



HP mt40 Mobile Thin Client

Maintenance and Service Guide

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First Edition: December 2012

Document Part Number: 709400-001

Safety warning notice

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

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1 Product description

Category	Description
Product Name	HP mt40 Mobile Thin Client
Processor	Intel® Celeron® B840 1.90-GHz processor (1333-MHz FSB, 2.0-MB L3 cache, 35 W)
Chipset	Mobile Intel HM76 chipset
Graphics	Intel HD Graphics 4000 universal memory architecture (UMA) graphics with shared video memory Supports dual display ports through the dock
Panel	14.0-in light-emitting diode (LED), high-definition (HD), AntiGlare (AG), SVA (1600×900) display with and without webcam and microphone All display assemblies include two wireless local area network (WLAN) antenna cables Supports low voltage differential signalling (LVDS) Supports 16:9 aspect ratio Supports privacy filter
Memory	Two customer-accessible/upgradable memory module slots DDR3-12800 (1600-MHz) dual channel support Supports 8192-MB of system RAM in the following configurations: <ul style="list-style-type: none">• 8192-MB (4096×2)• 4096-MB (4096-MB×1)
Solid-state drive	Solid-state drive (SSD) mounts in the hard drive bracket Customer-accessible Serial ATA Supports a 16-GB SSD

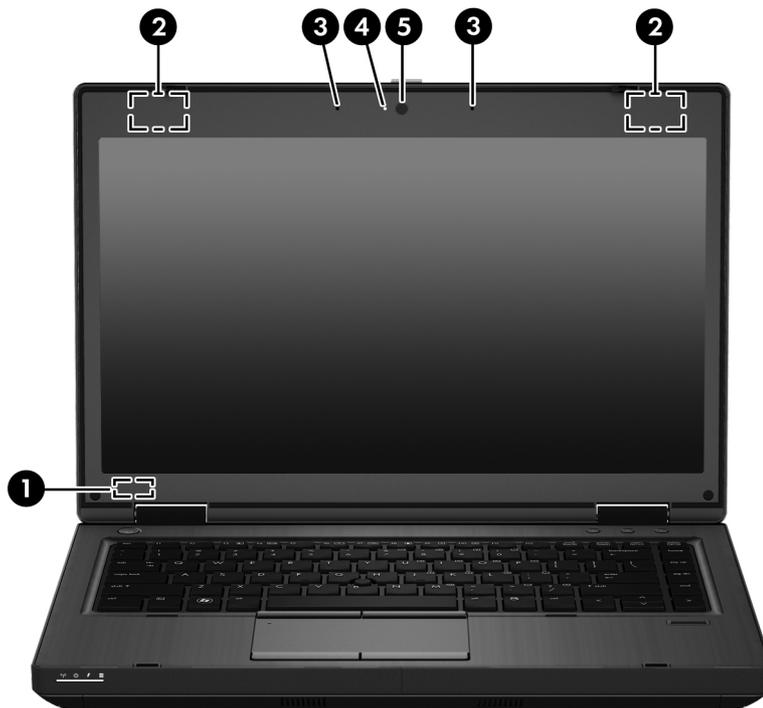
Category	Description
Optical drive	<p>Fixed</p> <p>Serial ATA</p> <p>12.7-mm tray load</p> <p>Supports a DVD-ROM drive</p> <p>Supports "no drive" option</p>
Audio and video	<p>Two stereo speakers</p> <p>HD audio with SRS Premium Sound</p> <p>Integrated 720p HD webcam (supports no camera option)</p> <p>Integrated dual-array microphone on computer models equipped with a webcam</p> <p>Integrated mono microphone on computer models not equipped with a webcam</p>
Ethernet	<p>Intel 82579V Gigabit 10/100/1000 Ethernet network interface card (NIC)</p> <p>NIC Power Down technology</p> <p>S3/S4/S5 wake on LAN</p> <p>Ethernet cable not included</p>
Wireless	<p>Integrated wireless local area network (WLAN) options by way of wireless module</p> <p>Three WLAN antennas built into display assembly</p> <p>Supports the Broadcom 43228 802.11abgn 2x2 Wi-Fi Adapter</p> <p>Supports no WLAN option</p>
External media cards	<p>Integrated 54-mm ExpressCard</p> <p>Secure Digital (SD) flash media slot with push-push technology, supporting the following digital card formats:</p> <ul style="list-style-type: none"> • MultiMediaCard (MMC) • MMC+ • Secure Digital (SD) Memory Card • SDHC • SDXC

Category	Description
Ports	<ul style="list-style-type: none"> • 1394a port • Audio-in (mono microphone) • Audio-out (stereo headphone) • Battery connector • DisplayPort 1.1a • Docking connector • eSATA/USB 2.0 combo port • HP Smart AC adapter • RJ-45 (Ethernet) • Secondary battery connector • USB 3.0 ports (2) • USB 2.0 port • VGA Dsub 15 pin) supporting: 1920×1200 external resolution @ 75 Hz, hot plug and unplug and autodetection for correct output to wide-aspect vs. standard aspect video
Keyboard/pointing devices	<p>Full-size keyboard with numeric keypad (upper-left justified), dual-point, spill-resistant, chiclet-style, with durakeys</p> <p>Gesture support: MultiTouch gestures enabled, two-finger scrolling, and pinch-zoom as default</p> <p>Taps enabled by default</p> <p>Support for TouchPad with image sensor</p> <p>Support for Windows 8 Indirect Touch</p>
Power requirements	<p>Supports the following HP Smart AC adapters:</p> <ul style="list-style-type: none"> • 65-W HP Smart AC adapter (non-PFC, 3-wire) • 65-W HP Smart AC adapter (RC/V, EM, 3-wire) <p>Supports the following batteries:</p> <ul style="list-style-type: none"> • 9-cell, 100-Wh, 3.0-Ah battery (does not support HP Fast Charge) • 6-cell, 55-Wh, 2.5-Ah battery
Security	<p>Supports security cable lock</p> <p>Supports Trusted Platform Module (TPM) 1.2 (Infineon, soldered down) and TPM Enhanced Drive Lock (not supported in Asia and the People's Republic of China)</p> <p>Integrated Smart Card reader (active)</p> <p>Full volume encryption</p>

Category	Description
Security <i>(continued)</i>	Preboot authentication (password, Smart Card)
Operating system	Preinstalled: Microsoft® Windows® Enterprise System 7 Web-only support: Microsoft Windows Enterprise System 7
Serviceability	End user replaceable parts: <ul style="list-style-type: none">• AC adapter• Battery• Keyboard• Memory module• Optical drive• Solid-state drive• WLAN module

2 External component identification

Display

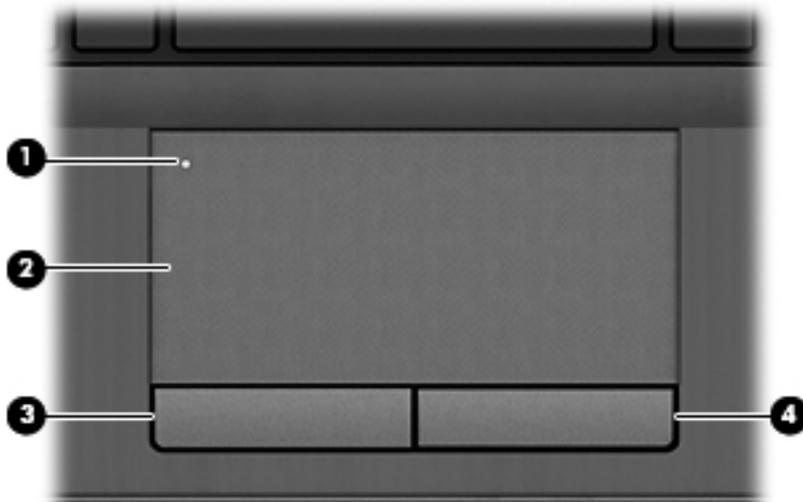


Content	Component	Content	Component
(1)	Internal display switch	(4)	Webcam light (select models only)
(2)	WLAN antennas (2)*	(5)	Webcam (select models only)
(3)	Internal microphone(s) (1 without webcam/2 with webcam)		

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

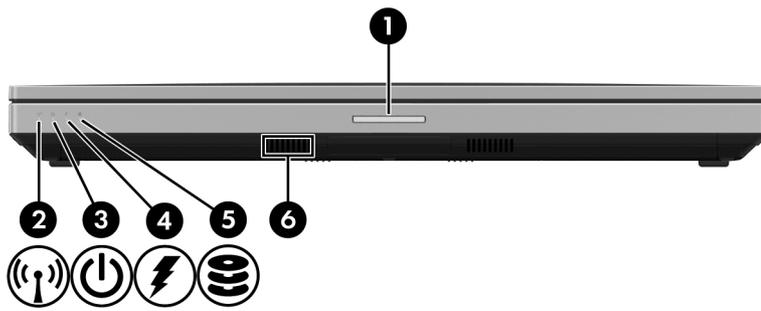
TouchPad

 **NOTE:** Your computer may look slightly different from the illustration in this section.



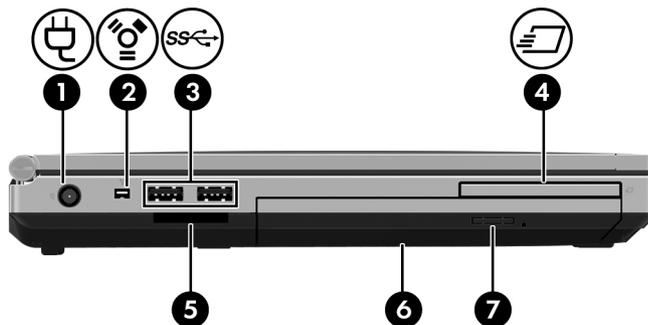
Content	Component	Content	Component
(1)	TouchPad on/off button	(3)	Left TouchPad button
(2)	TouchPad zone	(4)	Right TouchPad button

Front



Content	Component	Content	Component
(1)	Display release latch	(4)	Battery light
(2)	Wireless light	(5)	Drive light
(3)	Power light	(6)	Speakers (2)

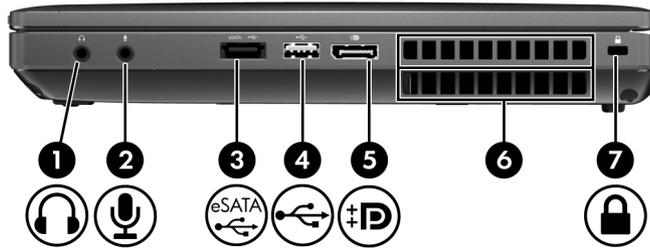
Left side



Content	Component	Content	Component
(1)	Power connector	(4)	Media Card Reader
(2)	USB 3.0 ports (2)	(5)	Upgrade bay (optical drive shown)
(3)	HP ExpressCard slot or smart card reader (depending on the configuration)	(6)	Optical drive eject button

*For information regarding the status of the USB ports and the ExpressCard slot, contact your network administrator.

Right side



Content	Component	Content	Component
(1)	Audio-out (headphone) jack	(5)	DisplayPort
(2)	Audio-in (microphone) jack	(6)	Vents (2)
(3)	eSATA/USB 2.0 port	(7)	Security cable slot
(4)	USB 2.0 port		

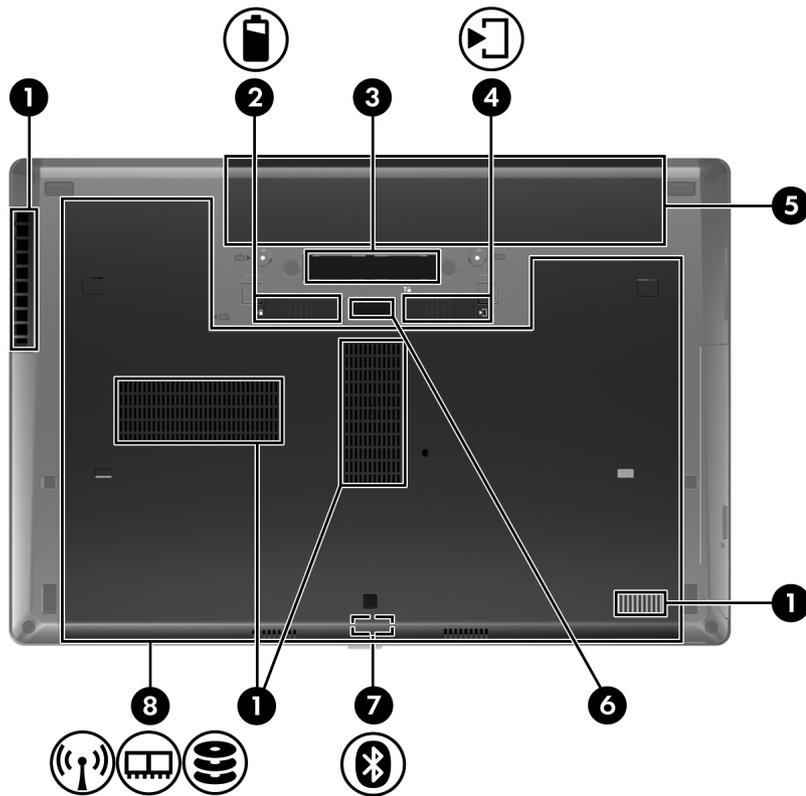
*For information regarding the status of the USB port, contact your network administrator.

Rear



Content	Component
(1)	External monitor port
(2)	RJ-45 (network) jack

Bottom

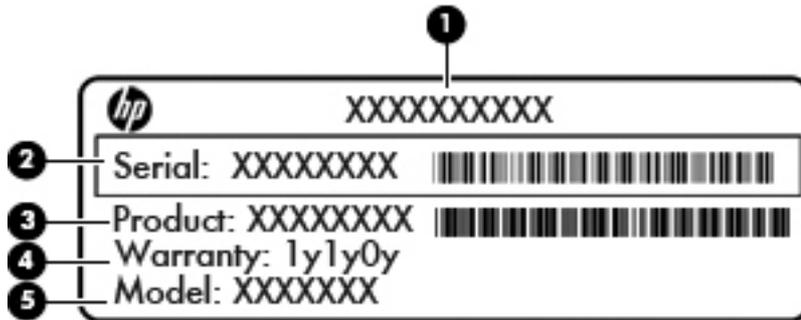


Content	Component	Content	Component
(1)	Vents (4)	(5)	Battery bay
(2)	Battery release latch	(6)	Accessory battery connector
(3)	Docking connector	(7)	Bluetooth compartment
(4)	Service cover release latch	(8)	Service cover

3 Illustrated parts catalog

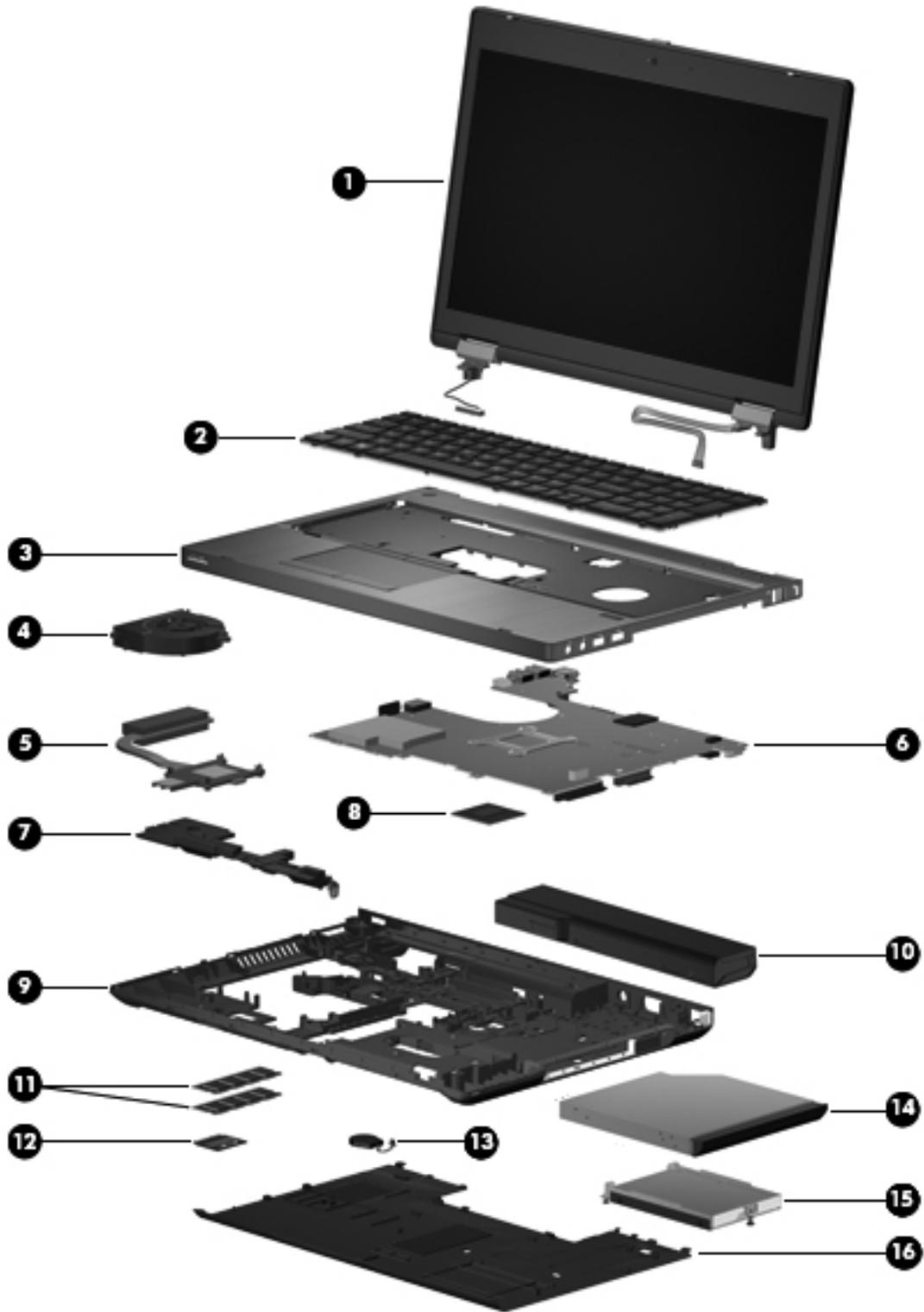
Service tag

When ordering parts or requesting information, provide the computer serial number and model number provided on the service tag. It is necessary to remove the battery to obtain these numbers. See Battery on page 34 for battery removal instructions.



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

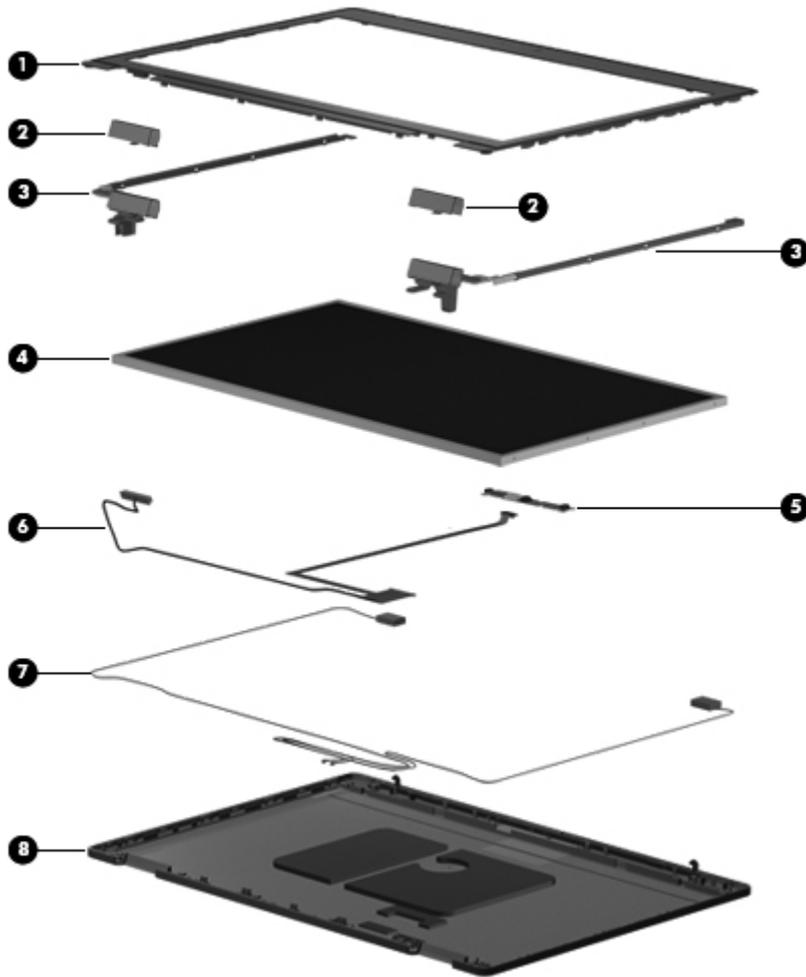
Computer major components



Item	Component	Spare part number
(1)	Display assembly: The display assembly is spared at the subcomponent level only. For more display assembly spare part information, see Display assembly subcomponents on page 15 .	
(2)	Keyboard (includes keyboard cable):	
	For use in Belgium	701976-A41
	For use in Bulgaria	701976-261
	For use in Canada	701976-DB1
	For use in the Czech Republic and Slovakia	701976-A81
	For use in Denmark	701976-081
	For use in France	701976-051
	For use in Germany	701976-041
	For use in Hungary	701976-211
	For use in Iceland	701976-DD1
	For use in India	701976-D61
	For use in Israel	701976-BB1
	For use in Italy	701976-061
	For use in Japan	701976-291
	For use in Latin America	701976-161
	For use in the Netherlands	701976-B31
	For use in Norway	701976-091
	For use in Northwest Africa	701976-FP1
	For use in Portugal	701976-131
	For use in Romania	701976-271
	For use in Russia	701976-251
	For use in Saudi Arabia	701976-171
	For use in Slovenia	701976-BA1
	For use in South Korea	701976-AD1
	For use in Spain	701976-071
	For use in Sweden and Finland	701976-B71
	For use in Switzerland	701976-BG1
	For use in Taiwan	701976-AB1
	For use in Thailand	701976-281
	For use in Turkey	701976-141
	For use in the United Kingdom and Singapore	701976-031

Item	Component	Spare part number
	For use in the United States	701976-001
(3)	Top cover (includes TouchPad and 2 TouchPad buttons):	684338-001
(4)	Fan (includes cable)	641839-001
(5)	Heat sink (includes replacement thermal material)	693371-001
(6)	System board equipped with the Mobile Intel HM76 chipset and a graphics subsystem with UMA memory (includes replacement thermal material)	710658-001
(7)	Speaker assembly (includes cable)	641840-001
(8)	Intel Celeron B840 1.90-GHz processor (1333-MHz FSB, 2.0-MB L3 cache, 35 W; includes replacement thermal material)	664663-001
(9)	Base enclosure (includes rubber feet, service cover release latch assembly, and battery release latch assembly)	687224-001
	Rubber Kit (not illustrated, includes display bezel left and right rubber screw covers, base enclosure front and rear rubber screw covers, top cover rubber bumper)	641831-001
	Latch Kit (not illustrated, includes service cover release latch assembly components and battery release latch assembly components)	684339-001
(10)	Battery (Li ion):	
	9-cell, 100-Wh, 3.00-Ah	631243-001
	6-cell, 62-Wh, 2.80-Ah	628668-001
(11)	4-GB memory module (PC3-12800, 1666-MHz, DDR3)	641369-001
(12)	Broadcom 43228 802.11abgn 2x2 Wi-Fi Adapter	669832-001
(13)	RTC battery	651948-001
(14)	DVD-ROM drive (includes optical drive bezel and optical drive bracket)	716387-001
(15)	16-GB SATA solid-state drive (does not include bracket or screws):	716388-001
	Hard Drive Hardware Kit (not illustrated, includes bracket and screws)	642774-001
(16)	Service cover:	
	Includes country of origin label	684326-001
	Includes regional configure to order (RCTO) with "made in China" label	699324-001

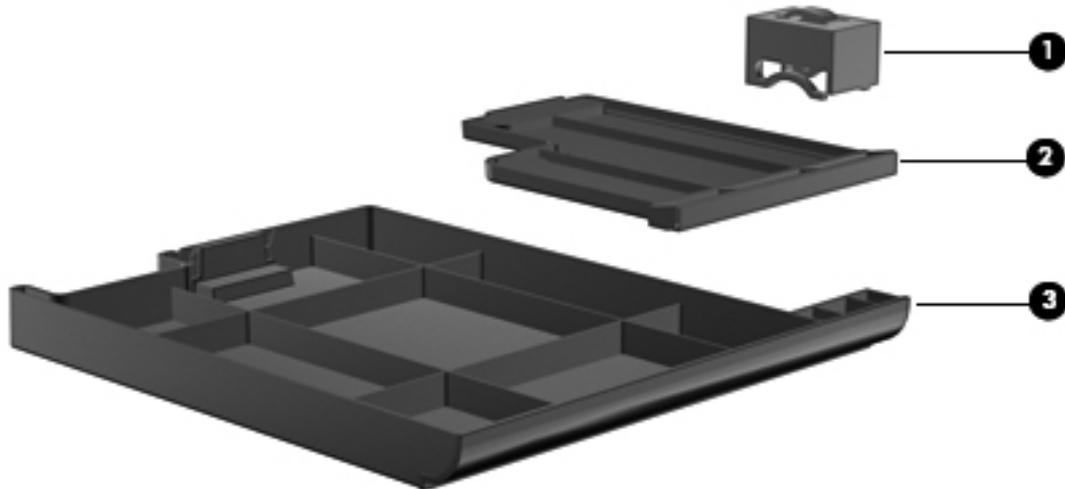
Display assembly subcomponents



Item	Component	Spare part number
(1)	Display bezel	685999-001
	Display Hinge Cover Kit , includes:	642783-001
(2)	Display hinge covers	
(3)	Display Hinge Kit (includes left and right display hinges and left and right hinge brackets)	641836-001
(4)	14.0-in, LED, SVA, HD, AntiGlare display panel	710653-001
(5)	Webcam/microphone module	684346-001
	Microphone module	642797-001
	Display Cable Kit , includes:	693063-001
(6)	Display panel cable	
(7)	WLAN Antenna Kit (includes left and right WLAN antenna cables and transceivers)	642799-001
(8)	Display enclosure	642778-001

Item	Component	Spare part number
	Display Panel Support Kit (not illustrated, includes WLAN antenna cables and transceivers and display enclosure)	710654-001
	Display Rubber Kit (not illustrated, includes display bezel rubber screw covers and display bezel rubber bumpers)	642785-001

Plastics Kit



Item	Description	Spare part number
	Plastics Kit , includes:	710656-001
(1)	RJ-11 jack plug	
(2)	ExpressCard slot space saver	
(3)	Optical drive bay space saver	

Mass storage devices



Item	Description	Spare part number
	Hard Drive Hardware Kit , includes:	642774-001
(1)	Hard drive bracket	
	Hard drive bracket screws (not illustrated)	
(2)	DVD-ROM drive (includes optical drive bezel and optical drive bracket)	716387-001
(3)	16-GB SATA solid-state drive (does not include solid-state drive bracket or screws):	716388-001

Miscellaneous parts

Component	Spare part number
AC adapter:	
65-W HP Smart AC adapter (non-PFC, 3-wire)	693711-001
65-W HP Smart AC adapter (RC/V, EM, 3-wire)	693710-001
Power cord (3-pin, black, 1.83-m):	
For use in Argentina	490371-D01
For use in Australia	490371-011
For use in Denmark	490371-081
For use in Europe	490371-021
For use in India	490371-D61
For use in Israel	490371-BB1
For use in Japan	490371-291
For use in North America	490371-001
For use in the People's Republic of China	490371-AA1
For use in South Africa	490371-AR1
For use in South Korea	490371-AD1
For use in Switzerland	490371-111
For use in Taiwan	490371-AB1
For use in Thailand	490371-201
For use in the United Kingdom and Singapore	490371-031
Screw Kit	710657-001

Sequential part number listing

Spare part number	Description
490371-001	Power cord for use in North America (3-pin, black, 1.83-m)
490371-011	Power cord for use in Australia (3-pin, black, 1.83-m)
490371-021	Power cord for use in Europe (3-pin, black, 1.83-m)
490371-031	Power cord for use in the United Kingdom and Singapore (3-pin, black, 1.83-m)
490371-081	Power cord for use in Denmark (3-pin, black, 1.83-m)
490371-111	Power cord for use in Switzerland (3-pin, black, 1.83-m)
490371-201	Power cord for use in Thailand (3-pin, black, 1.83-m)
490371-291	Power cord for use in Japan (3-pin, black, 1.83-m)
490371-AA1	Power cord for use in the People's Republic of China (3-pin, black, 1.83-m)
490371-AB1	Power cord for use in Taiwan (3-pin, black, 1.83-m)
490371-AD1	Power cord for use in South Korea (3-pin, black, 1.83-m)
490371-AR1	Power cord for use in South Africa (3-pin, black, 1.83-m)
490371-BB1	Power cord for use in Israel (3-pin, black, 1.83-m)
490371-D01	Power cord for use in Argentina (3-pin, black, 1.83-m)
490371-D61	Power cord for use in India (3-pin, black, 1.83-m)
628668-001	6-cell, 62-Wh, 2.80-Ah, Li-ion battery
631243-001	9-cell, 100-Wh, 3.0-Ah, Li-ion battery
641369-001	4-GB memory module (PC3, 12800, 1600-MHz)
641831-001	Rubber Kit (includes display bezel left and right rubber screw covers, base enclosure front and rear rubber screw covers, top cover rubber bumper)
641836-001	Display Hinge Kit (includes left and right display hinges and left and right hinge brackets)
641839-001	Fan (includes cable)
641840-001	Speaker assembly (includes cable)
642774-001	Hard Drive Hardware Kit (includes hard drive bracket and screws)
642778-001	Display enclosure
642783-001	Display Hinge Cover Kit (includes left and right display hinge covers)
642785-001	Display Rubber Kit (includes display bezel rubber screw covers and display bezel rubber bumpers)
642797-001	Microphone module
642799-001	WLAN Antenna Kit (includes left and right WLAN antenna cables and transceivers)
651948-001	RTC battery (includes cable and double-sided tape)

Spare part number	Description
664663-001	Intel Celeron B840 1.90-GHz processor for use only on HP ProBook 6470b Notebook PC computer models (1333-MHz, 2.0-MB L3 cache, 35 W; includes replacement thermal material)
669832-001	Broadcom 43228 802.11abgn 2x2 Wi-Fi Adapter
684326-001	Service cover (includes country of origin label)
684338-001	Top cover equipped with two TouchPad buttons (includes TouchPad)
684339-001	Latch Kit (includes service cover release latch assembly components and battery release latch assembly components)
684340-001	Display lid switch board
684345-001	ExpressCard assembly
684346-001	Webcam/microphone module
684353-001	Smart Card reader
685999-001	Display bezel
687224-001	Base enclosure (includes rubber feet, service cover release latch assembly, and battery release latch assembly)
693063-001	Display Cable Kit
693371-001	Heat sink (includes replacement thermal material)
693710-001	65-W HP Smart AC adapter (RC/V, EM, 3-wire)
693711-001	65-W HP Smart AC adapter (non-PFC, 3-wire)
699324-001	Service cover (includes regional configure to order (RCTO) with "made in China" label)
701976-001	Keyboard for use in the United States (includes keyboard cable)
701976-031	Keyboard for use in the United Kingdom and Singapore (includes keyboard cable)
701976-041	Keyboard for use in Germany (includes keyboard cable)
701976-051	Keyboard for use in France (includes keyboard cable)
701976-061	Keyboard for use in Italy (includes keyboard cable)
701976-071	Keyboard for use in Spain (includes keyboard cable)
701976-081	Keyboard for use in Denmark (includes keyboard cable)
701976-091	Keyboard for use in Norway (includes keyboard cable)
701976-131	Keyboard for use in Portugal (includes keyboard cable)
701976-141	Keyboard for use in Turkey (includes keyboard cable)
701976-161	Keyboard for use in Latin America (includes keyboard cable)
701976-171	Keyboard for use in Saudi Arabia (includes keyboard cable)
701976-211	Keyboard for use in Hungary (includes keyboard cable)
701976-251	Keyboard for use in Russia (includes keyboard cable)
701976-261	Keyboard for use in Bulgaria (includes keyboard cable)

Spare part number	Description
701976-271	Keyboard for use in Romania (includes keyboard cable)
701976-281	Keyboard for use in Thailand (includes keyboard cable)
701976-291	Keyboard for use in Japan (includes keyboard cable)
701976-A41	Keyboard for use in Belgium (includes keyboard cable)
701976-AB1	Keyboard for use in Taiwan (includes keyboard cable)
701976-AD1	Keyboard for use in South Korea (includes keyboard cable)
701976-B31	Keyboard for use in the Netherlands (includes keyboard cable)
701976-B71	Keyboard for use in Sweden and Finland (includes keyboard cable)
701976-BA1	Keyboard for use in Slovenia (includes keyboard cable)
701976-BB1	Keyboard for use in Israel (includes keyboard cable)
701976-BG1	Keyboard for use in Switzerland (includes keyboard cable)
701976-D61	Keyboard for use in India (includes keyboard cable)
701976-DB1	Keyboard for use in Canada (includes keyboard cable)
701976-DD1	Keyboard for use in Iceland (includes keyboard cable)
701976-FL1	Keyboard for use in the Czech Republic and Slovakia (includes keyboard cable)
701976-FP1	Keyboard for use in Northwest Africa (includes keyboard cable)
710653-001	14.0-in, LED, SVA, HD, AntiGlare display panel for use on all computer models
710654-001	Display Panel Support Kit (not illustrated, includes WLAN antenna cables and transceivers and display enclosure)
710655-001	Cable Kit (includes TouchPad cable)
710656-001	Plastics Kit (includes ExpressCard slot space saver, optical drive bay space saver, RJ-11 jack plug, and wireless antenna clips)
710657-001	Screw Kit
710658-001	System board equipped with the Mobile Intel HM76 chipset and a graphics subsystem with UMA memory (includes replacement thermal material)
716387-001	DVD-ROM drive
716388-001	16-GB SATA solid-state drive

4 Removal and replacement procedures

Preliminary replacement requirements

Tools required

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

- Flat-bladed screw driver
- Magnetic screw driver
- Phillips P0 and P1 screw drivers

Service considerations

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



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

Plastic parts



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

Cables and connectors

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

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

Drive handling

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

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

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

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

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

Avoid dropping drives from any height onto any surface.

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

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

Avoid exposing a drive to temperature extremes or liquids.

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

Grounding guidelines

Electrostatic discharge damage

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

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

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

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

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

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

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

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

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

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

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

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

- To avoid hand contact, transport products in static-safe tubes, bags, or boxes.
- Protect ESD-sensitive parts and assemblies with conductive or approved containers or packaging.
- Keep ESD-sensitive parts in their containers until the parts arrive at static-free workstations.
- Place items on a grounded surface before removing items from their containers.
- Always be properly grounded when touching a component or assembly.
- Store reusable ESD-sensitive parts from assemblies in protective packaging or 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 $\pm 10\%$ resistance in the ground cords. To provide proper ground, wear a strap snugly against the skin at all times. On grounded mats with banana-plug connectors, use alligator clips to connect a wrist strap.
- When standing, use foot straps and a grounded floor mat. Foot straps (heel, toe, or boot straps) can be used at standing workstations and are compatible with most types of shoes or boots. On conductive floors or dissipative floor mats, use foot straps on both feet with a minimum of one megohm resistance between the operator and ground. To be effective, the conductive must be worn in contact with the skin.

The following grounding equipment is recommended to prevent electrostatic damage:

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

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

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

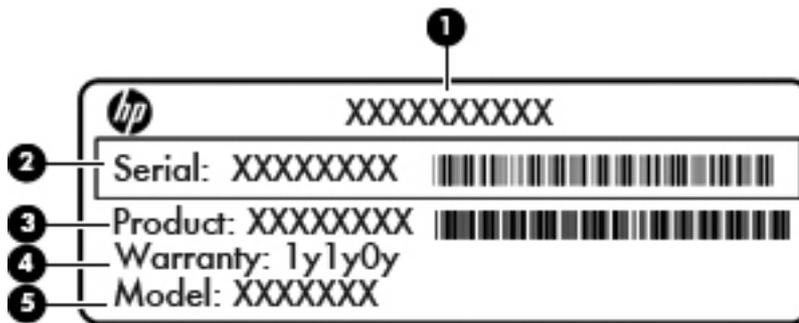
Component replacement procedures

This chapter provides removal and replacement procedures.

There are as many as 84 screws that must be removed, replaced, and/or loosened when servicing the computer. Make special note of each screw size and location during removal and replacement.

Service tag

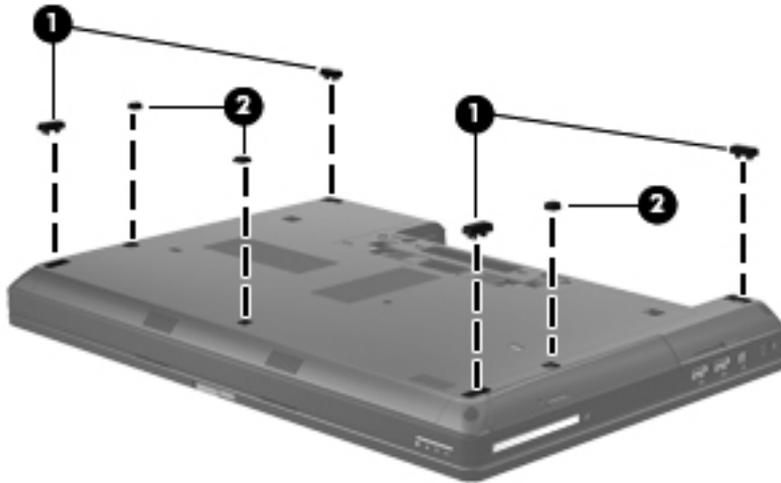
When ordering parts or requesting information, provide the computer serial number and model number provided on the service tag. It is necessary to remove the battery to obtain these numbers. See [Battery on page 29](#) for battery removal instructions.



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

Computer feet

The computer feet are adhesive-backed rubber pads. The feet are included in the Rubber Kit, spare part number 641831-001. There are four rectangular rubber feet **(1)** and three square rubber feet **(2)** that attach to the base enclosure and service cover in the locations illustrated below.



Battery

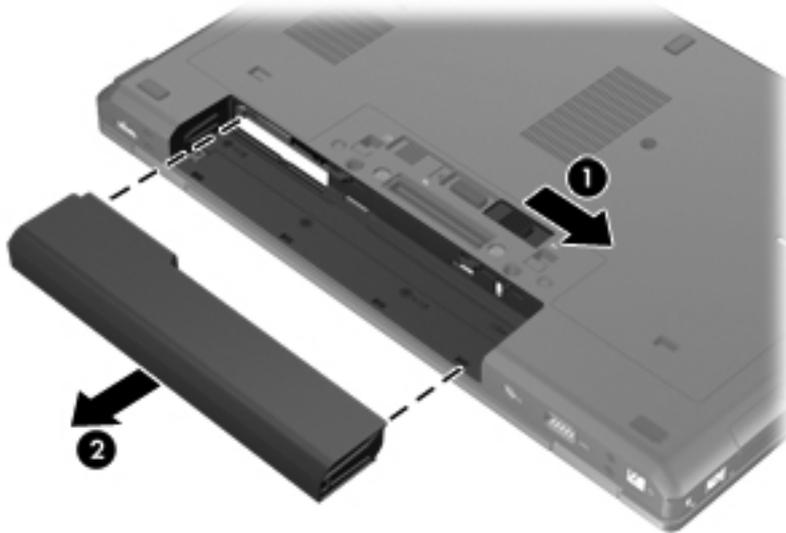
Description	Spare part number
9-cell, 100-Wh, 3.00-Ah	631243-001
6-cell, 62-Wh, 2.80-Ah	628668-001

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.

Remove the battery:

1. Position the computer upside-down on a flat surface, with the battery bay toward you.
2. Slide the battery release latch **(1)** to release the battery.
3. Remove the battery **(2)** from the computer.



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

Service cover

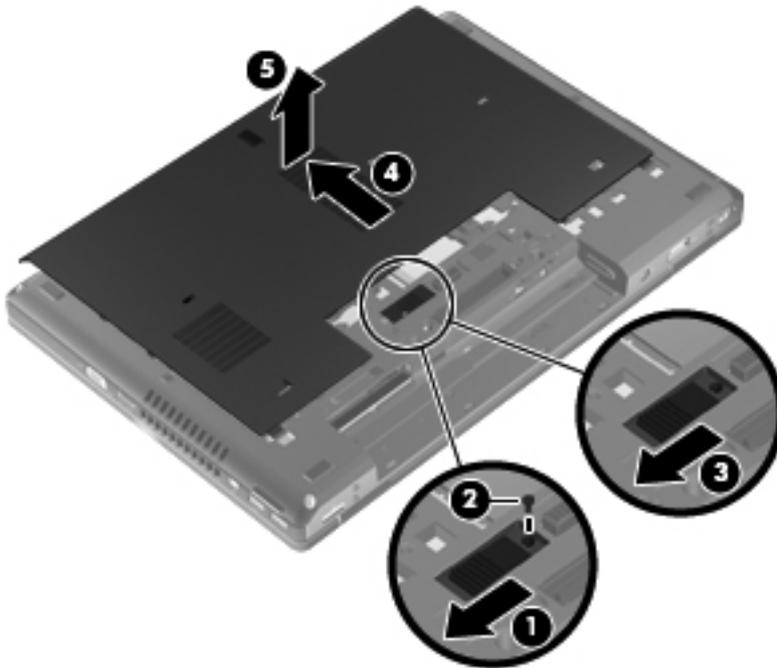
Description	Spare part number
Includes country of origin label	684326-001
Includes regional configure to order (RCTO) with “made in China” label	699324-001

Before removing the service 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 [Battery on page 29](#)).

Remove the service cover:

1. Slide the release latch **(1)** and remove the locking screw (if installed) **(2)**.
2. Slide the release latch **(3)** to disengage the door from the computer.
3. Slide the door toward the front of the computer **(4)**, and then lift the door off the computer **(5)**.



Reverse the removal procedures to install the service cover.

Optical drive

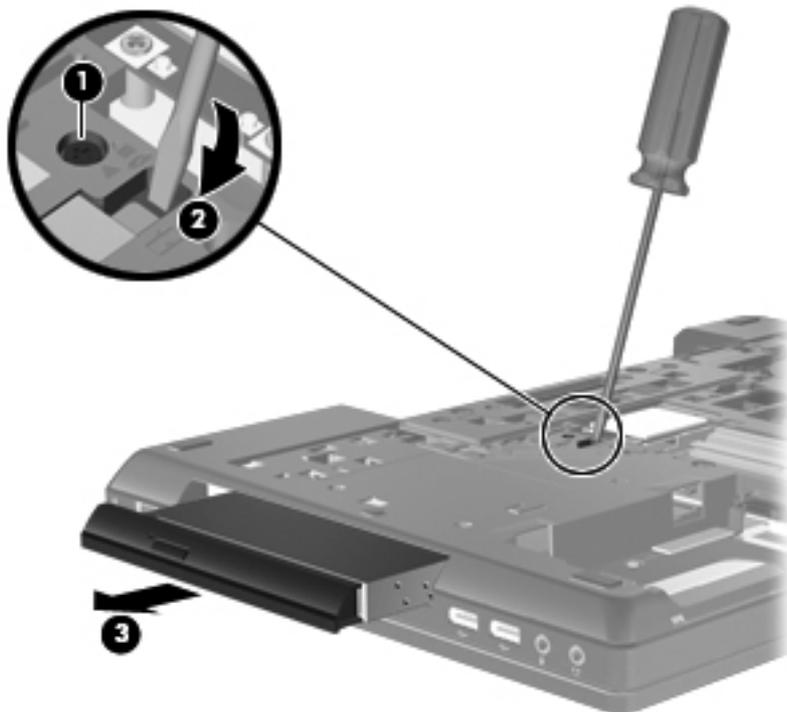
Description	Spare part number
DVD-ROM drive (includes an optical drive bezel and optical drive bracket)	716387-001

Before removing the optical drive, follow these steps:

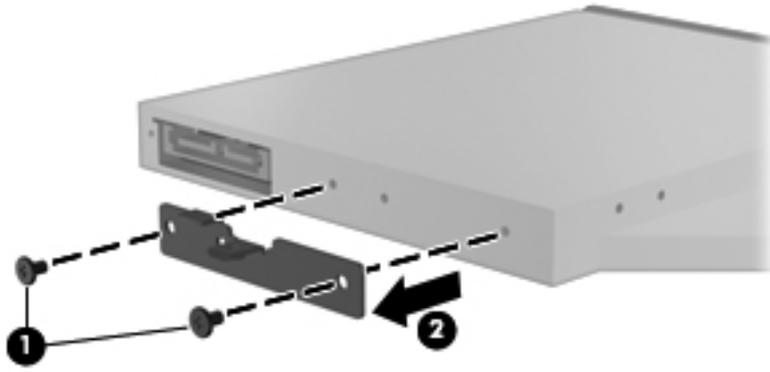
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 29](#)).
5. Remove the service cover (see [Service cover on page 30](#)).

Remove the optical drive:

1. Position the computer upside-down with the right side toward you.
2. Loosen the captive Phillips screw **(1)** that secures the optical drive to the computer.
3. Use a flat-blade screw driver or similar tool to press on the optical drive bracket tab **(2)** to release the optical drive.
4. Remove the optical drive **(3)** from the computer.



5. If it is necessary to replace the optical drive bracket, position the optical drive with the rear panel toward you.
6. Remove the two Phillips PM2.0×3.0 screws **(1)** that secure the optical drive bracket to the optical drive.
7. Remove the optical drive bracket **(2)**.



Reverse this procedure to reassemble and install the optical drive.

Solid-state drive

Description	Spare part number
16-GB SATA solid-state drive (does not include bracket or screws)	716388-001
Hard Drive Hardware Kit (includes hard drive bracket and screws)	642774-001

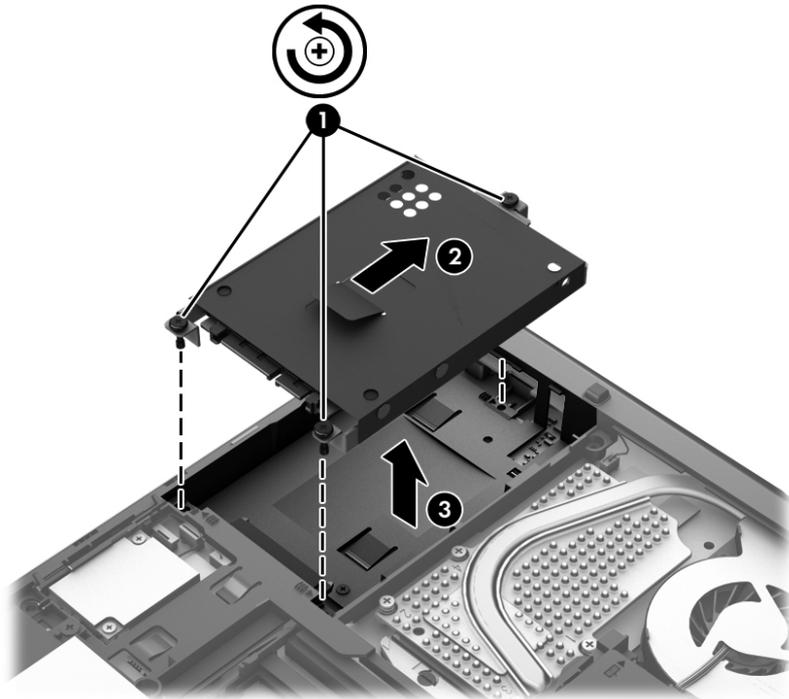
Before removing the solid-state drive, follow these steps:

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 battery (see [Battery on page 29](#)).
5. Remove the service cover (see [Service cover on page 30](#)).

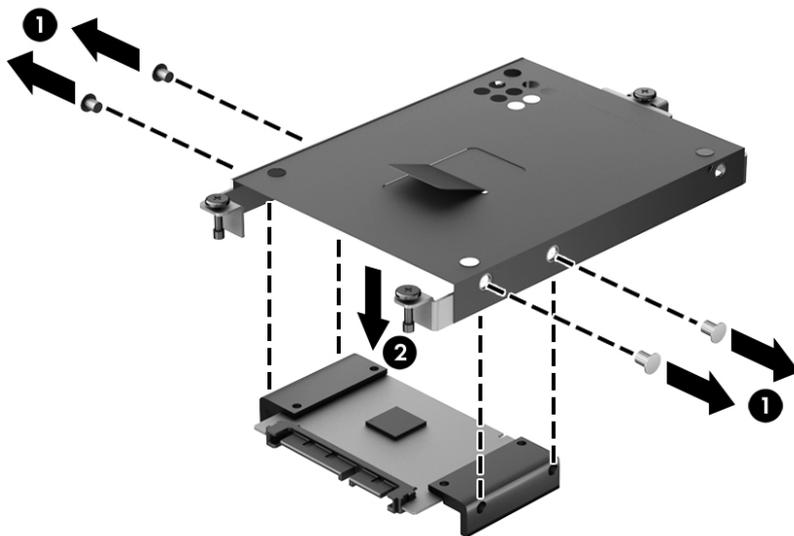
Remove the hard drive:

1. Loosen the three captive Phillips screws **(1)** that secure the solid-state drive to the computer.
2. Use the tab **(2)** to slide the solid-state drive to the right to disconnect it from the system board.

3. Remove the solid-state drive **(3)** from the solid-state drive bay.



4. If it is necessary to disassemble the solid-state drive, perform the following steps:
 - a. Remove the four Phillips PM3.0×3.0 screws **(1)** that secure the hard drive bracket to the solid-state drive.
 - b. Remove the hard drive bracket **(2)** from the solid-state drive. The hard drive bracket and screws are available in the Hard Drive Hardware Kit, spare part number 642774-001.



Reverse this procedure to reassemble and install the solid-state drive.

RTC battery

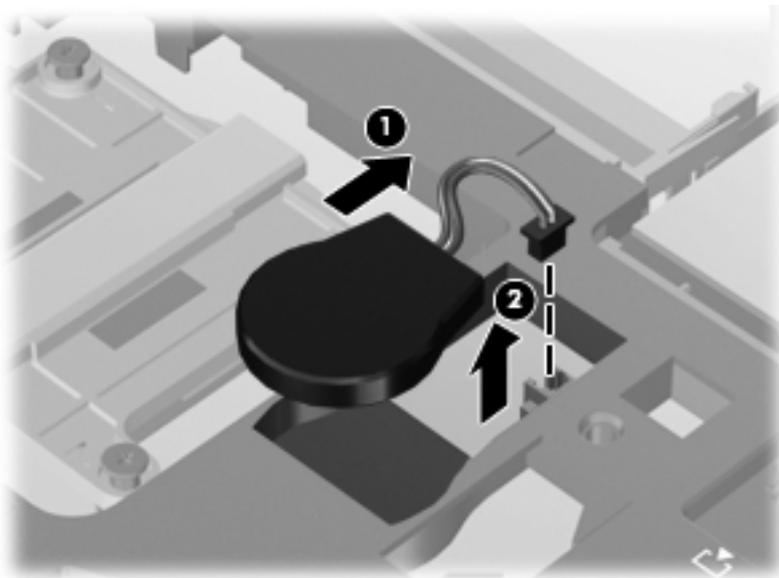
Description	Spare part number
RTC battery (includes cable and double-sided tape)	651948-001

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 battery (see [Battery on page 29](#)), and then remove the following components:
 - a. Service cover (see [Service cover on page 30](#))
 - b. Optical drive (see [Optical drive on page 31](#))
 - c. Solid-state drive (see [Solid-state drive on page 32](#))
 - d. Keyboard (see [Keyboard on page 40](#))
 - e. Base enclosure (see [Base enclosure on page 43](#))

Remove the RTC battery:

1. Disconnect the RTC battery cable **(1)** from the system board.
2. Detach the RTC battery **(2)** from the base enclosure. (The RTC battery is attached to the base enclosure with double-sided tape.)



3. Remove the RTC battery.

Reverse this procedure to install the RTC battery.

Memory module

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

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

Update BIOS before adding memory modules

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

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

To update BIOS:

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

Before removing 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 battery (see [Battery on page 29](#)).
5. Remove the service cover (see [Service cover on page 30](#)).

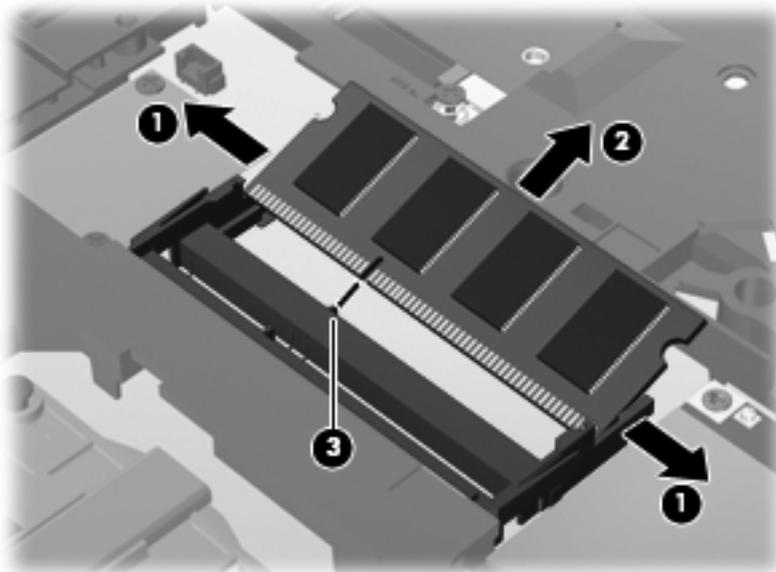
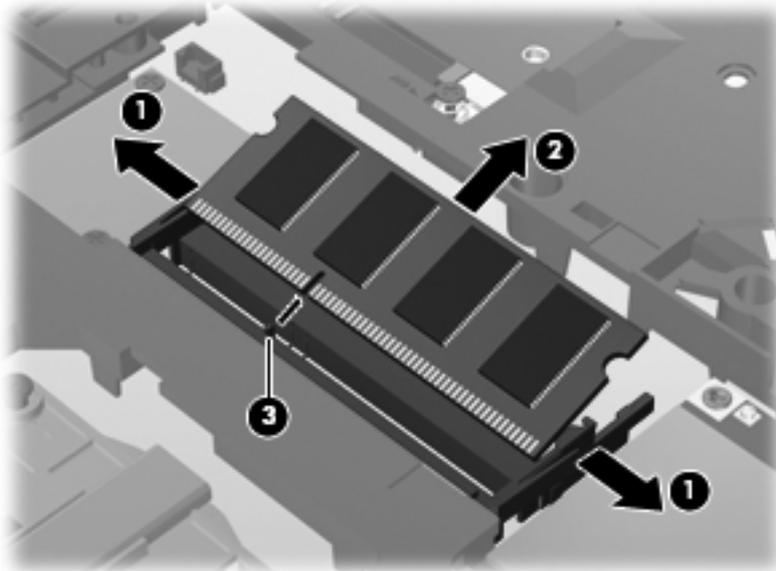
Remove the memory module:

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 **(3)** 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 is shown in the first image below. The bottom slot houses the primary memory module and is shown in the second image below.



Reverse this procedure to install a memory module.

WLAN module

Description	Spare part number
Broadcom 43228 802.11abgn 2x2 Wi-Fi Adapter	669832-001

⚠ CAUTION: To prevent an unresponsive system, replace the wireless module only with a wireless module authorized for use in the computer by the governmental agency that regulates wireless devices in your country or region. If you replace the module and then receive a warning message, remove the module to restore device functionality, and then contact 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 battery (see [Battery on page 29](#)).
5. Remove the service cover (see [Service cover on page 30](#)).

Remove the WLAN module:

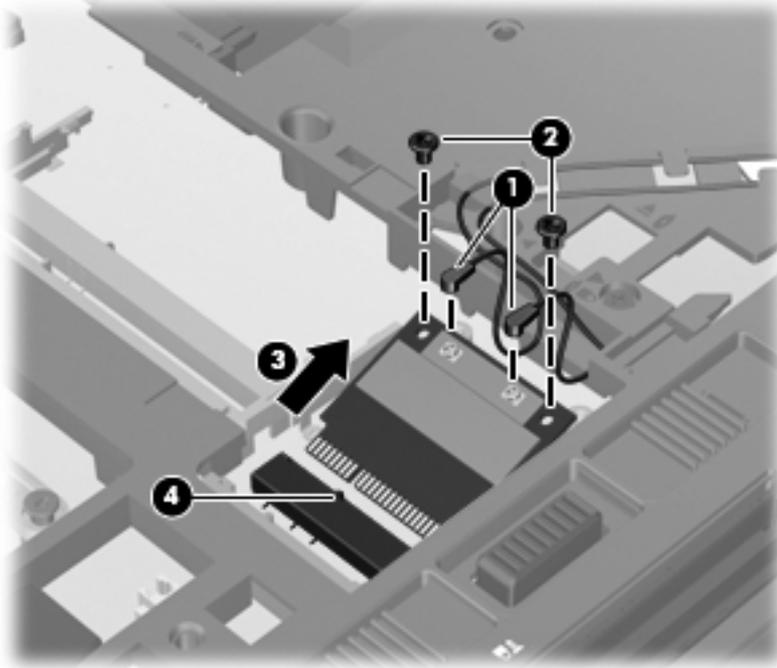
1. Disconnect the WLAN antenna cables **(1)** from the terminals on the WLAN module.

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.

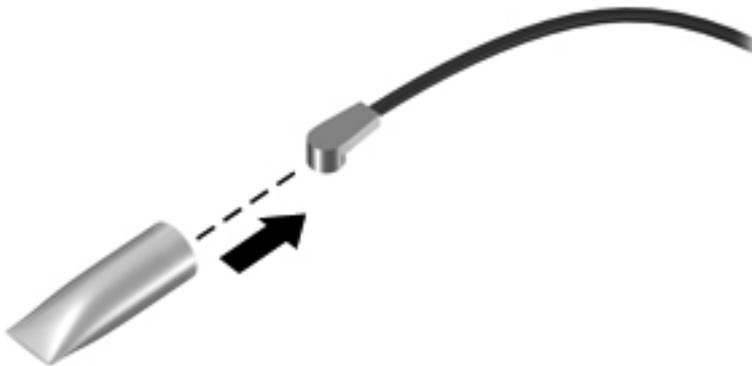
2. Remove the two Phillips PM2.0x3.0 screws **(2)** that secure the WLAN module to the base enclosure. (The WLAN module tilts up.)

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 **(4)** 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.

Fan

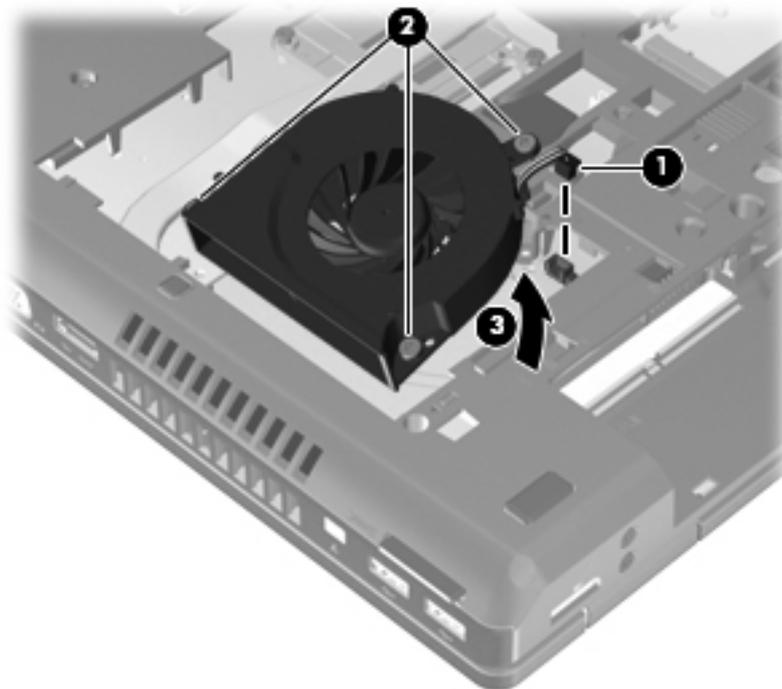
Description	Spare part number
Fan (includes cable)	641839-001

Before removing the fan, 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 [Battery on page 29](#)).
5. Remove the service cover (see [Service cover on page 30](#)).

Remove the fan:

1. Disconnect the fan cable **(1)** from the system board.
2. Loosen the three captive Phillips screws **(2)** that secure the fan to the top cover.
3. Remove the fan **(3)**.



Reverse this procedure to install the fan.

Keyboard

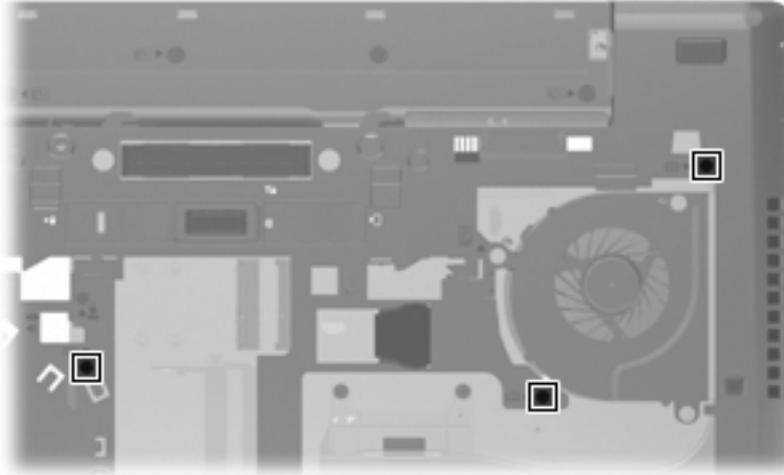
For use in country/region	Spare part number	For use in country/region	Spare part number
For use in Belgium	701976-A41	For use in Northwest Africa	701976-FP1
For use in Bulgaria	701976-261	For use in Portugal	701976-131
For use in Canada	701976-DB1	For use in Romania	701976-271
For use in the Czech Republic and Slovakia	701976-A81	For use in Russia	701976-251
For use in Denmark	701976-081	For use in Saudi Arabia	701976-171
For use in France	701976-051	For use in Slovenia	701976-BA1
For use in Germany	701976-041	For use in South Korea	701976-AD1
For use in Hungary	701976-211	For use in Spain	701976-071
For use in Iceland	701976-DD1	For use in Sweden and Finland	701976-B71
For use in India	701976-D61	For use in Switzerland	701976-BG1
For use in Israel	701976-BB1	For use in Taiwan	701976-AB1
For use in Italy	701976-061	For use in Thailand	701976-281
For use in Japan	701976-291	For use in Turkey	701976-141
For use in Latin America	701976-161	For use in the United Kingdom and Singapore	701976-031
For use in the Netherlands	701976-B31	For use in the United States	701976-001
For use in Norway	701976-091		

Before removing the keyboard, follow these steps:

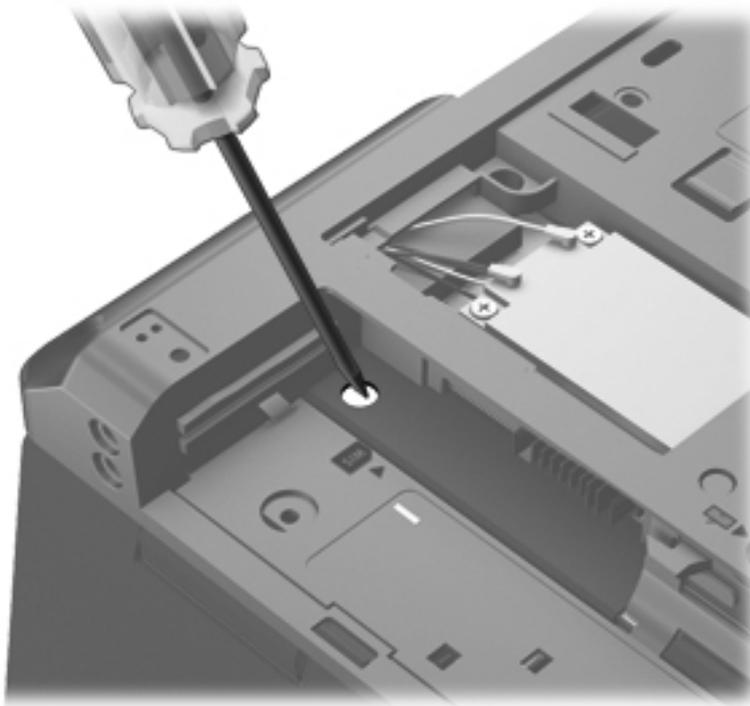
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 29](#)).
5. Remove the service cover (see [Service cover on page 30](#)).

Remove the keyboard:

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



2. Rest and secure the computer on its right side.
3. Partially open the computer.
4. Insert a screw driver or similar thin tool into the keyboard release opening in the battery bay, and then press on the back of the keyboard until the keyboard disengages from the computer.



5. Turn the computer right-side up with the front toward you.

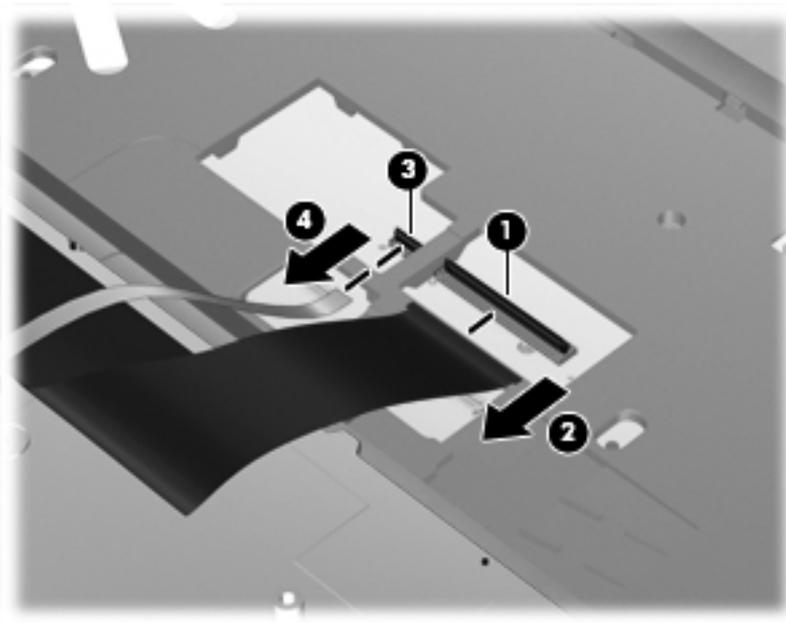
6. Lift the rear edge of the keyboard, and then swing the keyboard up and forward until it rests upside down on the palm rest.



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

 **NOTE:** The pointing stick cable is present on select models only.

8. Release the ZIF connector **(3)** to which the pointing stick cable is attached, and then disconnect the pointing stick cable **(4)** from the system board.



9. Remove the keyboard.

Reverse this procedure to install the keyboard.

Base enclosure

Description	Spare part number
Base enclosure (includes seven rubber feet, the service cover release latch assembly, and the battery release latch assembly)	687224-001

Before removing the base enclosure, 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 [Battery on page 29](#)), and then remove the following components:
 - a. Service cover (see [Service cover on page 30](#))
 - b. Optical drive (see [Optical drive on page 31](#))
 - c. Solid-state drive (see [Solid-state drive on page 32](#))
 - d. Keyboard (see [Keyboard on page 40](#))

 **NOTE:** When replacing the base enclosure, be sure to remove the speaker assembly (see [Speaker assembly on page 47](#)) from the defective base enclosure and install it on the replacement base enclosure:

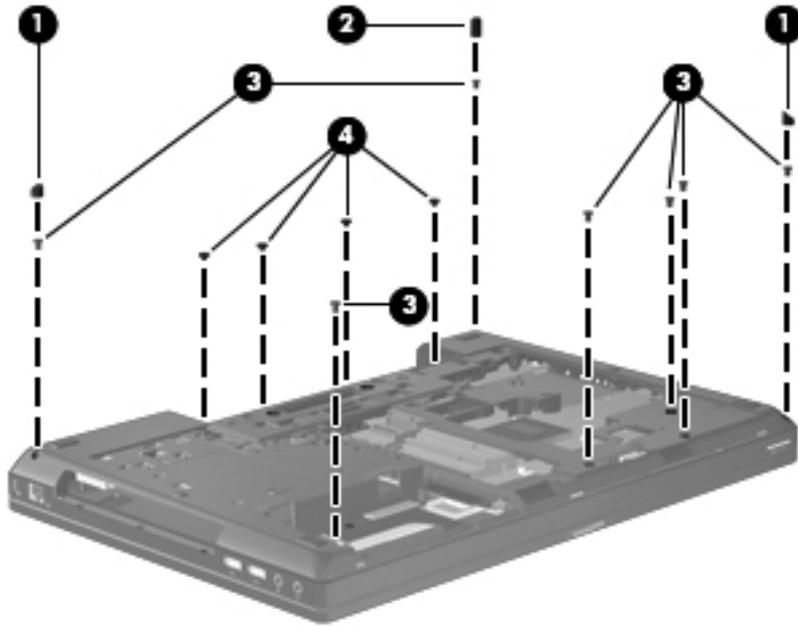
Remove the base enclosure:

1. Close the computer.
2. Turn the computer upside down, with the front toward you.
3. Remove the three rubber screw covers **(1)** and **(2)**. The rubber screw covers are included in the Rubber Kit, spare part number 641831-001.

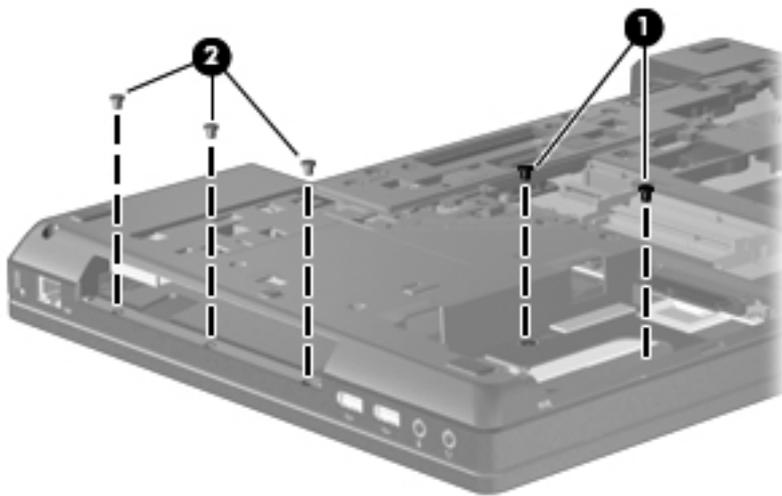
 **NOTE:** The rubber screw covers in the front/right and rear/left corners **(1)** are smaller than the screw cover in the rear/right corner.

4. Remove the seven Torx PM2.5×6.0 screws **(3)** that secure the base enclosure to the computer.

5. Remove the four Phillips PM2.5×3.0 screws from the battery bay **(4)** that secure the base enclosure to the computer.

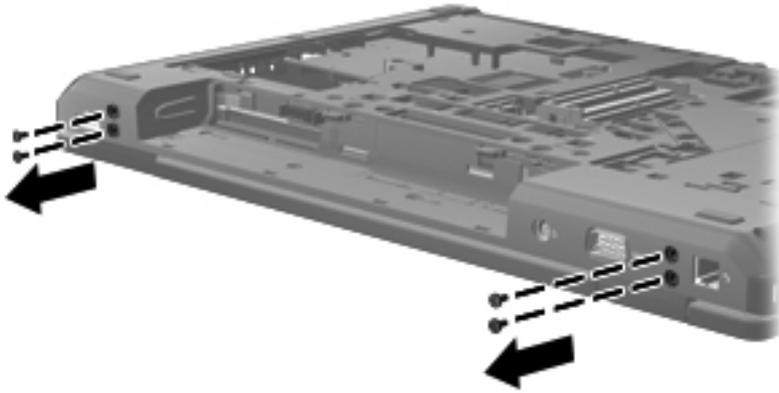


6. Remove the two Phillips PM2.5×3.0 screws **(1)** from the hard drive bay that secure the base enclosure to the computer.
7. Remove the three Phillips PM2.0×3.0 screws **(2)** from the optical drive bay that secure the base enclosure to the computer.

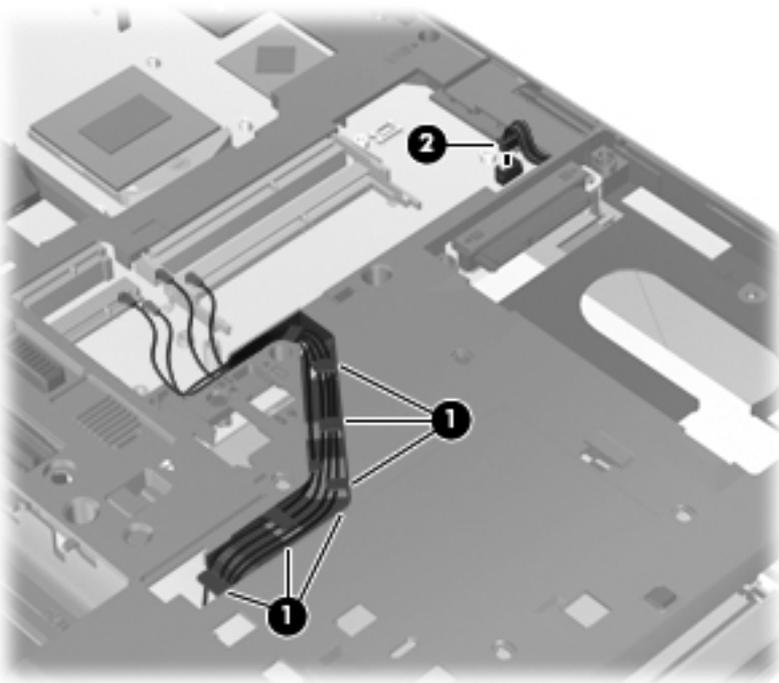


8. Position the computer with the battery bay toward you.

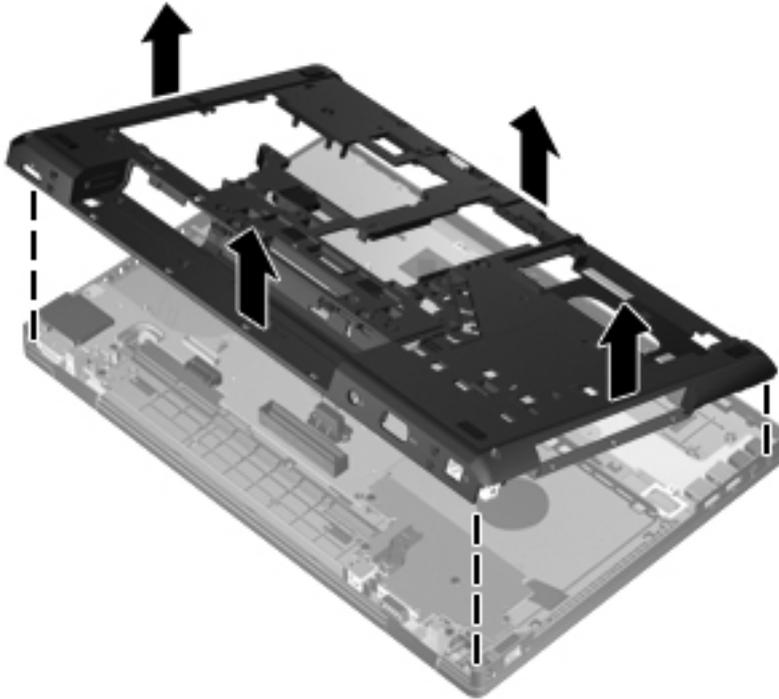
9. Remove the four Torx TM2.5x8.0 screws from the rear panel of the computer.



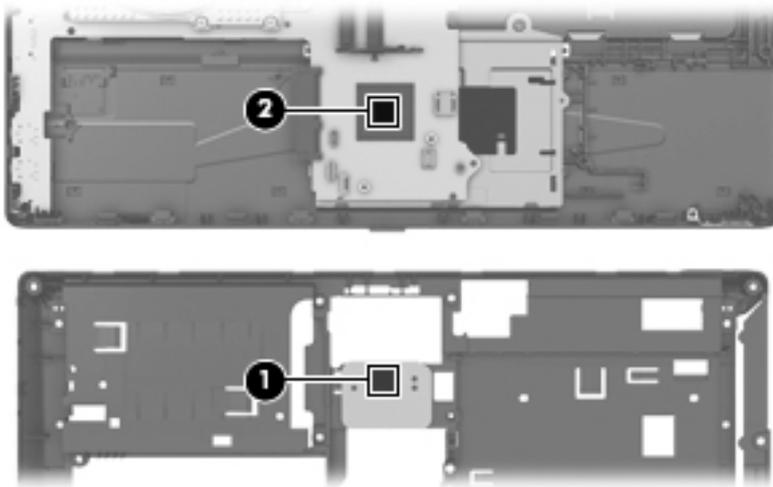
10. Remove the wireless cables from the clips (1) and routing channel built into the base enclosure.
11. Disconnect the speaker cable (2) from the system board.



12. Remove the base enclosure by lifting it straight up from the computer.



 **NOTE:** Thoroughly clean the thermal pad material from the surfaces of the base enclosure **(1)** and the PCH chip **(2)** each time you remove the base enclosure. All base enclosure and system board spare part kits include replacement thermal pad material.



Reverse this procedure to install the base enclosure.

Speaker assembly

Description	Spare part number
Speaker assembly (includes cable)	641840-001

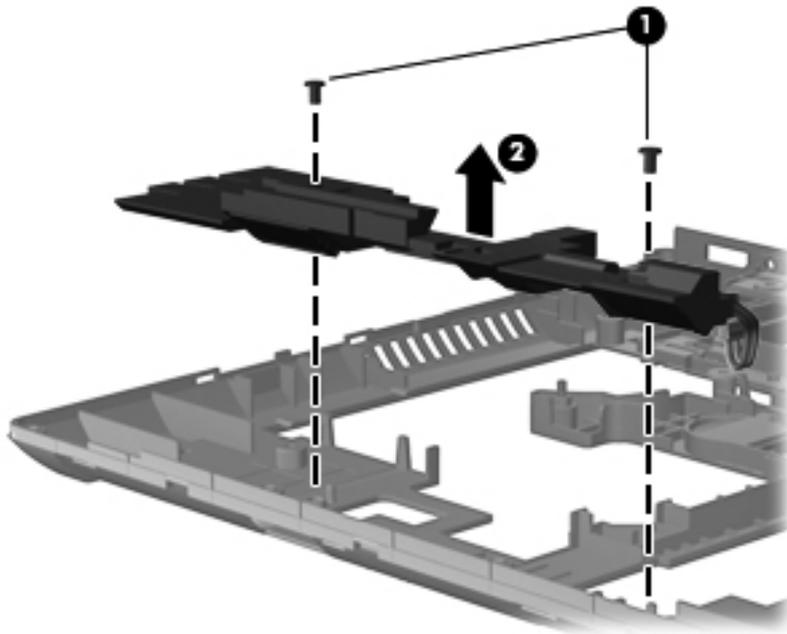
Before removing the speaker assembly, follow these steps:

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 battery (see [Battery on page 29](#)), and then remove the following components:
 - a. Service cover (see [Service cover on page 30](#))
 - b. Optical drive (see [Optical drive on page 31](#))
 - c. Solid-state drive (see [Solid-state drive on page 32](#))
 - d. Keyboard (see [Keyboard on page 40](#))
 - e. Base enclosure (see [Base enclosure on page 43](#))

Remove the speaker assembly:

1. Turn the base enclosure right-side up, with the front toward you.
2. Remove the two Phillips PM2.0×3.0 screws **(1)** that secure the speaker assembly to the base enclosure.

3. Remove the speaker assembly **(2)** from the base enclosure.



Reverse this procedure to install the speaker assembly.

Service cover release latch assembly

 **NOTE:** The service cover release latch assembly components are included in the Latch Kit, spare part number 684339-001.

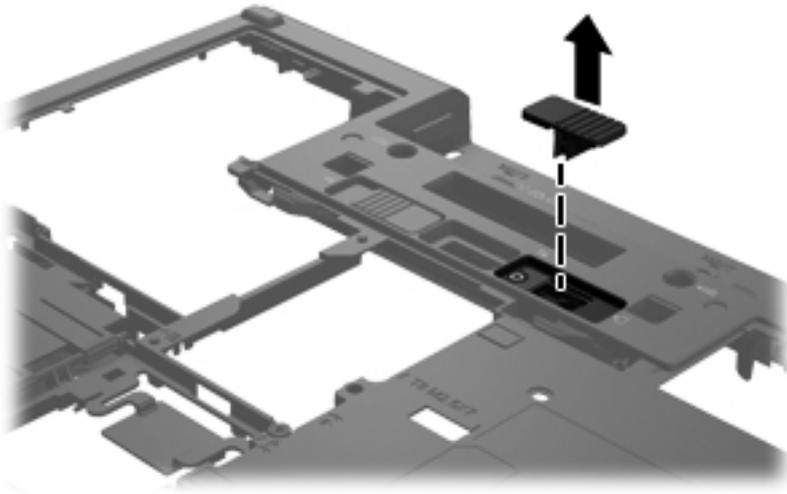
Before removing the service cover release latch assembly, follow these steps:

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 battery (see [Battery on page 29](#)), and then remove the following components:
 - a. Service cover (see [Service cover on page 30](#))
 - b. Optical drive (see [Optical drive on page 31](#))
 - c. Solid-state drive (see [Solid-state drive on page 32](#))
 - d. Keyboard (see [Keyboard on page 40](#))
 - e. Base enclosure (see [Base enclosure on page 43](#))

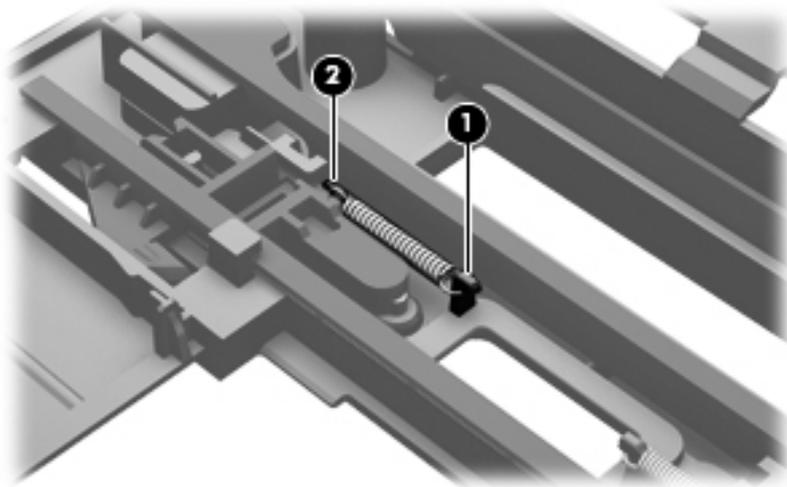
Remove the service cover release latch assembly:

1. Position the base enclosure with the front toward you.

2. Remove the service cover release latch actuator from the base enclosure.

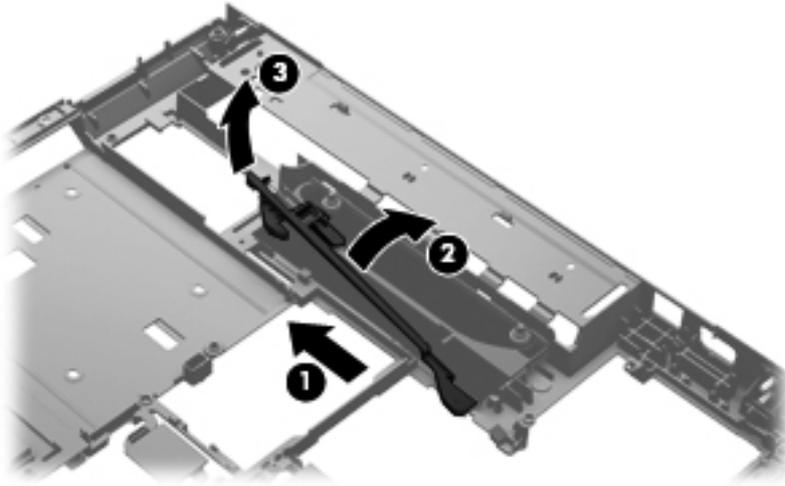


3. Turn the base enclosure right side up, with the front toward you.
4. Remove the service cover release latch arm spring from the spring retention hooks on the service cover release latch arm **(1)** and the base enclosure **(2)**.

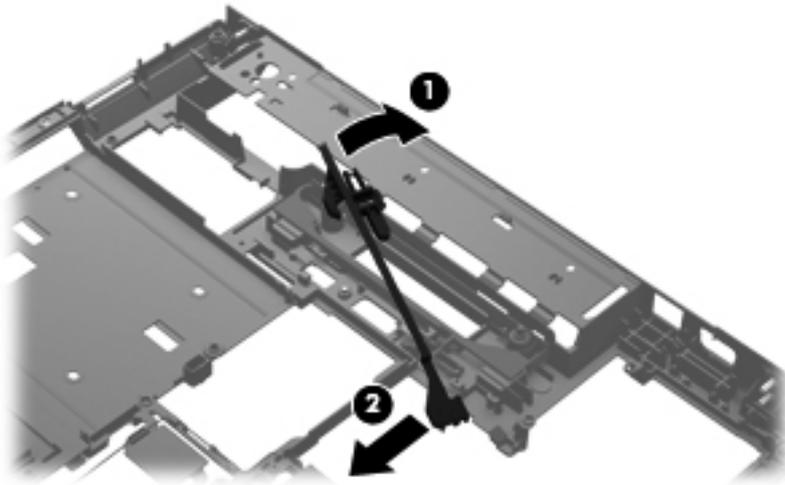


5. Slide the service cover release latch arm **(1)** as far to the left as it will go.
6. Flex the middle of the service cover release latch arm **(2)** up and back until it releases from the track built into the base enclosure.

7. Lift the left end of the service cover release latch arm **(3)** out of the openings in the base enclosure.



8. Swing the left end of the service cover release latch arm **(1)** toward the back of the computer.
9. Release the right end of the service cover release latch arm **(2)** from the openings in the base enclosure.



10. Remove the service cover release latch arm.

Reverse this procedure to install the service cover release latch assembly.

Battery release latch assembly

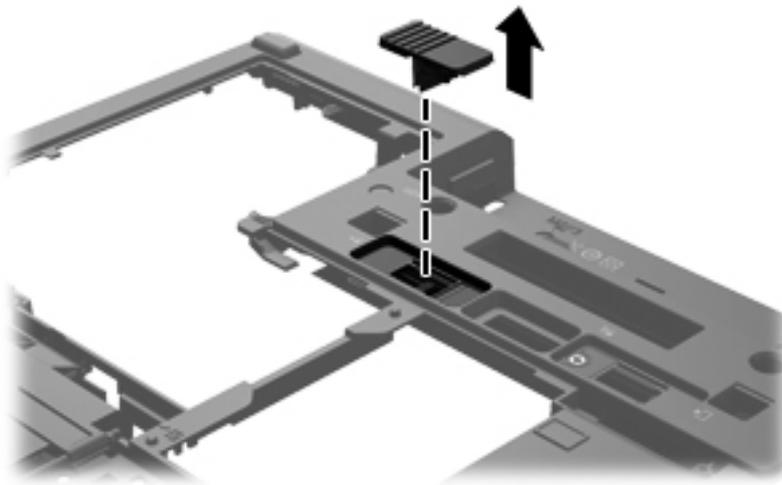
 **NOTE:** The battery release latch assembly components are included in the Latch Kit, spare part number 684339-001.

Before removing the battery release latch 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 battery (see [Battery on page 29](#)), and then remove the following components:
 - a. Service cover (see [Service cover on page 30](#))
 - b. Optical drive (see [Optical drive on page 31](#))
 - c. Solid-state drive (see [Solid-state drive on page 32](#))
 - d. Keyboard (see [Keyboard on page 40](#))
 - e. Base enclosure (see [Base enclosure on page 43](#))

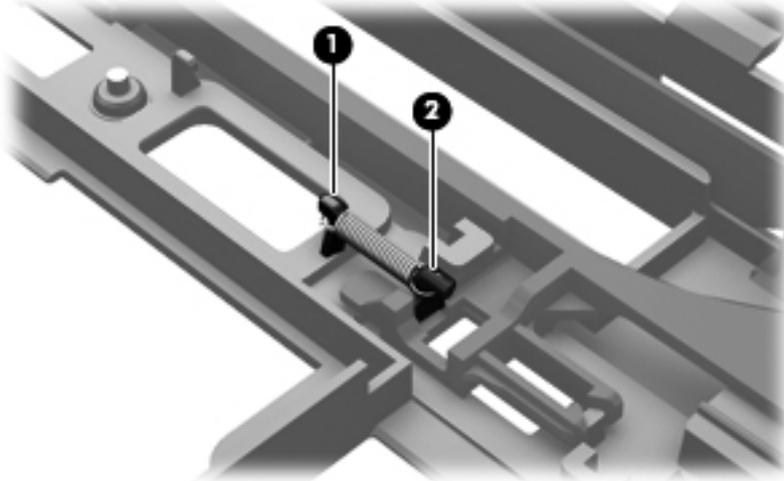
Remove the battery release latch assembly:

1. Position the base enclosure with the front toward you.
2. Remove the battery release latch actuator from the base enclosure.

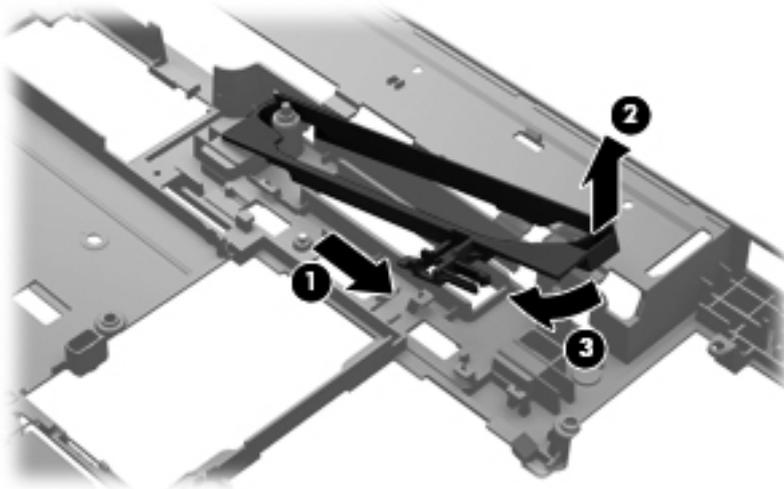


3. Turn the base enclosure right side up, with the front toward you.

4. Remove the battery release latch arm spring from the spring retention hooks on the base enclosure **(1)** and the battery release latch arm **(2)**.

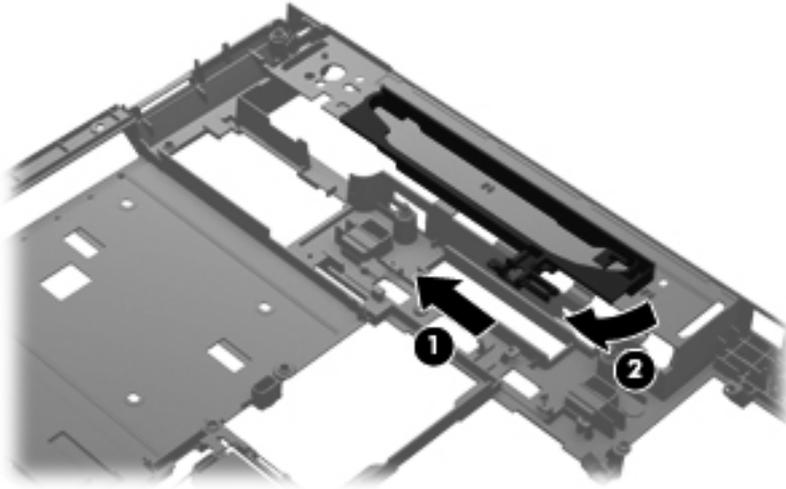


5. Slide the battery release latch arm **(1)** as far to the right as it will go.
6. Lift the right end of the battery release latch arm **(2)** until it is clear of the retention post built into the base enclosure.
7. Swing the right end of the battery release latch arm **(3)** clockwise until it is clear of the retention post built into the base enclosure.



8. Slide the battery release latch arm **(1)** as far to the left as it will go.

- Swing the right end of the battery release latch arm **(2)** clockwise until the left end of the arm release from the openings in the base enclosure.



- Remove the battery release latch arm.

Reverse this procedure to install the battery release latch assembly.

System board

Description	Spare part number
System board equipped with the Mobile Intel HM76 chipset and a graphics subsystem with UMA memory (includes replacement thermal material)	710658-001

Before removing the system board, follow these steps:

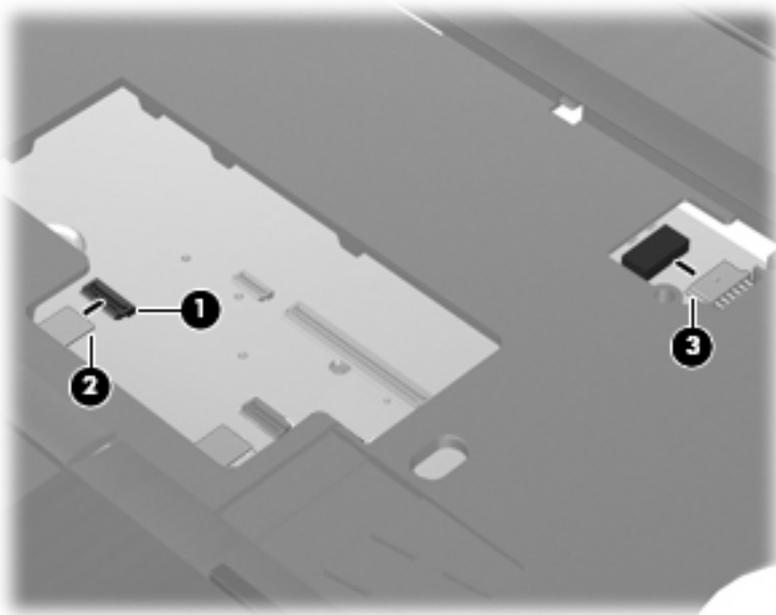
- Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
- Disconnect the power from the computer by unplugging the power cord from the computer.
- Disconnect all external devices from the computer.
- Remove the battery (see [Battery on page 29](#)), and then remove the following components:
 - Service cover (see [Service cover on page 30](#))
 - Optical drive (see [Optical drive on page 31](#))
 - Solid-state drive (see [Solid-state drive on page 32](#))
 - Fan (see [Fan on page 39](#))
 - Fan (see [Fan on page 39](#))
 - Keyboard (see [Keyboard on page 40](#))
 - Base enclosure (see [Base enclosure on page 43](#))

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

- Memory module (see [Memory module on page 35](#))
- WLAN module (see [WLAN module on page 37](#))
- Heat sink (see [Heat sink on page 56](#))
- Processor (see [Processor on page 58](#))

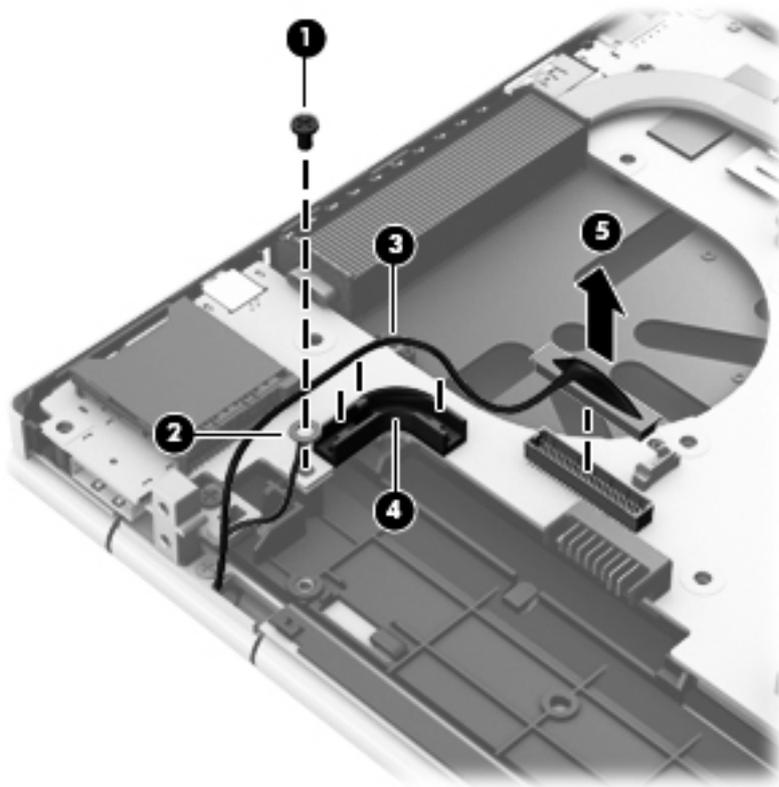
Remove the system board:

1. Position the computer right-side up, with the front toward you.
2. Open the computer.
3. Release the ZIF connector **(1)** to which the TouchPad cable is connected, and then disconnect the TouchPad cable **(2)** from the system board.
4. Disconnect the power connector cable **(3)** from the system board.

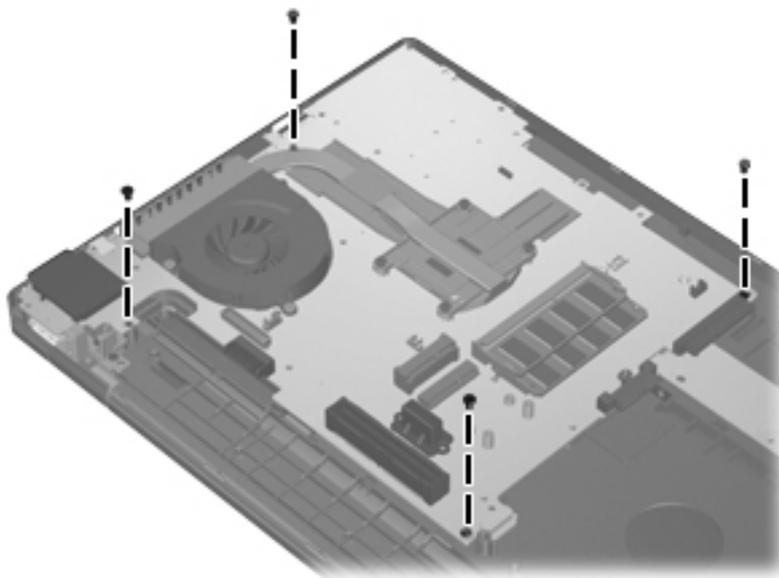


5. Close the computer.
6. Turn the computer upside down, with the battery bay toward you.
7. Remove the Phillips PM2.5×5.0 screw **(1)** that secures the display panel cable ground loop **(2)** to the computer.
8. Release the display panel cable **(3)** from the retention clip **(4)** attached to the system board.

9. Disconnect the display panel cable (5) from the system board.

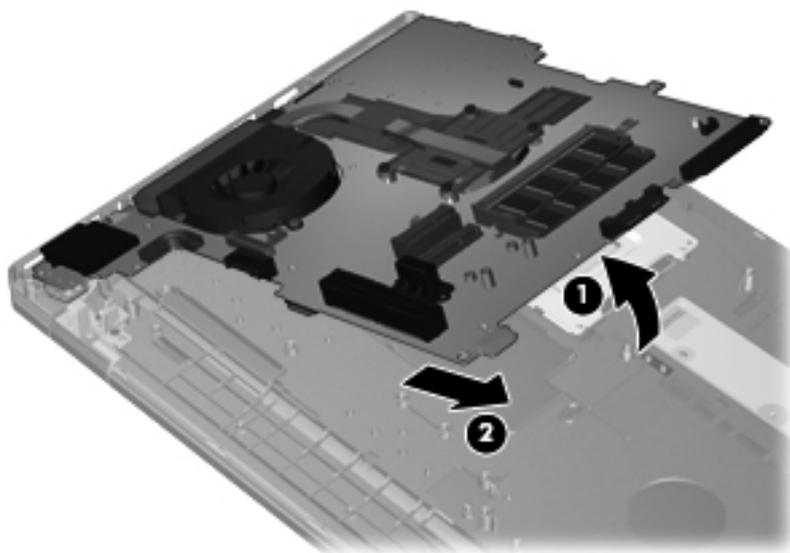


10. Remove the four Phillips PM2.5×5.0 screws that secure the system board to the top cover.



11. Lift the right side of the system board (1) until it rests at an angle.

12. Remove the system board (2) by sliding it up and to the right at an angle.



Reverse this procedure to install the system board.

Heat sink

Description	Spare part number
Heat sink (includes replacement thermal material)	693371-001

Before removing the heat sink, follow these steps:

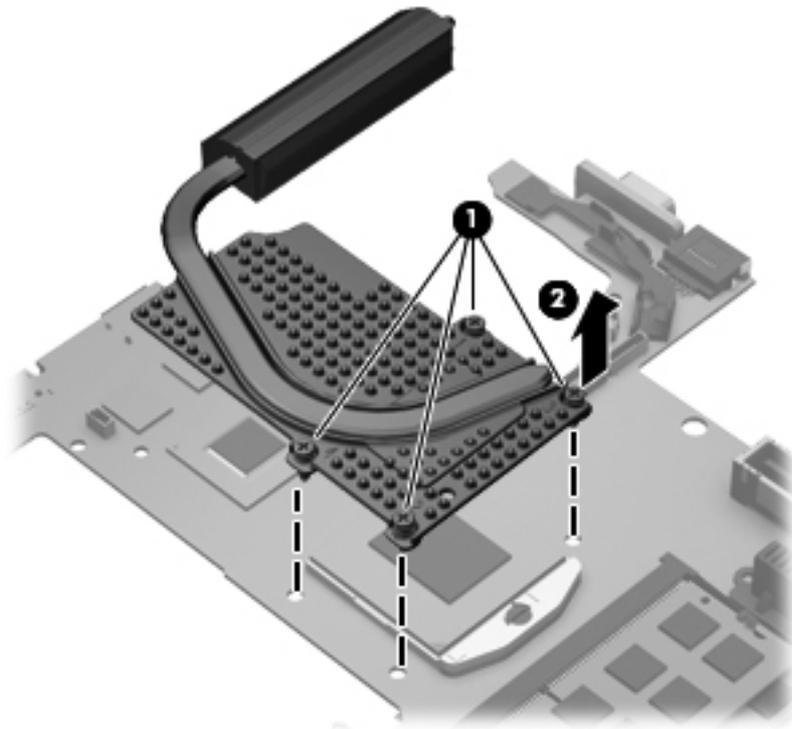
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 29](#)), and then remove the following components:
 - a. Service cover (see [Service cover on page 30](#))
 - b. Solid-state drive (see [Solid-state drive on page 32](#))
 - c. Optical drive (see [Optical drive on page 31](#))
 - d. WLAN module (see [WLAN module on page 37](#))
 - e. Fan (see [Fan on page 39](#))
 - f. Keyboard (see [Keyboard on page 40](#))

- g. Base enclosure (see [Base enclosure on page 43](#))
- h. System board (see [System board on page 53](#))

Remove the heat sink:

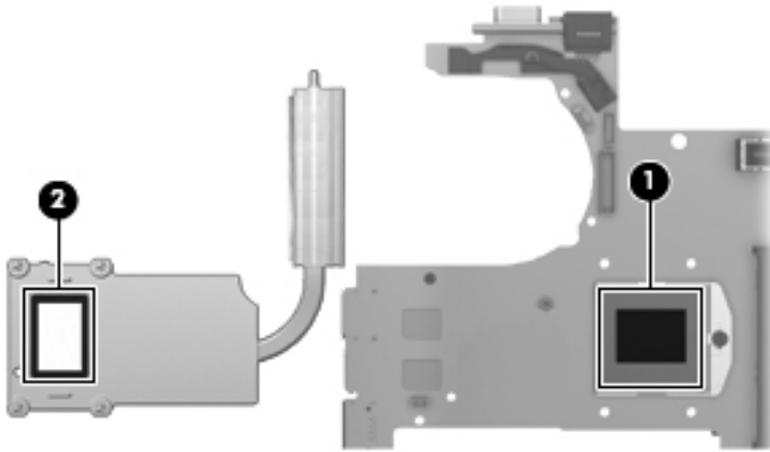
1. Following the 1, 2, 3, 4 sequence stamped into the heat sink, loosen the four captive Phillips screws **(1)** that secure the heat sink to the system board.
2. Remove the heat sink **(2)**.

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



 **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.

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



Reverse this procedure to install the heat sink.

Processor

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

Description	Spare part number
Intel Celeron B840 1.90-GHz processor (1333-MHz FSB, 2.0-MB L3 cache, 35 W; includes replacement thermal material)	664663-001

Before removing the processor, follow these steps:

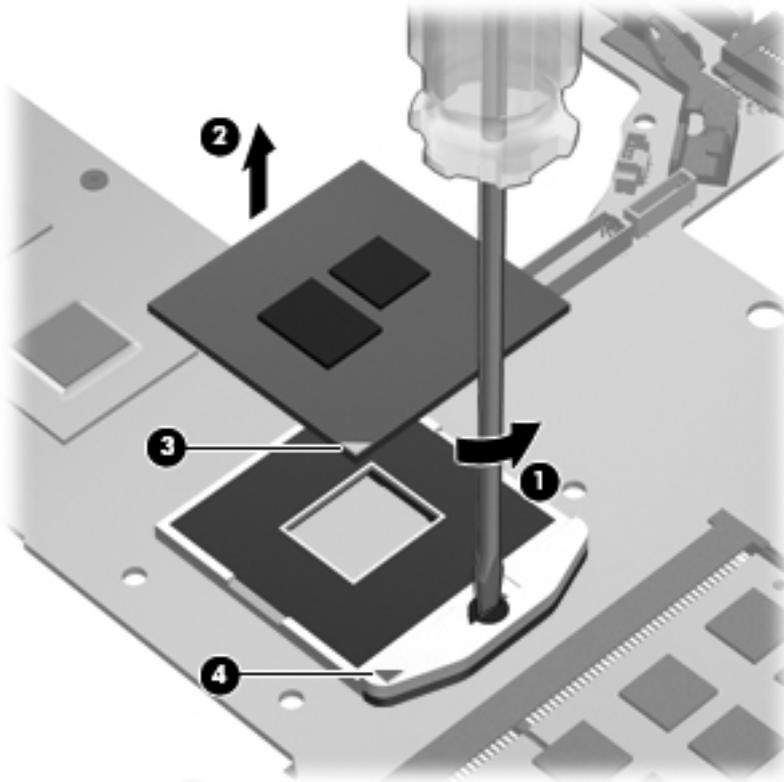
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 29](#)), and then remove the following components:
 - a. Service cover (see [Service cover on page 30](#))
 - b. Solid-state drive (see [Solid-state drive on page 32](#))
 - c. Optical drive (see [Optical drive on page 31](#))
 - d. WLAN module (see [WLAN module on page 37](#))
 - e. Fan (see [Fan on page 39](#))
 - f. Keyboard (see [Keyboard on page 40](#))
 - g. Base enclosure (see [Base enclosure on page 43](#))

- h. System board (see [System board on page 53](#))
- i. Heat sink (see [Heat sink on page 56](#))

Remove the processor:

1. Use a flat-bladed screw driver **(1)** to turn the processor locking screw one-half turn counterclockwise, until you hear a click.
2. Lift the processor **(2)** straight up, and remove it.

 **NOTE:** The gold triangle **(3)** on the processor must be aligned with the triangle icon **(4)** embossed on the processor socket when you install the processor.



Reverse this procedure to install the processor.

Display assembly



NOTE: The display assembly is spared at the subcomponent level only. For more display assembly spare part information, see the individual removal subsections.

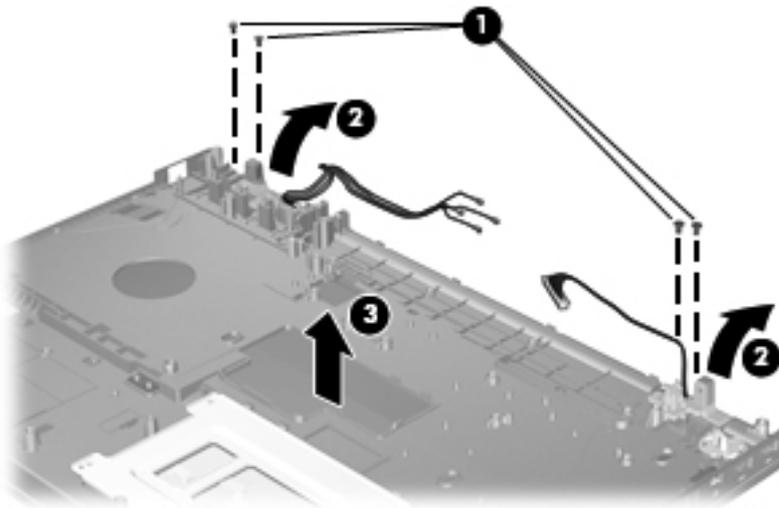
Before removing the display assembly, follow these steps:

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. Remove the battery (see [Battery on page 29](#)), and then remove the following components:
 - a. Service cover (see [Service cover on page 30](#))
 - b. Solid-state drive (see [Solid-state drive on page 32](#))
 - c. Optical drive (see [Optical drive on page 31](#))
 - d. WLAN module (see [WLAN module on page 37](#))
 - e. Fan (see [Fan on page 39](#))
 - f. Keyboard (see [Keyboard on page 40](#))
 - g. Base enclosure (see [Base enclosure on page 43](#))
 - h. System board (see [System board on page 53](#))

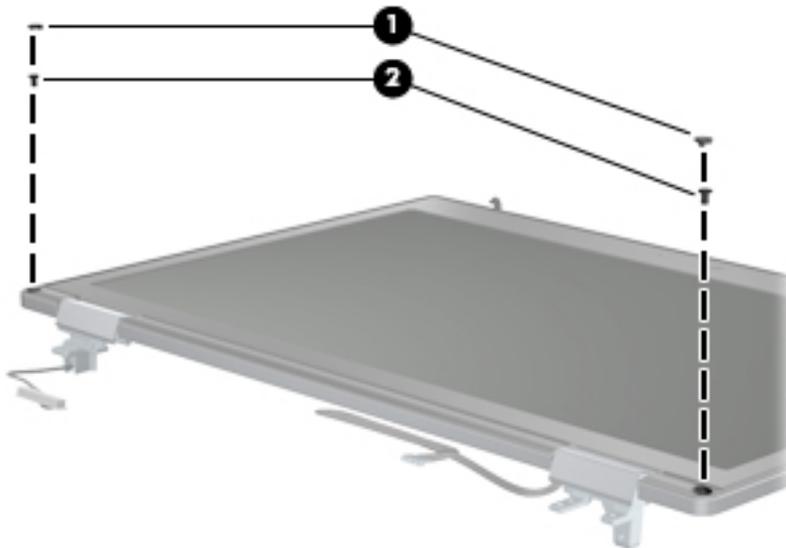
Remove the display assembly:

1. Position the computer with the front toward you.
2. Remove the four Phillips PM2.5×7.0 screws **(1)** that secure the display assembly to the computer.
3. Swing the display hinges **(2)** up and back until the top cover is free for removal.

4. Remove the top cover (3) from the display assembly.



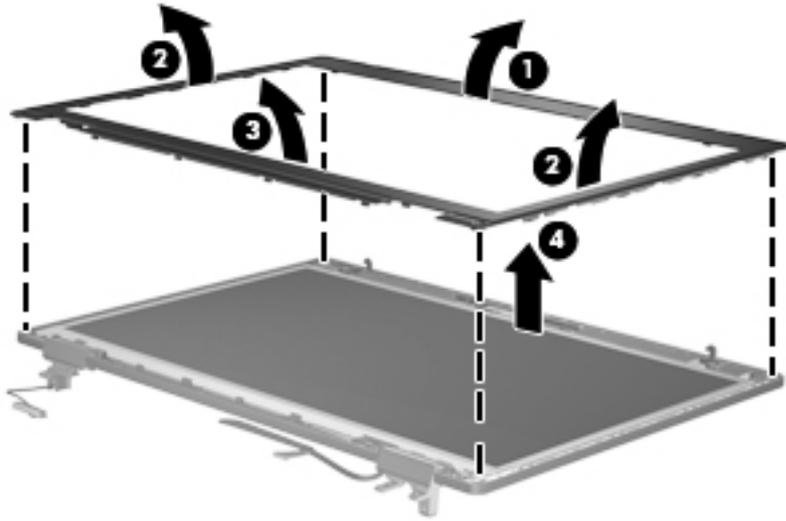
5. If it is necessary to replace the display bezel or any of the display assembly subcomponents:
- a. Remove the rubber screw covers (1). The rubber screw covers are available in the Display Rubber Kit, spare part number 642785-001.
 - b. Remove the two Phillips PM2.5×5.0 screws (2) that secure the display bezel to the display assembly.



- c. Flex the inside edges of the bottom edge (1), the left and right sides (2), and the top edge (3) of the display bezel until the bezel disengages from the display enclosure.

- d. Remove the display bezel **(4)**.

The display bezel is available using spare part number 685999-001.



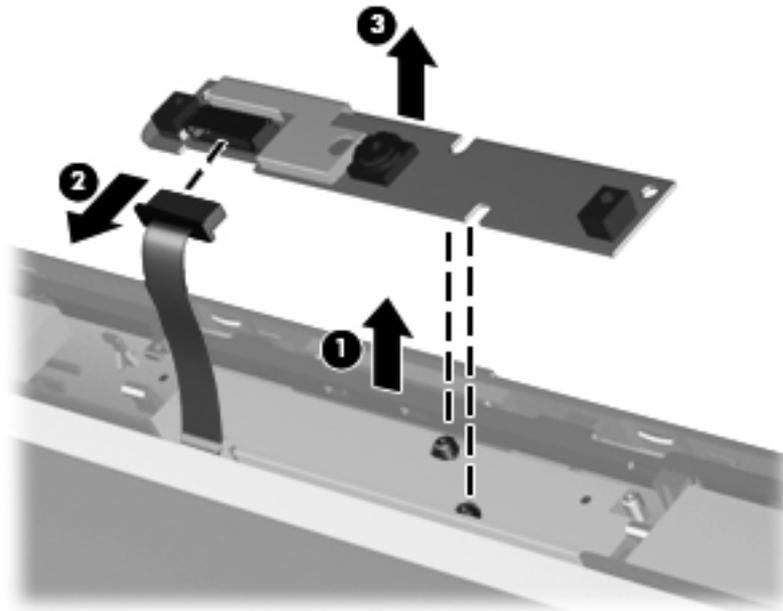
6. If it is necessary to replace the webcam/microphone module:

CAUTION: Handle the webcam/microphone module with caution. The module has a thin profile and is susceptible to damage when not handled carefully.

- a. Detach the webcam/microphone module **(1)** from the display enclosure. (The webcam/microphone module is attached to the display enclosure with double-sided tape.)
- b. Disconnect the webcam/microphone module cable **(2)** from the webcam/microphone module.

- c. Remove the webcam/microphone module **(3)**.

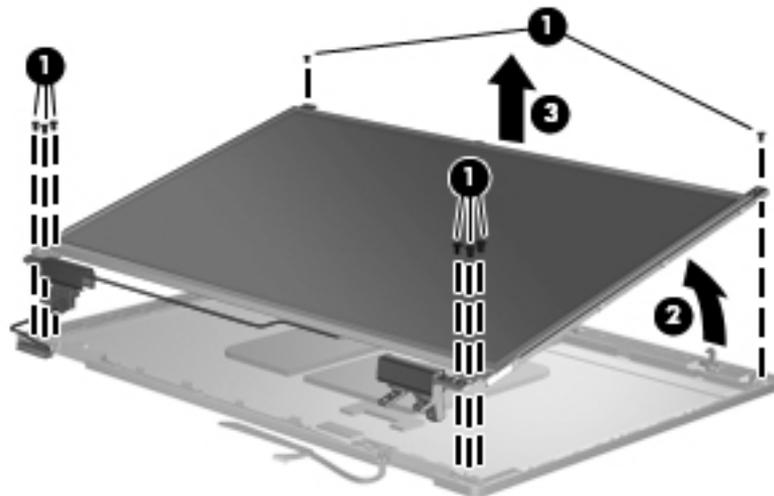
The webcam/microphone module is available using spare part number 684346-001. The microphone module is available using spare part number 642797-001.



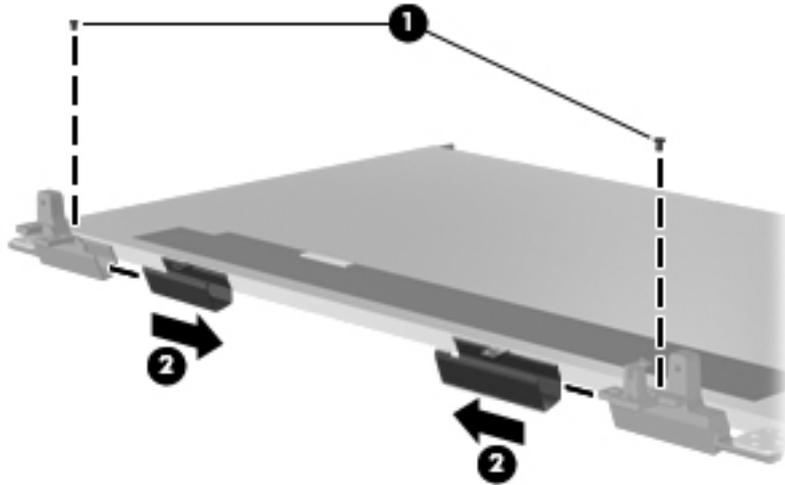
- 7. If it is necessary to replace the display panel:

- a. Remove the eight Phillips PM2.5×4.0 screws **(1)** that secure the display panel to the display enclosure.
- b. Lift the top edge of the display panel **(2)** until the display panel rests at an angle.
- c. Remove the display panel **(3)**.

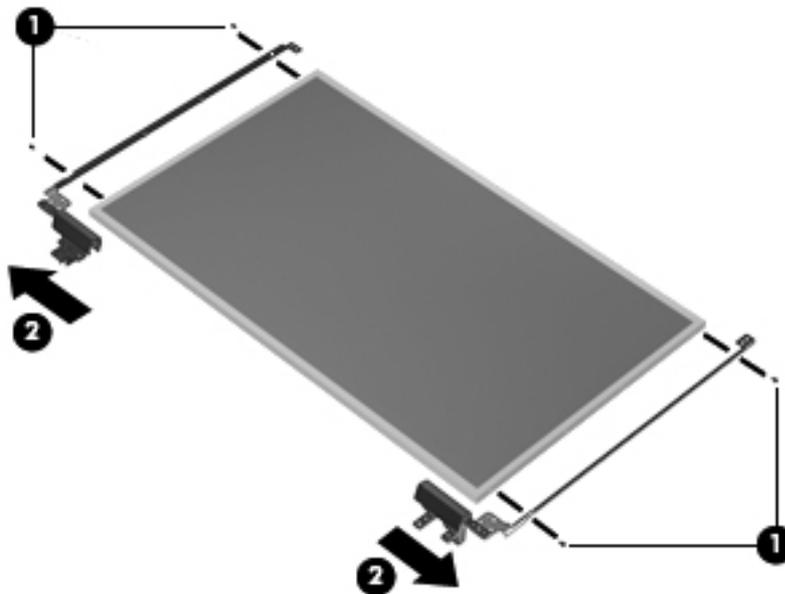
The display panel is available using the spare part number 710653-001.



8. If it is necessary to replace the display hinge covers:
- a. Remove the two Phillips PM2.5×3.0 screws **(1)** that secure the display hinge covers to the display hinges.
 - b. Slide the display hinge covers **(2)** toward each other to remove them from the display hinges.
- The display hinge covers are available using spare part number 642783-001.



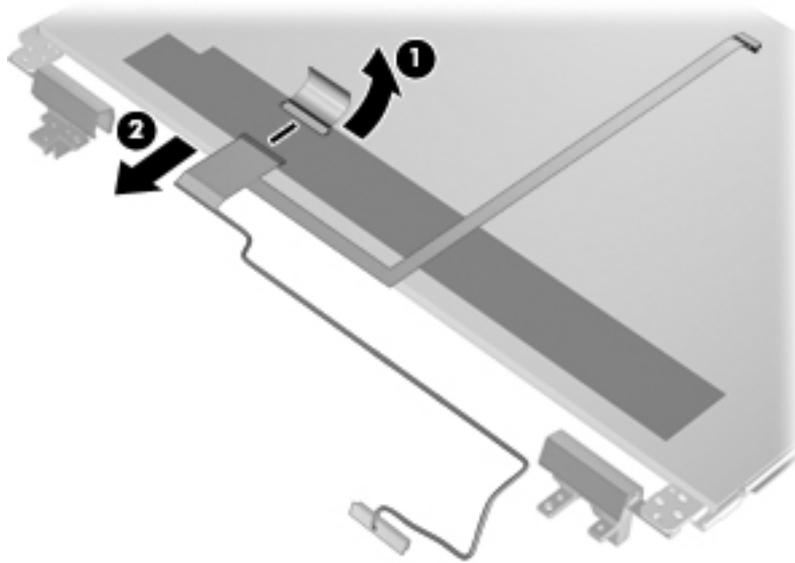
9. If it is necessary to replace the display hinges:
- a. Remove the four Phillips PM2.5×3.0 screws **(1)** that secure the display hinges to the display enclosure.
 - b. Remove the display hinges **(2)** from the display panel.
- The display hinges are available using spare part number 641836-001.



10. If it is necessary to replace the display panel cable:

⚠ CAUTION: Before turning the display panel upside down, make sure the work surface is clear of tools, screws, and any other foreign objects. Failure to follow this caution can result in damage to the display panel.

- a. Turn the display panel upside down, with the display panel cable toward you.
- b. Release the adhesive support strip **(1)** that secures the display panel cable to the display panel.
- c. Disconnect the display panel cable **(2)** from the display panel.



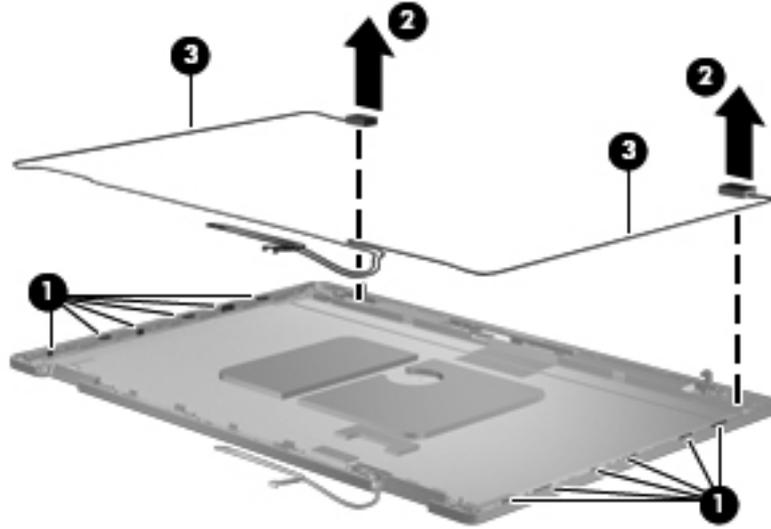
- d. Remove the display panel cable.

The display panel cable is available using spare part number 693063-001.

11. If it is necessary to replace the WLAN antenna cables and transceivers:

- a. Release the WLAN antenna cables from the clips **(1)** and routing channel built into the display enclosure.
- b. Detach the WLAN antenna transceivers **(2)** from the display enclosure. (The WLAN antenna transceivers are attached to the display enclosure with double-sided tape.)

- c. Remove the WLAN antenna cables and transceivers **(3)**. The WLAN antenna cables and transceivers are included in the Antenna Kit, spare part number 642799-001.



Reverse this procedure to reassemble and install the display assembly.

5 Computer Setup (BIOS) and Advanced System Diagnostics

Using Computer Setup

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

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

Starting Computer Setup

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

To start Computer Setup, follow these steps:

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

Navigating and selecting in Computer Setup

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

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

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

2. Press **f10** to enter Computer Setup.

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

- To exit Computer Setup menus without saving your changes:

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

– or –

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

- To save your changes and exit Computer Setup menus:

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

– or –

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

Your changes go into effect when the computer restarts.

Restoring factory settings in Computer Setup

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

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

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

– or –

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

Your changes go into effect when the computer restarts.

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

Updating the BIOS

The next sections describe different ways of updating the BIOS.

Downloading *SoftPaqs* to update the BIOS

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

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

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



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

BIOS Setup Menu

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

Main menu

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

Security menu

Select	To do this
Administrator password	Control access to Setup Utility.
Power-on password	Control access to your computer.
TPM Status	Disable and enable (select models only).
TPM Operation	Select no operation and TPM status (select models only).

Diagnostics menu

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

Using Advanced System Diagnostics

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

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

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

To start Advanced System Diagnostics:

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



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

6 Specifications

Computer specifications

	Metric	U.S.
Dimensions		
Width	33.80 cm	13.31 in
Depth	23.13 cm	9.11 in
Height (front to back)	3.40 to 3.60 cm	1.34 to 1.42 in
Weight		
Equipped with 9-cell battery, optical drive, graphics subsystem with UMA memory, one memory module, WLAN module, solid-state drive, and TouchPad	2.47 kg	5.45 lbs
Equipped with 9-cell battery, graphics subsystem with UMA memory, one memory module, WLAN module, solid-state drive, and TouchPad	2.33 kg	5.14 lbs
Equipped with 6-cell battery, optical drive, graphics subsystem with UMA memory, one memory module, WLAN module, solid-state drive, and TouchPad	2.31 kg	5.09 lbs
Equipped with 6-cell battery, graphics subsystem with UMA memory, one memory module, WLAN module, solid-state drive, and TouchPad	2.17 kg	4.78 lbs
Equipped with 6-cell battery, optical drive, graphics subsystem with UMA memory, one memory module, WLAN module, solid-state drive, and TouchPad	2.17 kg	4.78 lbs
Equipped with 6-cell battery, graphics subsystem with UMA memory, one memory module, WLAN module, solid-state drive, and TouchPad	2.03 kg	4.48 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		

	Metric	U.S.
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.		

14.0-inch SGA 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	200 nits (typical)	
Pixel resolution		
Pitch	0.197 × 0.197 mm	
Format	HD+, SVA (1600 × 1900)	
	HD, SVA (1366 × 768)	
Configuration	RGB vertical stripe	
Backlight	LED	
Character display	80 × 25	
Total power consumption	3.46 W	
Viewing angle	±65° horizontal, ±50° vertical (typical)	

7 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 **1.0m** (3.3 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
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.

8 Recycling

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>.

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