HP EliteBook Folio 1040 G1 Notebook PC

Maintenance and Service Guide

Product notice

This guide describes features that are common to most models. Some features may not be available on your computer.

Not all features are available on all editions of Windows 8. This computer may require upgraded and/or separately purchased hardware, drivers, and/or software to take full advantage of Windows 8 functionality. See http://www.microsoft.com for details.

This computer may require upgraded and/ or separately purchased hardware and/or a DVD drive to install the Windows 7 software and take full advantage of Windows 7 functionality. See http://windows.microsoft.com/en-us/ windows7/get-know-windows-7 for details.

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).

Table of contents

1 Product description

Category	Description
Product Name	HP EliteBook 1040 G1 Notebook PC
Processors	Intel® Core® processors: ● i7-4650U 1.7-GHz (max turbo frequency 3.3-GHz), 4-MB L3 Cache, 15W ● i7-4600U 2.1-GHz (max turbo frequency 3.3-GHz), 4-MB L3 Cache, 15W ● i5-4300U 1.9-GHz (max turbo frequency 2.9-GHz), 3-MB L3 Cache, 15W ● i5-4200U 1.6-GHz (max turbo frequency 2.6-GHz), 3-MB L3 Cache, 15W
Chipset	Mobile Intel QM87
Graphics	Intel HD Graphics 4400 (i5-4200U, i5-4300U, i7-4600U) Intel HD Graphics 5000 (i7-4650U)
Panels	35.6-cm (14.0-in), DP 1.2 slim, high-definition+ (HD+), AntiGlare (AG), SVA (1600×900) display with and without webcam and WWAN 35.6-cm (14.0-in), 3.0-mm, FHD, AG, UWVA (1600×900) display with and without webcam and WWAN All display assemblies include two wireless local area network (WLAN) antenna cables and NFC antenna WWAN models include two wireless wide area network (WWAN) antenna cables
Memory	One service provider-accessible/upgradable memory module slot 4-GB memory integrated into system board DDR3L PC3L-12800-(1600 MHz) dual channel support NOTE: DDR3 memory is not supported. Only DDR3L memory is supported. Supports 8-GB of system RAM in the following configurations: ● 8-GB (4-GB integrated + 4-GB SODIMM) ● 4-GB (4-GB integrated)
Primary storage	Supports M.2 SSD SS 2280 Serial ATA III Supports the following M.2 SSDs: ● 256-GB ● 180-GB ● 128-GB
Audio and video	Two stereo speakers
	HD audio with DTS Studio Sound
	Integrated 720p webcam (supports no camera option)
	Integrated dual-array microphone

Category	Description
Ethernet	Intel I218LM Gigabit Network Connection
	S3/S4/S5 wake on LAN
Wireless	**WLAN**
	Integrated wireless local area network (WLAN) options by way of wireless module
	Two WLAN antennas built into display assembly
	Support for the following WLAN formats:
	● Intel Dual Band Wireless-N 7260AN 802.11 a/b/g/n 2x2 WiFi + BT4.0
	● Intel Dual Band Wireless-AC 7260 802.11 ac 2x2 WiFi + BT 4.0
	● Intel Dual Band Wireless-N 7260NB 802.11 a/b/g/n 2x2 WiFi
	Supports no WLAN option
	WWAN
	Integrated wireless wide area network (WWAN) options by way of wireless module
	Two world-wide/5-band WWAN antennas built into display assembly only configured on WWAN models
	Secured by subscriber identity module (SIM, user-accessible on the side of the computer)
	Support for the following WWAN formats:
	● HP lt4111 LTE/EV-DO/HSPA+ Mobile Broadband Module
	● HP lt4112 LTE/HSPA+ Gobi 4G Module
	● HP hs3110 HSPA+ Mobile Broadband Module
	Supports no WWAN option
	NFC
	Integrated NFC module
	NFC antenna 100% attached to all models
	Supports no NFC option
External media cards	Micro SD Media Reader Slot - supports SD, SDHC, SDXC
Ports	Headphone/Microphone Combo
	DisplayPort 1.2
	Docking connector
	Multi-Pin AC port
	USB 3.0 port (1)
	USB 3.0 charging/powered port (1)
Keyboard/pointing devices	**Keyboard**
	Dura keys, backlit, spill-resistant with drain
	ForcePad
	Gestures enabled by default: two-finger scrolling, two-finger pinch-zoom
	Taps enabled by default

Category	Description
	ForcePad supports 2-way scroll
	Glass with chemical etched surface
Power requirements	**AC adapters:**
	45-W HP Smart AC adapter
	45-W HP Smart AC adapter
	65-W HP Smart AC adapter
	65-W Slim AC adapter
	Battery:
	Supports a 6-cell, 42-Whr battery
Security	Security lock
	Fingerprint reader
	Supports Trusted Platform Module (TPM) 1.2 (Infineon, soldered down)
	Integrated Smart Card reader (active)
	Full volume encryption
	Preboot authentication (password, smart card)
Operating system	**Preinstalled:**
	● Windows® 7 Home Premium 64- and 32-bit
	● Windows 7 Professional 64- and 32-bit
	● Windows 7 Professional MSNA 64- and 32-bit (only for China and Asia/Pacific)
	● Windows 7 Home Basic 32
	● Windows 8.1 Professional 64 DPK with Windows 7 Professional 32 or 64 image
	● Windows 8.1 Professional 64 DPK with Windows 7 Professional MSNA 32 or 64 image (only for China and Asia/Pacific)
	● Windows 8.1 China 64
	● Windows 8.1 Emerging Markets 64
	● Windows 8.1 Multilingual 64
	● Windows 8.1 Professional 64
	● Windows 8.1 Professional 64 MSNA
	● FreeDOS 2.0
	● SUSE Linux SLED 11 64-bit, Service Pack 2 (not available with WWAN)
	Restore media–DR-DVD:
	● Windows 7
	● Windows 8.1
	Restore media–SR-DVD:
	● SuSE Linux Enterprise (SLED) 64-bit, Service Pack 2
	Restore media–OS-DVD:
	● Windows 8.1 Professional 64-bit

Category	Description
	● Windows 8.1 64-bit
	● Windows 8.1 Country Specific 64-bit
	● Windows 8.1 Emerging Market 64-bit
	● Windows 7 Home Premium 64- and 32-bit
	● Windows 7 Professional 64- and 32-bit
	Certified:
	● SuSE Linux Enterprise (SLED) 64-bit Service Pack 2
	● Microsoft WHQL
	Web-only support:
	● Windows 8.1 Enterprise 64
	● Windows 7 Enterprise 64 and 32
	● Windows 7 Ultimate 64 and 32
Serviceability	End user replaceable parts:
	● AC adapter

2 External component identification

Display

Component		Description
(1)	WLAN antennas (2)* (select models only)	Send and receive wireless signals to communicate with wireless local area networks (WLAN).
(2)	WWAN antennas (2)* (select models only)	Send and receive wireless signals to communicate with wireless wide area networks (WWAN).
(3)	Internal microphones (2)	Record sound.
(4)	Webcam light (select models only)	On: The webcam is in use.
(5)	Webcam (select models only)	Records video and captures still photographs.
		For information on using the webcam in Windows 8, access HP Support Assistant. To access HP Support Assistant on the Start screen, select the **HP Support Assistant** app.
		For information on using the webcam in Windows 7, select Start > All Programs > Communication and Chat > Cyberlink YouCam.
(6)	Internal display switch	Turns off the display or initiates Sleep if the display is closed while the power is on.
		NOTE: The display switch is not visible on the outside of the computer.

Component		Description
(7)	Near Field Communication (NFC) antenna* (select models only)	Send and receive wireless signals to communicate and transfer data/info to and from your Near Field Communication (NFC)-compatible devices.

*The antennas are not visible on the outside of the computer. For optimal transmission, keep the areas immediately around the antennas free from obstructions. To see wireless regulatory notices, see the section of the *Regulatory, Safety, and Environmental Notices* that applies to your country or region. To access the user guides, select the **HP Support Assistant** app on the Start screen, select **My computer**, and then select **User guides**. To access the user guides in Windows 7, select **Start > Help and Support > User Guides**.

Top

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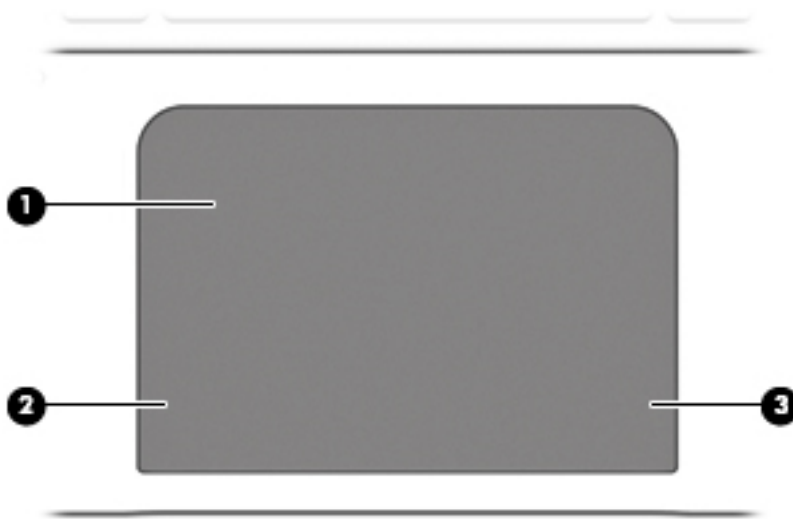
Component		Description
(1)	ForcePad zone	Moves the pointer and selects or activates items on the screen.
(2)	Left ForcePad zone	Functions like the left button on an external mouse.
(3)	Right ForcePad zone	Functions like the right button on an external mouse.

Lights

Component		Description
(1)	Power light	- On: The computer is on.
		- Blinking: The computer is in the Sleep state.
		- Off: The computer is off.
(2)	Caps lock light	On: Caps lock is on.
(3)	ForcePad light	- Amber: The ForcePad is off.
		- Off: The ForcePad is on.
(4)	Microphone mute light	- Amber: Microphone sound is off.
		- Off: Microphone sound is on.
(5)	Num lock light	On: Num lock is on.
(6)	Wireless light	- White: An integrated wireless device, such as a wireless local area network (WLAN) device and/or a Bluetooth® device, is on.
		- Amber: All wireless devices are off.
(7)	Mute light	- Amber: Computer sound is off.
		- Off: Computer sound is on.

Buttons and fingerprint reader
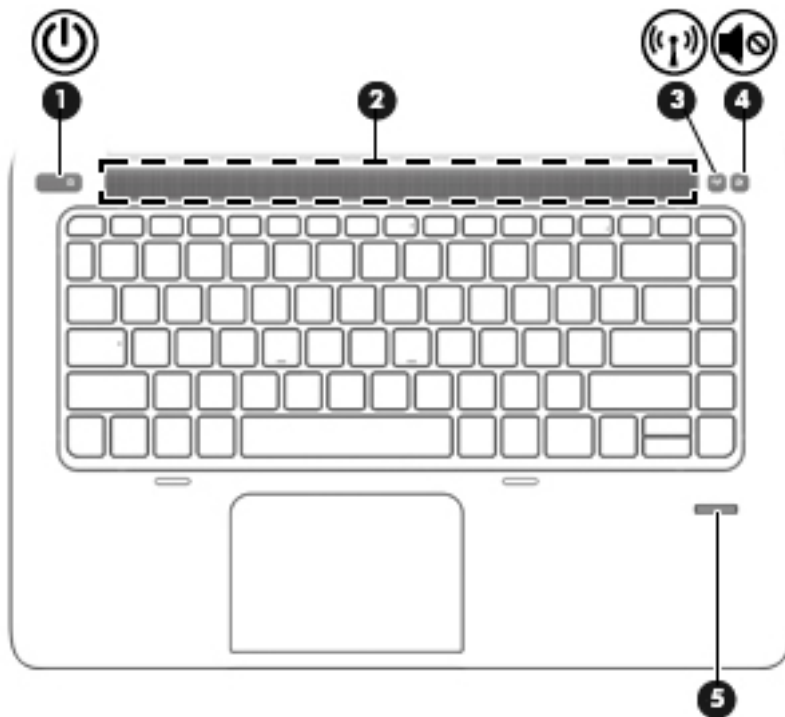
Component		Description
(1)	Power button	● When the computer is off, press the button to turn on the computer.
		● When the computer is on, press the button briefly to initiate Sleep.
		● When the computer is in the Sleep state, press the button briefly to exit Sleep.
		● When the computer is in Hibernation, press the button briefly to exit Hibernation.
		CAUTION: Pressing and holding down the power button will result in the loss of unsaved information.
		If the computer has stopped responding and Windows® shutdown procedures are ineffective, press and hold the power button for at least 5 seconds to turn off the computer.
		If the computer has stopped responding and the previous shutdown procedures are ineffective, press and hold the power button + volume mute button for at least 5 seconds to perform a hardware reset turning off the computer.
		To learn more about your power settings in Windows 8, see your power options. From the Start screen, type power, select **Power and sleep settings**, and then select **Power and sleep** from the list of applications.
		To learn more about your power settings in Windows 7: Select **Start > Control Panel > System and Security > Power Options**.
		To learn more about your power settings in Linux: Select **Computer > Control Center**. In the left pane, click **System**, and then click **Power Management** in the right pane.

Component		Description
(2)	Speaker grill	Produce sound.
(3)	Wireless button	Turns the wireless feature on or off but does not establish a wireless connection.
(4)	Volume mute button	Mutes and restores speaker sound.
(5)	Fingerprint reader	Allows a fingerprint logon to Windows, instead of a password logon.

Keys

Windows models

Component		Description
(1)	esc key	Displays system information when pressed in combination with the fn key.
(2)	fn key	Executes frequently used system functions when pressed in combination with a function key, the num lk key, the esc key, or the b key.
(3)	Windows button	Windows 8: Returns you to the Start screen from an open app or the Windows desktop.
		NOTE: Pressing the Windows button again will return you to the previous screen.
		Windows 7: Displays the Windows Start menu.
(4)	Function keys	Execute frequently used system functions when pressed in combination with the fn key.
(5)	Embedded numeric keypad	When the keypad is turned on, it can be used like an external numeric keypad.

Component		Description
		Each key on the keypad performs the function indicated by the icon in the upper-right corner of the key.
(6)	Operating system applications key	Windows 8: Displays options for a selected object.
		Windows 7 and Linux: Displays a shortcut menu for items beneath the cursor.
(7)	num lk key	Turns the embedded numeric keypad on and off when pressed in combination with the fn key.
		Alternates between the navigational and numeric functions on the integrated numeric keypad.

Linux models

Component		Description
(1)	esc key	Displays system information when pressed in combination with the fn key.
(2)	fn key	Executes frequently used system functions when pressed in combination with a function key, the num lk key, the esc key, or the b key.
(3)	Function keys	Execute frequently used system functions when pressed in combination with the fn key.
(4)	Embedded numeric keypad	When the keypad is turned on, it can be used like an external numeric keypad.
		Each key on the keypad performs the function indicated by the icon in the upper-right corner of the key.
(5)	Operating system applications key	Windows 8: Displays options for a selected object.

Component		Description
		Displays a shortcut menu for items beneath the cursor.
(6)	num lk key	Turns the embedded numeric keypad on and off when pressed in combination with the fn key.
		Alternates between the navigational and numeric functions on the integrated numeric keypad.

Left

Component			Description
(1)	🔒	Security cable slot	Attaches an optional security cable to the computer.
			NOTE: The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.
(2)		Vent	Enables airflow to cool internal components.
			NOTE: The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(3)	SS⟵	USB 3.0 charging port	Connects an optional USB device. The USB charging port can also charge select models of cell phones and MP3 players, even when the computer is off.
(4)	Micro SD	Micro SD memory card reader	Supports micro Secure Digital (SD) memory cards.
(5)	SC	Smart card reader	Supports optional Smart cards.

Right

Component		Description
(1)	SIM slot plug (select models only)	Supports a wireless subscriber identity module (SIM).
		For more information about SIM slot inserts and covers, see SIM slot on page 67.
(2)	Audio-out (headphone) jack/Audio-in (microphone) jack	Produces sound when connected to optional powered stereo speakers, headphones, earbuds, a headset, or television audio. Also connects an optional headset microphone.
		WARNING! To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, see the *Regulatory, Safety, and Environmental Notices*. To access the user guides in Windows 8, select the **HP Support Assistant** app on the Start screen, select **My computer**, and then select **User guides**.
		To access the user guides in Windows 7, select **Start > Help and Support > User Guides.**
		NOTE: When a device is connected to the jack, the computer speakers are disabled.
		NOTE: Be sure that the device cable has a 4-conductor connector that supports both audio-out (headphone) and audio-in (microphone).
(3)	USB 3.0 port	Connect optional USB 3.0 devices and provide enhanced USB power performance.
(4)	DisplayPort	Connects an optional digital display device, such as a high-performance monitor or projector.
(5)	Docking connector	Connects an optional docking device or mini docking station.
(6)	AC adapter/Battery light	● White: The computer is connected to external power and the battery is charged from 90 to 99 percent.
		● Amber: The computer is connected to external power and the battery is charged from 0 to 90 percent.
		● Blinking amber: A battery that is the only available power source has reached a low battery level. When the battery reaches a critical battery level, the battery light begins blinking rapidly.
		● Off: The battery is fully charged.
(7)	Power connector	Connects an AC adapter.

Bottom

Component		Description
(1)	Docking device receptors (2)	Connects an optional docking device.
(2)	Vents (2)	Enable airflow to cool internal components.
		NOTE: The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.

Service tag and PCID label

Service tag

When ordering parts or requesting information, provide the computer serial number and model description provided on the service tag.
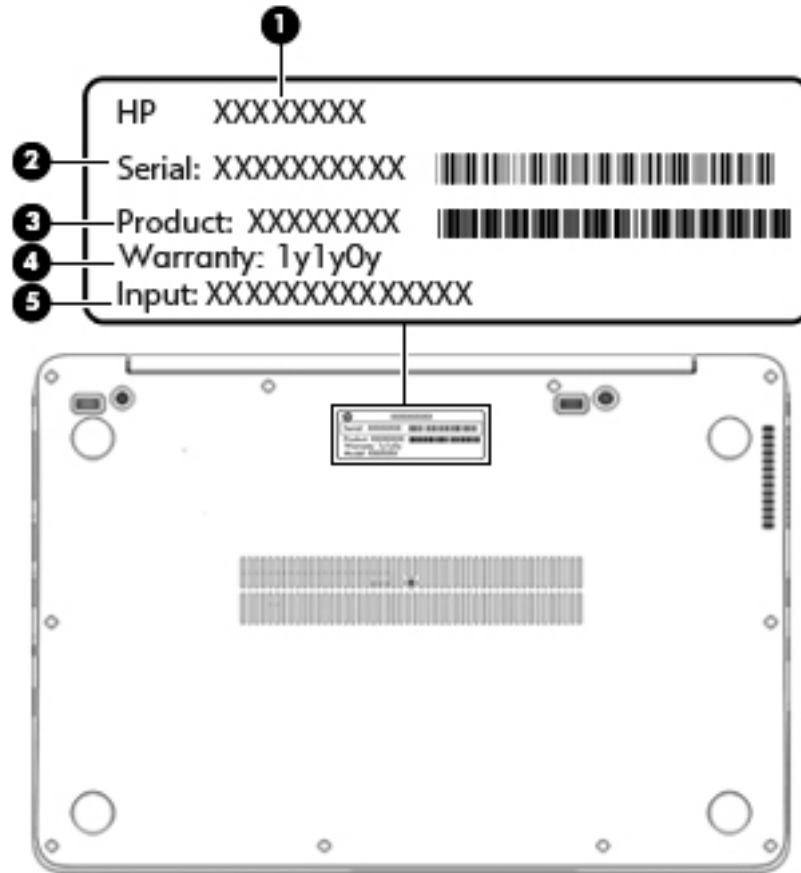
- Product name **(1)**. This is the product name affixed to the front of the computer.

- Serial number (s/n) **(2)**. This is an alphanumeric identifier that is unique to each product.

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

- Warranty period **(4)**. This number describes the duration (in years) of the warranty period for the computer.

- Power ratings **(5)**. This is the power information for the computer.

PCID label

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

Windows 8 models

PCID:XXXXXXXXXXXXXXXXXXXXXXXXXXXXX

Non-Windows 8 models

PCID:XXXXXXXX

3 Illustrated parts catalog

Computer major components
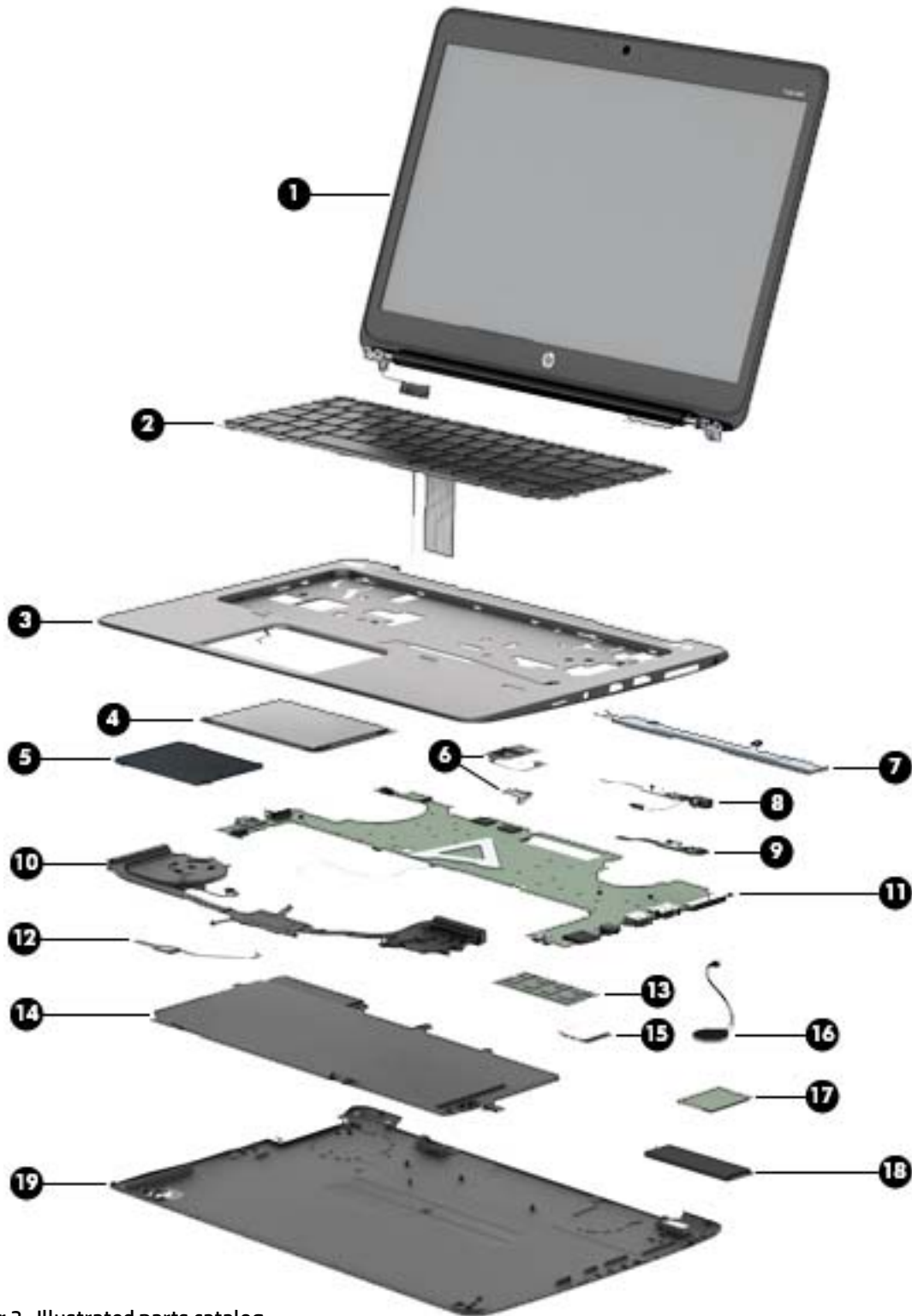
Item	Component	Spare part number
(1)	**Display assembly**: The display assembly is spared at the subcomponent level only. For more display assembly spare part information, see Display assembly subcomponents on page 19.	
(2)	**Keyboard** (backlit; includes keyboard cable and backlight cable): **NOTE:** For a detailed list of available keyboards, see Sequential part number listing on page 22.	739563-xx1
(3)	**Top cover** (with buttons)	739576-001
(4)	**ForcePad (Touchpad)**	739565-001
(5)	**Smart Card reader** (includes cable)	739566-001
(6)	**Fingerprint reader board** (includes bracket and cable)	739567-001
(7)	**Speakers** (includes cable)	739577-001
(8)	**AC power connector**	749612-001
(9)	**Function board**	739574-001
(10)	**Heat sink/thermal module with fans** (includes replacement thermal material):	739561-001
(11)	**System board** (includes processor and replacement thermal material):	
	For use in models without Windows 8:	
	• Intel Core i7-4650U processor (1.70 GHz [3.3-GHz max turbo frequency], 4-MB cache)	739583-001
	• Intel Core i7-4600U processor (2.10 GHz [2.8-GHz max turbo frequency], 4-MB cache)	748354-001
	• Intel Core i5-4300U processor (1.90 GHz [2.9-GHz max turbo frequency], 3-MB cache)	739580-001
	• Intel Core i5-4200U processor (1.60 GHz [2.6-GHz max turbo frequency], 3-MB cache)	739579-001
	For use in models with Windows 8 Standard:	
	• Intel Core i7-4650U processor (1.70 GHz [3.3-GHz max turbo frequency], 4-MB cache)	739583-501
	• Intel Core i7-4600U processor (2.10 GHz [2.8-GHz max turbo frequency], 4-MB cache)	748354-501
	• Intel Core i5-4300U processor (1.90 GHz [2.9-GHz max turbo frequency], 3-MB cache)	739580-501
	• Intel Core i5-4200U processor (1.60 GHz [2.6-GHz max turbo frequency], 3-MB cache)	739579-501
	For use in models with Windows 8 Professional:	
	• Intel Core i7-4650U processor (1.70 GHz [3.3-GHz max turbo frequency], 4-MB cache)	739583-601
	• Intel Core i7-4600U processor (2.10 GHz [2.8-GHz max turbo frequency], 4-MB cache)	748354-601
	• Intel Core i5-4300U processor (1.90 GHz [2.9-GHz max turbo frequency], 3-MB cache)	739580-601
	• Intel Core i5-4200U processor (1.60 GHz [2.6-GHz max turbo frequency], 3-MB cache)	739579-601
(12)	**NFC module**	739578-001
(13)	**Memory module** (DDR3L-12800, 1600-MHz, DDR3): **NOTE:** Only DDR3L memory is supported. DDR3 memory is not supported.	
	4-GB	747221-005
(14)	**Battery** (6-cell, 42-Wh, 1.93-Ah, Li ion):	722297-005
(15)	**WLAN module:**	

Item	Component	Spare part number
	Intel Dual Band Wireless-N 7260AN 802.11 a/b/g/n 2x2 WiFi + BT 4.0	717379-005
	Intel Dual Band Wireless-AC 7260 802.11 ac 2x2 WiFi + BT 4.0	717380-005
	Intel Wireless-N 7260BN 802.11 b/g/n 2x2 WiFi + BT 4.0	735532-005
	Intel Dual Band Wireless-N 7260AN BT 4.0 combo adapter	747833-005
(16)	**RTC battery** (includes double-sided tape)	739562-001
(17)	**WWAN module:**	
	HP lt4111 LTE/EV-DO/HSPA+ Mobile Broadband Module	704030-005
	HP lt4112 LTE/HSPA+ Gobi 4G Module	704031-005
	HP hs3110 HSPA+ Mobile Broadband Module	723895-005
(18)	**Solid-state drive**	
	256-GB, SATA III	746906-001
	180-GB, SATA III	746908-001
	128-GB, SATA III	746907-001
(19)	**Base enclosure** (includes feet)	739560-001
	Cable Kit (not illustrated)	739564-001
	NFC module antenna	
	NFC module cable	
	Function board cable	

Display assembly subcomponents
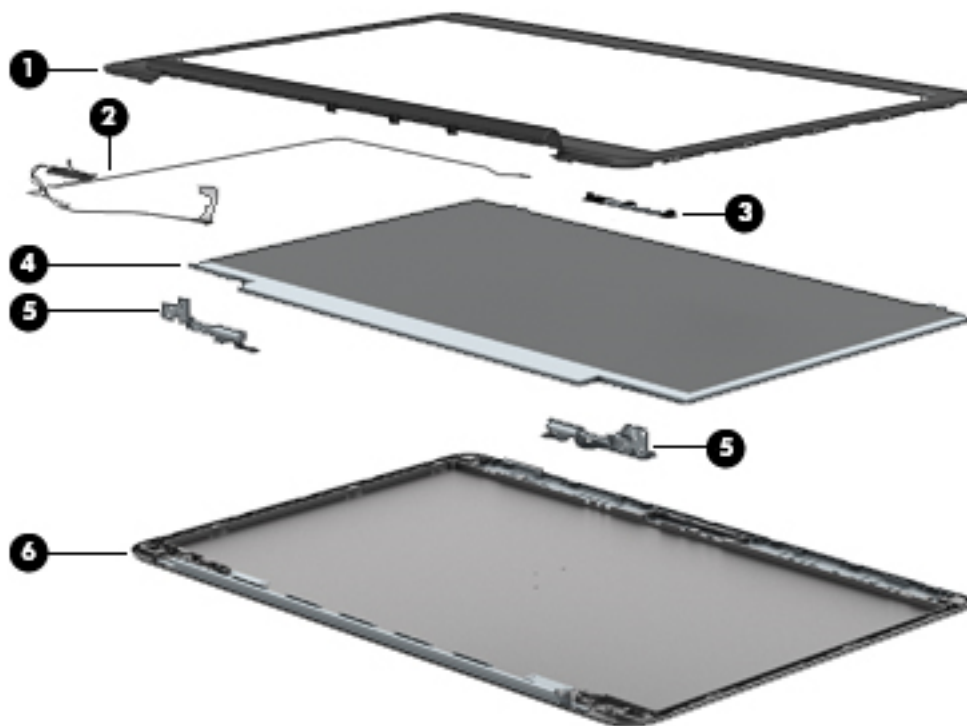
Item	Component	Spare part number
(1)	**Display bezel:**	
	For use on models with a webcam	739568-001
	For use on models without a webcam	748015-001
(2)	**Display cable**	739573-001
(3)	**Webcam/microphone module**	739570-001
	Microphone module	739571-001
(4)	**35.6-cm (14.0-in), LED, AntiGlare display panel:**	
	SVA HD+	739581-001
	UWVA	739582-001
(5)	**Display Hinge Kit** (includes left and right display hinges)	739572-001
(6)	**Display enclosure** (includes wireless antenna)	739569-001

Plastics Kit
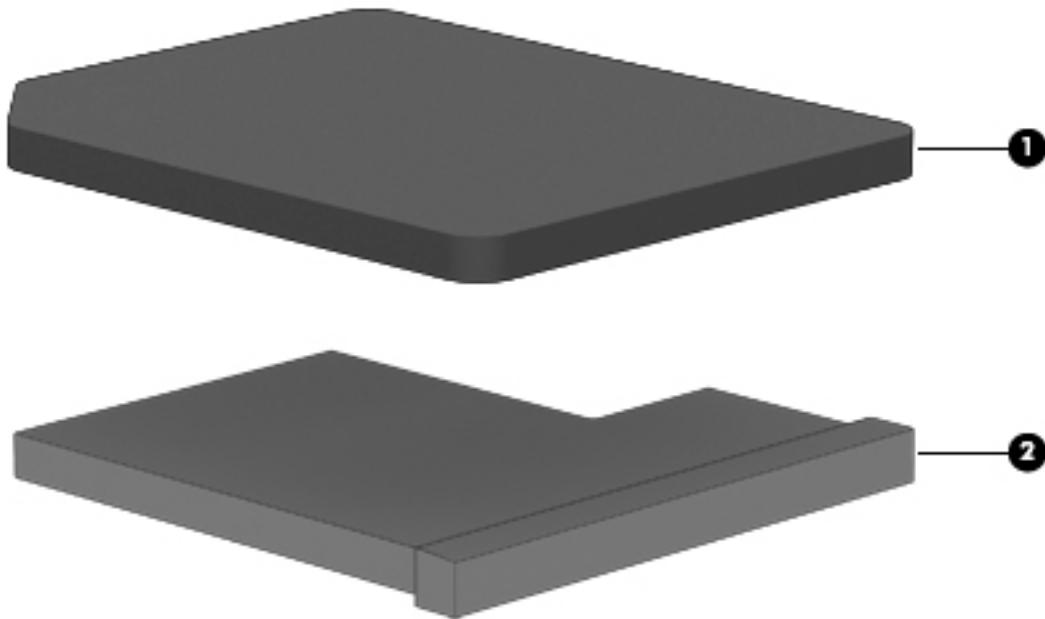
Item	Component	Spare part number
	Plastics Kit	739575-001
(1)	SIM card slot cover (for WWAN SKU)	
(2)	SIM card insert (for non-WWAN SKU – customer non-removable)	
	Rubber antenna cover (not illustrated)	

Mass storage devices

Item	Description	Spare part number
(1)	**Solid-State Drive** (SATA III)	
	256-GB	746906-001
	180-GB	746908-001
	128-GB	746907-001

Miscellaneous parts

Component	Spare part number
AC adapter:	
45-W HP Smart AC adapter (non-PFC)	721092-001
65-W HP Smart AC adapter	714657-001
65-W HP Smart AC travel adapter	693716-001
Mouse:	
HP USB optical travel mouse	434594-001
HP USB Laser	674318-001
HP Comfort Grip Wireless Mouse	691922-001
Power cord (3-pin, black, 1.83-m):	
For use in Argentina	490371-D01
For use in Australia	490371-011
For use in Brazil	490371-202
For use in the Denmark	490371-081
For use in Europe	490371-021
For use in India	490371-D61
For use in Israel	490371-BB1
For use in Italy	490371-061
For use in Japan	490371-291
For use in North America	490371-001
For use in the People's Republic of China	490371-AA1
For use in South Africa	490371-AR1
For use in South Korea	490371-AD1
For use in Switzerland	490371-111
For use in Taiwan	490371-AB1
For use in Thailand	490371-201
For use in the United Kingdom	490371-031
Screw Kit	746909-001
Docking station	732252-001
Cable lock docking station	575921-001
Adapter, RJ-45 to VGA	747488-001
Lock, combination	591699-001

Component	Spare part number
HP Business Slim Top Load Case	718549-001
HP Business Backpack	718548-001

Sequential part number listing

CSR flag designations:

A = Mandatory

B = Optional

C = Service technician recommended

N = Non-user replaceable

Spare part number	CSR flag	Description
434594-001	A	HP USB optical travel mouse
490371-001	A	Power cord for use in North America (3-pin, black, 1.83-m)
490371-011	A	Power cord for use in Australia (3-pin, black, 1.83-m)
490371-021	A	Power cord for use in Europe (3-pin, black, 1.83-m)
490371-031	A	Power cord for use in the United Kingdom (3-pin, black, 1.83-m)
490371-061	A	Power cord for use in the Italy (3-pin, black, 1.83-m)
490371-081	A	Power cord for use in Denmark (3-pin, black, 1.83-m)
490371-111	A	Power cord for use in Switzerland (3-pin, black, 1.83-m)
490371-201	A	Power cord for use in Thailand (3-pin, black, 1.83-m)
490371-202	A	Power cord for use in Brazil (3-pin, black, 1.83-m)
490371-291	A	Power cord for use in Japan (3-pin, black, 1.83-m)
490371-AA1	A	Power cord for use in the People's Republic of China (3-pin, black, 1.83-m)
490371-AB1	A	Power cord for use in Taiwan (3-pin, black, 1.83-m)
490371-AD1	A	Power cord for use in South Korea (3-pin, black, 1.83-m)
490371-AR1	A	Power cord for use in South Africa (3-pin, black, 1.83-m)
490371-BB1	A	Power cord for use in Israel (3-pin, black, 1.83-m)
490371-D01	A	Power cord for use in Argentina (3-pin, black, 1.83-m)
490371-D61	A	Power cord for use in India (3-pin, black, 1.83-m)
575921-001	A	Cable lock docking station
591699-001	A	Lock, combination
674318-001	A	HP USB Laser
691922-001	A	HP Comfort Grip Wireless Mouse

Spare part number	CSR flag	Description
693716-001	A	65-W HP Smart AC travel adapter
704030-005	N	HP lt4111 LTE/EV-DO/HSPA+ Mobile Broadband Module
704031-005	N	HP lt4112 LTE/HSPA+ Gobi 4G Module
714657-001	A	65-W HP Smart AC adapter
717379-005	N	Intel Dual Band Wireless-N 7260AN 802.11 a/b/g/n 2x2 WiFi + BT 4.0
717380-005	N	Intel Dual Band Wireless-AC 7260 802.11 ac 2x2 WiFi + BT 4.0
718548-001	A	HP Business Backpack
718549-001	A	HP Business Slim Top Load Case
721092-001	N	45-W HP Smart AC adapter (non-PFC)
722297-005	N	6-cell, 42-Wh, 1.93-Ah
723895-005	N	HP hs3110 HSPA+ Mobile Broadband Module
723897-001	N	320-GB, 7200-rpm, 7-mm hard drive, locked (does not include hard drive bracket, connector, or screws)
732252-001	A	Docking station
735532-005	N	Intel Wireless-N 7260BN 802.11 b/g/n 2x2 WiFi + BT 4.0
739560-001	N	Base enclosure (includes feet)
739561-001	N	Heat sink/thermal module with fans
739562-001	N	RTC battery (includes double-sided tape)
739563-001	N	Keyboard with backlight for use in the United States (includes keyboard cable and backlight cable)
739563-031	N	Keyboard with backlight for use in the United Kingdom and Singapore (includes keyboard cable and backlight cable)
739563-041	N	Keyboard with backlight for use in Germany (includes keyboard cable and backlight cable)
739563-051	N	Keyboard with backlight for use in France (includes keyboard cable and backlight cable)
739563-061	N	Keyboard with backlight for use in Italy (includes keyboard cable and backlight cable)
739563-071	N	Keyboard with backlight for use in Spain (includes keyboard cable and backlight cable)
739563-081	N	Keyboard with backlight for use in Denmark (includes keyboard cable and backlight cable)
739563-091	N	Keyboard with backlight for use in Norway (includes keyboard cable and backlight cable)
739563-131	N	Keyboard with backlight for use in Portugal (includes keyboard cable and backlight cable)
739563-141	N	Keyboard with backlight for use in Turkey (includes keyboard cable and backlight cable)
739563-151	N	Keyboard for use in Greece (includes keyboard cable and backlight cable)
739563-161	N	Keyboard with backlight for use in Latin America (includes keyboard cable and backlight cable)
739563-171	N	Keyboard with backlight for use in Saudi Arabia (includes keyboard cable and backlight cable)
739563-201	N	Keyboard with backlight for use in Brazil (includes keyboard cable and backlight cable)
739563-211	N	Keyboard with backlight for use in Hungary (includes keyboard cable and backlight cable)
739563-251	N	Keyboard with backlight for use in Russia (includes keyboard cable and backlight cable)

Spare part number	CSR flag	Description
739563-261	N	Keyboard with backlight for use in Bulgaria (includes keyboard cable and backlight cable)
739563-271	N	Keyboard with backlight for use in Romania (includes keyboard cable and backlight cable)
739563-281	N	Keyboard with backlight for use in Thailand (includes keyboard cable and backlight cable)
739563-291	N	Keyboard with backlight for use in Japan (includes keyboard cable and backlight cable)
739563-A41	N	Keyboard with backlight for use in Belgium (includes keyboard cable and backlight cable)
739563-AB1	N	Keyboard with backlight for use in Taiwan (includes keyboard cable and backlight cable)
739563-AD1	N	Keyboard with backlight for use in South Korea (includes keyboard cable and backlight cable)
739563-B31	N	Keyboard with backlight for use in the Netherlands (includes keyboard cable and backlight cable)
739563-B71	N	Keyboard with backlight for use in Sweden and Finland (includes keyboard cable and backlight cable)
739563-BA1	N	Keyboard with backlight for use in Slovenia (includes keyboard cable and backlight cable)
739563-BB1	N	Keyboard with backlight for use in Israel (includes keyboard cable and backlight cable)
739563-BG1	N	Keyboard with backlight for use in Switzerland (includes keyboard cable and backlight cable)
739563-D61	N	Keyboard with backlight for use in India (includes keyboard cable and backlight cable)
739563-DB1	N	Keyboard with backlight for use in Canada (includes keyboard cable and backlight cable)
739563-DD1	N	Keyboard with backlight for use in Iceland (includes keyboard cable and backlight cable)
739563-FL1	N	Keyboard with backlight for use in the Czech Republic and Slovakia (includes keyboard cable and backlight cable)
739563-FP1	N	Keyboard with backlight for use in northwest Africa (includes keyboard cable and backlight cable)
739564-001	N	Cable Kit (includes function cable, NFC module cable, NFC antenna cable)
739565-001	N	ForcePad (Touchpad) assembly (includes cable)
739566-001	N	Smart Card reader (includes cable)
739567-001	N	Fingerprint reader board (includes cable)
739568-001	N	Display bezel for use on models with a webcam
739569-001	N	Display enclosure (includes wireless antenna)
739570-001	N	Webcam/microphone module (includes double-sided tape)
739571-001	N	Microphone module
739572-001	N	Display Hinge Kit (includes left and right hinges)
739573-001	N	Display cable
739574-001	N	Function board
739575-001	N	Plastics Kit (includes SIM card insert, SIM card slot cover, rubber antenna cover)
739576-001	N	Top cover (includes buttons)
739577-001	N	Speaker assembly (includes cable)
739578-001	N	NFC module

Spare part number	CSR flag	Description
739579-001	N	System board with Intel Core i5-4200U processor (1.60 GHz, 3-MB cache) for use in models without Windows 8
739579-501	N	System board with Intel Core i5-4200U processor (1.60 GHz, 3-MB cache) for use in models with Windows 8 Standard
739579-601	N	System board with Intel Core i5-4200U processor (1.60 GHz, 3-MB cache) for use in models with Windows 8 Professional
739580-001	N	System board with Intel Core i5-4300U processor (1.90 GHz [2.9-GHz max turbo frequency], 3-MB cache) for use in models without Windows 8
739580-501	N	System board with Intel Core i5-4300U processor (1.90 GHz [2.9-GHz max turbo frequency], 3-MB cache) for use in models with Windows 8 Standard
739580-601	N	System board with Intel Core i5-4300U processor (1.90 GHz [2.9-GHz max turbo frequency], 3-MB cache) for use in models with Windows 8 Professional
739581-001	N	35.6-cm (14.0-in), LED, SVA HD+, AntiGlare display panel
739582-001	N	35.6-cm (14.0-in), LED, HD, AntiGlare display panel
739583-001	N	System board with Intel Core i7-4650U processor (1.70 GHz [3.3-GHz max turbo frequency], 4-MB cache) for use in models without Windows 8
739583-501	N	System board with Intel Core i7-4650U processor (1.70 GHz [3.3-GHz max turbo frequency], 4-MB cache) for use in models with Windows 8 Standard
739583-601	N	System board with Intel Core i7-4650U processor (1.70 GHz [3.3-GHz max turbo frequency], 4-MB cache) for use in models with Windows 8 Professional
746906-001	N	Solid-state drive, 256-GB, SATA III
746907-001	N	Solid-state drive, 128-GB, SATA III
746908-001	N	Solid-state drive, 180-GB, SATA III
746909-001	N	Screw Kit
747221-005	N	4-GB memory module (DDR3L, 12800, 1600-MHz)
747488-001	A	Adapter, RJ-45 to VGA
747833-005	N	Intel Dual Band Wireless-N 7260AN BT 4.0 combo adapter
748015-001	N	Display bezel for use on models without a webcam
748354-001	N	System board with Intel Core i7-4600U processor (2.10 GHz [3.3-GHz max turbo frequency], 4-MB cache) for use in models without Windows 8
748354-501	N	System board with Intel Core i5-4600U processor (2.10 GHz [3.3-GHz max turbo frequency], 4-MB cache) for use in models with Windows 8 Standard
748354-601	N	System board with Intel Core i5-4600U processor (2.10 GHz [3.3-GHz max turbo frequency], 4-MB cache) for use in models with Windows 8 Professional
749612-001	N	AC power connector

4   Removal and replacement procedures preliminary requirements

Tools required

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

- Flat-bladed screw driver
- Torx T8 screw driver
- Phillips P0 and P1 screw drivers
- Non-marking pry tool

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

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

● To avoid hand contact, transport products in static-safe tubes, bags, or boxes.

● Protect ESD-sensitive parts and assemblies with conductive or approved containers or packaging.

● Keep ESD-sensitive parts in their containers until the parts arrive at static-free workstations.

● Place items on a grounded surface before removing items from their containers.

● Always be properly grounded when touching a component or assembly.

● Store reusable ESD-sensitive parts from assemblies in protective packaging or nonconductive foam.

● Use transporters and conveyors made of antistatic belts and roller bushings. Be sure that mechanized equipment used for moving materials is wired to ground and that proper materials are selected to avoid static charging. When grounding is not possible, use an ionizer to dissipate electric charges.

Workstation guidelines

Follow these grounding workstation guidelines:

● Cover the workstation with approved static-shielding material.

● Use a wrist strap connected to a properly grounded work surface and use properly grounded tools and equipment.

● Use conductive field service tools, such as cutters, screw drivers, and vacuums.

● When fixtures must directly contact dissipative surfaces, use fixtures made only of static-safe materials.

● Keep the work area free of nonconductive materials, such as ordinary plastic assembly aids and Styrofoam.

● Handle ESD-sensitive components, parts, and assemblies by the case or PCM laminate. Handle these items only at static-free workstations.

●   Avoid contact with pins, leads, or circuitry.

●   Turn off power and input signals before inserting or removing connectors or test equipment.

Equipment guidelines

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

●   When seated, wear a wrist strap connected to a grounded system. Wrist straps are flexible straps with a minimum of one megohm ±10% resistance in the ground cords. To provide proper ground, wear a strap snugly against the skin at all times. On grounded mats with banana-plug connectors, use alligator clips to connect a wrist strap.

●   When standing, use foot straps and a grounded floor mat. Foot straps (heel, toe, or boot straps) can be used at standing workstations and are compatible with most types of shoes or boots. On conductive floors or dissipative floor mats, use foot straps on both feet with a minimum of one megohm resistance between the operator and ground. To be effective, the conductive 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

5 Removal and replacement procedures for Authorized Service Provider parts

⚠ **CAUTION:** Components described in this chapter should only be accessed by an authorized service provider. Accessing these parts can damage the computer or void the warranty.

Component replacement procedures

📝 **NOTE:** Details about your computer, including model, serial number, product key, and length of warranty, are on the service tag at the bottom of your computer. See Service tag and PCID label on page 14 for details.

This chapter provides removal and replacement procedures.

Make special note of each screw size and location during removal and replacement.

Display assembly components (panel, bezel, webcam, microphone)

All display assemblies include WLAN antenna transceivers and cables. WWAN models also include 2 WWAN antenna transceivers and cables.

Full hinge-up displays are not spared.

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

To remove the remaining display components, including the display brackets, antennas, and enclosure, you must remove the entire display assembly from the computer. See for more information about removing the remaining components.

Description	Spare part number
Display panels (35.6-cm [14.0-in], anti-glare, LED)	
SVA HD+	739581-001
UVWA	739582-001
Display bezels	
For use with models with a webcam	739568-001
For use with models without a webcam	748015-001
Webcam module with microphone	739570-001
Microphone module	739571-001

Before removing the display panel, follow these steps:

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

2. Disconnect all external devices connected to the computer.

3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.

4. Remove the battery (see).

Remove the display assembly components:

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

2. Open the computer as far as possible.

3. If it is necessary to replace the display bezel:

   a. Close the computer, position it so you can access the bottom of the display, and then open the computer slightly.

b. From the rear of the computer, press through the slightly open computer to disengage the bottom of the bezel **(1)**.
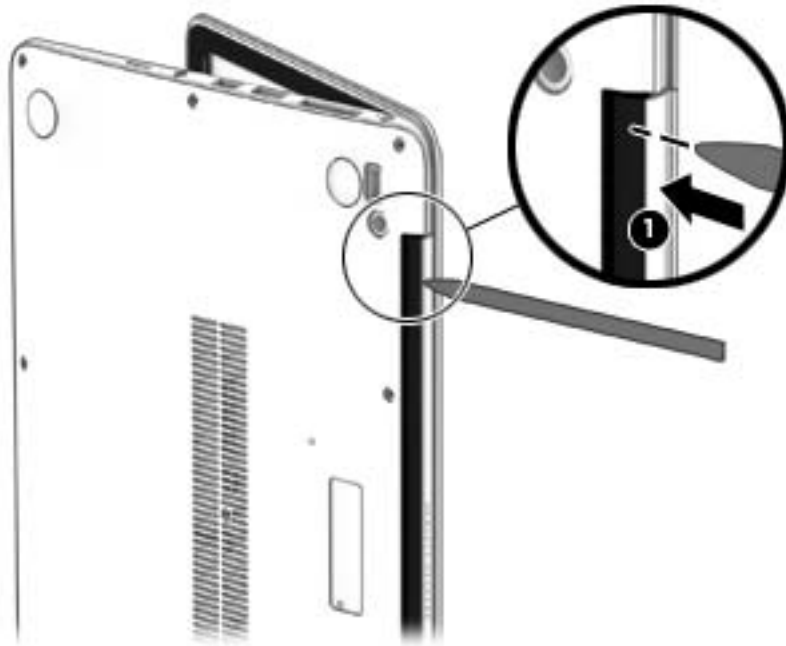
c. Open the computer.

d. Use a tool to disengage the bottom of the bezel from the display **(2)**, and then remove the bezel from the display **(2)**.

e. Flex the inside edges of the top edge **(3)**, the left and right sides **(4)**, and the bottom edge **(5)** of the display bezel until the bezel disengages from the display enclosure. The display bezel is available using spare part number 739568-001 on models with a webcam and 748015-001 on models without a webcam.
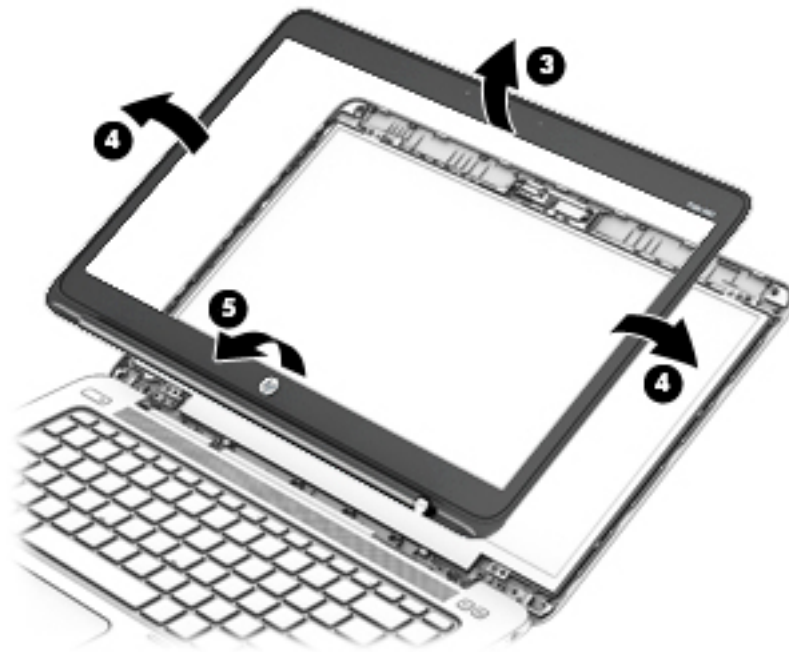
4. If it is necessary to replace the webcam/microphone module:

a. Detach the webcam/microphone module **(1)** from the display enclosure. (The webcam/microphone module is attached to the display enclosure with adhesive.)

b. Disconnect the cable **(2)** from the webcam/microphone module.

The webcam module is available using spare part number 739570-001. The microphone module is available using spare part number 739571-001.
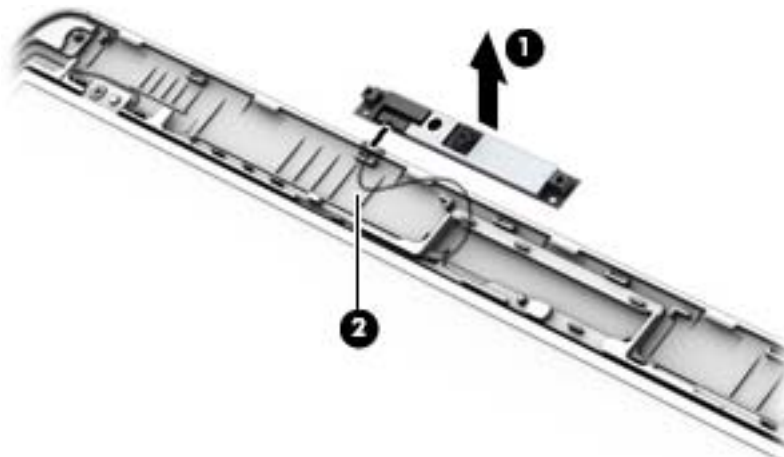
5. If it is necessary to replace the display panel:

a. Remove the four Phillips PM2.0×2.0 screws that secure the display panel to the display enclosure.

- 739582-001 — 35.6-cm (14.0-in), LED, AntiGlare display panel, UWVA
- 739581-001 — 35.6-cm (14.0-in), LED, AntiGlare display panel, SVA HD+
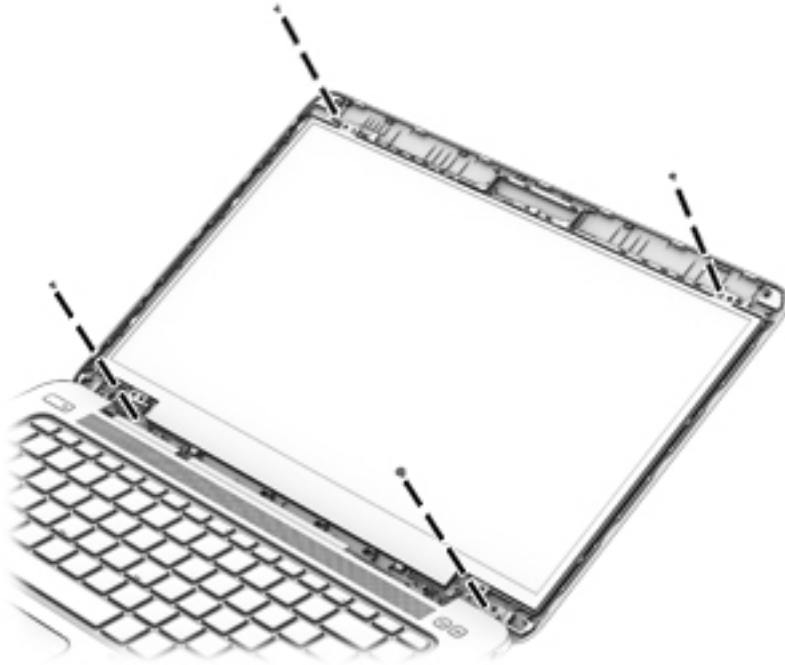
b. Rotate the top of the display panel downward **(1)** onto the keyboard.

c. Lift the tape that secure the display cable connector on the panel **(2)**, and then disconnect the cable from the connector **(3)**.

Reverse this procedure to reassemble and install the display assembly components.

Bottom cover

NOTE: The bottom cover is available in the Plastics kit, spare part number 739575-001.

Description	Spare part number
Plastics kit	739575-001

Before removing the bottom cover, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the battery (see).

Remove the bottom cover:

1. Remove the five inner Torx T8M2.0×5.0 screws **(1)** and the six outer Torx T8M2.0×5.0 screws **(2)** that secure the bottom cover to the computer.
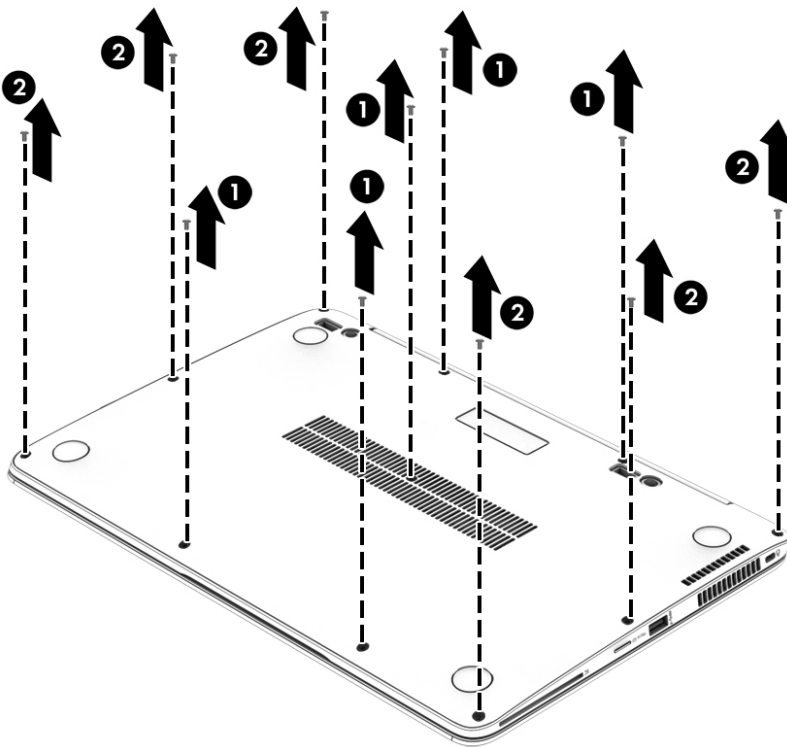
2. Pry up on the top (near the display hinge) of the bottom cover to disengage it from the computer.
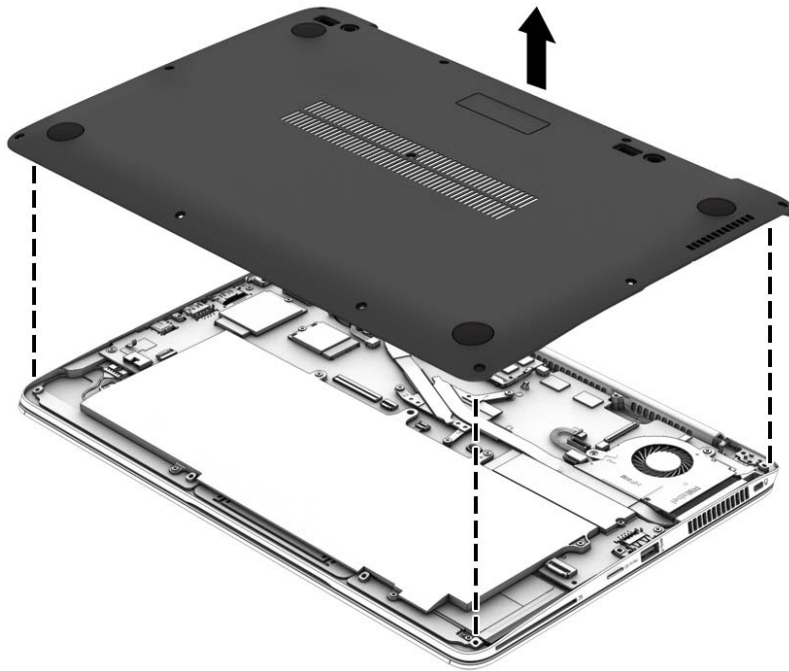
Reverse the removal procedures to install the bottom cover.

When reinstalling the bottom cover, install the screws in the sequence as illustrated in the following image.

IMPORTANT: To prevent rocking, be sure to use the correct sequence when installing the screws.
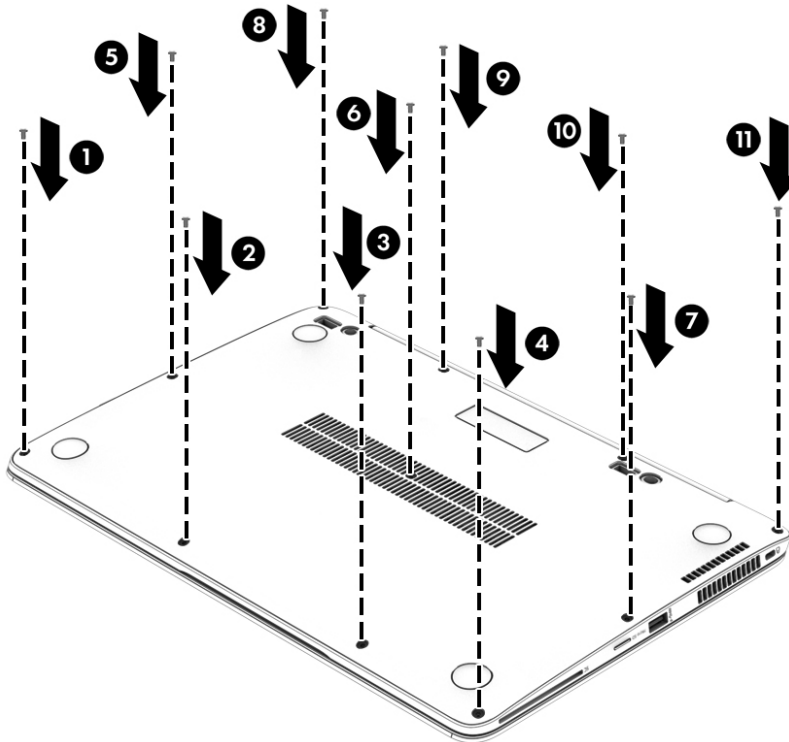
Display assembly

This section describes removing components that require you to completely remove the display panel. For more information about removing display components that do not require that you remove the assembly from the computer, see Display assembly components (panel, bezel, webcam, microphone) on page 31.

📝 **NOTE:** The display assembly is spared at the subcomponent level only.

Before removing the display assembly, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Bottom cover (see Bottom cover on page 35)

5. Remove the battery (see Battery on page 41), and then remove the following components:

Remove the display assembly:

1. Open the computer and position it with the base enclosure on a table and the display hanging down.

   📝 **NOTE:** Be sure to support the display when removing the screws.

2. Disconnect the WWAN antennas cables from the WWAN module and remove the cables from the routing path **(1)** from the system board.

3. Disconnect the display panel cable **(2)** from the system board.

4. Remove the six Phillips PM2.5×4.0 screws **(3)** that secure the display assembly to the computer.

5. Remove the computer from the display assembly **(4)**.
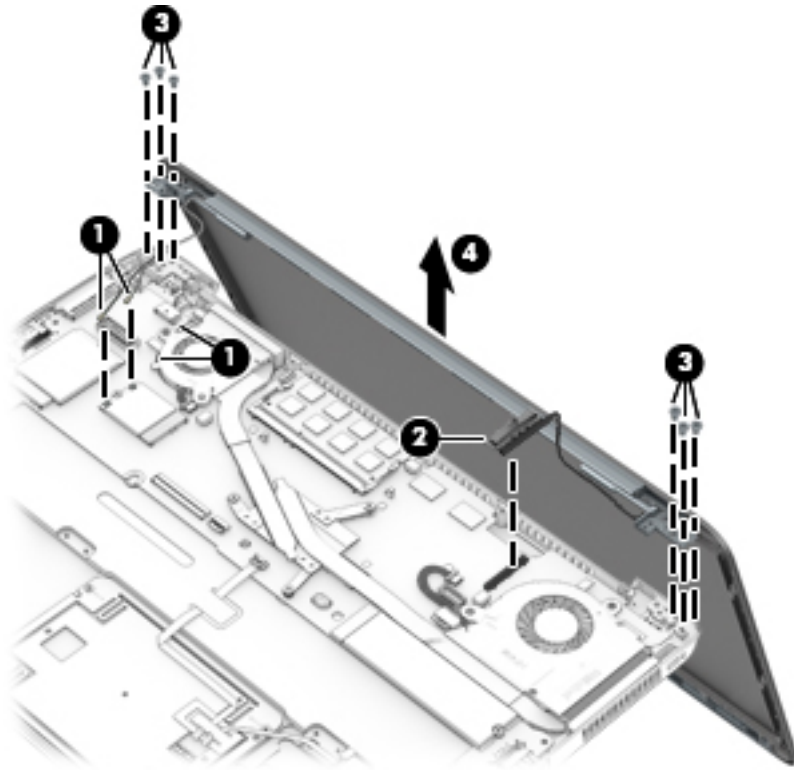
6. If you need to remove the display bezel, webcam/microphone module, or raw display panel, see the related procedures in Display assembly components (panel, bezel, webcam, microphone) on page 31.

7. If it is necessary to replace the display hinges:

Display hinges are available in the Display Hinge Kit, spare part number 739572-001.

a. Remove the four broadhead Phillips PM2.5×3.0 screws **(1)** that secure each display hinge to the display enclosure.

b. Lift the display hinges off the display enclosure **(2)**.
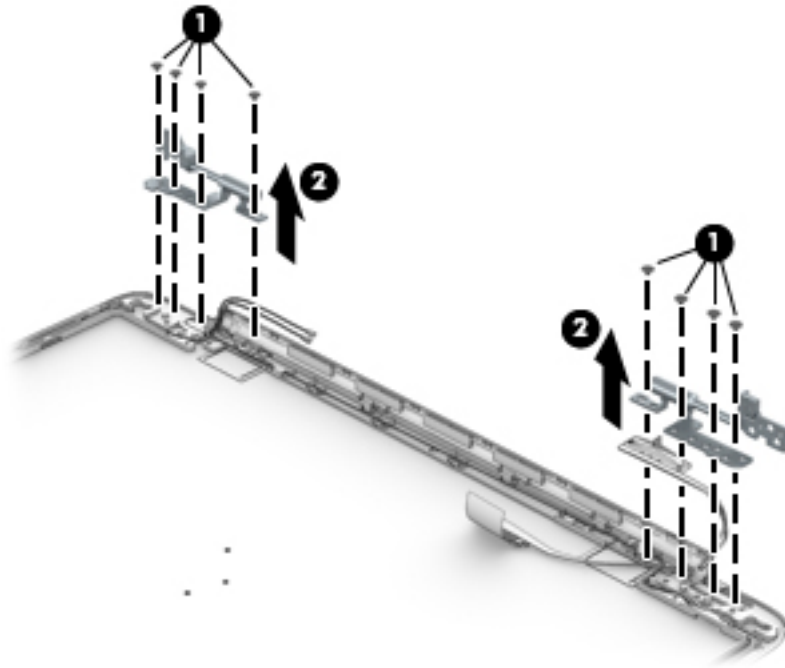
Reverse this procedure to reassemble and install the display assembly.

RTC battery

Description	Spare part number
RTC battery (includes double-sided tape)	739562-001

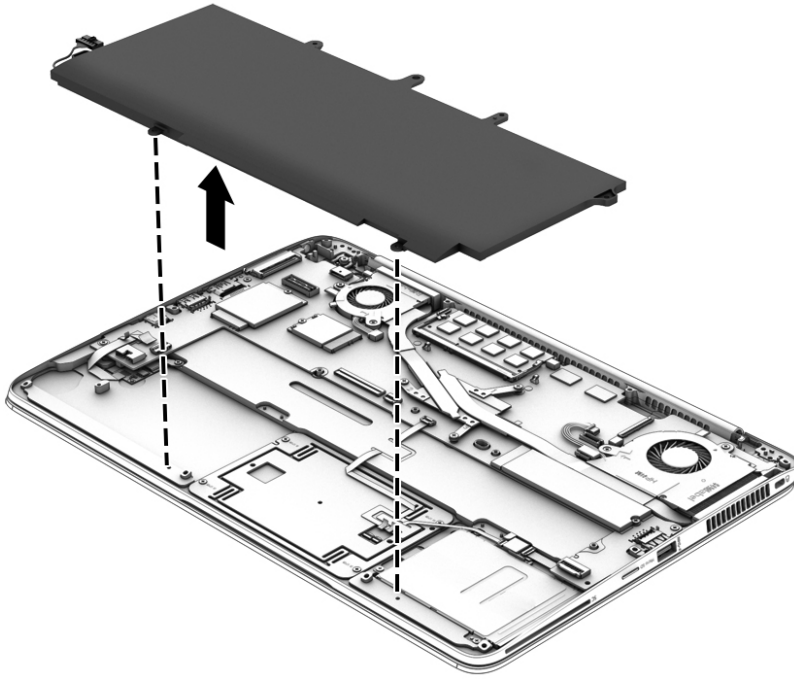Before removing the RTC battery, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see Bottom cover on page 35).

Remove the RTC battery:

1. Disconnect the RTC battery cable **(1)** from the system board.

2. Detach the RTC battery **(2)** from the computer.
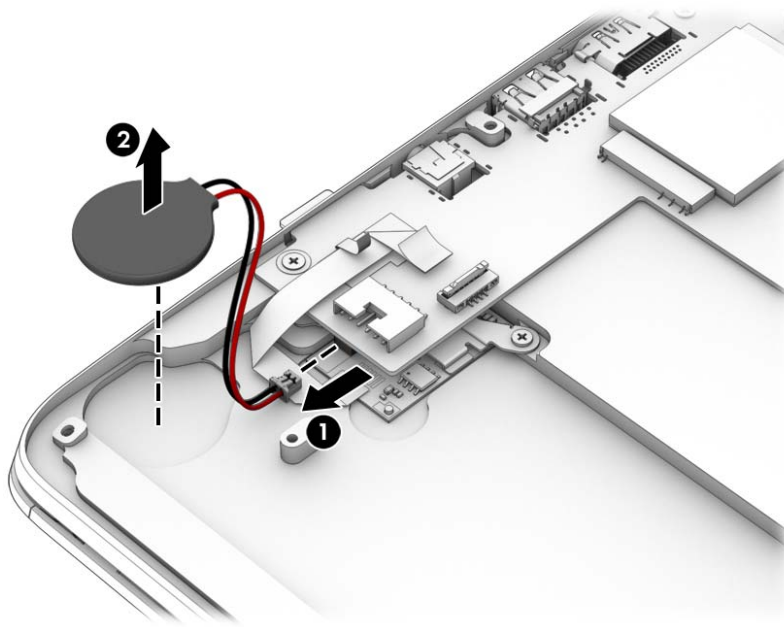
3. Remove the RTC battery.

Reverse this procedure to install the RTC battery.

Battery

Description	Spare part number
6-cell, 42-Wh, 1.93-Ah, Li ion battery	722297-005

Before disassembling the computer, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see).

Remove the battery:

1. Disconnect the battery cable from the system board **(1)**.

2. Remove the five Phillips PM2.0×4.0 screws **(2)** that secure the battery to the computer.
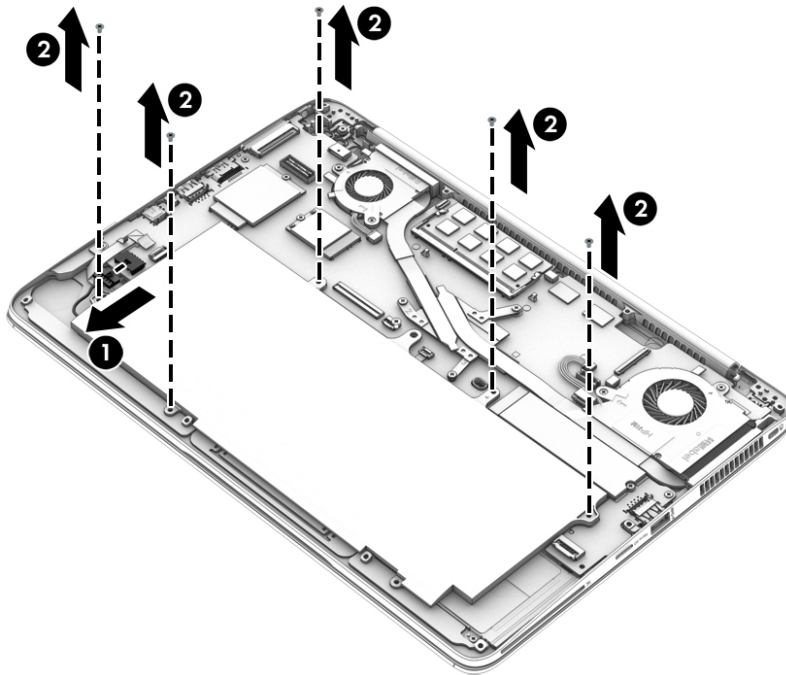
3. Lift the battery out of the computer.

NOTE: In the locked position there will be no red color shown in the latch slot.

SSD drive

Description	Spare part number
Solid-state drive	
256-GB, SATA III	746906-001
180-GB, SATA III	746908-001
128-GB, SATA III	746907-001

Before removing the hard drive, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see Bottom cover on page 35).

5. Disconnect the battery (see Battery on page 41).

Remove the SSD:

1. Remove the Phillips PM2.0×3.0 screw **(1)** that secures the drive to the system board.
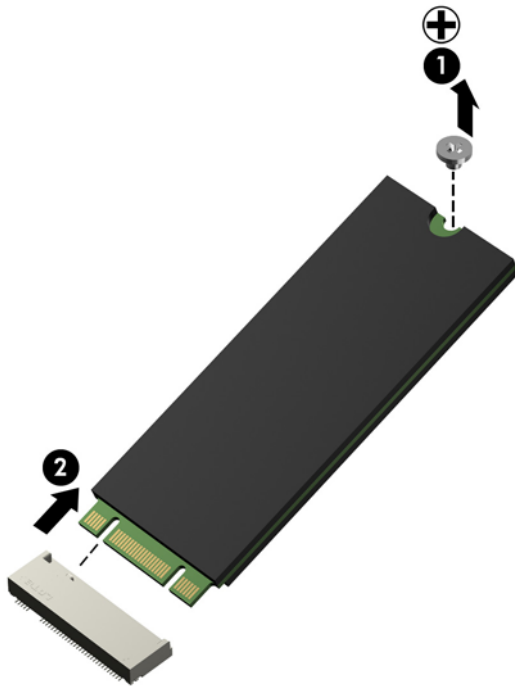
2. Remove the drive **(2)** by pulling it away from the connector.

> **NOTE:** mSATA drives are designed with notches to prevent incorrect insertion.

Reverse this procedure to reassemble and install the mSATA drive.

Memory module

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

NOTE: DDR3 memory is not supported. Only DDR3L memory is supported.

Description	Spare part number
4-GB memory module (DDR3L, 12800, 1600-MHz)	747221-005

Update BIOS before adding memory modules

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

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

To update BIOS:

1. Navigate to www.hp.com.

2. Click **Support & Drivers > Drivers & Software**.

3. In the **Enter a product name/number box**, type the computer model information, and then click **Search**.

4. Click the link for the computer model.

5. Select the operating system, and then click **Next**.

6. Under **Step 2: Select a Download**, click the **BIOS** link.

7. Click the link for the most recent BIOS.

8. Click the **Download** button, and then follow the on-screen instructions.

Before removing a memory module, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see Bottom cover on page 35).

5. Disconnect the battery (see Battery on page 41).

Remove the memory module:

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

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

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

NOTE: The computer uses two memory slots. The top slot houses the expansion memory module and the bottom slot houses the primary memory module.
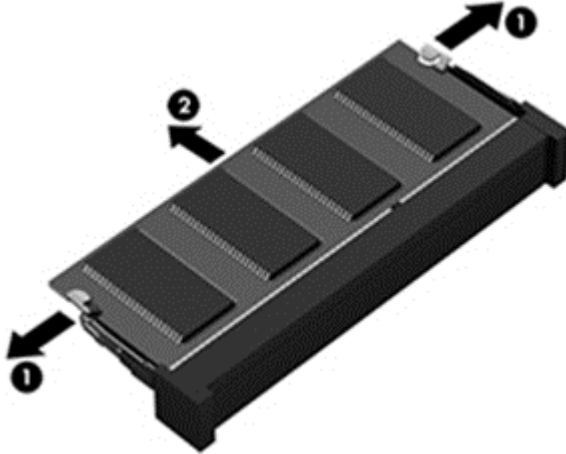
Reverse this procedure to install a memory module.

WWAN module

NOTE: The WWAN module and the WLAN module are not interchangeable.

Description	Spare part number
HP lt4111 LTE/EV-DO/HSPA+ Mobile Broadband Module	704030-005
HP lt4112 LTE/HSPA+ Gobi 4G Module	704031-005
HP hs3110 HSPA+ Mobile Broadband Module	723895-005

Before removing the WWAN module, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the hard drive cover (see Bottom cover on page 35).

5. Remove the bottom cover (see ForcePad (Touchpad) on page 53).

6. Disconnect the battery (see Battery on page 41).

Remove the WWAN module:

1. Disconnect the WWAN antenna cables **(1)** from the terminals on the WWAN module.

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

2. Remove the Phillips PM2.0×3.0 screw **(2)** that secures the WWAN module to the system board.

3. Remove the WWAN module **(3)** by pulling the module away from the slot.

NOTE: WWAN modules are designed with a notch to prevent incorrect insertion.
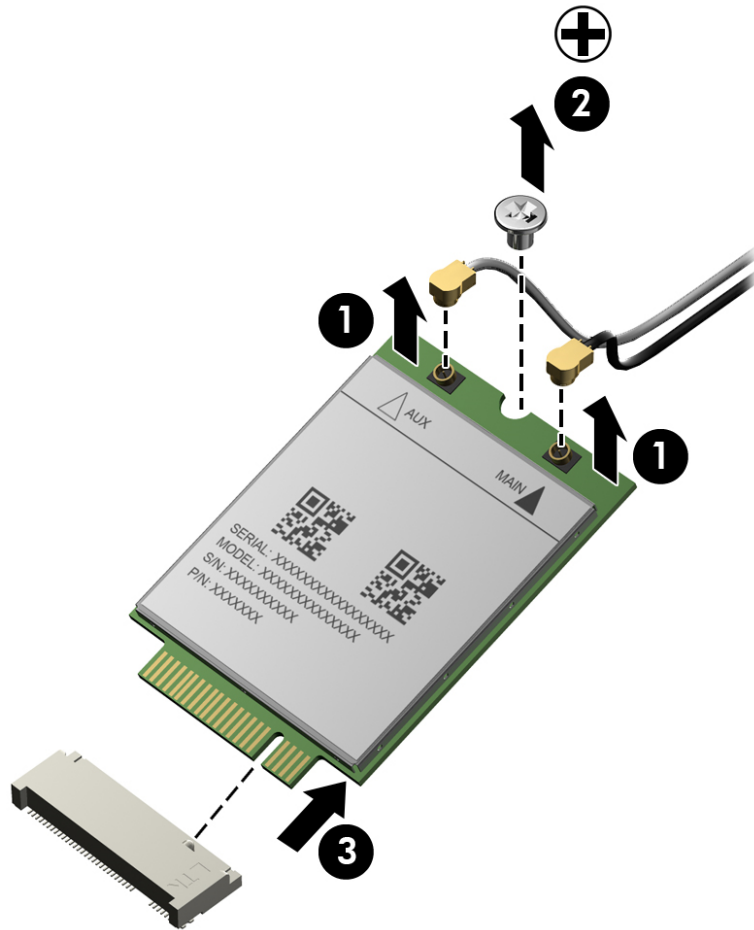
NOTE: If the WWAN antennas are not connected to the terminals on the WWAN module, the protective sleeves must be installed on the antenna connectors, as shown in the following illustration.
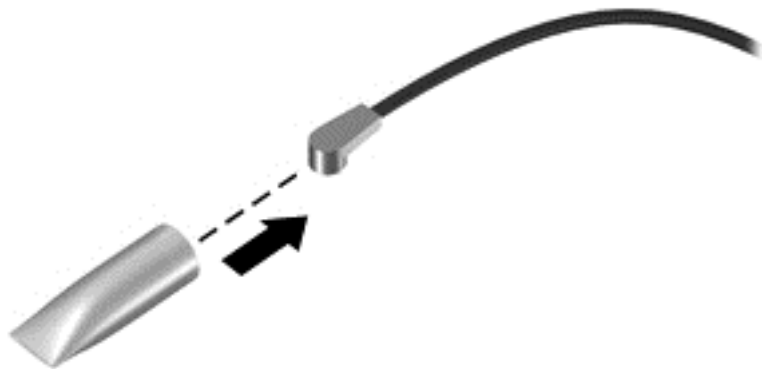
Reverse this procedure to install the WWAN module.

WLAN module

Description	Spare part number
Intel Dual Band Wireless-N 7260AN 802.11 a/b/g/n 2x2 WiFi + BT 4.0	717379-005
Intel Dual Band Wireless-AC 7260 802.11 ac 2x2 WiFi + BT 4.0	717380-005
Intel Wireless-N 7260BN 802.11 b/g/n 2x2 WiFi + BT 4.0	735532-005
Intel Dual Band Wireless-N 7260AN BT 4.0 combo adapter	747833-005

⚠ **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 technical support.

Before removing the WLAN module, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see).

5. Disconnect the battery (see).

Remove the WLAN module:

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

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

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

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

> **NOTE:** WLAN modules are designed with a notch to prevent incorrect insertion.
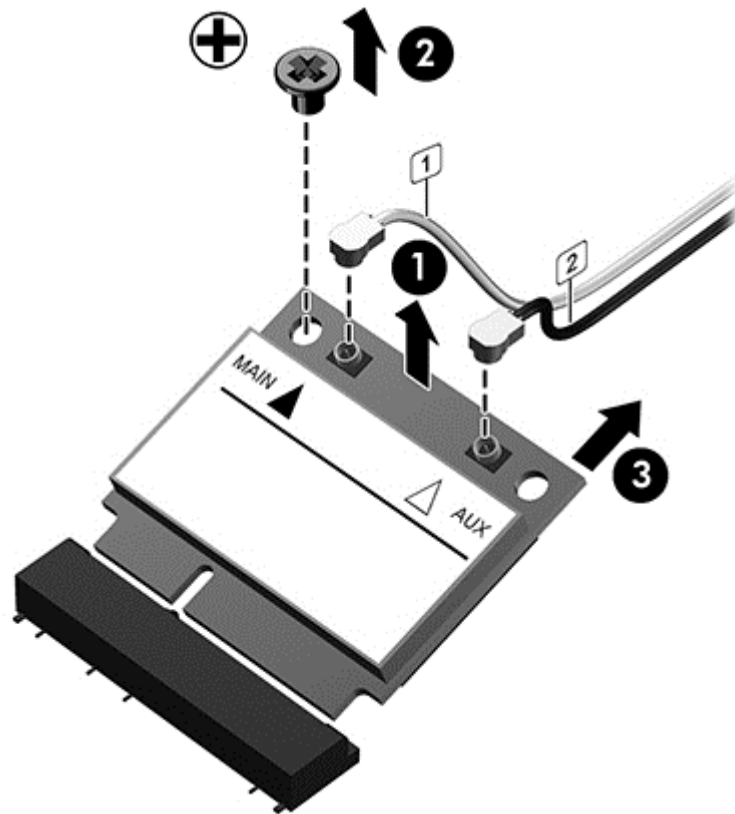
> **NOTE:** If the WLAN antennas are not connected to the terminals on the WLAN module, the protective sleeves must be installed on the antenna connectors, as shown in the following illustration.
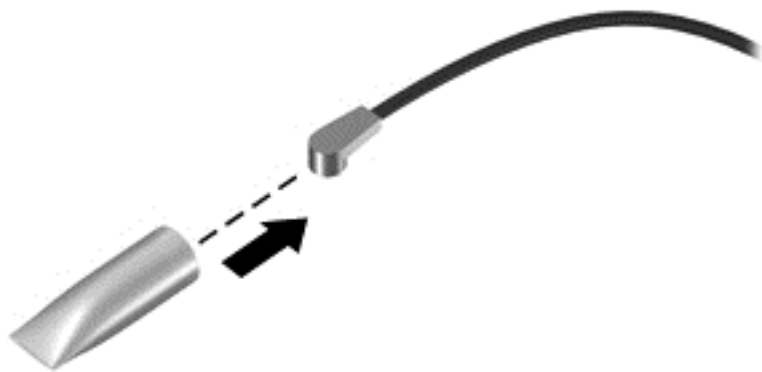
Reverse this procedure to install the WLAN module.
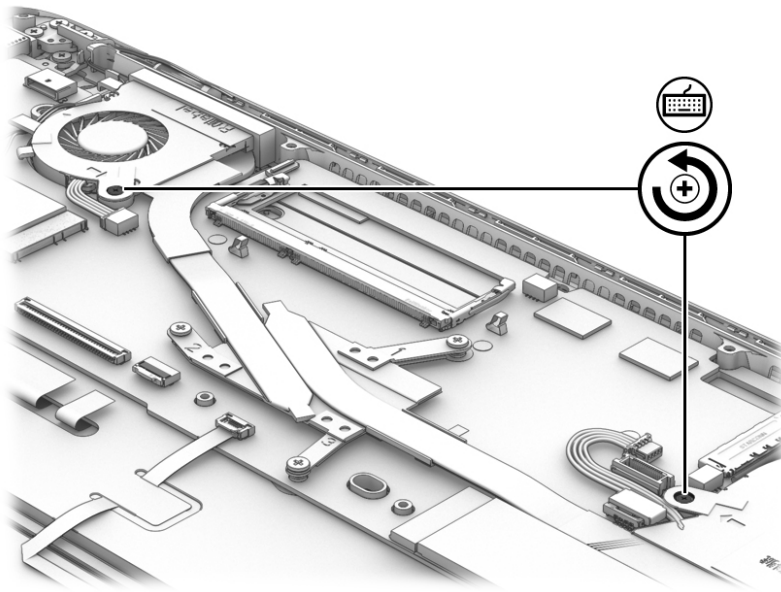
Keyboard

Description	Spare part number
Keyboard	739563-xx1

NOTE: For a detailed list of available keyboards, see .

Before removing the keyboard, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see).

5. Remove the battery (see).

6. Remove the memory module (see).
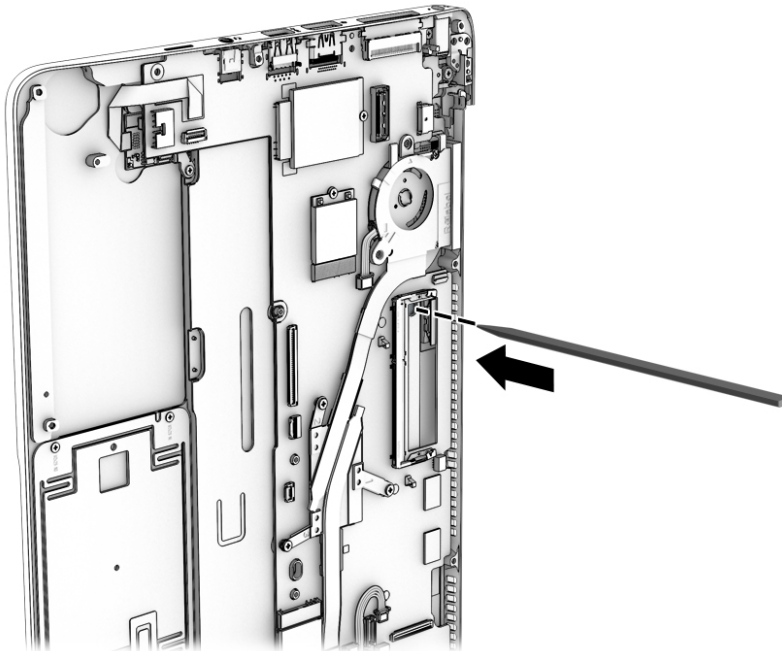
Remove the keyboard:

1. Loosen the 2 captive Phillips screws that secure the keyboard to the computer.


2. Release and disconnect the following connectors and cables:

   ● Release the keyboard connector **(1)** and remove the cable **(2)**.

   ● Release the backlight connector **(3)** and remove the cable **(4)**.
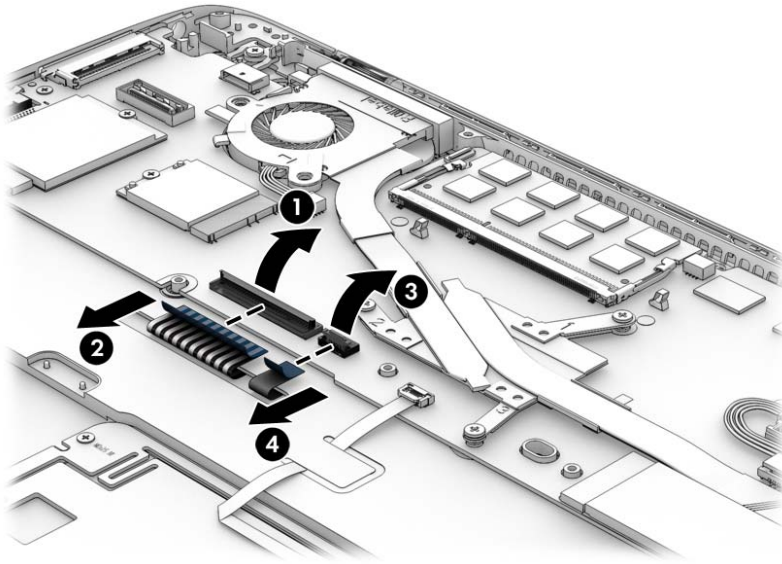
3. Position the computer open and on its side.

4. Insert a screw driver or similar thin tool into the keyboard release opening under the memory module, and then press on the back of the keyboard until the keyboard disengages from the computer.

5. Lift the rear edge of the keyboard **(1)**, and then remove the keyboard **(2)**.
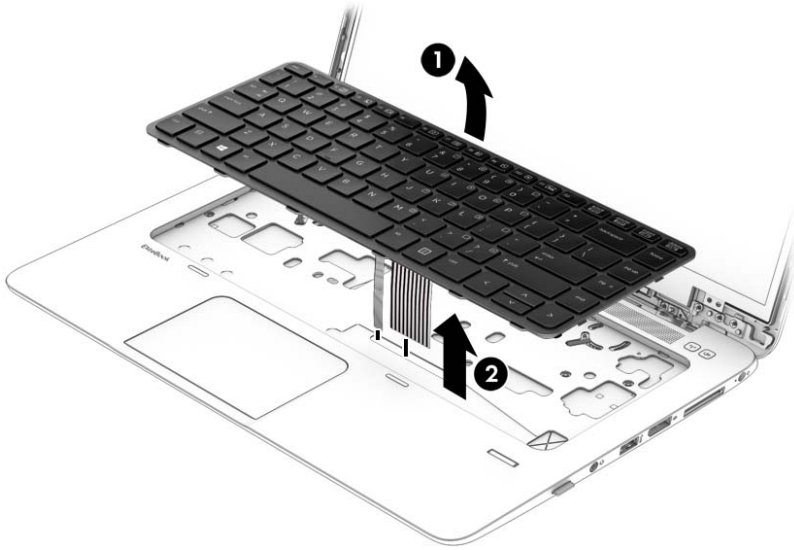
6. Remove the keyboard.

Reverse this procedure to install the keyboard.

ForcePad (Touchpad)

Description	Spare part number
ForcePad (Touchpad) (includes cable)	739565-001

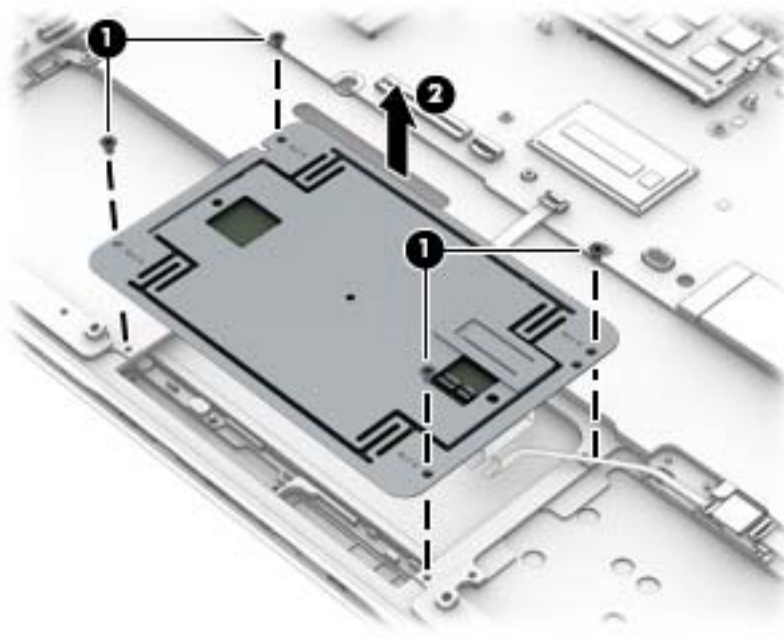Before removing the ForcePad, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see).

5. Remove the battery (see).

Remove the ForcePad:

1. Disconnect the ForcePad cable **(1)** and the NFC module cable **(2)** from the connectors on the ForcePad.

2. Remove the cables from under the Mylar that secures them **(3)**.
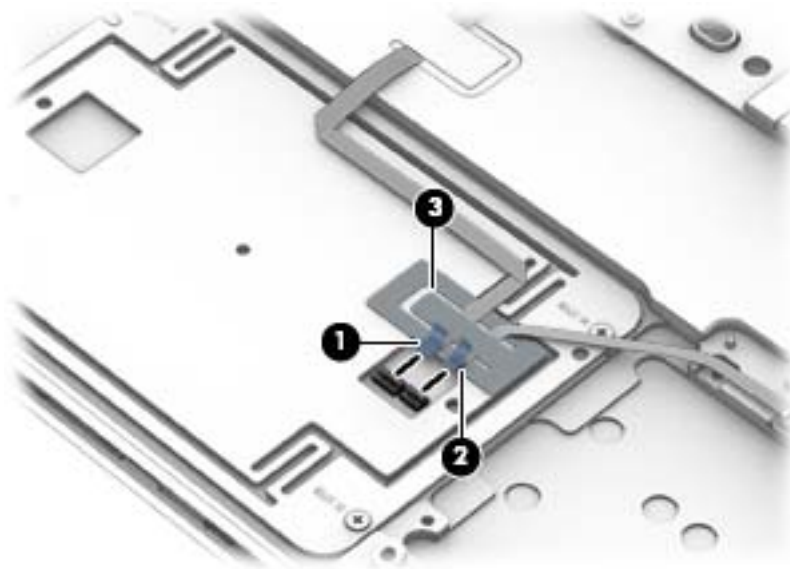
3. Remove the four Phillips PM2.0×2.5 screws **(1)** that secure the ForcePad to the computer, and then lift the ForcePad from the computer **(2)**..

Reverse the removal procedures to install the ForcePad.

NFC module

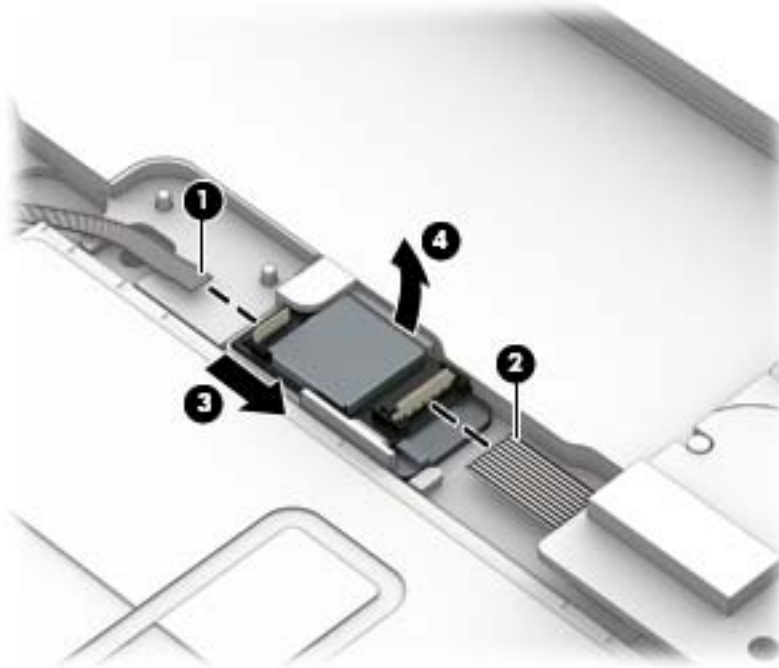| Description	Spare part number
NFC (Near Field Communication) module	739578-001

Before removing the NFC module, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Bottom cover (see Bottom cover on page 35)

5. Remove the battery (see Battery on page 41).

Remove the NFC module:

1. Disconnect the NFC antenna **(1)** and the system board cable **(2)** from the NFC module..

2. Slide the module away from the ForcePad **(3)**, and the lift it from the computer **(4)**.

> **NOTE:** The NFC module cable and NFC antenna are available in the Cable Kit, spare part number 739564-001.

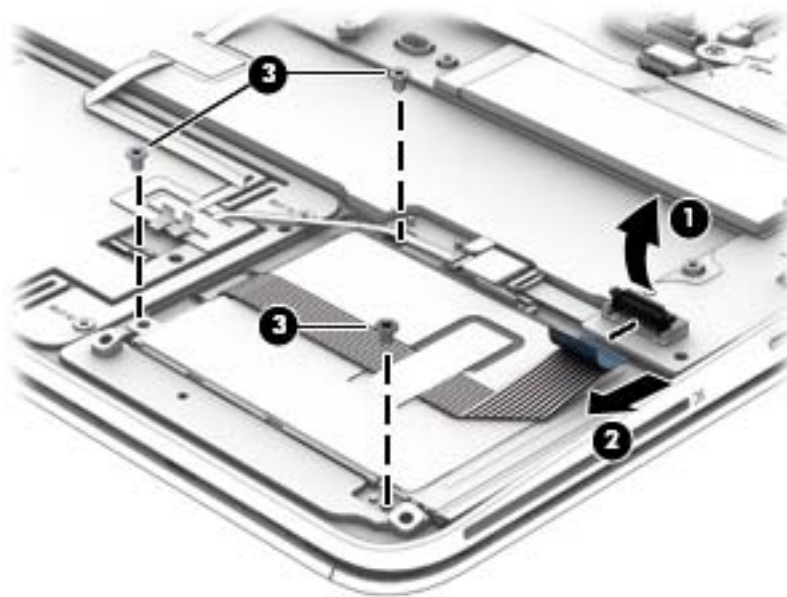Reverse the removal procedures to install the NFC module.

Smart card reader

Description	Spare part number
Smart card reader (includes cable)	739566-001

Before removing the smart card reader, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Bottom cover (see Bottom cover on page 35)

5. Remove the battery (see Battery on page 41).

Remove the smart card reader:

1. Lift the system board connector **(1)**, and then disconnect the cable from the connector **(2)**.

2. Remove the three Phillips PM2.0×2.5 screws **(3)** that secure the reader to the computer.

3. Rotate the bottom up the reader upward at an angle **(1)**, and then remove it from the computer **(3)**.

Reverse the removal procedures to install the smart card board.

Power connector

Description	Spare part number
Power connector	749612-001

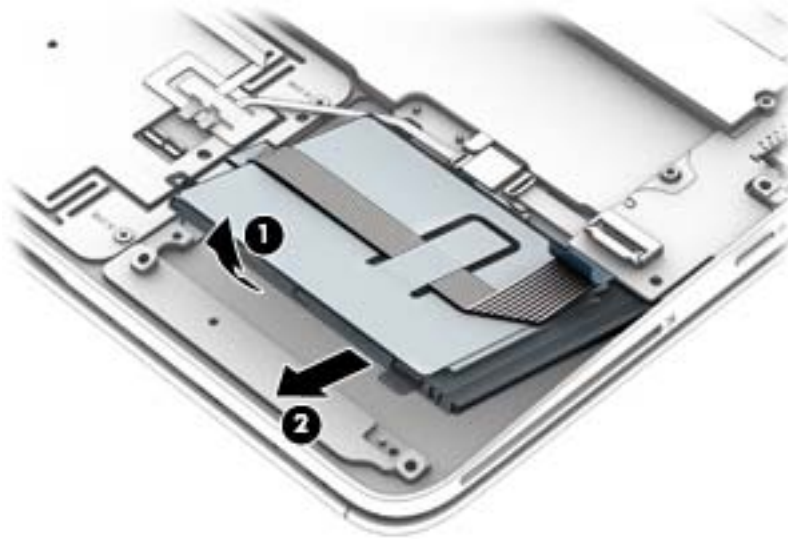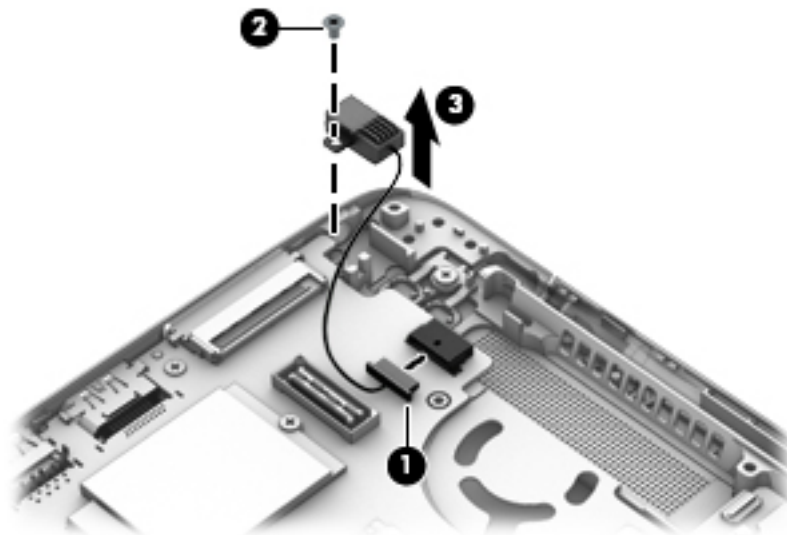Before removing the power connector, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Bottom cover (see Bottom cover on page 35)

5. Remove the battery (see Battery on page 41), and then remove the following components:

Remove the power connector:

1. Disconnect the power connector cable from the system board **(1)**.

2. Remove the Phillips PM2.0×3.0 screw **(2)** that secures the power connector cable to the computer.

3. Lift the power connector from the computer **(3)**.

Reverse this procedure to install the power connector.

Heat sink/fan assembly

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

Description	Spare part number
Heat sink/thermal module with fans	739561-001

Before removing the heat sink/fan assembly, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Bottom cover (see Bottom cover on page 35)

5. Remove the battery (see Battery on page 41), and then remove the following components:

Remove the heat sink/fan assembly:

1. Disconnect both fan cables **(1) (2)** from the system board.
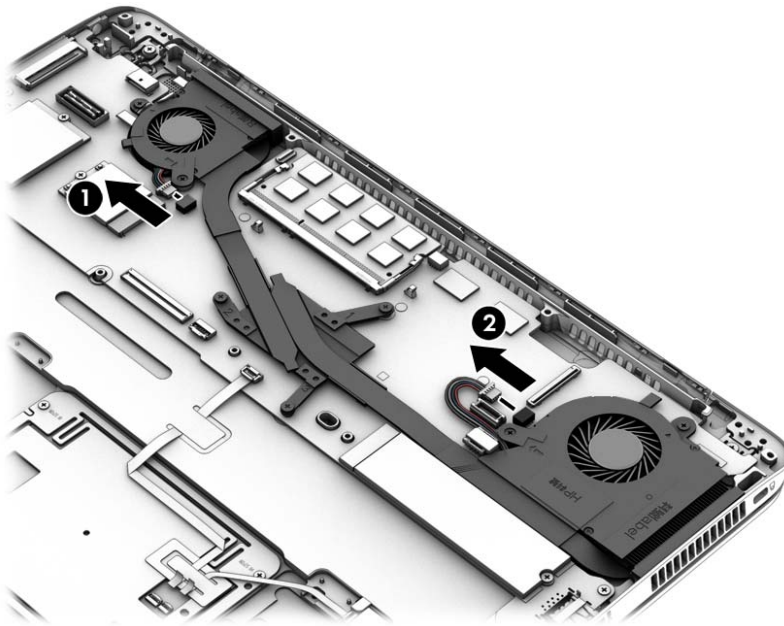
2. Loosen the captive Philllips screw from each fan **(1)**.

3. Following the sequence stamped into the heat sink, loosen the three captive Philllips screws **(2)** that secure the heat sink to the system board.

4. Using both hands, lift up both fans at the same time and remove the assembly **(3)**.

⚠ **CAUTION:** Take extreme care when removing the heat sink and fan assembly. The heatpipes between the fans are very fragile and can be easily damaged and bent during removal.
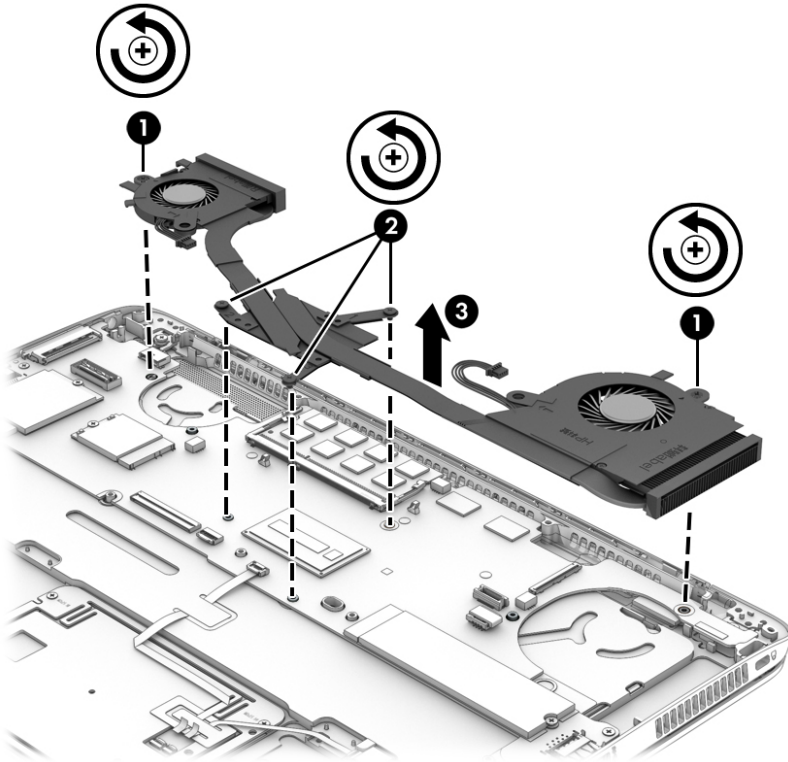
📝 **NOTE:** The thermal material must be thoroughly cleaned from the surfaces of the heat sink and the system board components each time the heat sink is removed. Replacement thermal material is included with the heat sink, processor, and system board spare part kits.

The following illustration shows the replacement thermal material locations. Thermal paste is used on the heat sink **(1)** and the processor **(2)**.
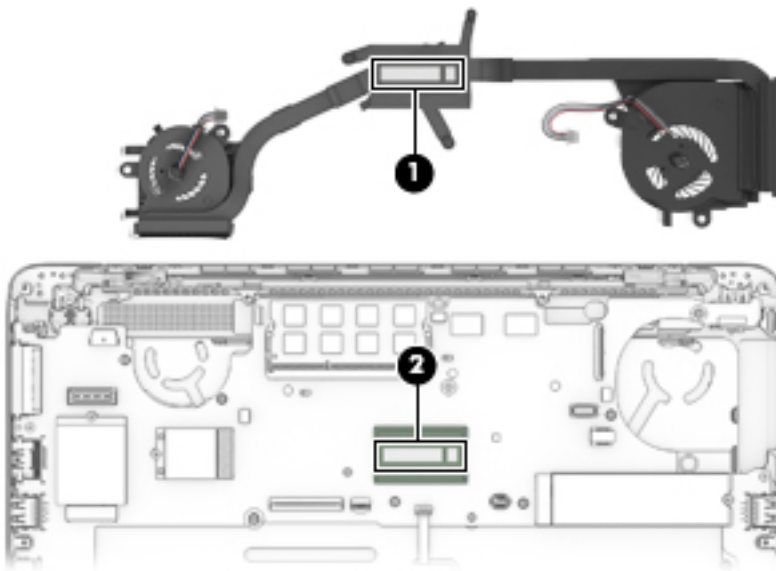
Reverse this procedure to install the heat sink/fan assembly.

System board

NOTE: The system board spare part kit includes replacement thermal material.

Description	Spare part number
System boards for use in models without Windows 8:	
Intel Core i7-4650U processor (1.70 GHz, 4-MB cache)	739583-001
Intel Core i7-4600U processor (1.80 GHz, 3-MB cache)	748354-001
Intel Core i5-4300U processor (1.90 GHz, 3-MB cache)	739580-001
Intel Core i5-4200U processor (1.60 GHz, 3-MB cache)	739579-001
System boards for use in Windows 8 models:	
Intel Core i7-4650U processor (1.70 GHz, 4-MB cache) for use in models with Windows 8 Standard	739583-501
Intel Core i7-4650U processor (1.70 GHz, 4-MB cache) for use in models with Windows 8 Professional	739583-601
Intel Core i7-4600U processor (2.10 GHz, 4-MB cache) for use in models with Windows 8 Standard	748354-501
Intel Core i7-4600U processor (2.10 GHz, 4-MB cache) for use in models with Windows 8 Professional	748354-601
Intel Core i5-4300U processor (1.70 GHz, 3-MB cache) for use in models with Windows 8 Standard	739580-501
Intel Core i5-4300U processor (1.70 GHz, 3-MB cache) for use in models with Windows 8 Professional	739580-601
Intel Core i5-4200U processor (1.60 GHz, 3-MB cache) for use in models with Windows 8 Standard	739579-501
Intel Core i5-4200U processor (1.60 GHz, 3-MB cache) for use in models with Windows 8 Professional	739579-601

Before removing the system board, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see Bottom cover on page 35)

5. Remove the keyboard (see Keyboard on page 50)

6. Remove the heat sink/fan assembly (see Heat sink/fan assembly on page 59)

7. Remove the battery (see Battery on page 41).

**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:

- SSD drive module (see SSD drive on page 43)

- Memory module (see Memory module on page 44)

- WWAN module (see WWAN module on page 46)

- WLAN module (see WLAN module on page 48)

- Heat sink (see Heat sink/fan assembly on page 59)

Remove the system board:

1. Disconnect the following cables:
    *   **(1)**: Power connector
    *   **(2)**: Speaker
    *   **(3)**: Display panel
    *   **(4)**: NFC module cable
    *   **(5)**: Fingerprint reader
    *   **(6)**: RTC battery
    *   **(7)**: Multi-function board
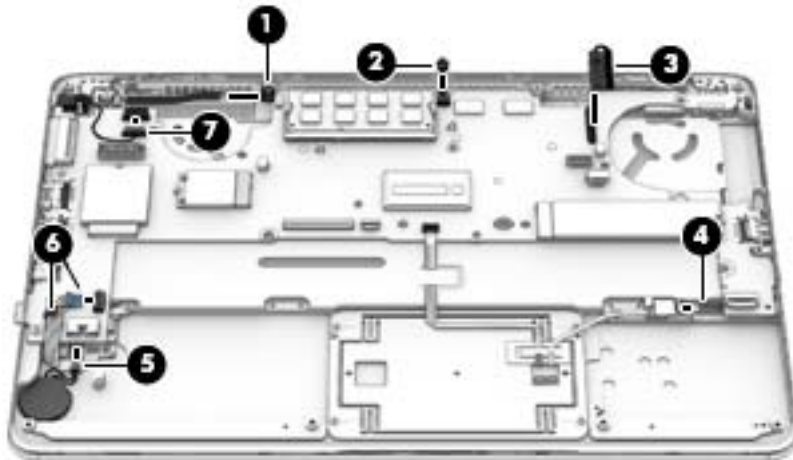
2. Remove the four Phillips PM2.0×3.0 screws that secure the system board to the computer.
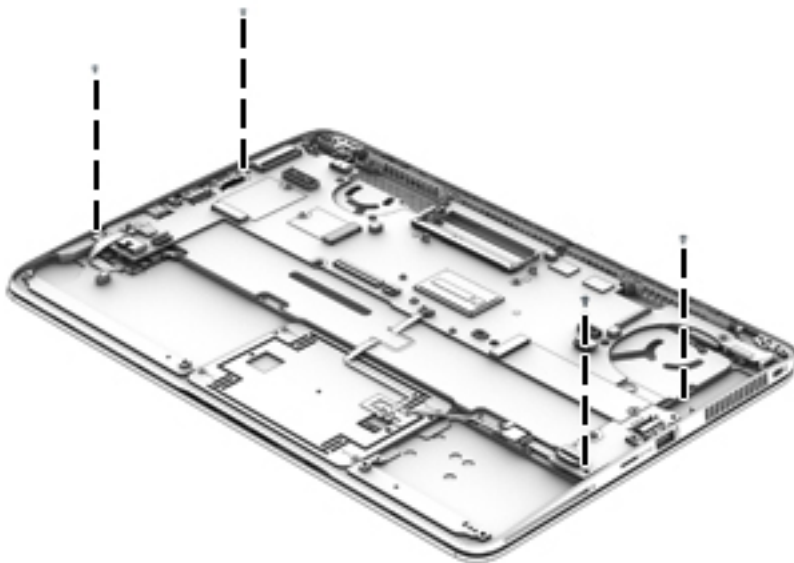
3. To remove the system board, be sure to lift near the middle of the board near the connectors as shown by callout **(1)** in the following image.

    ⚠ CAUTION: To avoid damaging or breaking the system board, when removing the board, lift up near the middle of the board. Do not lift up on the narrow end of the board.

4. Lift the right side of the system board up at an angle **(2)**.

5. Pull the system board away from and out of the computer **(3)**, making sure the connectors on the side of the board are clear of the computer.
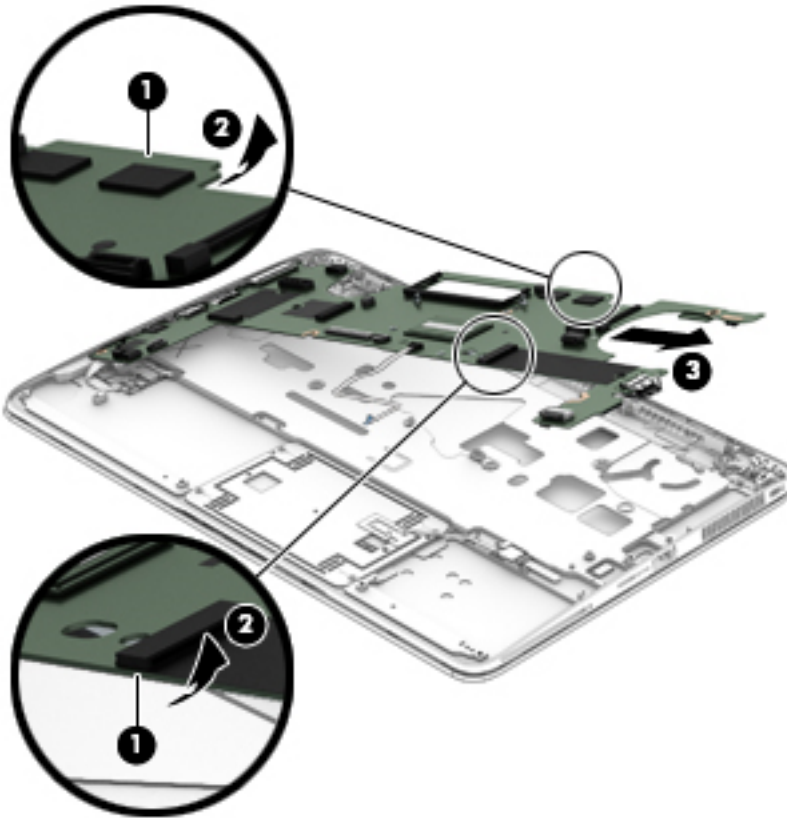
Use the following image to determine all Mylar locations on the system board.
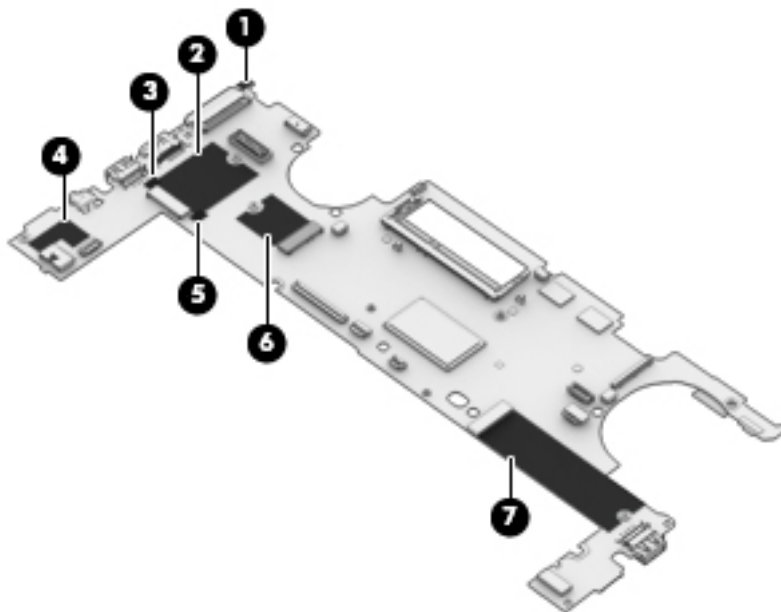
Reverse this procedure to install the system board.

Multi-function board

Description	Spare part number
Function board	739574-001

Before removing the function board, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see Bottom cover on page 35)

5. Remove the battery (see Battery on page 41).

6. Remove the keyboard (see Keyboard on page 50)

7. Remove the heat sink/fan assembly (see Heat sink/fan assembly on page 59)

8. Remove the system board (see System board on page 61)

Remove the function board:

1. Remove the Phillips PM2.0×3.0 screw **(1)** that secures the board to the computer.

2. Lift the board up and off the computer **(2)**.

> **NOTE:** The function board cable is available in the Cable Kit, spare part number 739564-001.

Reverse the removal procedures to install the function board.

Fingerprint reader board

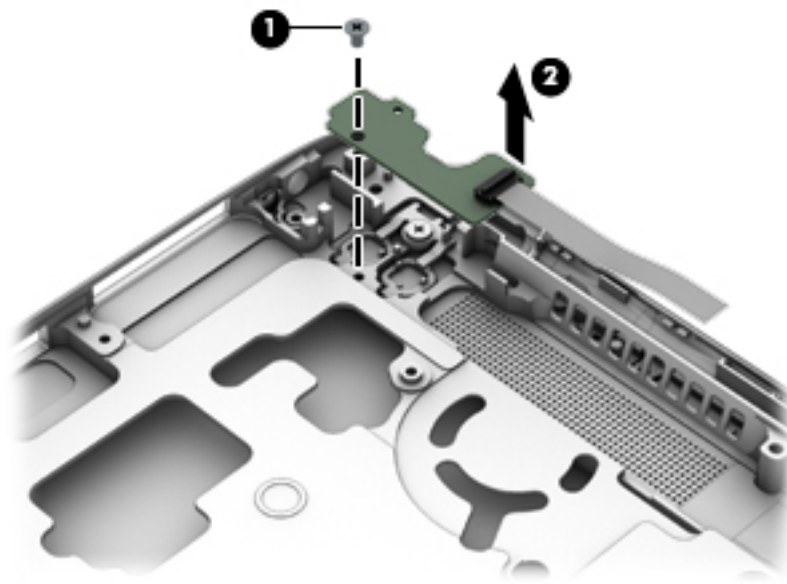| Description	Spare part number
Fingerprint reader board (includes cable)	739567-001

Before removing the fingerprint reader board, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see)

5. Remove the battery (see).

6. Remove the keyboard (see)

7. Remove the heat sink/fan assembly (see)

8. Remove the system board (see)

Remove the fingerprint reader board:

1. Remove the two Phillips PM2.0×3.0 screws **(1)** that secure the board to the computer.

2. Remove the bracket from atop the fingerprint reader board **(2)**.

3. Remove the fingerprint reader board and cable from the computer **(3)**.
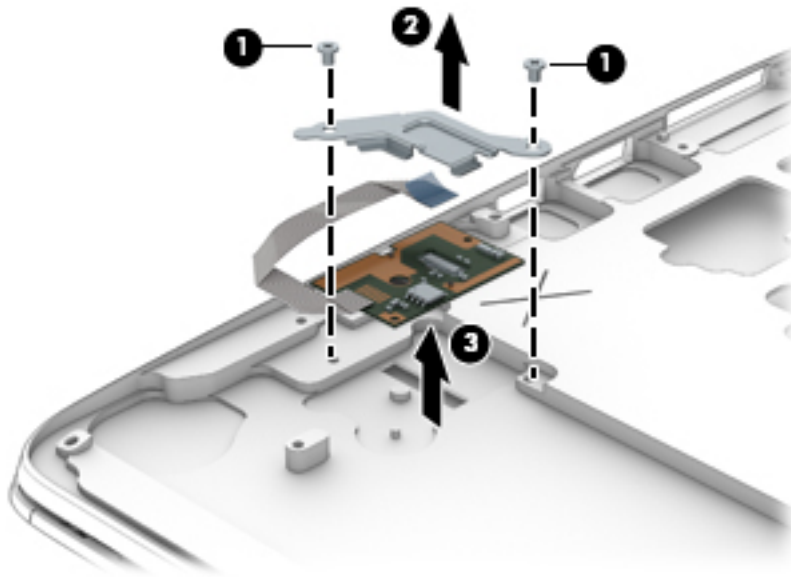
Reverse this procedure to install the fingerprint reader board.

Speaker assembly

Description	Spare part number
Speaker assembly (includes cable)	739577-001

Before removing the speaker assembly, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see Bottom cover on page 35)

5. Remove the battery (see Battery on page 41).

6. Remove the keyboard (see Keyboard on page 50)

7. Remove the heat sink/fan assembly (see Heat sink/fan assembly on page 59)

8. Remove the system board (see System board on page 61)

Remove the speaker assembly:

1. Use a tool to pry the speaker and disengage the adhesive that secures it to the computer **(1)**.

2. Remove the speaker **(2)** from the computer.
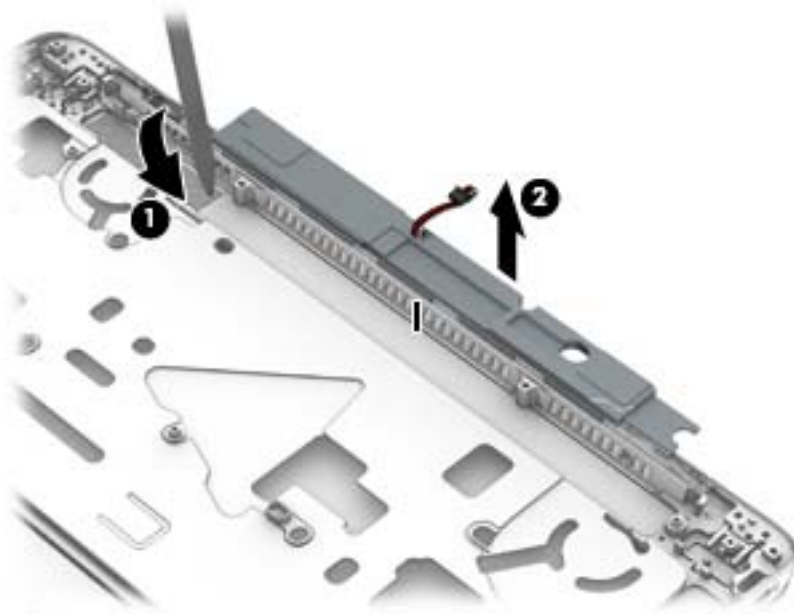
Reverse this procedure to install the speakers.

SIM slot

Description	Spare part number
Plastics Kit	739575-005

The Plastics Kit includes both the SIM slot insert for use in models with WWAN and the SIM slot cover for use in models without WWAN.

Service technicians must remove the system board to remove the SIM slot cover.

SIM slot insert (WWAN models)

The SIM slot insert, used on WWAN models, matches the size of the SIM card and is customer removable.

To insert and remove the SIM slot insert:

1. Insert with the arrow on insert visible.
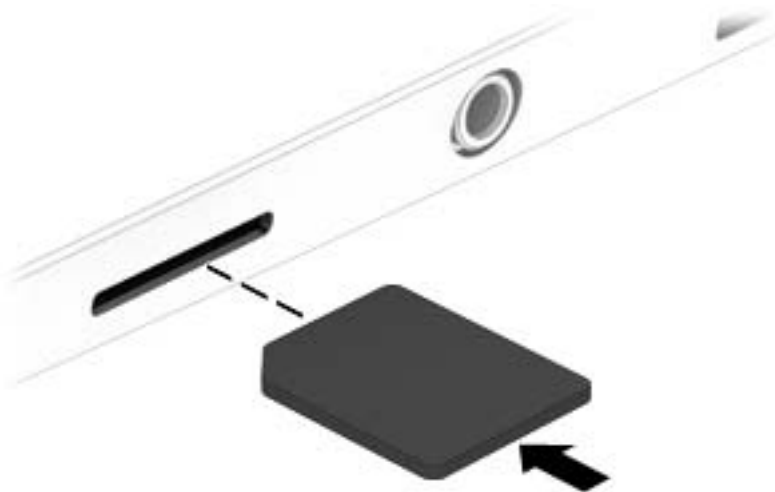
2. To remove the insert, use the standard with push-pull movement.

SIM slot cover (non-WWAN models)

The SIM slot cover, used on models without WWAN, is shorter than a SIM card, notched, and is not customer removable.

To insert and remove the SIM slot cover:

1. Insert with the arrow on insert visible.
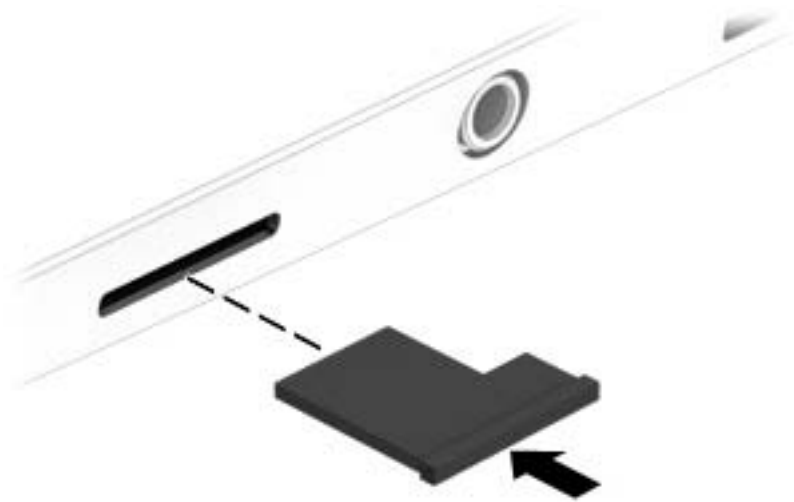
2. To remove the SIM slot cover, you must first remove the system board, and then pull the cover out of the SIM slot.

6 Computer Setup (BIOS), MultiBoot, and HP PC Hardware Diagnostics (UEFI) in Windows 8

Using Computer Setup

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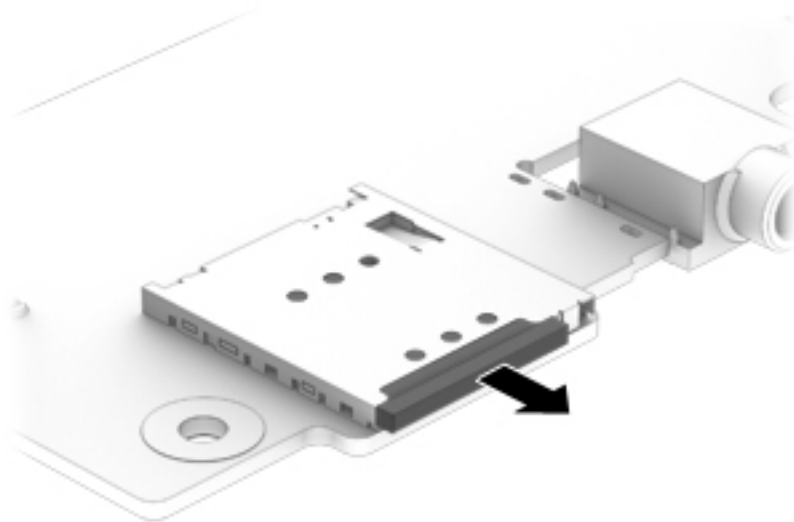etup includes settings for the types of devices installed, the startup sequence of the computer, and the amount of system and extended memory.

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

Starting Computer Setup

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

To start Computer Setup, follow these steps:

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

2. Press f10 to enter Computer Setup.

Navigating and selecting in Computer Setup

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

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

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

2. Press f10 to enter Computer Setup.

   - To select a menu or a menu item, use the tab key and the keyboard arrow keys and then press enter, or use a pointing device to click the item.

   - To scroll up and down, click the up arrow or the down arrow in the upper-right corner of the screen, or use the up arrow key or the down arrow key on the keyboard.

   - To close open dialog boxes and return to the main Computer Setup screen, press esc, and then follow the on-screen instructions.

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

- To exit Computer Setup menus without saving your changes:

  Click the **Exit** icon in the lower-right corner of the screen, and then follow the on-screen instructions.

– or –

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

●   To save your changes and exit Computer Setup menus:

Click the **Save** icon in the lower-right corner of the screen, and then follow the on-screen instructions.

– or –

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

Your changes go into effect when the computer restarts.

Restoring factory settings in Computer Setup

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

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

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

2.   Press f10 to enter Computer Setup.

3.   Use a pointing device or the arrow keys to select **Main > Restore Defaults**.

4.   Follow the on-screen instructions.

5.   To save your changes and exit, click the **Save** icon in the lower-right corner of the screen, and then follow the on-screen instructions.

– or –

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

Your changes go into effect when the computer restarts.

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

Updating the BIOS

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

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

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

Determining the BIOS version

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

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

1. Start Computer Setup.

2. Use a pointing device or the arrow keys to select **Main > System Information**.

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

   – or –

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

Downloading a BIOS update

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

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

Do not shut down the computer or initiate Sleep.

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

1. From the Start screen, type `hp support assistant`, and then select the HP Support Assistant app.

2. Click **Updates and tune-ups**, and then click **Check for HP updates now**.

3. Follow the on-screen instructions.

4. At the download area, follow these steps:

   a. Identify the most recent BIOS update and compare it to 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.

   If the update is more recent than your BIOS, make a note of the path to the location on your hard drive where the BIOS update is downloaded. You will need to access this path when you are ready to install the update.

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

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

1. From the Start screen, type `file`, and then select **File Explorer**.

2. 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 MultiBoot

About the boot device order

As the computer starts, the system attempts to boot from enabled devices. The MultiBoot utility, which is enabled at the factory, controls the order in which the system selects a boot device. Boot devices can include optical drives, diskette drives, a network interface card (NIC), hard drives, and USB devices. Boot devices contain bootable media or files that the computer needs to start and operate properly.

NOTE: Some boot devices must be enabled in Computer Setup before they can be included in the boot order.

You can change the order in which the computer searches for a boot device by changing the boot order in Computer Setup. You can also press esc while the "Press the ESC key for Startup Menu" message is displayed at the bottom of the screen, and then press f9. Pressing f9 displays a menu that shows the current boot devices and allows you to select a boot device. Or, you can use MultiBoot Express to set the computer to prompt you for a boot location each time the computer turns on or restarts.

Choosing MultiBoot preferences

You can use MultiBoot in the following ways:

- To set a new boot order that the computer uses each time it is turned on, by changing the boot order in Computer Setup.

- To dynamically choose the boot device, by pressing esc while the "Press the ESC key for Startup Menu" message is displayed at the bottom of the screen, and then pressing f9 to enter the Boot Device Options menu.

- To use MultiBoot Express to set variable boot orders. This feature prompts you for a boot device each time the computer is turned on or restarted.

Setting a new boot order in Computer Setup

To start Computer Setup and set a boot device order that the computer uses each time it is turned on or restarted, follow these steps:

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

2. Press f10 to enter Computer Setup.

3. Use a pointing device or the arrow keys to select **Advanced > Boot Options > UEFI Boot Order for UEFI Hybrid** or **UEFI Native Boot mode**, or select **Advanced > Boot Options > Legacy Boot Order** for Legacy Boot Mode, and then press enter.

4. To move the device up in the boot order, use a pointing device to click the up arrow, or press the + key.

   – or –

   To move the device down in the boot order, use a pointing device to click the down arrow, or press the - key.

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

   – or –

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

Dynamically choosing a boot device using the f9 prompt

To dynamically choose a boot device for the current startup sequence, follow these steps:

1. Open the Select Boot Device menu by turning on or restarting the computer, and then pressing esc while the "Press the ESC key for Startup Menu" message is displayed at the bottom of the screen.

2. Press f9.

3. Use a pointing device or the arrow keys to select a boot device, then press enter.

Setting a MultiBoot Express prompt

To start Computer Setup and set the computer to display the MultiBoot startup location menu each time the computer is started or restarted, follow these steps:

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

2. Press f10 to enter Computer Setup.

3. Use a pointing device or the arrow keys to select **Advanced > Boot Options > MultiBoot Express Boot Popup Delay (Sec)**, and then press enter.

4. In the **MultiBoot Express Popup Delay (Sec)** field, enter the length of time in seconds that you want the computer to display the startup location menu before it defaults to the current MultiBoot setting. (When 0 is selected, the Express Boot startup location menu is not displayed.)

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

   – or –

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

Your changes go into effect when the computer restarts.

Entering MultiBoot Express preferences

When the Express Boot menu is displayed during startup, you have the following choices:

● To specify a boot device from the Express Boot menu, select your preference within the allotted time, and then press enter.

● To prevent the computer from defaulting to the current MultiBoot setting, press any key before the allotted time expires. The computer will not start until you select a boot device and press enter.

● To allow the computer to start according to the current MultiBoot settings, wait for the allotted time to expire.

Using HP PC Hardware Diagnostics (UEFI) (select models only)

HP PC Hardware Diagnostics is a Unified Extensible Firmware Interface (UEFI) that allows you to run diagnostic tests to determine if the computer hardware is functioning properly. The tool runs outside of the operating system to isolate hardware failures from issues that may be caused by the operating system or other software components.

To start HP PC Hardware Diagnostics UEFI:

1. Turn on or restart the computer, quickly press esc, and then press f2.

   After pressing f2, the BIOS searches three places for the HP PC Hardware Diagnostics (UEFI) tools in the following order:

   a. Connected USB drive

      NOTE: To download the HP PC Hardware Diagnostics (UEFI) tool to a USB drive, see Downloading HP PC Hardware Diagnostics (UEFI) to a USB device on page 74.

   b. Hard drive

   c. BIOS

2. Click the type of diagnostic test you want to run, and then follow the on-screen instructions.

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

Downloading HP PC Hardware Diagnostics (UEFI) to a USB device

NOTE: The HP PC Hardware Diagnostics (UEFI) download instructions are provided in English only.

1. Go to http://www.hp.com.

2. Click **Support & Drivers**, and then click the **Drivers & Software** tab.

3. Enter the product name in the text box, and then click **Search**.

4. Select your computer model, and then select your operating system.

5. In the Diagnostic section, click **HP UEFI Support Environment**.

   – or –

   Click **Download**, and then select **Run**.

7 Computer Setup (BIOS), MultiBoot, and HP PC Hardware Diagnostics (UEFI) in Windows 7

Using Computer Setup

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

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

Starting Computer Setup

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

To start Computer Setup, follow these steps:

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

2. Press f10 to enter Computer Setup.

Navigating and selecting in Computer Setup

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

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

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

2. Press f10 to enter Computer Setup.

   ● To select a menu or a menu item, use the tab key and the keyboard arrow keys and then press enter, or use a pointing device to click the item.

   ● To scroll up and down, click the up arrow or the down arrow in the upper-right corner of the screen, or use the up arrow key or the down arrow key on the keyboard.

   ● To close open dialog boxes and return to the main Computer Setup screen, press esc, and then follow the on-screen instructions.

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

● To exit Computer Setup menus without saving your changes:

   Click the **Exit** icon in the lower-right corner of the screen, and then follow the on-screen instructions.

– or –

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

- To save your changes and exit Computer Setup menus:

Click the **Save** icon in the lower-right corner of the screen, and then follow the on-screen instructions.

– or –

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

Your changes go into effect when the computer restarts.

Restoring factory settings in Computer Setup

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

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

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

2. Press f10 to enter Computer Setup.

3. Use a pointing device or the arrow keys to select **Main > Restore Defaults**.

4. Follow the on-screen instructions.

5. To save your changes and exit, click the **Save** icon in the lower-right corner of the screen, and then follow the on-screen instructions.

   – or –

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

Your changes go into effect when the computer restarts.

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

Updating the BIOS

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

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

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

Determining the BIOS version

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

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

1. Start Computer Setup.

2. Use a pointing device or the arrow keys to select **Main > System Information**.

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

    – or –

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

Downloading a BIOS update

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

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

Do not shut down the computer or initiate Sleep.

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

1. Access Help and Support by selecting **Start > Help and Support**.

2. Select **Updates and tune-ups**, and then select **Check for HP updates now**.

3. At the download area, follow these steps:

    a. Identify the most recent BIOS update and compare it to 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.

        If the update is more recent than your BIOS, 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. Select **Start > Computer**.

2. 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 MultiBoot

About the boot device order

As the computer starts, the system attempts to boot from enabled devices. The MultiBoot utility, which is enabled at the factory, controls the order in which the system selects a boot device. Boot devices can include optical drives, diskette drives, a network interface card (NIC), hard drives, and USB devices. Boot devices contain bootable media or files that the computer needs to start and operate properly.

NOTE: Some boot devices must be enabled in Computer Setup before they can be included in the boot order.

You can change the order in which the computer searches for a boot device by changing the boot order in Computer Setup. You can also press esc while the "Press the ESC key for Startup Menu" message is displayed at the bottom of the screen, and then press f9. Pressing f9 displays a menu that shows the current boot devices and allows you to select a boot device. Or, you can use MultiBoot Express to set the computer to prompt you for a boot location each time the computer turns on or restarts.

Choosing MultiBoot preferences

You can use MultiBoot in the following ways:

- To set a new boot order that the computer uses each time it is turned on, by changing the boot order in Computer Setup.

- To dynamically choose the boot device, by pressing esc while the "Press the ESC key for Startup Menu" message is displayed at the bottom of the screen, and then pressing f9 to enter the Boot Device Options menu.

- To use MultiBoot Express to set variable boot orders. This feature prompts you for a boot device each time the computer is turned on or restarted.

Setting a new boot order in Computer Setup

To start Computer Setup and set a boot device order that the computer uses each time it is turned on or restarted, follow these steps:

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

2. Press f10 to enter Computer Setup.

3. Use a pointing device or the arrow keys to select the **Advanced > Boot Options > UEFI Boot Order for UEFI Hybrid** or **UEFI Native Boot mode**, or select **Advanced > Boot Options > Legacy Boot Order** for Legacy Boot Mode, and then press enter.

4. To move the device up in the boot order, use a pointing device to click the up arrow, or press the + key.

   – or –

   To move the device down in the boot order, use a pointing device to click the down arrow, or press the - key.

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

   – or –

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

Dynamically choosing a boot device using the f9 prompt

To dynamically choose a boot device for the current startup sequence, follow these steps:

1. Open the Select Boot Device menu by turning on or restarting the computer, and then pressing esc while the "Press the ESC key for Startup Menu" message is displayed at the bottom of the screen.

2. Press f9.

3. Use a pointing device or the arrow keys to select a boot device, then press enter.

Setting a MultiBoot Express prompt

To start Computer Setup and set the computer to display the MultiBoot startup location menu each time the computer is started or restarted, follow these steps:

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

2. Press f10 to enter Computer Setup.

3. Use a pointing device or the arrow keys to select **Advanced > Boot Options > MultiBoot Express Boot Popup Delay (Sec)**, and then press enter.

4. In the **MultiBoot Express Popup Delay (Sec)** field, enter the length of time in seconds that you want the computer to display the startup location menu before it defaults to the current MultiBoot setting. (When 0 is selected, the Express Boot startup location menu is not displayed.)

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

   – or –

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

Your changes go into effect when the computer restarts.

Entering MultiBoot Express preferences

When the Express Boot menu is displayed during startup, you have the following choices:

● To specify a boot device from the Express Boot menu, select your preference within the allotted time, and then press enter.

● To prevent the computer from defaulting to the current MultiBoot setting, press any key before the allotted time expires. The computer will not start until you select a boot device and press enter.

● To allow the computer to start according to the current MultiBoot settings, wait for the allotted time to expire.

Using HP PC Hardware Diagnostics (UEFI) (select models only)

HP PC Hardware Diagnostics is a Unified Extensible Firmware Interface (UEFI) that allows you to run diagnostic tests to determine if the computer hardware is functioning properly. The tool runs outside of the operating system to isolate hardware failures from issues that may be caused by the operating system or other software components.

To start HP PC Hardware Diagnostics UEFI:

1. Turn on or restart the computer, quickly press esc, and then press f2.

    After pressing f2, the BIOS searches three places for the HP PC Hardware Diagnostics (UEFI) tools in the following order:

    a. Connected USB drive

        NOTE: To download the HP PC Hardware Diagnostics (UEFI) tool to a USB drive, see Downloading HP PC Hardware Diagnostics (UEFI) to a USB device on page 74.

    b. Hard drive

    c. BIOS

2. Click the type of diagnostic test you want to run, and then follow the on-screen instructions.

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

Downloading HP PC Hardware Diagnostics (UEFI) to a USB device

NOTE: The HP PC Hardware Diagnostics (UEFI) download instructions are provided in English only.

1. Go to http://www.hp.com.

2. Click **Support & Drivers**, and then click the **Drivers & Software** tab.

3. Enter the product name in the text box, and then click **Search**.

4. Select your computer model, and then select your operating system.

5. In the Diagnostic section, click **HP UEFI Support Environment**.

    − or −

    Click **Download**, and then select **Run**.

8 Computer Setup (BIOS) and Advanced System Diagnostics in Linux

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

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

Starting Computer Setup

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

To start Computer Setup, follow these steps:

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

2. Press f10 to enter Computer Setup.

Using Computer Setup

Navigating and selecting in Computer Setup

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

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

   - To select a menu or a menu item, use the tab key and the keyboard arrow keys and then press enter, or use a pointing device to click the item.

   - To scroll up and down, click the up arrow or the down arrow in the upper-right corner of the screen, or use the up arrow key or the down arrow key.

   - To close open dialog boxes and return to the main Computer Setup screen, press esc, and then follow the on-screen instructions.

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

2. Press f10 to enter Computer Setup.

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

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

     – or –

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

– or –

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

– or –

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

Your changes go into effect when the computer restarts.

Restoring factory settings in Computer Setup

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

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

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

2. Press f10 to enter Computer Setup.

3. Use a pointing device or the arrow keys to select **File > Restore Defaults**.

4. Follow the on-screen instructions.

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

– or –

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

Your changes go into effect when the computer restarts.

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

Updating the BIOS

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

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

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

Determining the BIOS version

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

BIOS version information (also known as *ROM date* and *System BIOS*) can be displayed as follows:

1. Start Computer Setup.

2. Use a pointing device or the arrow keys to select **File > System Information**.

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

   – or –

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

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

Downloading a BIOS update

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

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

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

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

1. Open your web browser. For U.S. support, go to http://www.hp.com/go/contactHP. For worldwide support, go to http://welcome.hp.com/country/us/en/wwcontact_us.html.

2. Follow the on-screen instructions to identify your computer and access the BIOS update you want to download.

3. Click the option for software and driver downloads, type your computer model number in the product box, and then press enter. Follow the on-screen instructions to identify your computer and access the BIOS update you want to download.

4. Click your specific product from the models listed.

5. Click the appropriate operating system.

6. Go to the BIOS section and download the BIOS software package.

7. Follow the installation instructions as provided with the downloaded BIOS software package.

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

Using Advanced System Diagnostics

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

● Start-up test—This test analyzes the main computer components that are required to start the computer.

● Run-in test—This test repeats the start-up test and checks for intermittent problems that the start-up test does not detect.

- Hard disk test—This test analyzes the physical condition of the hard drive, and then checks all data in every sector of the hard drive. If the test detects a damaged sector, it attempts to move the data to a good sector.

- Memory test—This test analyzes the physical condition of the memory modules. If it reports an error, replace the memory modules immediately.

- Battery test—This test analyzes the condition of the battery and calibrates the battery if necessary. If the battery fails the test, contact support to report the issue and purchase a replacement battery.

- System Tune-Up—This group of additional tests checks your computer to make sure that the main components are functioning correctly. System Tune-Up runs longer and more comprehensive tests on memory modules, hard drive SMART attributes, the hard drive surface, the battery (and battery calibration), video memory, and the WLAN module status.

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

To start Advanced System Diagnostics:

1. Turn on or restart the computer. While the "Press the ESC key for Startup Menu" message is displayed in the lower-left corner of the screen, press esc. When the Startup Menu is displayed, press f2.

2. Click the diagnostic test you want to run, and then follow the on-screen instructions.

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

9 Specifications

Computer specifications

	Metric	U.S.
Dimensions		
Width	**33.80 cm**	13.3 in
Depth	**23.5 cm**	9.19 in
Height	**1.59 cm**	0.63 in
Weight		
Equipped with one memory module, WLAN module, and mSATA drive	**1.49 kg**	3.3 lbs
Input power		
Operating voltage and current	18.5 V dc @ 3.5 A - 65 W	
	– or –	
	19.0 V dc @ 4.74 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.

35.6-cm (14.0-in) HD+ display specifications

	Metric	U.S.
Dimensions		
Height	**17.6 cm**	6.93 in
Width	**31.2 cm**	12.28 in
Diagonal	**35.7 cm**	14.06 in
Number of colors	up to 16.8 million	
Contrast ratio	200:1 (typical)	
Brightness	250 nits (typical)	
Pixel resolution		
Pitch	**0.197 × 0.197 mm**	
Format	HD+ (1600 x 900)	
Configuration	RGB vertical stripe	
Backlight	LED	
Character display	80 × 25	
Total power consumption	3.46 W	
Viewing angle	±65° horizontal, ±50° vertical (typical)	

35.6-cm (14.0-in) FHD display specifications

	Metric	U.S.
Dimensions		
Height	**17.6 cm**	6.93 in
Width	**31.2 cm**	12.28 in
Diagonal	**35.7 cm**	14.06 in
Number of colors	up to 16.8 million	
Contrast ratio	200:1 (typical)	
Brightness	300 nits (typical)	
Pixel resolution		
Pitch	**0.197 × 0.197 mm**	
Format	HD+ (1920 x 1080)	
Configuration	RGB vertical stripe	
Backlight	LED	
Character display	80 × 25	
Total power consumption	3.46 W	
Viewing angle	±65° horizontal, ±50° vertical (typical)	

M.2 solid-state drive specifications

	128-GB*	180-GB*	256-GB*
Dimensions			
Height	1 mm	1 mm	1 mm
Length	50.8 mm	50.8 mm	50.8 mm
Width	28.9 mm	28.9 mm	28.9 mm
Weight	< 10 g	< 10 g	< 10 g
Interface type	ATA-7	ATA-7	ATA-7
Transfer rate			
Sequential Read	Up to 160 MB/s	Up to 380 MB/s	Up to 490 MB/s
Random Read	Up to 128 MB/s	Up to 180 MB/s	Up to 480 MB/s
Sequential Write	Up to 115 MB/s	Up to 80 MB/s	Up to 250 MB/s
Random Write	Up to 16 MB/s	Up to 40 MB/s	Up to 100 MB/s
Ready time, Maximum (to not busy)	2.0 s	4.0 s	4.0 s
Access times			
Logical	0.1 ms	0.1 ms	0.1
Total logical sectors	117,905,264	352,533,296	500,118,192
Operating temperature			
Operating	0° to 70℃ (32°F to 158°F)	0° to 70℃ (32°F to 158°F)	0° to 70℃ (32°F to 158°F)
Non-operating	-55° to 95℃ (-67°F to 203°F)	-40° to 80℃ (-40°F to 176°F)	-40° to 80℃ (-40°F to 176°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.

10 Backup and recovery in Windows 8

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

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

NOTE: For detailed instructions on various backup and restore options, perform a search for these topics in HP Support Assistant. To access HP Support Assistant on the Start screen, select the **HP Support Assistant** app.

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

NOTE: Windows includes the User Account Control feature to improve the security of your computer. You may be prompted for your permission or password for tasks such as installing software, running utilities, or changing Windows settings. For more information, see HP Support Assistant. To access HP Support Assistant on the Start screen, select the **HP Support Assistant** app.

Backing up your information

Recovery after a system failure is as good as your most recent backup. You should create system repair media and your initial backup immediately after initial system setup. As you add new software and data files, you should continue to back up your system on a regular basis to maintain a reasonably current backup.

For more information on the Windows backup features, see HP Support Assistant To access HP Support Assistant, from the Start screen, select the **HP Support Assistant** app.

Performing a system recovery

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

- Windows recovery tools: You can use Windows Backup and Restore to recover information you have previously backed up. You can also use Windows Automatic Repair to fix problems that might prevent Windows from starting correctly.

- f11 recovery tools: You can use the f11 recovery tools to recover your original hard drive image. The image includes the Windows operating system and software programs installed at the factory.

NOTE: If you are unable to boot (start up) your computer and you cannot use the system repair media you previously created (select models only), you must purchase Windows operating system media to reboot the computer and repair the operating system. For additional information, see Using Windows operating system media (purchased separately) on page 91.

Using the Windows recovery tools

To recover information you previously backed up:

▲ To access HP Support Assistant, from the Start screen, select the **HP Support Assistant** app.

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

⚠ **CAUTION:** Some Startup Repair options will completely erase and reformat the hard drive. All files you have created and any software installed on the computer are permanently removed. When reformatting is complete, the recovery process restores the operating system, as well as the drivers, software, and utilities from the backup used for recovery.

1. If possible, back up all personal files.

2. If possible, check for the presence of the Recovery Image partition and the Windows partition.

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

   – or –

   From the Start screen, type `pc`, and then select **This PC**.

   📝 **NOTE:** If the Windows partition and the Recovery Image partition are not listed, you must recover your operating system and programs using the Windows operating system DVD and the *Driver Recovery* media (both purchased separately). For additional information, see Using Windows operating system media (purchased separately) on page 91.

3. If the Windows partition and the Recovery Image partition are listed, restart the computer by pressing and holding the shift key while clicking **Restart**.

4. Select **Troubleshoot**, then select **Advanced Options**, and then select **Startup Repair**.

5. Follow the on-screen instructions.

📝 **NOTE:** For additional information on recovering information using the Windows tools, perform a search for these topics in HP Support Assistant. To access HP Support Assistant on the Start screen, select the **HP Support Assistant** app.

Using f11 recovery tools

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

To recover the original hard drive image using f11:

1. If possible, back up all personal files.

2. If possible, check for the presence of the Recovery Image partition: From the Start screen, type `pc`, and then select **This PC**.

   📝 **NOTE:** If the Recovery Image partition is not listed, you must recover your operating system and programs using the Windows operating system media and the *Driver Recovery* media (both purchased separately). For additional information, see Using Windows operating system media (purchased separately) on page 91.

3. If the Recovery Image partition is listed, restart the computer, and then press esc while the "Press the ESC key for Startup Menu" message is displayed at the bottom of the screen.

4. Press f11 while the "Press <F11> for recovery" message is displayed on the screen.

5. Follow the on-screen instructions.

Using Windows operating system media (purchased separately)

To order a Windows operating system DVD, contact support. See the *Worldwide Telephone Numbers* booklet included with the computer. You can also find contact information from the HP website. Go to http://www.hp.com/support, select your country or region, and follow the on-screen instructions.

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

To initiate recovery using a Windows operating system DVD:

NOTE: This process takes several minutes.

1. If possible, back up all personal files.

2. Insert the Windows operating system DVD into the optical drive, and then restart the computer.

3. When prompted, press any keyboard key.

4. Follow the on-screen instructions.

After the repair is completed:

1. Eject the Windows operating system media and then insert the *Driver Recovery* media.

2. Install the Hardware Enabling Drivers first, and then install Recommended Applications.

Using Windows Refresh or Windows Reset

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

The Windows Reset option allows you to perform detailed reformatting of your computer, or remove personal information before you give away or recycle your computer. For more information on these features, see HP Support Assistant. To access HP Support Assistant, from the Start screen, select the **HP Support Assistant** app.

Using HP Software Setup

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

1. From the Start screen, type `HP Software Setup`.

2. Open HP Software Setup.

3. Follow the on-screen directions to reinstall drivers or select software.

11 Backup and recovery in Windows 7

Your computer includes HP and Windows tools to help you safeguard your information and retrieve it if you ever need to. These tools will help you return your computer to a proper working state, all with simple steps. This section provides information about the following processes:

- Creating recovery media and backups
- Restoring and recovering your system

Creating recovery media and backups

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

1. After you successfully set up the computer, create HP Recovery media. This step creates a Windows 7 operating system DVD and a *Driver Recovery* DVD. The Windows DVD can be used to reinstall the original operating system in cases where the hard drive is corrupted or has been replaced. The *Driver Recovery* DVD installs specific drivers and applications. See Creating recovery media with HP Recovery Disc Creator on page 92.

2. Use Windows Backup and Recovery tools to perform the following:
   - Back up individual files and folders
   - Back up your entire hard drive (select models only)
   - Create system repair discs (select models only) with an optional external optical drive
   - Create system restore points

> **NOTE:** This guide describes an overview of backing up, restoring, and recovering options. For more details about the tools provided, see Help and Support. To access Help and Support, select **Start > Help and Support**.

> **NOTE:** HP recommends that you print the recovery procedures and save them for later use, in case of system instability.

In case of system failure, you can use the backup files to restore the contents of your computer. See Backing up your information on page 93.

Guidelines

- When creating recovery media or backing up to discs, use any of the following types of discs (purchased separately): DVD+R, DVD+R DL, DVD-R, DVD-R DL, or DVD±RW. The discs you use will depend on the type of optical drive you are using.
- Be sure that the computer is connected to AC power before you start the recovery media creation process or the backup process.

Creating recovery media with HP Recovery Disc Creator

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

applications if the hard drive becomes corrupted. HP Recovery Disc Creator can create two kinds of recovery DVDs:

●   Windows 7 operating system DVD—Installs the operating system without additional drivers or applications.

●   *Driver Recovery* DVD—Installs specific drivers and applications only, in the same way that the HP Software Setup utility installs drivers and applications.

Creating recovery media

NOTE: The Windows 7 operating system DVD can be created only once. Thereafter, the option to create that media will not be available after you create a Windows DVD.

To create the Windows DVD:

1.   Select **Start > All Programs > Productivity and Tools > HP Recovery Disc Creator**.

2.   Select **Windows disk**.

3.   From the drop-down menu, select the drive for burning the recovery media.

4.   Click the **Create** button to start the burning process.

After the Windows 7 operating system DVD has been created, create the *Driver Recovery* DVD:

1.   Select **Start > All Programs > Productivity and Tools > HP Recovery Disc Creator**.

2.   Select **Driver disk**.

3.   From the drop-down menu, select the drive for burning the recovery media.

4.   Click the **Create** button to start the burning process.

Backing up your information

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

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

Note the following when backing up:

●   Store personal files in the Documents library, and back it up regularly.

●   Back up templates that are stored in their associated directories.

●   Save customized settings that appear in a window, toolbar, or menu bar by taking a screen shot of your settings. The screen shot can be a time-saver if you have to reset your preferences.

●   When backing up to discs, number each disc after removing it from the drive.

NOTE: For detailed instructions on various backup and restore options, perform a search for these topics in Help and Support. To access Help and Support, select **Start > Help and Support**.

NOTE: Windows includes the User Account Control feature to improve the security of your computer. You may be prompted for your permission or password for tasks such as installing software, running utilities, or changing Windows settings. Refer to Help and Support. To access Help and Support, select **Start > Help and Support**.

To create a backup using Windows Backup and Restore:

1. Select **Start > All Programs > Maintenance > Backup and Restore**.

2. Follow the on-screen instructions to set up your backup, create a system image (select models only), or create system repair media (select models only).

Performing a system recovery

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

- Windows recovery tools: You can use Windows Backup and Restore to recover information you have previously backed up. You can also use Windows Startup Repair to fix problems that might prevent Windows from starting correctly.

- f11 recovery tools (select models only): You can use the f11 recovery tools to recover your original hard drive image. The image includes the Windows operating system and software programs installed at the factory.

NOTE: If you are unable to boot (start up) your computer and you cannot use the system repair media you previously created (select models only), you must purchase Windows 7 operating system media to reboot the computer and repair the operating system. For additional information, see Using Windows 7 operating system media on page 95.

Using the Windows recovery tools

Using the Windows recovery tools, you can:

- Recover individual files

- Restore the computer to a previous system restore point

- Recover information using recovery tools

NOTE: For detailed instructions on various recovery and restore options, perform a search for these topics in Help and Support. To access Help and Support, select **Start > Help and Support**.

NOTE: Windows includes the User Account Control feature to improve the security of your computer. You may be prompted for your permission or password for tasks such as installing software, running utilities, or changing Windows settings. Refer to Help and Support. To access Help and Support, select **Start > Help and Support**.

To recover information you previously backed up:

1. Select **Start > All Programs > Maintenance > Backup and Restore**.

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

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

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

1. If possible, back up all personal files.

2. If possible, check for the presence of the Windows partition.

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

   NOTE: If the Windows partition is not listed, you must recover your operating system and programs using the Windows 7 operating system DVD and the *Driver Recovery* media. For additional information, see Using Windows 7 operating system media on page 95.

3. If the Windows partition is listed, restart the computer, and then press f8 before the Windows operating system loads.

4. Select **Startup Repair**.

5. Follow the on-screen instructions.

NOTE: For additional information on recovering information using the Windows tools, select **Start > Help and Support**.

Using f11 recovery tools (select models only)

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

To recover the original hard drive image using f11:

1. If possible, back up all personal files.

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

   NOTE: If the HP Recovery partition is not listed, you must recover your operating system and programs using the Windows 7 operating system media and the *Driver Recovery* media. For additional information, see Using Windows 7 operating system media on page 95.

3. If the HP Recovery partition is listed, restart the computer, and then press esc while the "Press the ESC key for Startup Menu" message is displayed at the bottom of the screen.

4. Press f11 while the "Press <F11> for recovery" message is displayed on the screen.

5. Follow the on-screen instructions.

Using Windows 7 operating system media

If you cannot use the recovery media you previously created using the HP Recovery Disc Creator (select models only), you must purchase a Windows 7 operating system DVD to reboot the computer and repair the operating system.

To order a Windows 7 operating system DVD, go to the HP website. For U.S. support, go to http://www.hp.com/support. For worldwide support, go to http://welcome.hp.com/country/us/en/wwcontact_us.html. You can also order the DVD by calling support. For contact information, see the *Worldwide Telephone Numbers* booklet included with the computer.

CAUTION: Using a Windows 7 operating system DVD completely erases hard drive contents and reformats the hard drive. All files that you have created and any software that you have installed on the computer are permanently removed. When reformatting is complete, the recovery process helps you restore the operating system, as well as drivers, software, and utilities.

To initiate recovery using a Windows 7 operating system DVD:

NOTE: This process takes several minutes.

1. If possible, back up all personal files.

2. Restart the computer, and then insert the Windows 7 operating system DVD into the optical drive before the Windows operating system loads.

3. When prompted, press any keyboard key.

4. Follow the on-screen instructions.

5. Click **Next**.

6. Select **Repair your computer**.

7. Follow the on-screen instructions.

After the repair is completed:

1. Eject the Windows 7 operating system DVD and then insert the *Driver Recovery* DVD.

2. Install the Hardware Enabling Drivers first, and then install Recommended Applications.

12 Backup and Recovery in Linux

Recovery after a system failure is as good as your most recent backup. As you add new software and data files, you should continue to back up your system on a regular basis to maintain a reasonably current backup.

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

Creating backups

1. Create restore media immediately after you set up the computer. For more information, see .

2. As you add files, routinely create a backup of your system and personal information.

Backing up your information

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

- At regularly scheduled times

- Before the computer is repaired or restored

- Before you add or modify hardware or software

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

1. Select **Computer > More Applications > Tools > Backup Manager Settings**, and click **Backup my home directory**.

2. Click **Storage Destination Location**, and then select a location to back up your information.

3. Click **Schedule**, and then select a time schedule to perform backups at a regularly scheduled time.

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

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

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

To restore backup files:

1. Select **Computer > More Applications > Tools > Backup Manager Restore**.

2. Click **Backup Source**, and then select the location of the backup files.

3. Click **Restore Destination**, and then select the destination to restore the files.

4. To restore all files from the selected location, click **Restore all files**. To restore select files only, click **Restore selected files**, click **Select Files** and then select the files to be restored.

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

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

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

Performing a system recovery

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

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

To restore the computer using the HP Factory Image Restore DVD, you must first create the recovery disc. To create the recovery disc:

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

1. Select **Computer > More Applications**.

2. In the left pane, click **Tools**, and then click **Create HP Factory Image Restore DVD** in the right pane.

3. Follow the on-screen instructions to create an image file to burn a recovery disc.

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

1. If possible, back up all personal files.

2. Insert the HP Factory Image Restore DVD into the optical drive and restart the computer.

3. As the computer is restarting, press f9 to open the Computer Setup boot option menu.

4. Press the down arrow to select **Restore SLED HP-BNB preload image** from the **Linux boot** menu, and then press enter.

5. Using the arrow keys, select **Yes** when prompted: **Do you want to start the System-Restore?**

6. Follow the on-screen instructions.

USB Recovery option (select models only)

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

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

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

Creating a USB Recovery Disk On Key

1.	Connect the USB Disk On Key to a USB port on the computer.

2.	Select **Computer > More applications > Tools > Create Recovery USB**.

3.	Enter the root password when prompted.

4.	Select **USB Disk On Key** from the list.

5.	Click **OK**.

6.	A question dialog will remind you that the data on the USB key will be destroyed. To continue, click **OK**. Otherwise, click **Cancel** and back up the contents of the Disk On Key on another computer.

7.	The backup process will display a status dialog box while the backup is in progress.

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

Recovering from a USB Recovery Disk On Key

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

1.	Turn off the computer.

2.	Connect the USB Disk On Key to a USB port on the computer.

3.	Turn on the computer while holding down the f9 key.

4.	Once the system has booted, the **Boot Options** menu should appear.

5.	Using the arrow keys, select **USB Disk On Key** and press enter.

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

6.	Once the USB Recovery Disk On Key has been selected, press enter. The USB Recovery Disk On Key will boot.

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

8.	After the files are copied to the system, follow the on-screen instructions.

Remove everything and reinstall SLED

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

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

You can initiate this option by using the f11 key.

To use the f11 key:

Press f11 while the computer boots.

– or –

Press and hold f11 as you press the power button.

The following options are available:

- Cancel/Reboot—Reboots the system. No recovery or restore activity is performed.

- Recover/Repair System—This option repairs a system that is not working properly and preserves user data.

- Restore Factory System—This option restores the system back to the original factory state. User data is not preserved.

Select an option and follow the on-screen instructions.

13 Statement of Volatility

The purpose of this document is to provide general information regarding non-volatile memory in industry-standards based HP Business Notebook PC systems and provide general instructions for restoring nonvolatile memory that can contain personal data after the system has been powered off and the hard drive has been removed.

HP Business Notebook PC products that use Intel®-based or AMD®-based system boards contain volatile DDR memory. The amount of nonvolatile memory present in the system depends upon the system configuration. Intel-based and AMD-based system boards contain nonvolatile memory subcomponents as originally shipped from HP assuming that no subsequent modifications have been made to the system and assuming that no applications, features, or functionality have been added to or installed on the system.

Following system shutdown and removal of all power sources from an HP Business Notebook PC system, personal data can remain on volatile system memory (DIMMs) for a finite period of time and will also remain in nonvolatile memory. The steps below will remove personal data from the notebook PC, including the nonvolatile memory found in Intel-based and AMD-based system boards. Some of these steps are disclosed in the Maintenance & Service Guides available for HP PC products available on the product support pages at www.hp.com.

1. Follow steps (a) through (I) below to restore the nonvolatile memory that can contain personal data. Restoring or re-programming nonvolatile memory that does not store personal data is neither necessary nor recommended.

    a. Enter BIOS (F10) Setup by powering on the system and pressing F10 when prompted near the bottom of the display, or press the ESC key to display the start up menu, then press F10 . If the system has a BIOS administrator password, enter the password at the prompt.

    b. Select the **File** menu, then **Restore Defaults**.

    c. Select the **System Configuration** menu, then **Restore Security Defaults**.

    d. If an asset or ownership tag is set, select the **Security** menu and scroll down to the **Utilities** menu. Select **System IDs**, and then select the tag that has been set. Press the spacebar once to clear the tag, then press Enter to return to the prior menu.

    e. If a DriveLock password is set, select the **Security** menu, scroll down to **DriveLock**, then select **DriveLock password**. Select the desired hard drive. Click **Disable protection**, enter the existing master DriveLock password, then press Enter to confirm and return to the prior menu. Repeat this procedure if more than one hard drive has a DriveLock password.

    f. If an Automatic DriveLock password is set, select the **Security** menu, scroll down to **Automatic DriveLock**, then select the desired hard drive and disable protection. Repeat this procedure if more than one hard drive has an Automatic DriveLock password.

    g. Select the **File** menu, then **Reset BIOS Security** to factory default. Click **yes** at the warning message.

    h. Select the **File** menu, then **Save Changes and Exit**.

    i. Reboot the system. If the system has a Trusted Platform Module (TPM) and/or fingerprint sensor, one or two prompts will appear. One to clear the TPM and the other to Reset Fingerprint Sensor; press F1 to accept or F2 to reject.

        If the HP notebook model number includes Intel® Centrino with VPro™, reboot the PC and enter BIOS Setup by pressing F10 when prompted. Select **System Configuration**, then **AMT Options**.

Then select **Un-configure AMT on next boot**. Select **Save** then **Yes**. Select the **File** menu, and then select **Save Changes and Exit**. Reboot the system and confirm that you want to un-configure AMT.

    j. If the optional Intel® Anti-Theft Technology (AT) was activated, contact the provider to de-activate it.

    k. If the optional Absolute® Software Computrace® management and tracking service was activated on the notebook PC, contact the provider to deactivate it.

    l. Remove all power and system batteries for at least 24 hours.

2. Remove and retain the storage drive or clear the contents of the drive.

    a. Hard Disk Drive (HDD)

Clear the HDD contents by using the HP Disk Sanitizer® utility or a third party application that, ideally, is U.S. Department of Defense (DOD) 5220.22-M approved.

To run HP Disk Sanitizer, enter BIOS Setup by powering on the system and pressing F10 when prompted near the bottom of the display, or press ESC to display the start up menu, then press F10. Select the **Security** menu and scroll down to the **Utilities** menu. Select **Disk Sanitizer** and select the desired drive. For a higher level of protection, select **Optimum**.

NOTE: This process will take a long time, and the amount of time varies based on the hard drive capacity.

    b. Solid State Drive (SSD)

Clear the SSD contents by using the BIOS Setup Secure Erase command option, or by using a third party utility designed to erase data from an SSD. To run Secure Erase, enter BIOS Setup by powering on the system and pressing F10 when prompted near the bottom of the display. Select the **Security** menu and scroll down to the **Utilities** menu. Select **Secure Erase** and select the desired hard drive.

Non-volatile memory usage

Non Volatile Memory Type	Amount (Size)	Does this memory store customer data?	Does this memory retain data when power is removed?	What is the purpose of this memory?	How is data input into this memory?	How is this memory write protected?
HP Sure Start	2 MB	No	Yes	Only in platforms that support Sure Start to provide protected backup of critical System BIOS code, EC firmware, and critical PC configuration data.	Data cannot be written to this device via the host processor. The content is managed solely by the HP Sure Start Embedded Controller.	Protected by the HP Sure Start Embedded Controller.
Real Time Clock (RTC) battery backed-up CMOS configuration memory (CMOS)	256 Bytes	No	Yes	Stores system date and time and limited keyboard controller data.	Using the F10 Setup utility or changing the Microsoft® Windows® date & time.	This memory is not write-protected. HP recommends password protecting the F10 Setup utility.

Non Volatile Memory Type	Amount (Size)	Does this memory store customer data?	Does this memory retain data when power is removed?	What is the purpose of this memory?	How is data input into this memory?	How is this memory write protected?
Controller (NIC) EEPROM	64 Kbytes (not customer accessible)	No	Yes	Store NIC configuration and NIC firmware.	Using a utility from the NIC vendor that can be run from DOS.	A utility is required to write data to this memory and is available from NIC vendor. Writing data to this ROM in an inappropriate manner will render the NIC non-functional.
Keyboard ROM	64 Kbytes (not customer accessible)	No	Yes	Stores firmware code (keyboard, mouse, & battery management).	Programmed at the factory. Code is updated when the system BIOS is updated.	A utility is required for writing data to this memory and is available on the HP website. Writing data to this ROM in an inappropriate manner can render the PC non-functional.
DIMM Serial Presence Detect (SPD) configuration data	256 Bytes per memory module, 128 Bytes programmable (not customer accessible)	No	Yes	Stores memory module information.	Programmed by the memory vendor.	Data cannot be written to this memory when the module is installed in a PC. The specific write protection method varies by memory vendor.
System BIOS	4 to 5 MBytes	Yes	Yes	Store system BIOS code and PC configuration data.	System BIOS code is programmed at the factory. Code is updated when the system BIOS is updated. Configuration data and settings are input using the F10 setup utility or a custom utility.	A utility is required for writing data to this memory and is available on the HP website. Writing data to this ROM in an inappropriate manner can render the PC non-functional.
Intel Management Engine Firmware (present only in models ending in a 'p' or 'w' or with Intel Centrino Pro technology)	1.5 or 5MByte	Yes	Yes	Stores Management Engine Code, Settings, Provisioning Data and iAMT third party data store.	Management Engine Code is programmed at the factory. Code is updated via Intel secure firmware update utility. Unique Provisioning Data can be entered at the factory or by an administrator using the Management Engine (MEBx) setup utility. The third party data store contents can populated by a remote management console or local applications registered by an administrator to have access to the space.	The Intel chipset is configured to enforce HW protection to block all direct read/write access to this area. An Intel utility is required for updating the firmware. Only firmware updates digitally signed by Intel can be applied using this utility.
Bluetooth flash	2Mbit	No	Yes	Stores Bluetooth configuration and firmware.	Programmed at the factory. Tools for writing data to this memory are not publicly available but can be obtained from the silicon vendor.	A utility is required for writing data to this memory and is made available through newer versions of the driver if the flash requires an upgrade.

Non Volatile Memory Type	Amount (Size)	Does this memory store customer data?	Does this memory retain data when power is removed?	What is the purpose of this memory?	How is data input into this memory?	How is this memory write protected?
802.11 WLAN EEPROM	4kb to 8kb	No	Yes	Stores configuration and calibration data.	Programmed at the factory. Tools for writing data to this memory are not made public.	A utility is required for writing data to this memory and is typically not made available to the public unless a firmware upgrade is necessary to address a unique issue.
Web Camera	64K bit	No	Yes	Store Web Cam configuration and firmware.	Using a utility from the device manufacturer that can be run from Windows.	A utility is required for writing data to this memory and is typically not made available to the public unless a firmware upgrade is necessary to address a unique issue.
Fingerprint Reader	512kByte Flash	Yes	Yes	Stores fingerprint templates.	By enrolling in HP ProtectTools Security Manager.	Only a digitally signed application can make the call to write to the flash.

Questions and answers

1. **How can the BIOS settings be restored (returned to factory settings)?**

   a. Turn on or restart the computer and press F10 when prompted near the bottom of the display.

   b. Select **File**, then select **Restore defaults**.

   c. Follow the on-screen instructions.

   d. Select **File**, save changes and exit, then press Enter.

2. **What kind of configuration data is stored on the DIMM Serial Presence Detect (SPD) memory module? How would this data be written?**

   The DIMM SPD memory contains information about the memory module such as size, serial number, data width, speed/timing, voltage and thermal information. This information is written by the module manufacturer and stored on an EEPROM. This EEPROM cannot be written to when the memory module is installed in a PC. Third party tools do exist that can write to the EEPROM when the memory module is not installed in a PC. There are various third party tools available to read SPD memory.

3. **Does the "Firmware Hub for System BIOS" contain the BIOS program? Is this chip writable, and if so how?**

   The Firmware Hub does contain the BIOS program and is writable. A utility is required to perform the write function.

4. **In some PC systems, the Firmware Hub for System BIOS is a flash memory chip so that updates can be written by the customer. Is this true for these BIOS chips?**

   Yes, they are flash memory chips.

5. **What is meant by "Restore the nonvolatile memory found in Intel-based system boards"?**

This relates to clearing the Real Time Clock (RTC) CMOS memory that contains PC configuration data.

6. **Does resetting the CMOS configuration memory return the PC back to factory defaults?**

The process of resetting the CMOS will return certain system settings to factory default but will not reset many of the system data and configuration defaults to their factory settings. To return these system data and configuration defaults to factory settings, refer to question and answer 1 and follow the instructions for returning the BIOS settings to factory defaults.

14 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 amps and a nominal voltage rating of 125 or 250 V AC, as required by the power system of each country or region.

* The appliance coupler must meet the mechanical configuration of an EN 60 320/IEC 320 Standard Sheet C13 connector for mating with the appliance inlet on the back of the computer.

Requirements for specific countries and regions

Country/region	Accredited agency	Applicable note number
Australia	EANSW	1
Austria	OVE	1
Belgium	CEBC	1
Canada	CSA	2
Denmark	DEMKO	1
Finland	FIMKO	1
France	UTE	1
Germany	VDE	1
Italy	IMQ	1
Japan	METI	3
The Netherlands	KEMA	1
Norway	NEMKO	1
The People's Republic of China	COC	5
South Korea	EK	4

Country/region	Accredited agency	Applicable note number
Sweden	SEMKO	1
Switzerland	SEV	1
Taiwan	BSMI	4
The United Kingdom	BSI	1
The United States	UL	2

1. The flexible cord must be Type HO5VV-F, 3-conductor, 1.0-mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.

2. The flexible cord must be Type SPT-3 or equivalent, No. 18 AWG, 3-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15 A, 125 V) or NEMA 6-15P (15 A, 250 V) configuration.

3. The appliance coupler, flexible cord, and wall plug must bear a "T" mark and registration number in accordance with the Japanese Dentori Law. The flexible cord must be Type VCT or VCTF, 3-conductor, 1.00-mm² conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V) configuration.

4. The flexible cord must be Type RVV, 3-conductor, 0.75-mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.

5. The flexible cord must be Type VCTF, 3-conductor, 0.75-mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.

15 Recycling

Battery

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

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

Display

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

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

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

This section provides disassembly instructions for the display assembly. The display assembly must be disassembled to gain access to the backlight **(1)** and the liquid crystal display (LCD) panel **(2)**.
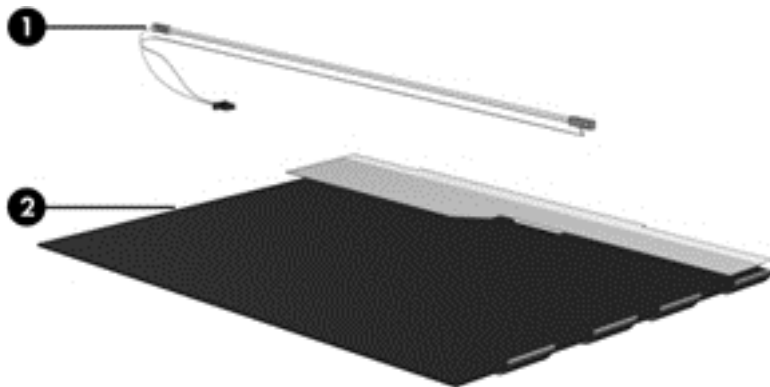
📝 **NOTE:** The procedures provided in this chapter are general disassembly instructions. Specific details, such as screw sizes, quantities, and locations, and component shapes and sizes, can vary from one computer model to another.

Perform the following steps to disassemble the display assembly:

1. Remove all screw covers **(1)** and screws **(2)** that secure the display bezel to the display assembly.
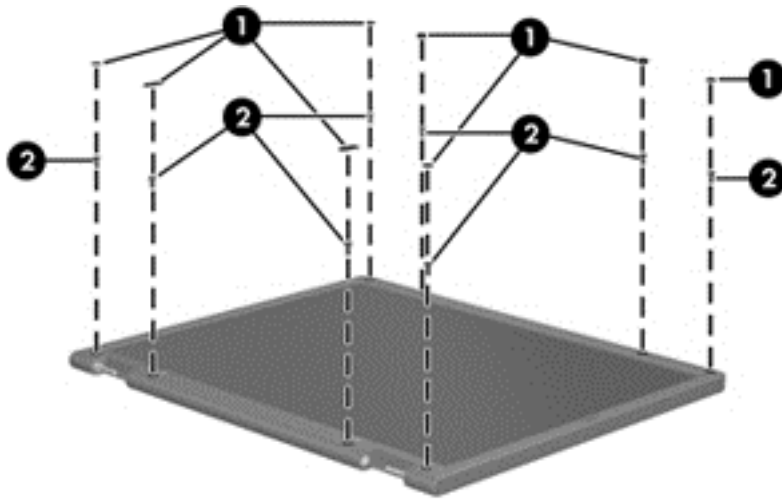
2. Lift up and out on the left and right inside edges **(1)** and the top and bottom inside edges **(2)** of the display bezel until the bezel disengages from the display assembly.

3. Remove the display bezel **(3)**.
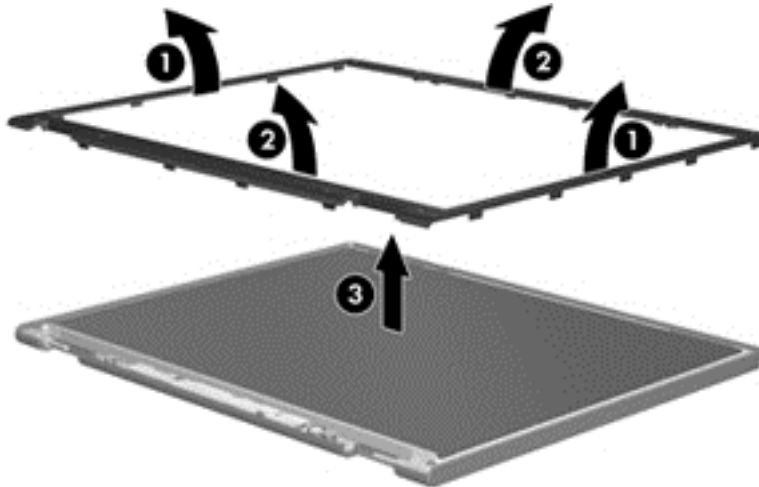
4. Disconnect all display panel cables **(1)** from the display inverter and remove the inverter **(2)**.
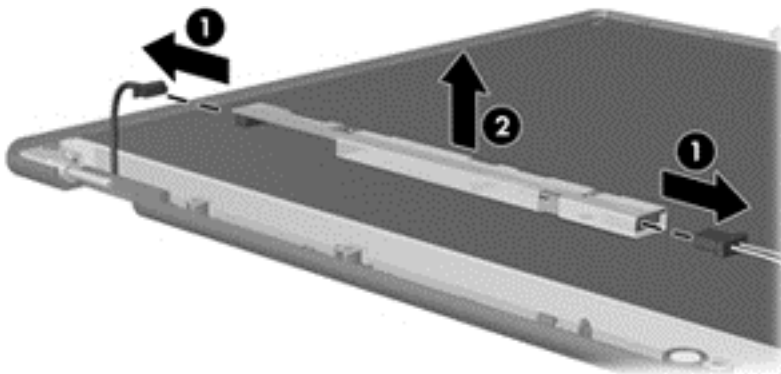
5. Remove all screws **(1)** that secure the display panel assembly to the display enclosure.

6. Remove the display panel assembly **(2)** from the display enclosure.
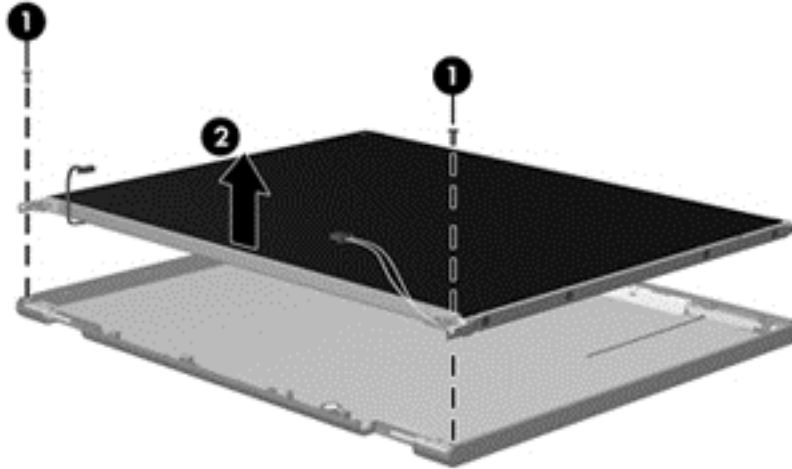
7. Position the display panel assembly upside-down.

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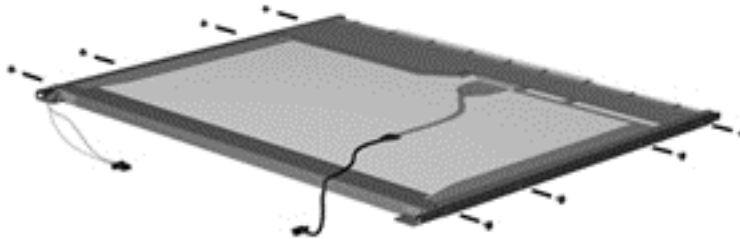
9. Use a sharp-edged tool to cut the tape **(1)** that secures the sides of the display panel to the display panel frame.

10. Remove the display panel frame **(2)** from the display panel.
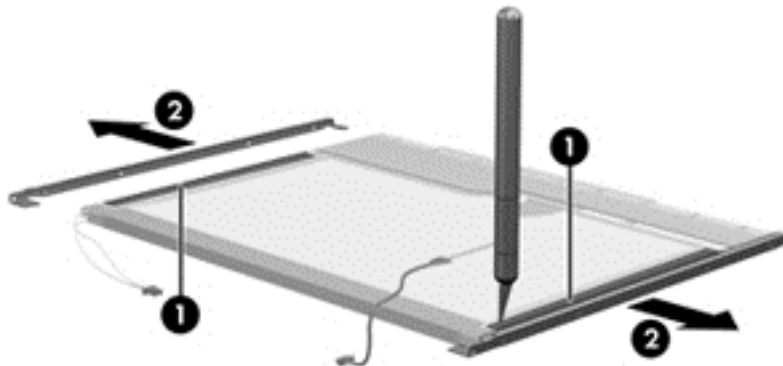
11. Remove the screws **(1)** that secure the backlight cover to the display panel.

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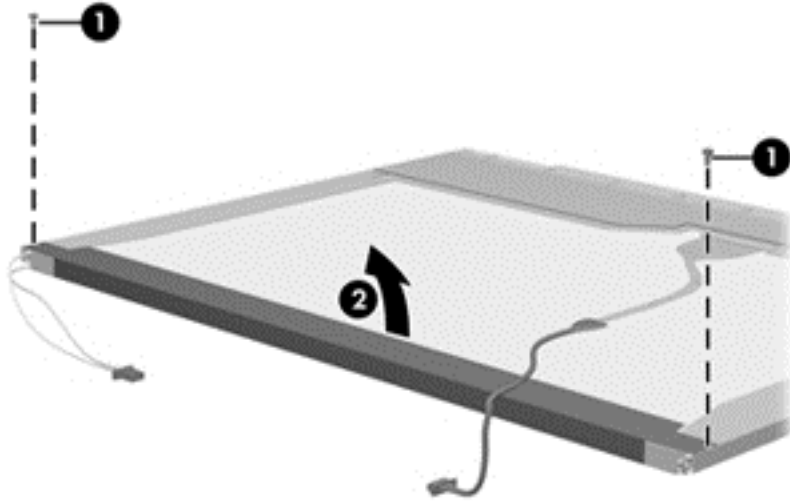
13. Remove the backlight cover.

14. Position the display panel right-side up.

15. Remove the backlight cables **(1)** from the clip **(2)** in the display panel.
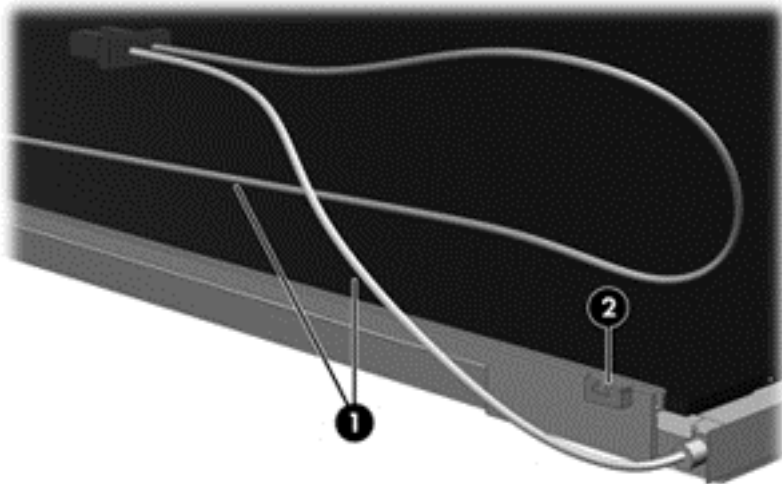
16. Position the display panel upside-down.

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

17. Remove the backlight frame from the display panel.
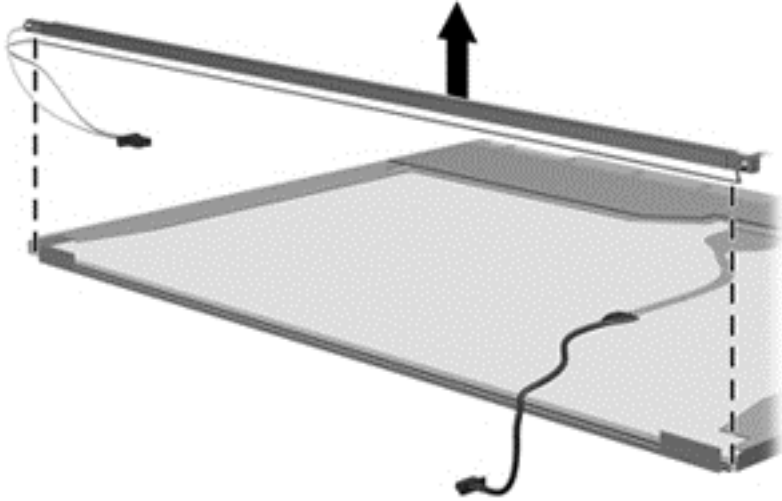
18. Remove the backlight from the backlight frame.
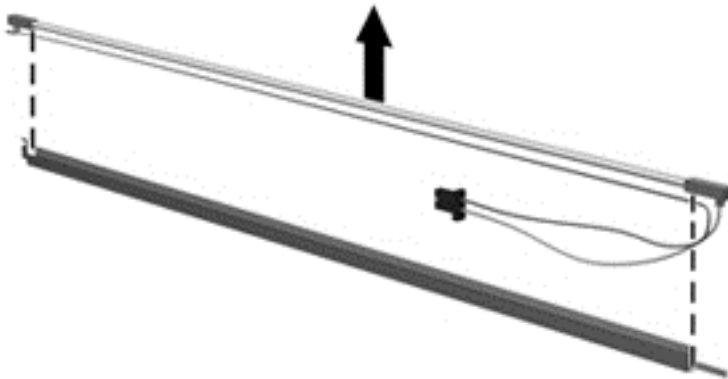
19. Disconnect the display panel cable **(1)** from the LCD panel.

20. Remove the screws **(2)** that secure the LCD panel to the display rear panel.

21. Release the LCD panel **(3)** from the display rear panel.

22. Release the tape **(4)** that secures the LCD panel to the display rear panel.
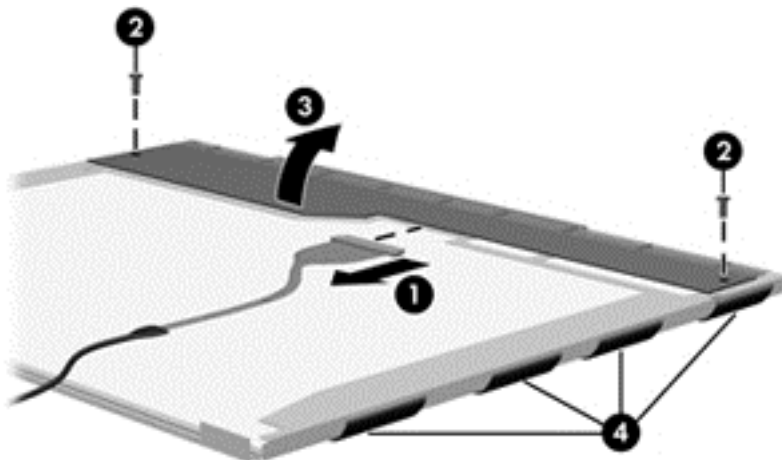
23. Remove the LCD panel.
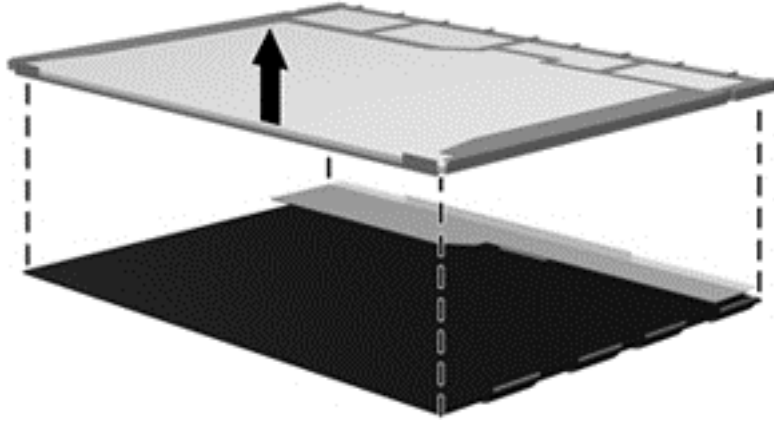
24. Recycle the LCD panel and backlight.

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