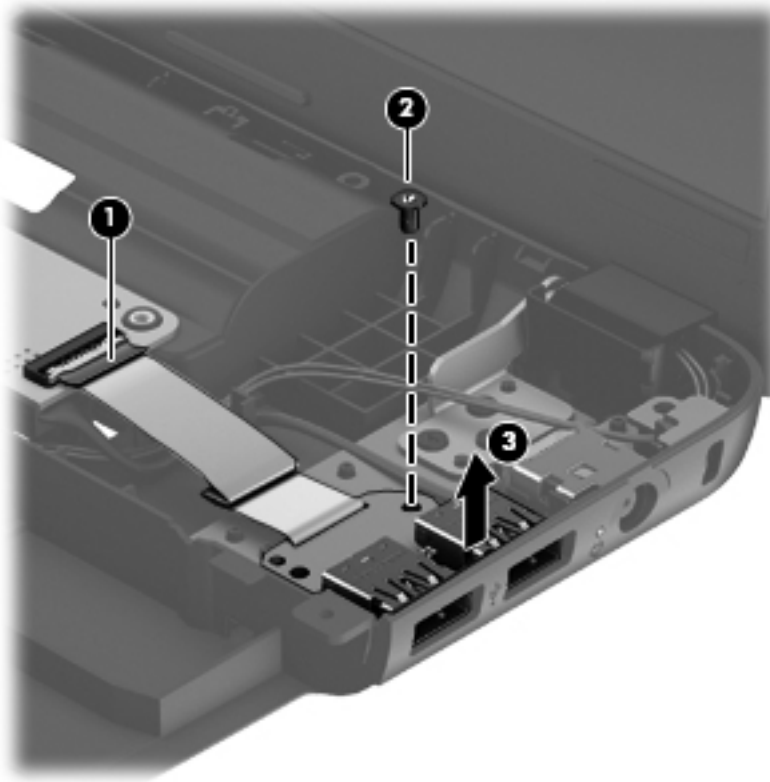
Before removing the USB board, follow these steps:

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 32](#)), and then remove the following components:
 - Memory module/wireless module compartment cover (see [WLAN module on page 41](#))
 - Hard drive (see [Hard drive on page 46](#))
 - Keyboard (see [Keyboard on page 51](#))
 - Top cover (see [Top cover on page 55](#))

To remove the USB board:

1. Position the computer upright with the right side toward you.
2. Release the ZIF connector **(1)** that secures the USB board cable to the system board, and then disconnect the USB board cable.
3. Remove the Phillips PM2.5×5.0 screw **(2)** that secures the USB board to the base enclosure.

4. Remove the USB board (3).



Reverse this procedure to install the USB board.

Power connector cable

Description	Spare part number
Power connector cable	689678-001

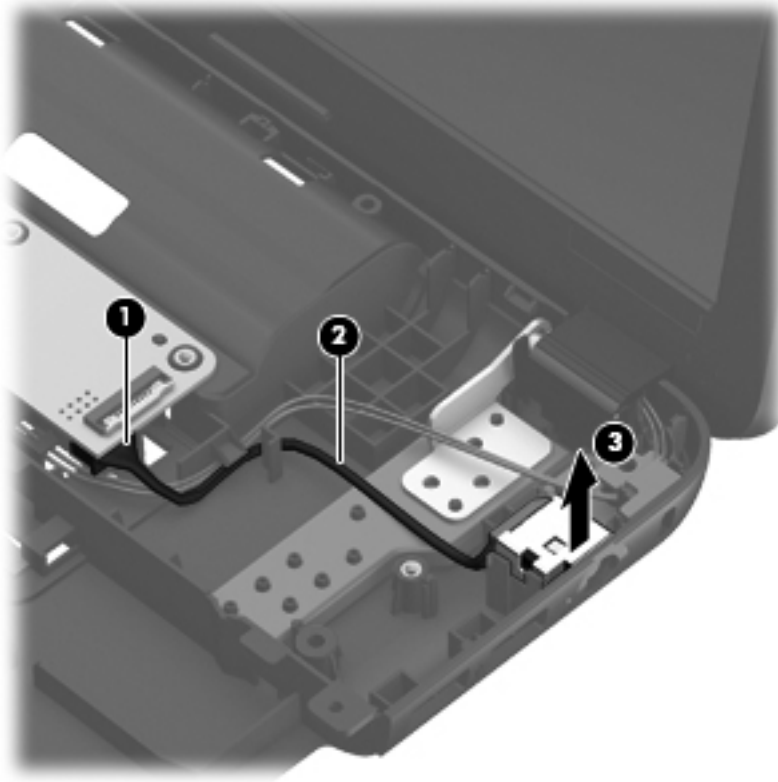
Before removing the power connector cable, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 32](#)), and then remove the following components:
 - Memory module/wireless module compartment cover (see [WLAN module on page 41](#))
 - Hard drive (see [Hard drive on page 46](#))
 - Keyboard (see [Keyboard on page 51](#))
 - Top cover (see [Top cover on page 55](#))

To remove the power connector cable:

1. Position the computer upright with the right side toward you.
2. Disconnect the power connector cable **(1)** from the system board.
3. Release the power connector cable from the clips **(2)** built into the base enclosure.

4. Remove the power connector cable (3).



Reverse this procedure to install the power connector cable.

Display assembly

This section describes removing the display assembly in its entirety and disassembling all the display subcomponents.

If you only need to remove the display bezel, webcam/microphone module, or display panel, you do not need to remove the entire display assembly from the computer. See [Display subcomponents \(bezel, webcam, panel\) on page 33](#) for more information about removing the display subcomponents that do not require that you remove the entire display assembly from the computer.

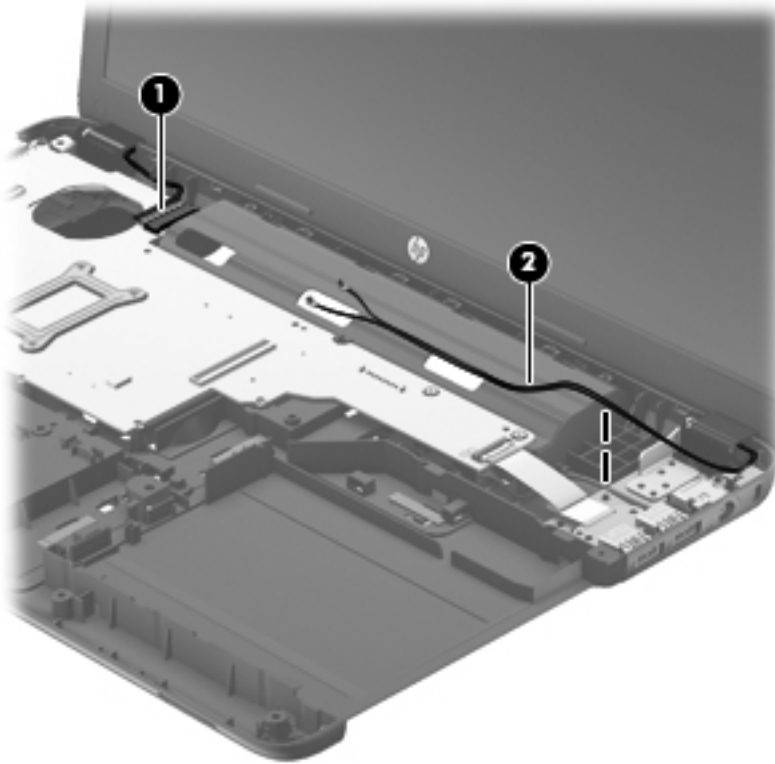
Description	Spare part number
39.6-cm (15.6-inch), HD, LED, BrightView display panel	689690-001
Antennas (includes wireless antenna cables and transceivers)	689670-001
Display bezel for use with Compaq models	689676-001
Display bezel for use with HP models	689675-001
Display cable (includes display panel cable and webcam/microphone cable)	689677-001
Display enclosure for use with Compaq models	689673-001
Display enclosure for use with black HP models	689672-001
Display enclosure for use with blue HP models	689671-001
Hinges (includes hinges and left and right hinge covers)	689679-001
Webcam/microphone module	685112-001

Before removing the display assembly in its entirety, 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 32](#)).
5. Disconnect the WLAN module antenna cables from the WLAN module (see [WLAN module on page 41](#)).
6. Remove the following components:
 - Hard drive (see [Hard drive on page 46](#))
 - Keyboard (see [Keyboard on page 51](#))
 - Top cover (see [Top cover on page 55](#))
 - USB board (see [USB board on page 65](#))
 - Power connector cable (see [Power connector cable on page 67](#))

To remove the display assembly in its entirety:

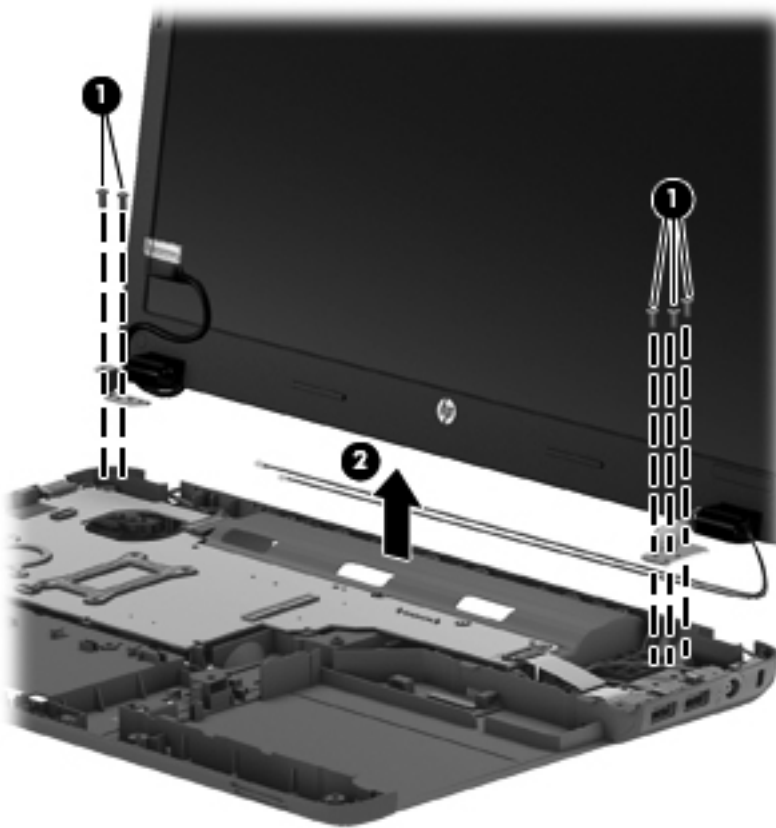
1. Disconnect the display panel cable (1) from the system board.
2. Release the wireless antenna cables from the clips (2) built into the base enclosure.



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

3. Remove the five Phillips PM2.5×7.0 screws (1) that secure the display assembly to the computer.

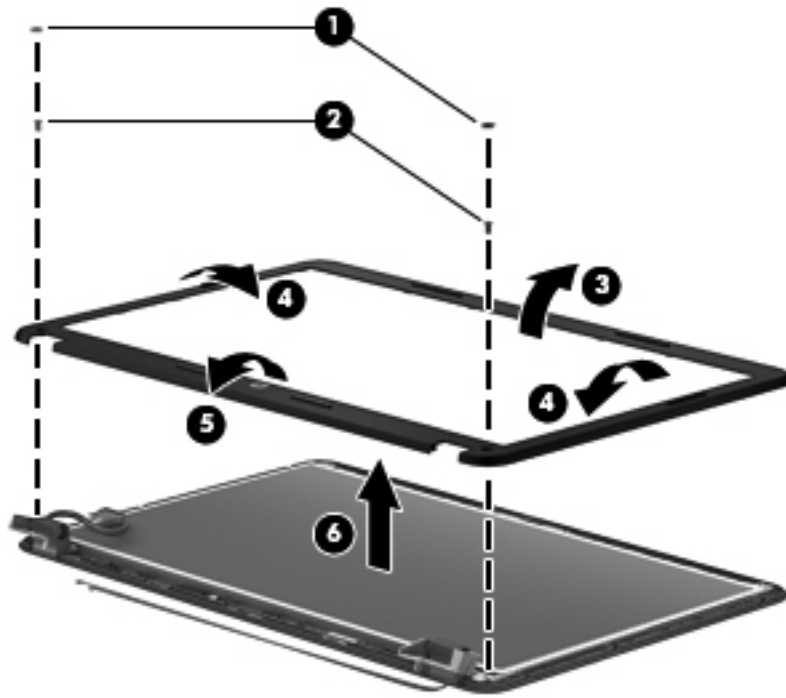
4. Remove the display assembly (2).



If it is necessary to replace any of the display assembly subcomponents:

1. To remove the display bezel:
 - a. Remove the two Mylar screw covers (1) and the two Phillips PM2.5×4.0 screws (2) that secure the display bezel to the display assembly. The Mylar screw covers are included with the display bezel spare part kit.
 - b. Flex the bottom edge (3), the left and right sides (4), and the top edge (5) of the display bezel until the bezel disengages from the display enclosure.

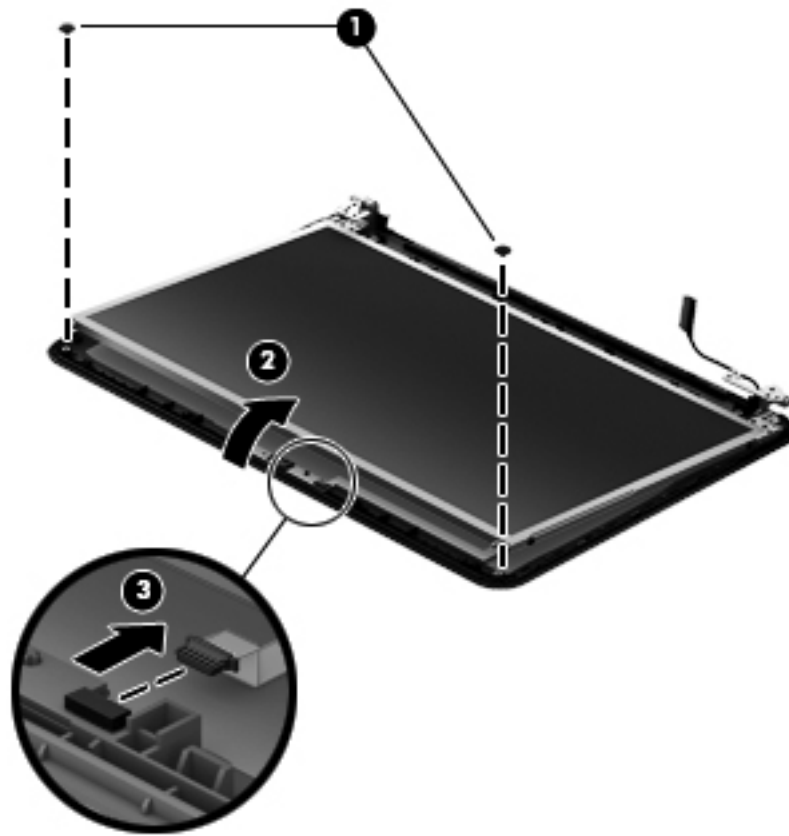
- c. Remove the display bezel (6).



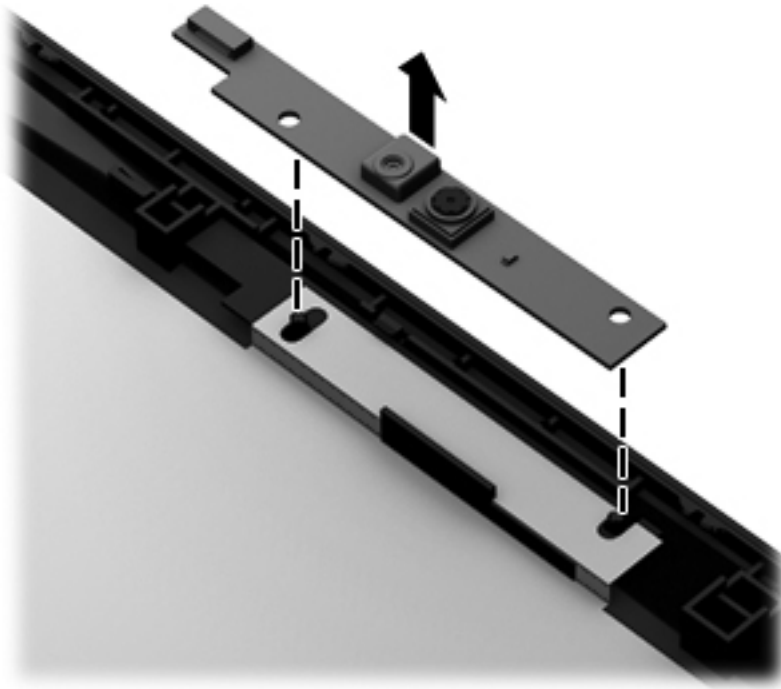
2. To remove the webcam/microphone module:

- a. Remove the two broadhead Phillips PM2.5×2.5 screws (1) that secure the display panel to the enclosure.
- b. Tilt the display panel (2) up.

- c. Disconnect the module cable (3) from the module.

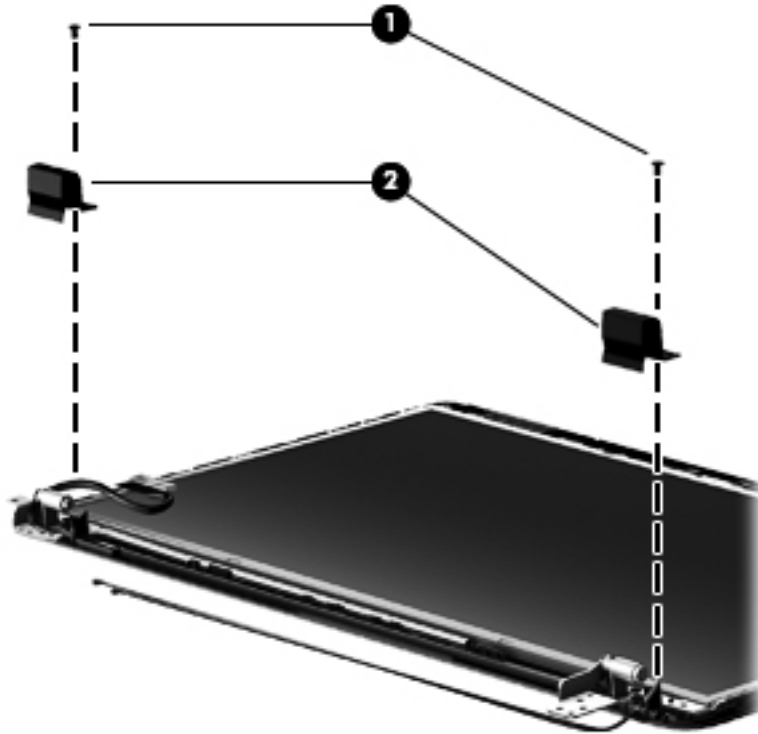


- d. Remove the webcam/microphone module.

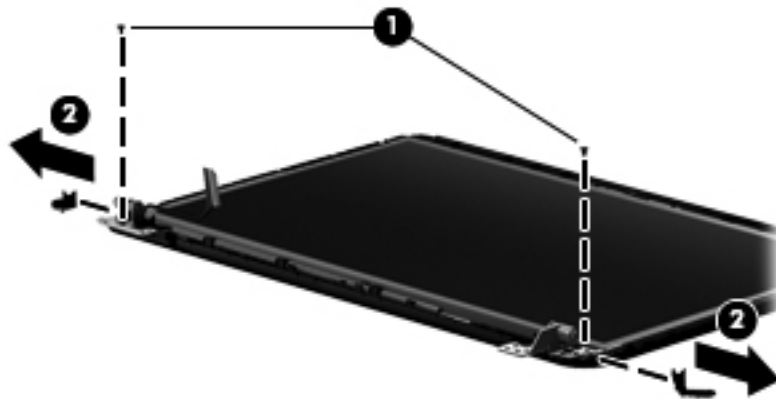


3. To remove the hinge covers:

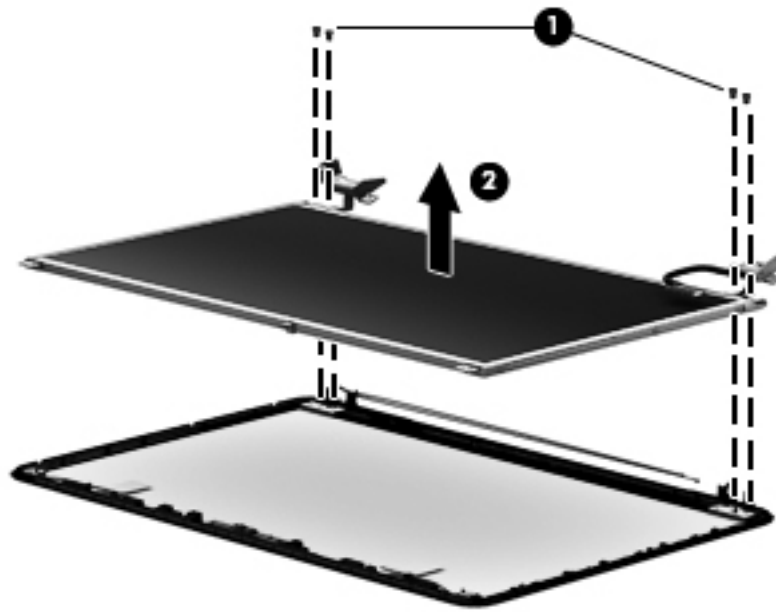
- a. Remove the two Phillips PM2.5×4.0 screws (1) that secure the top hinge covers to the display enclosure, and then remove the top hinge covers (2).



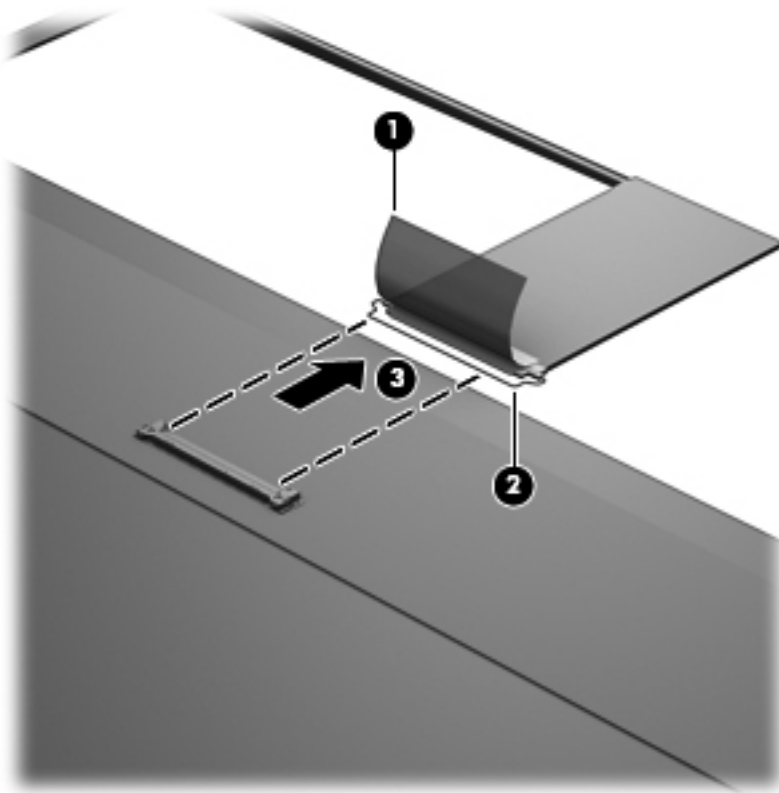
- b. Remove the two Phillips PM2.0×3.0 screws (1) that secure the side hinge covers to the display enclosure, and then remove the side hinge covers (2).



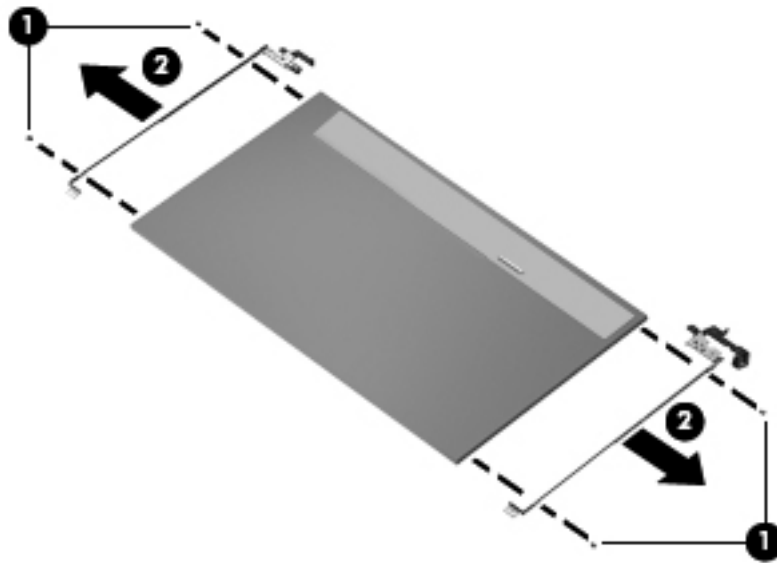
4. To remove the display panel, cable, and hinges:
- Remove the four Phillips PM2.5×4.0 screws (1) that secure the display panel to the enclosure, and then remove the display panel (2) from the enclosure.



- Release the adhesive strip (1) that secures the display panel cable to the display panel, and then disconnect (2) and remove (3) the cable.



- c. Remove the four Phillips PM2.0×3.0 screws **(1)** that secure the display hinges to the display panel.
- d. Remove the display hinges **(2)**.



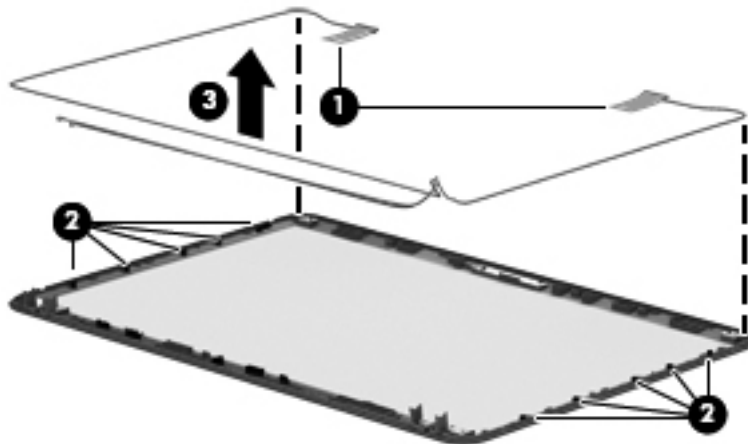
5. To remove the wireless antenna cables and transceivers:

- a. Release the wireless antenna transceivers **(1)** from the display enclosure. (The wireless antenna transceivers are attached to the display enclosure with double-sided tape.)



NOTE: Some models may only have one antenna transceiver.


- b. Release the wireless antenna cables from the clips **(2)** built into the display enclosure.
- c. Remove the wireless antenna cables and transceivers **(3)**.




- 6.** If replacing the display enclosure, be sure that the other subcomponents (including the webcam/microphone module, the antenna receivers, and all associated cables and hardware) are transferred to the new enclosure.

Reverse this procedure to reassemble and install the display assembly.

System board


 **NOTE:** On models with Intel processors, you can remove the processor from the system board. The processor is included with the system board in AMD models and cannot be removed.

 **NOTE:** The system board spare part kit includes replacement thermal materials (including a thermal pad).

Description	Spare part number
System board for use only in models with an AMD E2-1800 processor	688277-001
System board for use only in models with an AMD E1-1200 processor	688278-001
System board for use only in models with an Intel Core i5 or i3 processor	685107-001
System board for use only in models with an Intel Pentium or Celeron processor	685783-001
Thermal pad (for use with all models)	651046-001

Before removing the system board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 32](#)).
5. Remove the following components:
 - WLAN module (see [WLAN module on page 41](#))
 - Hard drive (see [Hard drive on page 46](#))
 - Keyboard (see [Keyboard on page 51](#))
 - Top cover (see [Top cover on page 55](#))
 - Speakers (see [Speakers on page 63](#))
 - USB board (see [USB board on page 65](#))
 - Power connector cable (see [Power connector cable on page 67](#))
 - Display assembly (see [Display assembly on page 69](#))

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

- Memory module (see [Memory module on page 44](#))
- RTC battery (see [RTC battery on page 48](#))
- Fan/heat sink assembly (see [Fan/heat sink assembly on page 83](#))
- Processor (see [Processor on page 87](#))

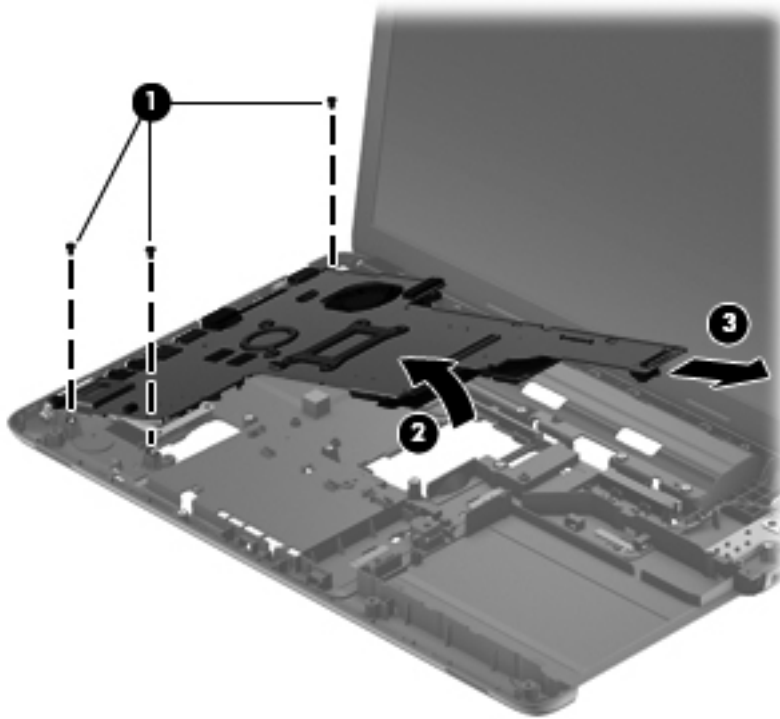
To remove the system board:


1. Position the computer upside down, and then disconnect the optical drive connector cable from the system board.



2. Position the computer upright, and then remove the three Phillips PM2.5×4.0 screws **(1)** that secure the system board to the base enclosure.

3. Tilt the system board up to the left slightly (2), and then remove the system board (3).



 **NOTE:** A thermal pad services a component on the bottom of the system board. Replacement thermal material is included with all system board spare part kits.

Reverse this procedure to install the system board.

Optical drive cable

Description	Spare part number
Optical drive cable (includes cable bracket)	685084-001

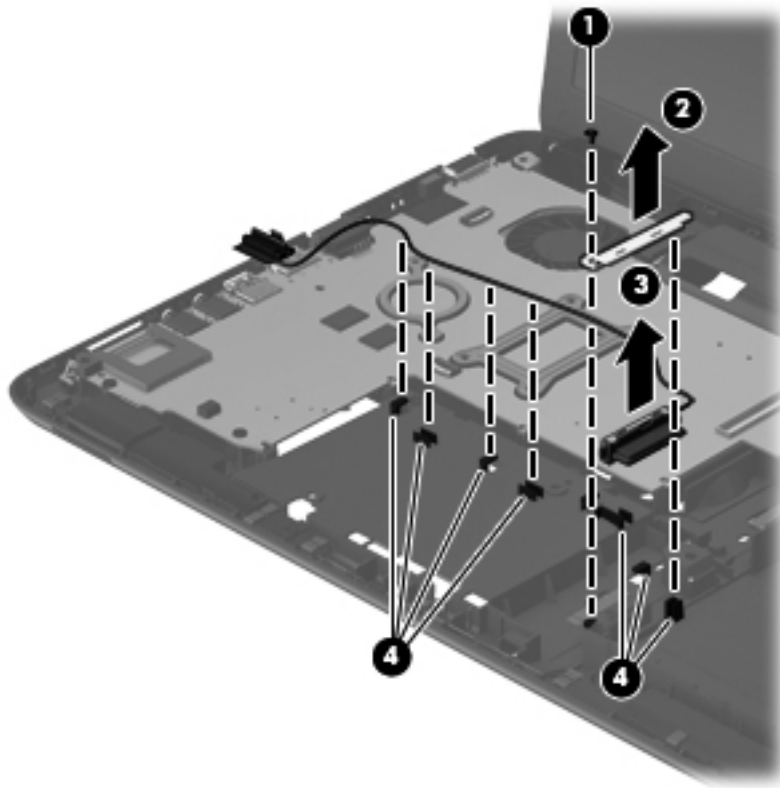
Before removing the optical drive cable, follow these steps:

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 32](#)), and then remove the following components:
 - WLAN module (see [WLAN module on page 41](#))
 - Hard drive (see [Hard drive on page 46](#))
 - Keyboard (see [Keyboard on page 51](#))
 - Top cover (see [Top cover on page 55](#))
 - Speakers (see [Speakers on page 63](#))
 - USB board (see [USB board on page 65](#))
 - Power connector cable (see [Power connector cable on page 67](#))
 - Display assembly (see [Display assembly on page 69](#))
 - System board (see [System board on page 78](#))

Remove the optical drive cable:

1. Remove the Phillips PM2.0×3.0 screw **(1)** that secures the optical drive cable and cable bracket to the base enclosure.
2. Remove the cable bracket **(2)** and cable **(3)**.

3. Release the optical drive cable from the clips (4) built into the base enclosure.



Reverse this procedure to install the optical drive cable.

Fan/heat sink assembly



NOTE: The fan/heat sink assembly spare part kit includes replacement thermal materials.

Description	Spare part number
Fan/heat sink assembly for use only in models with an AMD processor	688281-001
Fan/heat sink assembly for use only in models with an Intel processor	685086-001



NOTE: To properly ventilate the computer, allow at least 7.6 cm (3 in) of clearance on the left side of the computer. The computer uses an electric fan for ventilation. The fan is controlled by a temperature sensor and is designed to turn on 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.

Before removing the fan/heat sink 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 32](#)), and then remove the following components:
 - WLAN module (see [WLAN module on page 41](#))
 - Hard drive (see [Hard drive on page 46](#))
 - Keyboard (see [Keyboard on page 51](#))
 - Top cover (see [Top cover on page 55](#))
 - Speakers (see [Speakers on page 63](#))
 - USB board (see [USB board on page 65](#))
 - Power connector cable (see [Power connector cable on page 67](#))
 - Display assembly (see [Display assembly on page 69](#))
 - System board (see [System board on page 78](#))


To remove the fan/heat sink assembly:


1. Disconnect the fan cable **(1)** from the system board.
2. Loosen the captive screws on the heat sink **(2)** that secure the fan/heat sink assembly to the system board.

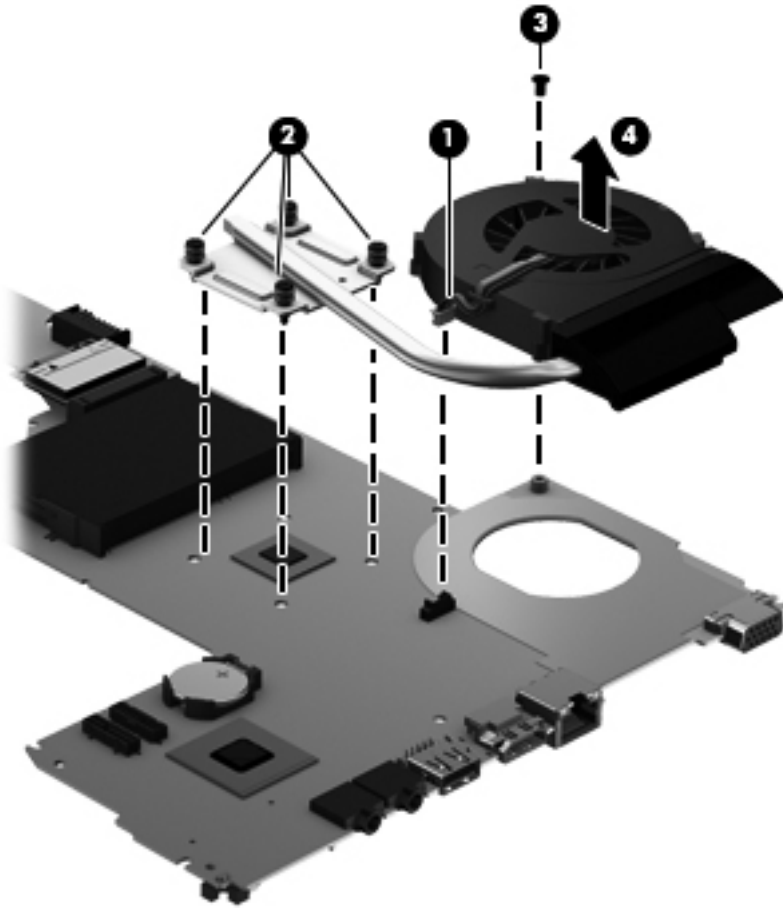



NOTE: The number of screws used to secure the fan/heat sink assembly to the system board varies by computer model.

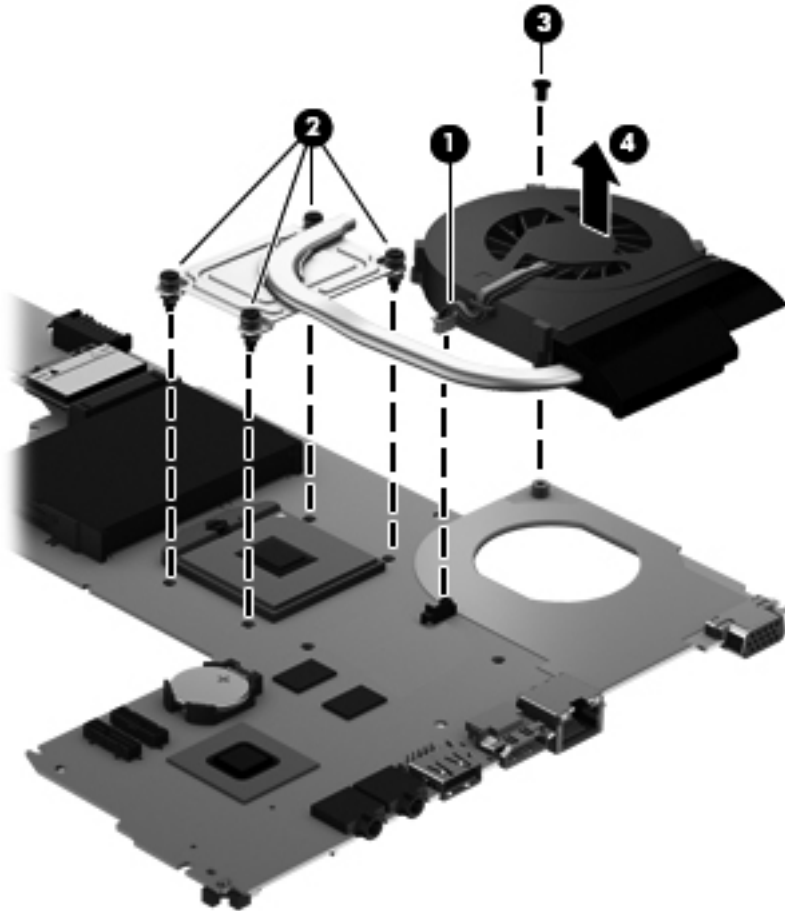
3. Remove the Phillips PM2.0×3.0 screw (3) that secures the fan to the system board.
4. Remove the fan/heat sink assembly (4).

 **NOTE:** Due to the adhesive quality of the thermal material located between the heat sink and system board components, it may be necessary to move the heat sink from side to side to detach it.


 **NOTE:** The following illustration shows the fan/heat sink assembly removal process on a computer model equipped with an AMD processor.

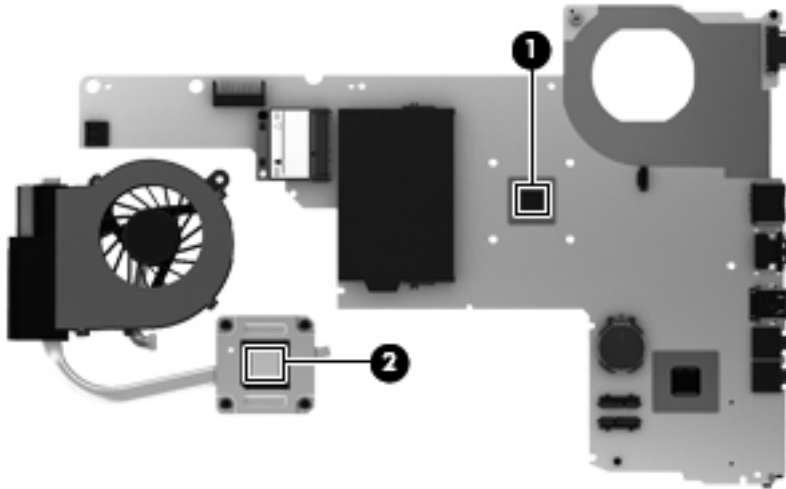


 **NOTE:** The following illustration shows the fan/heat sink assembly removal process on a computer model equipped with an Intel processor.



The thermal material must be thoroughly cleaned from the surfaces of the heat sink and the system board components each time the heat sink is removed. Replacement thermal materials are included with the fan/heat sink assembly, processor, and system board spare part kits.

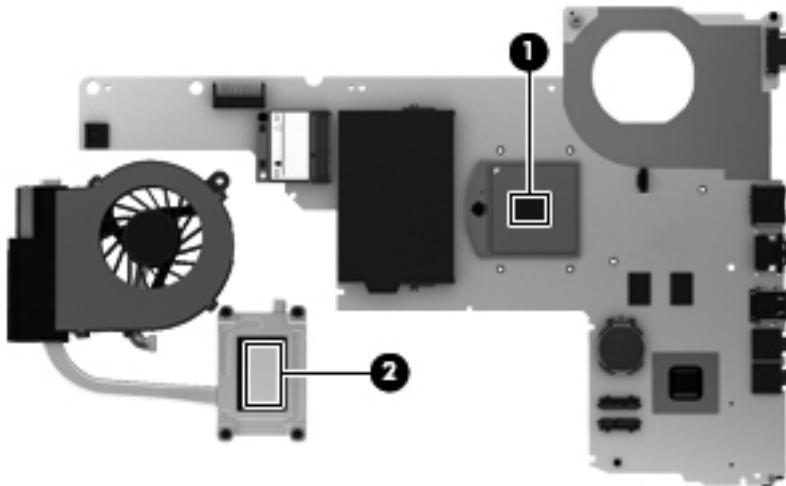
 **NOTE:** The following illustration shows the replacement thermal material locations on a computer model equipped with an AMD processor.



- Thermal paste is used on the processor (1) and the heat sink section (2) that services it




NOTE: The following illustration shows the replacement thermal material locations on a computer model equipped with an Intel processor.




- Thermal paste is used on the processor (1) and the heat sink section (2) that services it

Reverse this procedure to reassemble and install the fan/heat sink assembly.

Processor

 **NOTE:** This section applies only to computer models equipped with an Intel processor.

 **NOTE:** On models with Intel processors you can remove the processor from the system board. The processor is included with the system board in AMD models and cannot be removed.

 **NOTE:** The processor spare part kit includes replacement thermal materials.

Description	Spare part number
Intel Core i3-3110M 2.40-GHz processor (1600-MHz, 3.0-MB L3 cache, dual core, 35 W)	682417-001
Intel Core i3-2370M 2.40-GHz processor (1333-MHz, 3.0-MB L3 cache, dual core, 35 W)	677152-001
Intel Core i3-2350M 2.30-GHz processor (1333-MHz, 3.0-MB L3 cache, dual core, 35 W)	653340-001
Intel Pentium B970 2.30-GHz processor (1333-MHz, 2.0-MB L3 cache, dual core, 35 W)	676785-001
Intel Pentium B950 2.10-GHz processor (1333-MHz, 2.0-MB L3 cache, dual core, 35 W)	653338-001
Intel Celeron B820 1.70-GHz processor (1333-MHz, 2.0-MB L3 cache, dual core, 35 W)	690537-001


Before removing the processor, follow these steps:

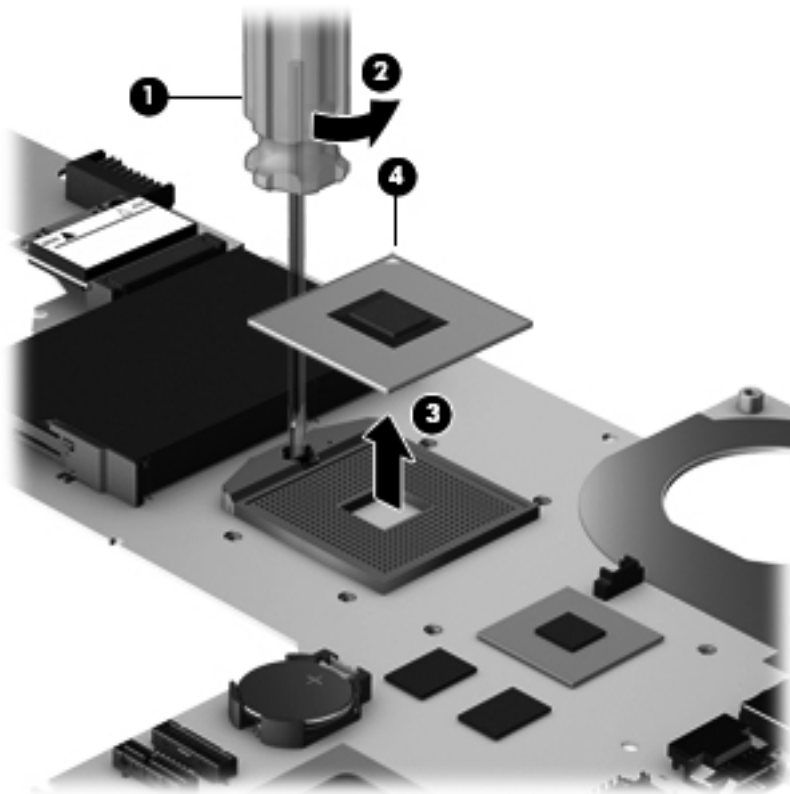
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 32](#)), and then remove the following components:
 - WLAN module (see [WLAN module on page 41](#))
 - Hard drive (see [Hard drive on page 46](#))
 - Keyboard (see [Keyboard on page 51](#))
 - Top cover (see [Top cover on page 55](#))
 - Speakers (see [Speakers on page 63](#))
 - USB board (see [USB board on page 65](#))
 - Power connector cable (see [Power connector cable on page 67](#))
 - Display assembly (see [Display assembly on page 69](#))
 - System board (see [System board on page 78](#))
 - Fan/heat sink assembly (see [Fan/heat sink assembly on page 83](#))

To remove the processor:

1. Use a flat-bladed screw driver **(1)** to turn the processor locking screw one-half turn counterclockwise **(2)** until you hear a click.

2. Lift the processor (3) straight up, and then remove it.

 **NOTE:** The gold triangle (4) on the processor must be aligned with the triangle icon embossed on the processor socket when you install the processor.



Reverse this procedure to install the processor.

5 Using Setup Utility (BIOS) and System Diagnostics

Setup Utility, 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). Setup Utility (BIOS) includes settings for the types of devices installed, the startup sequence of the computer, and the amount of system and extended memory.

Starting Setup Utility (BIOS)

To start Setup Utility (BIOS), 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 Setup Utility (BIOS).

Information about how to navigate in Setup Utility (BIOS) is located at the bottom of the screen.



NOTE: Use extreme care when making changes in Setup Utility (BIOS). Errors can prevent the computer from operating properly.

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 Setup Utility (BIOS).

1. Start Setup Utility (BIOS).
2. Use the arrow keys to select **Main**.
3. To exit Setup Utility (BIOS) without saving your changes, use the tab key and the arrow keys to select **Exit > Exit Discarding Changes**, 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.

Using System Diagnostics

System Diagnostics allows you to run diagnostic tests to determine if the computer hardware is functioning properly.

To start 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		
Depth	23.1 cm	9.09 in
Width	34.2 cm	13.46 in
Height (front to back)	3.00 to 3.55 cm	1.18 to 1.40 in
Weight	2.19 kg	4.84 lb
Input power		
Operating voltage and current	18.5 V dc @ 3.5 A or 19.5 V dc @ 3.33 A – 65 W	
	19 V dc @ 4.74 A or 19.5 V dc @ 4.62 A – 90 W	
Temperature		
Operating	5°C to 35°C	41°F to 95°F
Nonoperating	-20°C to 60°C	-4°F to 140°F
Relative humidity (noncondensing)		
Operating	10% to 90%	
Nonoperating	5% to 95%	
Maximum altitude (unpressurized)		
Operating	-15 m to 3,048 m	-50 ft to 10,000 ft
Nonoperating	-15 m to 12,192 m	-50 ft to 40,000 ft
NOTE: Applicable product safety standards specify thermal limits for plastic surfaces. The device operates well within this range of temperatures.		

39.6-cm (15.6-in), HD display specifications

	Metric	U.S.
Active diagonal size	39.6-cm	15.6-in
Resolution	1366x768 (HD)	
Active area	344.232x193.536	
PPI	100	
Surface treatment	Anti-glare or BrightView	
Contrast ratio	300:1 (typical) – Anti-glare 500:1 – BrightView	
Response time	8 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 (R, G, B)	+/- 0.03	
Color gamut	60% (typical)	

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
Length	100.4 mm	100.4 mm	100.4 mm	100.4 mm
Width	69.9 mm	69.9 mm	69.9 mm	69.9 mm
Weight	115 g	98.8 g	98.8 g	98.8 g
Interface type	SATA	SATA	SATA	SATA
Transfer rate				
Synchronous (maximum)	300 MB/sec	300 MB/sec	300 MB/sec	300 MB/sec
Security	ATA security	ATA security	ATA security	ATA security
Seek times (typical read, including setting)				
Single track	1.5 ms	2.0 ms	3.0 ms	1.5 ms
Average (read/write)	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	976,773,168	625,142,448
Disk rotational speed	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.				
NOTE: Certain restrictions and exclusions apply. Contact technical support for details.				

7 Backing up, restoring, and recovering

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

Creating backups

1. Use HP Recovery Manager to create recovery media immediately after you set up the working computer.
2. As you add hardware and software programs, create system restore points.
3. As you add photos, video, music, and other personal files, create a backup of your system and personal information.

Creating recovery media to recover the original system

After you successfully set up the computer, you should create recovery discs or a recovery flash drive using HP Recovery Manager. You will need these recovery discs or recovery flash drive to perform a system recovery should the hard drive become corrupted. A system recovery reinstalls the original operating system, and then configures the settings for the default programs.

What you need to know

- Only one set of recovery media can be created. Handle these recovery tools carefully, and keep them in a safe place.
- HP Recovery Manager examines the computer and determines the required storage capacity for the flash drive or the number of blank DVD discs that will be required.

Use DVD-R, DVD+R, DVD-R DL, DVD+R DL discs or a flash drive. Do not use rewriteable discs such as CD±RW, DVD±RW, double-layer DVD±RW, and BD-RE (rewritable Blu-ray) discs; they are not compatible with HP Recovery Manager software.

- If your computer does not include an integrated optical drive, you can use an optional external optical drive (purchased separately) to create recovery discs, or you can obtain recovery discs for your computer from the HP website. If you use an external optical drive, it must be connected directly to a USB port on the computer, not to a USB port on an external device, such as a USB hub.
- Be sure that the computer is connected to AC power before you begin creating the recovery media.
- The creation process can take up to an hour or more. Do not interrupt the creation process.

- Store the recovery media in a safe location, separate from the computer.
- If necessary, you can exit the program before you have finished creating the recovery media. The next time you open HP Recovery Manager, you will be prompted to continue the process.

Creating the recovery media

1. Select **Start** and type `recovery` in the search field. Select **Recovery Manager** from the list. Allow the action to continue, if prompted.
2. Click **Recovery Media Creation**.
3. Follow the on-screen instructions to continue.

To recover, see [Recovering the original system using HP Recovery Manager on page 99](#).

Creating system restore points

A system restore point is a snapshot of certain hard drive contents saved by Windows System Restore at a specific time. A restore point contains information such as registry settings that Windows uses. Restoring to a previous restore point allows you to reverse changes that have been made to the system since the restore point was created.

Restoring to an earlier system restore point does not affect data files saved or emails created since the last restore point, but it does affect software you may have installed.

For example, if you download a photo from a digital camera and then restore the computer to the state it was on the previous day, the photo remains on the computer.

However, if you install photo viewing software and then restore your computer to the state it was on the previous day, the software will be uninstalled, and you won't be able to use it.

What you need to know

- If you restore to a restore point and then change your mind, you can undo the restoration.
- You should create system restore points:
 - Before you add or change software or hardware
 - Periodically, whenever the computer is running normally
- System Restore also saves shadow copies of files that have been changed since the last restore point was created. For more information about using shadow copies to restore, see Help and Support.

Creating a system restore point

1. Select **Start > Control Panel > System and Security > System**.
2. In the left pane, click **System Protection**.
3. Click the **System Protection** tab.
4. Click **Create**, and follow the on-screen instructions.

To restore, see [Restoring to a previous system restore point on page 98](#).

Backing up system and personal information

Your computer stores information that is important to you, such as files, emails, and photos, and you will want to keep that information even if you download a virus or the system stops working properly. How completely you are able to recover your files depends on how recent your backup is. As you add new software and data files, you should create backups on a regular basis.

Tips for a successful backup

- Number backup discs before inserting them into the optical drive.
- Store personal files in the Documents, Music, Pictures, and Videos libraries, and back up these folders periodically.
- Save customized settings 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 re-enter your preferences.

To create a screen shot:

1. Display the screen you want to save.
2. Copy the screen image:
To copy only the active window, press **alt+prt sc**.
To copy the entire screen, press **prt sc**.
3. Open a word-processing document or graphics editing program, and then select **Edit > Paste**. The screen image is added to the document.
4. Save and print the document.

What you need to know

- You can back up your information to an optional external hard drive, a flash drive, a network drive, or discs.
- Connect the computer to AC power during backups.
- Allow enough time for the backup. Depending on files sizes, it may take more than an hour.
- Verify the amount of free space on your backup storage device before you back up.
- You should back up:
 - Before adding or changing software or hardware.
 - Before the computer is repaired or restored.
 - On a regular schedule to be sure you have recent copies of personal information.
 - After you add many files—for example, if you saved videos from a birthday party.
 - Before using antivirus software to remove a malicious program.
 - After adding information that is hard to replace, such as pictures, videos, music, project files, or data records.

Creating a backup using Windows Backup and Restore

Windows allows you to back up files using Windows Backup and Restore. You can select the level you want to back up, from individual folders to drives. The backups are compressed to save space. To back up:

1. Select **Start > Control Panel > System and Security > Backup and Restore**.
2. Follow the on-screen instructions to schedule and create a backup.



NOTE: Windows includes the User Account Control feature to improve the security of the 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.

To restore, see [Restoring specific files using Windows Backup and Restore on page 98](#).

Restore and recovery

Restoring to a previous system restore point

Sometimes installing a software program causes your computer or Windows to behave unpredictably. Usually uninstalling the software fixes the problems. If uninstalling does not fix the problems, you can restore the computer to a previous system restore point (created at an earlier date and time).

To restore to a previous system restore point, when the computer was running correctly:

1. Select **Start > Control Panel > System and Security > System**.
2. In the left pane, click **System Protection**.
3. Click the **System Protection** tab.
4. Click **System Restore**, and follow the on-screen instructions.

Restoring specific files

If files are accidentally deleted from the hard disk and they can no longer be restored from the Recycle Bin, or if files become corrupt, restoring specific files is useful. Restoring specific files is also useful if you ever choose to recover the original system using HP Recovery Manager. You can only restore specific files that you have backed up before.

Restoring specific files using Windows Backup and Restore

Windows allows you to restore files that were backed up using Windows Backup and Restore:

1. Select **Start > Control Panel > System and Security > Backup and Restore**.
2. Follow the on-screen instructions to restore your backup.



NOTE: Windows includes the User Account Control feature to improve the security of the 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.

Recovering the original system using HP Recovery Manager

HP Recovery Manager software allows you to repair or recover the computer to its original factory state.


What you need to know

- HP Recovery Manager recovers only software that was installed at the factory. For software not provided with this computer, you must either download the software from the manufacturer's website or reinstall the software from the disc provided by the manufacturer.
- A system recovery should be used as a final attempt to correct computer issues. If you have not already tried restore points (see [Restoring to a previous system restore point on page 98](#)) and partial restores (see [Restoring specific files on page 98](#)), try them before using HP Recovery Manager to recover your system.
- A system recovery must be performed if the computer hard drive fails or if all attempts to correct any functional computer issues fail.
- If the recovery media do not work, you can obtain recovery discs for your system from the HP website.
- The Minimized Image Recovery option is recommended for advanced users only. All hardware-related drivers and software are re-installed, but other software applications are not. Do not interrupt the process until it is complete, otherwise the recovery will fail.

Recovering using HP Recovery partition (select models only)

The HP Recovery partition (select models only), allows you to restore your system without the need for recovery discs or a recovery flash drive. This type of recovery can only be used if the hard drive is still working.

To check for the presence of a recovery partition, select **Start**, right-click **Computer** then select **Manage > Disk Management**. If the recovery partition is present, a Recovery drive is listed in the window.

 **NOTE:** Recovery discs have been included if your computer did not ship with a recovery partition.

1. Access HP Recovery Manager in either of the following ways:
 - Select **Start** and type `recovery` in the search field. Select **Recovery Manager** from the list.
 - or –
 - 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. Then press `f11` while the “F11 (System Recovery)” message is displayed on the screen.
2. Click **System Recovery** in the **HP Recovery Manager** window.
3. Follow the on-screen instructions.

Recovering using the recovery media

1. If possible, back up all personal files.
2. Insert the first recovery disc into the optical drive on your computer or an optional external optical drive, and then restart the computer.

– or –

Insert the recovery flash drive into a USB port on your computer, and then restart the computer.



NOTE: If the computer does not automatically restart in HP Recovery Manager, change the computer boot order. See [Changing the computer boot order on page 100](#).

3. Press **f9** at system bootup.
4. Select the optical drive or the flash drive.
5. Follow the on-screen instructions.

Changing the computer boot order

To change the boot order for recovery discs:

1. Restart the computer.
2. Press **esc** while the computer is restarting, and then press **f9** for boot options.
3. Select **Internal CD/DVD ROM Drive** from the boot options window.

To change the boot order for a recovery flash drive:

1. Insert the flash drive into a USB port.
2. Restart the computer.
3. Press **esc** while the computer is restarting, and then press **f9** for boot options.
4. Select the flash drive from the boot options window.

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

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 H05VV-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. Caution must be exercised when removing and handling the backlight to avoid damaging this component and causing exposure to the mercury.

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

📝 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.eiai.org>.

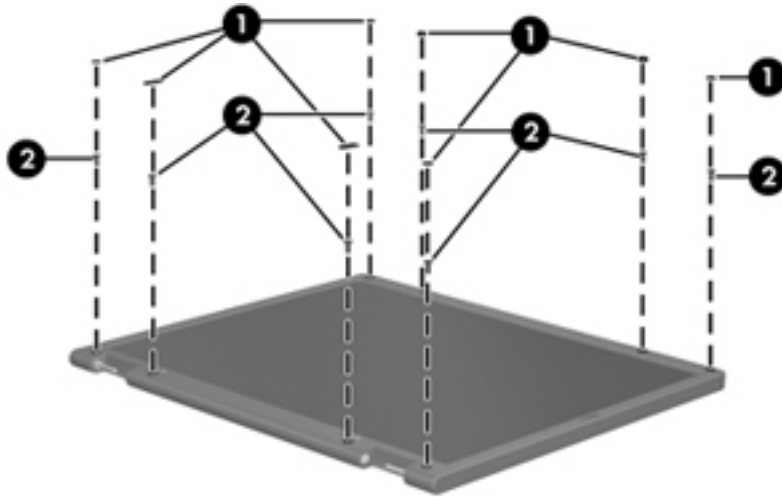
This section provides disassembly instructions for the display assembly. The display assembly must be disassembled to gain access to the backlight **(1)** and the liquid crystal display (LCD) panel **(2)**.



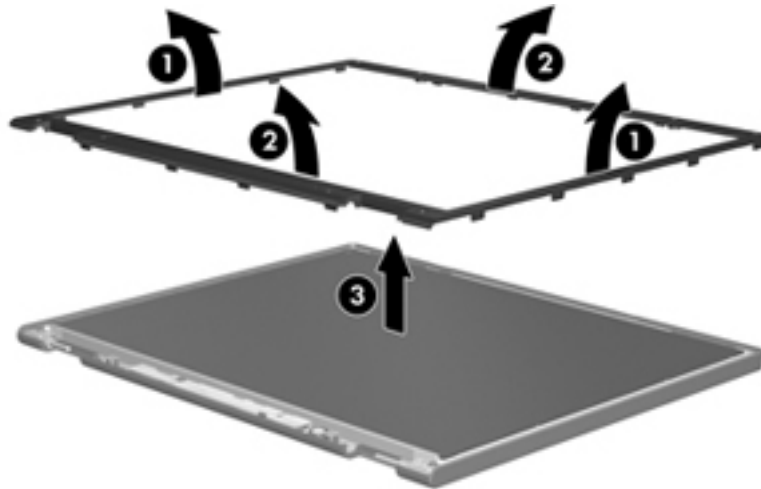
📝 NOTE: The procedures provided in this chapter are general disassembly instructions. Specific details, such as screw sizes, quantities, and locations, and component shapes and sizes, can vary from one computer model to another.

Perform the following steps:

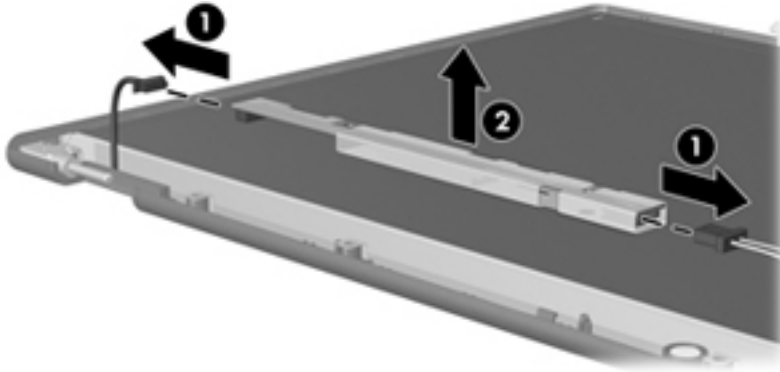
1. Remove all screw covers (1) and screws (2) that secure the display bezel to the display assembly.



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

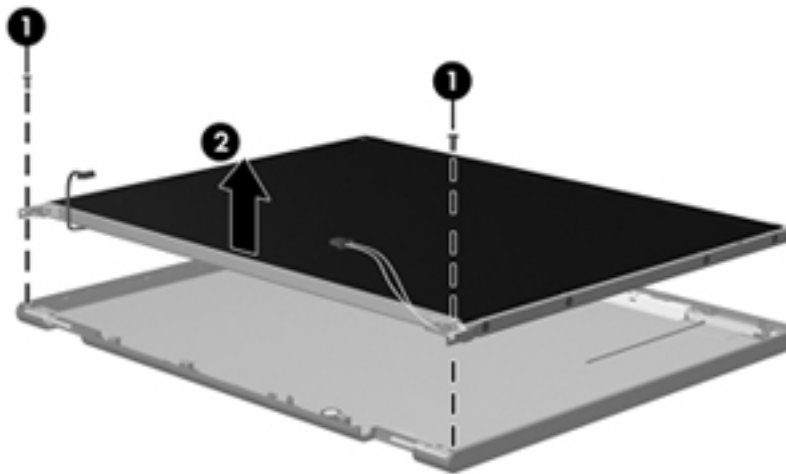


4. Disconnect all display panel cables (1) from the display inverter and remove the inverter (2).



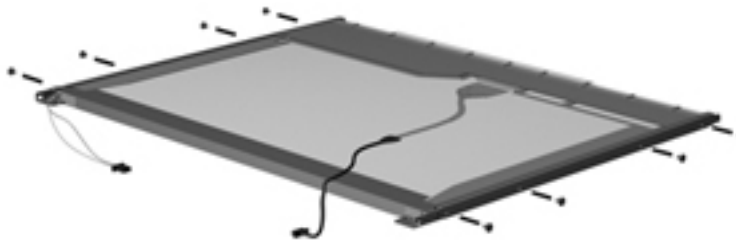
5. Remove all screws (1) that secure the display panel assembly to the display enclosure.

6. Remove the display panel assembly (2) from the display enclosure.



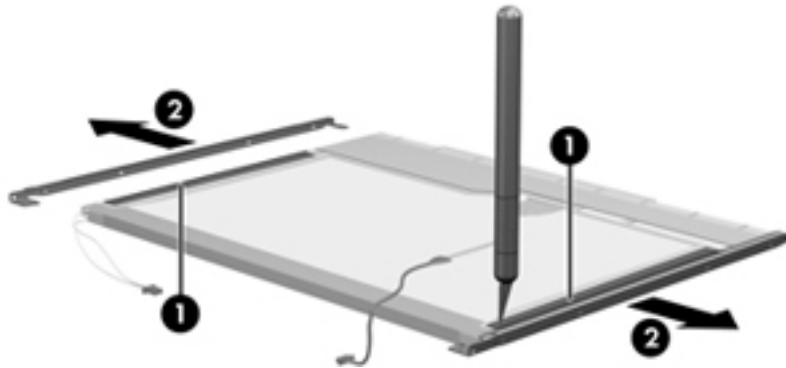
7. Turn the display panel assembly upside down.

8. Remove all screws that secure the display panel frame to the display panel.



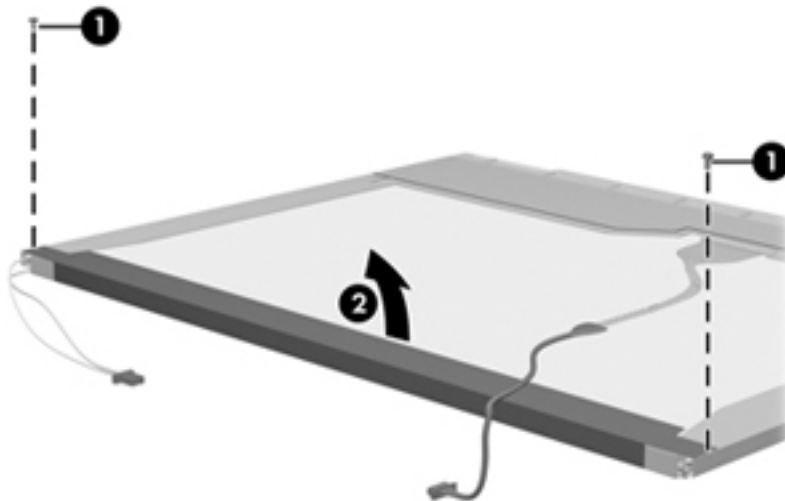
9. Use a sharp-edged tool to cut the tape (1) that secures the sides of the display panel to the display panel frame.

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



11. Remove the screws (1) that secure the backlight cover to the display panel.

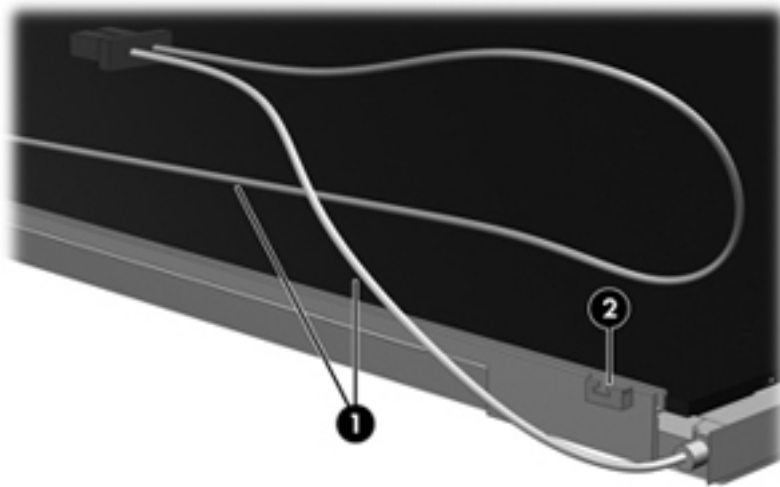
12. Lift the top edge of the backlight cover (2) and swing it outward.



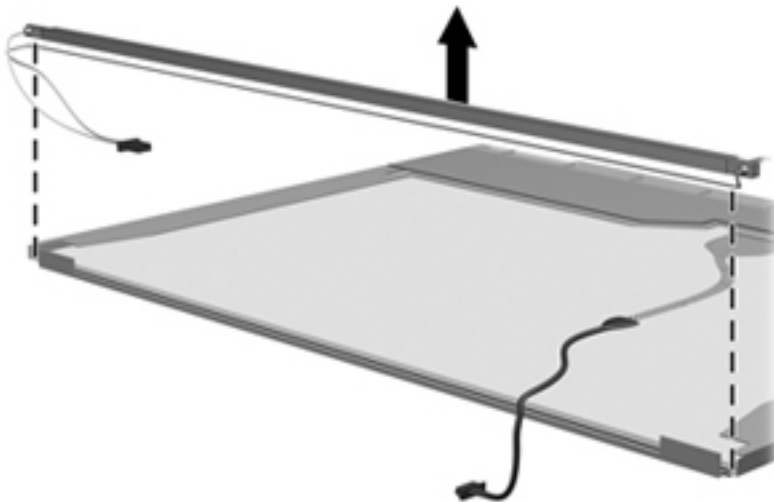
13. Remove the backlight cover.

14. Turn the display panel right-side up.

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

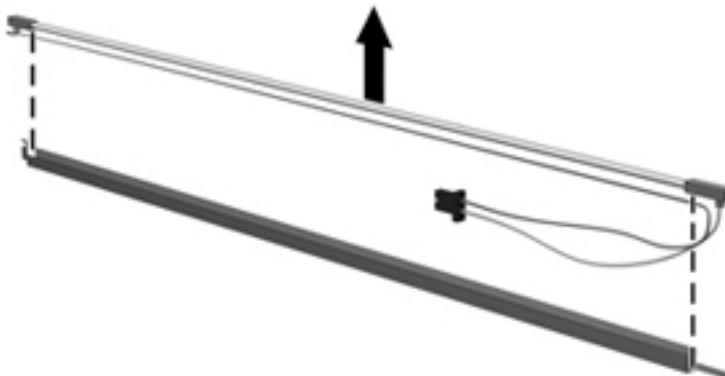


16. Turn the display panel upside down.
17. Remove the backlight frame from the display panel.

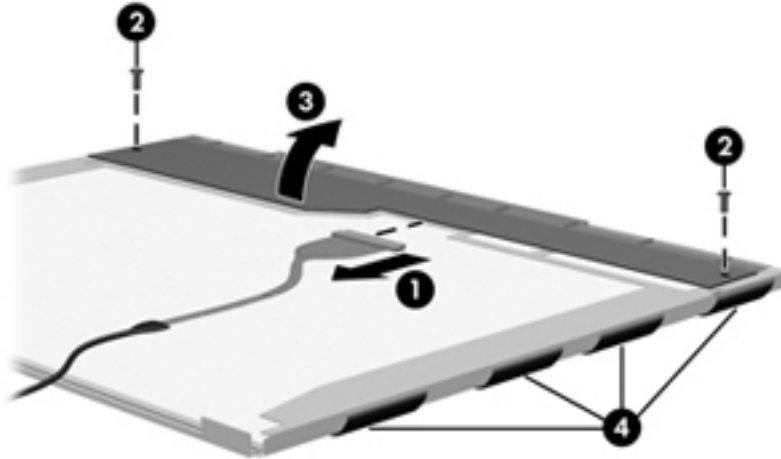


⚠ WARNING! The backlight contains mercury. Exercise caution when removing and handling the backlight to avoid damaging this component and causing exposure to the mercury.

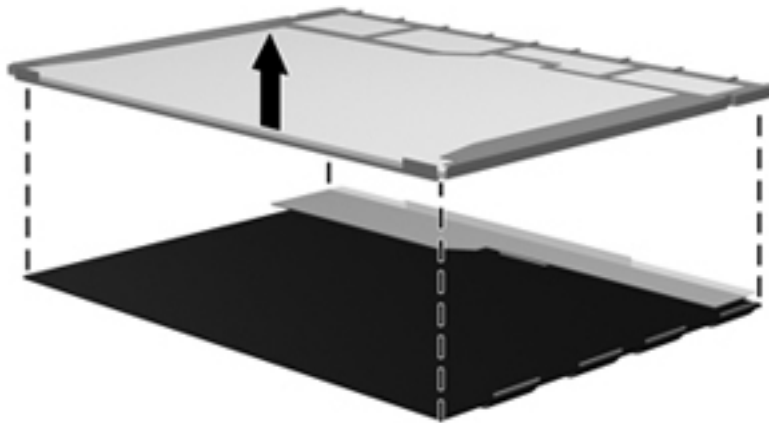
18. Remove the backlight from the backlight frame.



- 19. Disconnect the display cable (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.

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