

HP Compaq 6720t Mobile Thin Client

Maintenance and Service Guide

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Safety warning notice

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

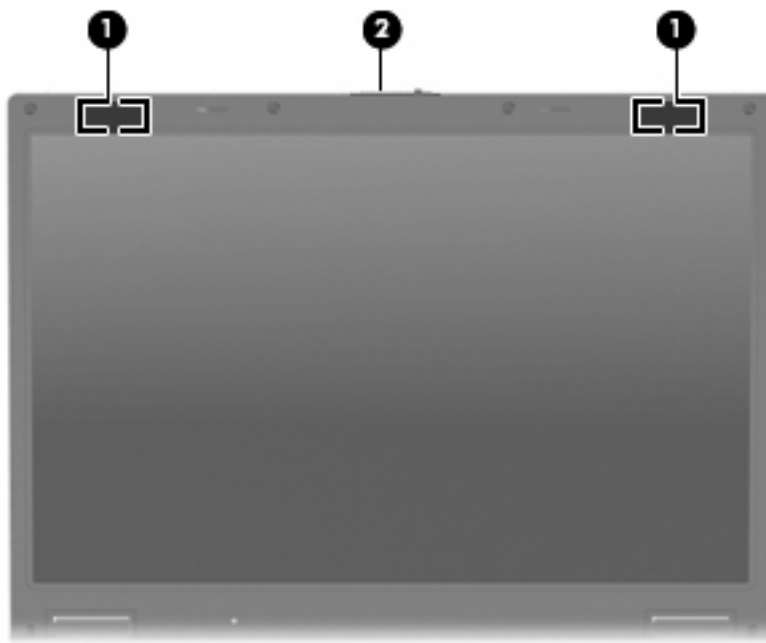
Category	Description
Product Name	HP Compaq 6720t Mobile Thin Client
Processors	Intel® Celeron® M423 1.06-GHz processor 1-MB L2 cache, 533-MHz front side bus (FSB)
Chipset	Northbridge: Mobile Intel 945GM Express chipset with up to 800-MHz FSB Southbridge: Intel ICH-7M
Graphics	Intel unified memory architecture (UMA) graphics subsystem with up to 224-MB shared graphics subsystem memory
Panel	15.4-inch WXGA AntiGlare display assembly with 2 wireless local area network (WLAN) antennae
Memory	One customer-accessible/upgradable memory module slot, support for up to 1 GB of PC2-5300, 667-MHz, DDR2 system RAM
Flash drive	Support for one 1-GB solid-state flash module Customer-accessible Parallel ATA (PATA)
Optical drives	Fixed (removal of 1 screw required) DVD-ROM Drive Customer-accessible PATA 12.7-mm tray load
Diskette drive	Supports external USB diskette drive only Supports boot from external USB diskette drive
Audio	HD audio - ADI1981 Single speaker
Modem	56K V.92 1.5-inch data/fax modem with digital line guard
Ethernet	Integrated 10/100 NIC
Wireless	Integrated WLAN options by way of wireless module: 2 dual-band WLAN antennae built into display assembly Support for Broadcom 802.11a/b/g WLAN module
External media card	One Type I/II PC Card slot (16-bit PCMCIA and 32-bit Cardbus)
Ports	Audio-in (stereo microphone)

Category	Description
	Audio-out (stereo headphone)
	Docking
	RJ-11 (modem)
	RJ-45 (Ethernet)
	USB (3)
	VGA (Dsub 15-pin) supporting 1600 × 1200 external resolution at 75-GHz (hot plug/unplug with auto-detect)
	3-pin HP Smart Adapter AC power
Keyboard/pointing devices	Full-sized, spill-resistant keyboard with embedded numeric keypad
	TouchPad only, with 2 TouchPad buttons and vertical scrolling
Power requirements	65-W HP Smart Adapter with localized cable plug support (3-wire plug with ground pin, supports 3-pin DC connector)
	6-cell, 47-Wh Li-ion battery
	Support for optional 12- or 8-cell accessory battery
Security	Supports Kensington security lock
Operating system	Preinstalled: Microsoft® Windows® XPe
Serviceability	End-user replaceable parts:
	AC adapter
	Battery (system)
	Memory module
	Optical drive
	RTC battery
	WLAN module

2 External component identification

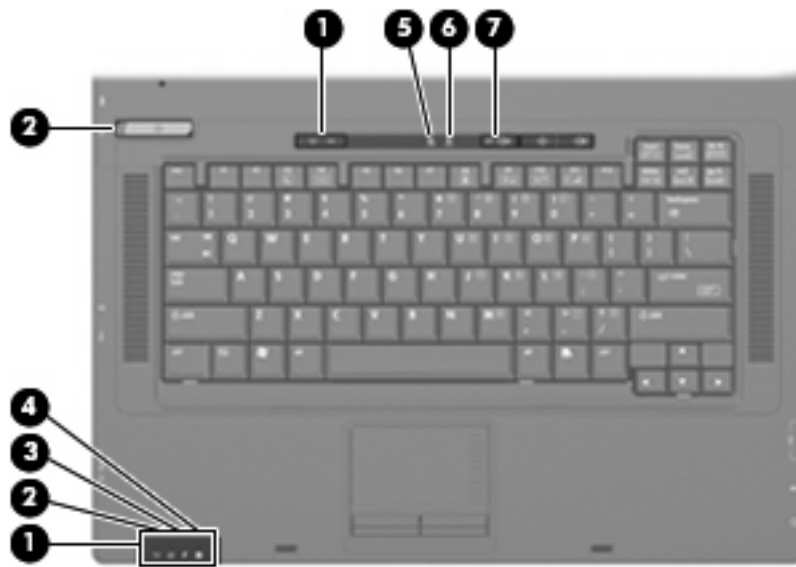
Top components

Display



Item	Component	Function
(1)	Wireless antennae (2)	Send and receive signals from one or more wireless devices. These antennae are not visible from the outside of the computer.
(2)	Display release latch	Opens the computer.

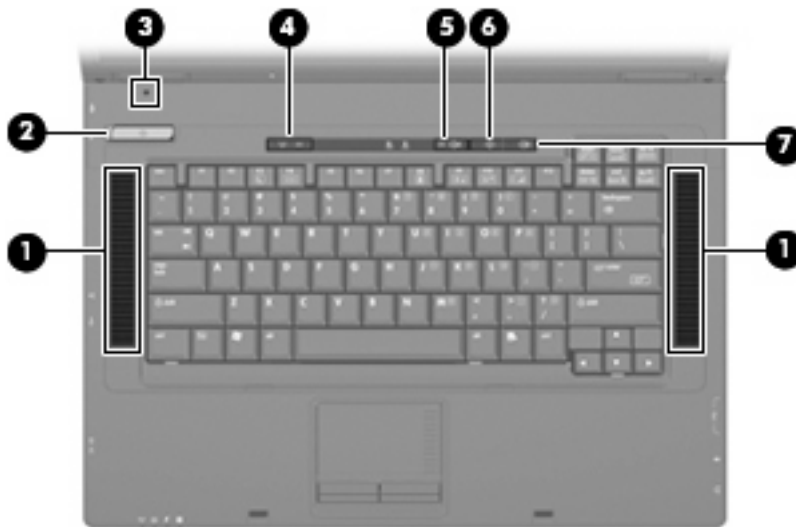
Lights



Item	Component	Function
(1)	Wireless lights* (2)	- Blue: An integrated wireless device, such as a wireless local area network (WLAN) device, is on. - Off: All wireless devices are off.
(2)	Power lights† (2)	- On: The computer is on. - Blinking: The computer is in Standby. - Off: The computer is off.
(3)	Battery light	- Amber: A battery is charging. - Blue: A battery is close to full charge capacity. - Blinking amber: A battery that is the only available power source has reached a low battery level. When the battery reaches a critical battery level, the battery light begins blinking - Off: If the computer is plugged into an external power source, the light turns off when all batteries in the computer are fully charged. If the computer is not plugged into an external power source, the light stays off until the battery reaches a low battery level.
(4)	Drive light	Blinking: The flash drive or optional optical drive is being accessed.
(5)	Caps lock light	On: Caps lock is on.
(6)	Numeric lock light	On: Numeric lock is on.
(7)	Volume mute light	On: Computer sound is turned off.

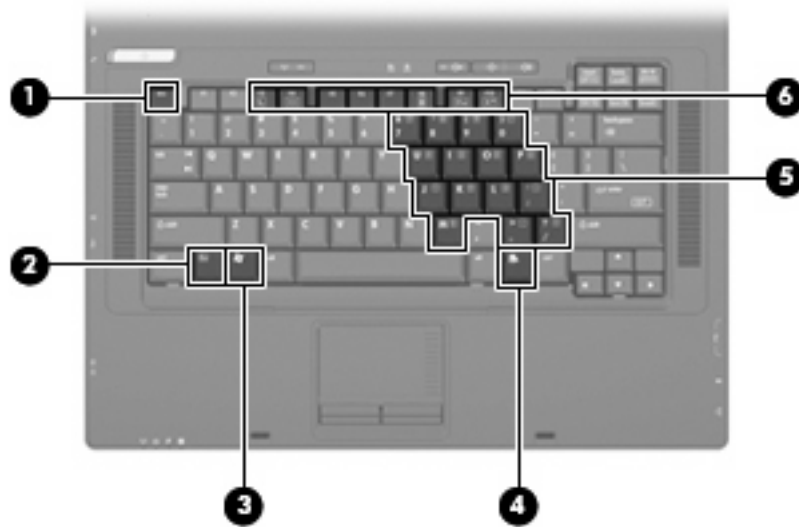
Item	Component	Function
*The 2 wireless lights display the same information. The light on the wireless button is visible only when the computer is open. The wireless light on the front of the computer is visible whether the computer is open or closed.		
†The 2 power lights display the same information. The light on the power button is visible only when the computer is open. The power light on the front of the computer is visible whether the computer is open or closed.		

Buttons and speakers



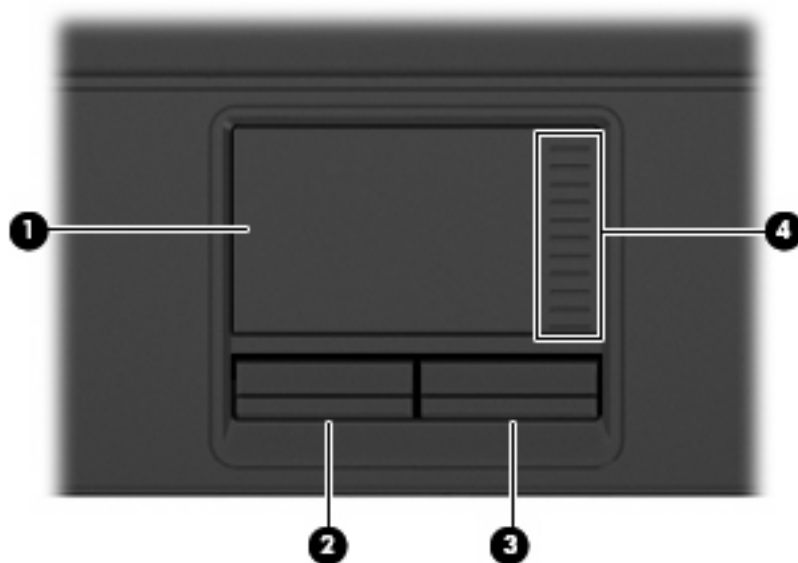
Item	Component	Function
(1)	Speakers (2)	Produce sound.
(2)	Power button	- When the computer is off, press the button to turn on the computer. - When the computer is in Standby, press the button briefly to exit Standby. If the computer has stopped responding and Windows® shutdown procedures are ineffective, press and hold the power button for at least 5 seconds to turn off the computer. To learn more about your power settings, right-click the Power Meter icon in the notification area, and then click Adjust Power Properties.
(3)	Internal display switch	Turns off the display if the display is closed while the power is on.
(4)	Wireless button	Turns the wireless feature on or off but does not establish a wireless connection.
		NOTE: A wireless network must be set up in order to establish a wireless connection.
(5)	Volume mute button	Mutes and restores speaker sound.
(6)	Volume down button	Decreases speaker volume.
(7)	Volume up button	Increases speaker volume.

Keys



Item	Component	Function
(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 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)	Numeric keypad keys	Can be used like the keys on an external numeric keypad.
(6)	Function keys	Execute frequently used system functions when pressed in combination with the <code>fn</code> key.

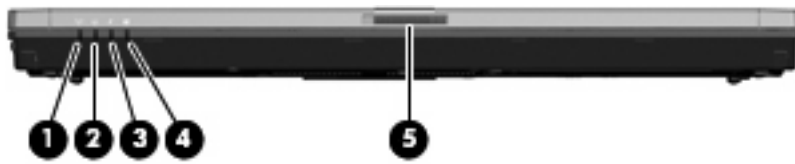
TouchPad



Item	Component	Function
(1)	TouchPad*	Moves the pointer and selects or activates items on the screen.
(2)	Left TouchPad button*	Functions like the left button on an external mouse.
(3)	Right TouchPad button*	Functions like the right button on an external mouse.
(4)	TouchPad scroll zone	Scrolls up or down.

*This table describes factory settings. To view or change pointing device preferences, select **Start > Control Panel > Printers and Other Hardware > Mouse**.

Front components



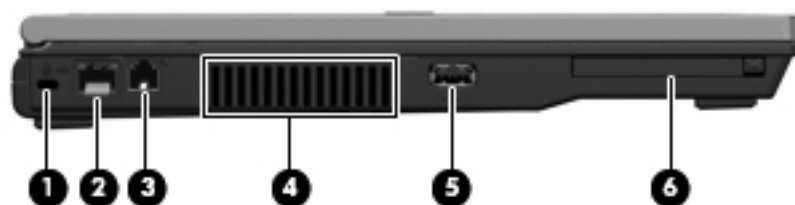
Item	Component	Function
(1)	Wireless light	- On: An integrated wireless device, such as a wireless local area network (WLAN) device, is on. - Off: All wireless devices are off.
(2)	Power light	- On: The computer is on. - Blinking: The computer is in Standby. - Off: The computer is off.
(3)	Battery light	- Amber: A battery is charging. - Blue: A battery is close to full charge capacity. - Blinking amber: A battery that is the only available power source has reached a low battery level. When the battery reaches a critical battery level, the battery light begins blinking rapidly. - Off: If the computer is plugged into an external power source, the light turns off when all batteries in the computer are fully charged. If the computer is not plugged into an external power source, the light stays off until the battery reaches a low battery level.
(4)	Drive light	Blinking: The flash drive or optional optical drive is being accessed.
(5)	Display release latch	Opens the computer.

Right-side components



Item	Component	Function
(1)	Audio-out (headphone) jack	Produces sound when connected to optional powered stereo speakers, headphones, ear buds, a headset, or television audio.
(2)	Audio-in (microphone) jack	Connects an optional computer headset microphone, stereo array microphone, or monaural microphone.
(3)	USB ports (2)	Connect optional USB devices.
(4)	Optical drive (select models only)	Reads an optical disc.

Left-side components



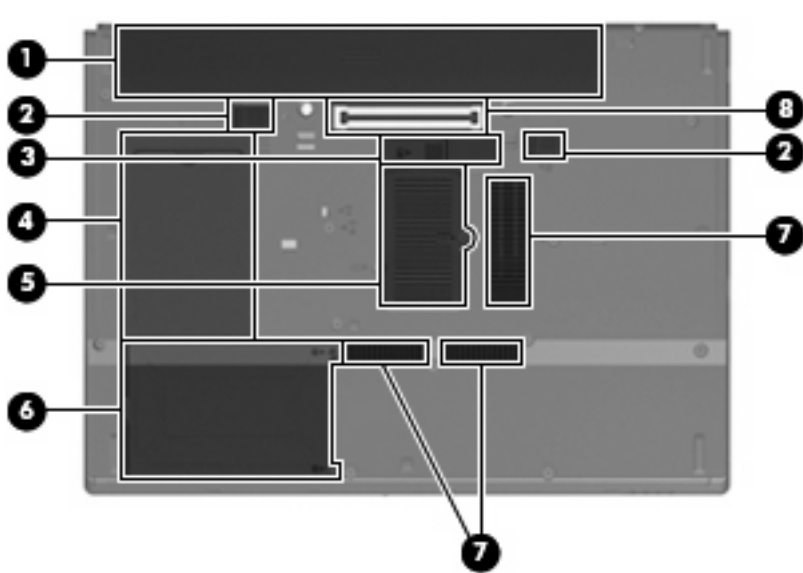
Item	Component	Function
(1)	Security cable slot	Attaches an optional security cable to the computer. NOTE: The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.
(2)	RJ-45 (network) jack	Connects a network cable.
(3)	RJ-11 (modem) jack	Connects a modem cable.
(4)	Vent	Enables airflow to cool internal components.
(5)	USB port	Connects an optional USB device.
(6)	PC Card slot	Supports optional Type I and Type II 32-bit (CardBus) or 16-bit PC Cards.

Rear components



Item	Component	Description
(1)	Power connector	Connects an AC adapter.
(2)	External monitor port	Connects an external VGA monitor or projector.

Bottom components

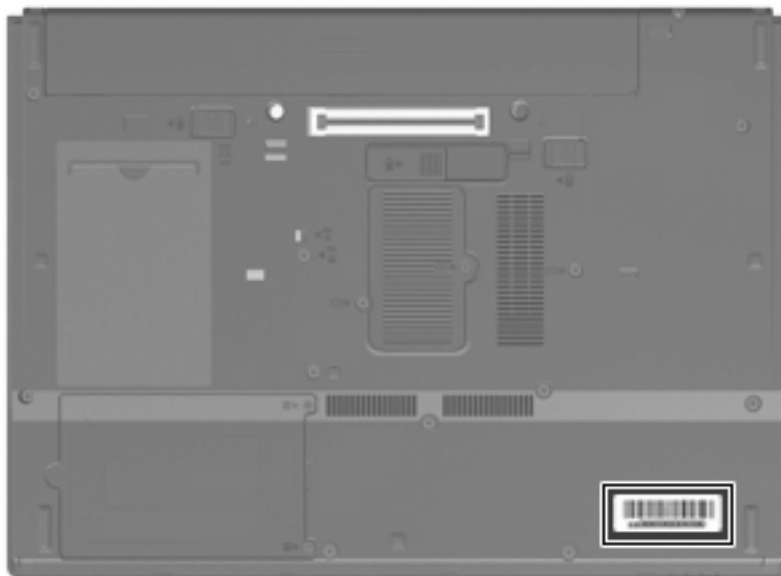


Item	Component	Function
(1)	Battery bay	Holds the battery.
(2)	Battery release latches (2)	Release the battery from the battery bay.
(3)	Accessory battery connector	Connects an optional accessory battery.
(4)	Business card holder	Holds a standard-size business card.
(5)	Memory module compartment	Contains the memory module slot.
(6)	Flash drive bay	Holds the flash drive.
(7)	Vent	Enables airflow to cool internal components.
(8)	Docking connector	Connects an optional docking device.

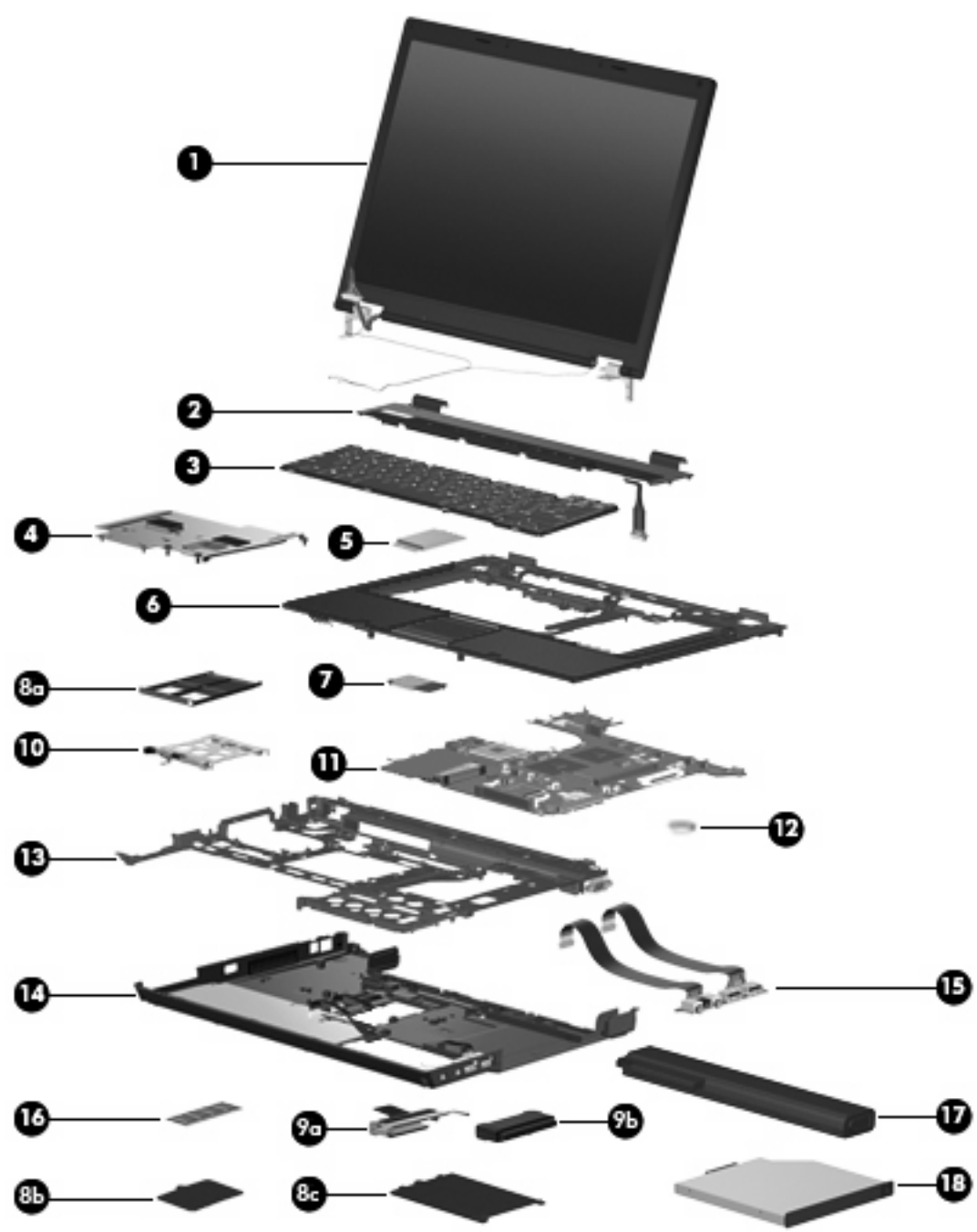
3 Illustrated parts catalog

Serial number location

When ordering parts or requesting information, provide the computer serial number and model number located on the bottom of the computer.



Computer major components



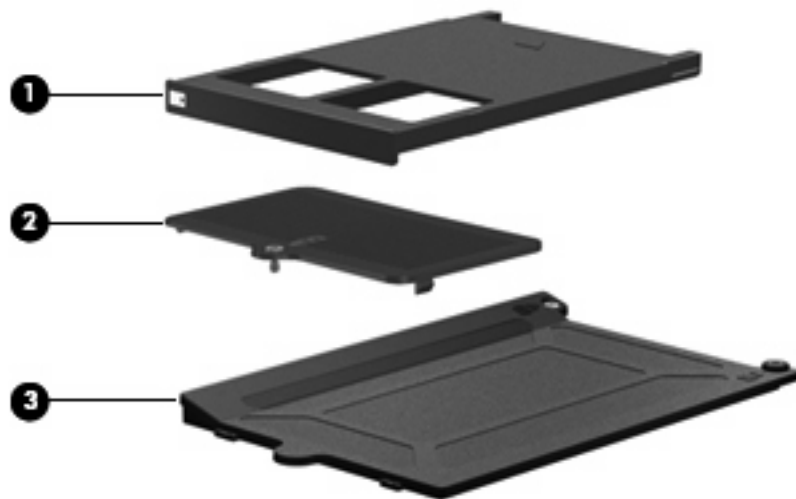
Item	Description	Spare part number
(1)	15.4-inch, WXGA, antiglare display assembly (includes display panel cable and 2 wireless antenna transceivers and cables)	467783-001
Display internal components:		
	Display bezel	466164-001

Item	Description	Spare part number
	Display hinges (includes left and right hinges)	466166-001
	Display inverter	466167-001
(2)	Switch cover (includes LED board and cable)	417520-001
(3)	Keyboards	
	For use in Belgium	481424-181
	For use in the Czech Republic	481424-221
	For use in Denmark	481424-081
	For use in France	481424-041
	For use in French Canada	481424-121
	For use in Germany	481424-041
	For use in Greece	481424-DJ1
	For use in Hungary	481424-211
	For use in Iceland	481424-DD1
	For use in Israel	481424-BB1
	For use in Italy	481424-061
	For use in Japan	481424-291
	For use in the Netherlands	481424-B31
	For use in Norway	481424-091
	For use in Portugal	481424-131
	For use in Russia	481424-251
	For use in Saudi Arabia	481424-171
	For use in Slovakia	481424-231
	For use in Slovenia	481424-BA1
	For use in South Korea	481424-AD1
	For use in Spain	481424-071
	For use in Sweden and Finland	481424-B71
	For use in Switzerland	481424-BG1
	For use in Taiwan	481424-AB1
	For use in Turkey	481424-141
	For use in the United Kingdom	481424-031
	For use in the United States	481424-001
(4)	Heat sink (includes replacement thermal material)	468102-001
(5)	Broadcom 802.11a/b/g WLAN modules:	

Item	Description	Spare part number
	For use in Canada, Cayman Islands, Guam, Puerto Rico, the U.S. Virgin Islands, and the United States	441075-001
	For use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, the People's Republic of China, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	441075-002
	For use in Japan	441075-291
(6)	Top cover (includes TouchPad board and cable, TouchPad button board and cable, speakers and cable)	466423-001
(7)	Modem module	441074-001
	NOTE: The modem module spare part kit does not include a modem module cable. The modem module cable is included with the system board frame, spare part number 480894-001.	
	Plastics Kit (see Plastics Kit on page 16 for more Plastics Kit spare part information):	417527-001
(8a)	PC Card slot bezel	
(8b)	Memory module compartment cover (includes one captive screw, secured by a C-clip)	
(8c)	Flash drive bay cover (includes 2 captive screws, secured by C-clips)	
(9a)	Flash drive bracket (included with flash drive)	
(9b)	1-GB flash drive (includes flash drive bracket)	465619-001
(10)	PC Card assembly	480829-001
(11)	System board (includes RTC battery and replacement thermal material)	466424-001
(12)	RTC battery	449137-001
(13)	System board frame (includes modem module cable)	480894-001
(14)	Base enclosure (includes 8 rubber feet)	466422-001
	Rubber Feet Kit (not illustrated)	480830-001
(15)	Audio/USB board (includes audio board cable and USB board cable)	480828-001

Item	Description	Spare part number
(16)	1024-MB, PC2-5300, 667-MHz, DDR2 memory module	414046-001
(17)	6-cell, 47-Wh Li-ion battery	467784-001
(18)	8X Max DVD-ROM Drive (includes bezel and bracket)	467782-001

Plastics Kit



Item	Description	Spare part number
Plastics Kit:		417527-001
(1)	Flash drive bay cover (includes 2 captive screws, secured by C-clips)	
(2)	PC Card slot bezel	
(3)	Memory module compartment cover (includes one captive screw, secured by a C-clip)	

Miscellaneous parts

Description	Spare part number
65-W HP Smart Adapter	391172-001
Power cords:	
For use in Australia and New Zealand	246959-011
For use in Brazil	246959-201
For use in Japan	246959-291
For use in South Korea	246959-AD1
For use the United States	246959-001
Screw Kit	417526-001
• Hex HM5.0×11.0 screw lock • Phillips PM2.5×4.0 screw • Phillips PM2.5×3.0 screw • Phillips PM2.0×6.0 captive screw • Black Phillips PM2.0×4.0 screw • Silver Phillips PM2.0×4.0 screw • Phillips PM2.0×3.0 screw • Phillips PM2.0×2.0 broad-head screw • Torx T8M2.5×9.0 screw • Torx T8M2.5×7.0 screw • Torx T8M2.5×6.0 screw • Torx T8M2.5×5.0 screw • Torx T8M2.5×4.0 screw	

Sequential part number listing

Spare part number	Description
246959-001	Power cord for use in the United States
246959-011	Power cord for use in Australia and New Zealand
246959-201	Power cord for use in Brazil
246959-291	Power cord for use in Japan
246959-AD1	Power cord for use in South Korea
391172-001	65-W HP Smart Adapter
414046-001	1024-MB, PC2-5300, 667-MHz, DDR2 memory module
417520-001	Switch cover (includes LED board and cable)
417526-001	Screw Kit
417527-001	Plastics Kit (see Plastics Kit on page 16 for more Plastics Kit spare part information)
441074-001	Modem module
	NOTE: The modem module spare part kit does not include a modem module cable. The modem module cable is included with the system board frame, spare part number 480894-001.
441075-001	Broadcom 802.11a/b/g WLAN module for use in Canada, Cayman Islands, Guam, Puerto Rico, the U.S. Virgin Islands, and the United States
441075-002	Broadcom 802.11a/b/g WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, the People's Republic of China, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe
441075-291	Broadcom 802.11a/b/g WLAN module for use in Japan
449137-001	RTC battery
465619-001	1-GB flash drive (includes flash drive bracket)
466164-001	Display bezel
466166-001	Display hinges (includes left and right hinges)
466167-001	Display inverter

Spare part number	Description
466422-001	Base enclosure (includes 8 rubber feet)
466423-001	Top cover (includes TouchPad board and cable, TouchPad button board and cable, speakers and cable)
466424-001	System board (includes RTC battery and replacement thermal material)
467782-001	8X Max DVD-ROM Drive (includes bezel and bracket)
467783-001	15.4-inch, WXGA, antiglare display assembly (includes display panel cable and 2 wireless antenna transceivers and cables)
467784-001	6-cell, 47-Wh Li-ion battery
468102-001	Heat sink (includes replacement thermal material)
480828-001	Audio/USB board (includes audio board cable and USB board cable)
480829-001	PC Card assembly
480830-001	Rubber Feet Kit
480894-001	System board frame (includes modem module cable)
481424-001	Keyboard for use in the United States
481424-031	Keyboard for use in the United Kingdom
481424-041	Keyboard for use in Germany
481424-051	Keyboard for use in France
481424-061	Keyboard for use in Italy
481424-071	Keyboard for use in Spain
481424-081	Keyboard for use in Denmark
481424-091	Keyboard for use in Norway
481424-121	Keyboard for use in French Canada
481424-131	Keyboard for use in Portugal
481424-141	Keyboard for use in Turkey
481424-171	Keyboard for use in Saudi Arabia
481424-181	Keyboard for use in Belgium
481424-211	Keyboard for use in Hungary
481424-221	Keyboard for use in the Czech Republic
481424-231	Keyboard for use in Slovakia
481424-251	Keyboard for use in Russia
481424-291	Keyboard for use in Japan
417025-AB1	Keyboard for use in Taiwan
481424-AD1	Keyboard for use in South Korea
481424-BA1	For use in the Netherlands
481424-BB1	For use in Sweden and Finland

Spare part number	Description
481424-BG1	For use in Slovenia
481424-B31	For use in Israel
481424-B71	For use in Switzerland
481424-DD1	For use in Iceland
481424-DJ1	For use in Greece

4 Removal and replacement procedures

Preliminary replacement requirements

Tools required

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

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

Service considerations

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



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

Plastic parts

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 flash drive, shut down the computer. If you are unsure whether the computer is off, turn the computer on, and then shut it down through the operating system.

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

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

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

Avoid dropping drives from any height onto any surface.

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

Avoid exposing a flash 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 nonmagnetic tools.

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

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

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

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

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

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

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

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

Workstation guidelines

Follow these grounding workstation guidelines:

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

Equipment guidelines

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

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

The following grounding equipment is recommended to prevent electrostatic damage:

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

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

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

Unknown user password

If the computer you are servicing has an unknown user password, follow these steps to clear the password:



NOTE: These steps also clear CMOS.

1. Shut down the computer. If you are unsure whether the computer is off, 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 29](#)).
5. Remove the real-time clock (RTC) battery (see [System board and system board frame on page 52](#)).
6. Wait approximately 5 minutes.
7. Replace the RTC battery and reassemble the computer.
8. Connect AC power to the computer. Do not reinsert any batteries at this time.
9. Turn on the computer.

All passwords and all CMOS settings have been cleared.

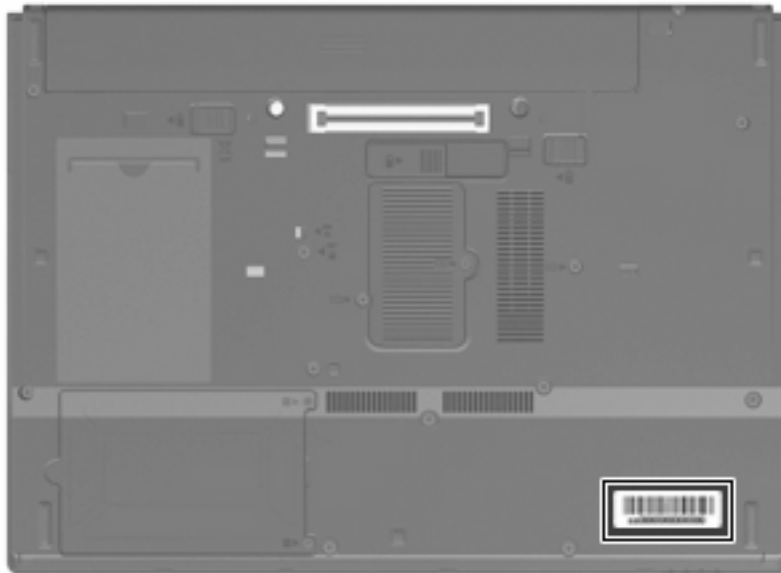
Component replacement procedures

This chapter provides removal and replacement procedures.

There are as many as 81 screws and screw locks, in 13 different sizes, that must be removed, replaced, or loosened when servicing the computer. Make special note of each screw size and screw lock location during removal and replacement.

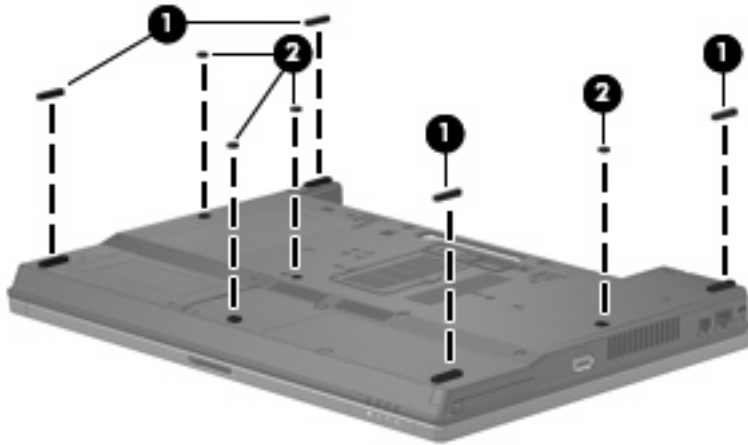
Serial number

Report the computer serial number to HP when requesting information or ordering spare parts. The serial number is located on the bottom of the computer.



Computer feet

The computer feet are adhesive-backed rubber pads. The feet are included in the Rubber Kit, spare part number 480830-001. There are four oblong rubber feet **(1)** and four square rubber feet **(2)**, that attach to the base enclosure in the locations illustrated below.



Battery

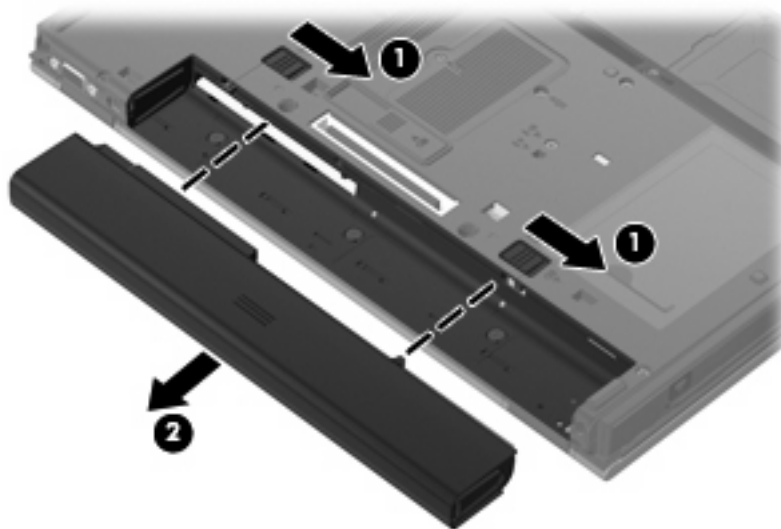
Description	Spare part number
6-cell, 47-Wh Li-ion battery	467784-001

Before disassembling the computer, follow these steps:

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

Remove the battery:

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



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

Flash drive

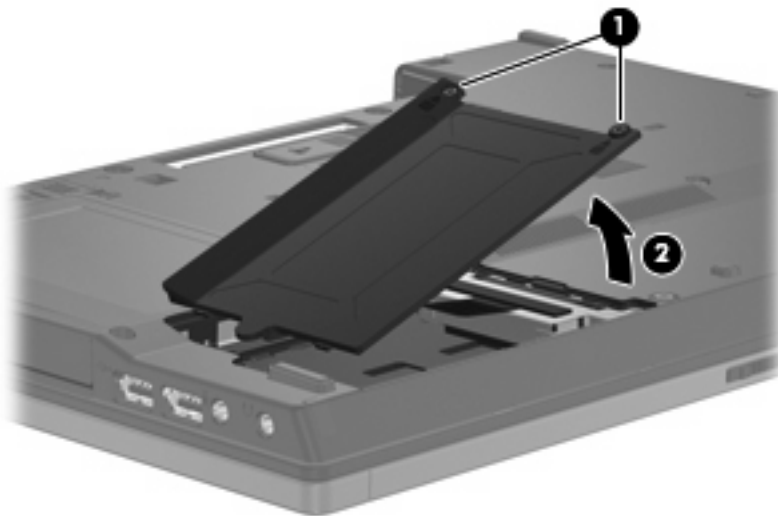
Description	Spare part number
1-GB flash drive (includes flash drive bracket)	465619-001

Before removing the flash drive, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off, 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 29](#)).

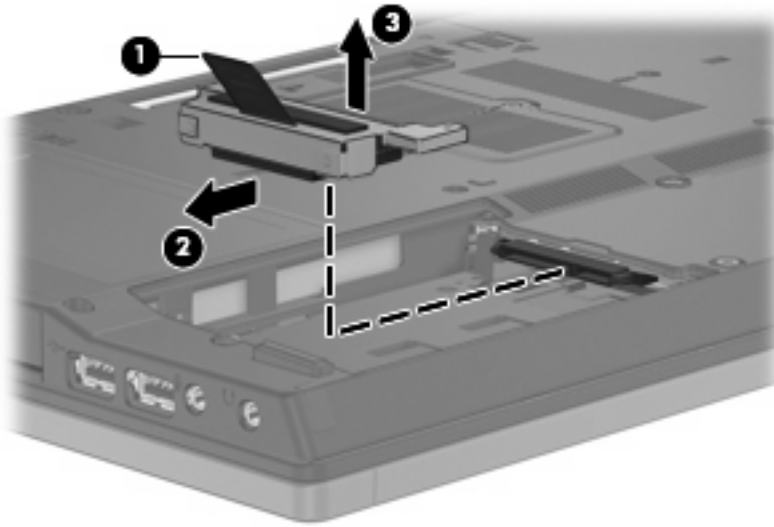
Remove the flash drive:

1. Position the computer with the front toward you.
2. Loosen the two Phillips PM2.0×6.0 captive screws **(1)** that secure the flash drive bay cover to the computer.
3. Lift the right side of the flash drive bay cover **(2)**, swing it to left, and remove the cover. The flash drive bay cover is included in the Plastics Kit, spare part number 417527-001.



4. Grasp the Mylar tab **(1)** on the flash drive and pull the module **(2)** to the left to disconnect it from the system board.

5. Remove the flash drive **(3)** from the flash drive bay.



6. If it is necessary to replace the flash drive bracket, slide the module out of the bracket.



Reverse this procedure to reassemble and install the flash drive.

Memory module

Description	Spare part number
1024-MB (PC2-5300, 667-MHz, DDR2)	414046-001

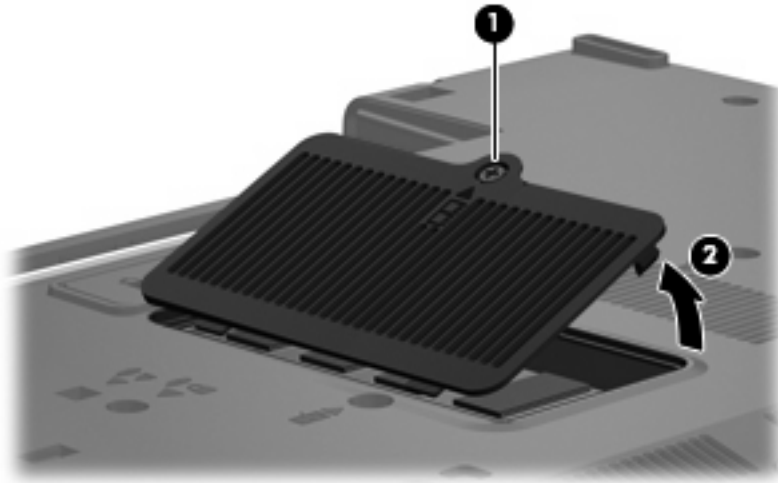
Before removing the memory module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off, 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 29](#)).

Remove the memory module:

1. Loosen the Phillips PM2.0×6.0 captive screw **(1)** that secures the memory module compartment cover to the computer.

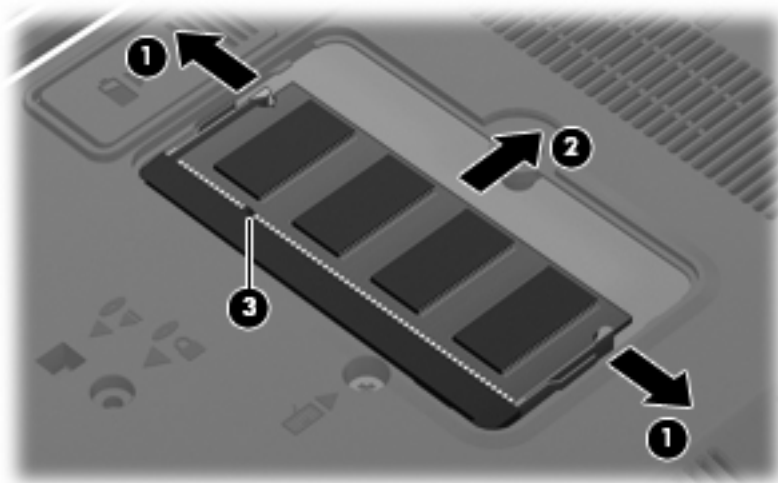
2. Lift the right edge of the cover **(2)**, swing it up and to the left, and remove the cover. The memory module compartment cover is included in the Plastics Kit, spare part number 417527-001.



3. Spread the retaining tabs **(1)** on each side of the memory module slot to release the memory module. (The edge of the module opposite the slot rises away from the computer.)
4. Remove the memory module **(2)** by pulling the module away from the slot at an angle.



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



Reverse this procedure to install a memory module.

Optical drive



NOTE: All optical drive spare part kits include an optical drive bezel.

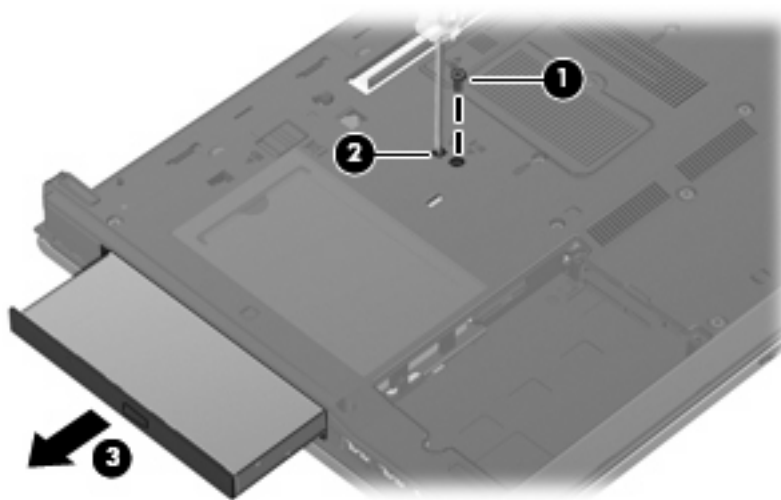
Description	Spare part number
8X Max DVD-ROM Drive	467782-001

Before removing the optical drive, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off, 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 29](#)).

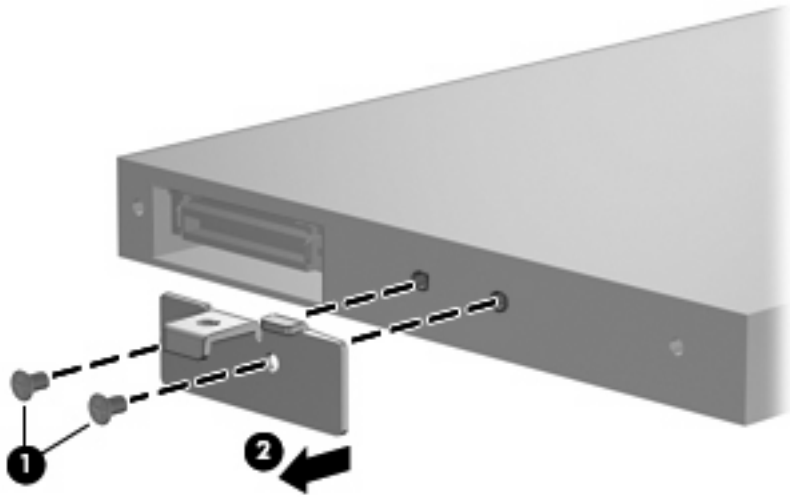
Remove the optical drive:

1. Position the computer with the left side toward you.
2. Remove the Torx T8M2.5×9.0 screw **(1)** that secures the optical drive to the computer.
3. Insert a flat-bladed screwdriver or similar tool into the optical drive tab access **(2)**, and press the tab to the left to release the optical drive from the computer.
4. Remove the optical drive **(3)** from the computer.



5. If it is necessary to replace the optical drive bracket, position the optical drive with the back edge toward you.
6. Remove the two Phillips PM2.0×4.0 screws **(1)** that secure the bracket to the optical drive.

7. Remove the optical drive bracket **(2)**.



Reverse this procedure to reassemble and install an optical drive.

Keyboard

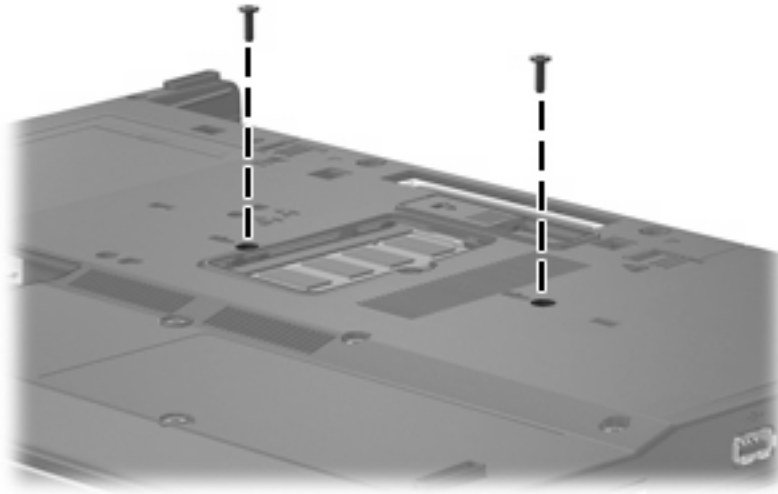
Description		Spare part number	
Keyboards for use in the following countries or regions:			
Belgium	481424-181	Portugal	481424-131
The Czech Republic	481424-221	Russia	481424-251
Denmark	481424-081	Saudi Arabia	481424-171
France	481424-051	Slovakia	481424-231
French Canada	481424-121	Slovenia	481424-BA1
Germany	481424-041	South Korea	481424-AD1
Greece	481424-DJ1	Spain	481424-071
Hungary	481424-211	Sweden and Finland	481424-B71
Iceland	481424-DD1	Switzerland	481424-BG1
Israel	481424-BB1	Taiwan	481424-AB1
Italy	481424-061	Turkey	481424-141
Japan	481424-291	The United Kingdom	481424-031
The Netherlands	481424-B31	The United States	481424-001
Norway	481424-091		

Before removing the switch cover and keyboard, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off, 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 29](#)).

Remove the keyboard:

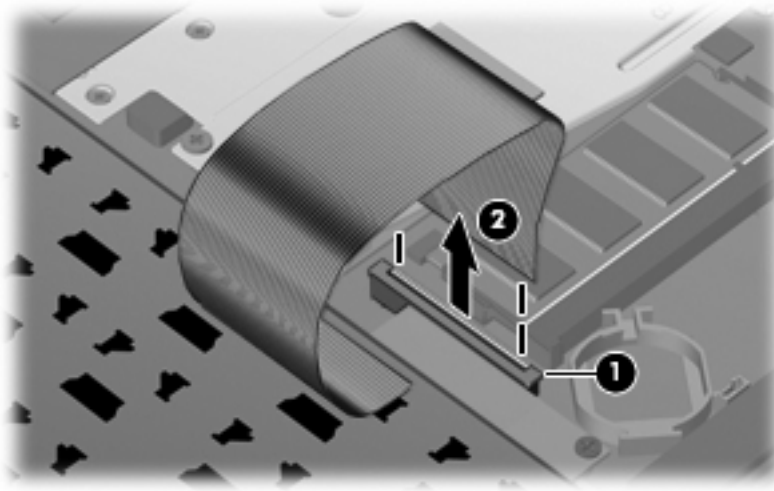
1. Remove the two Torx T8M2.5×9.0 screws that secure the keyboard to the computer.



2. Turn the computer display-side up, with the front toward you.
3. Open the computer as far as possible.
4. Slide the four keyboard retention tabs **(1)** toward you. The tabs are located between the **esc** and **f1** keys, between the **f4** and **f5** keys, between the **f8** and **f9** keys, and between the **f12** and **delete** keys.
5. Lift the rear edge of the keyboard **(2)** until it rests at an angle.
6. Slide the keyboard back **(3)** until it rests against the display.



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



8. Remove the keyboard.

Reverse this procedure to install the keyboard.

RTC battery

 **NOTE:** Removing the RTC battery and leaving it uninstalled for 5 or more minutes causes all passwords and CMOS settings to be cleared.

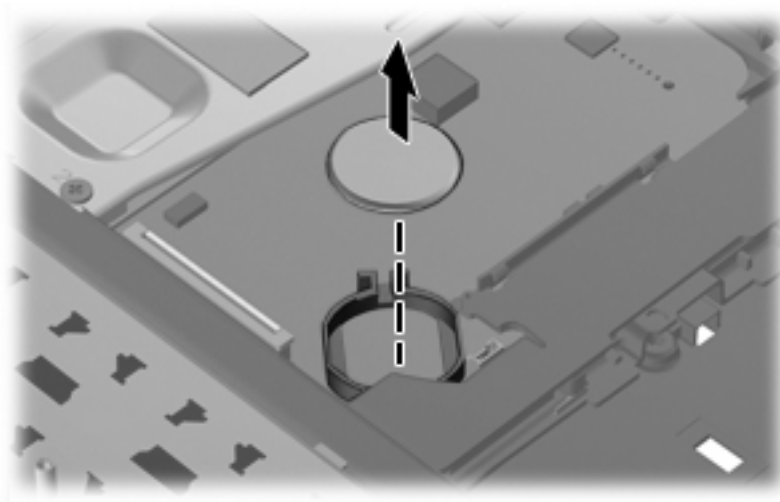
Description	Spare part number
RTC battery	449137-001

Before removing the RTC battery, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off, 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 29](#)).
5. Remove the keyboard (see [Keyboard on page 35](#)).

Remove the RTC battery:

- ▲ Use a non-conductive tool to remove the RTC battery from the socket on the system board.



Reverse this procedure to install the RTC battery.

Heat sink

Description	Spare part number
Heat sink (includes replacement thermal material)	468102-001

Before removing the heat sink, follow these steps:

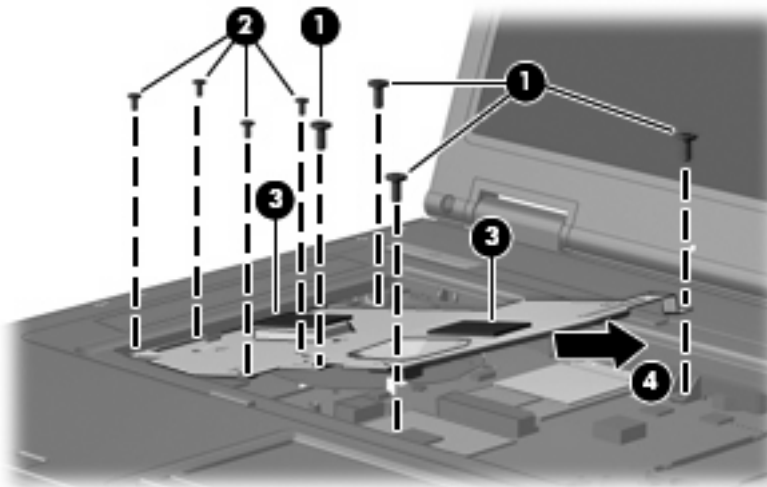
1. Shut down the computer. If you are unsure whether the computer is off, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 29](#)).
5. Remove the keyboard (see [Keyboard on page 35](#)).

Remove the heat sink:

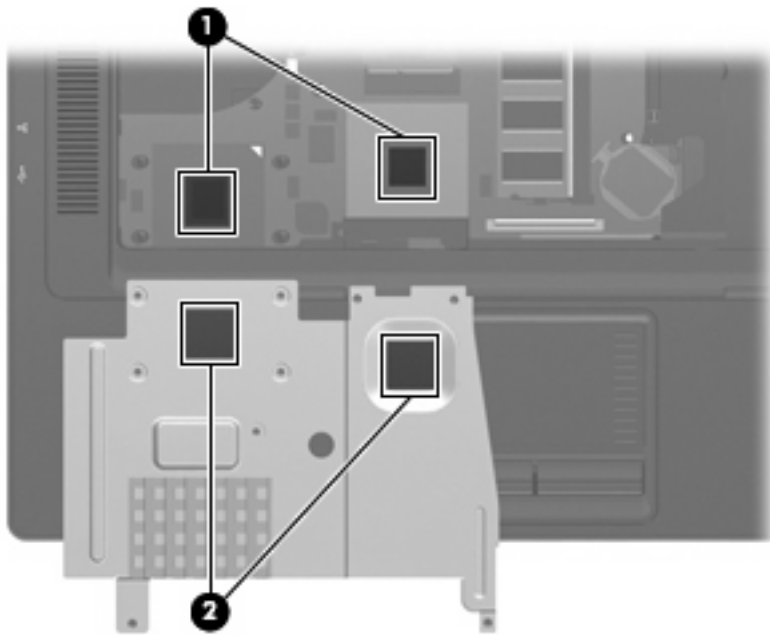
1. In the 1, 2, 3, 4, 5, 6, 7, 8 sequence stamped into the heat sink, remove the following screws:
 - (1) Four Phillips PM2.5×3.0 screws
 - (2) Four Phillips PM2.0×3.0 screws

 **NOTE:** When removing and replacing the heat sink, inspect the thermal pads (3) for damage. If the pads are damaged, replace them.

2. Remove the heat sink (4) by sliding it to the right until it clears the top cover.



 **NOTE:** The thermal material must be thoroughly cleaned from the processor and Northbridge chip (1) and the locations on the bottom of the heat sink (2) each time the heat sink is removed. Thermal material is included with all heat sink and system board spare part kits.



Reverse this procedure to install the heat sink.

WLAN module

Description	Spare part number
Broadcom 802.11a/b/g WLAN modules:	
For use in Canada, Cayman Islands, Guam, Puerto Rico, the U.S. Virgin Islands, and the United States	441075-001
For use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, the People's Republic of China, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	441075-002
For use in Japan	441075-291

Before removing the WLAN module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off, 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 29](#)).
5. Remove the keyboard (see [Keyboard on page 35](#)).
6. Remove the heat sink (see [Heat sink on page 39](#)).

Remove the WLAN module:

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

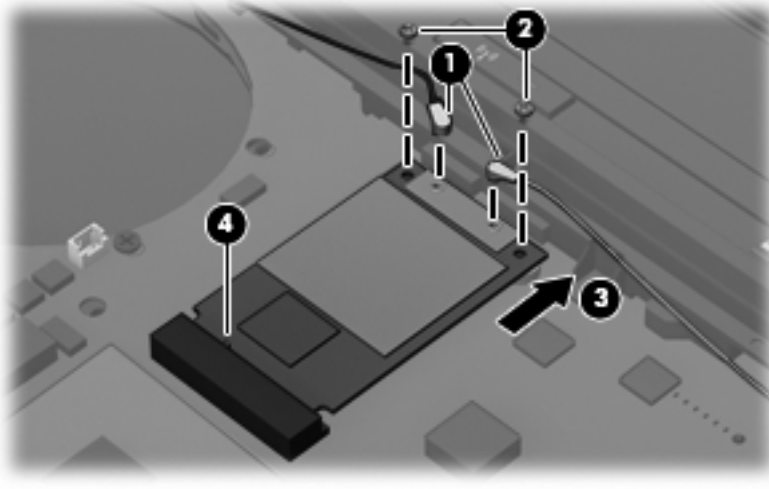


NOTE: The black WLAN antenna cable is connected to the WLAN module "Main" terminal. The white WLAN antenna cable is connected to the WLAN module "Aux" terminal.

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

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

 **NOTE:** WLAN modules are designed with a notch **(4)** to prevent incorrect installation.



Reverse this procedure to install the WLAN module.

Switch cover

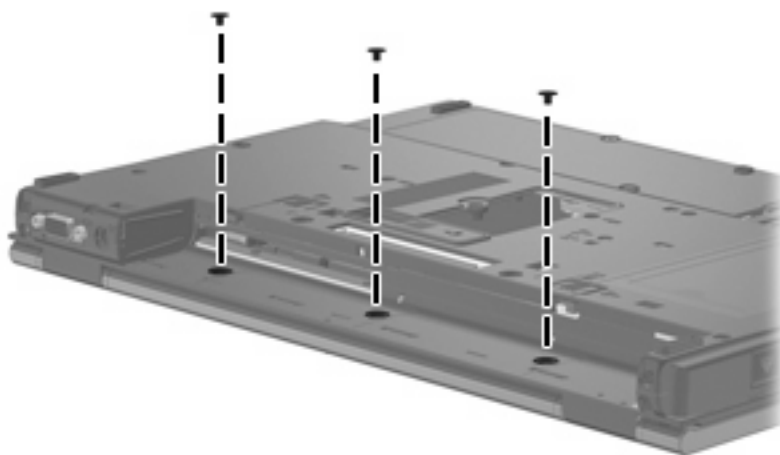
Description	Spare part number
Switch cover (includes LED board and cable)	417520-001

Before removing the switch cover, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off, 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 29](#)).
5. Remove the keyboard (see [Keyboard on page 35](#)).

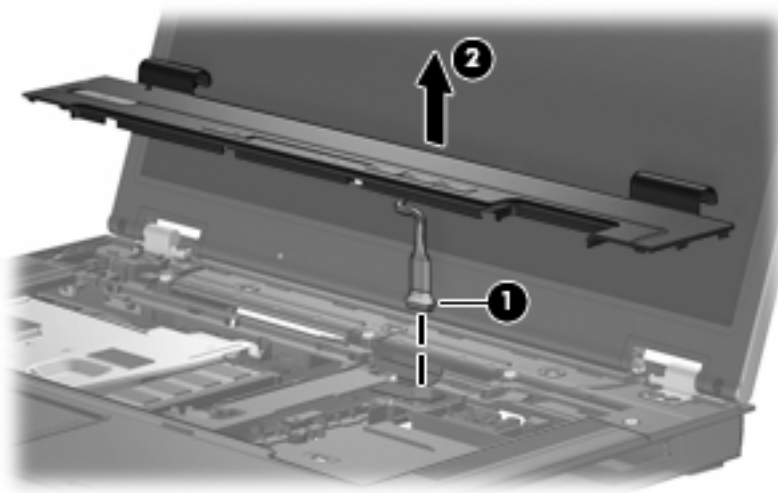
Remove the switch cover:

1. Close the computer.
2. Turn the computer upside down, with the rear toward you.
3. Remove the three Phillips PM2.0×2.0 broad-head screws that secure the switch cover to the computer.



4. Turn the computer display-side up, with the front toward you.
5. Open the computer as far as possible.
6. Disconnect the LED board cable **(1)** from the system board.

7. Remove the switch cover **(2)** by lifting it straight up.



Reverse this procedure to install the switch cover.

Display assembly

 **NOTE:** All display assembly spare part kits include 2 WLAN antenna transceivers and cables.

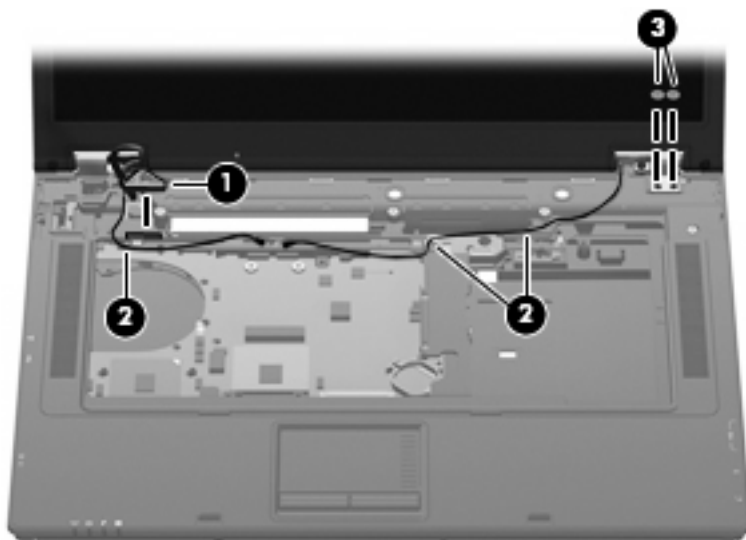
Description	Spare part number
15.4-inch, WXGA, antiglare display assembly (includes display panel cable and 2 wireless antenna transceivers and cables)	467783-001

Before removing the display assembly, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off, 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 29](#)).
5. Disconnect the wireless antenna cables from the WLAN module (see [WLAN module on page 41](#)).
6. Remove the keyboard (see [Keyboard on page 35](#)).
7. Remove the switch cover (see [Switch cover on page 43](#)).

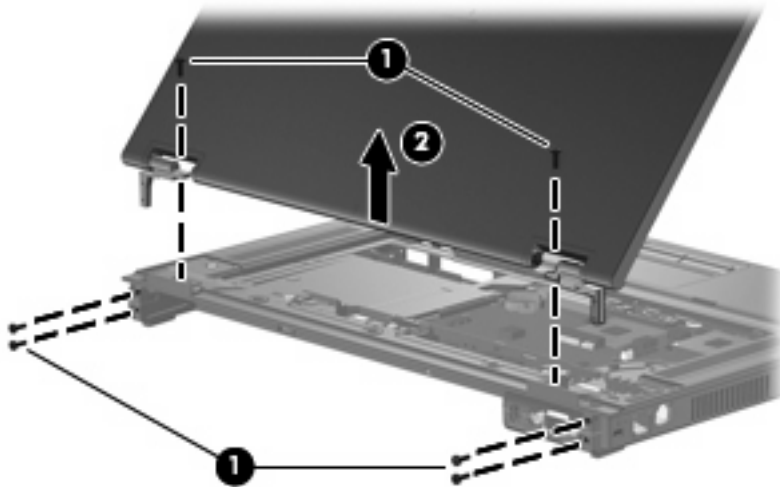
Remove the display assembly:

1. Disconnect the display panel cable **(1)** from the system board.
2. Remove the wireless antenna cables **(2)** from the clips and routing channels built into the top cover.
3. Remove the two Phillips PM2.0×2.0 broad-head screws **(3)** that secure the right display hinge to the computer.



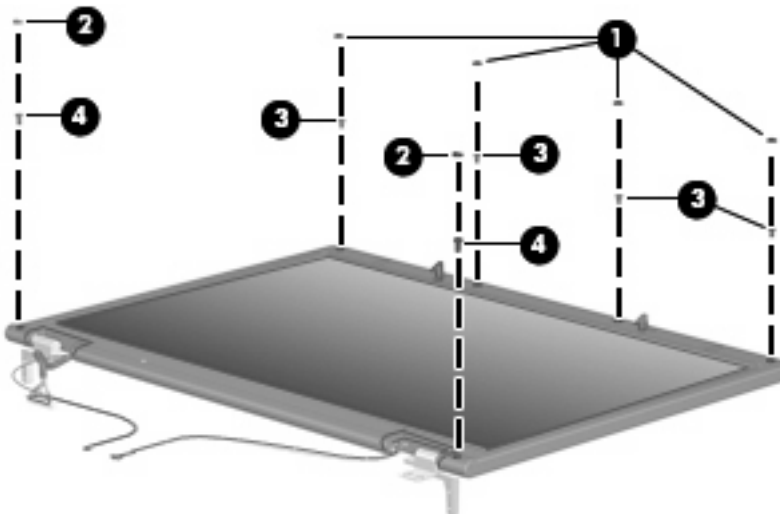
4. Position the computer with the rear panel toward you.

5. Remove the six Torx T8M2.5×9.0 screws **(1)** that secure the display assembly to the computer.
6. Lift the display assembly **(2)** straight up and remove it.



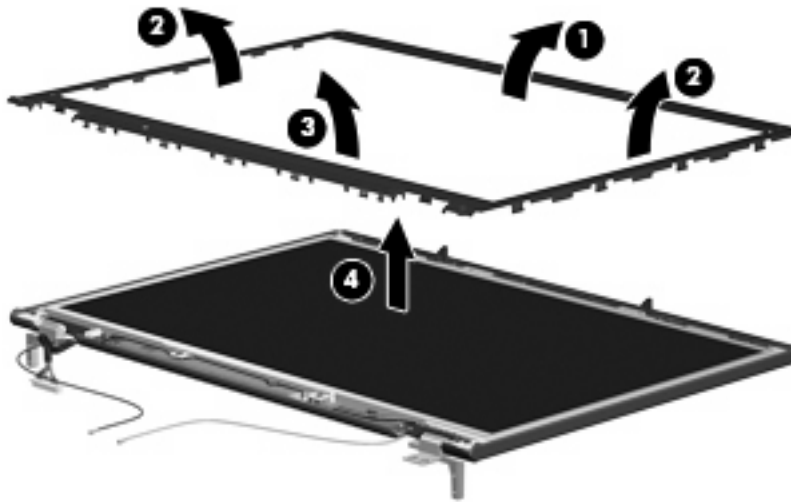
7. If it is necessary to replace the display bezel, display inverter, or display hinges, remove the rubber screw covers and screws listed below.

- (1)** Four rubber screw covers on the display bezel top edge.
- (2)** Two rubber screw covers on the display bezel bottom edge.
- (3)** Four Torx T8M2.5×5.0 screws on the display bezel top edge.
- (4)** Two Torx T8M2.5×7.0 screws on the display bezel bottom edge.



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

9. Remove the display bezel **(4)**. The display bezel is available using spare part number 466164-001.

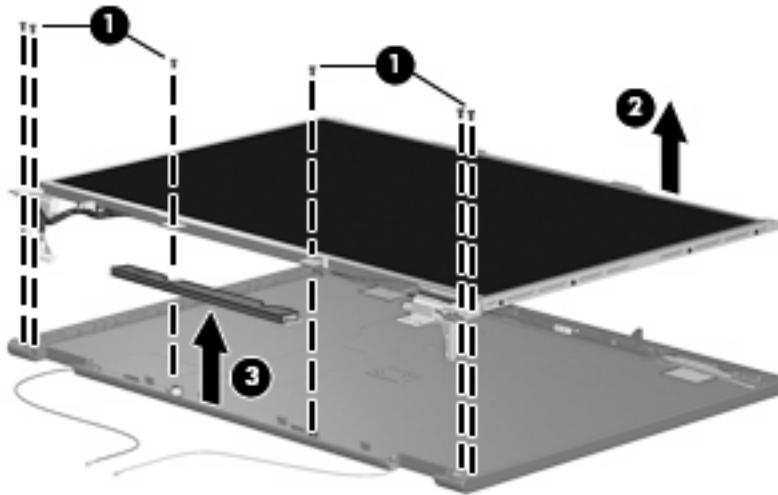


10. If it is necessary to replace the display inverter, disconnect the display panel cable **(1)** and the backlight cable **(2)** from the display inverter.

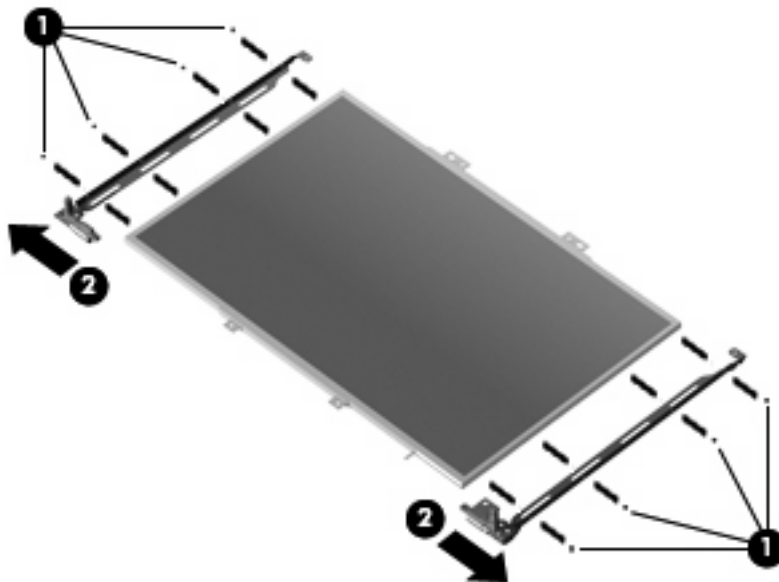


11. Remove the six Torx T8M2.5×5.0 screws **(1)** that secure the display panel to the display enclosure.
12. Remove the display panel **(2)**.

13. Remove the display inverter **(3)**. The display inverter is available using spare part number 466167-001.



14. If it is necessary to replace the display hinges, remove the four Phillips PM2.0x4.0 screws **(1)** that secure each display hinge to the display panel.
15. Remove the display hinges **(2)**. The left and right display hinges are available using spare part number 466166-001.



Reverse this procedure to reassemble and install the display assembly.

Top cover

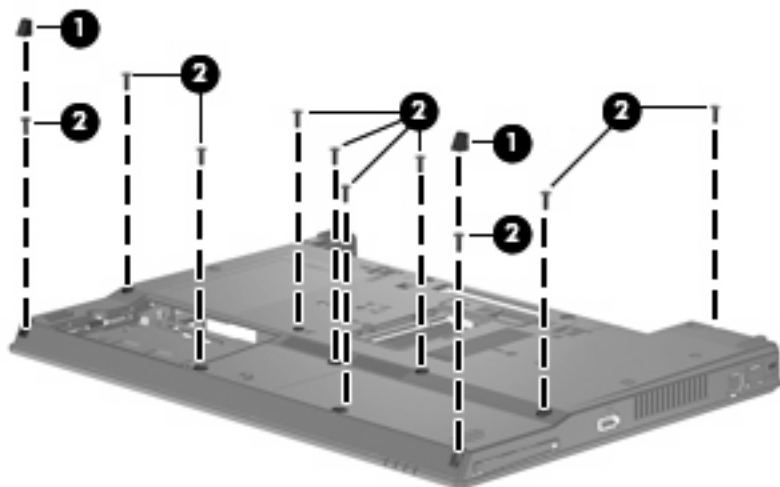
Description	Spare part number
Top cover (includes TouchPad board and cable, TouchPad button board and cable, speakers and cable)	466423-001

Before removing the top cover, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off, 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 29](#)).
5. Remove the following components:
 - a. Optical drive (see [Optical drive on page 33](#))
 - b. Keyboard (see [Keyboard on page 35](#))
 - c. Switch cover (see [Switch cover on page 43](#))
 - d. Display assembly (see [Display assembly on page 45](#))

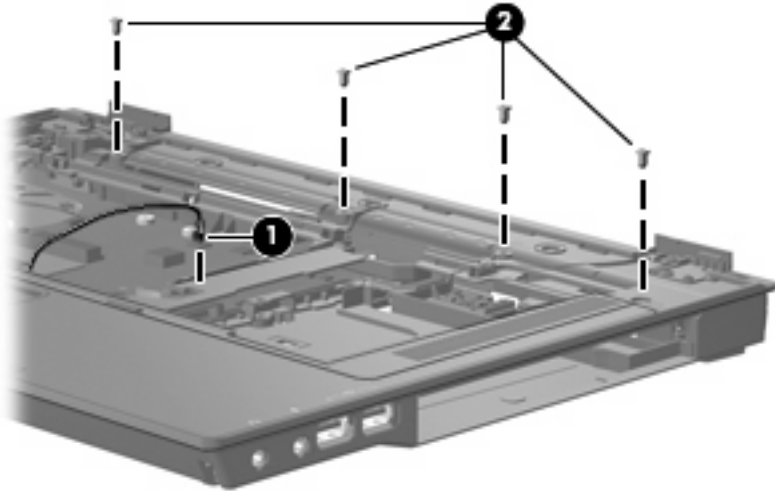
Remove the top cover:

1. Turn the computer upside down, with the front toward you.
2. Remove the following:
 - (1) Two rubber screw covers
 - (2) Ten Torx T8M2.5×9.0 screws

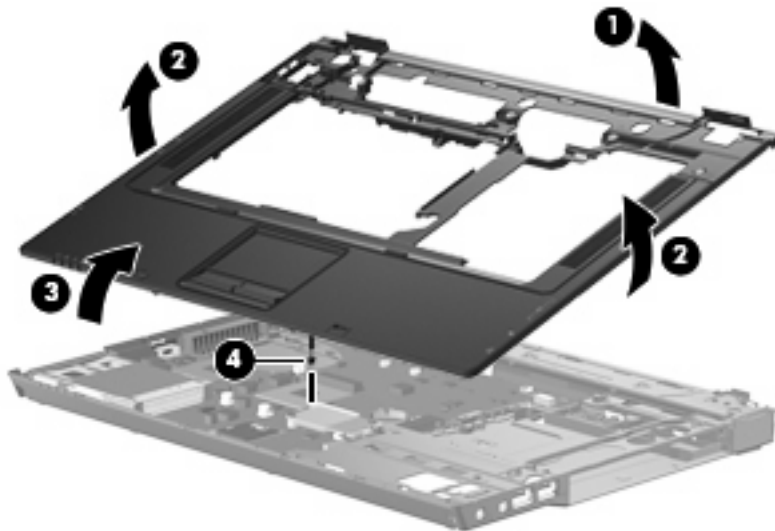


3. Turn the computer right-side up, with the front toward you.

4. Disconnect the speaker cable **(1)** from the system board.
5. Remove the four Torx T8M2.5×5.0 screws **(2)** that secure the top cover to the computer.



6. Lift the rear edge of the top cover **(1)** and swing it up and forward until it rests at an angle.
7. Lift up on the outside edges of the top cover left and right sides **(2)** until the top cover disengages from the base enclosure.
8. Lift up on the front edge of the top cover **(3)** until the TouchPad board cable is accessible.
9. Disconnect the TouchPad board cable **(4)** from the system board.



10. Remove the top cover.

Reverse this procedure to install the top cover.

Modem module

 **NOTE:** The modem module spare part kit does not include a modem module cable. The modem module cable is included with the system board frame, spare part number 480894-001.

Description	Spare part number
Modem module	441074-001

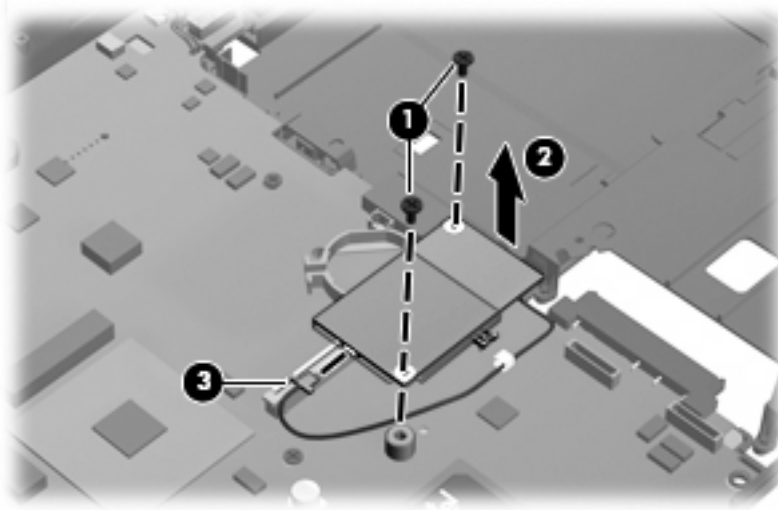
Before removing the modem module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off, 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 29](#)).
5. Remove the following components:
 - a. Optical drive (see [Optical drive on page 33](#))
 - b. Keyboard (see [Keyboard on page 35](#))
 - c. Switch cover (see [Switch cover on page 43](#))
 - d. Display assembly (see [Display assembly on page 45](#))
 - e. Top cover (see [Top cover on page 49](#))

Remove the modem module:

1. Remove the two Phillips PM2.5×4.0 screws **(1)** that secure the modem module to the system board.
2. Lift the modem module **(2)** straight up to disconnect it from the system board

3. Disconnect the modem module cable **(3)** from the modem module.



4. Remove the modem module.

Reverse this procedure to install the modem module.

System board and system board frame

Description	Spare part number
System board (includes RTC battery and replacement thermal material)	466424-001
System board frame (includes modem module cable)	480894-001

Before removing the system board and system board frame, follow these steps:

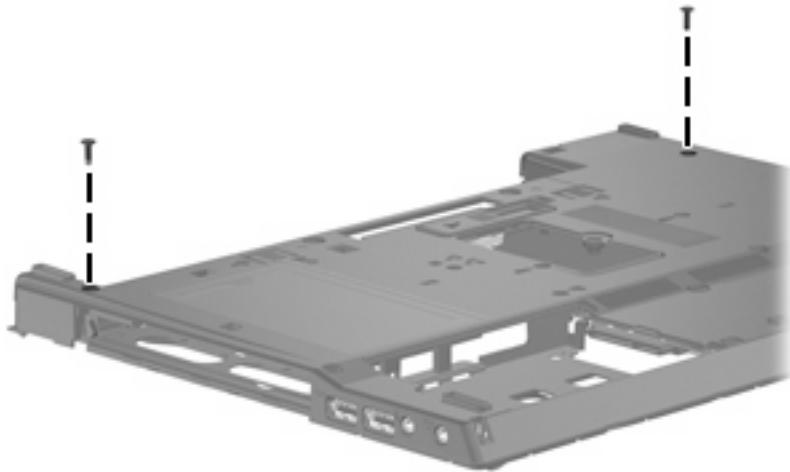
1. Shut down the computer. If you are unsure whether the computer is off, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 29](#)).
5. Remove the following components:
 - a. Flash drive (see [Flash drive on page 30](#))
 - b. Optical drive (see [Optical drive on page 33](#))
 - c. Keyboard (see [Keyboard on page 35](#))
 - d. Switch cover (see [Switch cover on page 43](#))
 - e. Display assembly (see [Display assembly on page 45](#))
 - f. Top cover (see [Top cover on page 49](#))

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

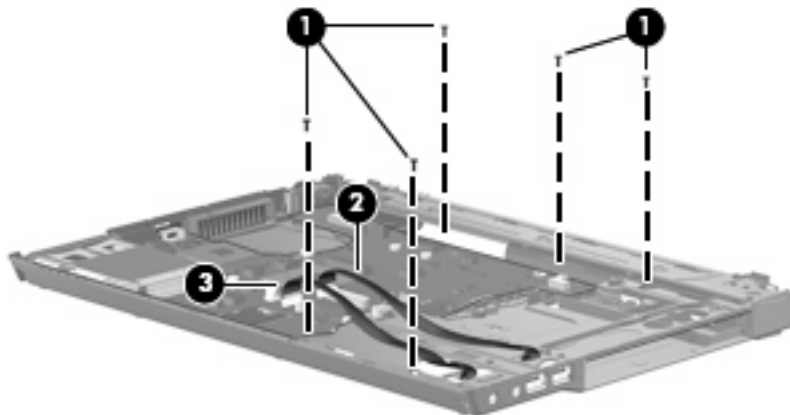
- Memory module (see [Memory module on page 31](#))
- WLAN module (see [WLAN module on page 41](#))

Remove the system board and system board frame:

1. Turn the computer upside down, with the front toward you.
2. Remove the two Torx T8M2.5×9.0 screws that secure the system board frame to the base enclosure.

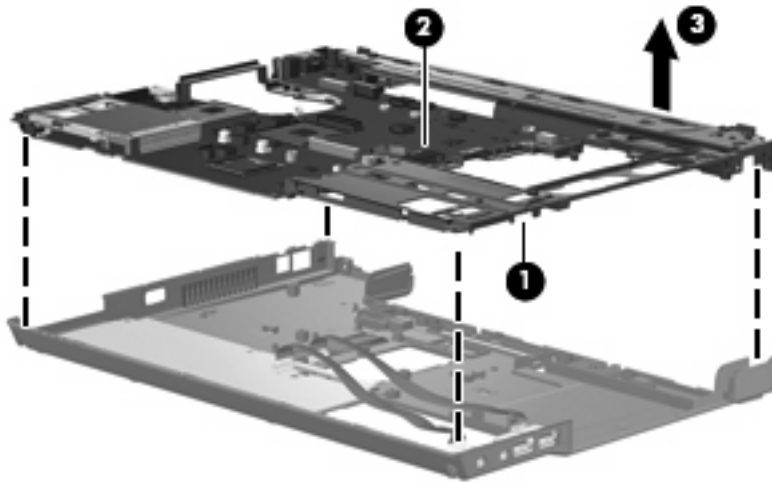


3. Turn the computer right-side up, with the front toward you.
4. Remove the five Torx T8M2.5×6.0 screws **(1)** that secure the system board frame to the base enclosure.
5. Disconnect the USB board cable **(2)** and audio board cable **(3)** from the system board.

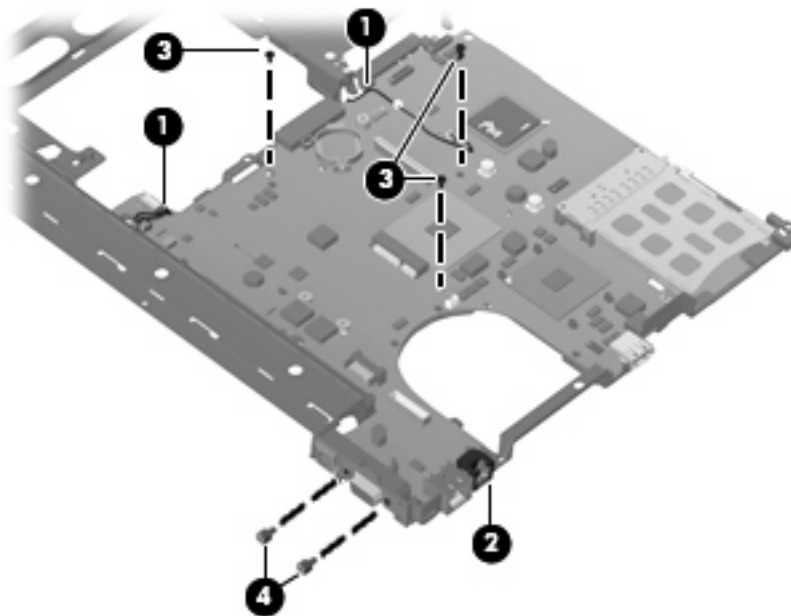


6. Position the base enclosure with the rear toward you.
7. Flex the base enclosure **(1)** above the USB connector until the connector is clear.
8. Use the optical drive connector **(2)** to release the system board frame and system board from the base enclosure.

9. Remove the system board frame and system board **(3)** from the base enclosure.

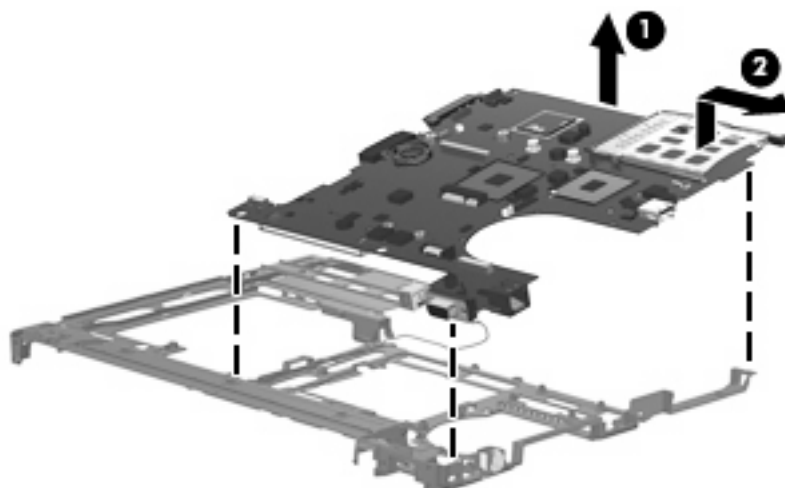


10. Release the modem module cable **(1)** from the two clips built into the system board.
11. Release the RJ-11 connector **(2)** from the clip built into the system board.
12. Remove the three Torx T8M2.5×4.0 screws **(3)** that secure the system board to the system board frame.
13. Remove the two Hex HM5.0×11.0 screw locks **(4)** that secure the system board to the system board frame.



14. Lift the front edge of the system board **(1)** until it rests at an angle.

15. Remove the system board **(2)** by pulling it away from the system board frame at an angle.



Reverse the preceding procedure to install the system board and system board frame.

PC Card assembly

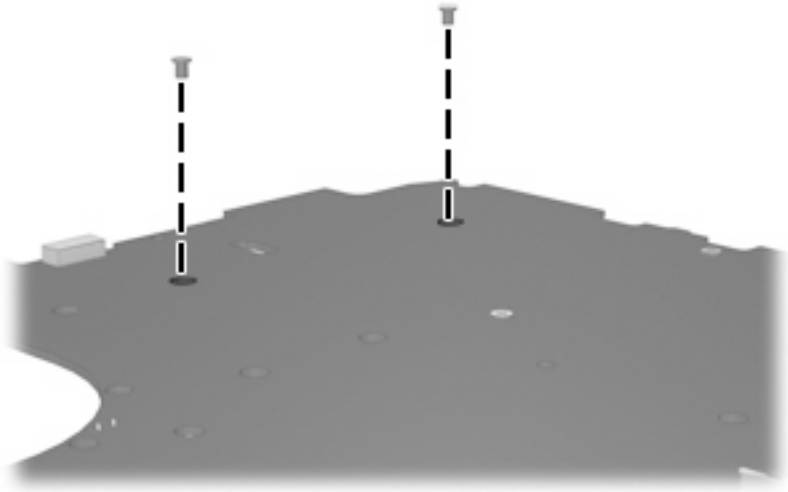
Description	Spare part number
PC Card assembly	480829-001

Before removing the PC Card assembly, follow these steps:

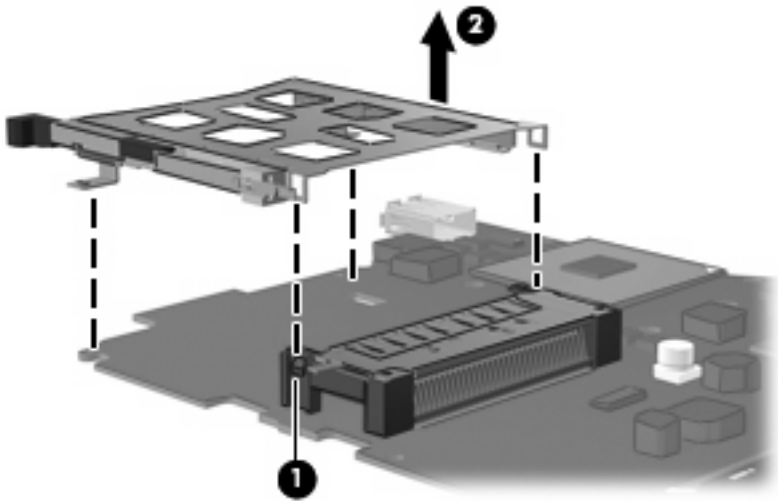
1. Shut down the computer. If you are unsure whether the computer is off, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 29](#)).
5. Remove the following components:
 - a. Flash drive (see [Flash drive on page 30](#))
 - b. Optical drive (see [Optical drive on page 33](#))
 - c. Keyboard (see [Keyboard on page 35](#))
 - d. Switch cover (see [Switch cover on page 43](#))
 - e. Display assembly (see [Display assembly on page 45](#))
 - f. Top cover (see [Top cover on page 49](#))
 - g. System board (see [System board and system board frame on page 52](#))

Remove the PC Card assembly:

1. Turn the system board upside down, with the front toward you.
2. Remove the two Phillips PM2.0×4.0 screws that secure the PC Card assembly to the system board.



3. Turn the system board right side up, with the front toward you.
4. Disengage the hook on the PC Card assembly from the tab **(1)** on the system board connector.
5. Remove the PC Card assembly **(2)**.



Reverse the preceding procedure to install the PC Card assembly.

Modem module cable

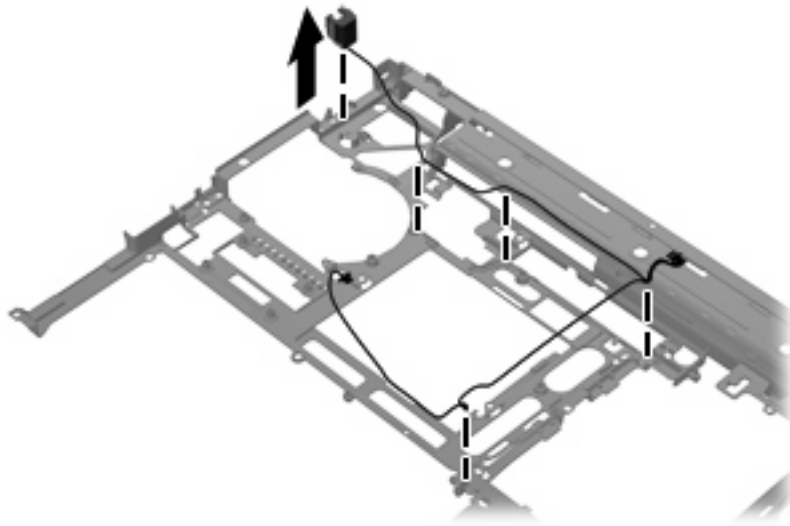
 **NOTE:** The modem module cable is included with the system board frame, spare part number 480894-001. See [System board and system board frame on page 52](#) for system board frame information.

Before removing the modem module cable, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off, 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 29](#)).
5. Remove the following components:
 - a. Flash drive (see [Flash drive on page 30](#))
 - b. Optical drive (see [Optical drive on page 33](#))
 - c. Keyboard (see [Keyboard on page 35](#))
 - d. Switch cover (see [Switch cover on page 43](#))
 - e. Display assembly (see [Display assembly on page 45](#))
 - f. Top cover (see [Top cover on page 49](#))
 - g. System board (see [System board and system board frame on page 52](#))

Remove the modem module cable:

- ▲ Remove the modem module cable from the clips built into the system board frame.



Reverse this procedure to install the modem module cable.

Audio/USB board

Description	Spare part number
Audio/USB board (includes audio board cable and USB board cable)	480828-001

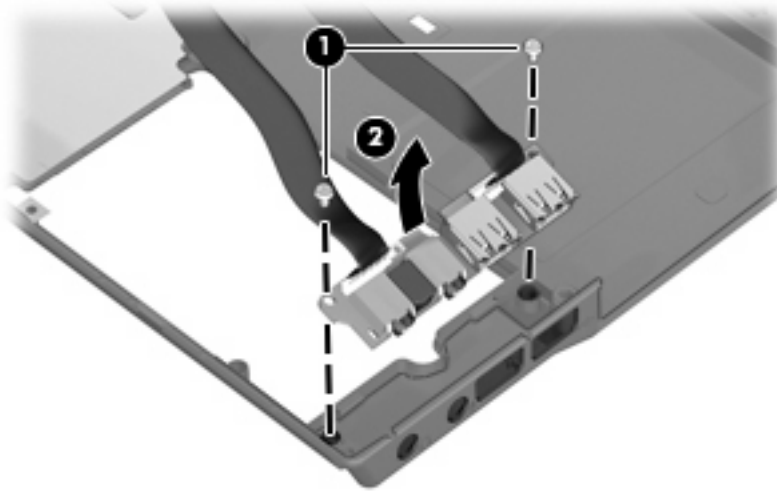
Before removing the audio/USB board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off, 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 29](#)).
5. Remove the following components:
 - a. Flash drive (see [Flash drive on page 30](#))
 - b. Optical drive (see [Optical drive on page 33](#))
 - c. Keyboard (see [Keyboard on page 35](#))
 - d. Switch cover (see [Switch cover on page 43](#))
 - e. Display assembly (see [Display assembly on page 45](#))
 - f. Top cover (see [Top cover on page 49](#))
 - g. System board (see [System board and system board frame on page 52](#))

Remove the audio/USB board:

1. Remove the two Torx T8M2.5×5.0 screws **(1)** that secure the audio/USB board to the base enclosure.

2. Lift the rear edge of the audio/USB board **(2)** until the board is clear of the base enclosure.



3. Remove the audio/USB board from the base enclosure.

Reverse this procedure to install the audio/USB board.

5 Computer Setup

Starting Computer Setup

Computer Setup is a preinstalled ROM-based utility that can be used even when the operating system is not working or will not load.

 **NOTE:** Some of the Computer Setup menu items listed in this guide may not be supported by your computer.

NOTE: Pointing devices are not supported in Computer Setup. You must use the keyboard to navigate and make selections.

To start Computer Setup:

1. Turn on or restart the computer.
2. Before Windows opens and while the “F10=ROM Based Setup” message is displayed in the lower-left corner of the screen, press **F10**.

Using Computer Setup

Navigating and selecting in Computer Setup

The information and settings in Computer Setup are accessed from the File, Security, Diagnostics, and System Configuration menus.

1. Open Computer Setup by turning on or restarting the computer, and then pressing **f10** while the "F10 = ROM Based Setup" message is displayed in the lower-left corner of the screen.

Because Computer Setup 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 select an item, press **enter**.
 - To close open dialog boxes and return to the main Computer Setup screen, press **esc**.
 - To view navigation information, press **f1**.
 - To change the language, press **f2**.
2. Select the **File**, **Security**, **Diagnostics**, or **System Configuration** menu.
 3. To exit Computer Setup, choose one of the following methods:
 - To exit Computer Setup without saving your preferences, use the arrow keys to select **File > Ignore changes and exit**. Then follow the instructions on the screen.
 - To save your preferences and exit Computer Setup, use the arrow keys to select **File > Save changes and exit**. Then follow the instructions on the screen.

Your preferences go into effect when the computer restarts.

Restoring factory settings in Computer Setup

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

1. Open Computer Setup by turning on or restarting the computer, and then pressing **f10** while the "F10 = ROM Based Setup" message is displayed in the lower-left corner of the screen.
2. Use the arrow keys to select **File > Restore defaults**, and then press **enter**.
3. When the confirmation dialog box opens, press **f10**.
4. To save your preferences and exit Computer Setup, use the arrow keys to select **File > Save changes and exit**. Then follow the instructions on the screen.

Your preferences go into effect when the computer restarts.



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

Computer Setup menus

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

 **NOTE:** Some of the Computer Setup menu items listed in this chapter may not be supported by your computer.

File menu

Select	To do this
System information	• View identification information for the computer and the batteries in the system. • View specification information for the processor, cache and memory size, system ROM, video revision, and keyboard controller version.
Restore defaults	Replace the configuration settings in Computer Setup with the original factory settings. (Password settings and security settings are not changed when you restore the factory settings.)
Ignore changes and exit	Cancel any changes entered during the current session and exit Computer Setup.
Save changes and exit	Save any changes entered during the current session and exit Computer Setup. Your changes go into effect when the computer restarts.

Security menu

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

Select	To do this
Setup Password	Enter, change, or delete a setup password.
Power-On Password	Enter, change, or delete a power-on password.
Password Options	• Enable/disable stringent security. • Enable/disable the password requirement on computer restart.
Smart Card Security	Enable/disable smart cards.
System IDs	Enter a user-defined computer asset tracking number and ownership tag.

Diagnostics menu

Select	To do this
Memory Check	Run a comprehensive test on system memory.

System Configuration menu



NOTE: Some of the listed System Configuration options may not be supported by your computer.

Select	To do this
Language (or press f2)	Change the Computer Setup language.
Boot Options	• Set an f9, f10, and f12 delay when starting up. • Enable/disable CD-ROM boot. • Enable/disable floppy boot. • Enable/disable internal network adapter boot and set the boot mode (PXE). • Enable/disable MultiBoot, which sets a boot order that can include most boot devices in the system. • Set the Express Boot Popup delay in seconds. • Set the boot order.
Device Configurations	• Swap the functions of the fn key and left ctrl key. • Enable/disable USB legacy support. When enabled, USB legacy support allows the following: ◦ Use of a USB keyboard in Computer Setup even when a Windows operating system is not running. ◦ Startup from bootable USB devices, including a hard drive, diskette drive, or optical drive connected by a USB port to the computer.
Built-In Device Options	• Enable/disable embedded WLAN Device Radio. • Network Interface Controller (LAN). • LAN/WAN switching. • Enable/disable Wake on LAN. • Enable/disable the optical disc drive.
Port Options	• Enable/disable the USB port. • Enable/disable the PC Card slot.

6 Specifications

Computer specifications

	Metric	U.S.
Dimensions		
Length	26.0 cm	10.23 in
Width	35.7 cm	14.05 in
Height (front to rear)	3.0 to 3.6 cm	1.16 to 1.43 in
Weight (equipped with optical drive, flash drive, and battery)	2.54 kg	5.6 lbs
Input power		
Operating voltage	19.0 V dc @ 4.74 A – 90 W	
Operating current	4.74 A	
Temperature		
Operating (not writing to optical disc)	0°C to 35°C	32°F to 95°F
Operating (writing to optical disc)	5°C to 35°C	41°F to 95°F
Nonoperating	-20°C to 60°C	-4°F to 140°F
Relative humidity		
Operating	10% to 90%	
Nonoperating	5% to 95%	
Maximum altitude (unpressurized)		
Operating	-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
Shock		
Operating	125 g, 2 ms, half-sine	
Nonoperating	200 g, 2 ms, half-sine	
Random vibration		
Operating	0.75 g zero-to-peak, 10 Hz to 500 Hz, 0.25 oct/min sweep rate	

	Metric	U.S.
Nonoperating	1.50 g zero-to-peak, 10 Hz to 500 Hz, 0.5 oct/min sweep rate	
NOTE: Applicable product safety standards specify thermal limits for plastic surfaces. The computer operates well within this range of temperatures.		

15.4-inch, WXGA display specifications

	Metric	U.S.
Dimensions		
Height	20.7 cm	8.15 in
Width	33.1 cm	13.03 in
Diagonal	39.1 cm	15.39 in
Number of colors	Up to 16.8 million	
Contrast ratio	200:1 (typical)	
Brightness	180 nits (typical)	
Pixel resolution		
Pitch	0.197 × 0.197 mm	
Format	1366 × 768	
Configuration	RGB vertical stripe	
Backlight	CCFT	
Character display	80 × 25	
Total power consumption	7.0 W	
Viewing angle	+/-40° horizontal, +/-50° vertical (typical)	

8X Max DVD-ROM Drive specifications

Applicable disc	DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18, CD-ROM (Mode 1 and 2), CD Digital Audio, CD-XA ready (Mode 2, Form 1 and Form 2), CD-I (Mode 2, Form 1 and Form 2), CD-R, CD-RW, Photo CD (single and multisession), CD-Bridge	
Access time	CD	DVD
Random	< 100 ms	< 125 ms
Cache buffer	512 KB	
Data transfer rate		
CD-R (24X)	3600 KB/s (150 KB/s at 1X CD rate)	
CD-RW (10X)	1500 KB/s (150 KB/s at 1X CD rate)	
CD-ROM (24X)	3600 KB/s (150 KB/s at 1X CD rate)	
DVD (8X)	10,800 KB/s (1,352 KB/s at 1X DVD rate)	
Multiword DMA mode 2	16.6 MB/s	

System DMA specifications

Hardware DMA	System function
DMA0	Not applicable
DMA1 *	Not applicable
DMA2 *	Not applicable
DMA3	Not applicable
DMA4	Direct memory access controller
DMA5 *	Available for ExpressCard
DMA6	Not assigned
DMA7	Not assigned
*ExpressCard controller can use DMA 1, 2, or 5.	

System interrupt specifications

Hardware IRQ	System function
IRQ0	System timer
IRQ1	Standard 101-/102-Key or Microsoft® Natural Keyboard
IRQ2	Cascaded
IRQ3	Intel 82801DB/DBM USB2 Enhanced Host Controller—24CD
IRQ4	COM1
IRQ5*	Conexant AC—Link Audio Intel 82801DB/DBM SMBus Controller—24C3 Data Fax Modem with SmartCP
IRQ6	Diskette drive
IRQ7*	Parallel port
IRQ8	System CMOS/real-time clock
IRQ9*	Microsoft ACPI-compliant system
IRQ10*	Intel USB UHCI controller—24C2
	Intel 82852/82855 GM/GME Graphic Controller
	Realtek RTL8139 Family PCI Fast Ethernet Controller
IRQ11	Intel USB EHCI controller—24CD
	Intel USB UHCI controller—24C4
	Intel USB UHCI controller—24C7
	Intel Pro/Wireless 2200BG
	TI OHCI 1394 host controller
	TI PCI1410 CardBus controller
IRQ12	Synaptics PS/2 TouchPad
IRQ13	Numeric data processor
IRQ14	Primary IDE channel
IRQ15	Secondary IDE channel
*Default configuration; audio possible configurations are IRQ5, IRQ7, IRQ9, IRQ10, or none.	
NOTE: ExpressCards may assert IRQ3, IRQ4, IRQ5, IRQ7, IRQ9, IRQ10, IRQ11, or IRQ15. Either the infrared or the serial port may assert IRQ3 or IRQ4.	

System I/O address specifications

I/O address (hex)	System function (shipping configuration)
000 - 00F	DMA controller no. 1
010 - 01F	Unused
020 - 021	Interrupt controller no. 1
022 - 024	Opti chipset configuration registers
025 - 03F	Unused
02E - 02F	87334 "Super I/O" configuration for CPU
040 - 05F	Counter/timer registers
044 - 05F	Unused
060	Keyboard controller
061	Port B
062 - 063	Unused
064	Keyboard controller
065 - 06F	Unused
070 - 071	NMI enable/RTC
072 - 07F	Unused
080 - 08F	DMA page registers
090 - 091	Unused
092	Port A
093 - 09F	Unused
0A0 - 0A1	Interrupt controller no. 2
I/O Address (hex)	System function (shipping configuration)
0A2 - 0BF	Unused
0C0 - 0DF	DMA controller no. 2
0E0 - 0EF	Unused
0F0 - 0F1	Coprocessor busy clear/reset
0F2 - 0FF	Unused
100 - 16F	Unused
170 - 177	Secondary fixed disk controller
178 - 1EF	Unused
1F0 - 1F7	Primary fixed disk controller
1F8 - 200	Unused
201	JoyStick (decoded in ESS1688)
202 - 21F	Unused

I/O address (hex)	System function (shipping configuration)
220 - 22F	Entertainment audio
230 - 26D	Unused
26E - 26	Unused
278 - 27F	Unused
280 - 2AB	Unused
2A0 - 2A7	Unused
2A8 - 2E7	Unused
2E8 - 2EF	Reserved serial port
2F0 - 2F7	Unused
2F8 - 2FF	Infrared port
300 - 31F	Unused
320 - 36F	Unused
370 - 377	Secondary diskette drive controller
378 - 37F	Parallel port (LPT1/default)
380 - 387	Unused
388 - 38B	FM synthesizer—OPL3
38C - 3AF	Unused
3B0 - 3BB	VGA
3BC - 3BF	Reserved (parallel port/no EPP support)
3C0 - 3DF	VGA
3E0 - 3E1	ExpressCard controller in CPU
3E2 - 3E3	Unused
3E8 - 3EF	Internal modem
3F0 - 3F7	"A" diskette controller
3F8 - 3FF	Serial port (COM1/default)
CF8 - CFB	PCI configuration index register (PCIDIVO-1)
CFC - CFF	PCI configuration data register (PCIDIVO-1)

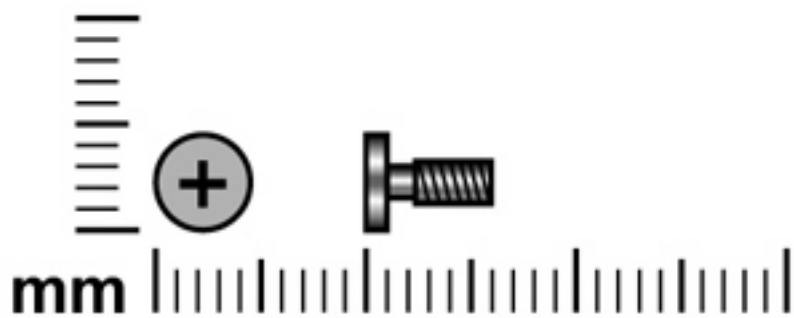
System memory map specifications

Size	Memory address	System function
640 KB	00000000-0009FFFF	Base memory
128 KB	000A0000-000BFFFF	Video memory
48 KB	000C0000-000CBFFF	Video BIOS
160 KB	000C8000-000E7FFF	Unused
64 KB	000E8000-000FFFFF	System BIOS
15 MB	00100000-00FFFFFF	Extended memory
58 MB	04800000-07FFFFFF	Super extended memory
58 MB	04800000-07FFFFFF	Unused
2 MB	08000000-080FFFFF	Video memory (direct access)
4 GB	08200000-FFFEFFFF	Unused
64 KB	FFFF0000-FFFFFFFF	System BIOS

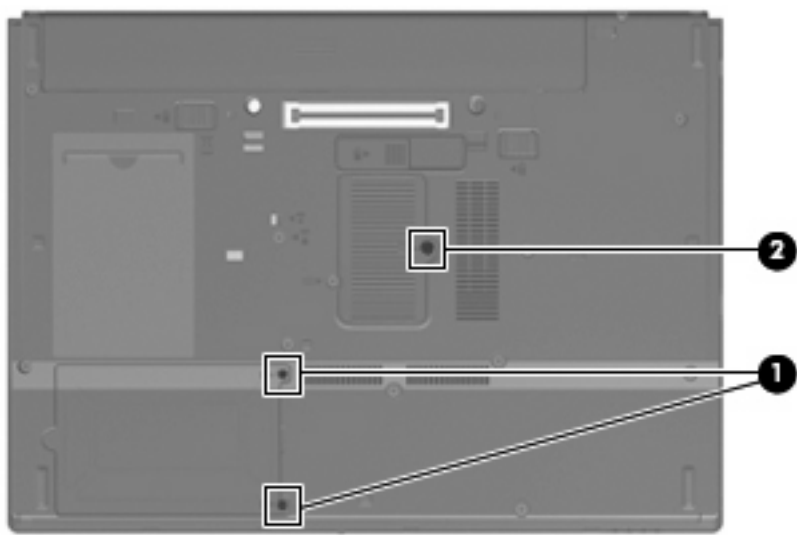
7 Screw listing

This section provides specification and reference information for the screws and screw locks used in the computer. All screws listed in this section are available in the Screw Kit, spare part number 417526-001.

Phillips PM2.0×6.0 captive screw



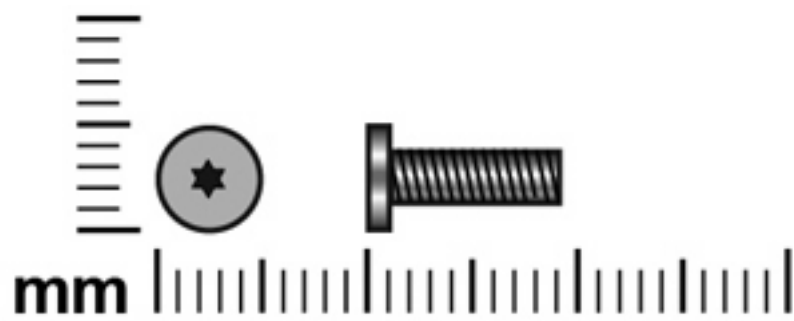
Color	Quantity	Length	Thread	Head diameter
Black	3	6.0 mm	2.0 mm	5.0 mm



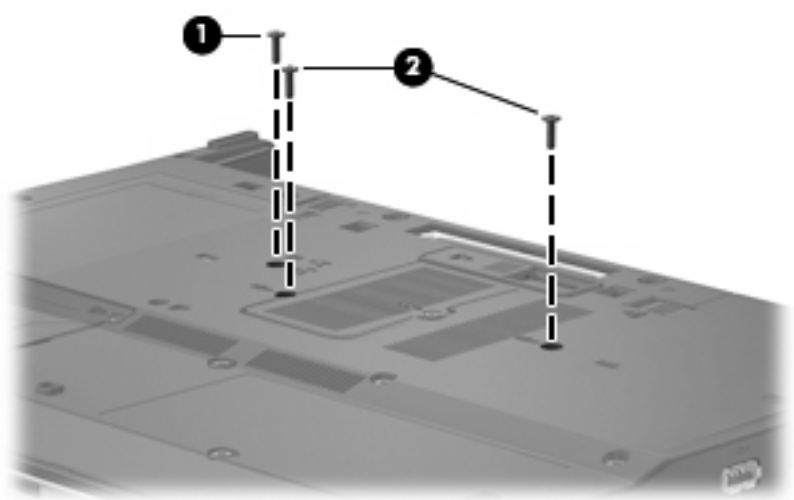
Where used:

- (1) Two captive screws that secure the flash drive bay cover to the computer (screws are captured on the cover by C-clips)
- (2) One captive screw that secures the memory module compartment cover to the computer (screw is captured on the cover by a C-clip)

Torx T8M2.5×9.0 screw

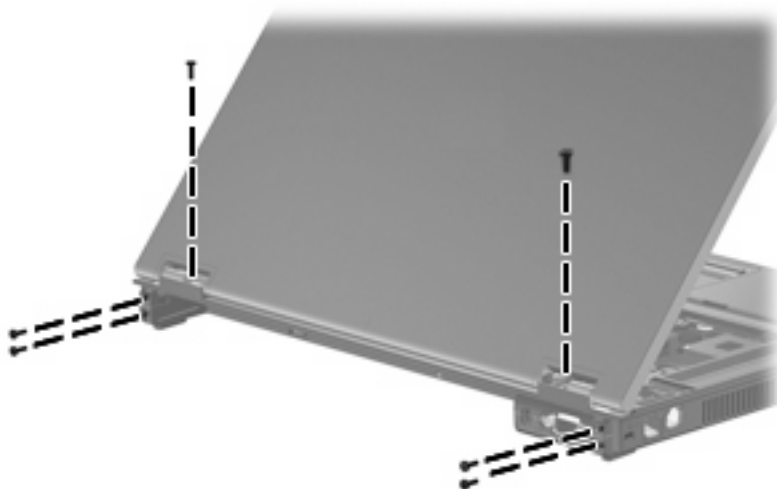


Color	Quantity	Length	Thread	Head diameter
Black	21	9.0 mm	2.5 mm	5.0 mm

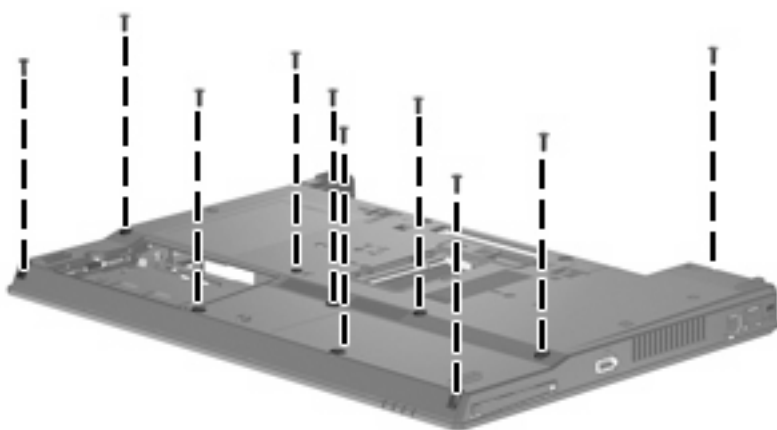


Where used:

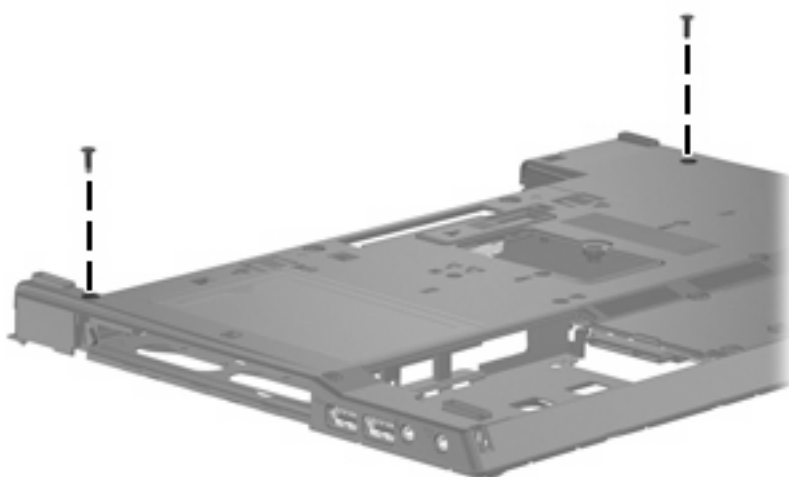
- (1) One screw that secures the optical drive to the computer
- (2) Two screws that secure the keyboard to the computer



Where used: 6 screws that secure the display assembly to the computer

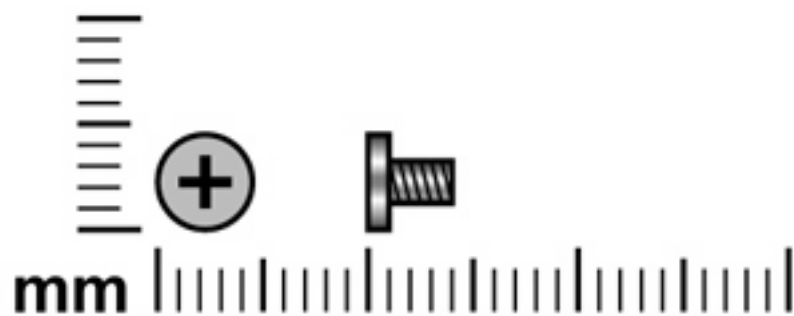


Where used: 10 screws that secure the top cover to the computer

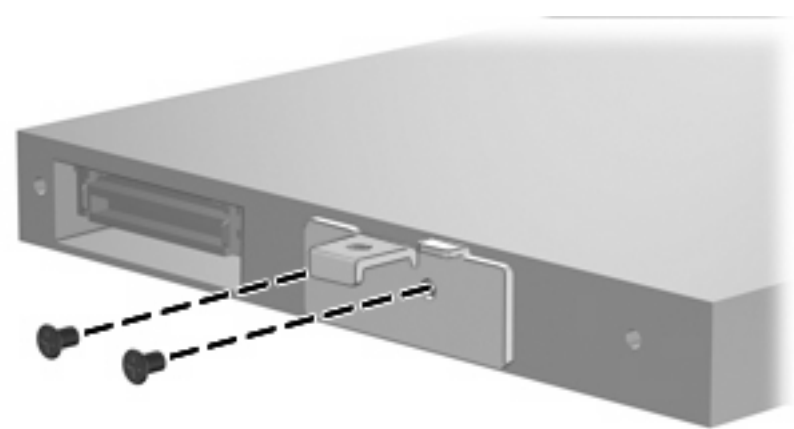


Where used: 2 screws that secure the system board frame to the base enclosure

Silver Phillips PM2.0×4.0 screw

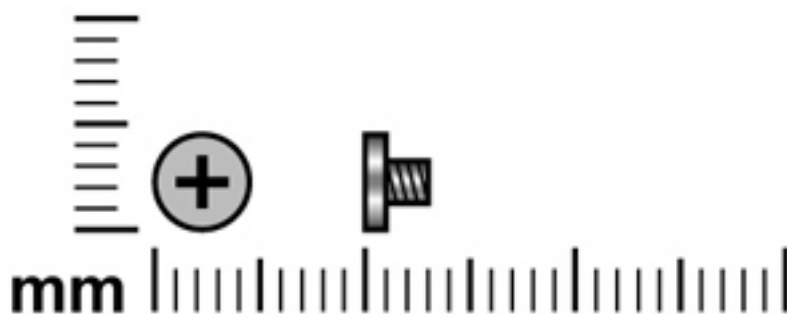


Color	Quantity	Length	Thread	Head diameter
Silver	2	4.0 mm	2.0 mm	4.5 mm

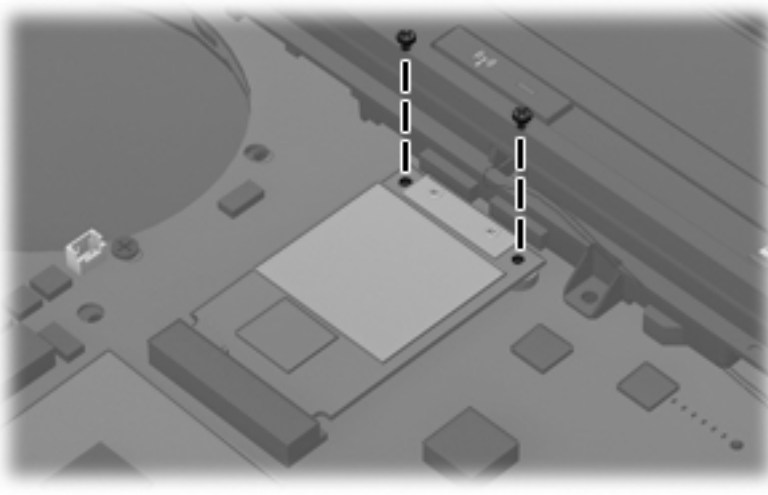


Where used: 2 screws that secure the optical drive bracket to the optical drive

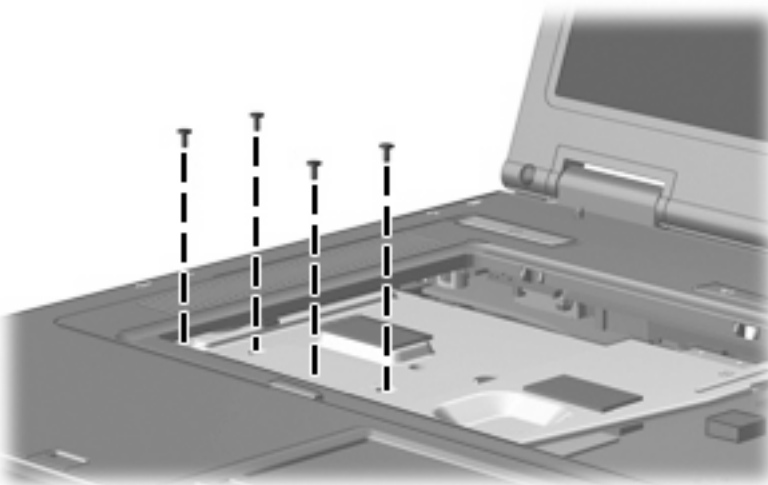
Phillips PM2.0×3.0 screw



Color	Quantity	Length	Thread	Head diameter
Silver	6	3.0 mm	2.0 mm	4.5 mm

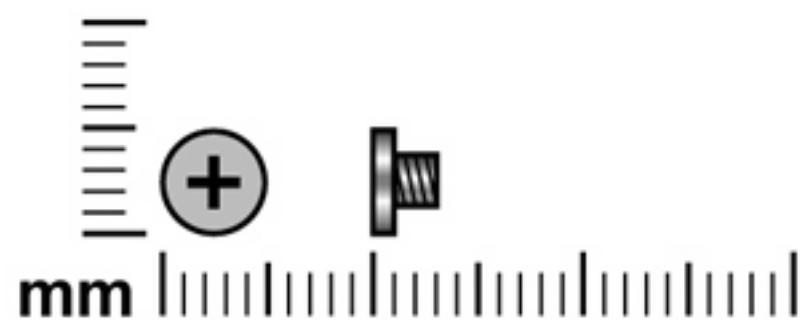


Where used: 2 screws that secure the WLAN module to the system board

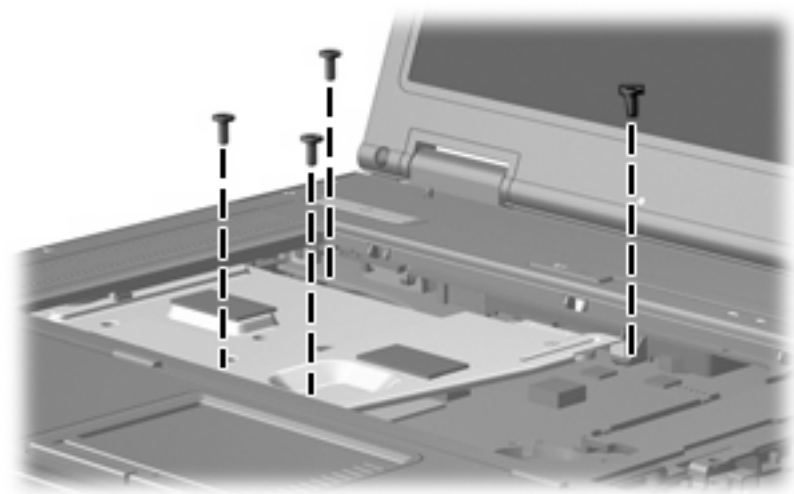


Where used: 4 screws that secure the heat sink to the computer

Phillips PM2.5×3.0 screw

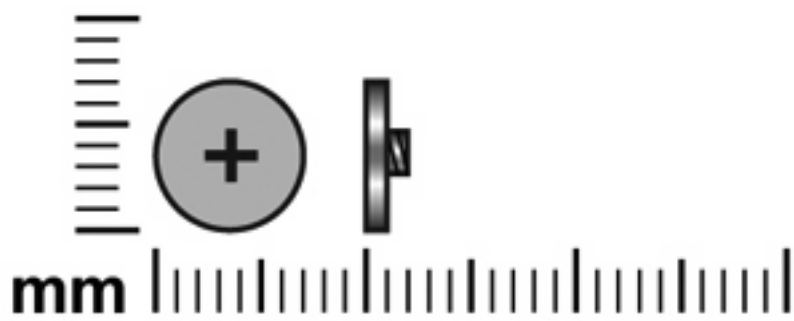


Color	Quantity	Length	Thread	Head diameter
Black	4	3.0 mm	2.5 mm	5.0 mm

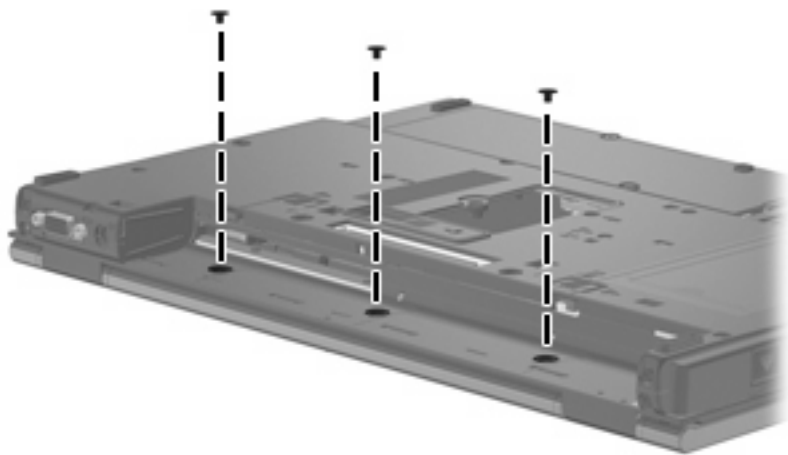


Where used: 4 screws that secure the heat sink to the computer

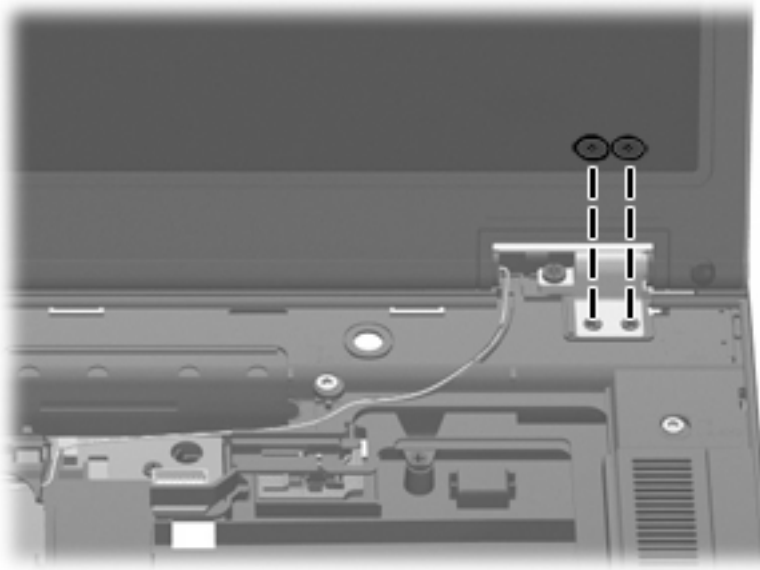
Phillips PM2.0×2.0 broad-head screw



Color	Quantity	Length	Thread	Head diameter
Black	5	2.0 mm	2.0 mm	7.0 mm

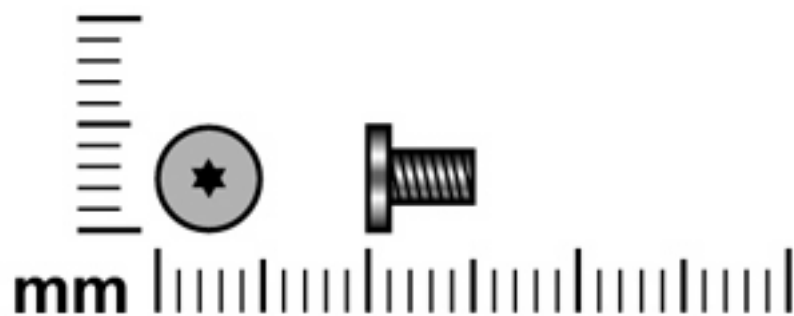


Where used: 3 screws that secure the switch cover to the computer

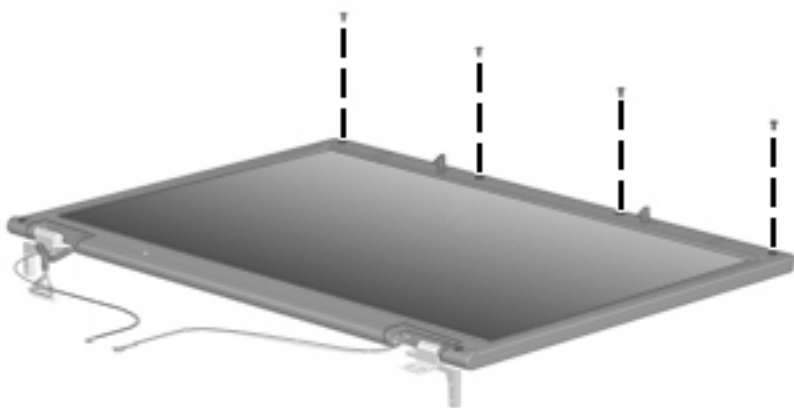


Where used: 2 screws that secure the display assembly right hinge to the computer

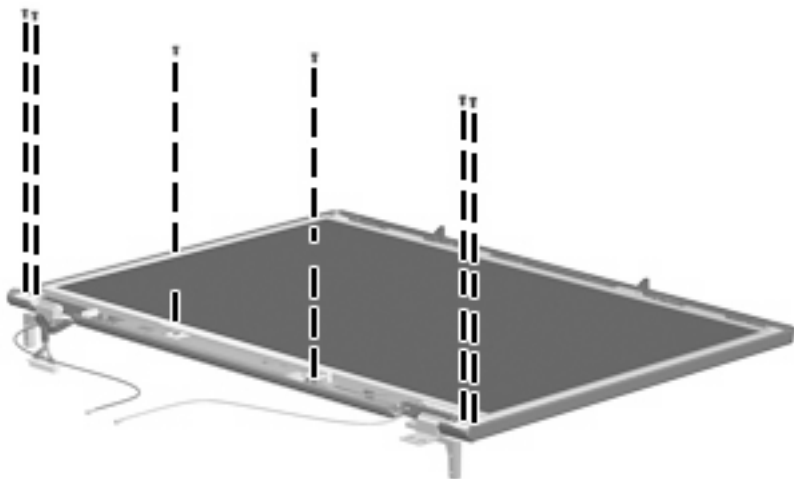
Torx T8M2.5×5.0 screw



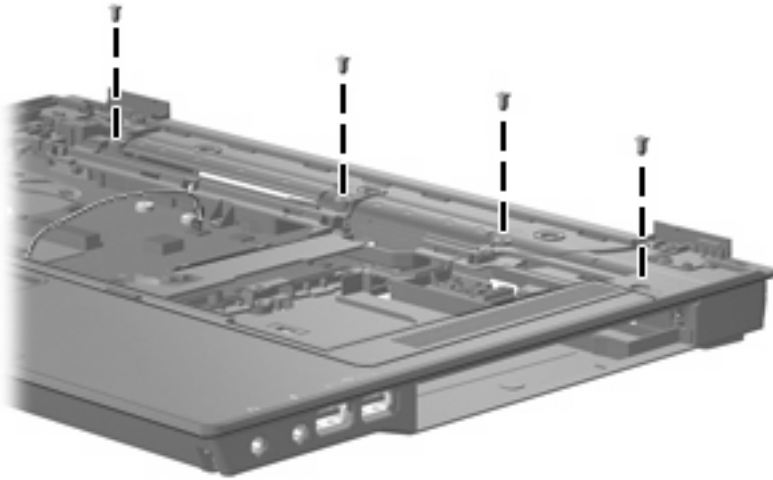
Color	Quantity	Length	Thread	Head diameter
Black	14	5.0 mm	2.5 mm	5.0 mm



Where used: 4 screws that secure the display bezel top edge to the display assembly

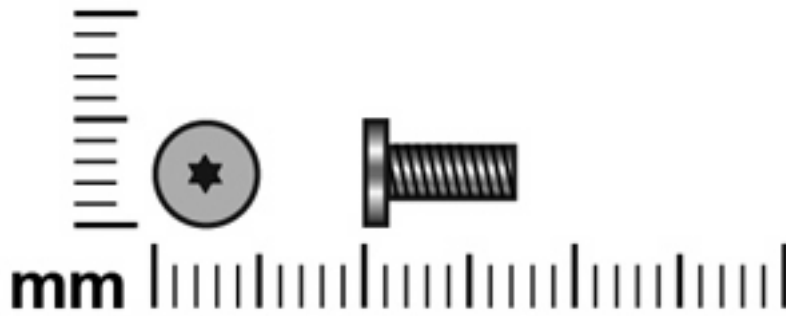


Where used: 6 screws that secure the display panel to the display enclosure

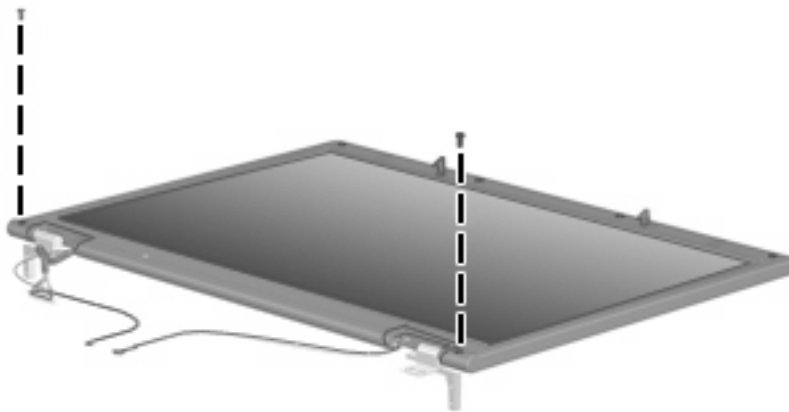


Where used: 4 screws that secure the top cover to the base enclosure

Torx T8M2.5×7.0 screw

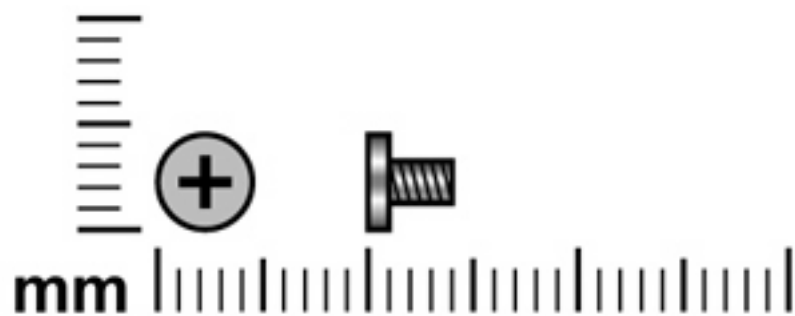


Color	Quantity	Length	Thread	Head diameter
Black	2	9.0 mm	2.5 mm	5.0 mm

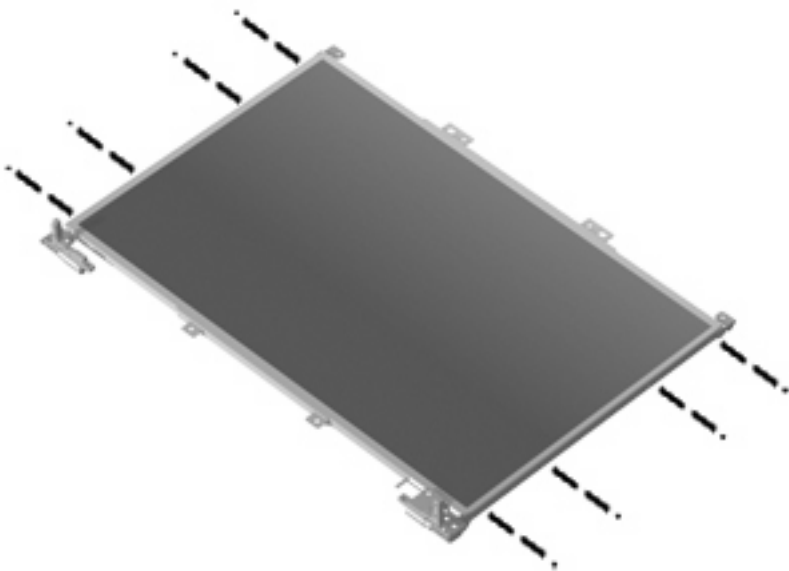


Where used: 2 screws that secure the display bezel bottom edge to the display assembly

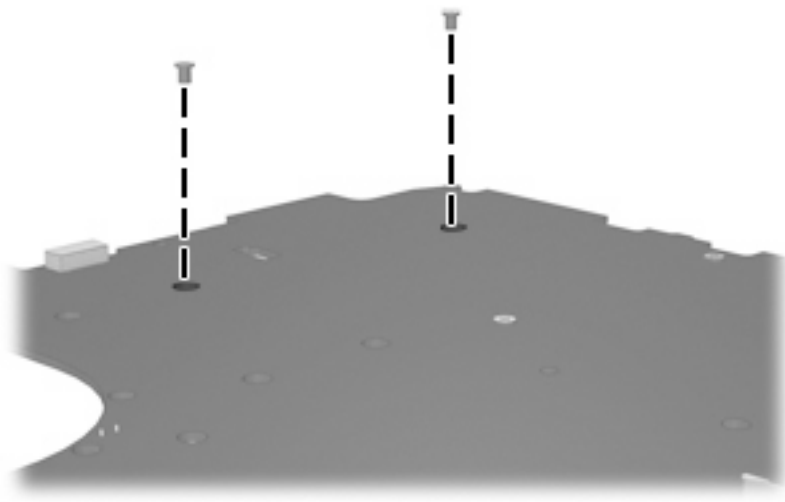
Black Phillips PM2.0×4.0 screw



Color	Quantity	Length	Thread	Head diameter
Black	10	4.0 mm	2.0 mm	4.5 mm

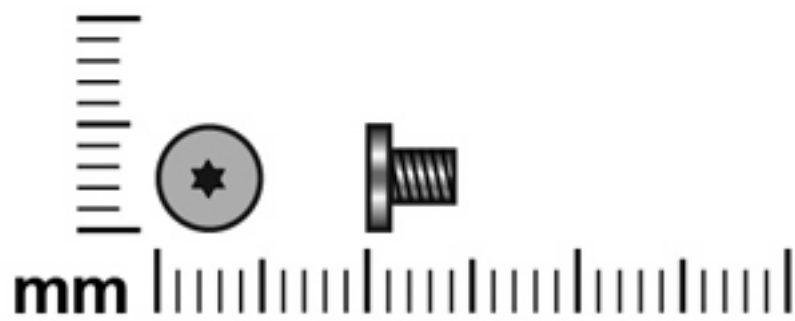


Where used: 8 screws that secure the display hinges to the display panel

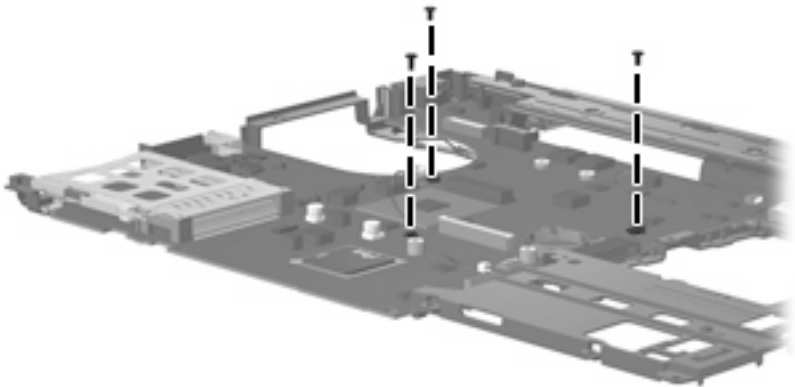


Where used: 2 screws that secure the PC Card assembly to the system board

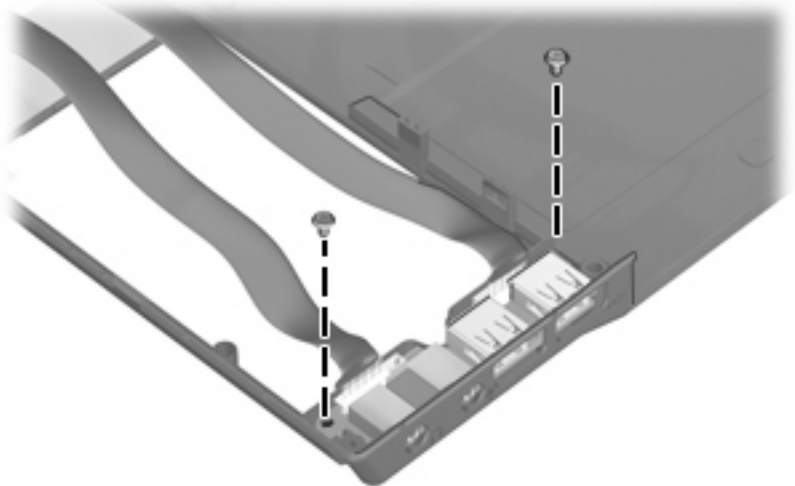
Torx T8M2.5×4.0 screw



Color	Quantity	Length	Thread	Heat width
Black	5	4.0 mm	2.5 mm	5.0 mm

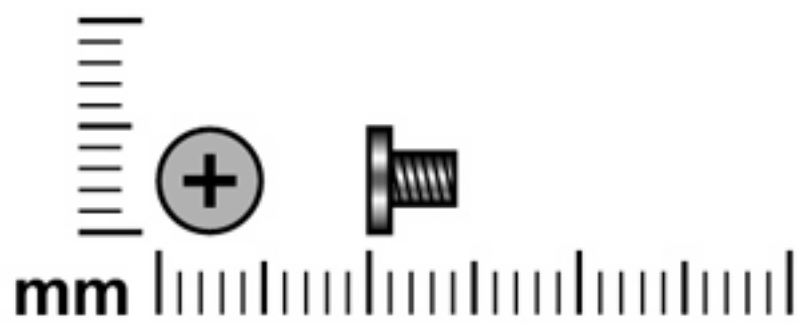


Where used: 3 screws that secure the system board to the system board frame

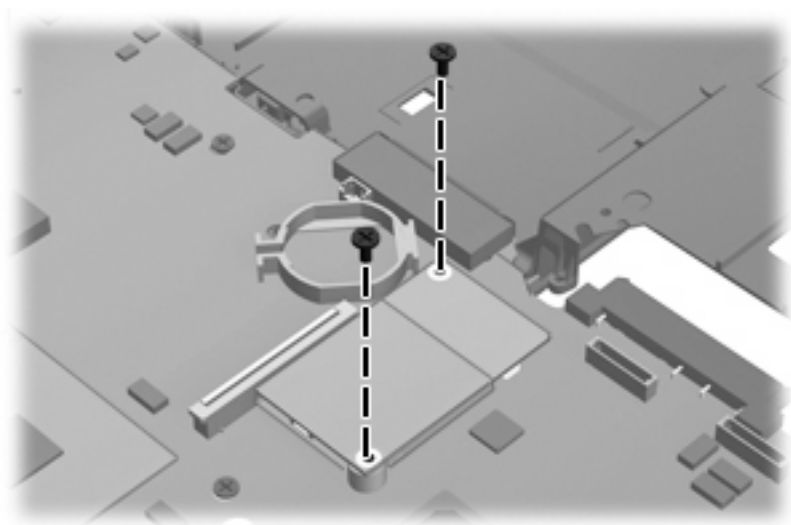


Where used: 2 screws that secure the audio/USB board to the base enclosure

Phillips PM2.5×4.0 screw

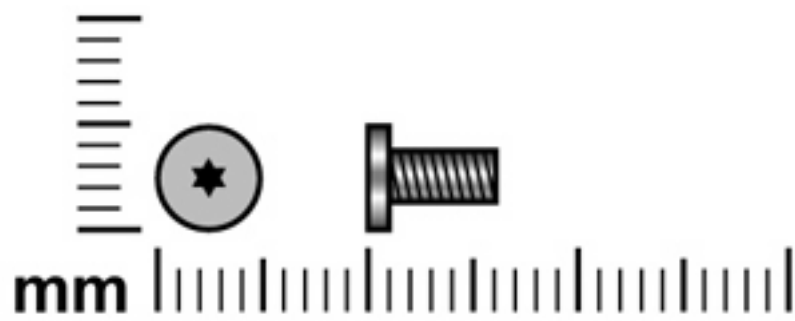


Color	Quantity	Length	Thread	Head diameter
Black	2	4.0 mm	2.5 mm	5.0 mm

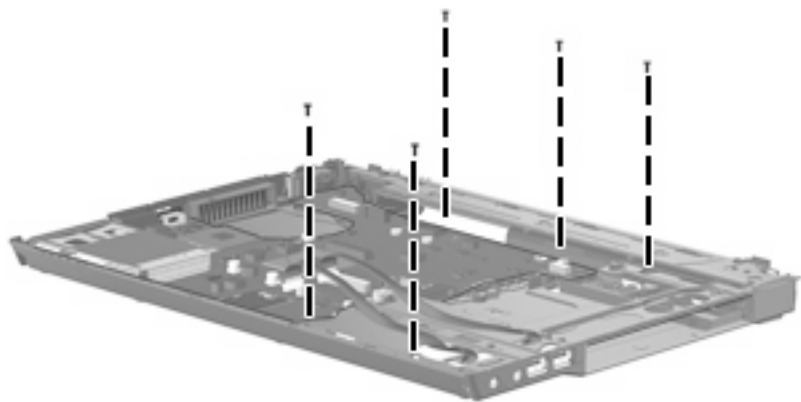


Where used: 2 screws that secure the modem module to the system board

Torx T8M2.5×6.0 screw

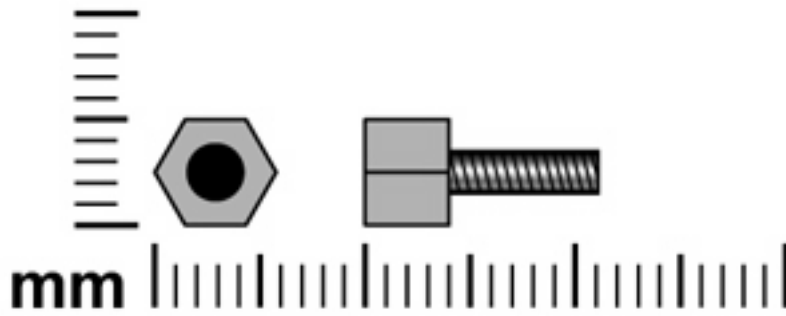


Color	Quantity	Length	Thread	Head diameter
Black	5	6.0 mm	2.5 mm	5.0 mm

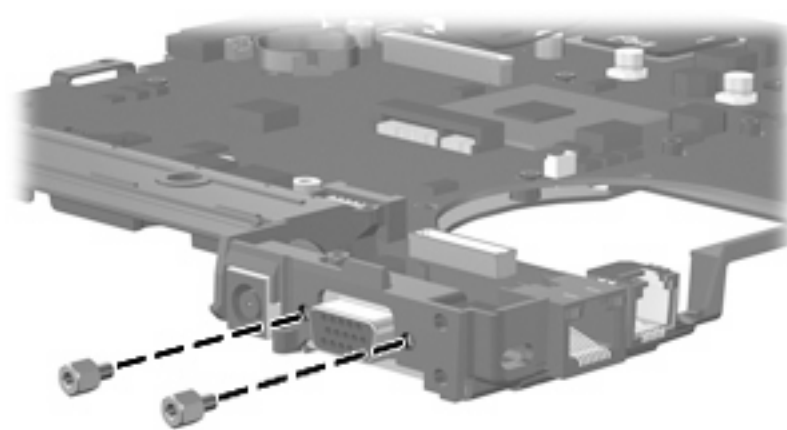


Where used: 5 screws that secure the system board frame to the base enclosure

Hex HM5.0×11.0 screw lock



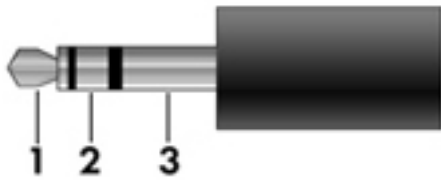
Color	Quantity	Length	Thread	Head diameter
Silver	2	11.0 mm	2.5 mm	5.0 mm



Where used: 2 screw locks that secure the system board to the system board frame

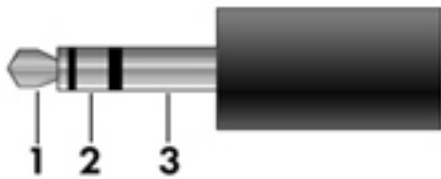
8 Connector pin assignments

Audio-out (headphone)



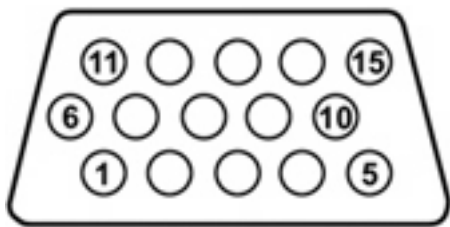
Pin	Signal
1	Audio out, left channel
2	Audio out, right channel
3	Ground

Audio-in (microphone)



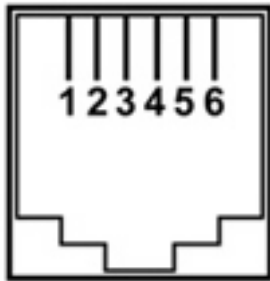
Pin	Signal
1	Audio signal in
2	Audio signal in
3	Ground

External monitor



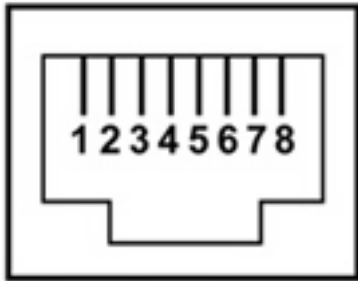
Pin	Signal
1	Red analog
2	Green analog
3	Blue analog
4	Not connected
5	Ground
6	Ground analog
7	Ground analog
8	Ground analog
9	+5 VDC
10	Ground
11	Monitor detect
12	DDC 2B data
13	Horizontal sync
14	Vertical sync
15	DDC 2B clock

RJ-11 (modem)



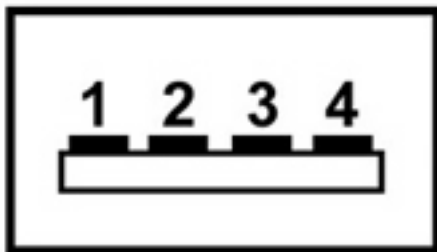
Pin	Signal
1	Unused
2	Tip
3	Ring
4	Unused
5	Unused
6	Unused

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 appendix can result in damage to display components. The only components intended for recycling purposes are the liquid crystal display (LCD) panel and the backlight. Careful handling must be exercised when removing these components. 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>.
-

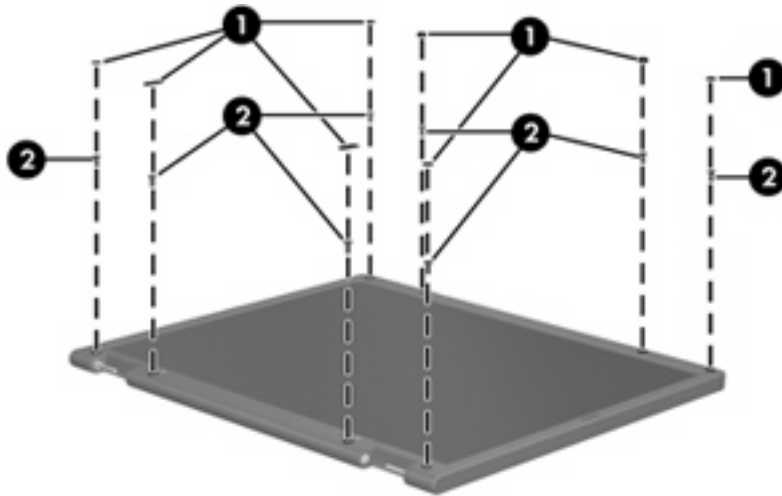
This section provides disassembly instructions for the display assembly. The display assembly must be disassembled to gain access to the backlight **(1)** and the liquid crystal display (LCD) panel **(2)**.



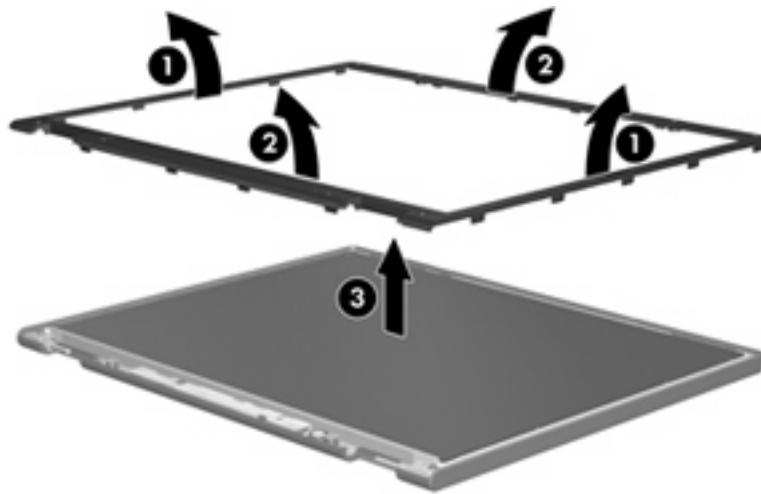
-
- 📝 **NOTE:** The procedures provided in this appendix are general disassembly instructions. Specific details, such as screw sizes, quantities, and locations, and component shapes and sizes, can vary from one computer model to another.
-

Perform the following steps to disassemble the display assembly:

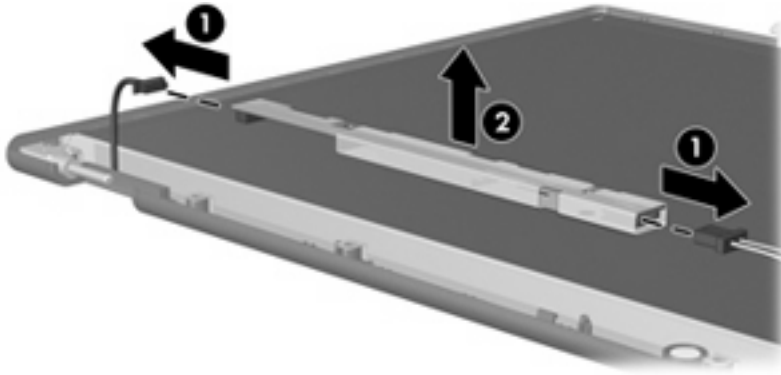
1. Remove all screw covers **(1)** and screws **(2)** that secure the display bezel to the display assembly.



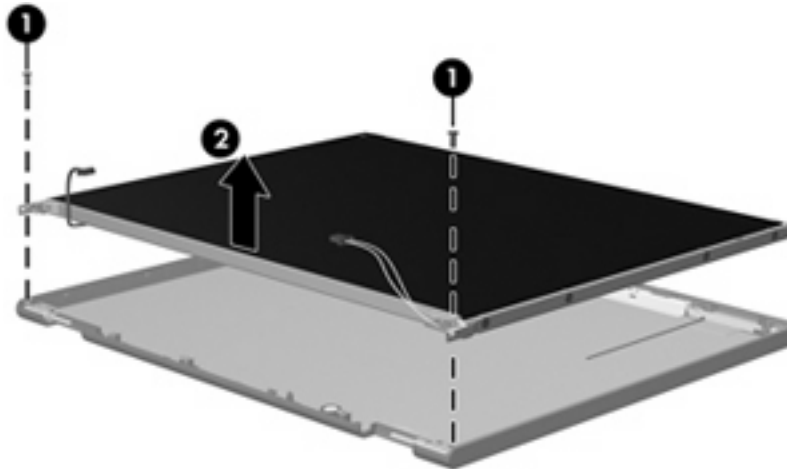
2. Lift up and out on the left and right inside edges **(1)** and the top and bottom inside edges **(2)** of the display bezel until the bezel disengages from the display assembly.
3. Remove the display bezel **(3)**.



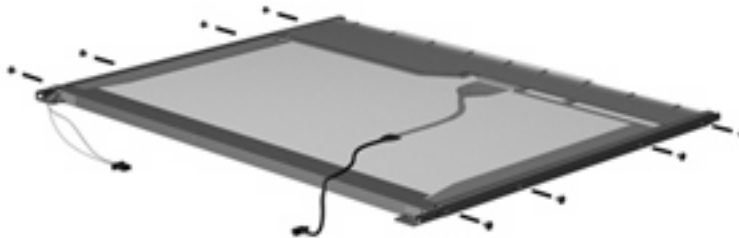
4. Disconnect all display panel cables **(1)** from the display inverter and remove the inverter **(2)**.



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.

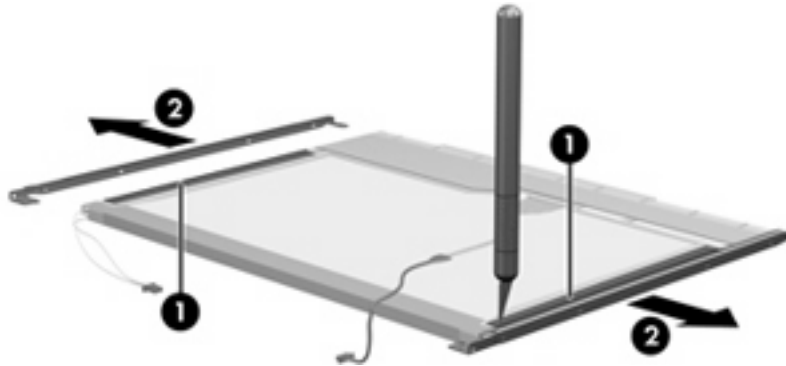


7. Turn the display panel assembly upside down.
8. Remove all screws that secure the display panel frame to the display panel.



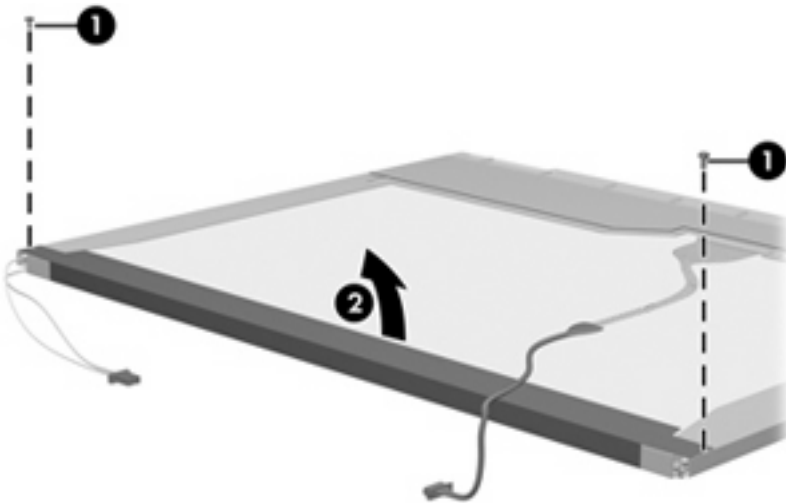
9. Use a sharp-edged tool to cut the tape **(1)** that secures the sides of the display panel to the display panel frame.

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.

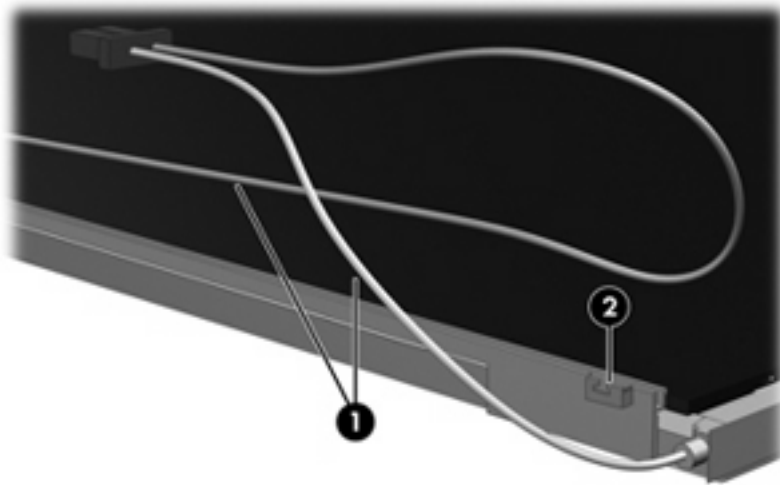
12. Lift the top edge of the backlight cover (2) and swing it outward.



13. Remove the backlight cover.

14. Turn the display panel right-side up.

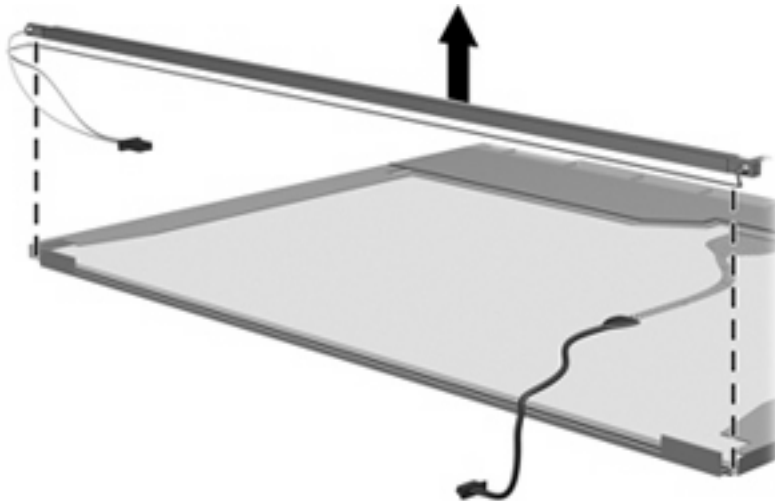
15. Remove the backlight cables (1) from the clip (2) in the display panel.



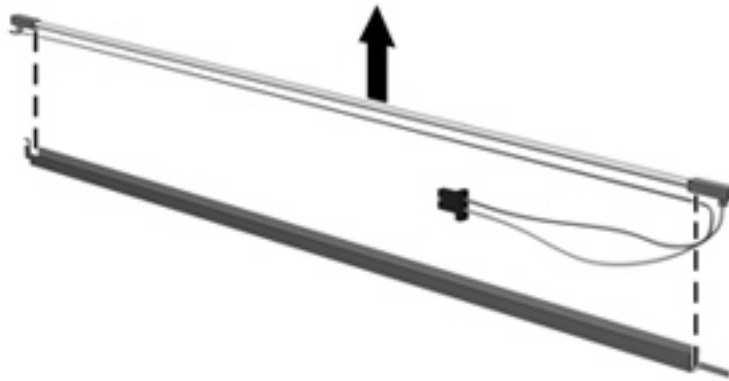
16. Turn the display panel upside down.

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

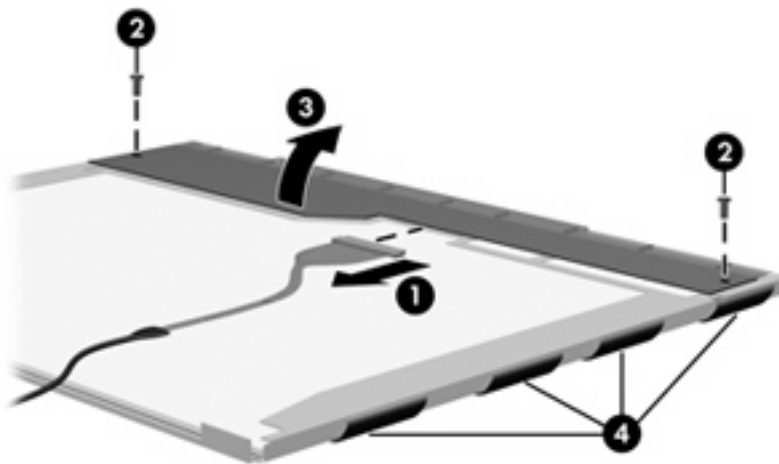
17. Remove the backlight frame from the display panel.



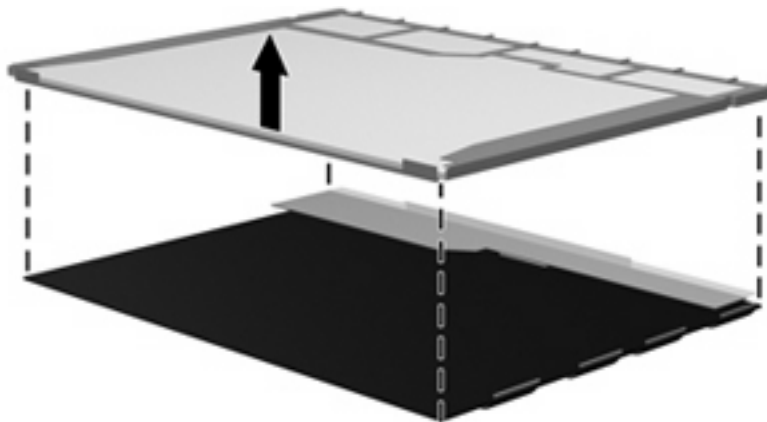
18. Remove the backlight from the backlight frame.



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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