



HP Pavilion dm1 Notebook PC

Maintenance and Service Guide

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Safety Warning Notice


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

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1 Product description

Category	Description
Product name	HP Pavilion dm1
Processor	AMD E350 1.6-GHz, 1MB L2 cache, 1333-MHz front-side bus (FSB), Dual Core 18W
Chipset	AMD A50M Fusion Controller Hub
Graphics	Universal Memory Architecture (UMA) graphics integrated with shared video memory: <ul style="list-style-type: none">• up to 372MB for =1024MB system RAM• up to 948MB for >=2048MB system RAM (1G+1G)• up to 948MB for >=2048MB system RAM (2G)• up to 1460MB for >=3072MB system RAM• up to 1972MB for >=4096MB system RAM (2G+2G)• up to 1972MB for >=4096MB system RAM (4G)• up to 3443MB for =8192MB system RAM (4G+4G)
Panel	29.5-cm (11.6-in) (1366 x 768) HD BrightView LED display assembly
Memory	2 customer-accessible/upgradable memory module slots Supports up to 8GB memory NOTE: For the Microsoft® Windows® Starter operating system, do not install more than 2 GB of memory. Supports the following DDR3 configurations at 1066 MHz: <ul style="list-style-type: none">• 1024MB total system memory (1024 MB x 1)• 2048MB total system memory (1024MB x 2)• 2048MB total system memory (2048MB x 1)• 3072MB total system memory (1024MB x 1 + 2048MB x 1)• 4096MB total system memory (2048MB x 2)• 8192MB total system memory (4096MB x 2)
Sold-state drive	Supports 128-GB solid-state drive

Category	Description
Hard drives	<p>Supports 9.50-mm, 6.35-cm (2.50-in) hard drives</p> <p>Supports HP ProtectSmart Hard Drive Protection</p> <p>Customer-accessible</p> <p>Serial ATA (SATA)</p> <p>Supports the following hard drives:</p> <p>NOTE: For the Windows Starter operating system, do not use a hard drive with a capacity more than 320 GB.</p> <ul style="list-style-type: none"> • 750 GB 5400 rpm • 640 GB 5400 rpm • 500 GB, 7200 rpm • 320 GB, 7200 rpm • 250 GB, 7200 rpm
Optical drives	<p>12.7-mm tray load external USB optical drive</p> <p>Serial ATA (SATA)</p> <p>Supports the following drives:</p> <ul style="list-style-type: none"> • External Blu-ray SuperMulti Double-Layer Optical Drive with LightScribe • External DVD±RW SuperMulti Double-Layer Optical Drive with LightScribe
Diskette drive	<p>Supports external USB drive only</p> <p>Supports boot from USB device</p>
Microphone	Single digital microphone
Audio	<p>2 integrated HD stereo speakers</p> <p>Audio-out (headphone) jack / Audio-in (microphone) jack</p>
Webcam	Integrated standard VGA camera with fixed focus
Ethernet	<p>Integrated 10/100/1000 network interface card (NIC)</p> <p>Ethernet cable not included</p>
Wireless	<p>Integrated wireless local-area network (WLAN) via Half-Mini Card:</p> <ul style="list-style-type: none"> • 802.11 bgn WLAN + Bluetooth® Combo card • 802.11 bgn Bluetooth® Combo card with 2 antennas <p>Integrated wireless wide-area network (WWAN) and GPS function (FMC)</p> <ul style="list-style-type: none"> • Qualcomm Gobi2/Birlion with 2 antennas • 6 band antenna support: 2100/1800/1900/800/900 with additional GPS band • 2.4 GHz and 5 GHz antennas in display enclosure

Category	Description
External media cards	Digital Media Slot supporting the following optional digital card formats: <ul style="list-style-type: none"> • MultiMediaCard (MMC) • Secure Digital (SD) Memory Card
Ports	Audio-in (stereo microphone)/Audio-out (stereo headphone) combo jack HDMI v.1.3 AC power RJ-45 (Ethernet, includes link and activity lights) USB v. 2.0 (3) VGA (Dsub 15-pin) supporting: <ul style="list-style-type: none"> • 1920 x 1200 external resolution at 60 GHz • 1600 x 1200 external resolution at 75 GHz
Keyboard/pointing device	TouchPad with TouchPad buttons Touch-sensitive controls Supports 2-way scroll with legend Taps enabled by default
Power requirements	65-W AC adapter 6-cell, 2.55-Ah (55-Wh) Li-ion battery
Security	Security cable slot
Operating system	Pre-installed: <ul style="list-style-type: none"> • Windows 7 Premium, 32- and 64-bit • Windows® 7 Professional, 32- and 64-bit • Windows 7 Basic, 32- and 64-bit • Windows 7 Starter, 32-bit
Serviceability	End-user replaceable parts: <ul style="list-style-type: none"> • AC adapter • Battery (system) • Hard drive / solid state drive • Memory modules • SIM card (for WWAN) • WLAN module • WWAN module


2 External component identification

Components that are included with the computer may vary by region and model. The illustrations in this chapter identify the standard features on most computer models.

Top components

TouchPad





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

This table describes factory settings. To view or change pointing device preferences, select **Start > Devices and Printers**.

Lights




Component	Description
(1)  TouchPad off indicator	<ul style="list-style-type: none"> • Amber: The TouchPad is off. • Off: The TouchPad is on.
(2) Caps lock light	<ul style="list-style-type: none"> • White: Caps lock is on. • Off: Caps lock is off.
(3)  Mute light	<ul style="list-style-type: none"> • Amber: Computer sound is off • Off: Computer sound is on
(4)  Wireless light	<ul style="list-style-type: none"> • On: An integrated wireless device, such as a wireless local area network (WLAN) device and/or a Bluetooth® device, is on. • Off: All wireless devices are off

NOTE: On some models, the wireless light is amber when all wireless devices are off.

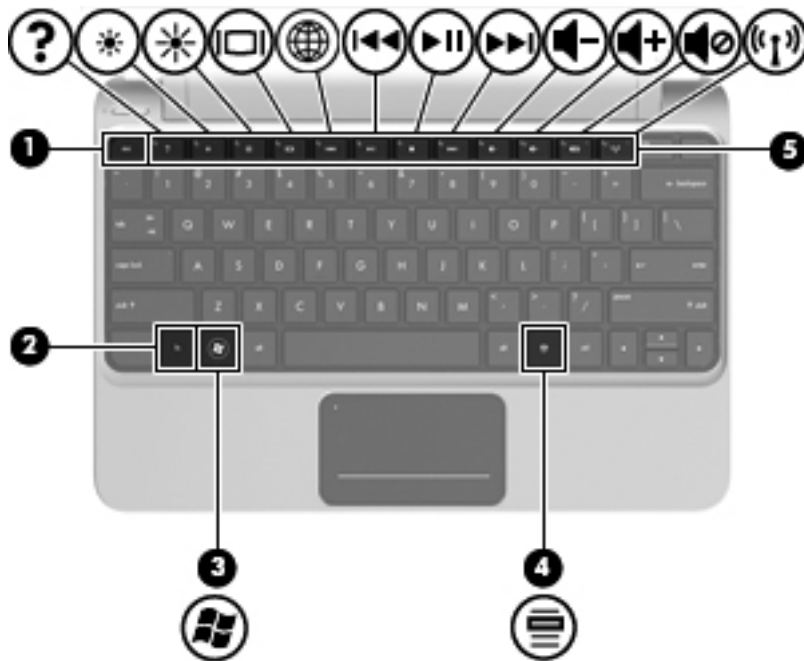
Buttons





Component	Description
 Power button*	<ul style="list-style-type: none">• When the computer is off, press the <code>power</code> button to turn on the computer.• When the computer is on, press the <code>power</code> button briefly to initiate Sleep mode.• When the computer is in Sleep mode, press the <code>power</code> button briefly to exit Sleep mode.• When the computer is in Hibernation mode, press the <code>power</code> button briefly to exit Hibernation mode. <p>If the computer has stopped responding and Windows® shutdown procedures are ineffective, press and hold the <code>power</code> button for at least 5 seconds to turn off the computer.</p> <p>To learn more about the power settings, select Start > Control Panel > System and Security > Power Options.</p>

*This table describes factory settings.

Keys



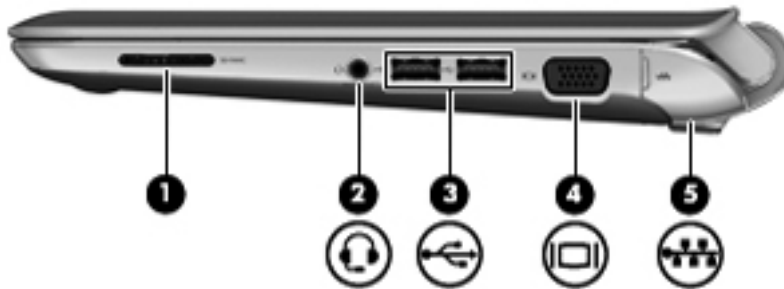
Component	Description
(1) <code>esc</code> key	Displays system information when pressed in combination with the <code>fn</code> key
(2) <code>fn</code> key	Executes frequently used system functions when pressed in combination with a function key, the <code>num lk</code> key, or the <code>esc</code> key
(3)  Windows® logo key	Displays the Windows Start menu
(4)  Windows applications key	Displays a shortcut menu for items beneath the pointer
(5) Function keys	Execute frequently used system functions when pressed in combination with the <code>fn</code> key






Front components



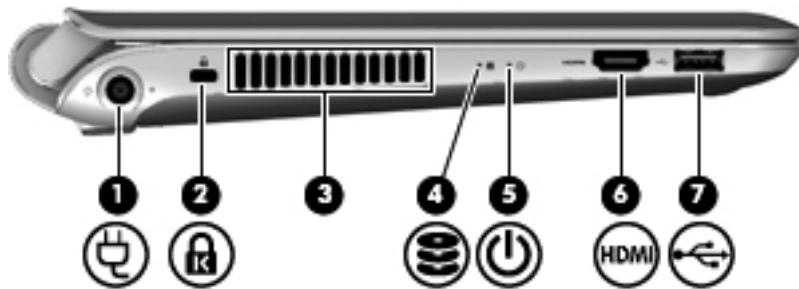
Component	Description
Speakers (2)	Produce sound







Right-side components



Component	Description
(1)  Digital Media Slot	Supports the following optional digital card formats: <ul style="list-style-type: none">• MultiMediaCard (MMC)• Secure Digital (SD) Memory Card
(2)  Audio-out (headphone) jack/Audio-in (microphone) jack	Connects optional powered stereo speakers, headphones, earbuds, a headset, or television audio; also connects an optional headset microphone. WARNING! To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, refer to the Regulatory, Safety and Environmental Notices. NOTE: When a device is connected to the jack, the computer speakers are disabled.
(3)  USB ports (2)	Connect optional USB devices
(4)  External monitor port	Connects an external VGA monitor or projector
(5)  RJ-45 (network) jack	Connects a network cable

Left-side components



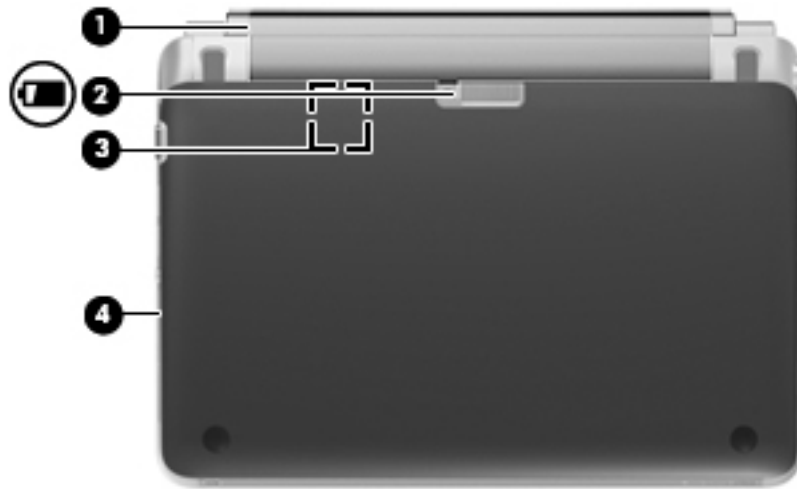
Component	Description
(1)  Power connector	Connects an AC power adapter
(2)  Security cable slot	Attaches an optional security cable to the computer NOTE: The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.
(3) Vent	Enables airflow 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.
(4)  Hard drive light	<ul style="list-style-type: none"> Blinking white: The hard drive is being accessed. Amber: HP ProtectSmart Hard Drive Protection has temporarily parked the hard drive. NOTE: For information on HP ProtectSmart Hard Drive Protection, refer to the HP Notebook Reference Guide.
(5)  Power light	<ul style="list-style-type: none"> Solid white: The computer is on. Blinking white: The computer is in Sleep mode. Off: The computer is off or in Hibernation mode.
(6)  HDMI port	Connects an optional video or audio device, such as a high-definition television, or any compatible digital or audio component
(7)  USB port	Connects an optional USB device


Display components



Component	Description
(1) WWAN antennas (2)* (select models only)	Send and receive wireless signals to communicate with wireless wide-area networks (WWANs)
(2) WLAN antennas (2)*	Send and receive wireless signals to communicate with wireless local area networks (WLANs)
(3) Webcam light	On: The webcam is in use.
(4) Webcam	Captures still photographs and videos To use the webcam, select Start > All Programs > HP > HP MediaSmart > HP MediaSmart Webcam
(5) Internal microphone	Records sound

Bottom components



Component	Description
(1) Battery	Removable battery
(2)  Battery release latch	Releases the battery from the battery bay
(3) SIM card slot	Contains a wireless subscriber identity module (SIM) card. The SIM card slot is located inside of the battery bay.
(4) Service cover	Remove to access the hard drive and memory components

Wireless antennas



Component	Description
(1) WLAN antennas (2)*	Send and receive wireless signals to communicate with wireless local area networks (WLANs)
(2) WWAN antennas (2) (select models only)*	Send and receive wireless signals to communicate with wireless wide-area networks (WWANs)

*The antennas are not visible from the outside of the computer. For optimal transmission, keep the areas immediately around the antennas free from obstructions.

To see wireless regulatory notices, refer to the section of the *Regulatory, Safety and Environmental Notices* that applies to your country or region. These notices are located in Help and Support.

Additional hardware components



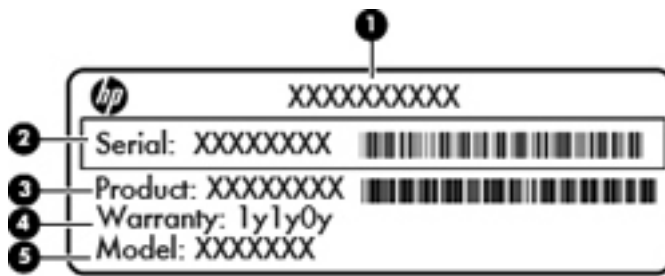
Component	Description
(1) Power cord*	Connects an AC adapter to an AC outlet
(2) AC adapter	Converts AC power to DC power
(3) Battery*	Powers the computer when the computer is not plugged into external power

*Batteries and power cords vary in appearance by country or region.

3 Illustrated parts catalog

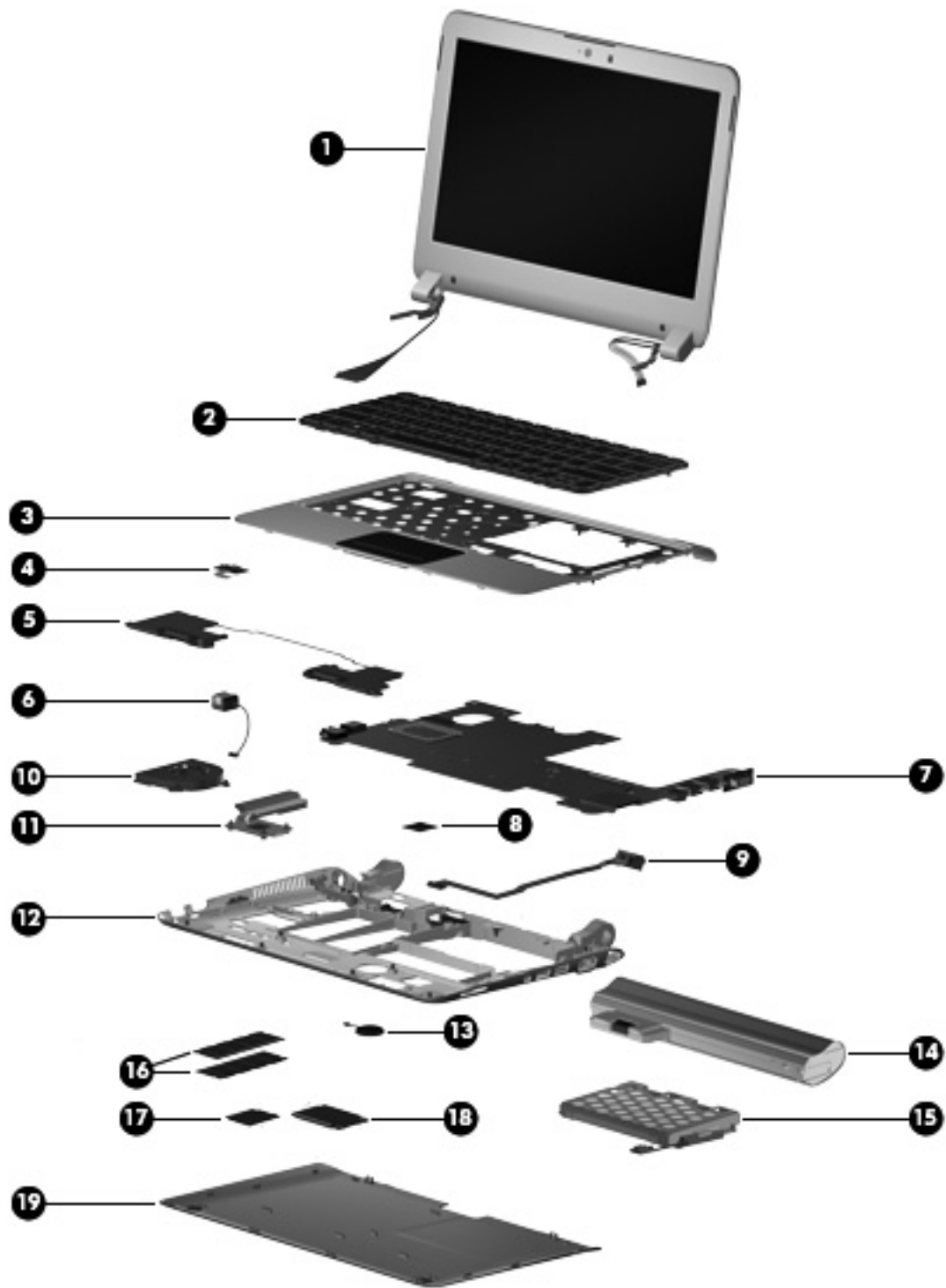
Service tag

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



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

Computer major components

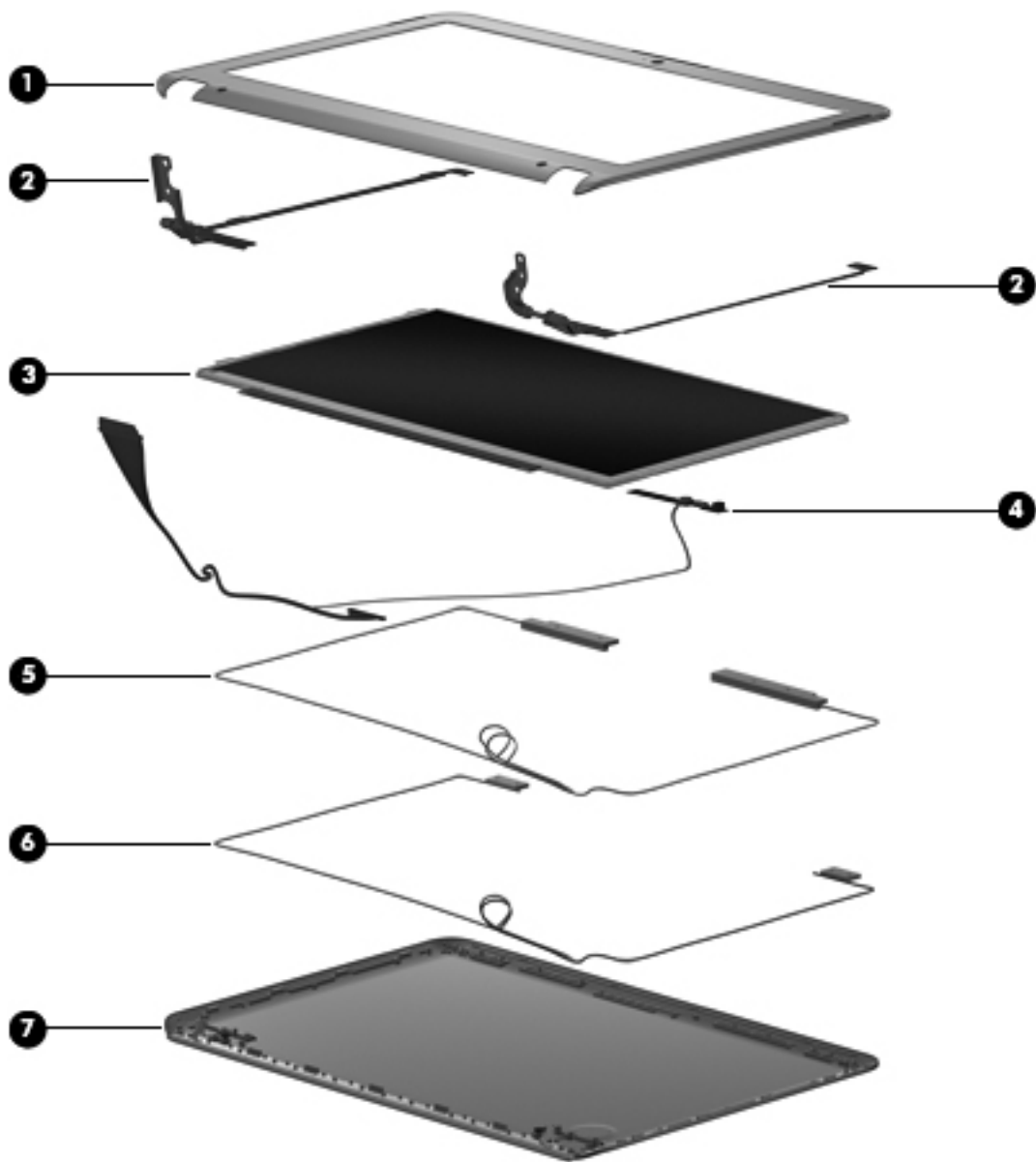


Item	Description	Spare part number
(1)	Display assembly	629775-001

Item	Description	Spare part number
	29.5-cm (11.6-in) (1366 × 768) HD BrightView LED display assembly (includes webcam, microphone, nameplate, and logo)	
	NOTE: See Display assembly subcomponents on page 19 for internal component spare part information.	
(2)	Keyboard (includes keyboard cable):	
	• For use in Belgium	635318-A41
	• For use in Brazil	635318-201
	• For use in the Czech Republic	635318-221
	• For use in France	635318-051
	• For use in French Canada	635318-021
	• For use in Germany	635318-041
	• For use in Greece	635318-041
	• For use in Hungary	635318-211
	• For international use	635318-B31
	• For use in Israel	608583-BB1
	• For use in Italy	635318-061
	• For use in Japan	635318-291
	• For use in Korea	635318-AD1
	• For use in Latin America	635318-161
	• For use in Norway	608583-DH1
	• For use in Portugal	635318-131
	• For use in Russia	635318-251
	• For use in Saudi Arabia	635318-171
	• For use in Spain	635318-071
	• For use in Switzerland	635318-BG1
	• For use in Taiwan	635318-AB1
	• For use in Thailand	635318-281
	• For use in Turkey	635318-141
	• For use in the United Kingdom	635318-031
	• For use in the United States	635318-001
(3)	Top cover (includes TouchPad board and cable)	635316-001
(4)	Power button board	636448-001
(5)	Speaker assembly	635313-001
(6)	Power connector (includes power connector cable and security cable bracket)	636451-001
(7)	System board:	

Item	Description	Spare part number
	<ul style="list-style-type: none"> E350 system board with WWAN 	635314-001
	<ul style="list-style-type: none"> E350 system board 	639297-001
(8)	Webcam	635317-001
(9)	RJ-45 connector (includes cable)	636452-001
(10)	Fan (includes cable)	636453-001
(11)	Heat sink assembly (includes replacement thermal material)	635306-001
(12)	Base enclosure	635303-001
(13)	RTC battery	635310-001
(14)	6-cell, 2.55-Ah (55-Wh) Li-ion battery	628419-001
(15)	Hard drive (includes hard drive bracket):	
	<ul style="list-style-type: none"> 750-GB, 5400-rpm 	634250-001
	<ul style="list-style-type: none"> 640-GB, 5400-rpm 	631160-001
	<ul style="list-style-type: none"> 500-GB, 7200-rpm 	634919-001
	<ul style="list-style-type: none"> 320-GB, 7200-rpm 	627731-001
	<ul style="list-style-type: none"> 250-GB, 7200-rpm 	634861-001
	Hard Drive Mounting Kit (not illustrated; includes mounting bracket and screws)	637177-001
	External optical drive (not illustrated; select models only)	
	<ul style="list-style-type: none"> DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe 	584383-001
	<ul style="list-style-type: none"> Blu-ray R/RE with LightScribe DVD±R/RW SuperMulti Double-Layer Drive 	584384-001
	Solid-state drive, 128-GB	635737-001
(16)	Memory module:	
	<ul style="list-style-type: none"> 1-GB memory module (1333-MHz, DDR3) 	598859-001
	<ul style="list-style-type: none"> 2-GB memory module (1333-MHz, DDR3) 	598856-001
	<ul style="list-style-type: none"> 4-GB memory module (1333-MHz, DDR3) 	599092-001
(17)	WLAN module	
	<ul style="list-style-type: none"> Broadcom 4313 802.11b/g/n 1x1 WiFi and 2070 Bluetooth 2.1+EDR Combo adapter (BT3.0+HS ready) 	600370-001
	<ul style="list-style-type: none"> Ralink RT5390 802.11b/g/n 1x1 WiFi and BC8 Bluetooth 3.0+HS Combo adaptor Rashi2 	630705-001
(18)	WWAN module	
	<ul style="list-style-type: none"> SPS-WWAN UNDP HSPA EVDO Birlion MINICARD 	531993-001
	<ul style="list-style-type: none"> SPS-WWAN VZW LTE HSPA+ EVDO Card Stngr 	634513-001
(19)	Service cover (included in the Plastics Kit, part number 635309-001)	

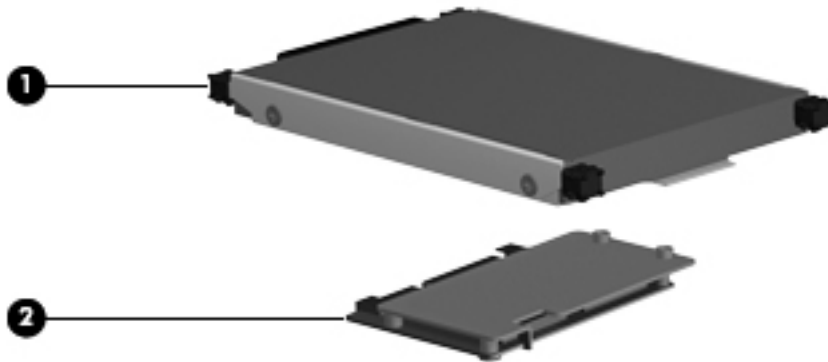
Display assembly subcomponents



Item	Description	Spare part number
(1)	Display bezel	635304-001
(2)	Display panel hinges	635307-001
(3)	29.5-cm (11.6-in) (1366 × 768) HD BrightView LED display panel	629775-001
(4)	Webcam / Display cable	635317-001 / 635305-001
(5)	WWAN antennas (includes cables)	635301-001
(6)	WLAN antennas (includes cables)	

Item	Description	Spare part number
(7)	Display enclosure	635302-001
	Verizon display enclosure	639300-001

Mass storage devices



Item	Description	Spare part number
(1)	Hard drive (includes hard drive bracket):	
	• 750-GB, 7200-rpm	634250-001
	• 640-GB, 5400-rpm	631160-001
	• 500-GB, 7200-rpm	634919-001
	• 320-GB, 7200-rpm	627731-001
	• 250-GB, 7200-rpm	634919-001
	• 250-GB, 7200-rpm (for use with WWAN models only)	634861-001
(2)	Solid-state drive , 128-GB	635737-001
	Hard drive mounting kit (not illustrated; includes mounting bracket and screws)	637177-001
	External optical drive (not illustrated; select models only)	
	• DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe	584383-001
	• Blu-ray R/RE with LightScribe DVD±R/RW SuperMulti Double-Layer Drive	584384-001

Miscellaneous parts

Description	Spare part number
Power button board (includes cable)	636448-001
Speakers (includes cables)	635313-001
65-W AC adapter	609939-001
Power cords, 3-pin, 1.83m	
<ul style="list-style-type: none"> • For use in Argentina 	490371-D01
<ul style="list-style-type: none"> • For use in Australia 	490371-011
<ul style="list-style-type: none"> • For use in Brazil 	490371-202
<ul style="list-style-type: none"> • For use in Denmark 	490371-081
<ul style="list-style-type: none"> • For use in Europe 	490371-021
<ul style="list-style-type: none"> • For use in India 	490371-D61
<ul style="list-style-type: none"> • For use in Israel 	490371-BB1
<ul style="list-style-type: none"> • For use in Italy 	490371-061
<ul style="list-style-type: none"> • For use in Japan 	490371-291
<ul style="list-style-type: none"> • For use in North America 	490371-001
<ul style="list-style-type: none"> • For use in the People's Republic of China 	490371-AA1
<ul style="list-style-type: none"> • For use in South Africa 	490371-AR1
<ul style="list-style-type: none"> • For use in South Korea 	490371-AD1
<ul style="list-style-type: none"> • For use in Switzerland 	490371-111
<ul style="list-style-type: none"> • For use in Taiwan 	490371-AB1
<ul style="list-style-type: none"> • For use in Thailand 	490371-201
<ul style="list-style-type: none"> • For use in the United Kingdom and Singapore 	490371-031
TouchPad button board (includes bracket and cable)	636449-001
WLAN antennas (includes cables)	611252-801
	630706-801
WWAN antennas (includes cables)	606493-801
Plastics Kit (includes service cover)	635309-001
Rubber Kit (includes two rear rubber feet)	635311-001
Screw Kit	635312-001

Sequential part number listing

Spare part number	Description
490371-001	Power cord for use in the United States
490371-011	Power cord for use in Australia
490371-021	Power cord for use in Europe, the Middle East, and Africa
490371-031	Power cord for use in the United Kingdom and Singapore
490371-061	Power cord for use in Italy
490371-081	Power cord for use in Denmark
490371-111	Power cord for use in Switzerland
490371-201	Power cord for use in Thailand
490371-202	Power cord for use in Brazil
490371-291	Power cord for use in Japan
490371-AA1	Power cord for use in the People's Republic of China
490371-AB1	Power cord for use in Taiwan
490371-AD1	Power cord for use in South Korea
490371-AR1	Power cord for use in South Africa
490371-BB1	Power cord for use in Israel
490371-D01	Power cord for use in Argentina
490371-D61	Power cord for use in India
531993-001	WWAN module
584383-001	DVD±RW and CD-RW SuperMulti Double-Layer Drive with LightScribe external USB optical drive
584384-001	Blu-ray ROM DVD±R/RW and CD-RW SuperMulti Double-Layer Drive with LightScribe external USB optical drive
598856-001	2-GB memory module (1333-MHz, DDR3)
598859-001	1-GB memory module (1333-MHz, DDR3)
599092-001	4-GB memory module (1333-MHz, DDR3)
600370-001	Broadcom 4313 802.11b/g/n 1x1 WiFi and 2070 Bluetooth 2.1+EDR Combo adapter (BT3.0+HS ready)
609939-001	65-W RC/V AC adapter
628419-001	6 cell, 2.55 Ah (55-Wh) Li-ion battery
629775-001	29.5-cm (11.6-in) (1366 x 768) HD BrightView LED display panel
630705-001	WLAN module
631160-001	Hard drive, 640-GB, 5400 rpm
634250-001	Hard drive, 750-GB, 5400 rpm
634513-001	WWAN module

634861-001	Hard drive, 250 GB, 7200 rpm
634919-001	Hard drive, 500 GB, 7200 rpm
635301-001	Antennas (includes WLAN and WWAN antennas)
635302-001	Display back cover
635303-001	Base enclosure
635304-001	Display bezel
635305-001	Display cable
635306-001	Heat sink assembly
635307-001	Display hinge kit
635308-001	29.5 cm (11.6-in) (1366 x 768) HD BrightView LED display assembly
635309-001	Plastics kit (includes service cover)
635310-001	RTC battery (includes cable)
635311-001	Rubber kit
635312-001	Screw kit
635313-001	Speaker kit
635314-001	E350 system board with WWAN
635315-001	Thermal pads
635316-001	Top cover
635317-001	WebCam
635318-001	Keyboard for use in the United States
635318-031	Keyboard for use in the United Kingdom
635318-041	Keyboard for use in Germany
635318-051	Keyboard for use in France
635318-061	Keyboard for use in Italy
635318-071	Keyboard for use in Spain
635318-121	Keyboard for use in French Canada
635318-131	Keyboard for use in Portugal
635318-141	Keyboard for use in Turkey
635318-161	Keyboard for use in Latin America
635318-171	Keyboard for use in Saudi Arabia
635318-201	Keyboard for use in Brazil
635318-211	Keyboard for use in Hungary
635318-221	Keyboard for use in the Czech Republic
635318-251	Keyboard for use in Russia
635318-281	Keyboard for use in Thailand

635318-291	Keyboard for use in Japan
635318-A41	Keyboard for use in Belgium
635318-AB1	Keyboard for use in Taiwan
635318-AD1	Keyboard for use in Korea
635318-B31	Keyboard for international use
635318-BB1	Keyboard for use in Israel
635318-BG1	Keyboard for use in Switzerland
635318-DH1	Keyboard for use in Norway
635318-DJ1	Keyboard for use in Greece
635737-001	Solid-state drive, 128-GB
636448-001	Power button board (includes cable)
636449-001	Top cover (includes TouchPad button board and cable)
636450-001	Hinge covers (upper and lower)
636451-001	Power connector (includes power connector cable)
636452-001	RJ-45 connector (includes RJ-45 connector cable)
636453-001	Fan (includes cable)
637177-001	Hard drive mounting kit (includes mounting bracket and screws)
639297-001	E350 system board with WWAN
639299-001	Verizon WLAN/WWAN antennas (includes cables)
639300-001	Display back cover
639301-001	Display bezel
639610-001	Verizon 29.5 cm (11.6-in) (1366 x 768) HD BrightView LED display assembly
641672-001	Hard drive, 320-GB, 7200 rpm
641673-001	Base enclosure

4 Removal and replacement procedures

Preliminary replacement requirements


Tools required

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


- Flat-bladed screwdriver
- Phillips P0 screwdriver
- Phillips P1 screwdriver

Service considerations


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

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

Plastic parts


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

Cables and connectors

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

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

Drive handling

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

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

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

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

Avoid dropping drives from any height onto any surface.

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

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

Avoid exposing a drive to temperature extremes or liquids.

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

Grounding guidelines

Electrostatic discharge damage

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

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

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

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

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

Use non-magnetic tools.

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

Avoid touching pins, leads, and circuitry. Handle electronic components as infrequently 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 that are generated by different activities.

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

Typical electrostatic voltage levels

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

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

- To avoid hand contact, transport products in static-safe tubes, bags, or boxes.
- Protect ESD-sensitive parts and assemblies with conductive or approved containers or packaging.
- Keep ESD-sensitive parts in their containers until the parts arrive at static-free workstations.
- Place items on a grounded surface before removing items from their containers.
- Always be properly grounded when touching a component or assembly.
- Store reusable ESD-sensitive parts from assemblies in protective packaging or non-conductive foam.
- Use transporters and conveyors made of anti-static belts and roller bushings. Be sure that mechanized equipment that is used for moving materials is wired to ground and that proper materials are selected to avoid static charging. When grounding is not possible, use an ionizer to dissipate electric charges.

Workstation guidelines

Follow these grounding workstation guidelines:

- Cover the workstation with approved static-shielding material.
- Use a wrist strap connected to a properly grounded work surface and use properly grounded tools and equipment.
- Use conductive field service tools, such as cutters, screwdrivers, and vacuums.
- When fixtures must directly contact dissipative surfaces, use fixtures made only of static-safe materials.
- Keep the work area free of non-conductive materials, such as ordinary plastic assembly aids and Styrofoam.
- Handle ESD-sensitive components, parts, and assemblies by the case or PCM laminate. Handle these items only at static-free workstations.
- Avoid contact with pins, leads, or circuitry.
- Turn off power and input signals before inserting or removing connectors or test equipment.

Equipment guidelines

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

- When seated, wear a wrist strap connected to a grounded system. Wrist straps are flexible straps with a minimum of one megohm $\pm 10\%$ resistance in the ground cords. To provide proper ground, wear a strap snugly against the skin at all times. On grounded mats with banana-plug connectors, use alligator clips to connect a wrist strap.
- When standing, use foot straps and a grounded floor mat. Foot straps (heel, toe, or boot straps) can be used at standing workstations and are compatible with most types of shoes or boots. On conductive floors or dissipative floor mats, use foot straps on both feet with a minimum of one megohm resistance between the operator and ground. To be effective, the conductive strips must be worn in contact with the skin.

The following grounding equipment is recommended to prevent electrostatic damage:

- Antistatic 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 that is provided by antistatic bags and floor mats.

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

Component replacement procedures

This chapter provides removal and replacement procedures.

Service tag

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

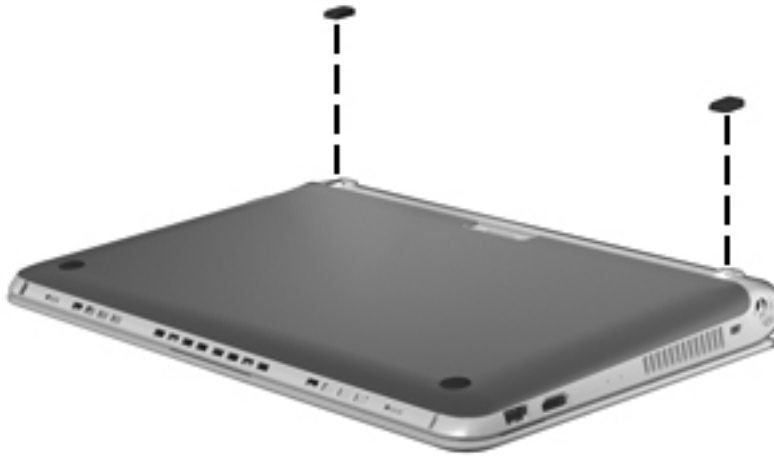


- (1) Product name: This is the product name that is affixed to the front of the computer.
- (2) Serial number (s/n): This is an alphanumeric identifier that is unique to each product.
- (3) Part number/Product number (p/n): This number provides specific information about the product's hardware components.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

Computer feet

The computer feet are adhesive-backed rubber pads that are attached to the base enclosure.

Description	Spare part number
Rubber Kit (includes computer feet – two rear)	635311-001



Battery

Description	Spare part number
6-cell, 2.55-Ah (55-Wh) Li-ion battery	628419-001

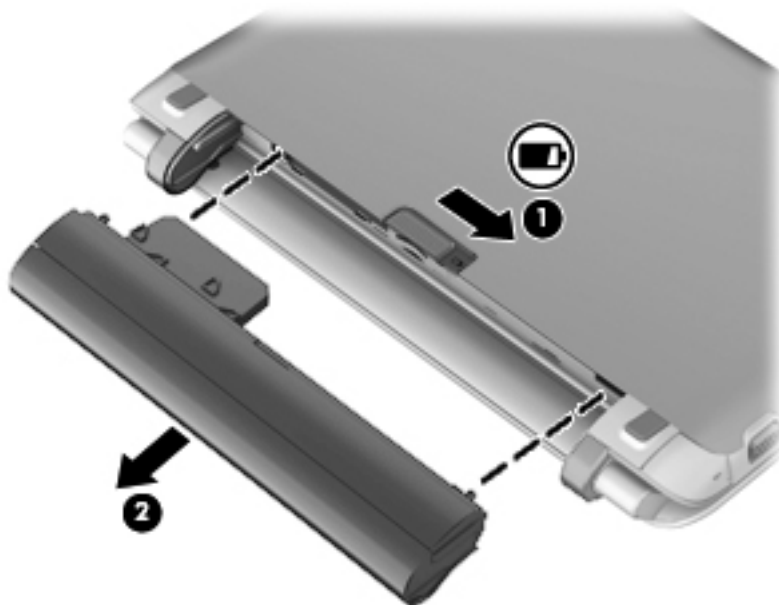
Before removing the battery, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation mode, turn on the computer, and then shut it down using the operating system.
2. Disconnect all of the external devices that are connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.

Remove the battery:

To remove the battery, follow these steps:


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.



Reverse this procedure to install the battery.

⚠ CAUTION: Removing a battery that is the sole power source for the computer can cause loss of information. To prevent loss of information, save your work and initiate Hibernation mode or shut down the computer using the operating system before removing the battery.

SIM Card

 **NOTE:** The SIM card is provided by the end user as a security measure for the WWAN module. The SIM card should be removed, placed into a static-dissipative container, and then replaced when the computer is reassembled.

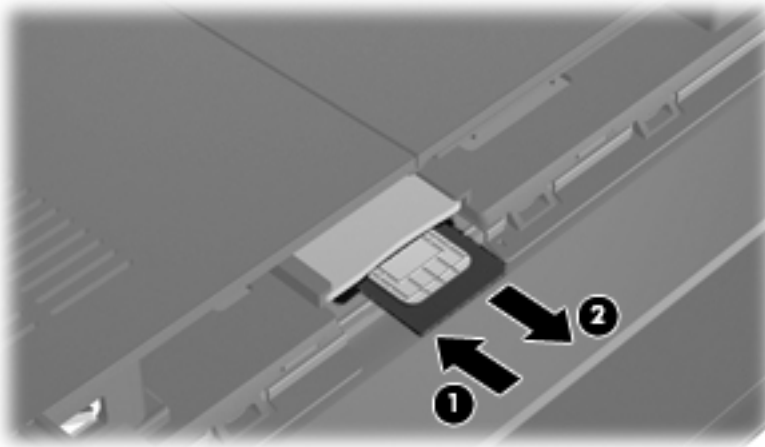
Before removing the SIM card, follow these steps:

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

Removing the SIM card:


To remove the SIM card, follow these steps:

1. Position the computer upside down on a flat surface, with the battery bay toward you.
2. Press in on the SIM card **(1)** to release it from the SIM card slot.
3. Remove the SIM card **(2)** from the computer.



Reverse this procedure to install the SIM card.

Hard drive / Solid state drive

 **NOTE:** The hard drive spare part kit and solid-state drive spare part kit include a bracket.

Description	Spare part number
Hard drive (includes hard drive bracket):	
<ul style="list-style-type: none">• 750-GB, 7200-rpm	634250-001
<ul style="list-style-type: none">• 640-GB, 5400-rpm	631160-001

Description	Spare part number
<ul style="list-style-type: none"> 500-GB, 7200-rpm 	634919-001
<ul style="list-style-type: none"> 250-GB, 7200-rpm 	634861-001
Hard Drive Mounting Kit (includes mounting bracket and screws)	637177-001
Solid state drive , 128-GB	635313-001

Before removing the hard drive or solid state drive, follow these steps:

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

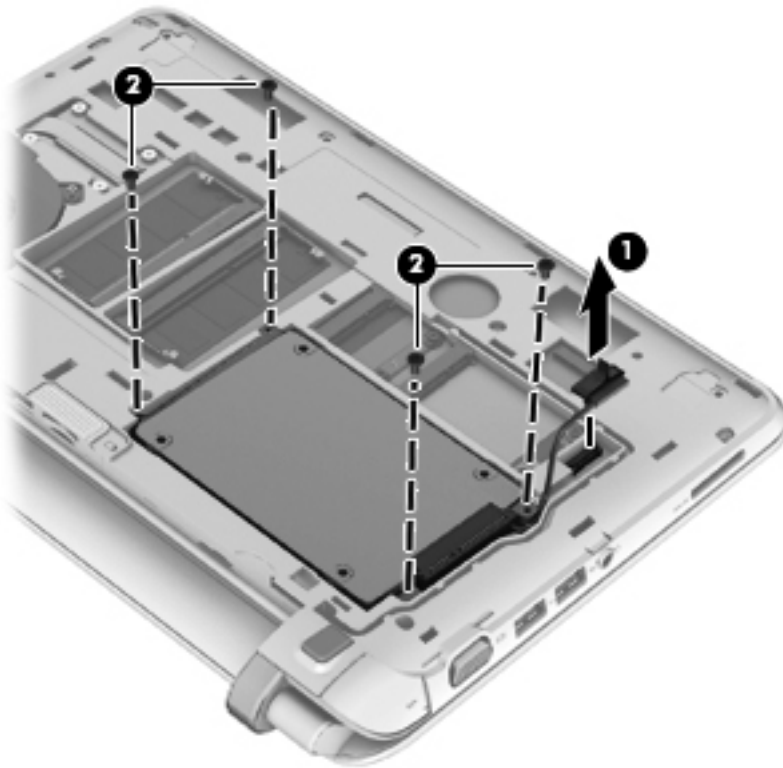
Remove the hard drive or solid state drive:

To remove the hard drive or solid state drive, follow these steps:

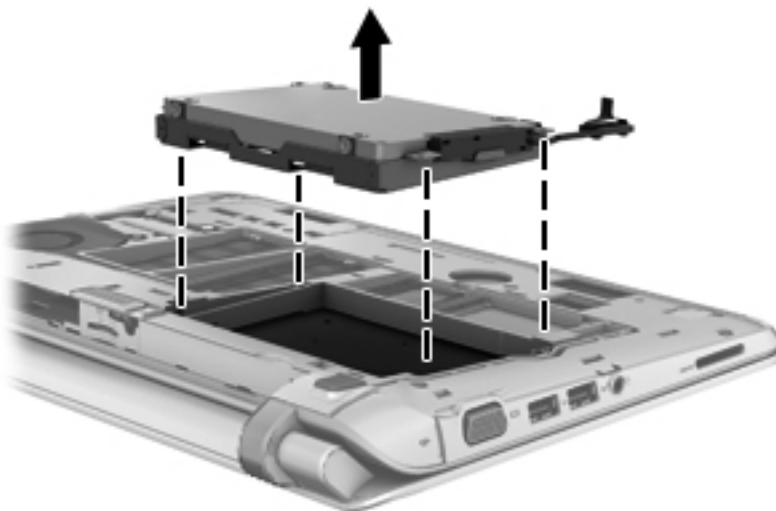
1. Save your work and shut down the computer.
2. Disconnect all of the external devices that are connected to the computer.
3. Unplug the power cord from the AC outlet, if necessary.
4. Turn the computer upside down on a flat surface and remove the battery.
5. Lift up at the two indentations **(1)** to remove the service cover **(2)**.



6. Disconnect the hard drive/solid state drive connector from the system board (1), and then remove the four screws (2) that secure the hard drive/solid state drive to the base enclosure.

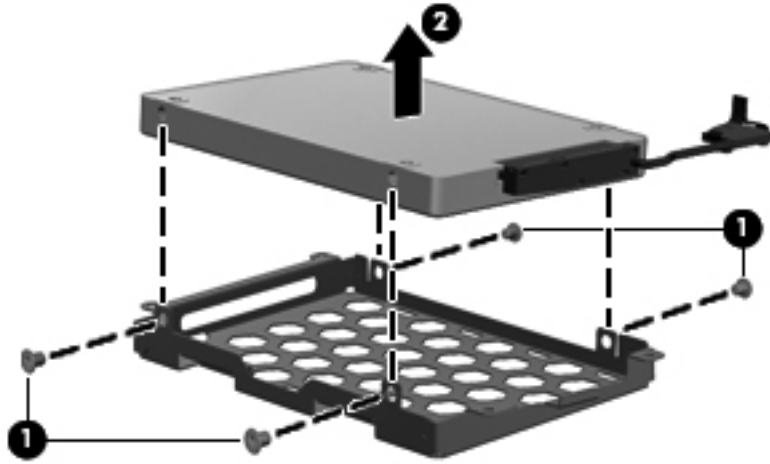


7. Lift the hard drive/solid state drive out of the hard drive/solid state drive bay.



8. If it is necessary to replace the hard drive/solid state drive bracket or connector, follow these steps:
 - a. Remove the 4 screws (1) that secure the hard drive/solid state drive bracket to the hard drive/solid state drive.

- b. Lift the hard drive/solid state drive (3) straight up to remove it from the hard drive/solid state drive bracket.



Reverse this procedure to install the hard drive/solid state drive.


WWAN module

Description	Spare part number
WWAN module	531993-001

Before removing the WWAN module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation mode, turn on the computer, and then shut it down using the operating system.
2. Disconnect all of the external devices that are connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 32](#)).
5. Remove the service cover (see [Hard drive / Solid state drive on page 33](#)).

Remove the WWAN module:

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

To remove the WWAN module, follow these steps:


1. Position the computer upside down on a flat surface, with the front toward you.
2. Disconnect the WWAN antenna cables **(1)** from the terminals on the WWAN module.

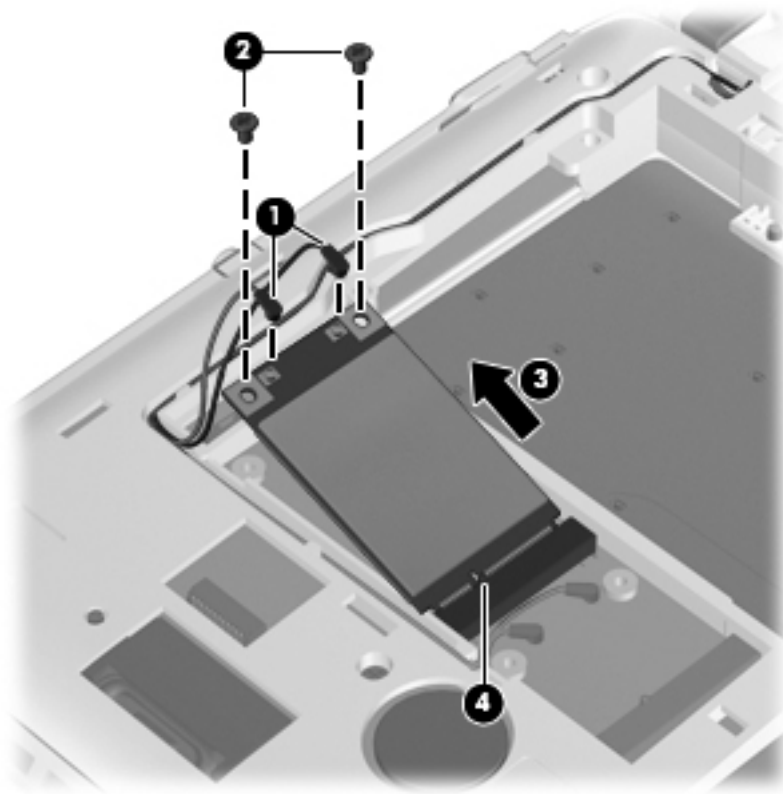


NOTE: The red WWAN antenna cable is connected to the WWAN module “Main” terminal. The blue WWAN antenna cable is connected to the WWAN module “Aux” terminal.

3. Remove the 2 screws **(2)** that secure the WWAN module to the system board. (The WWAN module tilts up.)

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

 **NOTE:** WWAN modules are designed with a notch (4) to prevent incorrect insertion of the WWAN module into the WWAN module slot.



Reverse this procedure to install the WWAN module.


WLAN module

Description	Spare part number
WLAN module:	
Broadcom 4313 802.11b/g/n 1x1 WiFi and 2070 Bluetooth 2.1+EDR Combo adapter (BT3.0+HS ready)	600370-001
Ralink RT3090BC4 802.11b/g/n 1x1 WiFi and Bluetooth 2.1+EDR Combo adapter (BT3.0+HS ready)	630705-001

Before removing the WLAN module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation mode, turn on the computer, and then shut it down using the operating system.
2. Disconnect all of the external devices that are connected to the computer.
3. Disconnect power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 32](#)).
5. Remove the service cover (see [Hard drive / Solid state drive on page 33](#)).

Remove the WLAN module:

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

To remove the WLAN module, follow these steps:


1. Position the computer upside down on a flat surface, with the front toward you.
2. Disconnect the WLAN antenna cables **(1)** from the terminals on the WLAN module.

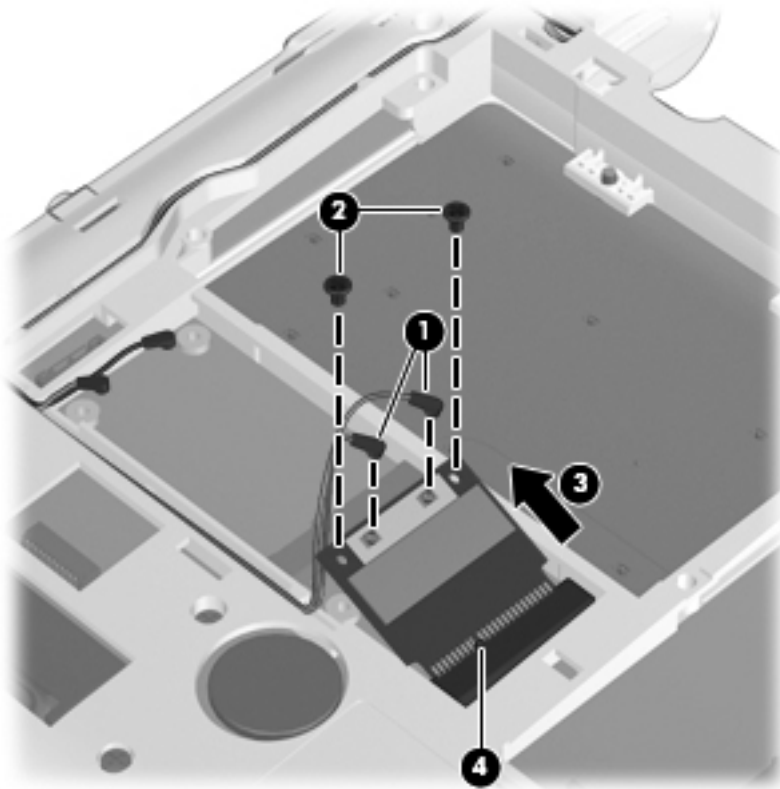


NOTE: The black WLAN antenna cable is connected to the WLAN module “Main” terminal. The gray WLAN antenna cable is connected to the WLAN module “Aux” terminal.

3. Remove the two screws **(2)** that secure the WLAN module to the system board. (The WLAN module tilts up.)

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

 **NOTE:** WLAN modules are designed with a notch (4) to prevent incorrect insertion of the WLAN module into the WLAN module slot.



Reverse this procedure to install the WLAN module.


Memory modules

Description	Spare part number
1-GB memory module (1333-MHz, DDR3)	598859-001
2-GB memory module (1333-MHz, DDR3)	598856-001
4-GB memory module (1333-MHz, DDR3)	599092-001

Before removing the memory module, follow these steps:


1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation mode, turn on the computer, and then shut it down using the operating system.
2. Disconnect all of the external devices that are connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 32](#)).
5. Remove the service cover (see [Hard drive / Solid state drive on page 33](#)).

Remove the memory module:


 **NOTE:** 1024-MB primary memory is included on the system board. Memory is both customer-accessible and upgradable. It is located in the accessory compartment.

To remove the memory module, follow these steps:

1. Save your work and shut down the computer.
2. Disconnect all of the external devices that are connected to the computer.

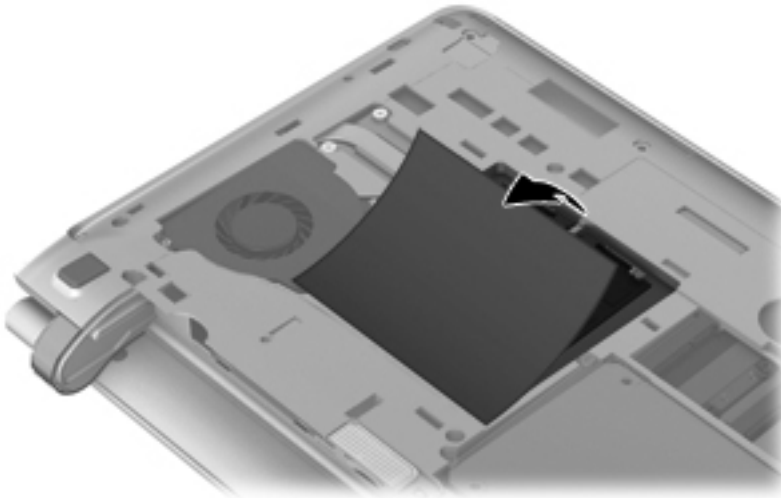
 **CAUTION:** To prevent damage to the memory module, hold it by the edges only. Do not touch the components on the memory module.

3. Unplug the power cord from the AC outlet.

 **NOTE:** Memory modules are designed with a notch **(3)** to prevent incorrect insertion into the memory module slot.

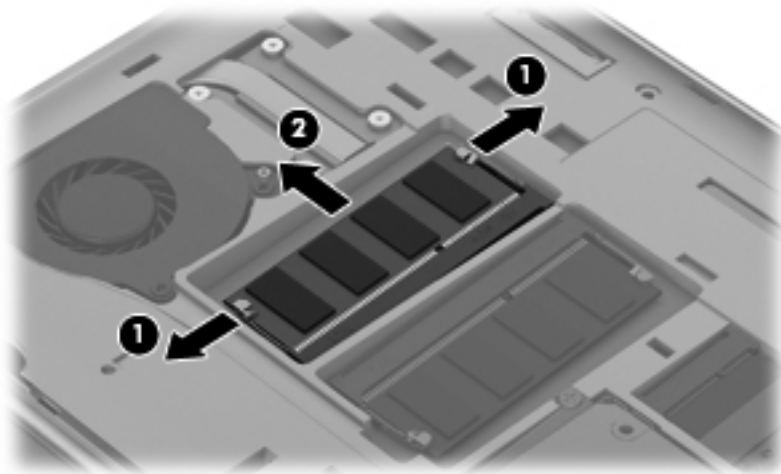
4. Turn the computer upside down on a flat surface and remove the battery.

5. Lift up the regulatory label to access the memory modules.



6. If you are replacing a memory module, remove the existing memory module:
 - a. Pull away the retention clips (1) on each side of the memory module.
The memory module tilts up.
 - b. Grasp the edge of the memory module (2), and then gently pull the memory module out of the memory module slot.

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



To protect a memory module after removal, place it in an electrostatic-safe container.
Reverse this procedure to install a memory module.

Keyboard



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

Description	Spare part number
For use in Belgium	635318-A41
For use in Brazil	635318-201
For use in the Czech Republic	635318-221
For use in France	635318-051
For use in French Canada	635318-121
For use in Germany	635318-041
For use in Greece	608583-DJ1
For use in Hungary	635318-211
For use in Israel	608583-BB1
For use in Italy	635318-061
For use in Japan	635318-291
For use in Korea	635318-AD1
For use in Latin America	6355318-161
For use in Norway	635318-DH1
For use in Portugal	635318-131
For use in Russia	635318-251
For use in Saudi Arabia	635318-171
For use in Spain	635318-071
For use in Switzerland	635318-BG1
For use in Taiwan	635318-AB1
For use in Thailand	635318-281
For use in Turkey	635318-141
For use in the United Kingdom	635318-031
For use in the United States	635318-001

Before removing the keyboard, follow these steps:

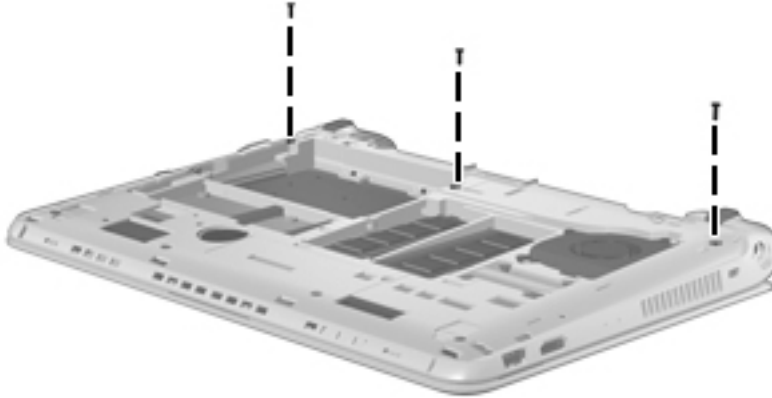
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation mode, turn on the computer, and then shut it down using the operating system.
2. Disconnect all of the external devices that are connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.

4. Remove the battery (see [Battery on page 32](#)).
5. Remove the service cover (see [Hard drive / Solid state drive on page 33](#)).
6. Remove the hard drive (see [Hard drive / Solid state drive on page 33](#)).

Removing the keyboard:

To remove the keyboard, follow these steps:

1. Position the computer upside down on a flat surface, with the rear toward you.
2. Remove the 3 screws that secure the keyboard to the computer.



3. Position the computer display-side up, with the front toward you.
4. Open the computer as far as possible.
5. Use a flat-bladed screwdriver to pry the rear edge of the keyboard **(1)** loose from the three retaining tabs.
6. Lift the keyboard **(2)** and turn it upside down, resting it on the top cover.



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



8. Remove the keyboard.

Reverse this procedure to install the keyboard.

Top cover

Description	Spare part number
Top cover	635316-001

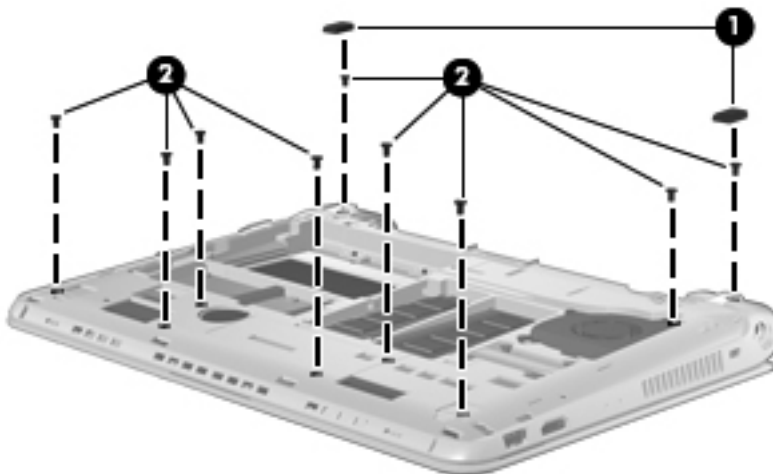
Before removing the top cover, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation mode, turn on the computer, and then shut it down using the operating system.
2. Disconnect all of the external devices that are connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 32](#)).
5. Remove the service cover [Hard drive / Solid state drive on page 33](#).
6. Remove the hard drive (see [Hard drive / Solid state drive on page 33](#)).
7. Remove the keyboard (see [Keyboard on page 43](#)).

Remove the top cover:

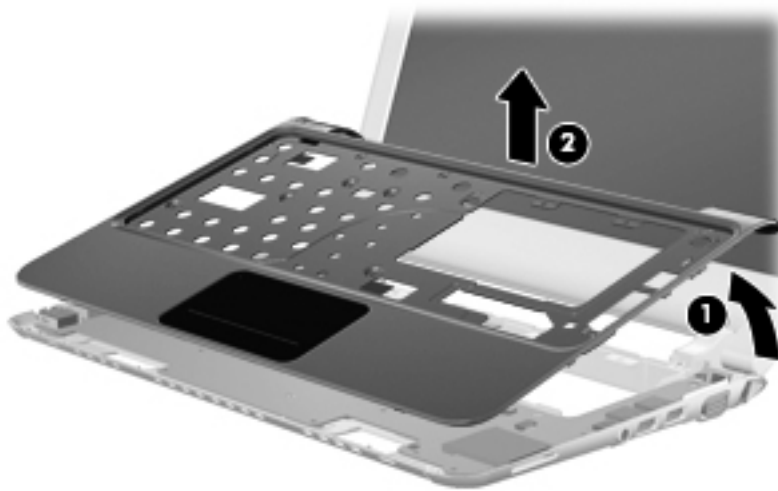
To remove the top cover, follow these steps:

1. Position the computer upside down on a flat surface, with the front toward you.
2. Use a thin, flat tool to release the 2 rubber feet, and then remove the two screws that are located under the rubber feet (**1**).
3. Remove the remaining 8 screws that secure the keyboard to the computer.



4. Position the computer right-side up, with the front toward you and the display open as far as possible.
5. Lift the rear edge (**1**) of the top cover until it detaches from the base enclosure.

6. Remove the top cover (2) by lifting it straight up.



Reverse this procedure to install the top cover.

Power button board

Description	Spare part number
Power button board (includes cable)	636448-001

Before removing the power button board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation mode, turn on the computer, and then shut it down using the operating system.
2. Disconnect all of the external devices that are connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 32](#)).
5. Remove the service cover (see [Hard drive / Solid state drive on page 33](#)).
6. Remove the keyboard (see [Keyboard on page 43](#)).
7. Remove the top cover (see [Top cover on page 46](#)).

Before removing the power button board, follow these steps:

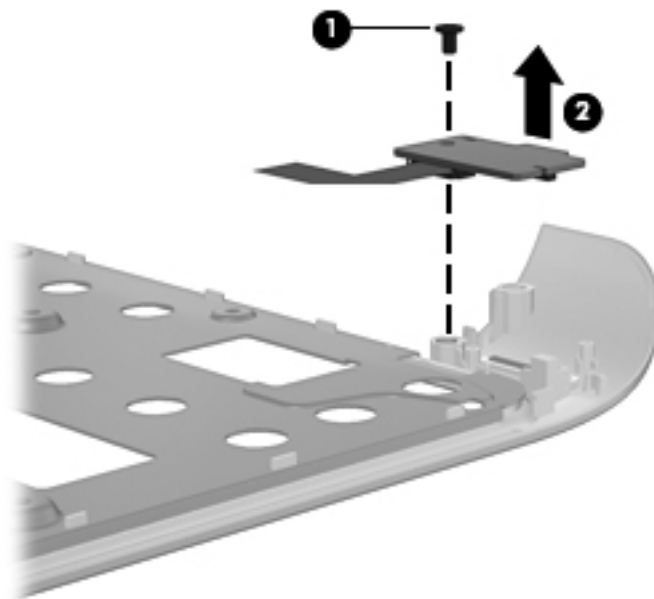
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation mode, turn on the computer, and then shut it down using the operating system.
2. Disconnect all of the external devices that are connected to the computer.
3. Disconnect the power from the computer by first unplugging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

5. Remove the service cover (see [WLAN module on page 39](#)).
6. Remove the hard drive (see [Hard drive / Solid state drive on page 33](#)).
7. Remove the keyboard (see [Keyboard on page 43](#)).
8. Remove the top cover (see [Top cover on page 46](#)).

Remove the power button board:

To remove the power button board, follow these steps:

1. Position the top cover upside down, with the front toward you.
2. Remove the screw (1) that secures the power button board to the top cover.
3. Lift up and remove the power button board (2).



Reverse this procedure to install the power button board.


TouchPad button board

Description	Spare part number
TouchPad button board (includes bracket and cable)	636449-001

Before removing the TouchPad button board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.

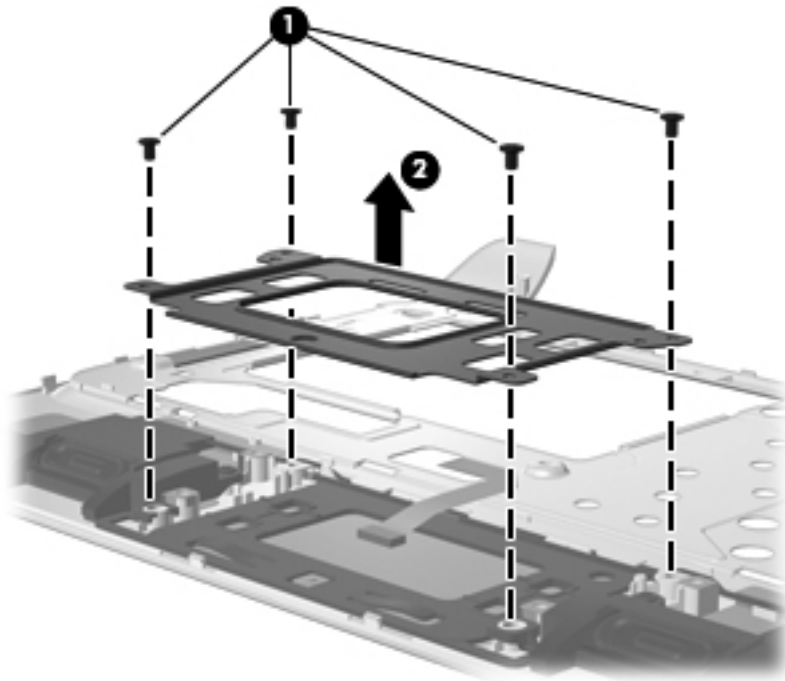
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 32](#)).
5. Remove the service cover (see [WLAN module on page 39](#)).
6. Remove the hard drive (see [Hard drive / Solid state drive on page 33](#)).
7. Remove the keyboard (see [Keyboard on page 43](#)).
8. Remove the top cover (see [Top cover on page 46](#)).

 **NOTE:** Before removing the TouchPad, it is necessary to remove the TouchPad button board bracket.

Remove the TouchPad button board bracket:

To remove the TouchPad button board bracket, follow these steps:

1. Position the top cover upside down, with the front toward you.
2. Remove the four screws that secure the TouchPad button board bracket to the top cover **(1)**.
3. Lift up and remove the TouchPad button board bracket **(2)**.

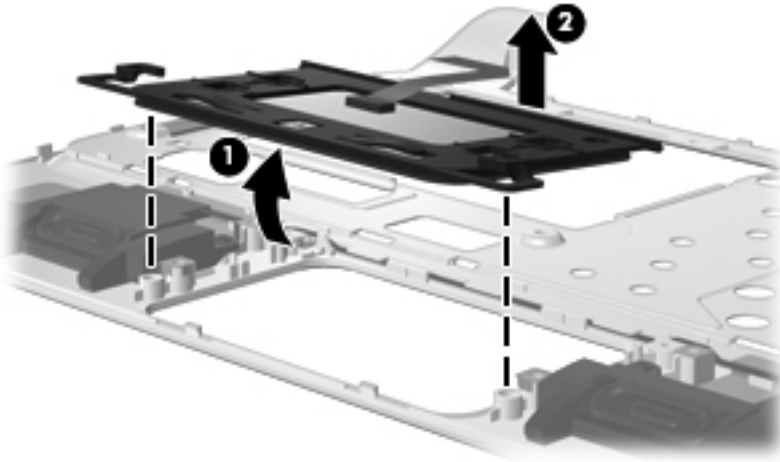


Reverse this procedure to install the TouchPad button board bracket.

Remove the TouchPad button board:

To remove the TouchPad button board, follow these steps:

1. Remove the 2 screws that secure the TouchPad button board to the top cover **(1)**.
2. Lift up and remove the TouchPad button board **(2)**.



Reverse this procedure to install the TouchPad button board.

Speaker assembly

Description	Spare part number
Speakers (include cables)	635313-001

Before removing the speaker assembly, follow these steps:

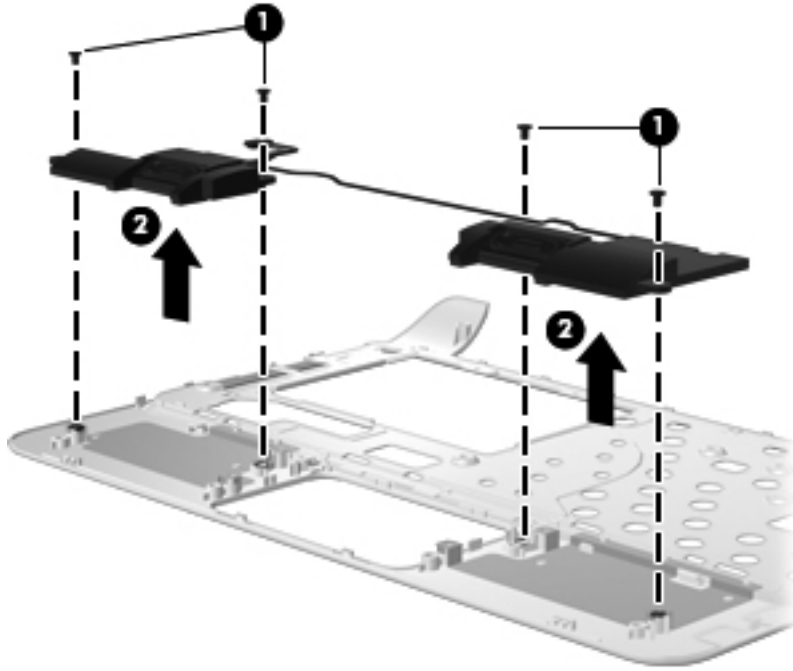
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation mode, turn on the computer, and then shut it down using the operating system.
2. Disconnect all of the external devices that are connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 32](#)).
5. Remove the service cover (see [Hard drive / Solid state drive on page 33](#)).
6. Remove the hard drive (see [Hard drive / Solid state drive on page 33](#)).
7. Remove the keyboard (see [Keyboard on page 43](#)).
8. Remove the top cover (see [Top cover on page 46](#)).

Remove the speaker assembly:

To remove the speaker assembly, follow these steps:

1. Position the top cover upside down with the front toward you.
2. Remove the 2 screws that secure the speaker assembly to the top cover (1).

3. Lift up and remove the speaker assembly(2).



Reverse this procedure to install the speaker assembly.

Display assembly

Description	Spare part number
29.5-cm (11.6-in) (1366 × 768) HD BrightView LED display assembly (includes webcam, microphone, nameplate, and logo)	635308-001
Verizon 29.5-cm (11.6-in) (1366 × 768) HD BrightView LED display assembly (includes webcam, microphone, nameplate, and logo)	639610-001

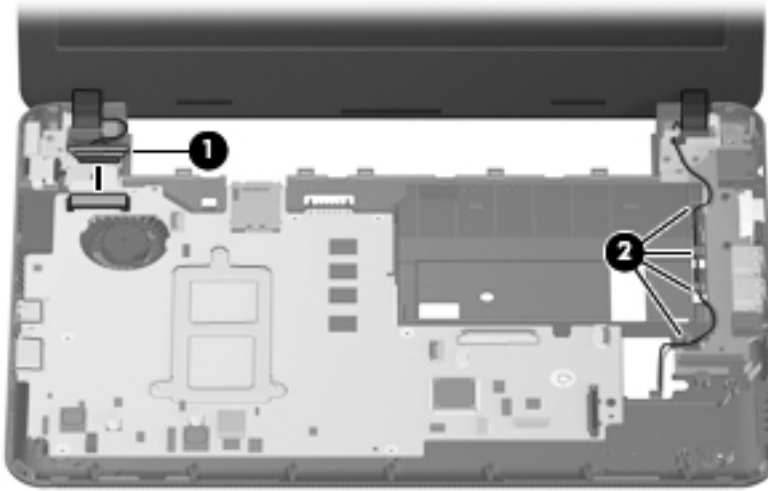
Before removing the display assembly, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation mode, turn on the computer, and then shut it down using the operating system.
2. Disconnect all of the external devices that are connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 32](#)).
5. Remove the service cover (see [Hard drive / Solid state drive on page 33](#)).
6. Remove the hard drive (see [Hard drive / Solid state drive on page 33](#)).
7. Disconnect the wireless antenna cables from the WLAN module (see [WLAN module on page 39](#)) and WWAN module (see [WWAN module on page 37](#)).
8. Remove the keyboard (see [Keyboard on page 43](#)).
9. Remove the top cover (see [Top cover on page 46](#)).

Remove the display assembly:

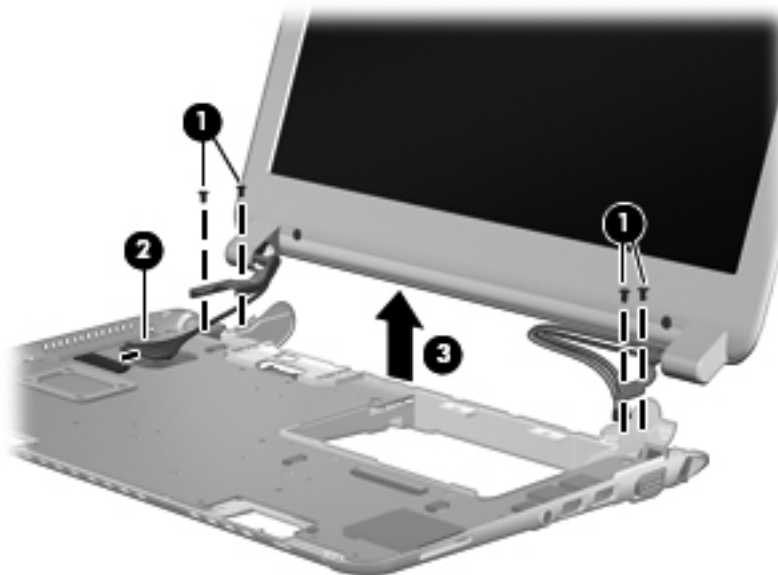
1. Position the computer display-side up, with the front toward you.
2. Open the computer as far as possible.
3. Disconnect the display panel cable **(1)** from the system board.

4. Remove the wireless antenna cables from the clips **(2)** and routing channel built into the base enclosure.



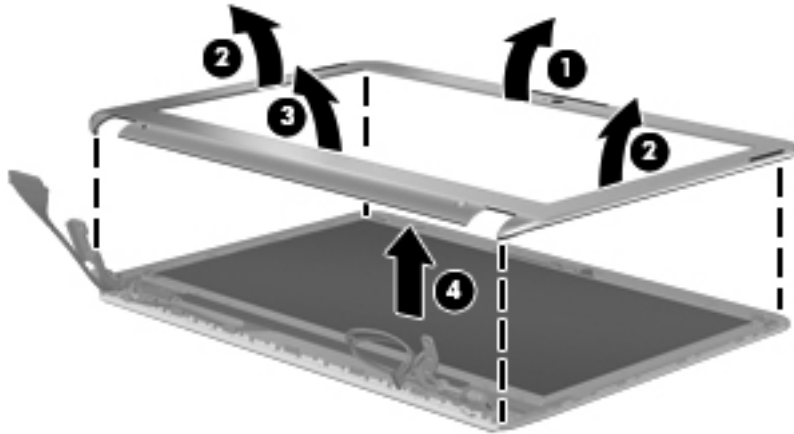
⚠ CAUTION: Support the display assembly when removing the following screws. Failure to support the display assembly can result in damage to the display assembly and other computer components.

5. Remove the 4 screws **(1)** that secure the display assembly to the base enclosure.
6. Slide the display panel cable **(2)** back toward the display assembly while lifting the display assembly **(3)** straight up to remove it.
7. Lift the display assembly **(3)** straight up and remove it.



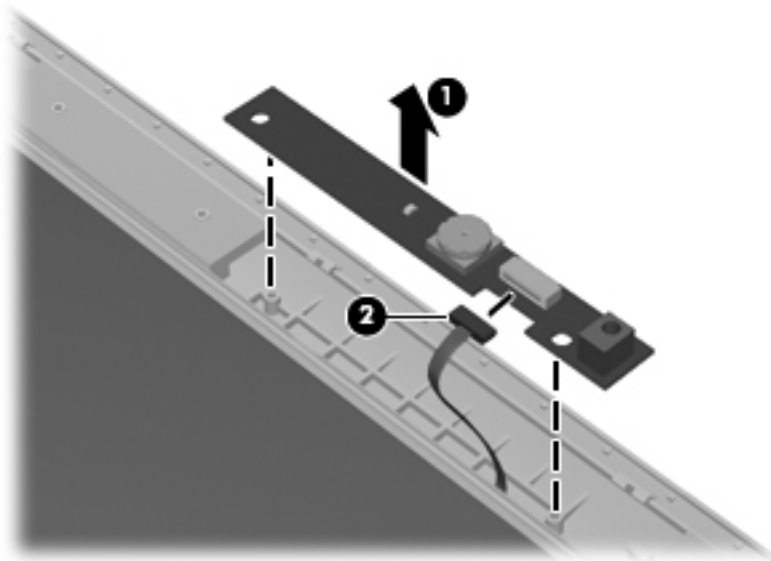
8. If it is necessary to replace the display bezel or any of the display assembly internal components:
 - a. Flex the inside edges of the top edge **(1)**, the left and right sides **(2)**, and the bottom edge **(3)** of the display bezel until the bezel disengages from the display enclosure.

- b. Lift up and remove the display bezel (4).



Reverse this procedure to install the display bezel.

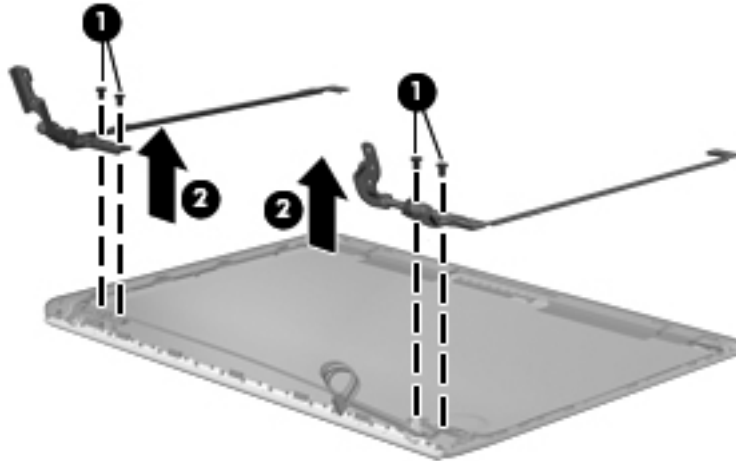
- 9. If it is necessary to replace the webcam module:
 - a. Lift the webcam module straight up (1) to release the adhesive material from the display enclosure.
 - b. Disconnect the webcam cable (2) from the webcam module.



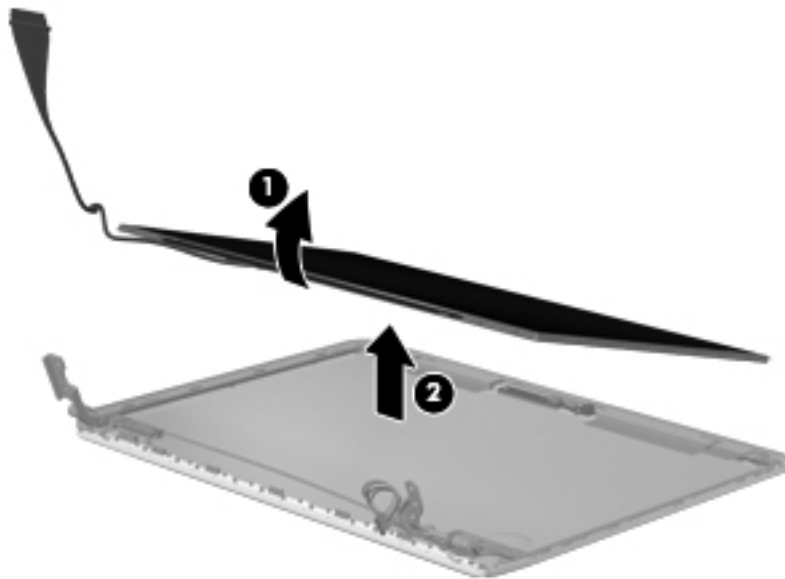
Reverse this procedure to install the webcam module.

- 10. If it is necessary to replace the display panel:
 - a. Remove the 4 screws (1) that secure the display hinge brackets to the display panel.

- b. Lift up and remove the display hinge brackets (2) from the display panel.



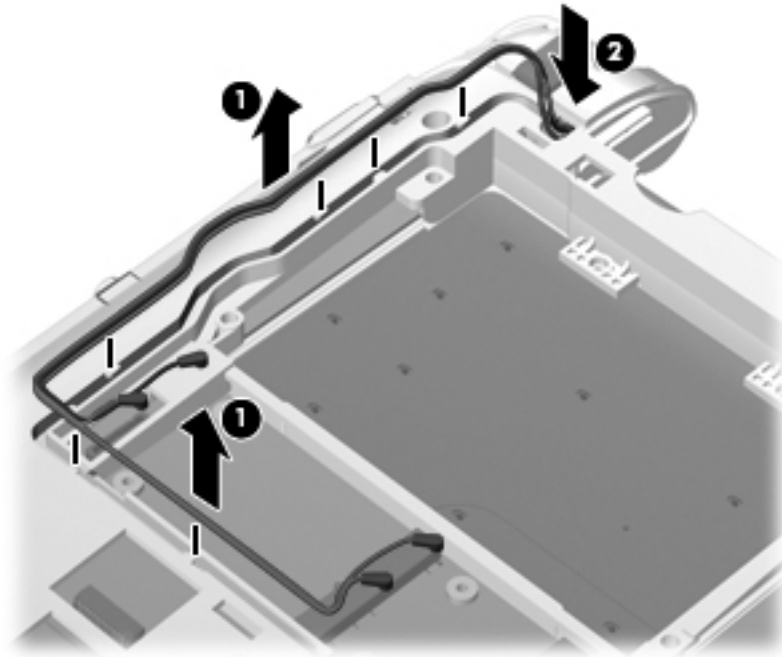
- c. Lift the display panel up at a 45-degree angle (1), and then lift straight up (2) to remove it.
d. Remove the display panel (2).



Reverse this procedure to install the display panel.

11. If it is necessary to replace the wireless antenna transceivers and cables:
- a. Release the wireless antenna cables (1) from the clips and routing channels built into the base enclosure.

- b. Slide the antenna cables through the hole near the display assembly (2).



Reverse this procedure to reassemble and install the display assembly.

System board

Description	Spare part number
System board:	
<ul style="list-style-type: none">E350 system board with WWAN	635314-001
<ul style="list-style-type: none">E350 system board	639297-001

Before removing the system board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation mode, turn on the computer, and then shut it down using the operating system.
2. Disconnect all of the external devices that are connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 32](#)).
5. Remove the following components:
 - a. Service cover (see [Hard drive / Solid state drive on page 33](#)).
 - b. Hard drive (see [Hard drive / Solid state drive on page 33](#)).
 - c. Keyboard (see [Keyboard on page 43](#)).
 - d. Top cover (see [Top cover on page 46](#)).
 - e. Display assembly (see [Display assembly on page 52](#)).

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:

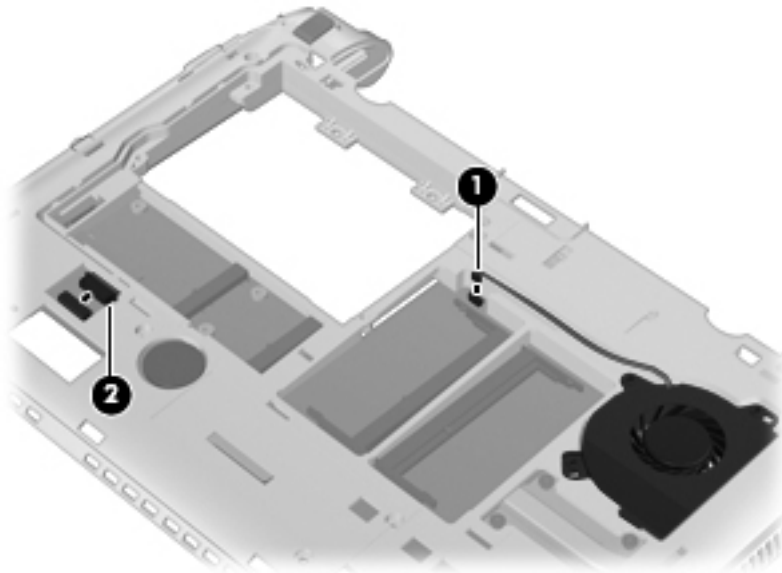
- RTC battery (see [RTC battery on page 59](#)).
- Heat sink (see [Heat sink assembly on page 60](#)).

Remove the system board:

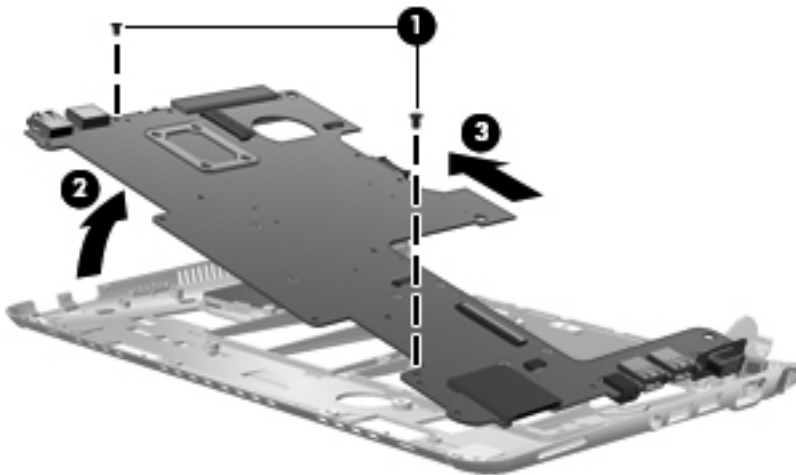
To remove the system board, follow these steps:

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

2. Disconnect the RJ-45 cable (2) from the system board.



3. Remove the 2 screws (1) that secure the system board to the base enclosure.
4. Lift the left side of the system board (2) until it rests at an angle.
5. Remove the system board (3) by sliding it away from the base enclosure at a 45-degree angle.



Reverse the procedure to install the system board.

RTC battery

Description	Spare part number
RTC battery	635310-001

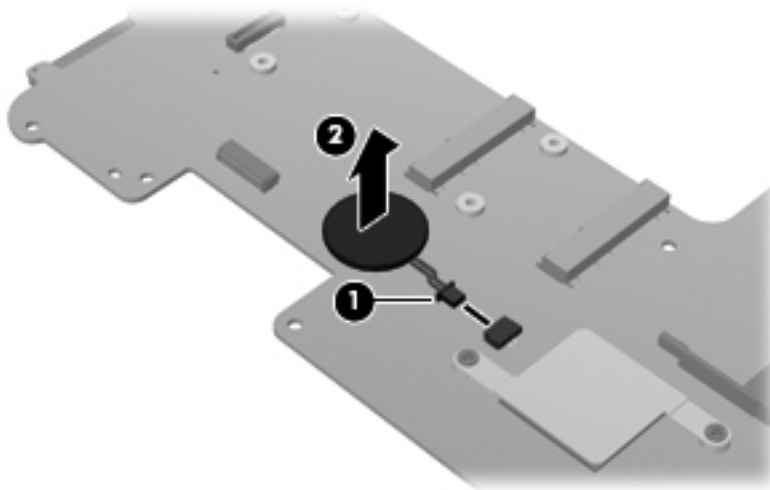
Before removing the real-time clock (RTC) battery, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation mode, turn on the, and then shut it down using the operating system.
2. Disconnect all of the external devices that are connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 32](#)).
5. Remove the service cover (see [Hard drive / Solid state drive on page 33](#)).

Remove the RTC battery:


To remove the RTC battery, follow these steps:

1. Position the computer upside down on a flat surface, with the front toward you.
2. Disconnect the RTC battery cable **(1)** from the system board.
3. Lift the RTC battery up to remove it **(2)** from the system board.



Reverse this procedure to install the RTC battery.

Heat sink assembly

 **NOTE:** To properly ventilate the computer, allow at least **7.6 cm** (3 in) of clearance on the left side of the computer. The computer uses an electric fan for ventilation. The fan is controlled by a temperature sensor and is designed to turn on automatically when high temperature conditions exist. These conditions are affected by high external temperatures, system power consumption, power management/battery conservation configurations, battery fast charging, and software requirements. Exhaust air is displaced through the ventilation grill located on the left side of the computer.

Description	Spare part number
Heat sink assembly (includes replacement thermal material)	608629-001


Before removing the heat sink assembly, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 32](#)).
5. Remove the following components:
 - a. Service cover (see [Hard drive / Solid state drive on page 33](#)).
 - b. Hard drive (see [Hard drive / Solid state drive on page 33](#)).
 - c. Keyboard (see [Keyboard on page 43](#)).
 - d. Top cover (see [Top cover on page 46](#)).
 - e. Display assembly (see [Display assembly on page 52](#)).
 - f. System board (see [System board on page 57](#)).

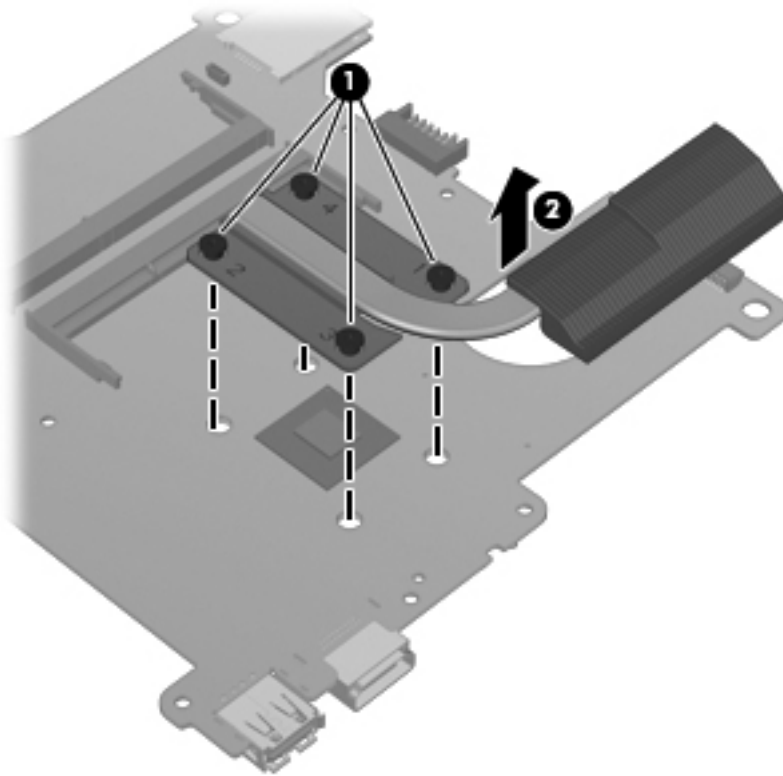
Remove the heat sink assembly:

To remove the heat sink assembly, follow these steps:

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

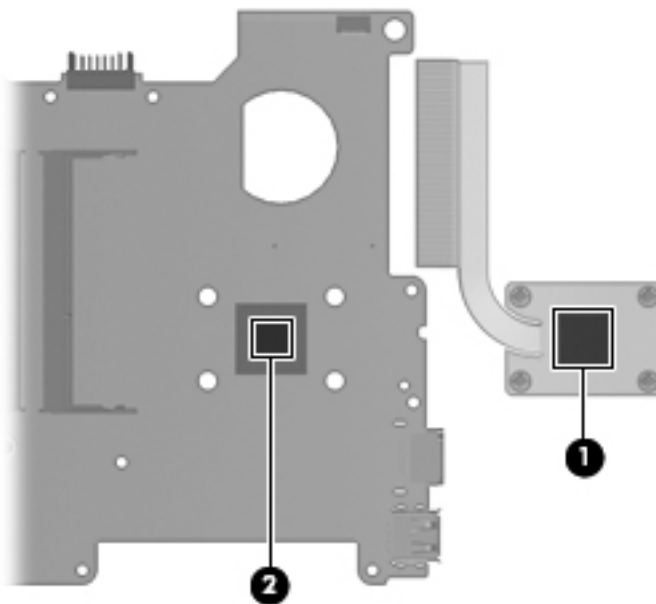
 **NOTE:** Due to the adhesive quality of the thermal material located between the heat sink assembly and system board components, it may be necessary to move the heat sink assembly from side to side to detach the assembly.

2. Remove the heat sink assembly (2).



NOTE: The thermal material must be thoroughly cleaned from the surfaces of the heat sink assembly and the system board each time the heat sink assembly is removed:

Thermal pads are located on the heat sink (1) and on the base enclosure (2) underneath the heat sink.



Reverse this procedure to install the heat sink assembly.

Power connector

Description	Spare part number
Power connector (includes power connector cable and security cable bracket)	591851-001

Before removing the power connector, follow these steps:

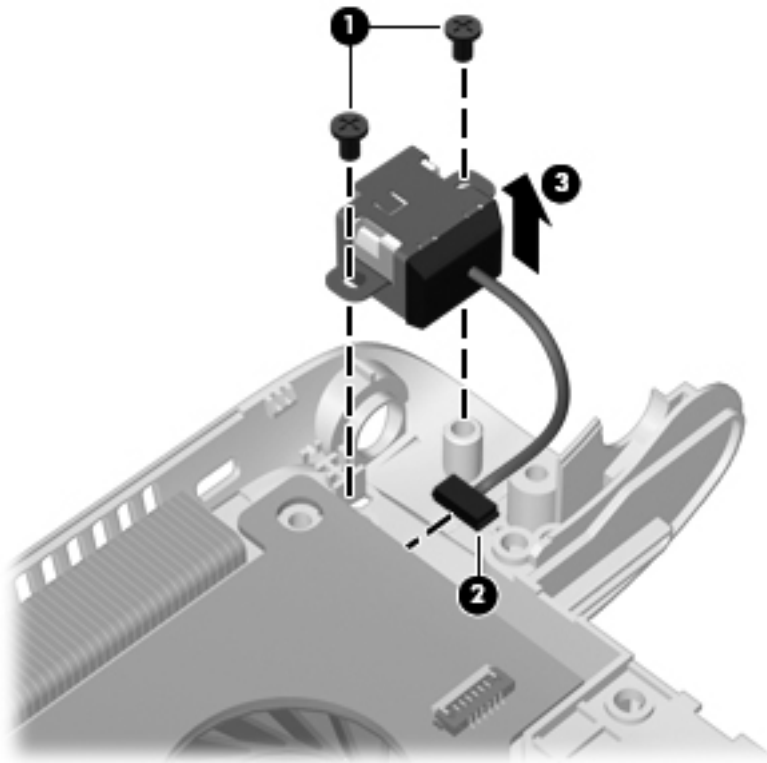
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation mode, turn on the computer, and then shut it down using the operating system.
2. Disconnect all of the external devices that are connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 32](#)).
5. Remove the following components:
 - a. Service cover (see [Hard drive / Solid state drive on page 33](#)).
 - b. Hard drive (see [Hard drive / Solid state drive on page 33](#)).
 - c. Keyboard (see [Keyboard on page 43](#)).
 - d. Top cover (see [Top cover on page 46](#)).
 - e. Display assembly (see [Display assembly on page 52](#)).
 - f. System board (see [System board on page 57](#)).

Remove the power connector:

To remove the power connector, follow these steps:

1. Remove the 2 screws **(1)** that secure the power connector to the base enclosure.
2. Disconnect the power connector cable **(2)** from the system board.

3. Lift up and remove the power connector (3).



Reverse this procedure to install the power connector.

RJ45 connector cover

To remove the RJ45 connector cover, follow these steps:

1. Slide the RJ45 cover to the right (grasping the cover at the indentation on the left side) (1) in order to release the cover.
2. Gently press the hinged bottom of the rubber tail and pull the RJ45 cover off of the computer (2).



Reverse this procedure to install the RJ-45 connector cover.

RJ-45 connector

Description	Spare part number
RJ-45 connector (includes cable)	636452-001

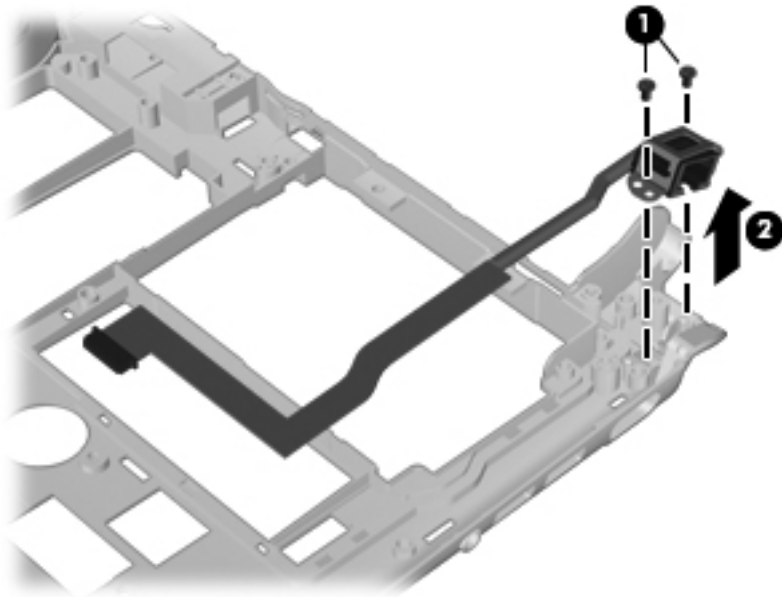
Before removing the RJ-45 connector, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation mode, turn on the computer, and then shut it down using the operating system.
2. Disconnect all of the external devices that are connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 32](#)).
5. Remove the following components:
 - a. Service cover (see [Hard drive / Solid state drive on page 33](#)).
 - b. Hard drive (see [Hard drive / Solid state drive on page 33](#)).
 - c. Keyboard (see [Keyboard on page 43](#)).
 - d. Top cover (see [Top cover on page 46](#)).
 - e. Display assembly (see [Display assembly on page 52](#)).
 - f. System board (see [System board on page 57](#)).

Remove the RJ-45 connector:

To remove the RJ-45 connector, follow these steps:

1. Remove the 2 screws that secure the RJ-45 connector to the base enclosure **(1)**.
2. Lift up and remove the RJ-45 connector **(2)**.



Reverse this procedure to install the RJ-45 connector.

Fan

Description	Spare part number
Fan (includes cable)	611688-001

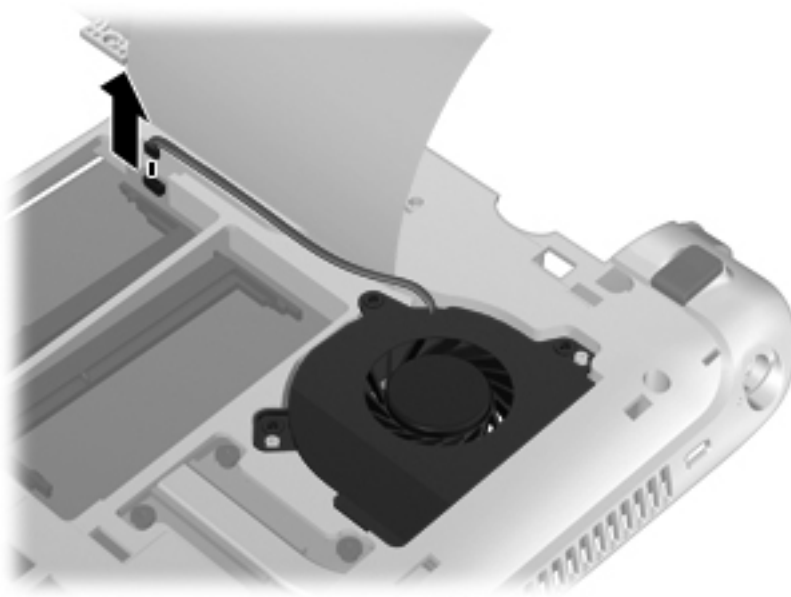
Before removing the fan, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation mode, turn on the computer, and then shut it down using the operating system.
2. Disconnect all of the external devices that are connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 32](#)).
5. Remove the following components:
 - a. Service cover (see [Hard drive / Solid state drive on page 33](#)).
 - b. Hard drive (see [Hard drive / Solid state drive on page 33](#)).
 - c. Keyboard (see [Keyboard on page 43](#)).
 - d. Top cover (see [Top cover on page 46](#)).
 - e. Display assembly (see [Display assembly on page 52](#)).
 - f. System board (see [System board on page 57](#)).
 - g. Heat sink (see [Heat sink assembly on page 60](#)).

Remove the fan:

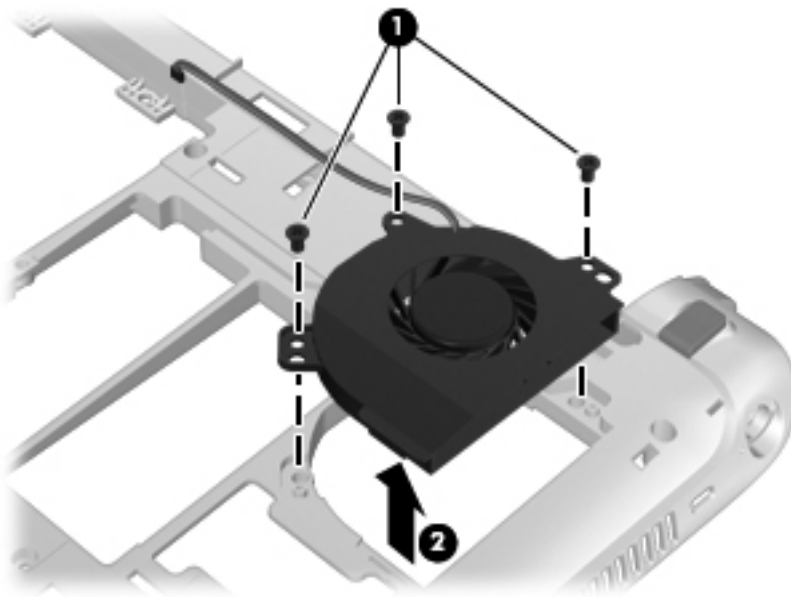
To remove the fan, follow these steps:

1. Disconnect the fan cable (1) from the system board.



2. Remove the 3 screws (1) that secure the fan to the base enclosure.

3. Lift up and remove the fan (2).



Reverse this procedure to install the fan.

5 Computer Setup

Computer Setup in Windows 7

Starting Setup Utility

Setup Utility is a ROM-based information and customization utility that can be used even when the Windows operating system is not working.

The utility reports information about the device and provides settings for startup, security, and other preferences.

To start Setup Utility:

- ▲ Open Setup Utility by turning on or restarting the device, and then pressing **f10** while the “F10 = BIOS Setup Options” message is displayed in the lower-left corner of the screen.

Using Setup Utility

Changing the language of Setup Utility

The following procedure explains how to change the language of the Setup Utility. If Setup Utility is not already running, begin at step 1. If Setup Utility is already running, begin at step 2.

1. Open Setup Utility by turning on or restarting the device, and then pressing **f10** while the “F10 = BIOS Setup Options” message is displayed in the lower-left corner of the screen.
2. Use the arrow keys to select **System Configuration > Language**, and then press **enter**.
3. Use the arrow keys to select a language, and then press **enter**.
4. When a confirmation prompt with your language selected is displayed, press **enter**.
5. To save your change and exit the Setup Utility, use the arrow keys to select **Exit > Exit Saving Changes**, and then press **enter**.

Your change goes into effect immediately.

Navigating and selecting in Setup Utility

Because Setup Utility is not Windows based, it does not support the TouchPad. Navigation and selection are by keystroke.

- To choose a menu or a menu item, use the arrow keys.
- To choose an item in a list or to toggle a field, for example an Enable/Disable field, use either the arrow keys or **f5** or **f6**.
- To select an item, press **enter**.
- To close a text box or return to the menu display, press **esc**.
- To display additional navigation and selection information while the Setup Utility is open, press **f1**.

Displaying system information

The following procedure explains how to display system information in Setup Utility. If Setup Utility is not open, begin at step 1. If Setup Utility is open, begin at step 2.

1. Open Setup Utility by turning on or restarting the device, and then pressing **f10** while the “F10 = BIOS Setup Options” message is displayed in the lower-left corner of the screen.
2. Select the **Main** menu. System information such as the system time and date, and identification information about the device displays.
3. To exit Setup Utility without changing any settings, use the arrow keys to select **Exit > Exit Discarding Changes**, and then press **enter**.

Restoring default settings in Setup Utility

The following procedure explains how to restore Setup Utility default settings. If Setup Utility is not already running, begin at step 1. If Setup Utility is already running, begin at step 2.

1. Open Setup Utility by turning on or restarting the device, and then pressing **f10** while the “F10 = BIOS Setup Options” message is displayed in the lower-left corner of the screen.
2. Use the arrow keys to select **Exit > Load Setup Defaults**, and then press **enter**.
3. When the Setup Confirmation displays, press **enter**.
4. To save your change and exit Setup Utility, use the arrow keys to select **Exit > Exit Saving Changes**, and then press **enter**.

The Setup Utility default settings go into effect when the device restarts.



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

Exiting Setup Utility

You can exit Setup Utility with or without saving changes.

- To exit Setup Utility and save your changes from the current session:

If the Setup Utility menus are not visible, press **esc** to return to the menu display. Then use the arrow keys to select **Exit > Exit Saving Changes**, and then press **enter**.


- To exit Setup Utility without saving your changes from the current session:

If the Setup Utility menus are not visible, press **esc** to return to the menu display. Then use the arrow keys to select **Exit > Exit Discarding Changes**, and then press **enter**.

After either choice, the device restarts in Windows.

Setup Utility menus

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

 **NOTE:** Some of the Setup Utility menu items that are listed in this section may not be supported by your computer.

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 the device• View specification information about the processor, memory size, and system BIOS

Security menu

Select	To do this
Administrator password	Enter, change, or delete an administrator password
Power-On Password	Enter, change, or delete a power-on password

System Configuration menu

Select	To do this
Language Support	Change the Setup Utility language

Select	To do this
Processor C4 State	Enable/disable the processor C4 sleep state
Boot Options	<p>Set the following boot options:</p> <ul style="list-style-type: none"> • f10 and f12 Delay (sec.)—set the delay for the f10 and f12 functions of the Setup Utility in intervals of 5 seconds each (0, 5, 10, 15, 20) • Internal Network Adapter boot—enable/disable boot from the internal network adapter. • Boot Order—set the boot order for the following: <ul style="list-style-type: none"> ◦ Internal hard drive (select models only) ◦ USB floppy drive ◦ USB CD/DVD ROM drive ◦ USB flash drive ◦ USB hard drive ◦ USB card reader ◦ Network adapter <p>NOTE: Only the devices that are available on the system appear in the boot order menu.</p>

Diagnostics menu

Select	To do this
Hard Disk Self Test (select models only)	Run a comprehensive self-test on the hard drive
Memory Test	Run a diagnostic test on the system memory

6 Specifications

Computer specifications

	Metric	U.S.
Dimensions		
Depth	20.40 cm	8.03 in
Width	28.90 cm	11.37 in
Height	1.98 cm	0.78 in
Weight		
Equipped with a hard drive	1470 g	3.24 lb
Equipped with a solid-state drive	1449 g	3.19 lb
Input power		
Operating voltage	19 V dc @ 1.58 A – 30 W	
Operating current	1.58 A	
Temperature		
Operating	5°C to 35°C	41°F to 95°F
Nonoperating	-20°C to 65°C	-4°F to 149°F
Relative humidity (noncondensing)		
Operating	10% to 90%	
Nonoperating	0% 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 computer operates well within this range of temperatures.

29.5-cm (11.6-in) (1366 x 768) HD BrightView LED display specifications

Dimensions	Metric	U.S.
Height	12.53 cm	4.93 in
Width	22.27 cm	8.77 in
Diagonal	25.55 cm	10.06 in
Number of colors	262,144	
Contrast ratio	400:1 (typical)	
Brightness	200 nits (typical)	
Pixel resolution		
Pitch	0.2175 × 0.2175 mm	
Format	1024 × 600	
Configuration	RGB vertical stripe	
Backlight	Edge lit	
Character display	80 × 25	
Total power consumption	3.0 W	
Viewing angle	±40° horizontal, +20/-40° vertical (typical)	

Hard drive specifications

	160-GB*	250-GB*	320-GB*	500-GB*
Dimensions				
Height	9.5 mm	9.5 mm	9.5 mm	9.5 mm
Width	63.5 mm	63.5 mm	63.5 mm	63.5 mm
Weight	101 g	101 g	101 g	101 g
Interface type	SATA	SATA	SATA	SATA
Transfer rate	100 MB/sec	100 MB/sec	100 MB/sec	100 MB/sec
Security	ATA security	ATA security	ATA security	ATA security
Seek times (typical read, including setting)				
Single track	3 ms	3 ms	3 ms	3 ms
Average	13 ms	13 ms	13 ms	13 ms
Maximum	24 ms	24 ms	24 ms	24 ms
Logical blocks	117,210,240	117,210,240	117,210,240	117,210,240
Disc rotational speed	7200 rpm	7200 rpm	7200 rpm	7200 rpm
Operating temperature	5°C to 55°C (41°F to 131°F)	5°C to 55°C (41°F to 131°F)	5°C to 55°C (41°F to 131°F)	5°C to 55°C (41°F to 131°F)

* 1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less. Actual drive specifications may differ slightly.

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

Solid-state drive specifications

128-GB solid-state drive	
Dimensions	
Height	9.5 mm
Width	63.5 mm
Weight	70 g
Interface type	SATA
Transfer rate	220 MB/sec
Security	SATA security
Logical blocks	250,069,680
Operating temperature	0°C to 70°C (32°F to 158°F)
<p>* 1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less. Actual drive specifications may differ slightly.</p>	
<p>NOTE: Certain restrictions and exclusions apply. Contact technical support for details.</p>	

7 Backup and recovery

- [Restore](#)
- [Creating restore media](#)
- [Performing a system restore](#)
- [Backing up and recovering your information](#)

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


This chapter provides information on the following topics:


- Creating a set of recovery discs or a recovery flash drive (Recovery Manager software feature)
- Performing a system restore (from the partition, recovery discs, or a recovery flash drive)
- Backing up your information
- Recovering a program or driver

Restore

In the event of hard drive failure, to restore your system to its factory image you will need a set of recovery discs or a recovery flash drive that you can create using HP Recovery Manager. HP recommends that you use this software to create either a set of recovery discs or a recovery flash drive immediately after software setup.


If for some other reason you need to restore your system, this can be achieved using the HP Recovery partition (select models only), without the need for recovery discs or a recovery flash drive. To check for the presence of a recovery partition, click **Start**, right-click **Computer**, click **Manage**, and then click **Disk Management**. If the recovery partition is present, a Recovery drive is listed in the window.

 **CAUTION:** HP Recovery Manager (partition, or discs/flash drive) restores only software that was preinstalled at the factory. Software not provided with this computer must be reinstalled manually.

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

Creating restore media


HP recommends that you create either a set of recovery discs or a recovery flash drive to be sure that you can restore your computer to its original factory state if the hard drive fails, or if for any reason you cannot restore using the recovery partition tools. Create these discs or the flash drive after setting up the computer for the first time.

 **NOTE:** HP Recovery Manager allows the creation of only one set of recovery discs or one recovery flash drive. Handle these discs or flash drive carefully and keep them in a safe place.


NOTE: If your computer does not include an integrated optical drive, you can use an optional external optical drive (purchased separately) to create recovery discs, or you can purchase recovery discs for your computer from the HP Web site. If you use an external optical drive, it must be connected directly to a USB port on the computer, not to a USB port on an external device, such as a USB hub.

Guidelines:

- Purchase high-quality DVD-R, DVD+R, DVD-R DL, or DVD+R DL discs.

 **NOTE:** Read-write discs, such as CD-RW, DVD±RW, double-layer DVD±RW, and BD-RE (rewritable Blu-ray) discs, are not compatible with the Recovery Manager software.

- The computer must be connected to AC power during this process.
- Only one set of recovery discs or one recovery flash drive can be created per computer.

 **NOTE:** If you are creating recovery discs, number each disc before inserting into the optical drive.


- If necessary, you can exit the program before you have finished creating the recovery discs or recovery flash drive. The next time you open Recovery Manager, you will be prompted to continue the backup creation process.

To create a set of recovery discs or a recovery flash drive:

1. Select **Start > All Programs > Recovery Manager > Recovery Media Creation**.
2. Follow the on-screen instructions.

Performing a system restore

Recovery Manager software allows you to repair or restore the computer to its original factory state. Recovery Manager works from recovery discs, a recovery flash drive, or from a dedicated recovery partition (select models only) on the hard drive.

 **NOTE:** A system restore needs to be performed if the computer hard drive has failed or if all attempts to correct any functional computer issues fail. A system restore should be used as a final attempt to correct computer issues.

Note the following when performing a system restore:

- You can restore only the system that you have previously backed up. HP recommends that you use HP Recovery Manager to create either a set of recovery discs or a recovery flash drive as soon as you set up the computer.
- Windows has its own built-in repair features, such as System Restore. If you have not already tried these features, try them before using Recovery Manager.
- Recovery Manager restores only software that was preinstalled at the factory. Software not provided with this computer must be downloaded from the manufacturer's Web site or reinstalled from the disc provided by the manufacturer.

Restoring using the dedicated recovery partition (select models only)

When using the dedicated recovery partition, there is an option to back up pictures, music and other audio, videos and movies, recorded TV shows, documents, spreadsheets and presentations, e-mails, Internet favorites and settings during this process.

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

1. Access Recovery Manager in either of the following ways:
 - Select **Start > All Programs > Recovery Manager > Recovery Manager**.
 - or –
 - Turn on or restart the computer, and then press **esc** while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen. Then, press **f11** while the “F11 (System Recovery)” message is displayed on the screen.
2. Click **System Recovery** in the **Recovery Manager** window.
3. Follow the on-screen instructions.

Restoring using the restore media

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

– or –

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



NOTE: If the computer does not automatically restart in the Recovery Manager, the computer boot order needs to be changed.

3. Press **F9** at system bootup.
4. Select the optical drive or the flash drive.
5. Follow the on-screen instructions.

Changing the computer boot order

To change the boot order for recovery discs:

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


To change the boot order for recovery flash drive:

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

Backing up and recovering your information


It is very important to back up your files and keep any new software in a safe place. As you add new software and data files, continue to create backups on a regular basis.

How completely you are able to recover your system depends on how recent your backup is.

 **NOTE:** A recovery from your most recent backup needs to be performed if the computer has a virus attack or if any major system components fail. In order to correct computer issues, a recovery should first be attempted before a system restore is attempted.

You can back up your information to an optional external hard drive, a network drive, or discs. Back up your system at the following times:

- At regularly scheduled times

 **TIP:** Set reminders to back up your information periodically.

- Before the computer is repaired or restored
- Before you add or modify hardware or software

Guidelines:

- Create system restore points using the Windows® System Restore feature, and periodically copy them to an optical disc or an external hard drive. For more information on using system restore points, refer to [Using Windows system restore points on page 81](#).
- Store personal files in the Documents library and back up this folder periodically.
- Save customized settings in a window, toolbar, or menu bar by taking a screen shot of your settings. The screen shot can be a time-saver if you have to re-enter your preferences.

To create a screen shot:

1. Display the screen you want to save.
2. Copy the screen image:

To copy only the active window, press **alt+fn+prt sc**.

To copy the entire screen, press **fn+prt sc**.

3. Open a word-processing document, and then select **Edit > Paste**. The screen image is added to the document.
4. Save and print the document.

Using Windows Backup and Restore

Guidelines:

- Be sure that the computer is connected to AC power before you start the backup process.
- Allow enough time to complete the backup process. Depending on file sizes, it may take over an hour.

To create a backup:


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



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

Using Windows system restore points


A system restore point allows you to save and name a snapshot of your hard drive at a specific point in time. You can then recover back to that point if you want to reverse subsequent changes.

 **NOTE:** Recovering to an earlier restore point does not affect data files saved or e-mails created since the last restore point.

You also can create additional restore points to provide increased protection for your files and settings.

When to create restore points

- Before you add or modify software or hardware
- Periodically, whenever the computer is functioning optimally

 **NOTE:** If you revert to a restore point and then change your mind, you can reverse the restoration.

Create a system restore point

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

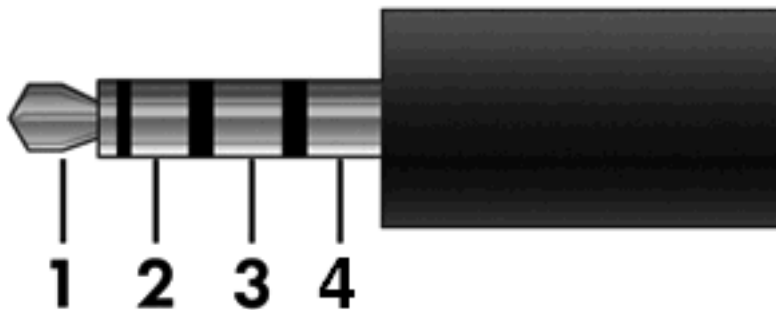
Restore to a previous date and time

To revert to a restore point (created at a previous date and time), when the computer was functioning optimally, follow these steps:

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

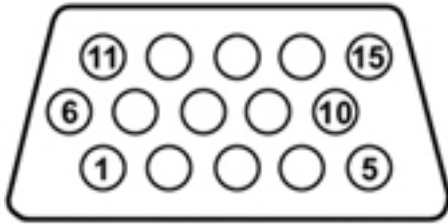
8 Connector pin assignments

Audio-out (headphone)/Audio-in (microphone) jack



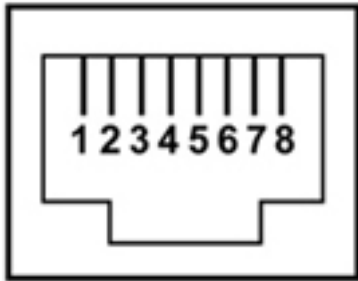
Pin	Signal
1	Left audio signal in
2	Right audio signal in
3	Ground
4	Microphone

External monitor



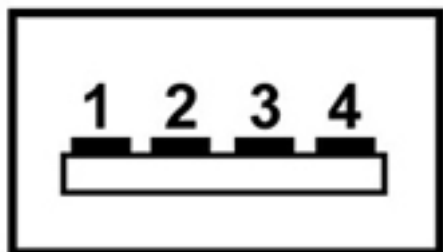
Pin	Signal
1	Red analog
2	Green analog
3	Blue analog
4	Not connected
5	Ground
6	Ground analog
7	Ground analog
8	Ground analog
9	+5 VDC
10	Ground
11	Monitor detect
12	DDC 2B data
13	Horizontal sync
14	Vertical sync
15	DDC 2B clock

RJ-45 (network)



Pin	Signal
1	Transmit +
2	Transmit -
3	Receive +
4	Unused
5	Unused
6	Receive -
7	Unused
8	Unused

Universal Serial Bus



Pin	Signal
1	+5 VDC
2	Data -
3	Data +
4	Ground

9 Power cord set requirements

The wide range input feature of the computer permits it to operate from any line voltage from 100 to 120 volts AC or from 220 to 240 volts AC.

The 3-conductor power cord set included with the computer meets the requirements for use in the country or region where the equipment is purchased.

Power cord sets for use in other countries and regions must meet the requirements of the country or region where the computer is used.

Requirements for all countries and regions

The requirements listed below are applicable to all countries and regions:

- The length of the power cord set must be at least 1.5 m (5.0 ft) and no more than 2.0 m (6.5 ft).
- All power cord sets must be approved by an acceptable accredited agency responsible for evaluation in the country or region where the power cord set will be used.
- The power cord sets must have a minimum current capacity of 10 amps and a nominal voltage rating of 125 or 250 V AC, as required by the power system of each country or region.
- The appliance coupler must meet the mechanical configuration of an EN 60 320/IEC 320 Standard Sheet C13 connector for mating with the appliance inlet on the back of the computer.

Requirements for specific countries and regions

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

10 Recycling

Battery

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

Display

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

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

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

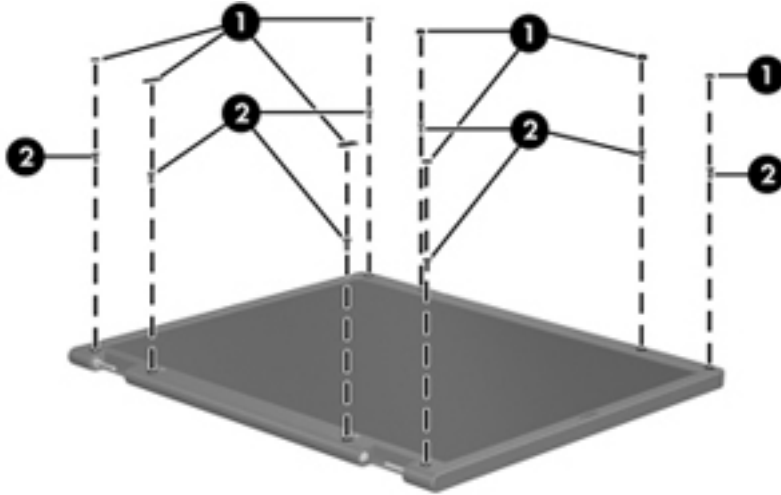
This section provides disassembly instructions for the display assembly. The display assembly must be disassembled to gain access to the backlight **(1)** and the liquid crystal display (LCD) panel **(2)**.



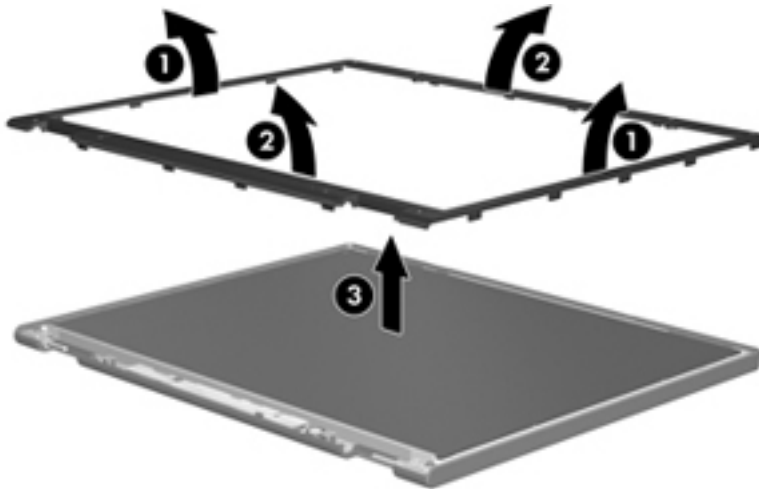
📄 NOTE: The procedures provided in this chapter are general disassembly instructions. Specific details, such as screw sizes, quantities, and locations, and component shapes and sizes, can vary from one computer model to another.

Perform the following steps to disassemble the display assembly:

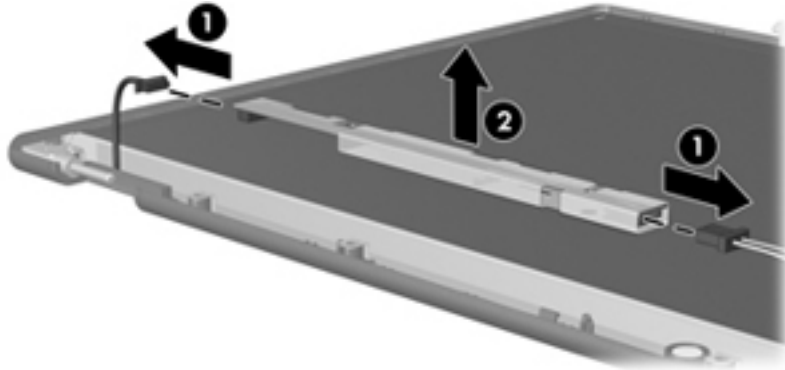
1. Remove all screw covers (1) and screws (2) that secure the display bezel to the display assembly.



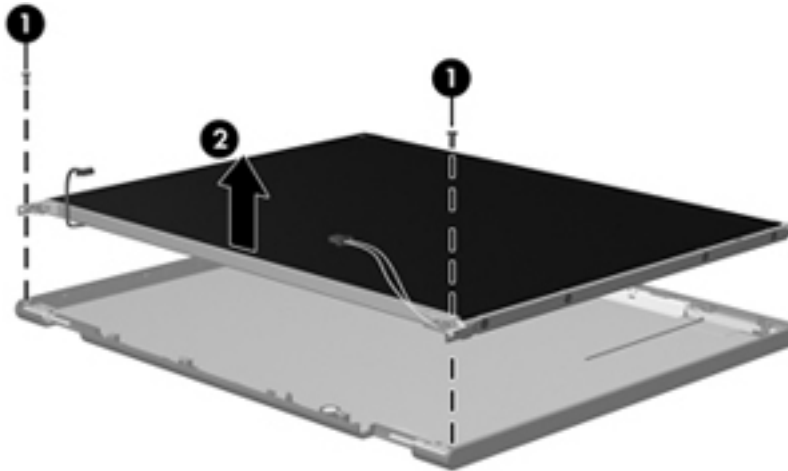
2. Lift up and out on the left and right inside edges (1) and the top and bottom inside edges (2) of the display bezel until the bezel disengages from the display assembly.
3. Remove the display bezel (3).



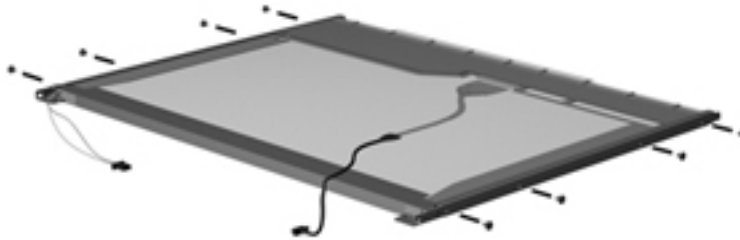
4. Disconnect all display panel cables (1) from the display inverter and remove the inverter (2).



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

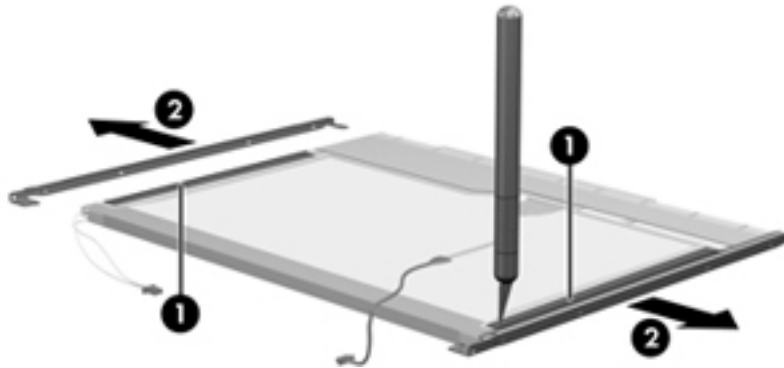


7. Turn the display panel assembly upside down.
8. Remove all screws that secure the display panel frame to the display panel.

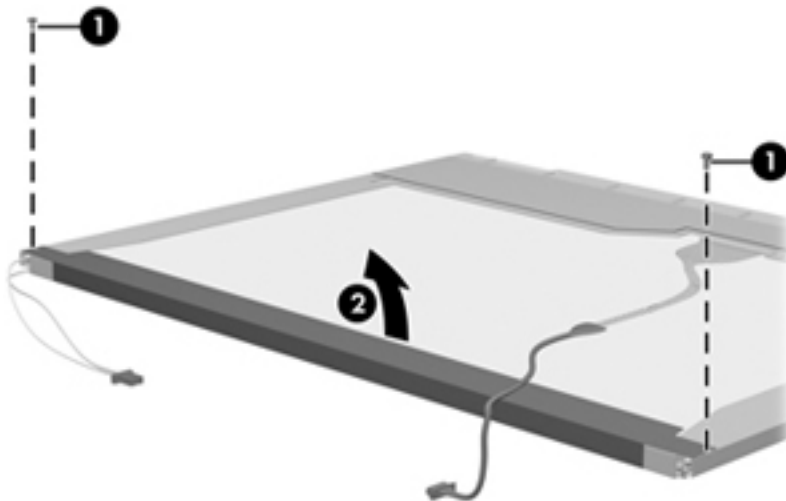


9. Use a sharp-edged tool to cut the tape (1) that secures the sides of the display panel to the display panel frame.

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

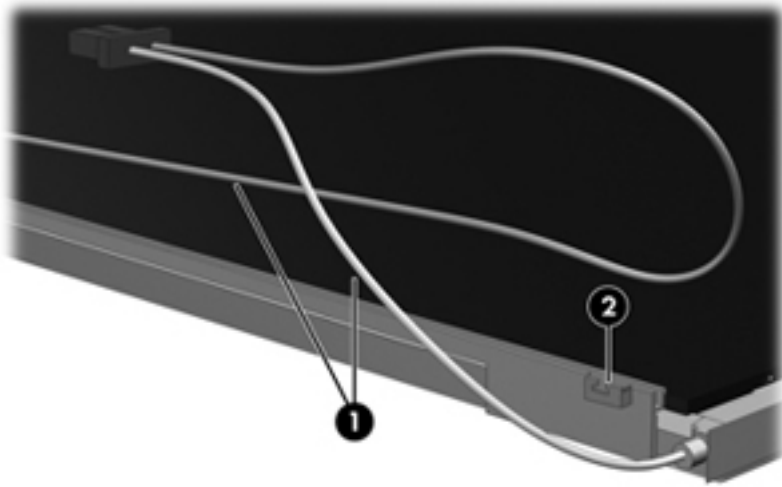


11. Remove the screws (1) that secure the backlight cover to the display panel.
12. Lift the top edge of the backlight cover (2) and swing it outward.



13. Remove the backlight cover.
14. Turn the display panel right-side up.

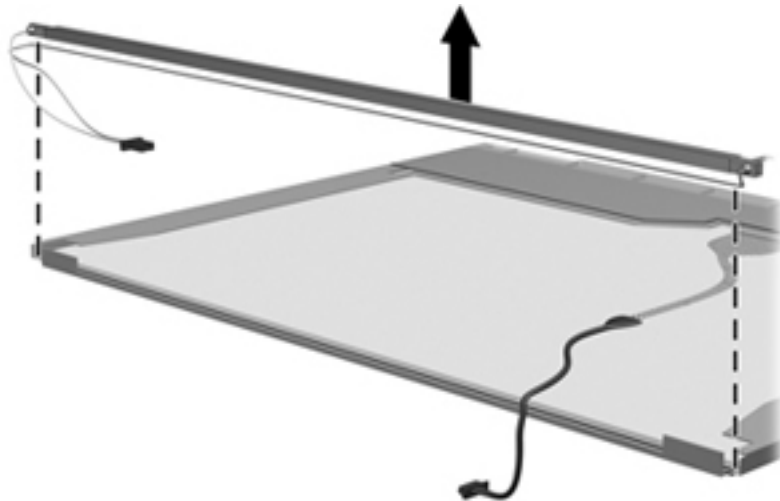
15. Remove the backlight cables (1) from the clip (2) in the display panel.



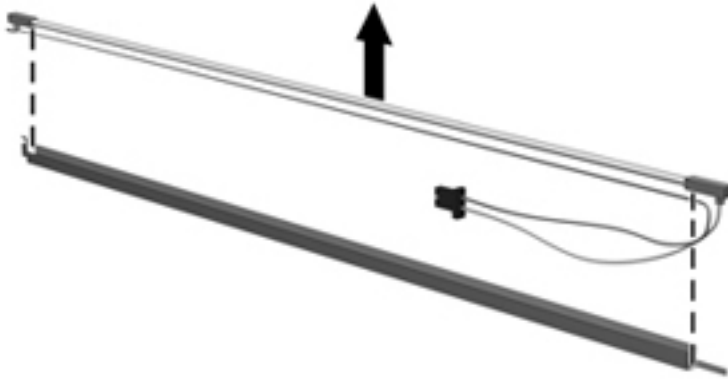
16. Turn the display panel upside down.

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

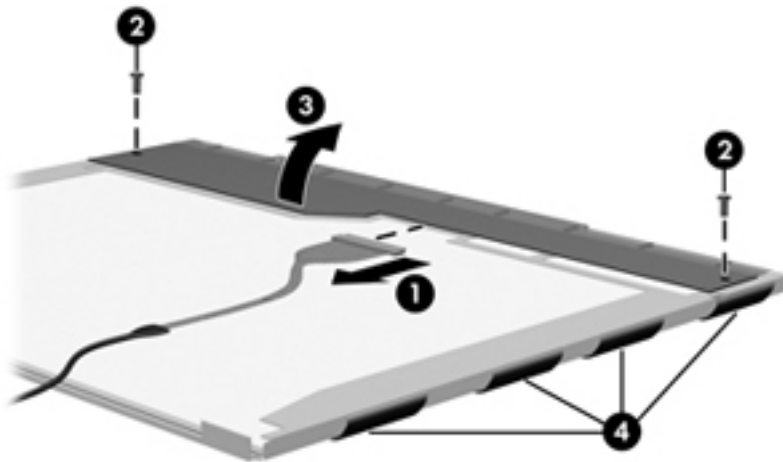
17. Remove the backlight frame from the display panel.



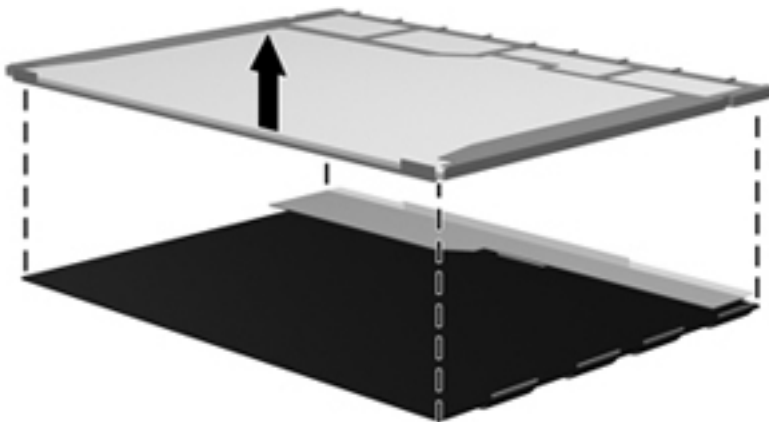
18. Remove the backlight from the backlight frame.



19. Disconnect the display panel cable (1) from the LCD panel.
20. Remove the screws (2) that secure the LCD panel to the display rear panel.
21. Release the LCD panel (3) from the display rear panel.
22. Release the tape (4) that secures the LCD panel to the display rear panel.



23. Remove the LCD panel.



24. Recycle the LCD panel and backlight.

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