Maintenance and Service Guide

HP Compaq nc6300 Notebook PC
HP Compaq nx6300 Notebook PC

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This guide is a troubleshooting reference used for maintaining and servicing the computer. It provides comprehensive information on identifying computer features, components, and spare parts; troubleshooting computer problems; and performing computer disassembly procedures.

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1

Product Description

The HP Compaq nc6300 Notebook PC and HP Compaq nx6300 Notebook PC offer advanced modularity, Intel® Core™ Duo, Intel Core Solo, and Celeron® M processors, and extensive multimedia support.

HP Compaq nc6300 Notebook PC and HP Compaq nx6300 Notebook PC

1.1 Features

Numerous references are made throughout this *Maintenance and Service Guide* to "full-featured" and "defeatured" units. A computer model is considered to be full-featured if it has 4 Universal Serial Bus ports, an ExpressCard slot, and the following components:

- Volume control buttons
- Info Center button
- Digital Media Slot
- Serial port
- Parallel port
- S-Video-out jack
- Docking connector

A computer model is considered to be defeatured if it has only 2 Universal Serial Bus ports and none of the components in the preceding list.

- The following processors are available, varying by computer model:
  - ❏ Intel Core Duo T2600 (2.16-GHz), T2500 (2.00-GHz), T2400 (1.83-GHz), or T2300 (1.67-GHz) processor
  - ❏ Intel Core Solo T1300 (1.66-GHz) processor
  - ❏ Intel Celeron M 1.73-GHz, 1.60-GHz, or 1.46-GHz processor
- The following displays are available, varying by computer model:
  - ❏ 15.0-inch, SXGA+WVA, TFT (1400 × 1050) with over 16.8 million colors
  - ❏ 15.0-inch or 14.1-inch, XGA, TFT (1280 × 800) with over 16.8 million colors
- 100-, 80-, 60-, and 40-GB high-capacity hard drive, varying by computer model

- 256-MB DDR2 synchronous DRAM (SDRAM) at 400 MHz and 533 MHz, expandable to 2.0 GB
- Microsoft® Windows® XP Professional
- Full-size Windows keyboard with embedded numeric keypad
- Pointing stick (select computer models only) and TouchPad pointing devices
- Integrated 10 Base-T/100 Base-TX Ethernet local area network (LAN) network interface card (NIC) with RJ-45 jack
- Integrated high-speed 56K modem with RJ-11 jack
- Integrated wireless support for Mini PCI IEEE 802.11a/b/g or 802.11b/g Wireless LAN (WLAN) device
- Integrated wireless support for Mini Card broadband wireless wide area network (WWAN) device
- Support for one optional Type I, Type II, or Type III 32-bit (CardBus) or 16-bit PC Card, varying by computer model
- External 65-watt AC adapter with 3-wire power cord, varying by computer model
- 6-cell Li-Ion battery
- Stereo speakers
- Volume up, volume mute, and volume down buttons
- Support for the following optical drives:
  - ❏ CD-ROM drive
  - ❏ DVD-ROM drive
  - ❏ DVD±RW and CD-RW Combo Drive
  - ❏ DVD/CD-RW Combo Drive
- Connectors:
  - ❏ Audio-out (headphone)
  - ❏ Audio-in (microphone)
  - ❏ Universal Serial Bus (USB) v. 2.0 (two to four, varying by computer model)
  - ❏ Power

- ❏ External monitor
- ❏ RJ-11 (modem)
- ❏ RJ-45 (network)
- ❏ IEEE 1394
- ❏ Accessory battery
- ❏ Digital Media Slot (select computer models only)
- ❏ S-Video-out (select computer models only)
- ❏ Docking connector (select computer models only)

1.2 Resetting the Computer

If the computer you are servicing has an unknown password, follow the steps below to reset the password. These steps also clear CMOS.

The following steps will not clear an unknown password if the stringent security option has been enabled in the BIOS. If stringent security is enabled, the system board must be replaced to reset an unknown password. Refer to Section 5.24, "System Board," for more information on replacing the system board.

Before replacing the system board, perform the steps below to make sure stringent security has been properly enabled.

Enabling stringent security provides enhanced protection for the power-on password and administrator password and other forms of power-on authorization. Stringent security is enabled/disabled by accessing the Password Options menu in the Computer Setup utility. Refer to Section 2.1, "Computer Setup," for more information.

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1. Prepare the computer for disassembly (refer to Section 5.3, "Preparing the Computer for Disassembly," for more information).Remove the real-time clock (RTC) battery (refer to Section 5.14, "RTC Battery," for more information on removing and replacing the RTC battery).

2. Wait approximately 5 minutes.
3. Replace the RTC battery and reassemble the computer.
4. Connect AC power to the computer. Do not reinsert any batteries at this time.
5. Turn on the computer.

All passwords and all CMOS settings have been cleared.

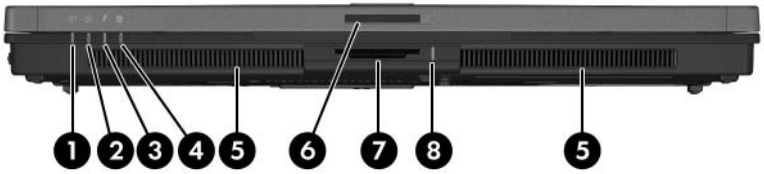
1.3 Power Management

The computer comes with power management features that extend battery operating time and conserve power. The computer supports the following power management features:

- Standby
- Hibernation
- Setting customization by the user
- Hotkeys for setting the level of performance
- Battery calibration
- Lid switch standby/resume
- Power button
- Advanced Configuration and Power Management (ACPM) compliance

1.4 External Components

The external components on the front of the computer are shown below and described in Table 1-1.



Front Components

Table 1-1

Front Components

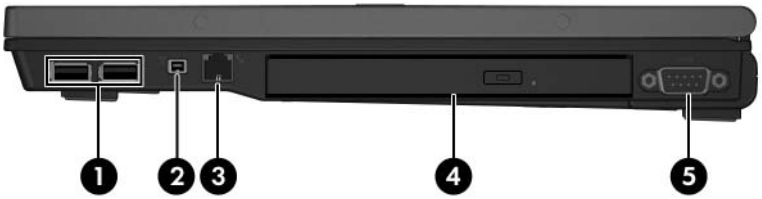
Item	Component	Function
1	Wireless light	On: An integrated wireless device has been enabled.
2	Power light	■ Green: The computer is on. ■ Blinking: The computer is in standby. ■ Blinking rapidly: An AC adapter with a higher power rating should be connected. ■ Off: The computer is off or in hibernation.

Table 1-1

Front Components *(Continued)*

Item	Component	Function
3	Battery light	■ Amber: A battery is charging. ■ Green: A battery is close to full charge capacity. ■ Blinking amber: A battery that is the only available power source has reached a low-battery condition. When the battery reaches a critical low-battery condition, the battery light begins blinking more quickly. ■ Off: If the computer is connected to an external power source, the light is turned off when all batteries in the computer are fully charged. If the computer is not connected to an external power source, the light is turned off until the battery reaches a low-battery condition.
4	Drive light	Blinking: The hard drive or optical drive is being accessed.
5	Stereo speakers (2)	Produce system sound.
6	Display release latch	Opens the computer.
7	Digital Media Slot (select computer models only)	Supports 7 optional digital memory card formats: SD (Secure Digital) Memory Card, MultiMediaCard, Memory Stick, Memory Stick Pro, Memory Stick Duo (with adapter), SmartMedia cards, and xD-Picture Card.
8	Digital Media Slot light (select computer models only)	On: A digital memory card is being accessed.

The external components on the right side of the computer are shown below and described in Table 1-2.



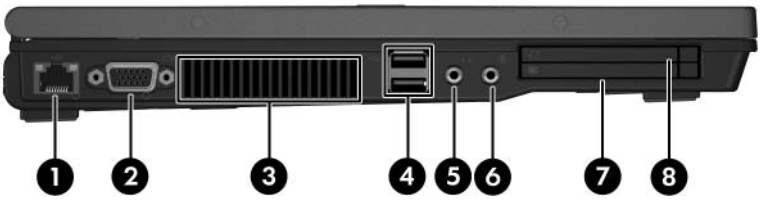
Right-Side Components

Table 1-2

Right-Side Components

Item	Component	Function
1	USB ports (2; select computer models only)	Connect USB 1.1- and 2.0-compliant devices to the computer using a standard USB cable, or connect an optional External MultiBay II to the computer. The MultiBay II must also be connected to an external power source.
2	1394 port	Connects an optional 1394a device such as a scanner, digital camera, or digital camcorder.
3	RJ-11 (modem) jack	Connects the modem cable.
4	Optical drive	Supports an optical disc. The type of optical drive varies by model.
5	Serial port (select computer models only)	Connects an optional serial device.

The external components on the left side of the computer are shown below and described in Table 1-3.



Left-Side Components

Table 1-3

Left-Side Components

Item	Component	Function
1	RJ-45 (network) jack	Connects an optional network cable.
2	External monitor port	Connects an optional VGA external monitor or projector.
3	Exhaust vent	Provides airflow to cool internal components. △ To prevent overheating, do not obstruct 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 thick rugs or clothing, to block airflow.
4	USB ports (2)	Connect USB 1.1- and 2.0-compliant devices to the computer using a standard USB cable, or connect an optional External MultiBay II to the computer. The MultiBay II must also be connected to an external power source.
5	Audio-out (headphone) jack	Connect optional headphones or powered stereo speakers. Also connects the audio function of an audio/video device such as a television or VCR.
6	Audio-in (microphone) jack	Connects an optional monaural microphone.
7	PC Card slot	Supports optional Type I, Type II, or Type III 32-bit (CardBus) or 16-bit PC Cards. Some computer models may be shipped with a smart card reader instead.
8	ExpressCard slot (select computer models only)	Supports optional ExpressCard/54 or ExpressCard/34 cards.

The external components on the rear panel of the computer are shown below and described in Table 1-4.

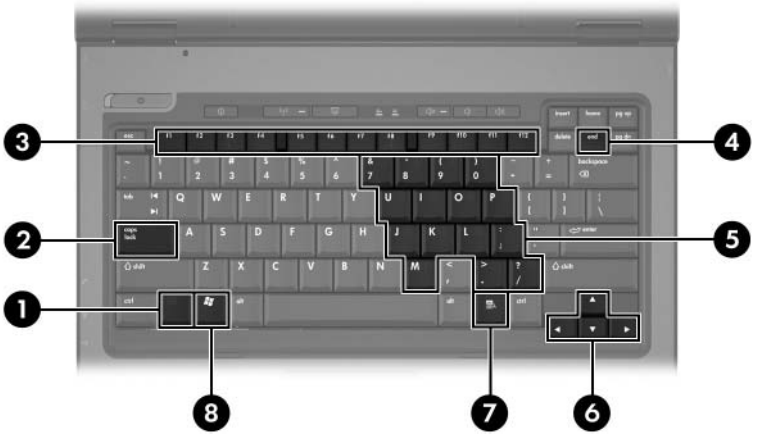
Rear Panel Components

Table 1-4

Rear Panel Components

Item	Component	Function
1	Security cable slot	Attaches an optional security cable to the computer. △ The security cable is designed to act as a deterrent, but may not prevent the computer from being mishandled or stolen.
2	Battery bay	Holds a battery.
3	Power connector	Connects an AC adapter or an optional power adapter.
4	Parallel port (select computer models only)	Connects an optional parallel device, such as an external diskette drive or a printer.
5	S-Video-out jack (select computer models only)	Connects an optional S-Video device, such as a television, VCR, camcorder, projector, or video capture card.

The standard keyboard components of the computer are shown below and described in Table 1-5.



Standard Keyboard Components

Table 1-5

Standard Keyboard Components

Item	Component	Function
1	**fn** key	Executes frequently used system functions when pressed in combination with a function key or the **esc** key.
2	**caps lock** key	Enables caps lock and turns on the caps lock light.
3	**f1** to **f12** keys (12)	Perform system and application tasks. When combined with the **fn** key, several keys and buttons perform additional tasks as hotkeys.
4	**num lock** key	Enables numeric lock, turns on the embedded numeric keypad, and turns on the num lock light.
5	Keypad keys (15)	In Windows, can be used like the keys on an external numeric keypad.
6	Arrow keys	Moves the cursor around the screen.
7	Windows applications key	In Windows, displays a shortcut menu for items beneath the pointer.
8	Windows logo key	In Windows, displays the Windows Start menu.

The computer top components are shown below and described in Table 1-6.

Top Components, Part 1

Table 1-6

Top Components, Part 1

Item	Component	Function
1	Power button	When the computer is: ■ Off, press to turn on the computer. ■ On, briefly press to initiate hibernation. ■ In standby, briefly press to resume from standby. ■ In hibernation, briefly press to restore from hibernation. If the system has stopped responding and Windows shutdown procedures cannot be used, press and hold for 5 seconds to turn off the computer.

Table 1-6

Top Components, Part 1 *(Continued)*

Item	Component	Function
2	Display lid switch	■ If the computer is closed while on, turns off the display. ■ If the computer is opened while in standby, turns on the computer (resumes from standby).
3	Info Center button (select computer models only)	Enables you to view a list of commonly used software solutions.
4	Wireless button	Turns the wireless functionality on or off, but does not create a wireless connection. ✎ To establish a wireless connection, a wireless network must already be set up.
5	Presentation mode button (select computer models only)	Turns on Presentation mode.
6	Volume mute button (select computer models only)	Mutes or restores speaker volume.
7	Volume down button (select computer models only)	Decreases speaker volume.
8	Volume up button (select computer models only)	Increases speaker volume.

The computer top components are continued below and described in Table 1-7.

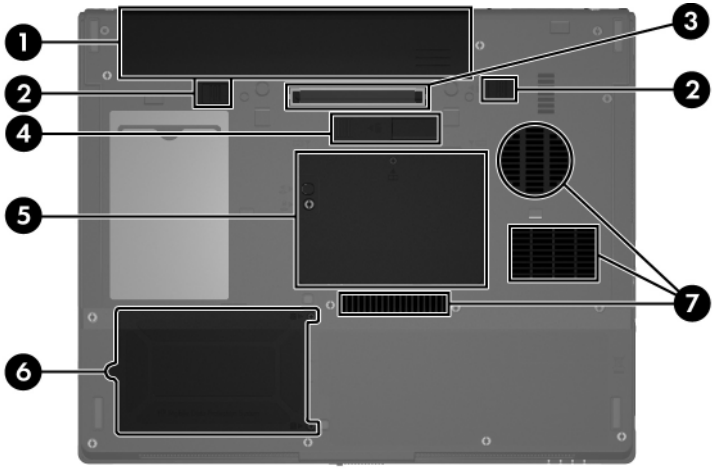
Top Components, Part 2

Table 1-7

Top Components, Part 2

Item	Component	Function
1	Power light	■ On: The computer is turned on. ■ Blinking: The computer is in standby, ■ Blinking rapidly: An AC adapter with a higher power rating should be connected. ■ Off: The computer is off.
2	Wireless light	On: An integrated wireless device has been turned on.
3	Caps lock light	On: **caps lock** is on.
4	Num lock light	On: **num lock** or the numeric keypad is on.
5	Microphone (select computer models only)	Records sound.
6	Pointing stick (select computer models only)	Moves the pointer and selects or activates items on the screen.
7	Left/right pointing stick buttons (select computer models only)	Function like the left and right buttons on an external mouse.
8	TouchPad	Moves the pointer and selects or activates items on the screen. Can be set to perform other mouse functions, such as scrolling, selecting, and double-clicking.
9	Left/right TouchPad buttons	Function like the left and right buttons on an external mouse.
10	TouchPad scroll zone	Scrolls up or down.
11	Fingerprint reader (select computer models only)	Allows a fingerprint logon to Windows instead of using a password.

The external components on the bottom of the computer are shown below and described in Table 1-8.



Bottom Components

Table 1-8

Bottom Components

Item	Component	Function
1	Battery bay	Holds the battery.
2	Battery release latches (2)	Releases the battery from the battery bay.
3	Docking connector (select computer models only)	Connects the computer to an optional docking device.
4	Accessory battery connector (select computer models only)	Connects an optional HP Ultra-Capacity Battery or HP Extended Life Battery.

Table 1-8

Bottom Components *(Continued)*

Item	Component	Function
5	Memory module compartment	Contains 2 memory slots that support replaceable memory modules. The number of preinstalled memory modules varies by computer model.
	Mini Card compartment	Holds an optional wireless LAN device. △ To prevent an unresponsive system and the display of a warning message, replace with only a Mini Card device authorized for use in the computer by the governmental agency that regulates wireless devices in your country. If you replace the device and then receive a warning message, remove the device to restore computer functionality. Then contact Customer Care through the Help and Support Center.
6	Hard drive bay	Holds the primary hard drive.
7	Exhaust vents	Provides airflow to cool internal components. △ To prevent overheating, do not obstruct 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 thick rugs or clothing, to block airflow.

1.5 Design Overview

This section presents a design overview of key parts and features of the computer. Refer to Chapter 3, "Illustrated Parts Catalog," to identify replacement parts, and Chapter 5, "Removal and Replacement Procedures," for disassembly steps.

The system board provides the following device connections:

- Audio
- Display
- Hard drive
- Intel Dual Core, Solo Core, and Celeron M processors
- Keyboard and TouchPad
- Memory module
- Mini Card module
- PC Card

CAUTION: To properly ventilate the computer, allow at least a 7.6-cm (3-inch) clearance on the left and right sides of the computer.

The computer uses an electric fan for ventilation. The fan is controlled by a temperature sensor and is designed to turn on automatically when high temperature conditions exist. These conditions are affected by high external temperatures, system power consumption, power management/battery conservation configurations, battery fast charging, and software. Exhaust air is displaced through the ventilation grill located on the left side of the computer.

2

Troubleshooting

WARNING: Only authorized technicians trained by HP should repair this equipment. All troubleshooting and repair procedures are detailed to allow only subassembly-/module-level repair. Because of the complexity of the individual boards and subassemblies, do not attempt to make repairs at the component level or modifications to any printed wiring board. Improper repairs can create a safety hazard. Any indication of component replacement or printed wiring board modification may void any warranty or exchange allowances.

2.1 Computer Setup

Computer Setup is a system information and customization utility that can be used even when the operating system is not working or will not load. This utility includes settings that are not available in Windows.

Using Computer Setup

Information and settings in Computer Setup are accessed from the File, Security, Diagnostics, or System Configuration menus:

1. Turn on or restart the computer. Press **f10** while the F10 = ROM-Based Setup message is displayed in the lower-left corner of the screen.
   - ❏ To change the language, use the cursor control keys to navigate to the **System Configuration** menu.
   - ❏ To view navigation information, press **f1**.
   - ❏ To return to the Computer Setup menu, press **esc**.

2. Select the **File**, **Security**, **Diagnostics**, or **System Configuration** menu.
3. To close Computer Setup and restart the computer:
   - ❑ Select **File > Save changes and exit**, and then press **enter**.

   – or –

   - ❑ Select **File > Ignore changes and exit**, and then press **enter**.

   – or –

   - ❑ Select **File > Restore defaults**, and then press **enter**.
4. When you are prompted to confirm your action, press **f10**.

Selecting from the File Menu

Table 2-1

File Menu

Select	To Do This
System Information	■ View identification information about the computer, processor, memory and cache size, and system ROM. ■ View BIOS revision, keyboard controller version, and battery pack serial number information.

Selecting from the Security Menu

Table 2-2

Security Menu

Select	To Do This
Setup Password	Enter, change, or delete an Setup password.
Power-On Password	Enter, change, or delete a power-on password.
Password Options (Password options can be selected only when a power-on password has been set.)	Enable/disable: ■ Stringent security. ■ Requirement of password on restart.
DriveLock Passwords	Enable/disable DriveLock; change a DriveLock user or master password. ✎ DriveLock Settings are accessible only when you enter Computer Setup by turning on (not restarting) the computer.
Smart Card Security	Enable/disable smart card power-on support. ✎ A setup password must be established to use this feature.
TPM Embedded Security	Enable/disable: ■ Embedded security device state. ■ Power-on authentication support. ■ Automatic DriveLock support.
System IDs	Establish: ■ Notebook asset tracking number. ■ Notebook ownership tags.
Disk Sanitizer	Establish fast, optimum, or custom settings for disk sanitizing.

*Not applicable to SuperDisk LS-120 drives.

Selecting from the Diagnostics Menu

Table 2-3

Diagnostics Menu

Select	To Do This
HDD Self-Test Options	Run a quick comprehensive self test on hard drives in the system that support the test features.
Memory Check	Run a quick comprehensive test on system memory on the following categories: ■ Walking 0s ■ Walking 1s ■ High Address line testing ■ Alternate Pattern testing

Selecting from the System Configuration Menu

Table 2-4

System Configuration Menu

Select	To Do This
Language	Change the Computer Setup language.
Boot Options	Enable/disable MultiBoot, which sets a startup sequence that can include most bootable devices and media in the system.
Device Configurations	Enable/disable: ■ Swap **Fn**/**Ctrl** keys. ■ USB legacy support. ■ BIOS DMA data transfers. ■ Fan Always on while on AC Power. ■ Data Execution Prevention. ■ LAN Power save.
Built-In Device Options	Enable/disable: ■ Embedded WLAN Device Radio. ■ Embedded Bluetooth Device Radio. ■ LAN/WLAN Switching. ■ Wake on LAN from Off.
Port Options	Enable/disable: ■ USB Port. ■ 1394 Port. ■ CardBus Slot.

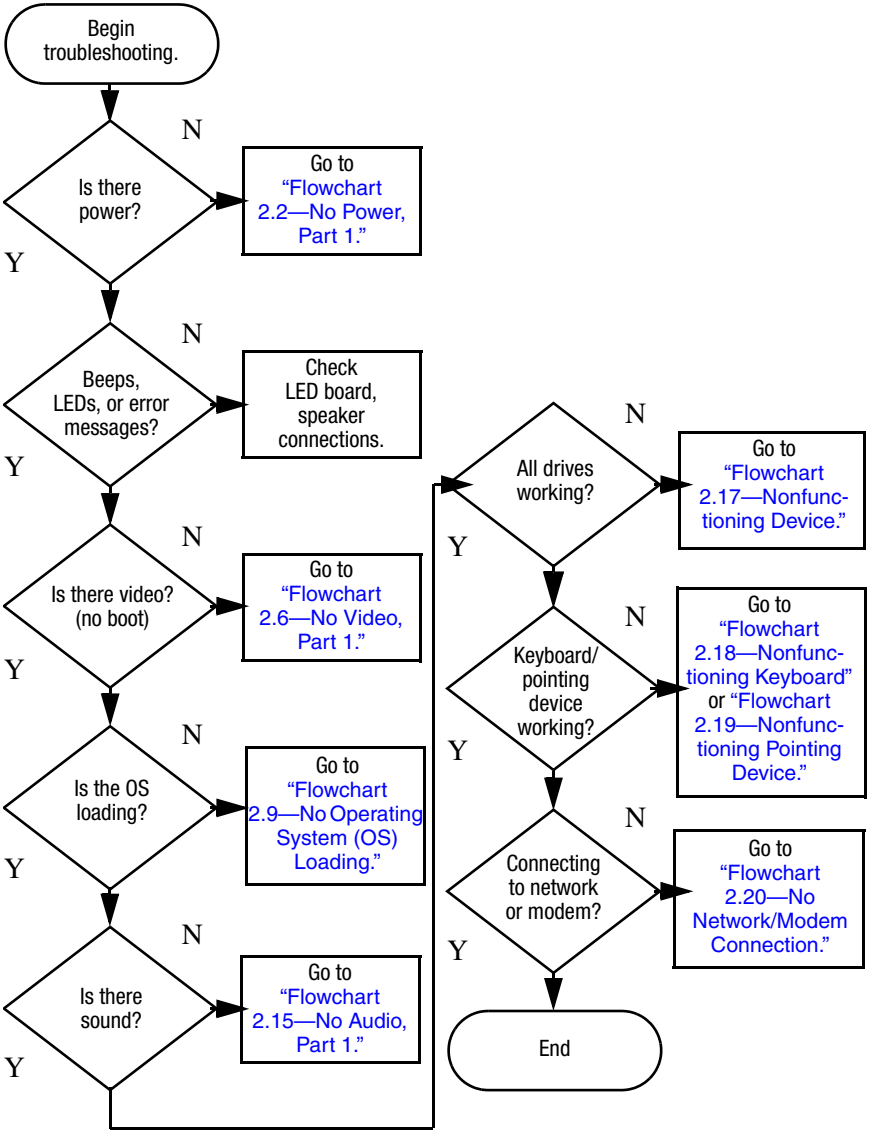
2.2 Troubleshooting Flowcharts

Table 2-5

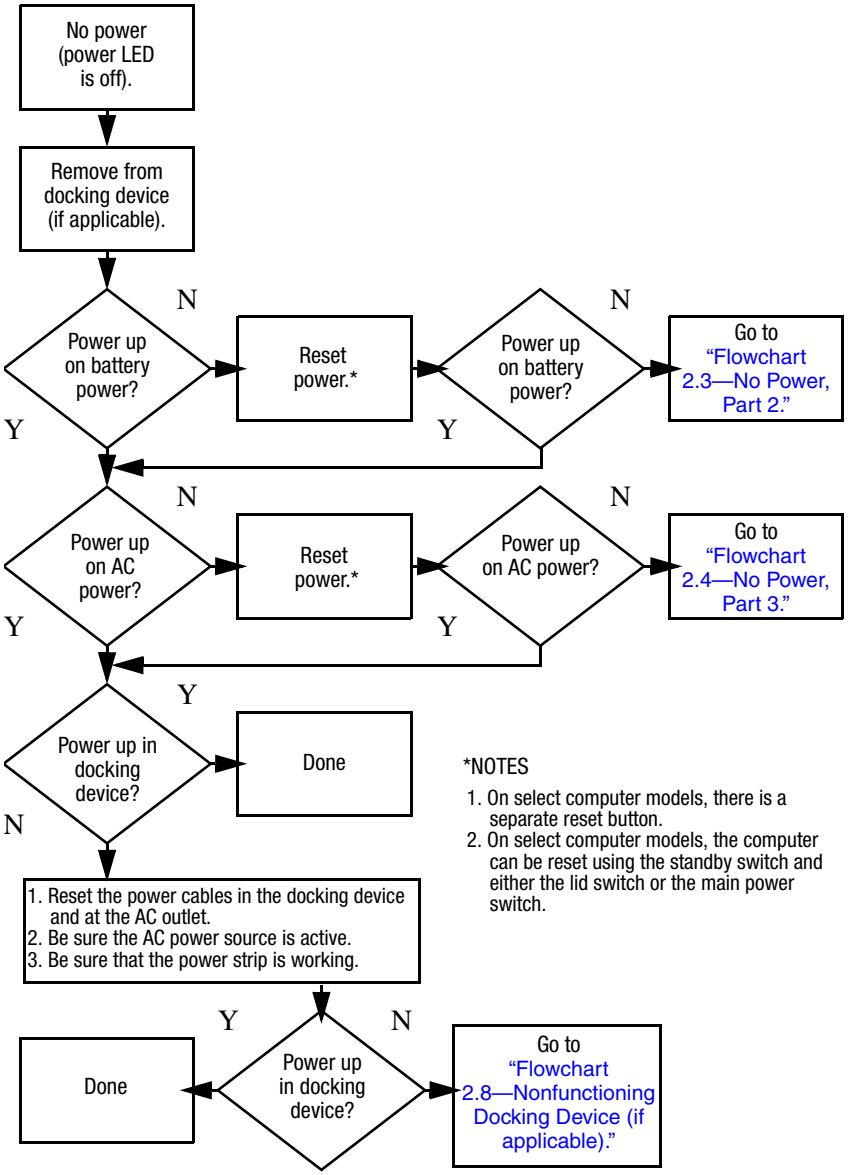
Troubleshooting Flowcharts Overview

Flowchart	Description
2.1	“Flowchart 2.1—Initial Troubleshooting”
2.2	“Flowchart 2.2—No Power, Part 1”
2.3	“Flowchart 2.3—No Power, Part 2”
2.4	“Flowchart 2.4—No Power, Part 3”
2.5	“Flowchart 2.5—No Power, Part 4”
2.6	“Flowchart 2.6—No Video, Part 1”
2.7	“Flowchart 2.7—No Video, Part 2”
2.8	“Flowchart 2.8—Nonfunctioning Docking Device (if applicable)”
2.9	“Flowchart 2.9—No Operating System (OS) Loading”
2.10	“Flowchart 2.10—No OS Loading, Hard Drive, Part 1”
2.11	“Flowchart 2.11—No OS Loading, Hard Drive, Part 2”
2.12	“Flowchart 2.12—No OS Loading, Hard Drive, Part 3”
2.13	“Flowchart 2.13—No OS Loading, Diskette Drive”
2.14	“Flowchart 2.14—No OS Loading, Optical Drive”
2.15	“Flowchart 2.15—No Audio, Part 1”
2.16	“Flowchart 2.16—No Audio, Part 2”
2.17	“Flowchart 2.17—Nonfunctioning Device”
2.18	“Flowchart 2.18—Nonfunctioning Keyboard”
2.19	“Flowchart 2.19—Nonfunctioning Pointing Device”
2.20	“Flowchart 2.20—No Network/Modem Connection”

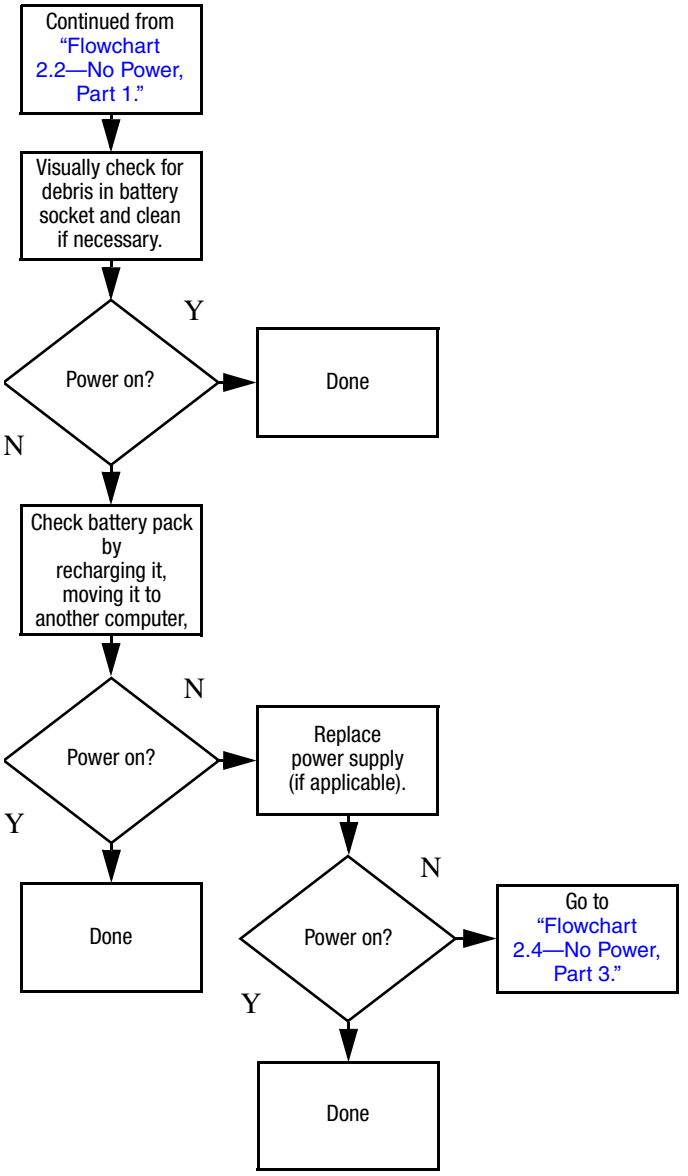
Flowchart 2.1—Initial Troubleshooting



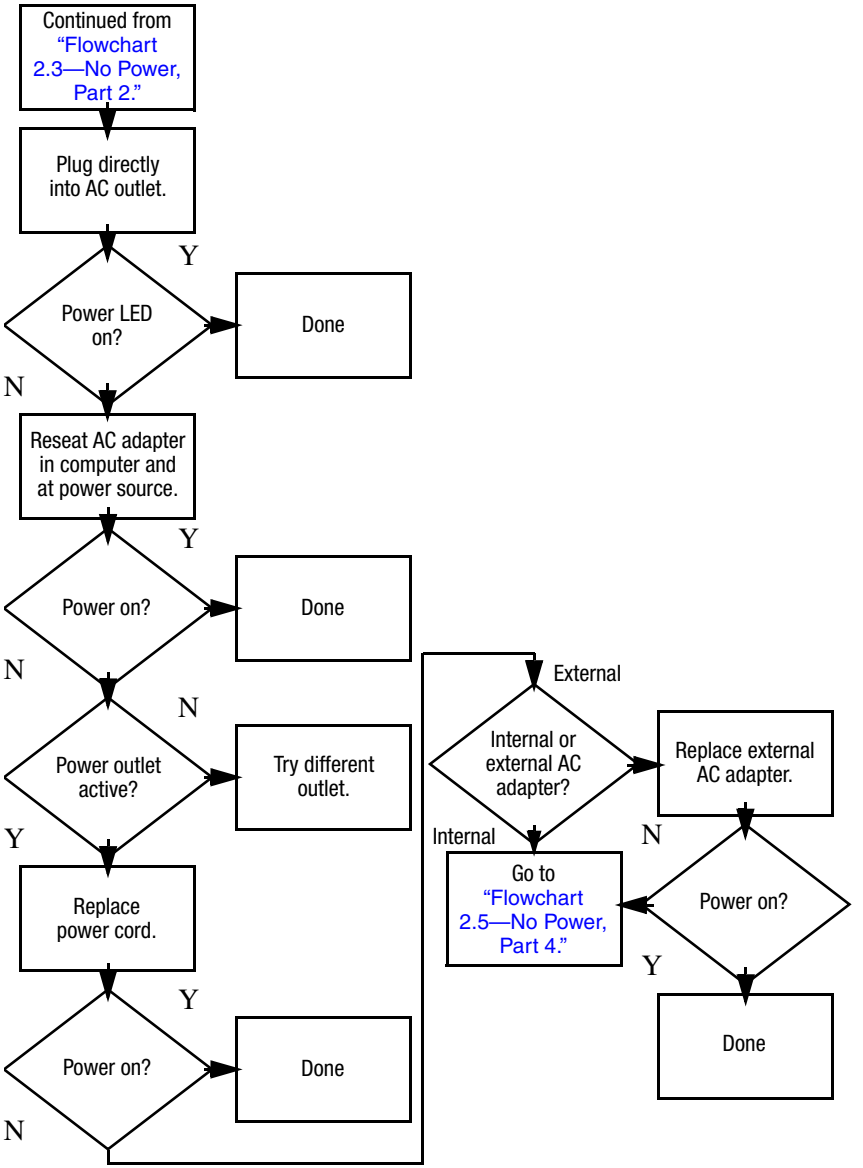
Flowchart 2.2—No Power, Part 1



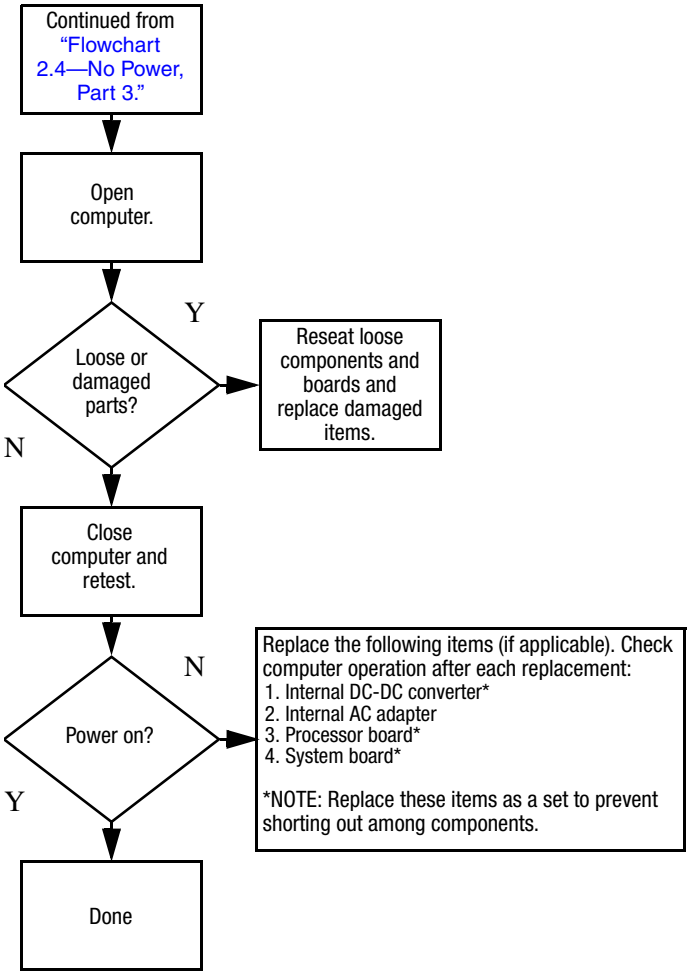
Flowchart 2.3—No Power, Part 2



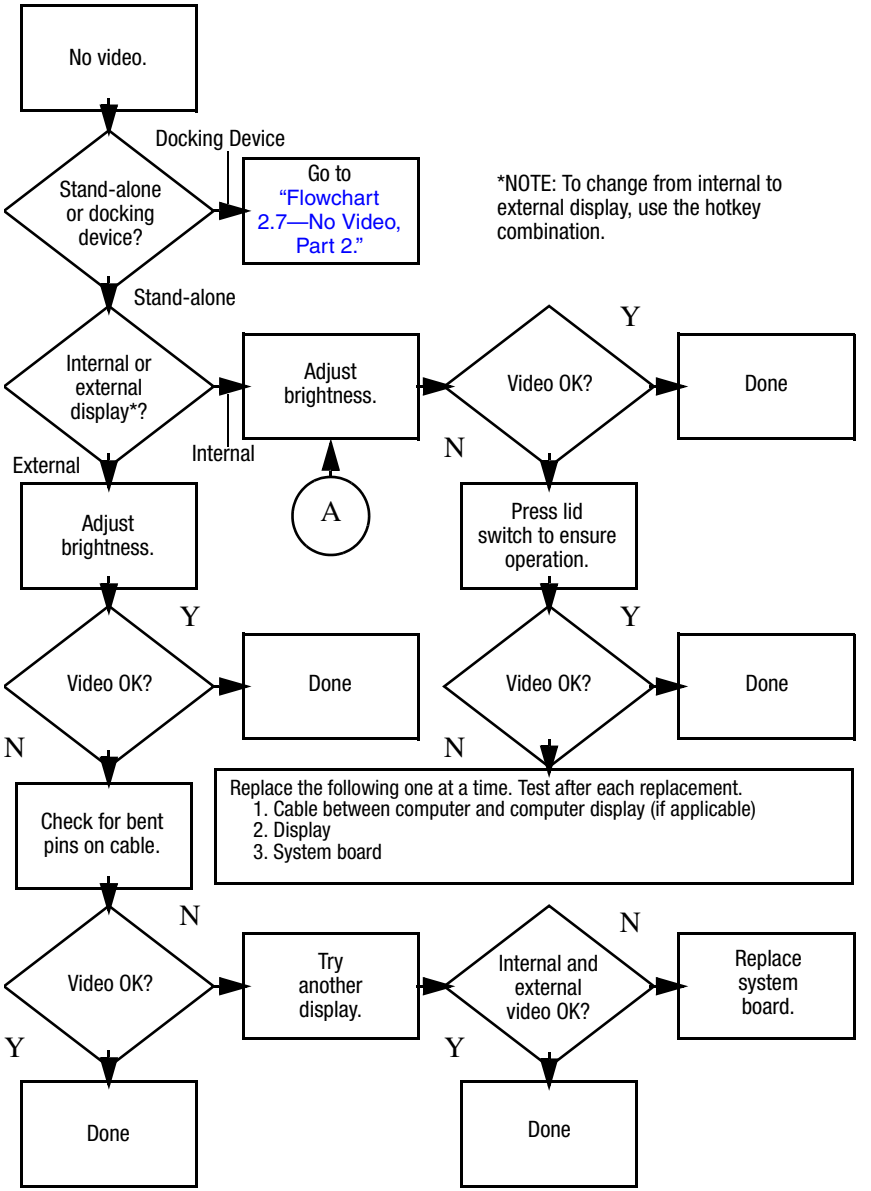
Flowchart 2.4—No Power, Part 3



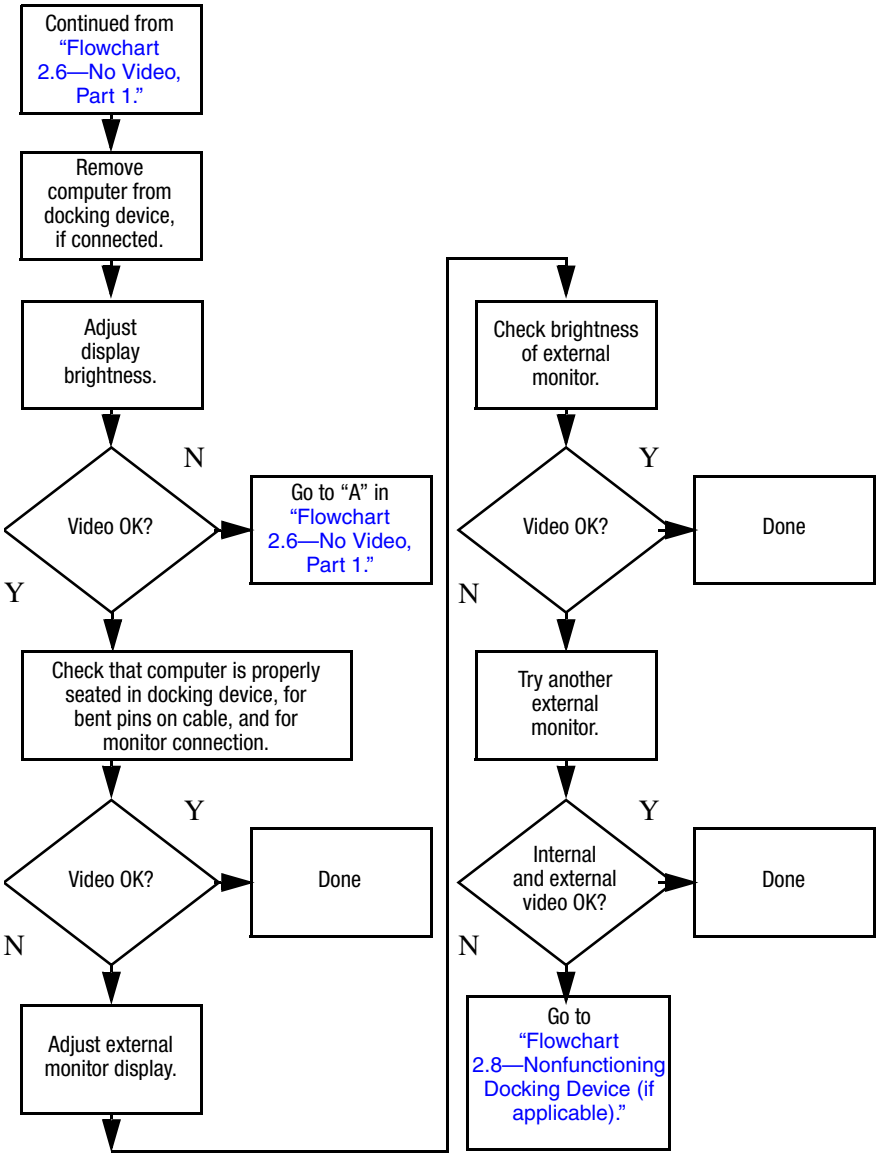
Flowchart 2.5—No Power, Part 4



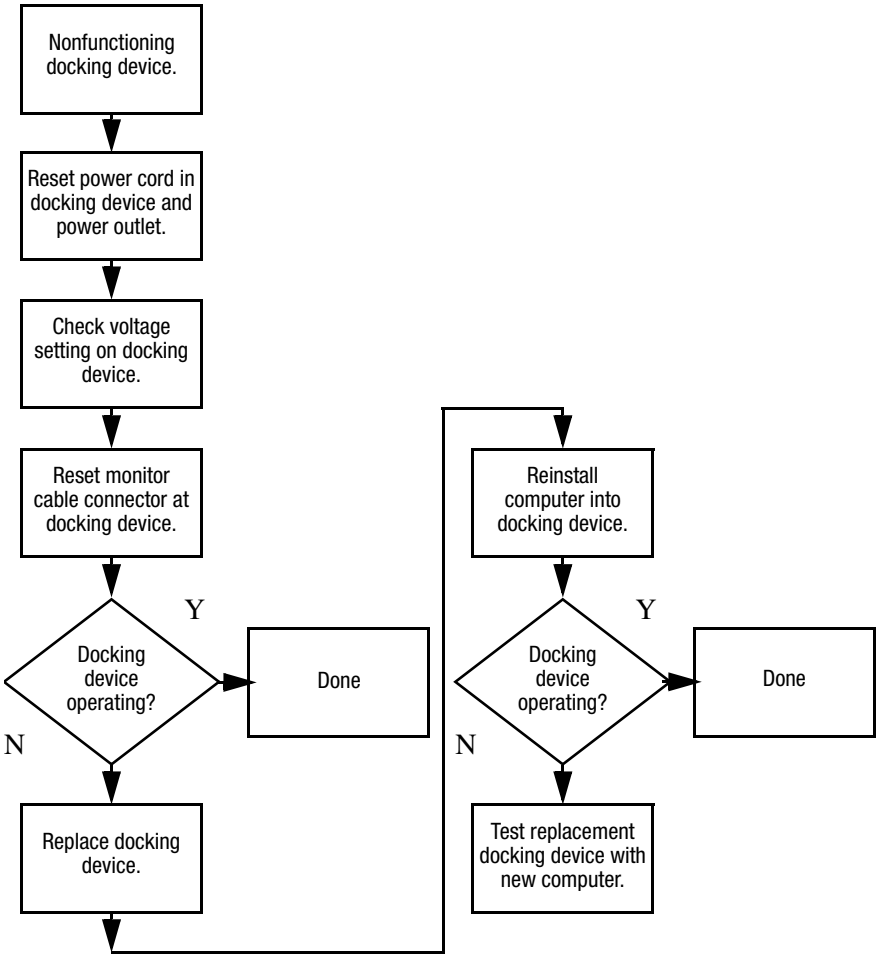
Flowchart 2.6—No Video, Part 1



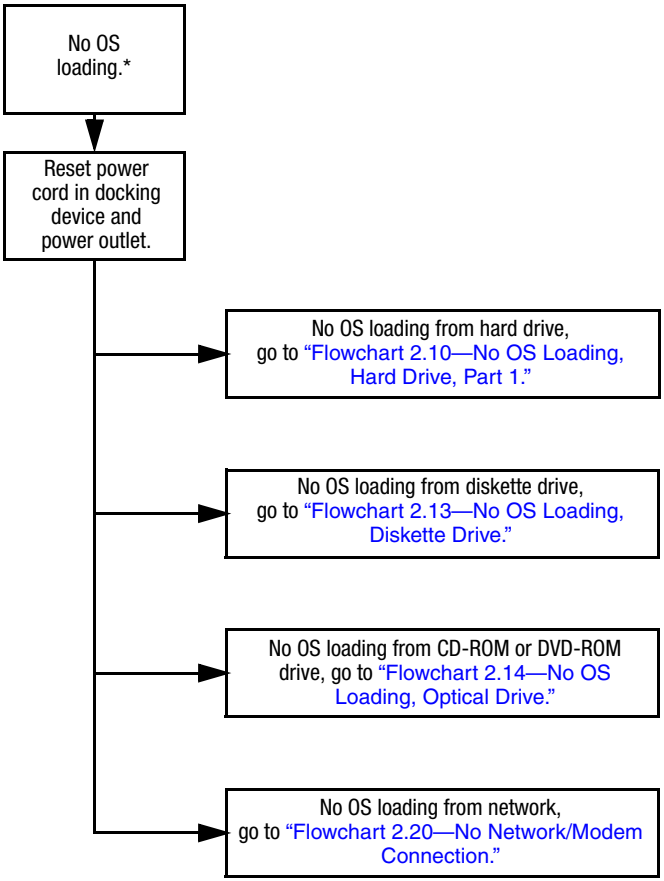
Flowchart 2.7—No Video, Part 2



Flowchart 2.8—Nonfunctioning Docking Device (if applicable)

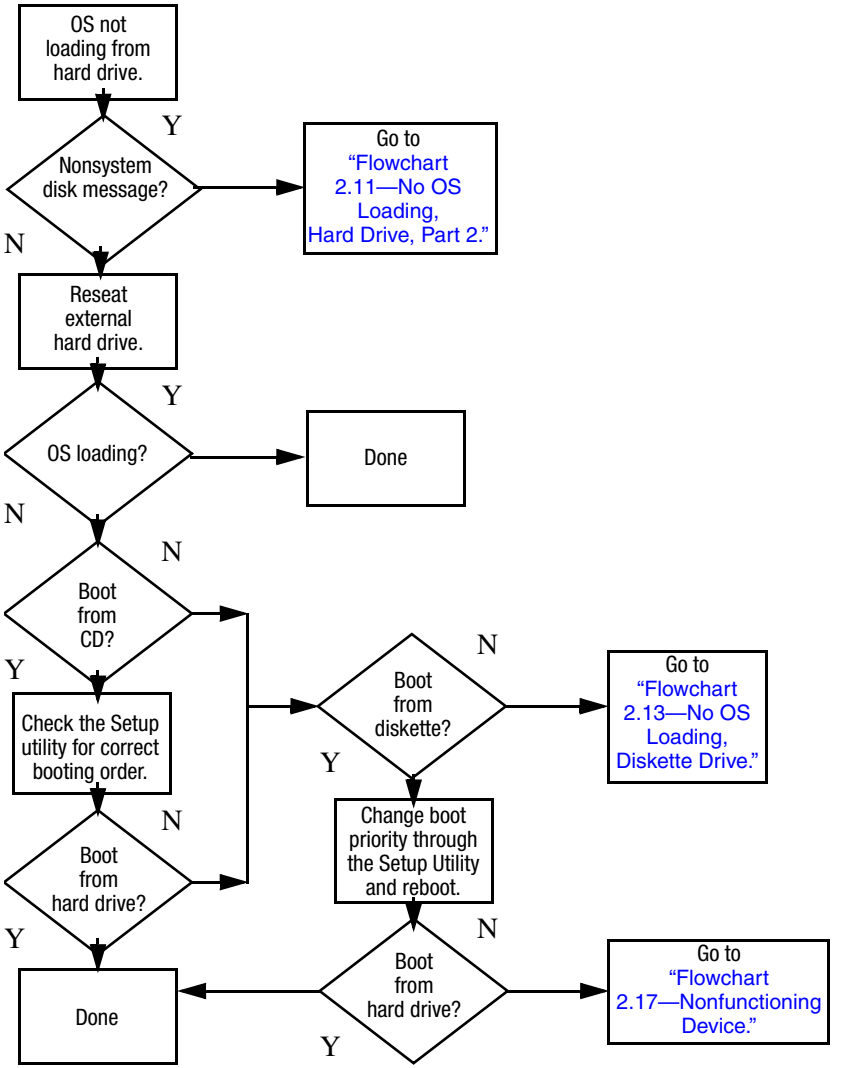


Flowchart 2.9—No Operating System (OS) Loading

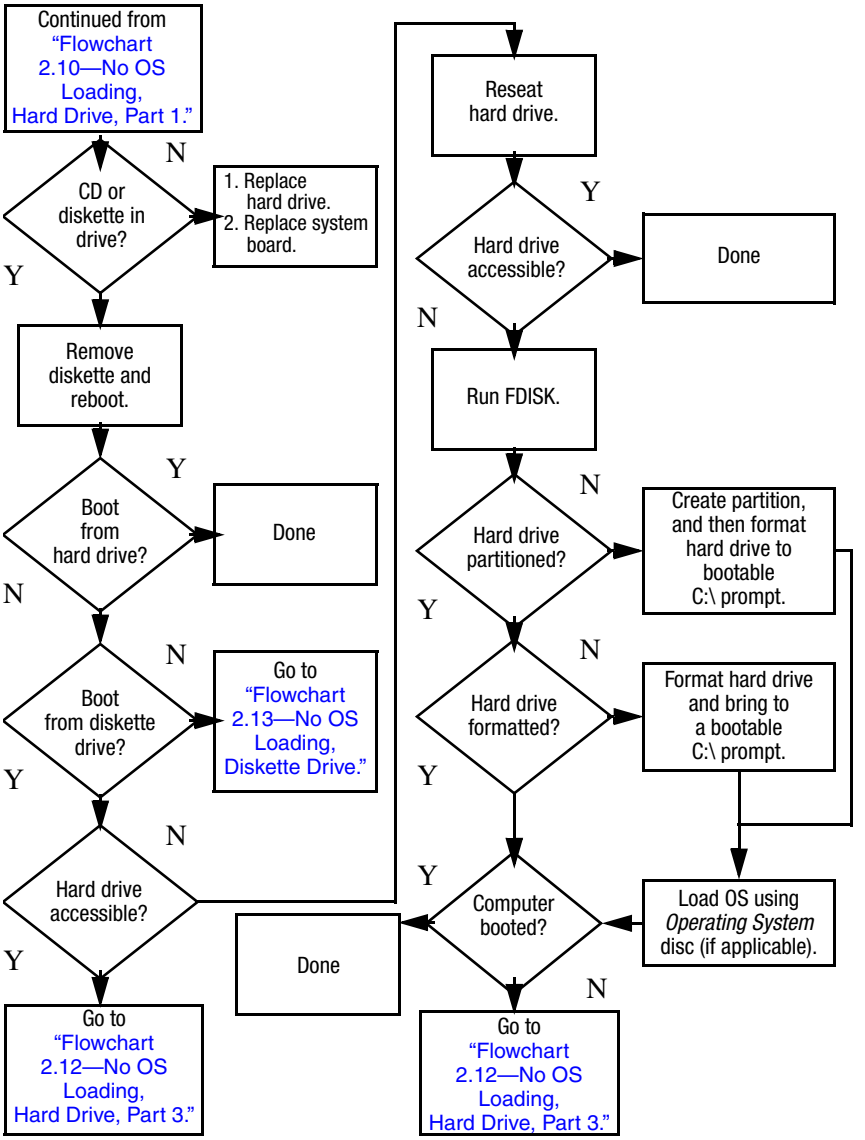


*NOTE: Before beginning troubleshooting, always check cable connections, cable ends, and drives for bent or damaged pins.

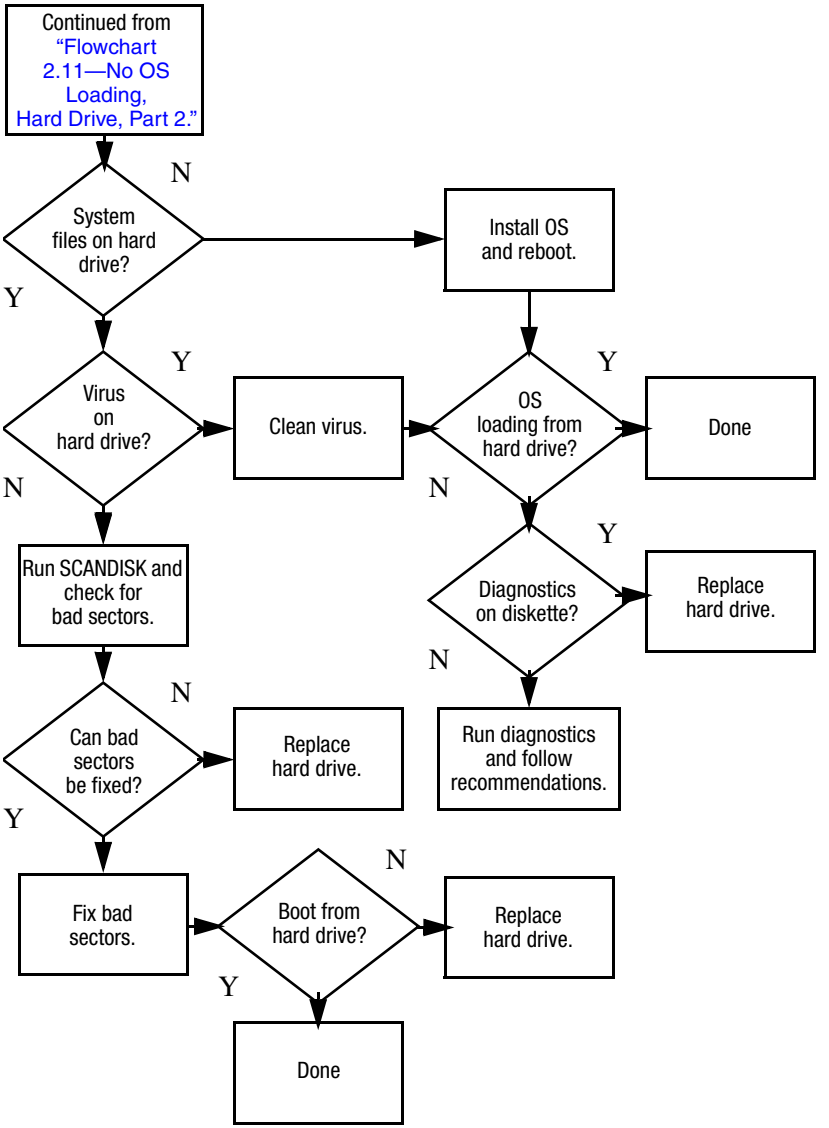
Flowchart 2.10—No OS Loading, Hard Drive, Part 1



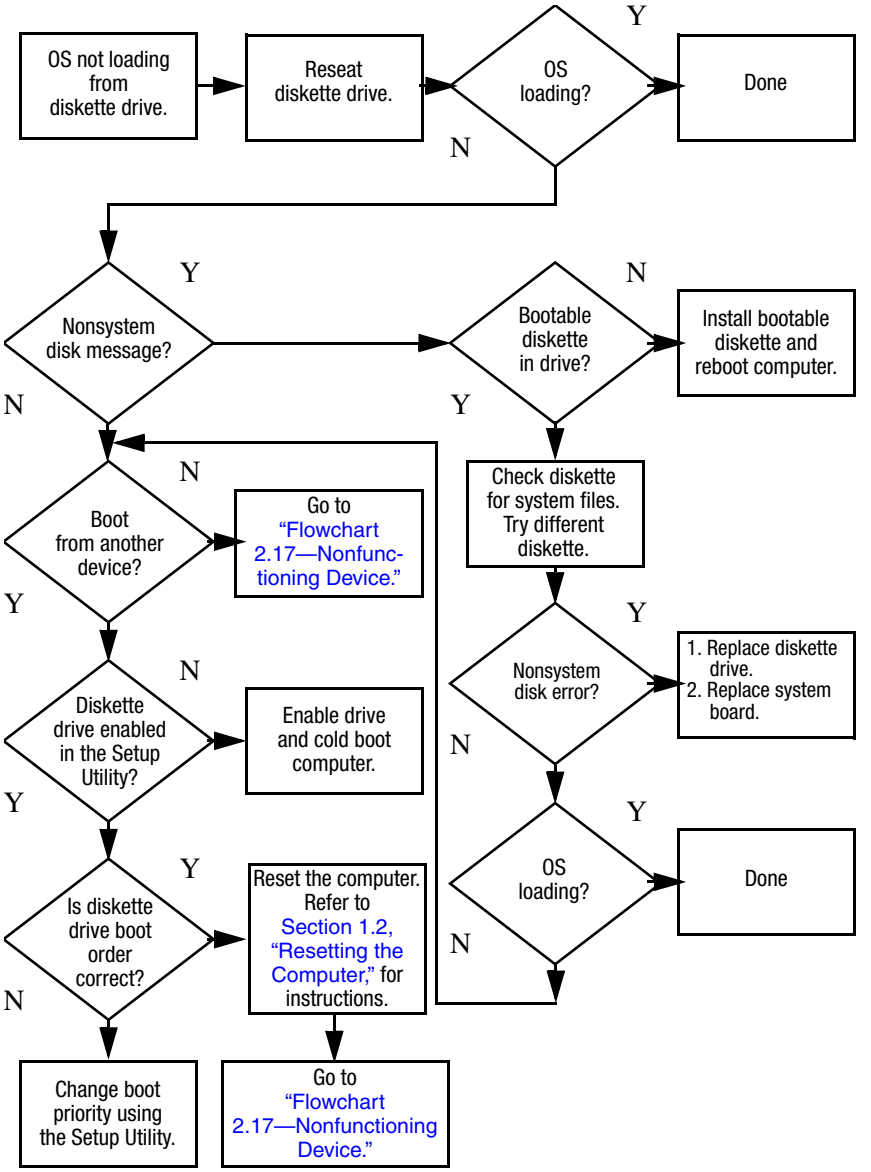
Flowchart 2.11—No OS Loading, Hard Drive, Part 2



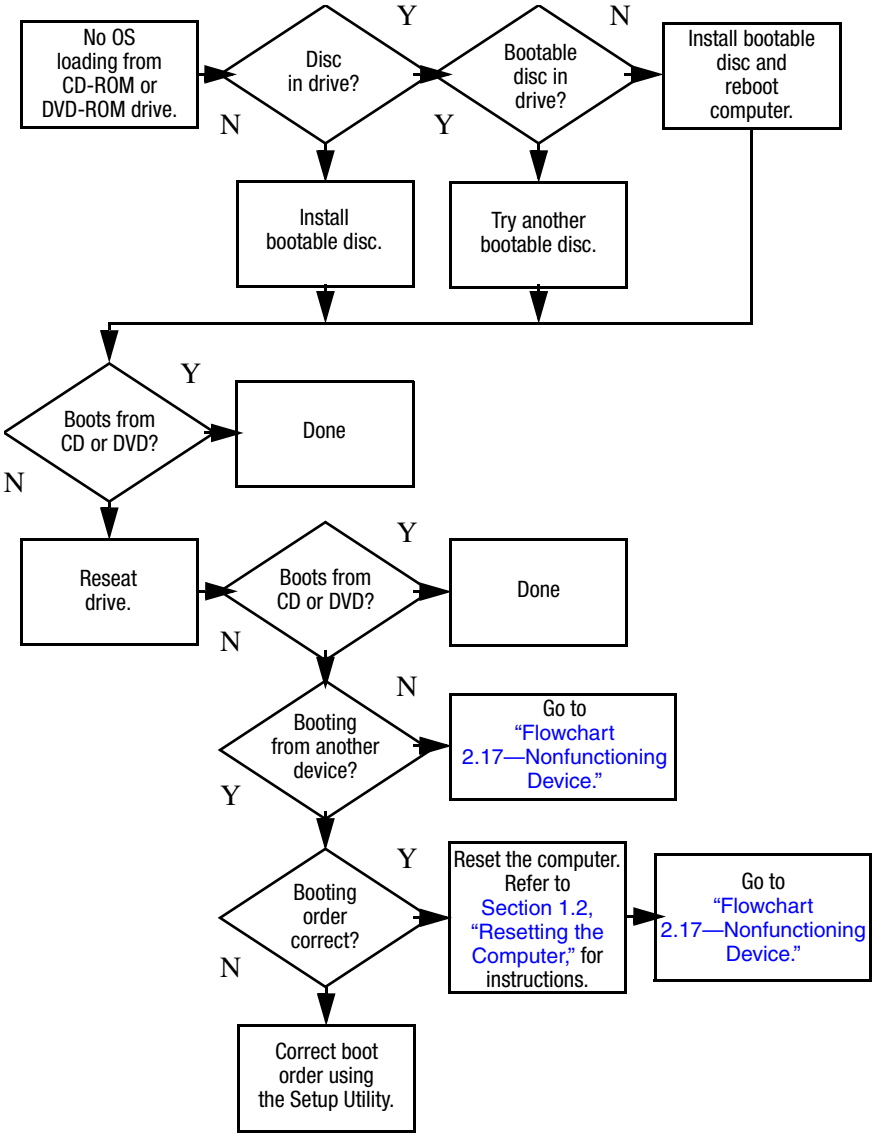
Flowchart 2.12—No OS Loading, Hard Drive, Part 3



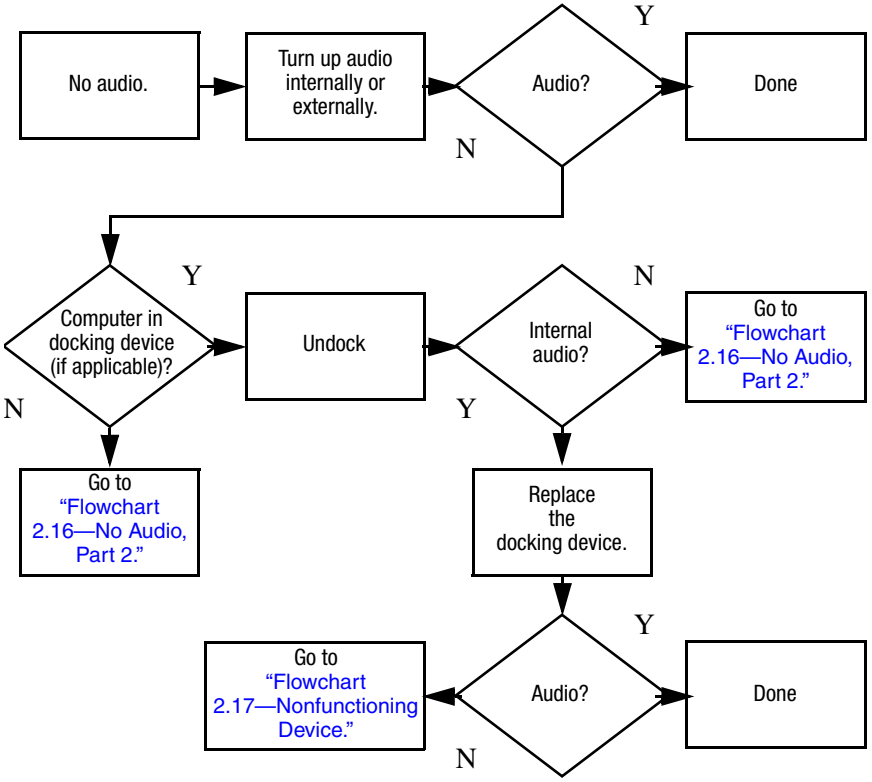
Flowchart 2.13—No OS Loading, Diskette Drive



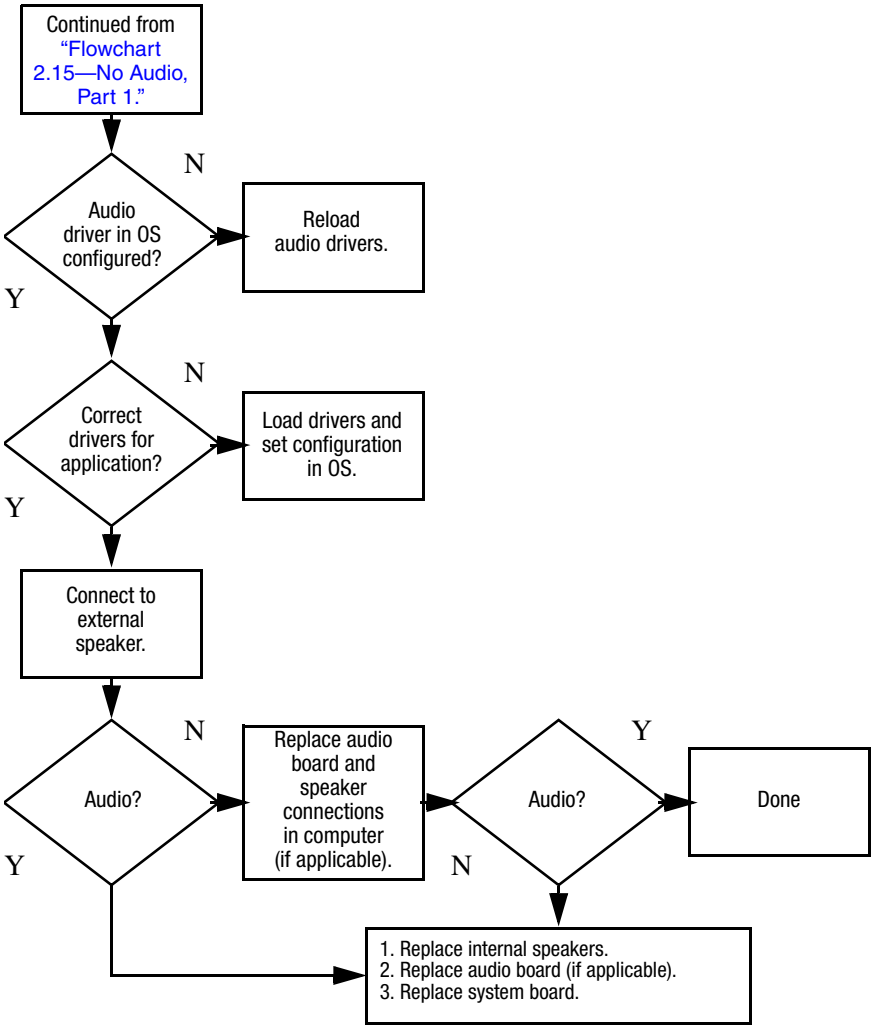
Flowchart 2.14—No OS Loading, Optical Drive



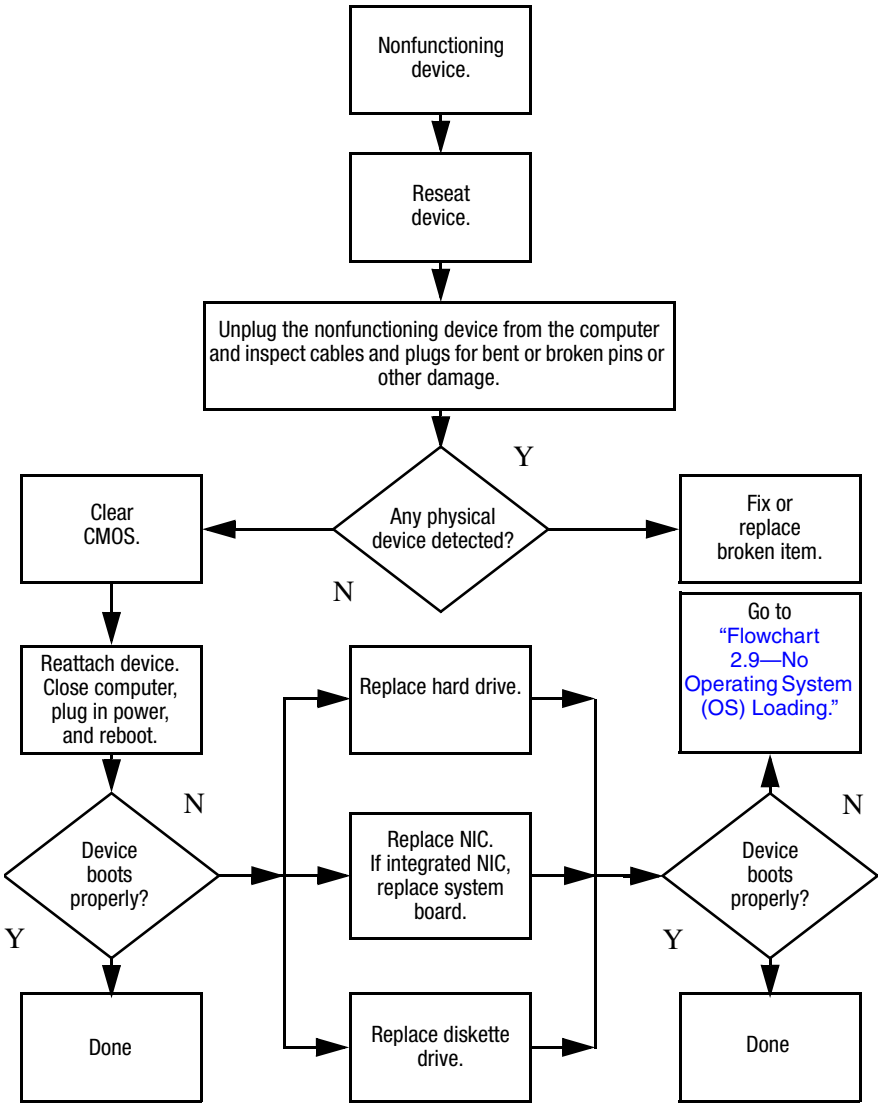
Flowchart 2.15—No Audio, Part 1



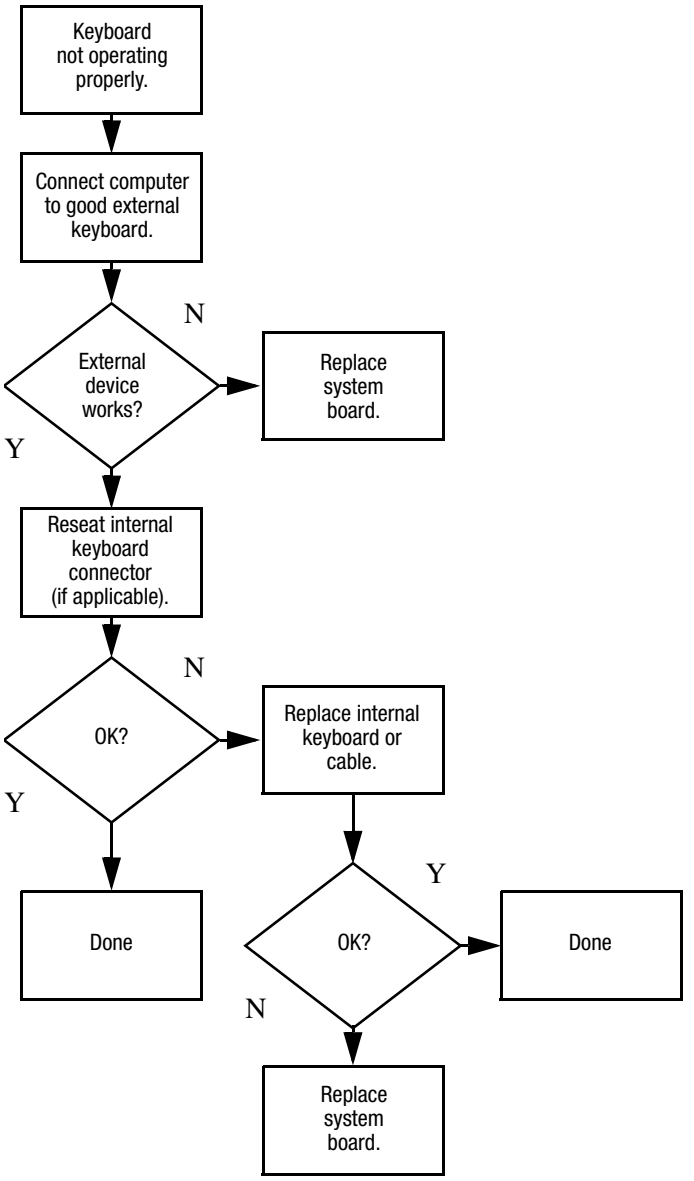
Flowchart 2.16—No Audio, Part 2



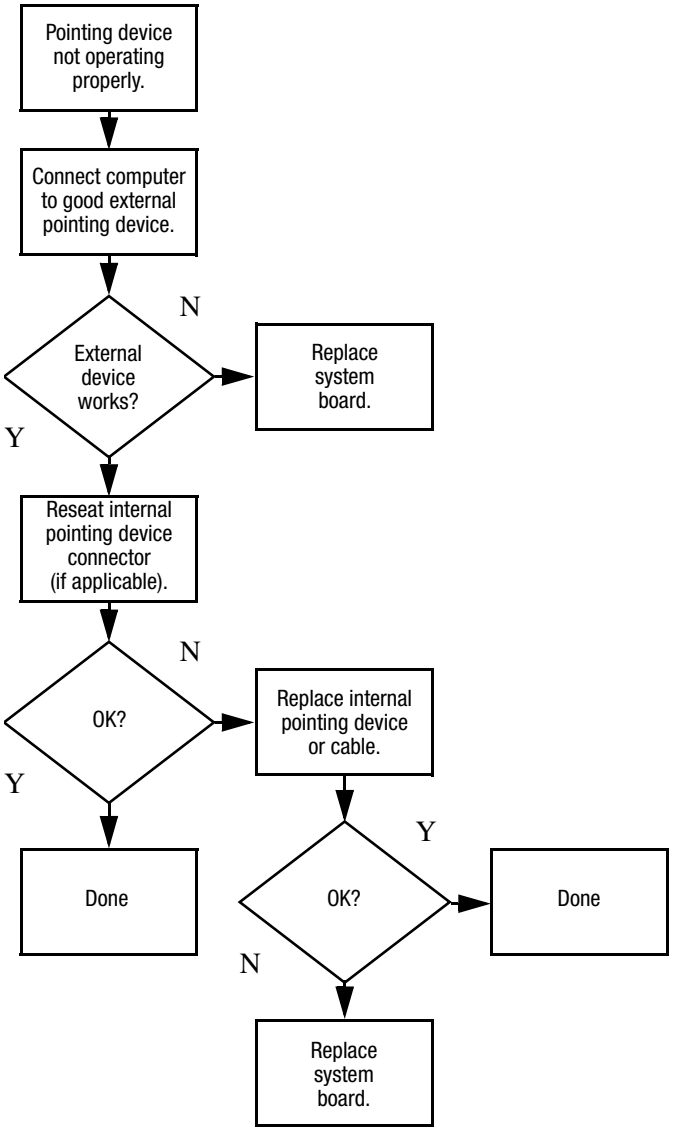
Flowchart 2.17—Nonfunctioning Device



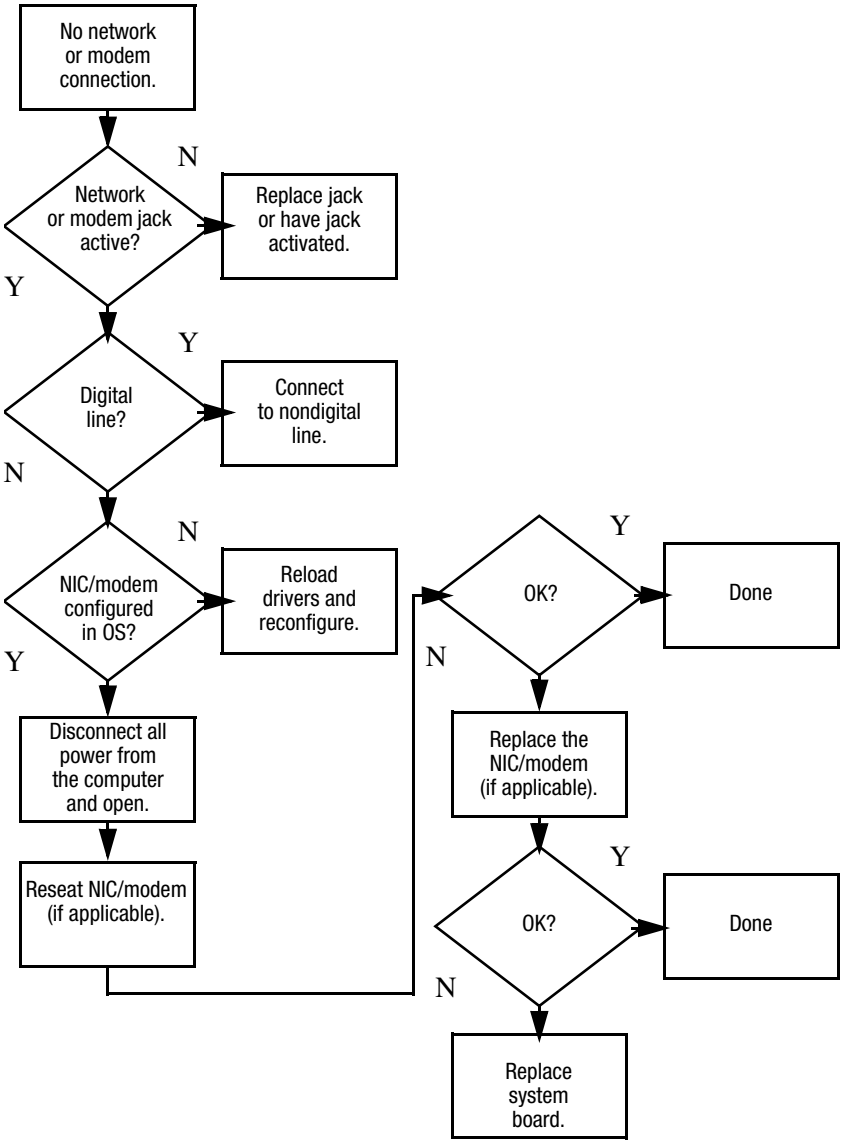
Flowchart 2.18—Nonfunctioning Keyboard



Flowchart 2.19—Nonfunctioning Pointing Device



Flowchart 2.20—No Network/Modem Connection



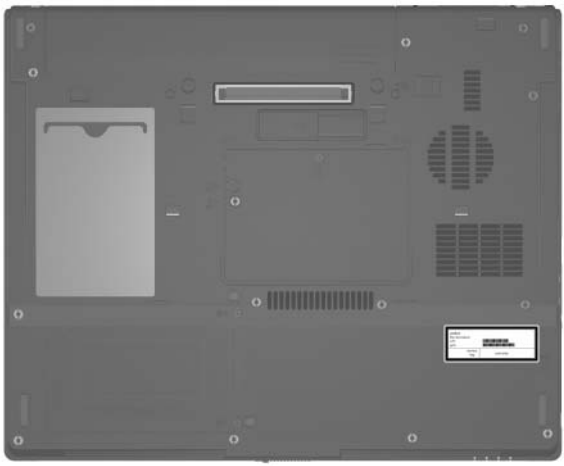
3

Illustrated Parts Catalog

This chapter provides an illustrated parts breakdown and a reference for spare part numbers.

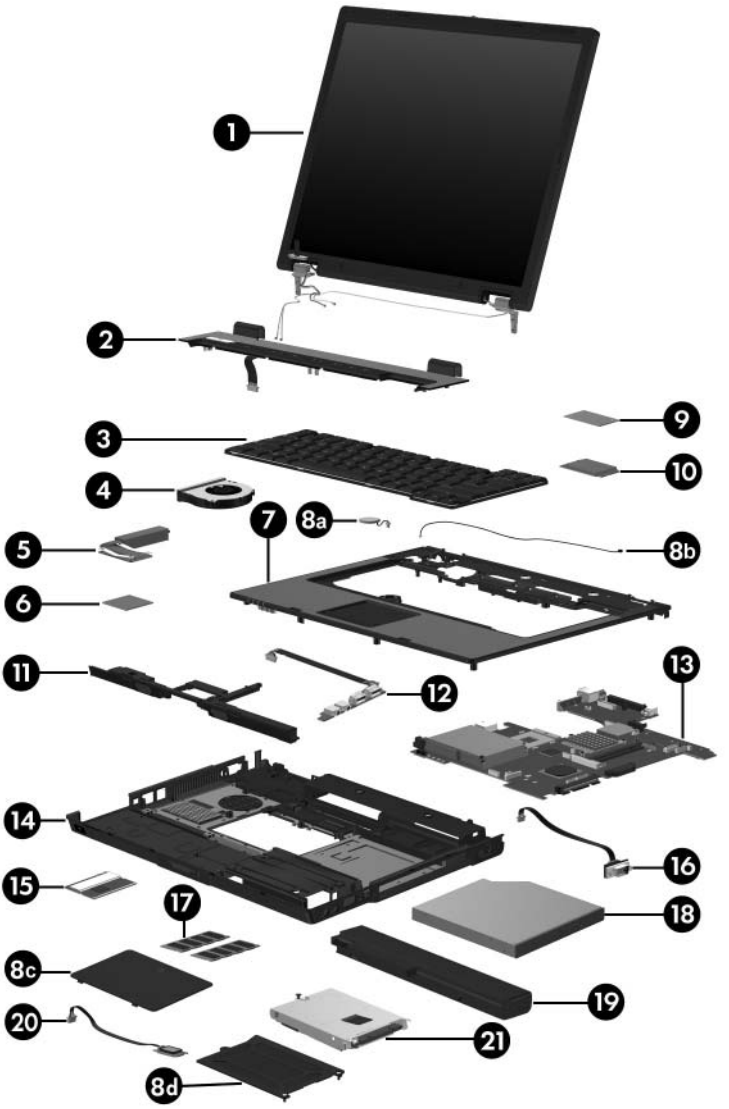
3.1 Serial Number Location

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



Serial Number Location

3.2 Computer Major Components

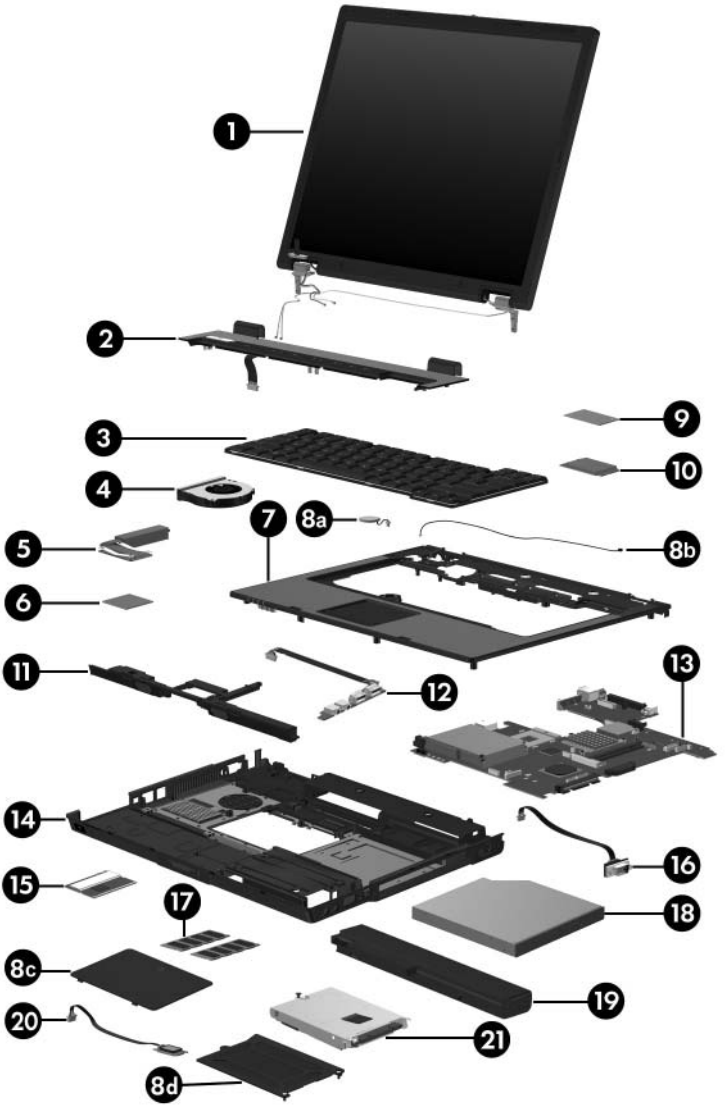


Computer Major Components

Table 3-1

Spare Parts: Computer Major Components

Item	Description	Spare Part Number
1	**Display assemblies for use with computer models with WWAN** (include wireless antenna transceivers and cables)	
	15.0-inch, SXGA+WVA, TFT	430967-001
	15.0-inch, XGA, TFT, with BrightView	430966-001
	Display assemblies for use with computer models without WWAN (include wireless antenna transceivers and cables)	
	15.0-inch, SXGA+WVA, TFT	413679-001
	15.0-inch, XGA, TFT, with BrightView	413678-001
	15.0-inch XGA, TFT	413677-001
	14.1-inch XGA, TFT	413676-001
2	**Switch covers** (include LED board and LED board cable)	
	For use with full-featured computer models	413688-001
	For use with defeatured computer models	413687-001

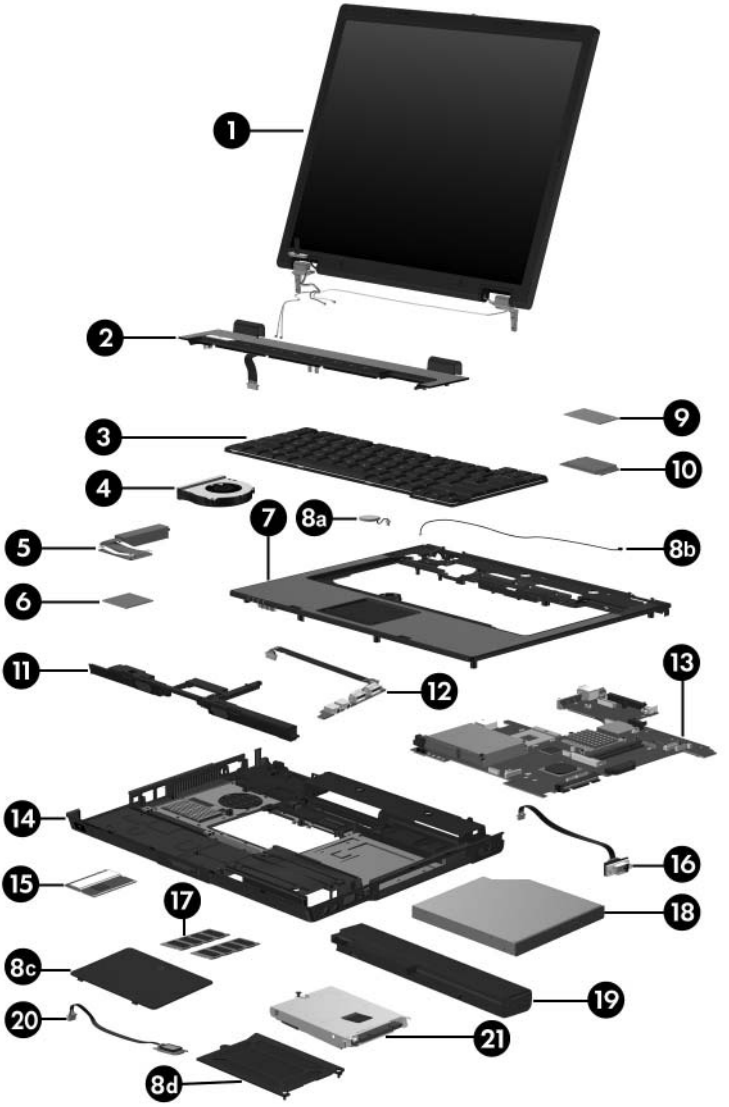


Computer Major Components

Table 3-1

Spare Parts: Computer Major Components *(Continued)*

Item	Description	Spare Part Number		
3	**Keyboards**			
	For use with computer models with TouchPad and fingerprint reader			
	Belgium	416039-A41	Norway	416039-091
	Brazil	416039-201	Portugal	416039-131
	The Czech Republic	416039-221	Russia	416039-251
			Saudi Arabia	416039-171
	Denmark	416039-081	Slovakia	416039-231
	Europe	416039-021	Slovenia	416039-BA1
	France	416039-051	Spain	416039-071
	French Canada	416039-121	Sweden	416039-B71
	Germany	416039-041	Switzerland	416039-111
	Greece	416039-151	Taiwan	416039-AB1
	Hungary	416039-211	Thailand	416039-281
	Iceland	416039-DD1	Turkey	416039-141
	Israel	416039-BB1	The United Kingdom	416039-031
	Italy	416039-061		
	Japan	416039-291	The United States	416039-001
	Korea	416039-AD1		
	Latin America	416039-161		

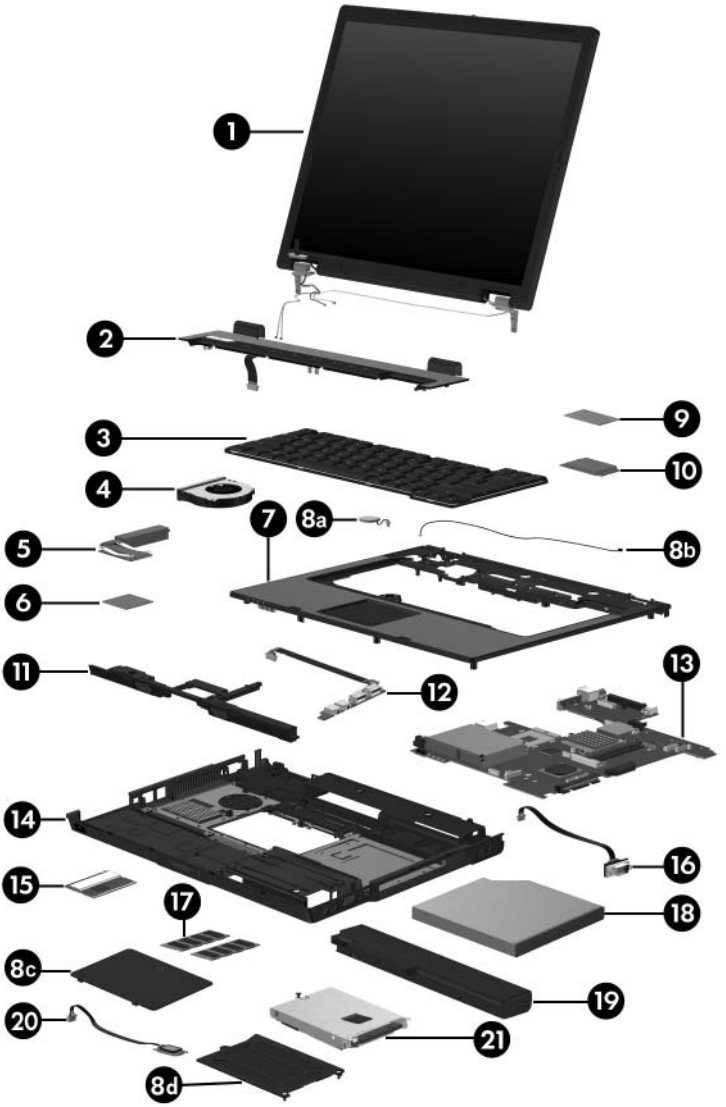


Computer Major Components

Table 3-1

Spare Parts: Computer Major Components *(Continued)*

Item	Description			Spare Part Number
3	**Keyboards** *(Continued)*			
	For use with computer models with pointing stick and fingerprint reader			
	Belgium	416038-A41	Norway	416038-091
	Brazil	416038-201	Portugal	416038-131
	The Czech Republic	416038-221	Russia	416038-251
			Saudi Arabia	416038-171
	Denmark	416038-081	Slovakia	416038-231
	Europe	416038-021	Slovenia	416038-BA1
	France	416038-051	Spain	416038-071
	French Canada	416038-121	Sweden	416038-B71
	Germany	416038-041	Switzerland	416038-111
	Greece	416038-151	Taiwan	416038-AB1
	Hungary	416038-211	Thailand	416038-281
	Iceland	416038-DD1	Turkey	416038-141
	Israel	416038-BB1	The United Kingdom	416038-031
	Italy	416038-061		
	Japan	416038-291	The United States	416038-001
	Korea	416038-AD1		
	Latin America	416038-161		
	Pointing stick board (not illustrated, includes pointing stick cable)			413692-001
4	**Fan**			413696-001
5	**Heat sink** (includes thermal paste)			379799-001
	Thermal Grease Kit (not illustrated)			413706-001

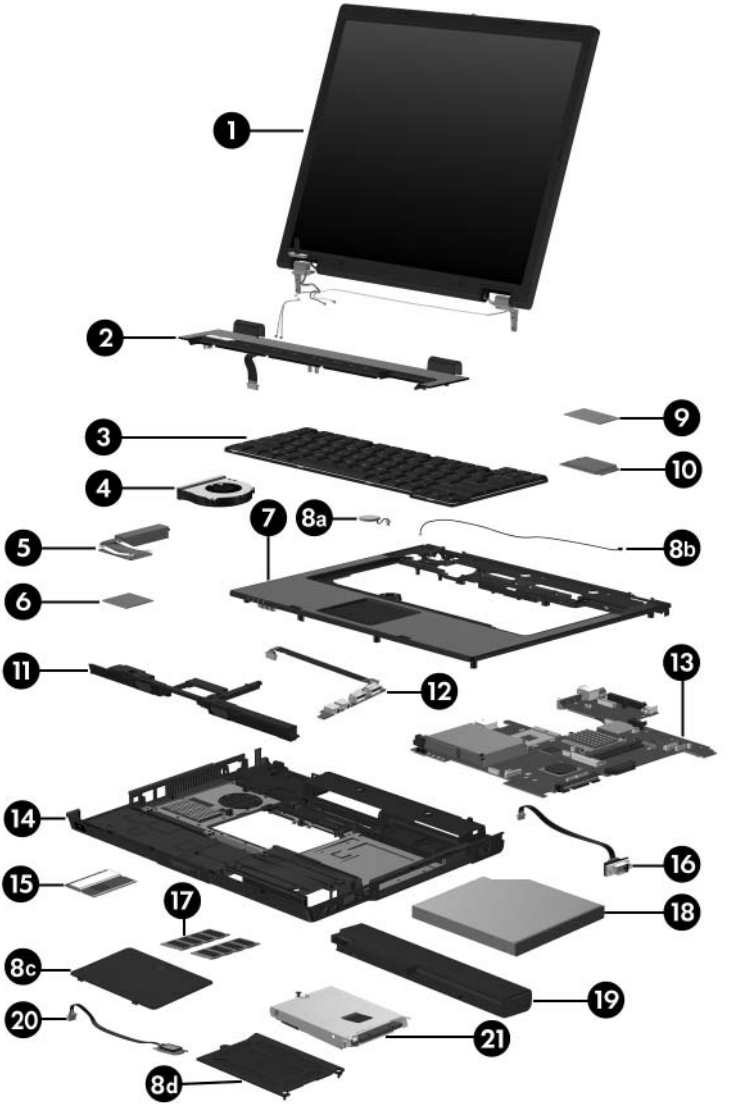


Computer Major Components

Table 3-1

Spare Parts: Computer Major Components *(Continued)*

Item	Description	Spare Part Number
6	**Processors** (include thermal paste)	
	Intel Core Duo T2600 (2.16-GHz) processor	413686-001
	Intel Core Duo T2500 (2.00-GHz) processor	413685-001
	Intel Core Duo T2400 (1.83-GHz) processor	413684-001
	Intel Core Duo T2300 (1.67-GHz) processor	413683-001
	Intel Core Duo T2300E (1.67-GHz) processor	430687-001
	Intel Core Solo T1300 (1.66-GHz) processor	413682-001
	Intel Celeron M 1.73-GHz processor	413896-001
	Intel Celeron M 1.60-GHz processor	413681-001
	Intel Celeron M 1.46-GHz processor	413680-001
7	**Top covers** (include TouchPad)	
	For use with full-featured computer models with pointing stick and fingerprint reader	413673-001
	For use with full-featured computer models with TouchPad and fingerprint reader	413674-001
	For use with full-featured computer models with TouchPad but without fingerprint reader	413675-001
	For use with defeatured computer models	413672-001
	Fingerprint reader board (not illustrated; includes fingerprint reader board cable)	413695-001

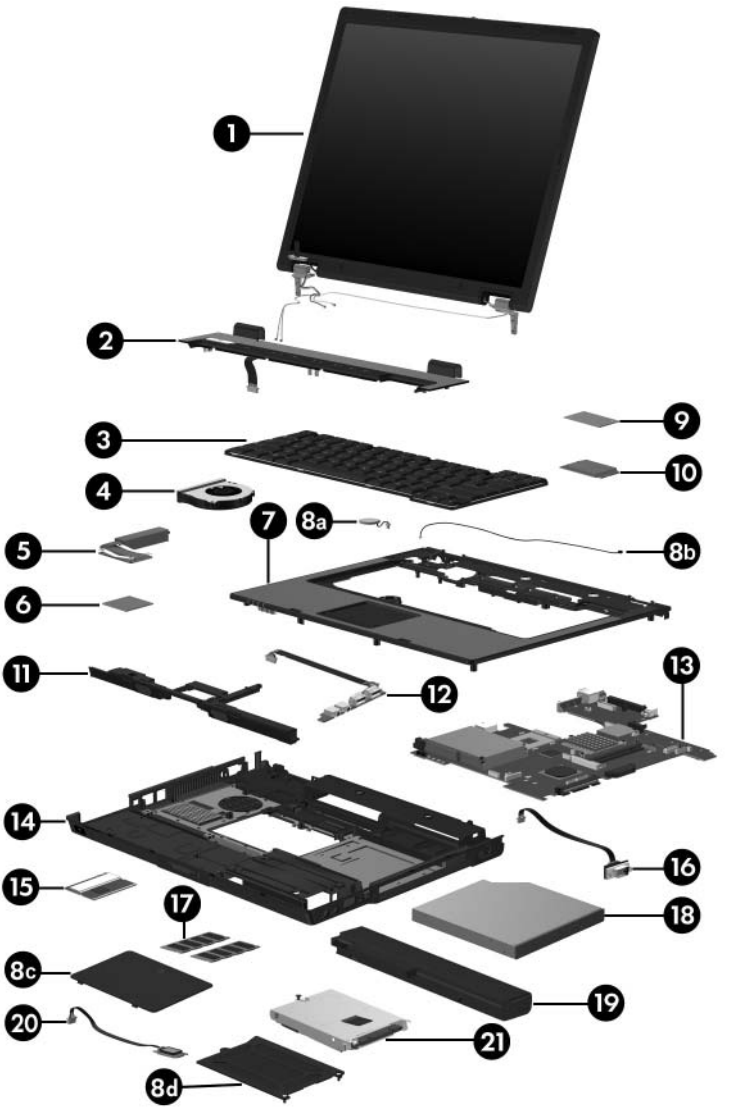


Computer Major Components

Table 3-1

Spare Parts: Computer Major Components *(Continued)*

Item	Description	Spare Part Number
	Plastics Kit	413704-001
	Includes:	
8a	RTC battery	
8b	Microphone	
8c	Memory/Mini Card module cover (includes 1 captive screw)	
8d	Hard drive cover (includes 2 captive screws)	
	Not illustrated: Computer feet (6) PC Card slot space savers (2)	
9	**Modem module**	399441-001
10	**Mini Card WWAN module**	399440-001
11	**Speaker**	413697-001
12	**USB/audio board** (includes USB/audio board cable)	413693-001
13	**System boards**	
	For use with full-featured computer models with Bluetooth and fingerprint reader	416165-001
	For use with full-featured computer models with TouchPad	413669-001 413670-001
	For use with full-featured computer models with fingerprint reader	413671-001
	For use with full-featured computer models with WWAN	
	For use with defeatured computer models “GM”	413667-001
	For use with defeatured computer models “GML”	413668-001
14	**Base enclosures**	
	For use with full-featured computer models	413689-001
	For use with defeatured computer models	413690-001

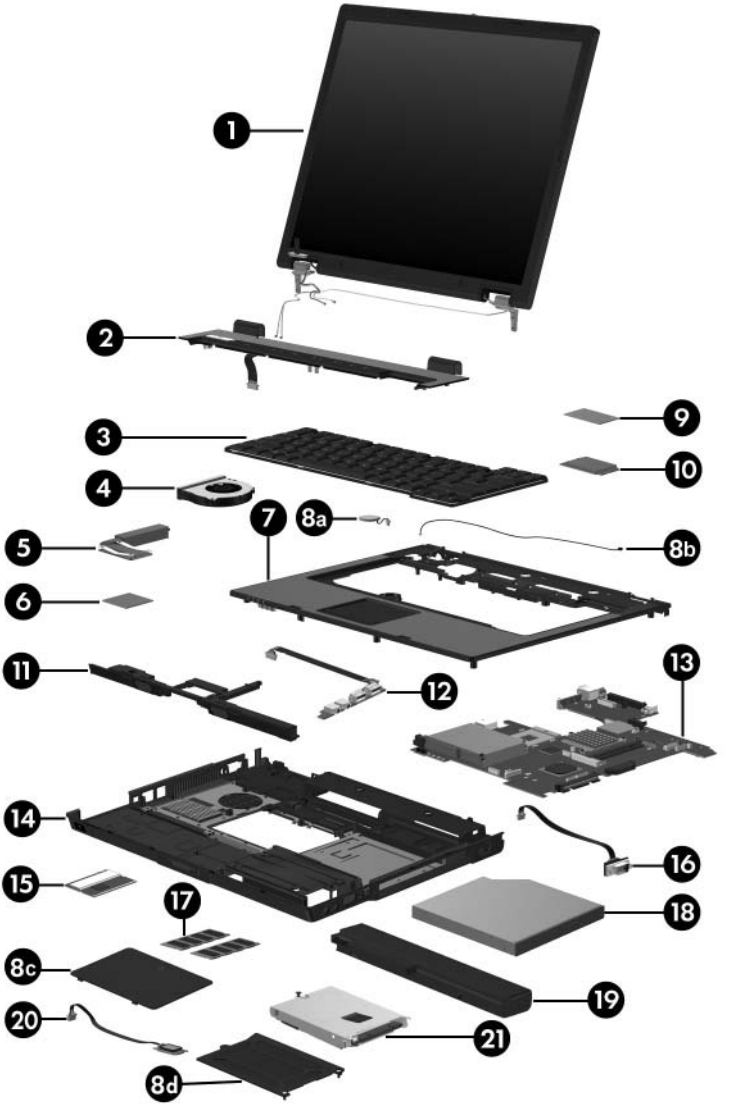


Computer Major Components

Table 3-1

Spare Parts: Computer Major Components *(Continued)*

Item	Description			Spare Part Number
15	**Mini Card modules**			
	802.11a/b/g Intel WLAN module for use in the countries listed below. These countries are categorized as most of the world 1 (MOW 1).			407575-001
	Antigua & Barbuda	Canada	Panama	Paraguay
	Argentina	Chile	India	Saudi Arabia
	Australia	Dominican Republic	Indonesia	Taiwan
	Bahamas	Guam	Malaysia	The United States
	Barbados	Guatemala	Mexico	Vietnam
	Brunei	Hong Kong	New Zealand	
	802.11a/b/g Intel WLAN module for use in the countries listed below. These countries are categorized as most of the world 2 (MOW 2).			407575-002
	Aruba	El Salvador	The Philippines	The Netherlands
	Austria	Estonia	Poland	Norway
	Azerbaijan	Finland	Portugal	Oman
	Bahrain	France	Romania	Slovenia
	Belgium	Georgia	Russia	South Africa
	Bermuda	Germany	Serbia and Montenegro	Spain
	Bulgaria	Greece	Singapore	Sri Lanka
	Cayman Islands	Hungary	Slovakia	Sweden
	Columbia	Iceland	Liechtenstein	Switzerland
	Croatia	Ireland	Lithuania	Turkey
	Cyprus	Italy	Luxembourg	The United Kingdom
	Czech Republic	Latvia	Malta	Uzbekistan
	Denmark	Lebanon	Monaco	
	Egypt			

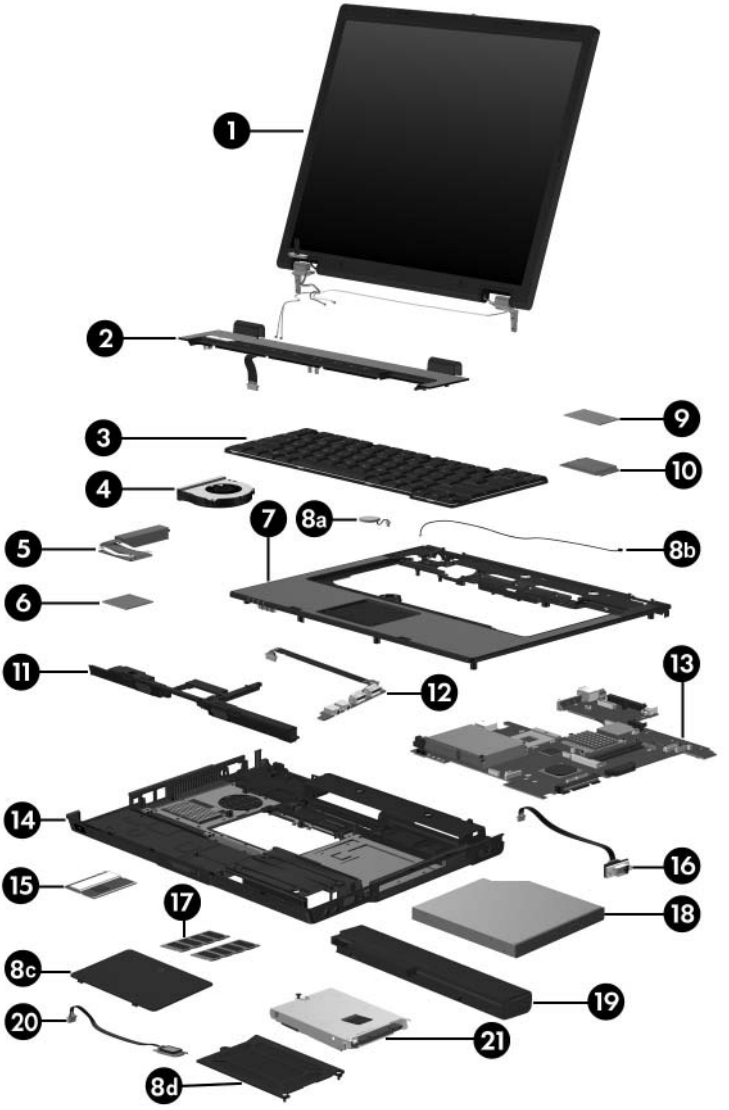


Computer Major Components

Table 3-1

Spare Parts: Computer Major Components *(Continued)*

Item	Description			Spare Part Number
15	**Mini Card modules** *(continued)*			
	802.11a/b/g Intel WLAN module for use in the countries listed below. These countries are categorized as the rest of the world ROW.			407575-003
	China Ecuador Haiti	Honduras Pakistan Peru	Qatar South Korea	Uruguay Venezuela
	802.11a/b/g Intel WLAN module for use in Japan.			407575-291
	802.11b/g GL WLAN module for use in the following countries:			409280-004
	Israel Jordan	Kuwait Thailand	United Arab Emirates	Ukraine

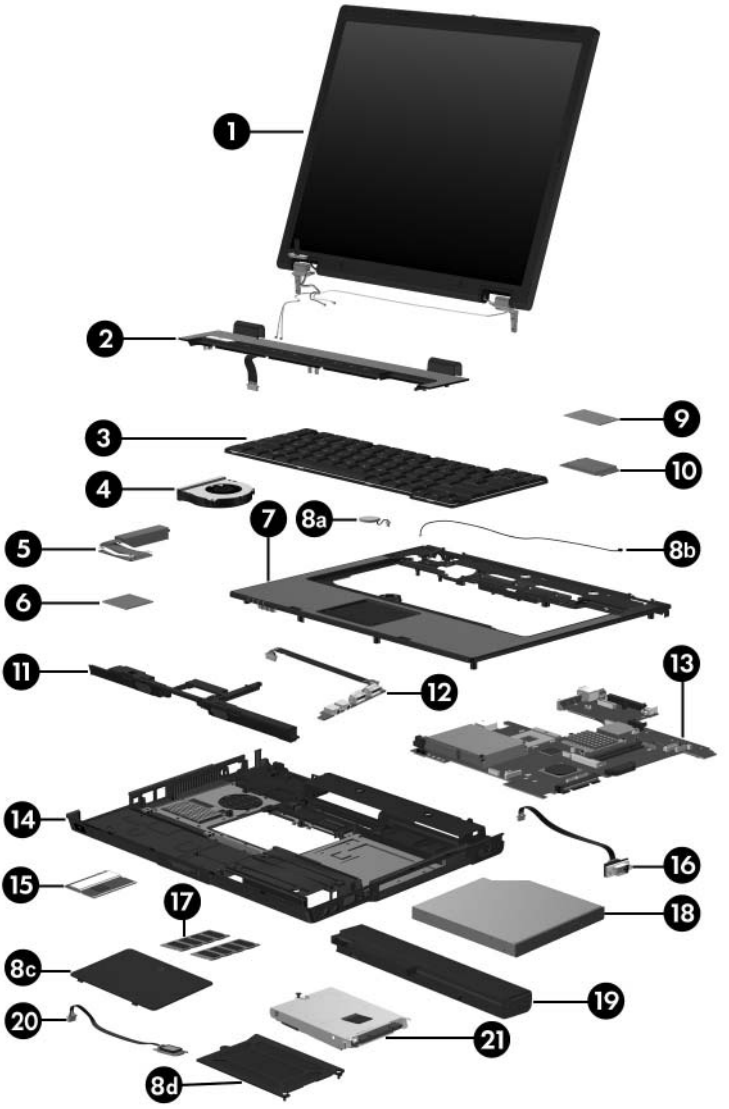


Computer Major Components

Table 3-1

Spare Parts: Computer Major Components *(Continued)*

Item	Description			Spare Part Number
15	**Mini Card modules** *(continued)*			
	802.11a/b/g LJ WLAN module for use in the United States and Canada.			407254-001
	802.11a/b/g LJ WLAN module for use in the MOW 2 countries listed below.			407254-002
	Aruba Austria Azerbaijan Bahrain Belgium Bermuda Bulgaria Cayman Islands Columbia Croatia Cyprus Czech Republic Denmark Egypt	El Salvador Estonia Finland France Georgia Germany Greece Hungary Iceland Ireland Italy Latvia Lebanon	The Philippines Poland Portugal Romania Russia Serbia and Montenegro Singapore Slovakia Liechtenstein Lithuania Luxembourg Malta Monaco	The Netherlands Norway Oman Slovenia South Africa Spain Sri Lanka Sweden Switzerland Turkey The United Kingdom Uzbekistan
	802.11a/b/g LJ WLAN module for use in Japan.			407254-291

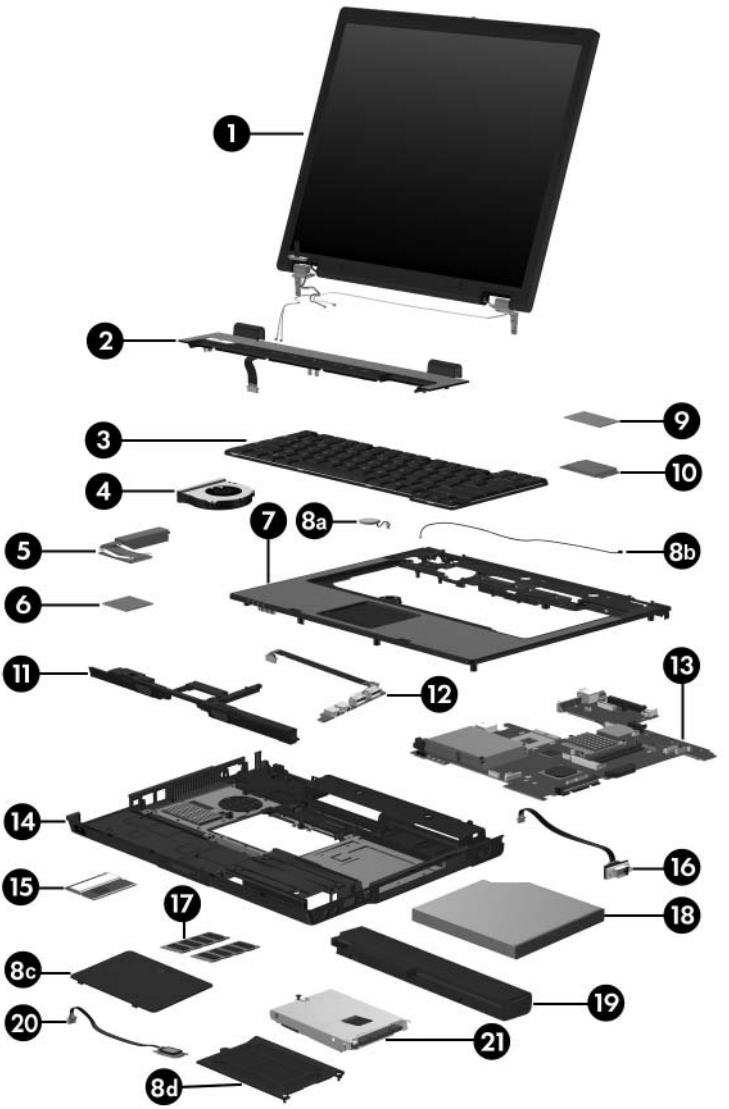


Computer Major Components

Table 3-1

Spare Parts: Computer Major Components *(Continued)*

Item	Description			Spare Part Number
15	**Mini Card modules** *(continued)*			
	802.11a/b/g HS WLAN module for use in the United States and Canada.			407253-001
	802.11a/b/g HS WLAN module for use in the MOW 2 countries listed below.			407253-002
	Aruba Austria Azerbaijan Bahrain Belgium Bermuda Bulgaria Cayman Islands Columbia Croatia Cyprus Czech Republic Denmark Egypt	El Salvador Estonia Finland France Georgia Germany Greece Hungary Iceland Ireland Italy Latvia Lebanon	The Philippines Poland Portugal Romania Russia Serbia and Montenegro Singapore Slovakia Liechtenstein Lithuania Luxembourg Malta Monaco	The Netherlands Norway Oman Slovenia South Africa Spain Sri Lanka Sweden Switzerland Turkey The United Kingdom Uzbekistan
	802.11a/b/g HS WLAN module for use in Japan.			407253-291
16	**Serial connector module** (includes serial connector board cable)			413694-001
17	**Memory modules**			
	PC2-5300		PC2-4200	
	1024-MB	414046-001	1024-MB	414042-001
	512-MB	414045-001	512-MB	414041-001
	256-MB	414044-001	256-MB	414040-001



Computer Major Components

Table 3-1

Spare Parts: Computer Major Components *(Continued)*

Item	Description			Spare Part Number
18	**Optical drives** (include bezel and optical drive bracket)			
	24X Max CD-ROM drive			413698-001
	8X Max DVD-ROM drive			413699-001
	4X Max DVD±RW and CD-RW Combo Drive			413700-001
	8X Max DVD±RW and CD-RW Combo Drive			413702-001
	24X Max DVD/CD-RW Combo Drive			413701-101
19	**Batteries**			
	6-cell, 4.8-Ah			372772-001
	6-cell, 4.0-Ah			393652-001
20	**Bluetooth® module** (includes Bluetooth module cable)			398393-001
21	**Hard drives** (include frame)			
	7200-rpm		5400-rpm	
	60-GB	413854-001	100-GB	413853-001
			80-GB	413852-001
			60-GB	413851-001
			40-GB	413850-001

3.3 Plastics Kit

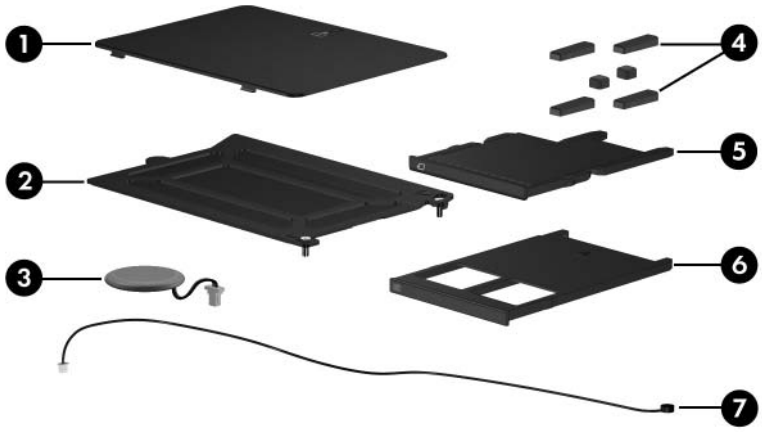


Table 3-2

Plastics Kit

Spare Part Number Information

Item	Description	Spare Part Number
	Plastics Kit Includes:	413704-001
1	Memory/Mini Card module cover (includes 1 captive screw)	
2	Hard drive cover (includes 2 captive screws)	
3	RTC battery	
4	Computer feet (6)	
5	ExpressCard slot space saver	
6	PC Card slot space saver	
7	Microphone	

3.4 Cable Kit

Table 3-3

Cable Kit

Spare Part Number Information

Item	Description	Spare Part Number
	Cable Kit Includes:	413703-001
1	TouchPad cable	
2	Modem cable	
3	USB/audio board cable	
4	Serial connector module cable	
5	Bluetooth cable	

3.5 Mass Storage Devices

Table 3-4
Mass Storage Devices
Spare Part Number Information

Item	Description			Spare Part Number
1	**Hard drives** (include frame)			
	7200-rpm, 60-GB	413854-001	5400-rpm, 100-GB	413853-001
			5400-rpm, 80-GB	413852-001
			5400-rpm, 60-GB	413851-001
			5400-rpm, 40-GB	413850-001
2	**Optical drives** (include bezel)			
	24X Max CD-ROM drive			413698-001
	8X Max DVD-ROM drive			413699-001
	4X Max DVD±RW and CD-RW Combo Drive			413700-001
	8X Max DVD±RW and CD-RW Combo Drive			413702-001
	24X Max DVD/CD-RW Combo Drive			413701-101

3.6 Miscellaneous (Not Illustrated)

Table 3-5

Miscellaneous (Not Illustrated)

Spare Part Information

Description	Spare Part Number
8-cell travel battery	367456-001
65-watt AC adapter	239704-001
External MultiBay II	366143-001
External MultiBay II power cable and stand	366144-001
HP Docking Station	413267-001
HP Docking Station 120 W AC adapter	391174-001
HP Docking Station Miscellaneous Plastics Kit	380089-001
MultiBay 8X DVD-ROM Drive (for use in External MultiBay II and HP Docking Station)	373314-001
MultiBay 24X DVD/CD-RW Combo Drive (for use in External MultiBay II and HP Docking Station)	373315-001
DVD±RW and CD-RW Double-Layer Combo Drive (for use in External MultiBay II and HP Docking Station)	375557-001
Nylon carrying case	325815-002

Table 3-5

Miscellaneous (Not Illustrated)

Spare Part Information *(Continued)*

Description	Spare Part Number
Power cords	
For use in:	
Australia	246959-011
Belgium, Europe, Finland, Germany, Greece, the Netherlands, Norway, Portugal, Spain, and Sweden	246959-021
Brazil	246959-201
Canada, French Canada, Latin America, Taiwan, and the United States	246959-001
Denmark	246959-081
Hong Kong and the United Kingdom	246959-031
Israel	246959-BB1
Italy	246959-061
Japan	246959-291
Korea	246959-AD1
Sweden	246959-AG1

Table 3-5

Miscellaneous (Not Illustrated)

Spare Part Information *(Continued)*

Description	Spare Part Number
Screw Kit (includes the following screws; refer to Appendix A, "Screw Listing," for more information on specifications and usage) ■ Hex socket HM5.0×9.0 screw lock ■ Phillips PM2.5×13.0 spring-loaded screw ■ Phillips PM2.5×4.0 shoulder screw ■ Phillips PM2.5×4.0 screw ■ Phillips PM2.0×8.0 shoulder screw ■ Phillips PM2.0×7.0 screw ■ Phillips PM2.0×4.0 screw ■ Phillips PM2.0×3.0 screw ■ Phillips PM1.5×4.0 screw ■ Phillips PM1.5×3.5 screw ■ Torx8 T8M2.0×9.0 screw ■ Torx8 T8M2.0×4.0 screw ■ Torx8 T8M2.0×2.0 screw	413705-001

3.7 Sequential Part Number Listing

Table 3-6

Sequential Part Number Listing

Spare Part Number	Description
239704-001	65-watt AC adapter
246959-001	Power cord for use in Canada, French Canada, Latin America, Taiwan, and the United States
246959-011	Power cord for use in Australia
246959-021	Power cord for use in Belgium, Europe, Finland, Germany, Greece, the Netherlands, Norway, Portugal, Spain, and Sweden
246959-031	Power cord for use in Hong Kong and the United Kingdom
246959-061	Power cord for use in Italy
246959-081	Power cord for use in Denmark
246959-201	Power cord for use in Brazil
246959-291	Power cord for use in Japan
246959-AD1	Power cord for use in Korea
246959-AG1	Power cord for use in Sweden
246959-BB1	Power cord for use in Israel
325815-002	Nylon carrying case
366143-001	External MultiBay II
366144-001	External MultiBay II power cable and stand
367456-001	8-cell travel battery
372772-001	6-cell, 4.8-Ah battery
373314-001	MultiBay 8X DVD-ROM Drive (for use in External MultiBay II and HP Docking Station)

Table 3-6

Sequential Part Number Listing *(Continued)*

Spare Part Number	Description
373315-001	MultiBay 24X DVD/CD-RW Combo Drive (for use in External MultiBay II and HP Docking Station)
375557-001	DVD±RW and CD-RW Double Layer Combo Drive (for use in External MultiBay II and HP Docking Station)
379799-001	Heat sink (includes thermal paste)
380089-001	HP Docking Station Miscellaneous Plastics Kit
391174-001	HP Docking Station 120 W AC adapter
393652-001	6-cell, 4.0-Ah battery
398393-001	Bluetooth module (includes Bluetooth module cable)
399440-001	Mini Card WWAN module
399441-001	Modem module
407254-001	802.11a/b/g LJ WLAN Mini Card module for use in the United States and Canada.

Table 3-6

Sequential Part Number Listing *(Continued)*

Spare Part Number	Description
407254-002	802.11a/b/g LJ WLAN Mini Card module for use in the MOW 2 countries listed below. Aruba Austria Azerbaijan Bahrain Belgium Bermuda Bulgaria Cayman Islands Columbia Croatia Cyprus Czech Republic Denmark Egypt El Salvador Estonia Finland France Georgia Germany Greece Hungary Iceland Ireland Italy Latvia Lebanon The Philippines Poland Portugal Romania Russia Serbia and Montenegro Singapore Slovakia Liechtenstein Lithuania Luxembourg Malta Monaco The Netherlands Norway Oman Slovenia South Africa Spain Sri Lanka Sweden Switzerland Turkey The United Kingdom Uzbekistan
407254-291	802.11a/b/g LJ WLAN Mini Card module for use in Japan.

Table 3-6

Sequential Part Number Listing *(Continued)*

Spare Part Number	Description			
407575-001	802.11a/b/g Intel WLAN Mini Card module for use in the MOW 1 countries listed below.			
	Antigua & Barbuda Argentina Australia Bahamas Barbados Brunei	Canada Chile Dominican Republic Guam Guatemala Hong Kong	Panama India Indonesia Malaysia Mexico New Zealand	Paraguay Saudi Arabia Taiwan The United States Vietnam
407575-002	802.11a/b/g Intel WLAN Mini Card module for use in the MOW 2 countries listed below.			
	Aruba Austria Azerbaijan Bahrain Belgium Bermuda Bulgaria Cayman Islands Columbia Croatia Cyprus Czech Republic Denmark	Egypt El Salvador Estonia Finland France Georgia Germany Greece Hungary Iceland Ireland Italy Latvia Lebanon	The Philippines Poland Portugal Romania Russia Serbia and Montenegro Singapore Slovakia Liechtenstein Lithuania Luxembourg Malta Monaco	The Netherlands Norway Oman Slovenia South Africa Spain Sri Lanka Sweden Switzerland Turkey The United Kingdom Uzbekistan

Table 3-6

Sequential Part Number Listing *(Continued)*

Spare Part Number	Description			
407575-003	802.11a/b/g Intel WLAN Mini Card module for use in the ROW countries listed below.			
	China	Honduras	Qatar	Uruguay
	Ecuador	Pakistan	South Korea	Venezuela
	Haiti	Peru		
407575-291	802.11a/b/g Intel WLAN Mini Card module for use in Japan.			
409280-004	802.11b/g GL WLAN Mini Card module for use in the countries listed below.			
	Israel	Kuwait	United Arab Emirates	Ukraine
	Jordan	Thailand		
413267-001	HP Docking Station			
413667-001	System board for use with defeatured computer models “GM”			
413668-001	System board or use with defeatured computer models “GML”			
413669-001	System board for use with full-featured computer models with TouchPad			
413670-001	System board for use with full-featured computer models with fingerprint reader			
413671-001	System board for use with full-featured computer models with Mini Card WWAN module			
413672-001	Top cover for use with defeatured computer models (includes TouchPad)			
413673-001	Top cover for use with full-featured computer models with pointing stick and fingerprint reader (includes TouchPad)			
413674-001	Top cover for use with full-featured computer models with TouchPad and fingerprint reader (includes TouchPad)			
413675-001	Top cover for use with full-featured computer models with TouchPad but without fingerprint reader (includes TouchPad)			

Table 3-6

Sequential Part Number Listing *(Continued)*

Spare Part Number	Description
413676-001	14.1-inch XGA, TFT display assembly for use with computer models without WWAN (include wireless antenna transceivers and cables)
413677-001	15.0-inch XGA, TFT display assembly for use with computer models without WWAN (include wireless antenna transceivers and cables)
413678-001	15.0-inch, XGA, TFT with BrightView display assembly for use with computer models without WWAN (include wireless antenna transceivers and cables)
413679-001	15.0-inch, SXGA+WVA, TFT display assembly for use with computer models without WWAN (include wireless antenna transceivers and cables)
413680-001	Intel Celeron M 1.46-GHz processor (includes thermal paste)
413681-001	Intel Celeron M 1.60-GHz processor (includes thermal paste)
413682-001	Intel Core Solo T1300 (1.66-GHz) processor (includes thermal paste)
413683-001	Intel Core Duo T2300 (1.67-GHz) processor (includes thermal paste)
413684-001	Intel Core Duo T2400 (1.83-GHz) processor (includes thermal paste)
413685-001	Intel Core Duo T2500 (2.00-GHz) processor (includes thermal paste)
413686-001	Intel Core Duo T2600 (2.16-GHz) processor (includes thermal paste)
413687-001	Switch cover for use with defeatured computer models (includes LED board and LED board cable)
413688-001	Switch cover for use with full-featured computer models (includes LED board and LED board cable)

Table 3-6

Sequential Part Number Listing *(Continued)*

Spare Part Number	Description
413689-001	Base enclosure for use with full-featured computer models
413690-001	Base enclosure for use with defeatured computer models
413692-001	Pointing stick board (includes pointing stick cable)
413693-001	USB/audio board (includes USB/audio board cable)
413694-001	Serial connector module (includes serial connector board cable)
413695-001	Fingerprint reader board (includes fingerprint reader board cable)
413696-001	Fan
413697-001	Speaker
413698-001	24X Max CD-ROM drive
413699-001	8X Max DVD-ROM drive
413700-001	4X Max DVD±RW and CD-RW Combo Drive
413701-001	24X Max DVD/CD-RW Combo Drive
413702-001	8X Max DVD±RW and CD-RW Combo Drive
413703-001	Cable Kit
413704-001	Plastics Kit
413706-001	Thermal Grease Kit
413850-001	5400-rpm, 40-GB hard drive (includes frame)
413851-001	5400-rpm, 60-GB hard drive (includes frame)
413852-001	5400-rpm, 80-GB hard drive (includes frame)
413853-001	5400-rpm, 100-GB hard drive (includes frame)
413854-001	7200-rpm, 60-GB hard drive (includes frame)

Table 3-6

Sequential Part Number Listing *(Continued)*

Spare Part Number	Description
413896-001	Intel Celeron M 1.73-GHz processor (includes thermal paste)
414040-001	PC2-4200, 256-MB memory module
414041-001	PC2-4200, 512-MB memory module
414042-001	PC2-4200, 1024-MB memory module
414044-001	PC2-5300, 256-MB memory module
414045-001	PC2-5300, 512-MB memory module
414046-001	PC2-5300, 1024-MB memory module
416038-001	Keyboard for use with computer models with pointing stick and fingerprint reader in the United States
416038-021	Keyboard for use with computer models with pointing stick and fingerprint reader in Europe
416038-031	Keyboard for use with computer models with pointing stick and fingerprint reader in the United Kingdom
416038-041	Keyboard for use with computer models with pointing stick and fingerprint reader in Germany
416038-051	Keyboard for use with computer models with pointing stick and fingerprint reader in France
416038-061	Keyboard for use with computer models with pointing stick and fingerprint reader in Italy
416038-071	Keyboard for use with computer models with pointing stick and fingerprint reader in Spain
416038-081	Keyboard for use with computer models with pointing stick and fingerprint reader in Denmark
416038-091	Keyboard for use with computer models with pointing stick and fingerprint reader in Norway

Table 3-6

Sequential Part Number Listing *(Continued)*

Spare Part Number	Description
416038-111	Keyboard for use with computer models with pointing stick and fingerprint reader in Switzerland
416038-121	Keyboard for use with computer models with pointing stick and fingerprint reader in French Canada
416038-131	Keyboard for use with computer models with pointing stick and fingerprint reader in Portugal
416038-141	Keyboard for use with computer models with pointing stick and fingerprint reader in Turkey
416038-151	Keyboard for use with computer models with pointing stick and fingerprint reader in Greece
416038-161	Keyboard for use with computer models with pointing stick and fingerprint reader in Latin America
416038-171	Keyboard for use with computer models with pointing stick and fingerprint reader in Saudi Arabia
416038-201	Keyboard for use with computer models with pointing stick and fingerprint reader in Brazil
416038-211	Keyboard for use with computer models with pointing stick and fingerprint reader in Hungary
416038-221	Keyboard for use with computer models with pointing stick and fingerprint reader in the Czech Republic
416038-231	Keyboard for use with computer models with pointing stick and fingerprint reader in Slovakia
416038-251	Keyboard for use with computer models with pointing stick and fingerprint reader in Russia
416038-281	Keyboard for use with computer models with pointing stick and fingerprint reader in Thailand
416038-291	Keyboard for use with computer models with pointing stick and fingerprint reader in Japan

Table 3-6

Sequential Part Number Listing *(Continued)*

Spare Part Number	Description
416038-A41	Keyboard for use with computer models with pointing stick and fingerprint reader in Belgium
416038-AB1	Keyboard for use with computer models with pointing stick and fingerprint reader in Taiwan
416038-AD1	Keyboard for use with computer models with pointing stick and fingerprint reader in Korea
416038-BA1	Keyboard for use with computer models with pointing stick and fingerprint reader in Slovenia
416038-B71	Keyboard for use with computer models with pointing stick and fingerprint reader in Sweden
416038-DD1	Keyboard for use with computer models with pointing stick and fingerprint reader in Israel
416039-001	Keyboard for use with computer models with TouchPad and fingerprint reader in the United States
416039-021	Keyboard for use with computer models with TouchPad and fingerprint reader in Europe
416039-031	Keyboard for use with computer models with TouchPad and fingerprint reader in the United Kingdom
416039-041	Keyboard for use with computer models with TouchPad and fingerprint reader in Germany
416039-051	Keyboard for use with computer models with TouchPad and fingerprint reader in France
416039-061	Keyboard for use with computer models with TouchPad and fingerprint reader in Italy
416039-071	Keyboard for use with computer models with TouchPad and fingerprint reader in Spain
416039-081	Keyboard for use with computer models with TouchPad and fingerprint reader in Denmark

Table 3-6

Sequential Part Number Listing *(Continued)*

Spare Part Number	Description
416039-091	Keyboard for use with computer models with TouchPad and fingerprint reader in Norway
416039-111	Keyboard for use with computer models with TouchPad and fingerprint reader in Switzerland
416039-121	Keyboard for use with computer models with TouchPad and fingerprint reader in French Canada
416039-131	Keyboard for use with computer models with TouchPad and fingerprint reader in Portugal
416039-141	Keyboard for use with computer models with TouchPad and fingerprint reader in Turkey
416039-151	Keyboard for use with computer models with TouchPad and fingerprint reader in Greece
416039-161	Keyboard for use with computer models with TouchPad and fingerprint reader in Latin America
416039-171	Keyboard for use with computer models with TouchPad and fingerprint reader in Saudi Arabia
416039-201	Keyboard for use with computer models with TouchPad and fingerprint reader in Brazil
416039-211	Keyboard for use with computer models with TouchPad and fingerprint reader in Hungary
416039-221	Keyboard for use with computer models with TouchPad and fingerprint reader in the Czech Republic
416039-231	Keyboard for use with computer models with TouchPad and fingerprint reader in Slovakia
416039-251	Keyboard for use with computer models with TouchPad and fingerprint reader in Russia
416039-281	Keyboard for use with computer models with TouchPad and fingerprint reader in Thailand

Table 3-6

Sequential Part Number Listing *(Continued)*

Spare Part Number	Description
416039-291	Keyboard for use with computer models with TouchPad and fingerprint reader in Japan
416039-A41	Keyboard for use with computer models with TouchPad and fingerprint reader in Belgium
416039-AB1	Keyboard for use with computer models with TouchPad and fingerprint reader in Taiwan
416039-AD1	Keyboard for use with computer models with TouchPad and fingerprint reader in Korea
416039-BA1	Keyboard for use with computer models with TouchPad and fingerprint reader in Slovenia
416039-B71	Keyboard for use with computer models with TouchPad and fingerprint reader in Sweden
416039-DD1	Keyboard for use with computer models with TouchPad and fingerprint reader in Israel
416165-001	System board for use with full-featured computer models with Bluetooth and fingerprint reader
430687-001	Intel Core Duo T2300E (1.67-GHz) processor (includes thermal paste)
430966-001	15.0-inch XGA, TFT display assembly for use with computer models with WWAN (include wireless antenna transceivers and cables)
430967-001	15.0-inch, SXGA+WVA, TFT display assembly for use with computer models with WWAN (include wireless antenna transceivers and cables)

4

Removal and Replacement Preliminaries

This chapter provides essential information for proper and safe removal and replacement service.

4.1 Tools Required

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

- Magnetic screwdriver
- Phillips P0 screwdriver
- Torx8 screwdriver
- 5.0-mm socket for system board screwlocks
- Flat-bladed screwdriver

4.2 Service Considerations

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

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.

4.3 Preventing Damage to Removable Drives

Removable drives are fragile components that must be handled with care. To prevent damage to the computer, damage to a removable drive, or loss of information, observe the following precautions:

- Before removing or inserting a hard drive, shut down the computer. If you are unsure whether the computer is off or in hibernation, turn the computer on, and then shut it down through the operating system.
- Before 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.
- Before handling a drive, be sure that you are discharged of static electricity. While handling a drive, avoid touching the connector.
- Handle drives on surfaces covered with at least one inch of shock-proof foam.
- Avoid dropping drives from any height onto any surface.
- After removing a hard drive, an optical drive, or a diskette drive, place it in a static-proof bag.
- Avoid exposing a hard drive to products that have magnetic fields, such as monitors or speakers.
- Avoid exposing a drive to temperature extremes or liquids.
- If a drive must be mailed, place the drive in a bubble pack mailer or other suitable form of protective packaging and label the package “FRAGILE: Handle With Care.”

4.4 Preventing Electrostatic Damage

Many 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, the discharge contains enough power to alter device parameters or melt silicon junctions.

A sudden discharge of static electricity from a finger or other conductor can destroy static-sensitive devices or microcircuitry. Often the spark is neither felt nor heard, but damage occurs.

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

4.5 Packaging and Transporting Precautions

Use the following grounding precautions when packaging and transporting equipment:

- To avoid hand contact, transport products in static-safe containers, such as tubes, bags, or boxes.
- Protect all electrostatic-sensitive parts and assemblies with conductive or approved containers or packaging.
- Keep electrostatic-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 sensitive component or assembly.
- Store reusable electrostatic-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.

4.6 Workstation Precautions

Use the following grounding precautions at workstations:

- Cover the workstation with approved static-shielding material (refer to Table 4-2, "Static-Shielding Materials").
- 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 electrostatic-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.

4.7 Grounding Equipment and Methods

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

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

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

Other grounding equipment recommended for use in preventing electrostatic damage includes:

- 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

Table 4-1 shows how humidity affects the electrostatic voltage levels generated by different activities.

Table 4-1

Typical Electrostatic Voltage Levels

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

✎ A product can be degraded by as little as 700 V.

Table 4-2 lists the shielding protection provided by antistatic bags and floor mats.

Table 4-2

Static-Shielding Materials

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

5

Removal and Replacement Procedures

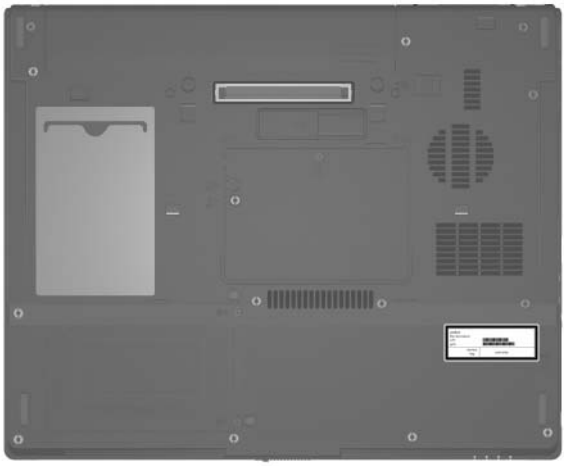
This chapter provides removal and replacement procedures.

There are as many as 58 screws and screw locks, in 11 different sizes, that must be removed, replaced, or loosened when servicing the computer. Make special note of each screw and screw lock size and location during removal and replacement.

Refer to Appendix A, "Screw Listing," for detailed information on screw and screw lock sizes, locations, and usage.

5.1 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.



Serial Number Location

5.2 Disassembly Sequence Chart

Use the chart below to determine the section number to be referenced when removing computer components.

Disassembly Sequence Chart

Section	Description	# of Screws Removed
5.3	Preparing the Computer for Disassembly	
	Battery	0
5.4	Hard Drive	2 loosened to remove the hard drive cover 1 loosened to remove the hard drive 4 to remove the hard drive frame
5.5	Computer Feet	0
5.6	Bluetooth Module	0
5.7	External Memory Module	1 loosened to remove the memory/Mini Card module cover
5.8	Mini Card WLAN Module	2
	△ To prevent an unresponsive system and the display of a warning message, replace with only a Mini Card device authorized for use in the computer by the governmental agency that regulates wireless devices in your country. If you replace the device and then receive a warning message, remove the device to restore computer functionality. Then contact Customer Care through the Help and Support Center.	
5.9	Optical Drive	1 to remove the optical drive 2 to remove the optical drive bracket

Disassembly Sequence Chart *(Continued)*

Section	Description	# of Screws Removed
5.10	Keyboard	2
5.11	Fan	2 loosened
5.12	Heat Sink	4 loosened
5.13	Processor	1 loosened
5.14	RTC Battery	0
5.15	Internal Memory Module	0
5.16	Mini Card WWAN Module ⚠ To prevent an unresponsive system and the display of a warning message, install only a Mini Card device authorized for use in your computer by the governmental agency that regulates wireless devices in your country. If you install a device and then receive a warning message, remove the device to restore computer functionality. Then contact Customer Care.	2
5.17	Switch Cover	2
5.18	Display Assembly	6
5.19	Top Cover	15
5.20	Speaker	1
5.21	Microphone	0
5.22	Modem Module	2
5.23	USB/Audio Board	1
5.24	System Board	1 screw 4 screw locks
5.25	Serial Connector Module	2 screw locks

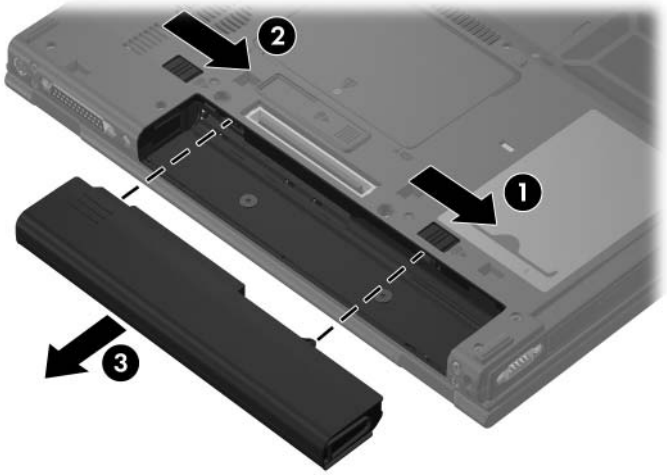
5.3 Preparing the Computer for Disassembly

Before you begin any removal or installation procedures:

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

Battery Spare Part Number Information	
6-cell, 4.8-Ah	372772-001
6-cell, 4.0-Ah	393652-001

4. Remove the battery by following these steps:
   a. Turn the computer upside down with the rear panel toward you.
   b. Slide the battery release latch on the right ❶ and then the battery release latch on the left ❷ to release the battery.
   c. Slide the battery ❸ straight back and remove it.



Removing the Battery

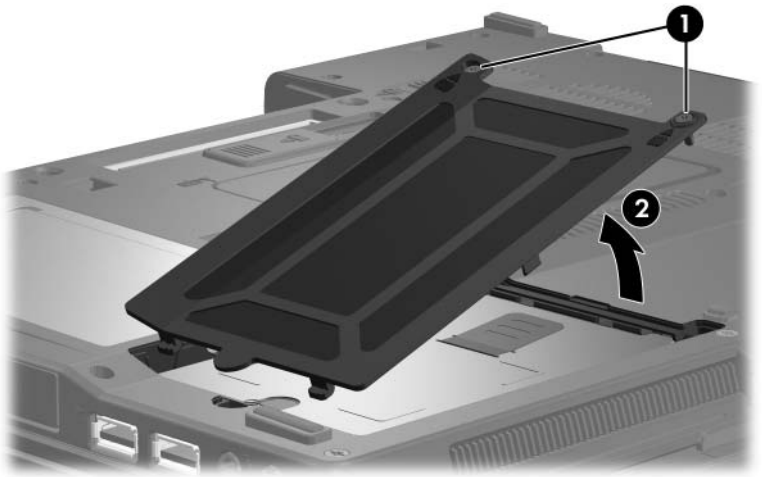
Reverse the above procedure to install the battery.

5.4 Hard Drive

Hard Drive Spare Part Number Information			
7200-rpm, 60-GB	413854-001	5400-rpm, 100-GB	413853-001
		5400-rpm, 80-GB	413852-001
		5400-rpm, 60-GB	413851-001
		5400-rpm, 40-GB	413850-001

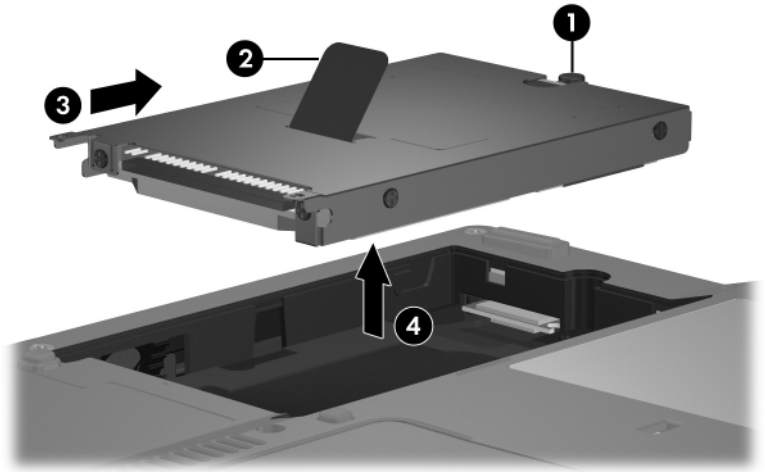
1. Prepare the computer for disassembly (refer to Section 5.3).
2. Position the computer with the front toward you.
3. Loosen the two Phillips PM2.0×4.0 screws ❶ that secure the hard drive cover to the computer.
4. Lift the right side of the hard drive cover ❷ and swing it up and to the left.
5. Remove the hard drive cover.

The hard drive cover is included in the Plastics Kit, spare part number 413704-001.



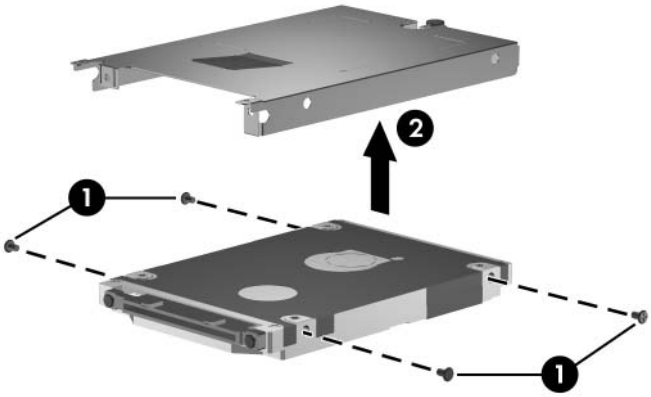
Removing the Hard Drive Cover

6. Loosen the Phillips PM2.5×13.0 spring-loaded hard drive retention screw ❶.
7. Grasp the mylar tab ❷ on the hard drive and slide the hard drive to the right ❸ to disconnect it from the system board.
8. Remove the hard drive ❹ from the hard drive bay.



Removing the Hard Drive

9. Remove the four Phillips PM3.0×4.0 hard drive frame screws ❶ from each side of the hard drive.
10. Lift the frame ❷ straight up to remove if from the hard drive.

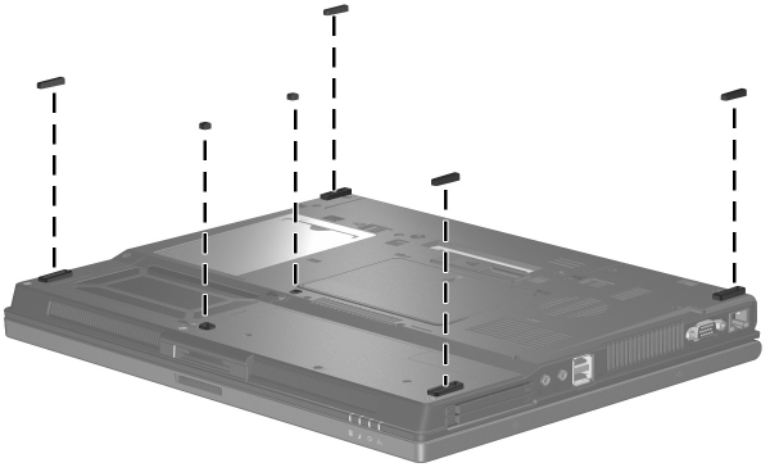


Removing the Hard Drive Frame

Reverse the above procedure to reassemble and install the hard drive.

5.5 Computer Feet

The computer feet are adhesive-backed rubber pads. The feet are included in the Plastics Kit, spare part number 413704-001.

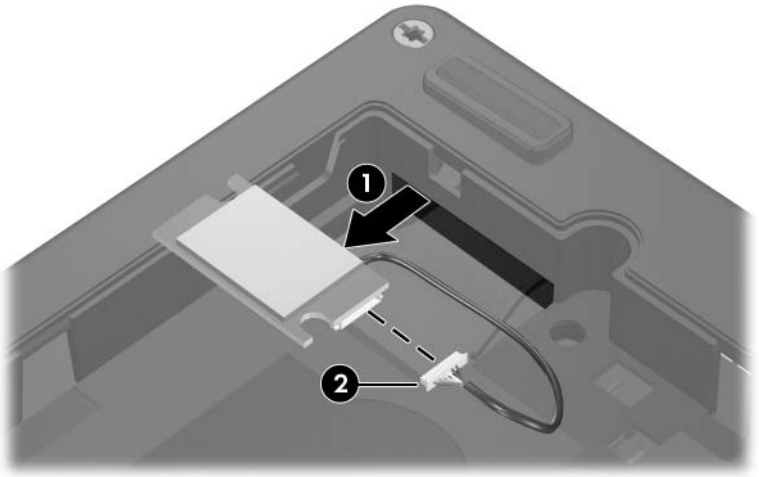


Replacing the Computer Feet

5.6 Bluetooth Module

Bluetooth Module Spare Part Number Information	
Bluetooth module (includes Bluetooth cable)	398393-001

1. Prepare the computer for disassembly (refer to Section 5.3).
2. Remove the hard drive (Section 5.4).
3. Slide the Bluetooth module ❶ out of the clip in the hard drive compartment.
4. Disconnect the Bluetooth cable ❷ from the module.



Removing the Bluetooth Module

Reverse the above procedure to install a Bluetooth module.

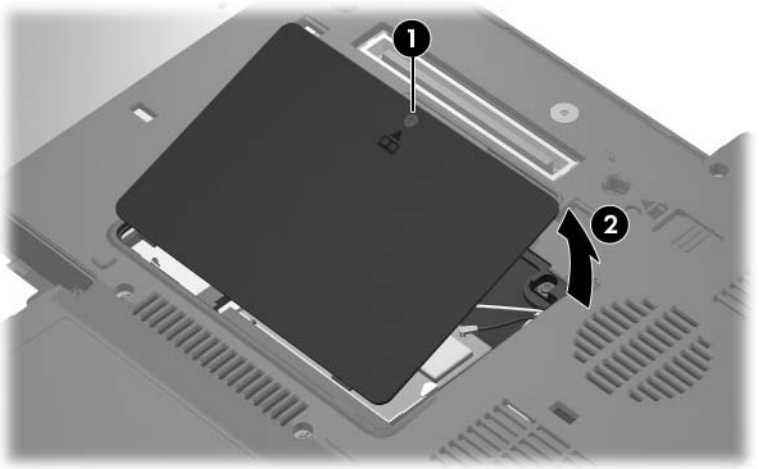
5.7 External Memory Module

Memory Module Spare Part Number Information			
PC2-5300		PC2-4200	
1024-MB	414046-001	1024-MB	414042-001
512-MB	414045-001	512-MB	414041-001
256-MB	414044-001	256-MB	414040-001

1. Prepare the computer for disassembly (refer to Section 5.3).
2. Position the computer with the front toward you.

3. Loosen the Phillips PM2.0×4.0 screw ❶ that secures the memory/Mini Card module cover to the computer.
4. Lift the rear edge of the cover ❷ up and swing it toward you.
5. Remove the memory/Mini Card module cover.

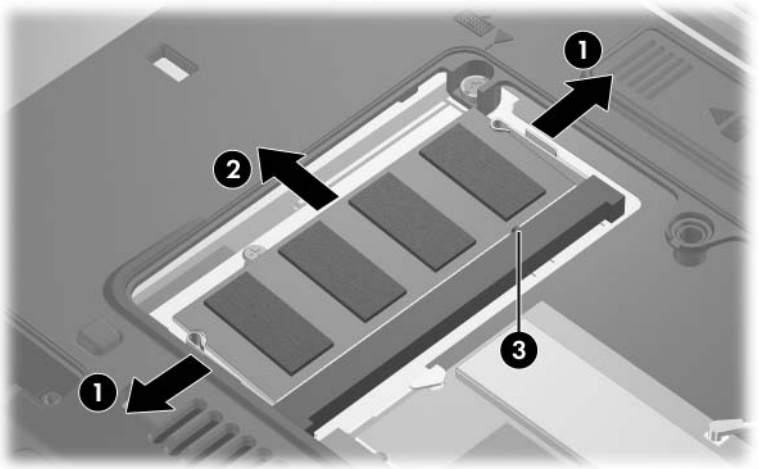
The memory/Mini Card module cover is included in the Plastics Kit, spare part number 413704-001.



Removing the Memory/Mini Card Module Cover

6. Spread the retaining tabs ❶ on each side of the memory module socket to release the memory module. (The edge of the module opposite the socket rises away from the computer.)
7. Slide the module ❷ away from the socket at an angle.
8. Remove the memory module.

Memory modules are designed with notches ❸ to prevent incorrect installation into the memory module socket.



Removing the Memory Module

Reverse the above procedure to install a memory module.

5.8 Mini Card WLAN Module

Mini Card WLAN Module

Spare Part Number Information

802.11a/b/g Intel Mini Card WLAN module for use in the MOW 1 countries listed below:			407575-001
Antigua & Barbuda	Chile	India	Saudi Arabia
Argentina	Dominican Republic	Indonesia	Taiwan
Australia	Guam	Malaysia	The United States
Bahamas	Guatemala	Mexico	Vietnam
Barbados	Hong Kong	New Zealand	
Brunei	Panama	Paraguay	
Canada			
802.11a/b/g Intel WLAN module for use in the MOW 2 countries listed below.			407575-002
Aruba	El Salvador	The Phillippines	The Netherlands
Austria	Estonia	Poland	Norway
Azerbaijan	Finand	Portugal	Oman
Bahrain	France	Romania	Slovenia
Belgium	Georgia	Russia	South Africa
Bermuda	Germany	Serbia and Montenegro	Spain
Bulgaria	Greece	Singapore	Sri Lanka
Cayman Islands	Hungary	Slovakia	Sweden
Columbia	Iceland	Liechtenstein	Switzerland
Croatia	Ireland	Lithuania	Turkey
Cyprus	Italy	Luxembourg	The United Kingdom
Czech Republic	Latvia	Malta	Uzbekistan
Denmark	Lebanon	Monaco	
Egypt			

Mini Card WLAN Module

Spare Part Number Information *(Continued)*

802.11a/b/g Intel WLAN module for use in the ROW countries listed below.			407575-003
China	Honduras	Qatar	Uruguay
Ecuador	Pakistan	South Korea	Venezuela
Haiti	Peru		
802.11a/b/g Intel WLAN module for use in Japan.			407575-291
802.11b/g GL WLAN module for use in the following countries:			409280-004
Israel	Kuwait	United Arab Emirates	Ukraine
Jordan	Thailand		
802.11a/b/g LJ WLAN module for use in the United States and Canada.			407254-001
802.11a/b/g LJ WLAN module for use in the MOW 2 countries listed below.			407254-002
Aruba	El Salvador	The Phillippines	The Netherlands
Austria	Estonia	Poland	Norway
Azerbaijan	Finand	Portugal	Oman
Bahrain	France	Romania	Slovenia
Belgium	Georgia	Russia	South Africa
Bermuda	Germany	Serbia and Montenegro	Spain
Bulgaria	Greece	Singapore	Sri Lanka
Cayman Islands	Hungary	Slovakia	Sweden
Columbia	Iceland	Liechtenstein	Switzerland
Croatia	Ireland	Lithuania	Turkey
Cyprus	Italy	Luxembourg	The United Kingdom
Czech Republic	Latvia	Malta	
Denmark	Lebanon	Monaco	Uzbekistan
Egypt			
802.11a/b/g LJ WLAN module for use in Japan.			407254-291

Mini Card WLAN Module

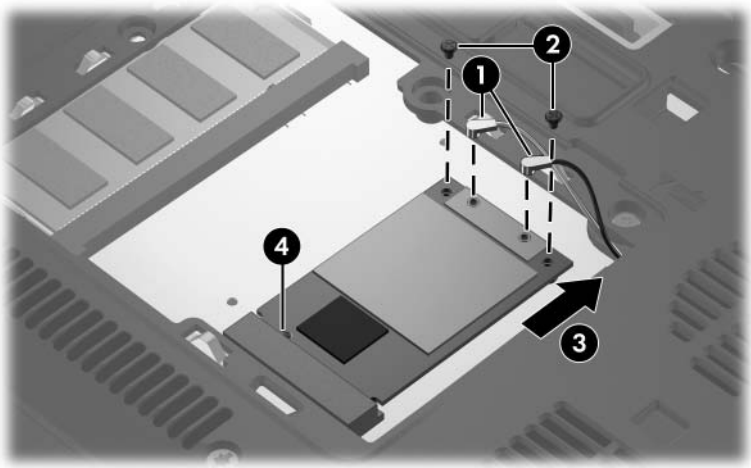
Spare Part Number Information *(Continued)*

802.11a/b/g HS WLAN module for use in the United States and Canada.			404253-001
802.11a/b/g HS WLAN module for use in the MOW 2 countries listed below.			407253-002
Aruba	El Salvador	The Phillippines	The Netherlands
Austria	Estonia	Poland	Norway
Azerbaijan	Finand	Portugal	Oman
Bahrain	France	Romania	Slovenia
Belgium	Georgia	Russia	South Africa
Bermuda	Germany	Serbia and Montenegro	Spain
Bulgaria	Greece	Singapore	Sri Lanka
Cayman Islands	Hungary	Slovakia	Sweden
Columbia	Iceland	Liechtenstein	Switzerland
Croatia	Ireland	Lithuania	Turkey
Cyprus	Italy	Luxembourg	The United Kingdom
Czech Republic	Latvia	Malta	
Denmark	Lebanon	Monaco	Uzbekistan
Egypt			
802.11a/b/g HS WLAN module for use in Japan.			407253-291

1. Prepare the computer for disassembly (Section 5.3).
2. Remove the memory/Mini Card module cover (Section 5.7).
3. Position the computer with the front toward you.

4. Make note of which antenna cable is attached to which antenna clip on the Mini Card WLAN module before disconnecting the cables, then disconnect the auxiliary and main antenna cables ❶ from the module.
5. Remove the two Phillips PM2.0×4.0 screws ❷ that secure the Mini Card WLAN module to the computer.
6. Remove the Mini Card WLAN module ❸ by pulling the module from the socket at an angle.

Mini Card WLAN modules are designed with notches ❹ to prevent incorrect installation.



Removing a Mini Card WLAN Module

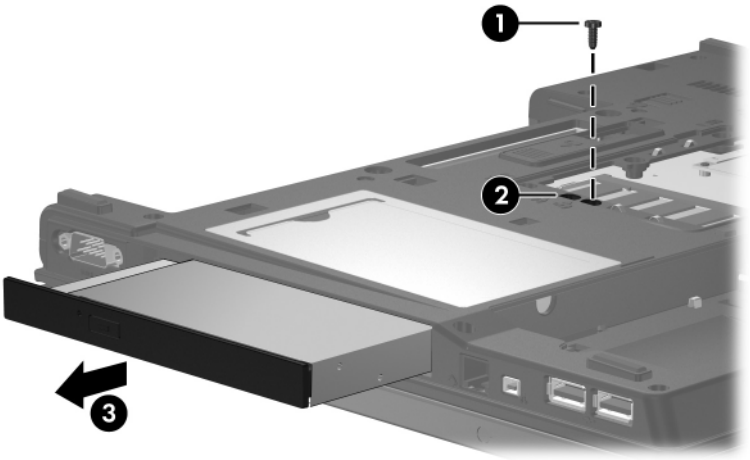
Reverse the above procedure to install a Mini Card WLAN module.

5.9 Optical Drive

Optical Drive Spare Part Number Information	
24X Max CD-ROM drive	413698-001
8X Max DVD-ROM drive	413699-001
4X Max DVD±RW and CD-RW Combo Drive	413700-001
8X Max DVD±RW and CD-RW Combo Drive	413702-001
24X Max DVD/CD-RW Combo Drive	413701-101

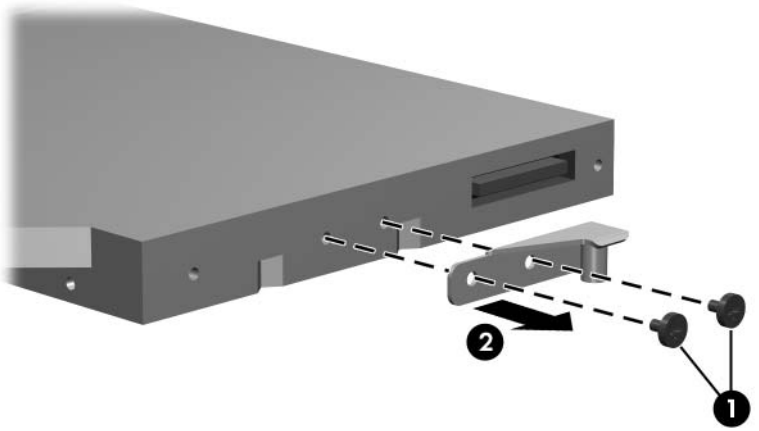
1. Prepare the computer for disassembly (Section 5.3).
2. Remove the memory/Mini Card module cover (Section 5.7).
3. Position the computer with the right side toward you.

4. Remove the Torx8 T8M2.0×9.0 screw ❶ that secures the optical drive to the computer.
5. Insert a flat-bladed driver into the slot ❷ on the bottom of the computer and push the tab.
6. Remove the optical drive ❸ from the computer.



Removing the Optical Drive

7. If it is necessary to replace the optical drive bracket, remove the two Phillips PM2.0×4.0 screws ❶ that secure the bracket to the optical drive.
8. Remove the optical drive bracket ❷.



Removing the Optical Drive

Reverse the above procedure to reassemble and install an optical drive.

5.10 Keyboard

Keyboard Spare Part Number Information			
For use with computer models with pointing stick and fingerprint reader			
Belgium	416038-A41	Latin America	416038-161
Brazil	416038-201	Norway	416038-091
The Czech Republic	416038-221	Portugal	416038-131
Denmark	416038-081	Russia	416038-251
Europe	416038-021	Saudi Arabia	416038-171
France	416038-051	Slovakia	416038-231
French Canada	416038-121	Slovenia	416038-BA1
Germany	416038-041	Spain	416038-071
Greece	416038-151	Sweden	416038-B71
Hungary	416038-211	Switzerland	416038-111
Iceland	416038-DD1	Taiwan	416038-AB1
Israel	416038-BB1	Thailand	416038-281
Italy	416038-061	Turkey	416038-141
Japan	416038-291	The United Kingdom	416038-031
Korea	416038-AD1	The United States	416038-001
Pointing stick board (not illustrated, includes pointing stick cable)			413692-001

Keyboard Spare Part Number Information *(Continued)*

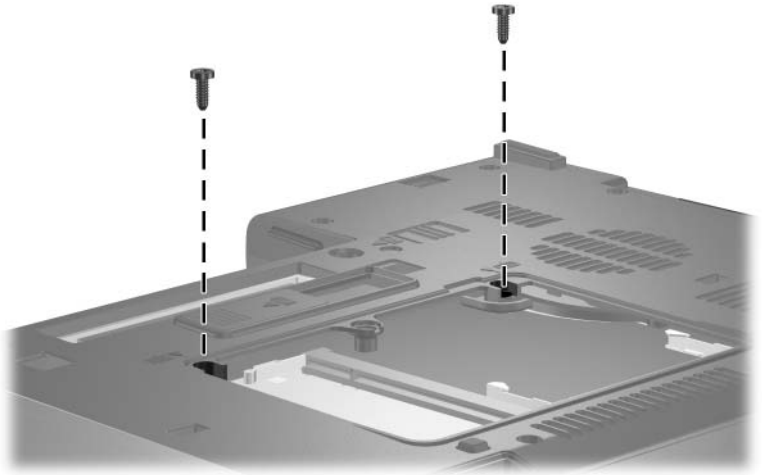
Keyboards *(Continued)*

For use with computer models with TouchPad and fingerprint reader

Belgium	416039-A41	Latin America	416039-161
Brazil	416039-201	Norway	416039-091
The Czech Republic	416039-221	Portugal	416039-131
Denmark	416039-081	Russia	416039-251
Europe	416039-021	Saudi Arabia	416039-171
France	416039-051	Slovakia	416039-231
French Canada	416039-121	Slovenia	416039-BA1
Germany	416039-041	Spain	416039-071
Greece	416039-151	Sweden	416039-B71
Hungary	416039-211	Switzerland	416039-111
Iceland	416039-DD1	Taiwan	416039-AB1
Israel	416039-BB1	Thailand	416039-281
Italy	416039-061	Turkey	416039-141
Japan	416039-291	The United Kingdom	416039-031
Korea	416039-AD1	The United States	416039-001

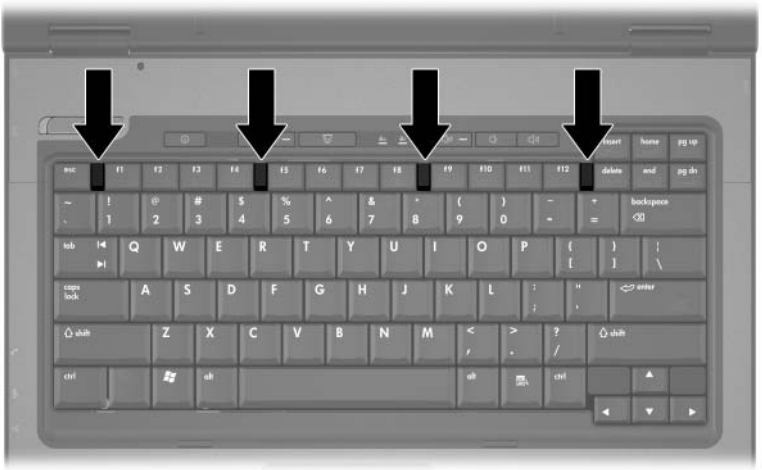
1. Prepare the computer for disassembly (Section 5.3).
2. Remove the memory/Mini Card module cover (Section 5.7).

3. Remove the two Torx8 T8M2.0×9.0 screws that secure the keyboard to the computer.



Removing the Keyboard Screws

4. Turn the computer display-side up with the front toward you.
5. Open the computer as far as possible.
6. Slide the 4 keyboard retaining latches toward you.



Releasing the Keyboard Latches

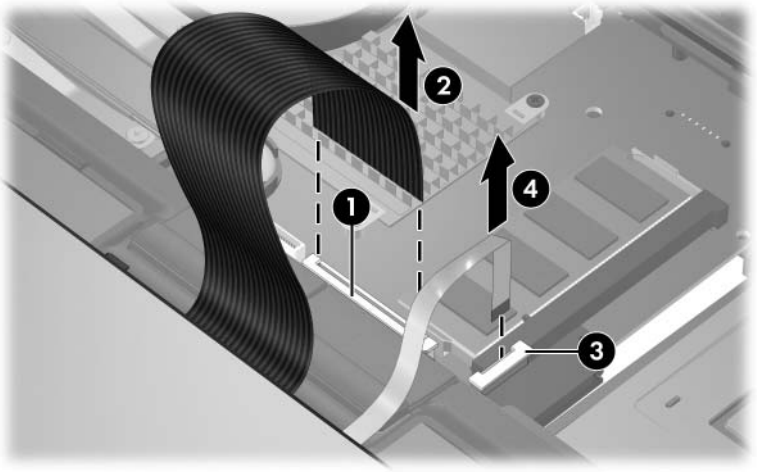
7. Lift the rear edge of the keyboard up and swing it toward you until it rests on the palm rest.

Releasing the Keyboard

8. Release the zero insertion force (ZIF) connector ❶ to which the keyboard cable is attached and disconnect the keyboard cable ❷.

Step 9 applies only to computer models with a pointing stick.

9. Release the ZIF connector ❸ to which the pointing stick cable is attached and disconnect the pointing stick cable ❹.



Disconnecting the Keyboard and Pointing Stick Cables

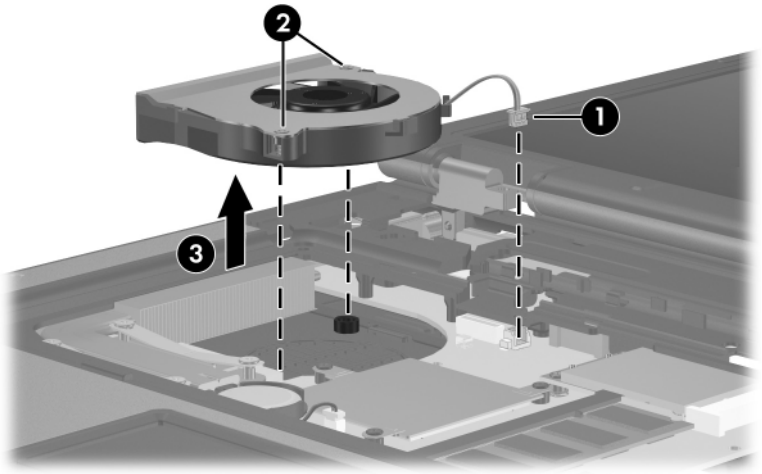
10. Remove the keyboard.

Reverse the above procedure to install the keyboard.

5.11 Fan

Fan Spare Part Number Information	
Fan	379799-001

1. Prepare the computer for disassembly (Section 5.3).
2. Release the keyboard (Section 5.10).
3. Disconnect the fan cable ❶ from the system board.
4. Loosen the two Phillips PM2.0×7.0 screws ❷ that secure the fan to the computer.
5. Remove the fan ❸.



Removing the Fan

Reverse the above procedure to install the fan.

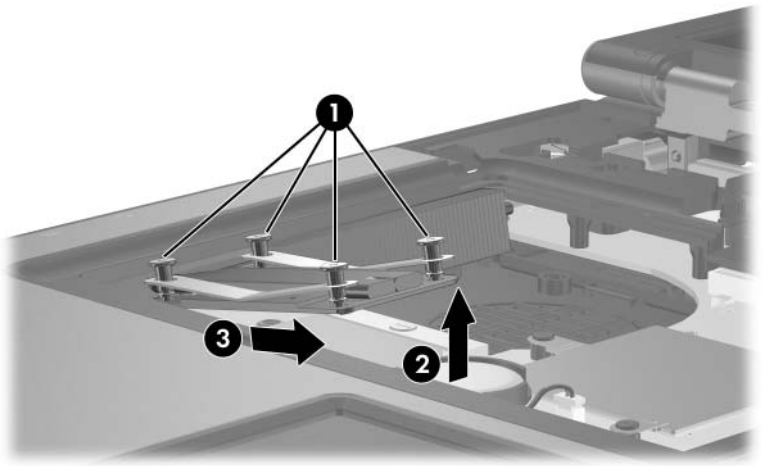
5.12 Heat Sink

Heat Sink Spare Part Number Information	
Heat sink (includes thermal paste)	379799-001
Thermal Grease Kit (not illustrated)	413706-001

1. Prepare the computer for disassembly (Section 5.3).
2. Release the keyboard (Section 5.10).
3. Remove the fan (Section 5.11).

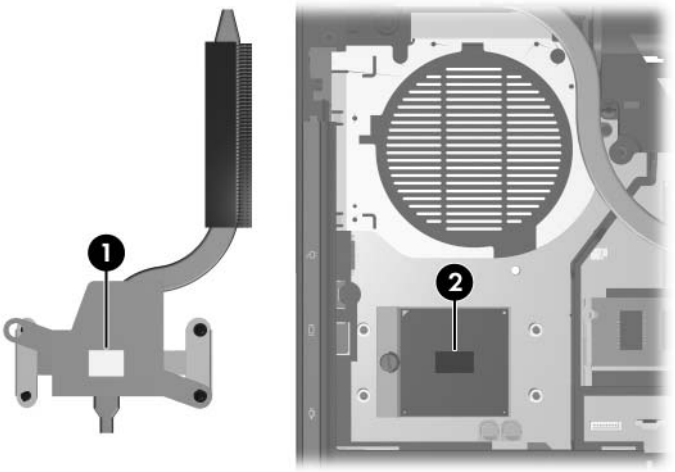
4. Loosen the four Phillips PM2.0×8.0 shoulder screws ❶ that secure the heat sink to the computer.
5. Lift the right side of the heat sink ❷ to disengage it from the processor.
6. Slide the heat sink ❸ to the right to remove it.

Due to the adhesive quality of the thermal paste located between the heat sink and processor, it may be necessary to move the heat sink from side to side to detach the heat sink from the processor.



Removing the Heat Sink

The thermal paste should be thoroughly cleaned from the surfaces of the heat sink ❶ and processor ❷ each time the heat sink is removed. Thermal paste is included with all heat sink and processor spare part kits.



Thermal Paste Locations

Reverse the above procedure to install the heat sink.

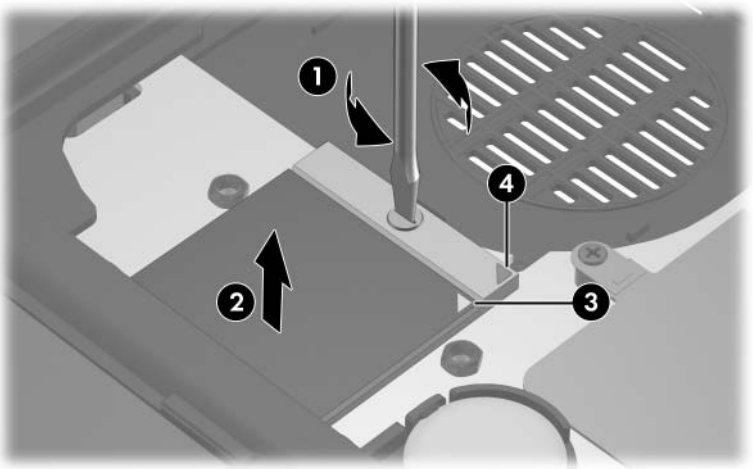
5.13 Processor

Processor Spare Part Number Information	
Intel Core Duo T2600 (2.16-GHz) processor	413686-001
Intel Core Duo T2500 (2.00-GHz) processor	413685-001
Intel Core Duo T2400 (1.83-GHz) processor	413684-001
Intel Core Duo T2300 (1.67-GHz) processor	413683-001
Intel Core Duo T2300E (1.67-GHz) processor	430687-001
Intel Core Solo T1300 (1.66-GHz) processor	413682-001
Intel Celeron M 1.73-GHz processor	413896-001
Intel Celeron M 1.60-GHz processor	413681-001
Intel Celeron M 1.46-GHz processor	413680-001

1. Prepare the computer for disassembly (Section 5.3).
2. Release the keyboard (Section 5.10).
3. Remove the fan (Section 5.11).
4. Remove the heat sink (Section 5.12).

5. Use a flat-bladed screwdriver to turn the processor locking screw ❶ one-half turn counterclockwise until you hear a click.
6. Lift the processor ❷ straight up and remove it.

The gold triangle ❸ on the processor should be aligned with the triangle icon ❹ embossed on the processor socket when you install the processor.



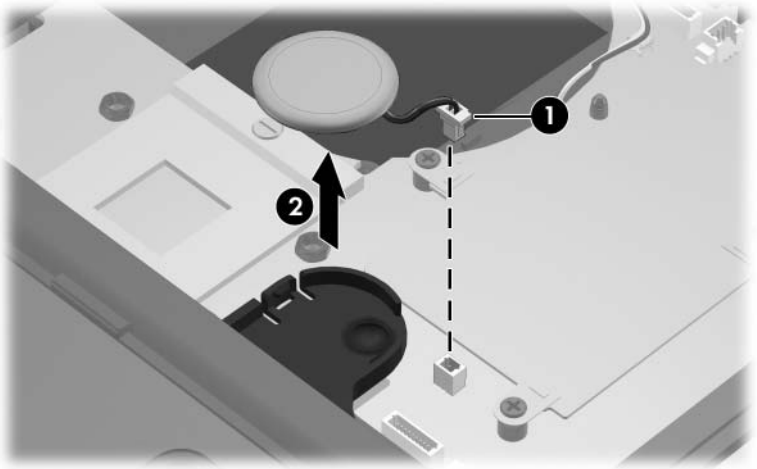
Removing the Processor

Reverse the above procedure to install the processor.

5.14 RTC Battery

The RTC battery is included in the Plastics Kit, spare part number 413704-001.

1. Prepare the computer for disassembly (Section 5.3).
2. Release the keyboard (Section 5.10).
3. Disconnect the RTC battery cable ❶ from the system board.
4. Remove the RTC battery ❷ from the clip in the top cover.



Removing the RTC Battery

Reverse the above procedure to install an RTC battery.

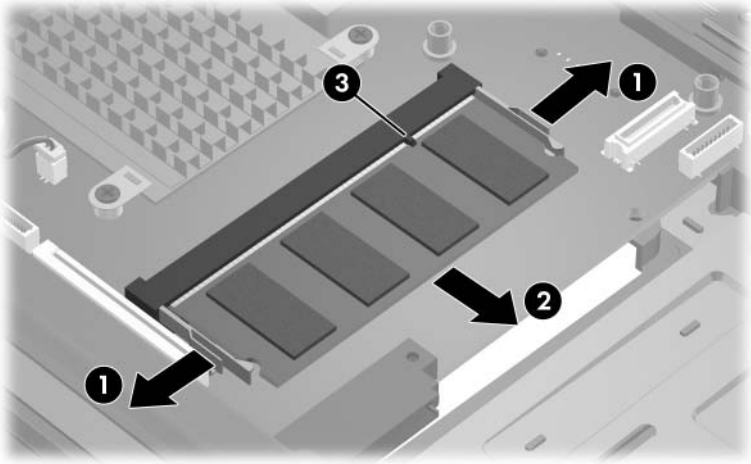
5.15 Internal Memory Module

Memory Module Spare Part Number Information	
1024 MB	336579-001
512 MB	336578-001

1. Prepare the computer for disassembly (Section 5.3).
2. Release the keyboard (Section 5.10).

3. Spread the retaining tabs ❶ on each side of the memory module socket to release the memory module. (The edge of the module opposite the socket rises away from the computer.)
4. Slide the module ❷ away from the socket at an angle .
5. Remove the memory module.

Memory modules are designed with notches ❸ to prevent incorrect installation into the memory module socket.



Removing the Memory Module

Reverse the above procedure to install a memory module.

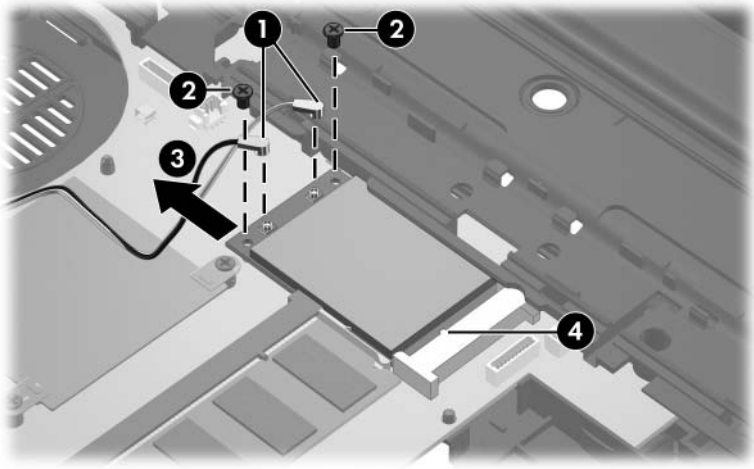
5.16 Mini Card WWAN Module

Mini Card WWAN Module Spare Part Number Information	
Mini Card WWAN module	399440-001

1. Prepare the computer for disassembly (Section 5.3).
2. Release the keyboard (Section 5.10).

3. Make note of which antenna cable is attached to which antenna clip on the Mini Card WWAN module before disconnecting the cables, then disconnect the auxiliary and main antenna cables ❶ from the module.
4. Remove the two Phillips PM2.0×4.0 screws ❷ that secure the Mini Card WWAN module to the computer.
5. Remove the Mini Card WWAN module ❸ by pulling the module from the socket at an angle.

Mini Card WWAN modules are designed with notches ❹ to prevent incorrect installation.



Removing a Mini Card WWAN Module

Reverse the above procedure to install a Mini Card WWAN module.

5.17 Switch Cover

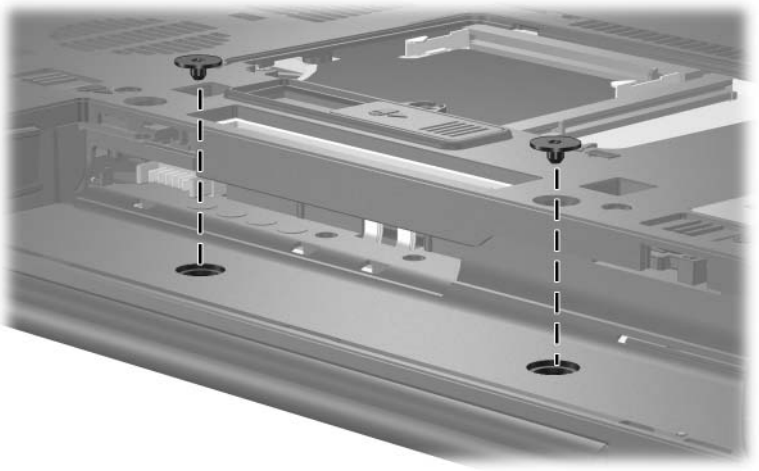
Both switch cover spare part kits include an LED board and LED board cable.

Switch Cover Spare Part Number Information

For use with full-featured computer models	413688-001
For use with defeatured computer models	413687-001

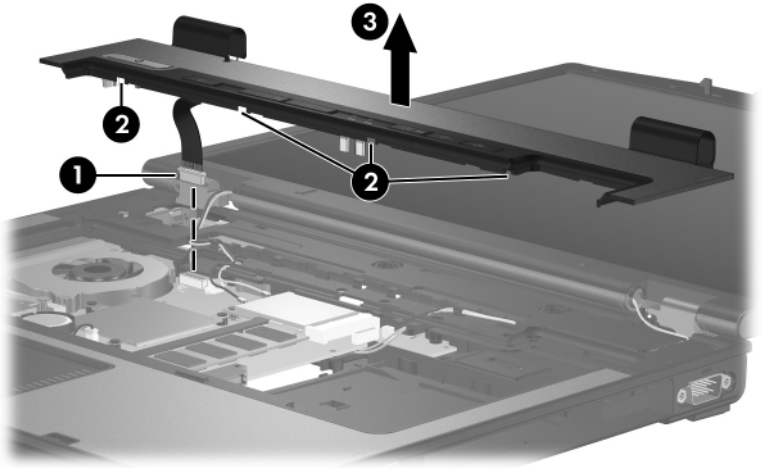
1. Prepare the computer for disassembly (Section 5.3).
2. Remove the keyboard (Section 5.10).
3. Turn the computer upside down with the rear panel toward you.

4. Remove the two Torx8 T8M2.0×2.0 screws that secure the switch cover to the computer.



Removing the Switch Cover Screws

5. Turn the computer display-side up with front toward you.
6. Open the computer as far as possible.
7. Disconnect the LED board cable ❶ from the system board.
8. Insert a flat-bladed screwdriver into the four notches ❷ on the front edge of the switch cover ❸ and lift up until the cover disengages from the computer.
9. Remove the switch cover.



Removing the Switch Cover

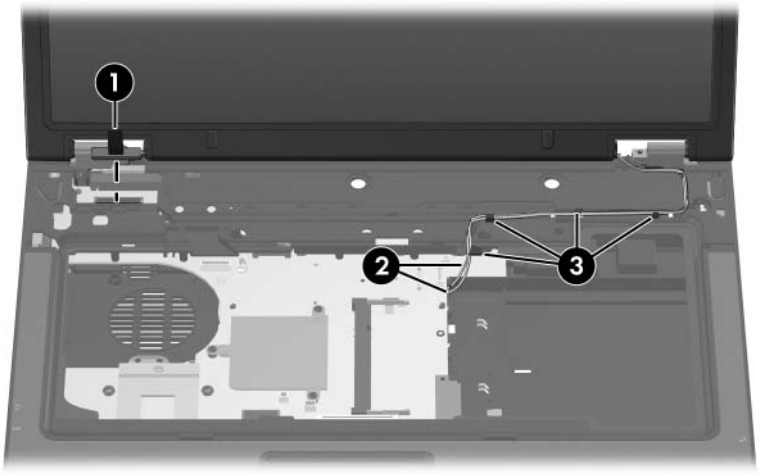
Reverse the above procedure to install the switch cover.

5.18 Display Assembly

Display Assembly Spare Part Number Information	
Display assemblies for use with computer models with WWAN (include wireless antenna transceivers and cables)	
15.0-inch, SXGA+WVA, TFT	430967-001
15.0-inch, XGA, TFT, with BrightView	430966-001
Display assemblies for use with computer models without WWAN (include wireless antenna transceivers and cables)	
15.0-inch, SXGA+WVA, TFT	413679-001
15.0-inch, XGA, TFT, with BrightView	413678-001
15.0-inch XGA, TFT	413677-001
14.1-inch XGA, TFT	413676-001

1. Prepare the computer for disassembly (Section 5.3).
2. Remove the memory compartment cover (Section 5.7) and disconnect the wireless antenna cables from the Mini Card WLAN module (Section 5.8).
3. Remove the keyboard (Section 5.10).
4. Remove the switch cover (Section 5.17)

5. Disconnect the display cable ❶ from the system board.
6. Remove the WLAN antenna cables ❷ from the routing channels ❸ in the base enclosure.

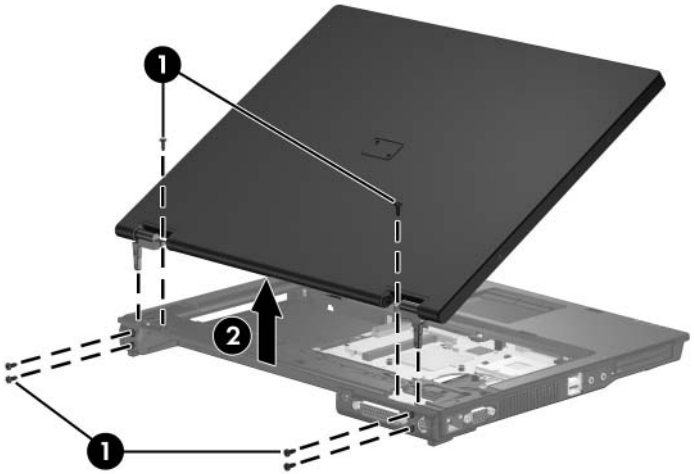


Disconnecting the Display and Wireless Cables

7. Swing the display assembly into a partially closed position.
8. Position the computer with the rear panel toward you.

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

9. Remove the six Torx8 T8M2.5×9.0 screws ❶ that secure the display assembly to the computer.
10. Lift the display assembly ❷ straight up and remove it.



Removing the Display Assembly

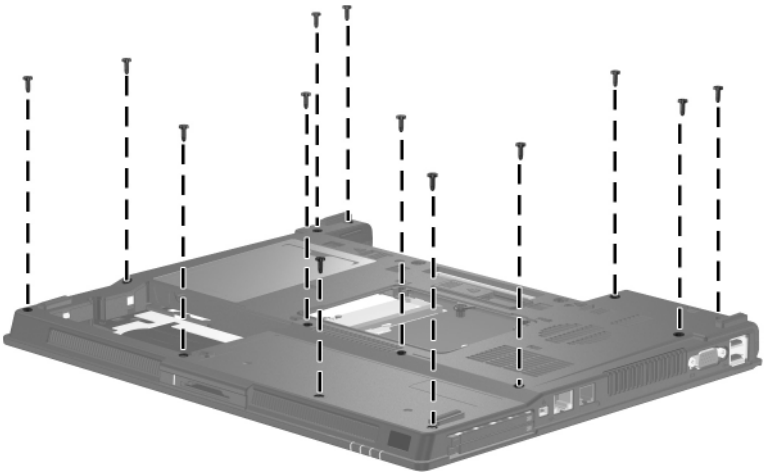
Reverse the above procedure to reassemble and install the display assembly

5.19 Top Cover

Top Cover Spare Part Number Information	
For use with full-featured computer models with pointing stick and fingerprint reader	413673-001
For use with full-featured computer models with TouchPad and fingerprint reader	413674-001
For use with full-featured computer models with TouchPad but without fingerprint reader	413675-001
For use with defeatured computer models	413672-001
Fingerprint reader board (not illustrated; includes fingerprint reader board cable)	413695-001

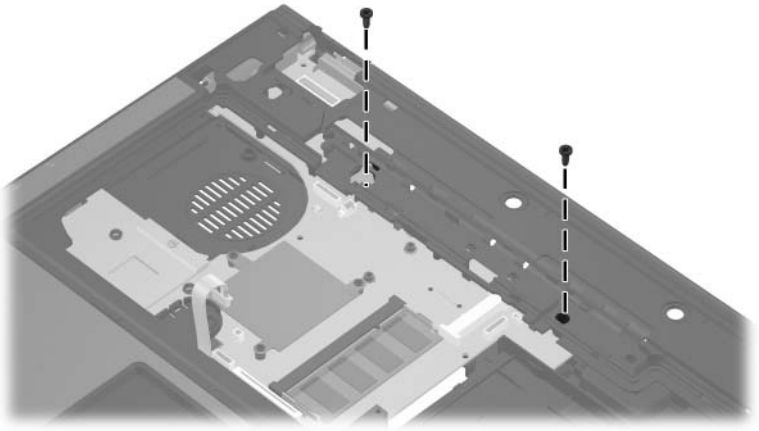
1. Prepare the computer for disassembly (Section 5.3), and then remove the following components:
   a. Hard drive (Section 5.4)
   b. Memory/Mini Card module cover (Section 5.7)
   c. Optical drive (Section 5.9)
   d. Keyboard (Section 5.10)
   e. Switch cover (Section 5.17)
   f. Display assembly (Section 5.18)
2. Turn the computer upside down with the front toward you.

3. Remove the thirteen Torx8 T8M2.5×9.0 screws that secure the top cover to the computer.



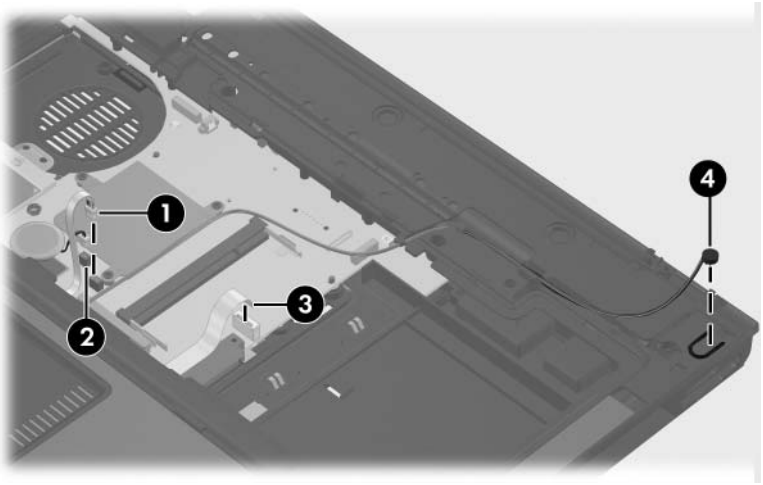
Removing the Top Cover Screws, Part 1

4. Turn the computer right-side up with the front toward you.
5. Remove the two Torx8 T8M2.5×9.0 screws that secure the top cover to the computer.



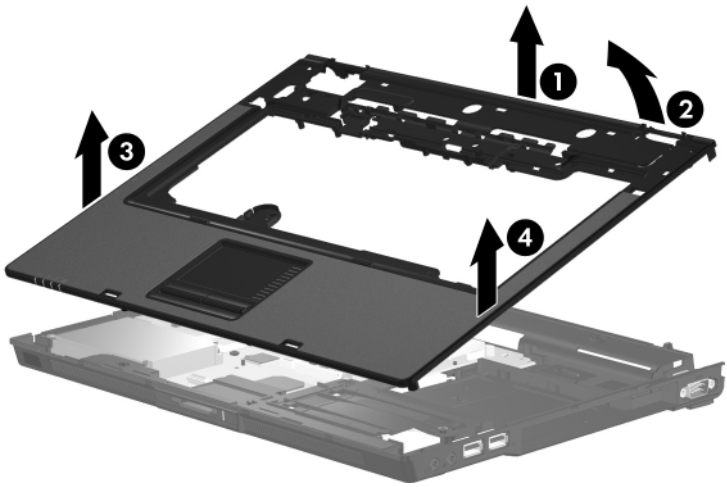
Removing the Top Cover Screws, Part 2

6. Disconnect the following cables from the system board:
   - ❶ RTC battery cable
   - ❷ TouchPad cable
   - ❸ Fingerprint reader board cable
7. Remove the microphone ❹ from the hole in the top cover.



Disconnecting the RTC Battery, TouchPad, and Fingerprint Reader Board Cables

8. Lift up the rear edge of the top cover ❶ until it disengages from the base enclosure.
9. Swing the top cover ❷ toward you until the left and right sides of the top cover disengage from the base enclosure.
10. Lift up on the left ❸ and right sides ❹ of the top cover until the top cover disengages from the base enclosure.



Releasing the Top Cover

11. Lift the top cover straight up until the front edge of the top cover disengages from the base enclosure and remove the top cover.

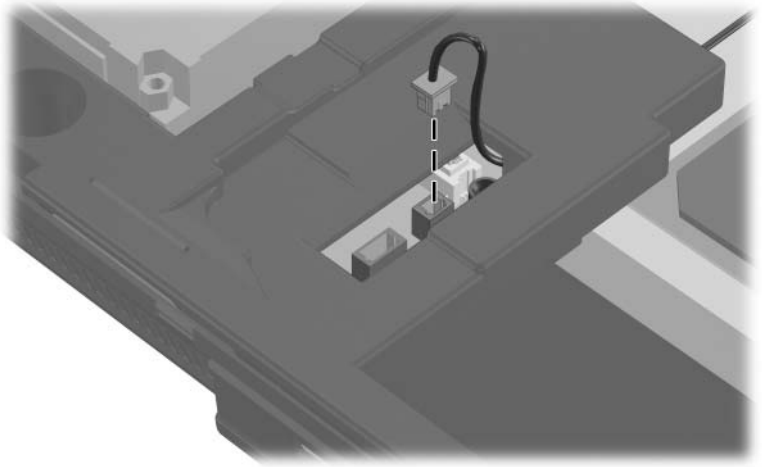
Reverse the above procedure to install the top cover.

5.20 Speaker

Speaker Spare Part Number Information	
Speaker	413697-001

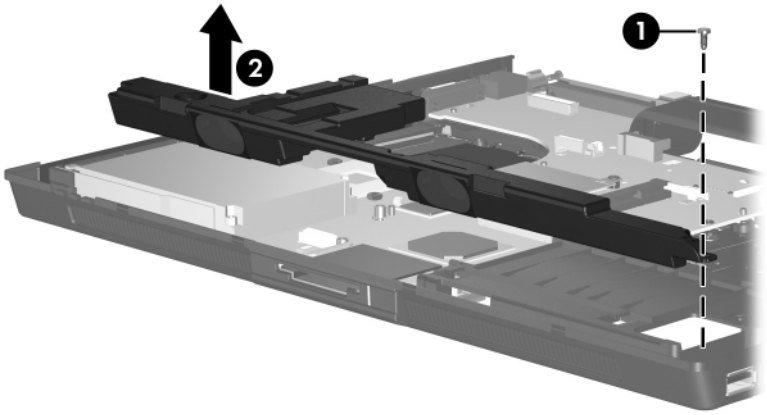
1. Prepare the computer for disassembly (Section 5.3), and then remove the following components:
   a. Hard drive (Section 5.4)
   b. Memory/Mini Card module cover (Section 5.7)
   c. Optical drive (Section 5.9)
   d. Keyboard (Section 5.10)
   e. Switch cover (Section 5.17)
   f. Display assembly (Section 5.18)
   g. Top cover (Section 5.19)

2. Disconnect the speaker cable from the system board.



Disconnecting the Speaker Cable

3. Remove the Torx8 T8M2.0×4.0 screw ❶ that secures the speaker to the computer.
4. Remove the speaker ❷ from the base enclosure.



Removing the Speaker

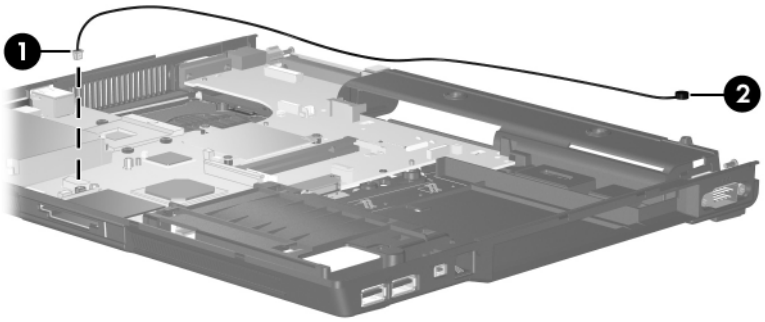
Reverse the above procedure to install the speaker.

5.21 Microphone

The microphone is included in the Plastics Kit, spare part number 413704-001.

1. Prepare the computer for disassembly (Section 5.3), and then remove the following components:
   a. Hard drive (Section 5.4)
   b. Memory/Mini Card module cover (Section 5.7)
   c. Optical drive (Section 5.9)
   d. Keyboard (Section 5.10)
   e. Switch cover (Section 5.17)
   f. Display assembly (Section 5.18)
   g. Top cover (Section 5.19)

2. Disconnect the microphone cable ❶ from the system board and remove the microphone ❷.



Removing the Microphone

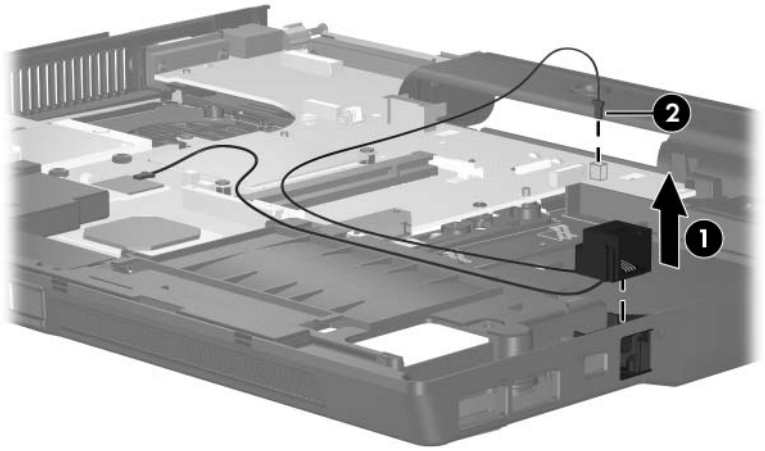
Reverse the above procedure to install the microphone.

5.22 Modem Module

Modem Module Spare Part Number Information	
Modem module	399441-001

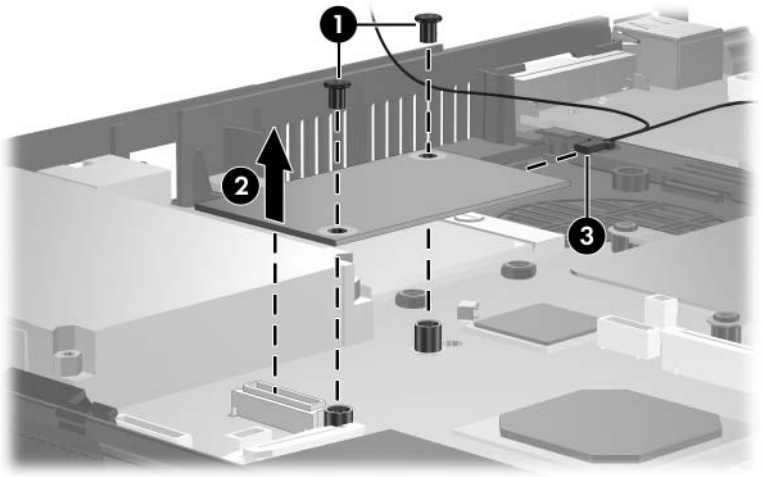
1. Prepare the computer for disassembly (Section 5.3), and then remove the following components:
   a. Hard drive (Section 5.4)
   b. Memory/Mini Card module cover (Section 5.7)
   c. Optical drive (Section 5.9)
   d. Keyboard (Section 5.10)
   e. Switch cover (Section 5.17)
   f. Display assembly (Section 5.18)
   g. Top cover (Section 5.19)

2. Remove the modem connector ❶ from the clip in the base enclosure.
3. Disconnect the modem cable ❷ from the system board.



Removing the Modem Module Cable

4. Remove the two Phillips PM2.5×3.0 screws ❶ that secure the modem module to the system board.
5. Lift the front edge of the modem module ❷ to disconnect it from the system board.
6. Disconnect the modem cable ❸ from the modem module.



Removing the Modem Module

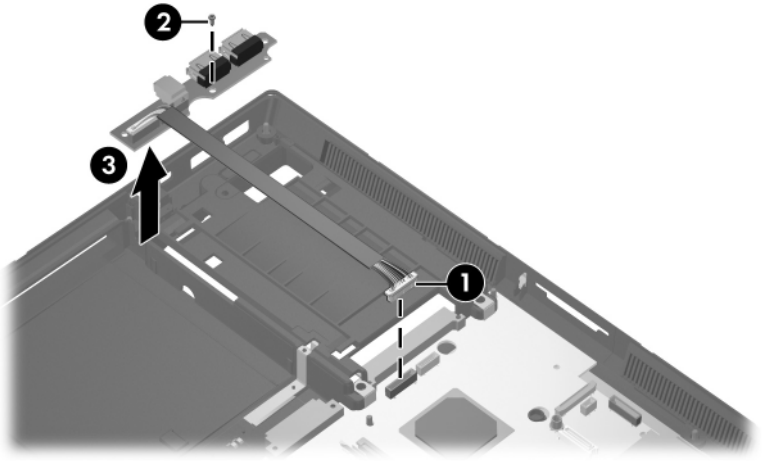
Reverse the above procedure to install the modem module.

5.23 USB/Audio Board

USB/Audio Board Spare Part Number Information	
USB/audio board (includes audio board cable and USB board cable)	413693-001

1. Prepare the computer for disassembly (Section 5.3), and then remove the following components:
   a. Hard drive (Section 5.4)
   b. Memory/Mini Card module cover (Section 5.7)
   c. Optical drive (Section 5.9)
   d. Keyboard (Section 5.10)
   e. Switch cover (Section 5.17)
   f. Display assembly (Section 5.18)
   g. Top cover (Section 5.19)

2. Position the computer with the rear panel toward you.
3. Release the ZIF connector to which the USB/audio board cable is connected and disconnect the USB/audio board cable ❶.
4. Remove the Phillips PM2.0×3.0 screw ❷ that secures the USB/audio board to the base enclosure.
5. Remove the cable from the clips in the base enclosure.
6. Remove the USB/audio board ❸.



Removing the USB/Audio Board

Reverse the above procedure to install the USB/audio board.

5.24 System Board

System Board Spare Part Number Information	
For use with full-featured computer models with Bluetooth and fingerprint reader	416165-001
For use with full-featured computer models with TouchPad	413669-001
For use with full-featured computer models with fingerprint reader	413670-001
For use with full-featured computer models with Mini Card WWAN module	413671-001
For use with defeatured computer models “GM”	413667-001
For use with defeatured computer models “GML”	413668-001

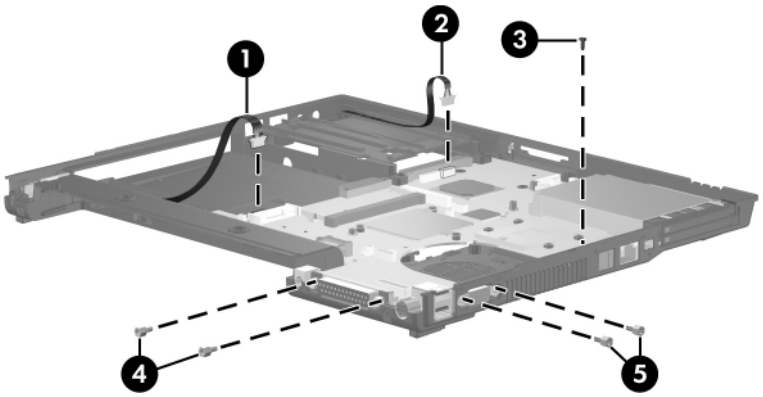
When replacing the system board, be sure that the following components are removed from the defective system board and installed on the replacement system board:

- Memory modules (Section 5.7 and Section 5.15)
- Mini Card WLAN module (Section 5.8)
- Processor (Section 5.13)
- Mini Card WWAN module (Section 5.16)
- Modem module and cable (Section 5.22)

1. Prepare the computer for disassembly (Section 5.3), and then remove the following components:
   a. Hard drive (Section 5.4)
   b. Bluetooth module (Section 5.6)
   c. Optical drive (Section 5.9)
   d. Keyboard (Section 5.10)
   e. Fan (Section 5.11)
   f. Heat sink (Section 5.12)

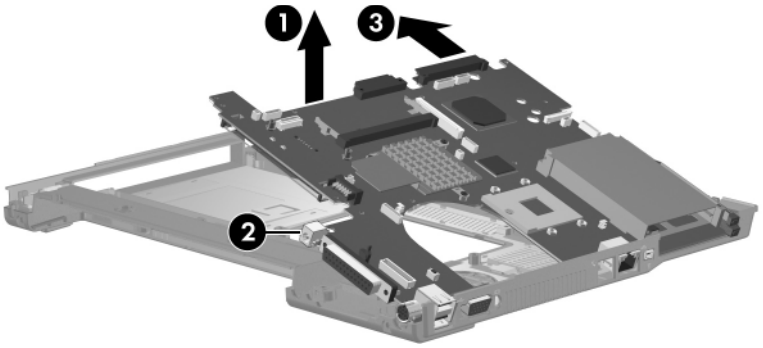
g. RTC battery (Section 5.14)
h. Switch cover (Section 5.17)
i. Display assembly (Section 5.18)
j. Top cover (Section 5.19)
k. Speaker (Section 5.20)
l. Microphone (Section 5.21)
m. USB/audio board (Section 5.23)

2. Disconnect the serial connector cable ❶ and the Bluetooth cable ❷ from the system board.
3. Remove the Torx8 T8M2.5×4.0 screw ❸ that secures the system board to the base enclosure next to the RJ-11 connector.
4. Remove the two HM5.0×9.0 screw locks ❹ on each side of the parallel connector.
5. Remove the two HM5.0×9.0 screw locks ❺ on each side of the external monitor connectors.



Removing the System Board Screws and Screw Locks

6. Use the optical drive connector to lift the system board ❶ until the power connector ❷ is clear of the base enclosure.
7. Slide the system board ❸ to the left at an angle and remove it.



Removing the System Board

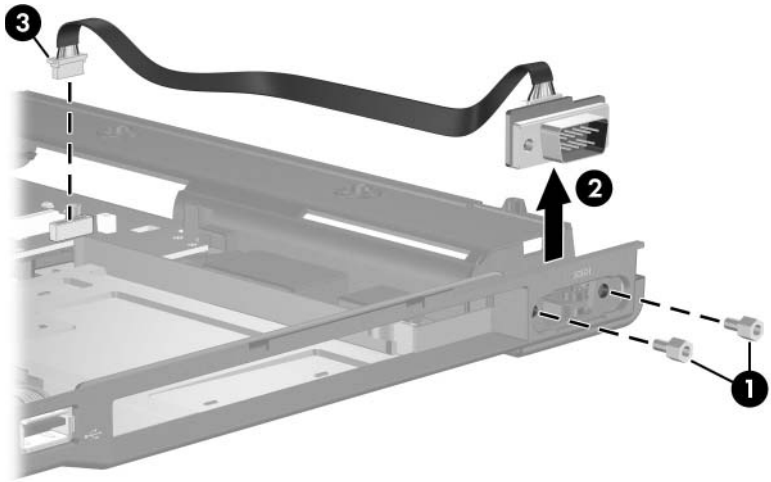
Reverse the above procedures to install the system board.

5.25 Serial Connector Module

Serial Connector Module Spare Part Number Information	
Serial connector module (includes serial connector module cable)	413694-001

1. Prepare the computer for disassembly (Section 5.3), and then remove the following components:
   a. Hard drive (Section 5.4)
   b. Bluetooth module (Section 5.6)
   c. Optical drive (Section 5.9)
   d. Keyboard (Section 5.10)
   e. Switch cover (Section 5.17)
   f. Fan (Section 5.11)
   g. Heat sink (Section 5.12)
   h. RTC battery (Section 5.14)
   i. Display assembly (Section 5.18)
   j. Top cover (Section 5.19)
   k. Speaker (Section 5.20)
   l. USB/audio board (Section 5.23)

2. Remove the two HM5.0×9.0 screw locks ❶ on each side of the serial connector.
3. Lift the serial connector module and cable ❷ out of the base enclosure.
4. Disconnect the serial connector module cable ❸ from the system board.



Removing the Serial Connector Module

Reverse the above procedures to install the serial connector module.

6

Specifications

This chapter provides physical and performance specifications.

Table 6-1

Computer

Dimensions	**Metric**	**U.S.**
Height	32.8 cm	12.91
Width	26.7 cm	10.51
Depth	3.1 cm	1.22
Weight		
With 15.0-inch display, optical drive, and 6-cell battery pack	2.86 kg	6.31 lbs
Input Power		
Operating voltage	18.5 V dc @ 3.5 A - 65 W	
Operating current	3.5 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

Table 6-1

Computer *(Continued)*

Relative humidity (noncondensing)		
Operating	10% to 90%	10% to 90%
Nonoperating	5% to 95%	5% to 95%
Maximum altitude (unpressurized)		
Operating (14.7 to 10.1 psia)	-15 m to 3,048 m	-50 ft to 10,000 ft
Nonoperating (14.7 to 4.4 psia)	-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	
Nonoperating	1.50 g zero-to-peak, 10 Hz to 500 Hz, 0.5 oct/min sweep rate	

Applicable product safety standards specify thermal limits for plastic surfaces. The computer operates well within this range of temperatures.

Table 6-2

15.0-inch, SXGA+WVA, TFT Display

Dimensions		
Height	30.0 cm	11.8 in
Width	22.9 cm	9.0 in
Diagonal	38.1 cm	15.0 in
Number of colors	Up to 16.8 million	
Contrast ratio	250:1	
Brightness	150 nits typical	
Pixel resolution		
Pitch	0.264 × 0.264 mm	
Format	1400 × 1050	
Configuration	RGB vertical stripe	
Backlight	Edge lit	
Character display	80 × 25	
Total power consumption	5.5 W	
Viewing angle	+/-35° horizontal, +15/-35° vertical typical	

Table 6-3

15.0-inch, XGA, TFT Display

Dimensions		
Height	30.0 cm	11.8 in
Width	22.9 cm	9.0 in
Diagonal	38.1 cm	15.0 in
Number of colors	Up to 16.8 million	
Contrast ratio	250:1	
Brightness	150 nits typical	
Pixel resolution		
Pitch	0.264 × 0.264 mm	
Format	1024 × 768	
Configuration	RGB vertical stripe	
Backlight	Edge lit	
Character display	80 × 25	
Total power consumption	5.5 W	
Viewing angle	+/-35° horizontal, +15/-35° vertical typical	

Table 6-4

14.1-inch, XGA, TFT Display

Dimensions		
Height	28.5 cm	11.2 in
Width	21.3 cm	8.4 in
Diagonal	35.8 cm	14.1 in
Number of colors	Up to 16.8 million	
Contrast ratio	250:1	
Brightness	180 nits typical	
Pixel resolution		
Pitch	0.279 × 0.279 mm	
Format	1024 × 768	
Configuration	RGB vertical stripe	
Backlight	Edge lit	
Character display	80 × 25	
Total power consumption	4.0 W	
Viewing angle	+/-40° horizontal, +120/-40° vertical typical	

Table 6-5

Hard Drives

	100-GB*	80-GB*	60-GB*	40-GB*
Dimensions				
Height	9.5 mm	9.5 mm	9.5 mm	9.5 mm
Width	70 mm	70 mm	70 mm	70 mm
Weight	99 g	99 g	99 g	102 g
Interface type	SATA	SATA	SATA	SATA
Transfer rate				
Synchronous (maximum)	100 MB/sec ATA	100 MB/sec ATA	100 MB/sec ATA	100 MB/sec ATA
Security	security	security	security	security
Seek times (typical read, including setting)				
Single track	3 ms	3 ms	3 ms	3 ms
Average	13 ms	13 ms	13 ms	13 ms
Maximum	24 ms	24 ms	24 ms	24 ms
Logical blocks†	195,363,650	156,301,488	117,210,240	78,140,160
Disc rotational speed	5400 rpm	5400 rpm	7200 and 5400 rpm	5400 rpm
Operating temperature	5°C to 55°C (41°F to 131°F)			

✎ Certain restrictions and exclusions apply. Consult Customer Care for details.

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

Table 6-6

Primary 6-cell, Li-Ion Battery Pack

Dimensions		
Height	2.00 cm	0.79 in
Width	9.40 cm	3.70 in
Depth	13.40 cm	5.28 in
Weight	0.34 kg	0.75 lb
Energy		
Voltage	11.1 V	
Amp-hour capacity	4.4 Ah	
Watt-hour capacity	48 Wh	
Temperature		
Operating	5°C to 45°C	41°F to 113°F
Nonoperating	0°C to 60°C	32°F to 140°F

Table 6-7

DVD-ROM Drive

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 2) CD-I ready (Mode 2, Form 1 and 2) CD-R CD-RW Photo CD (single and multisession) CD-Bridge	
Center hole diameter	1.5 cm (0.59 in)	
Disc diameter		
Standard disc	12 cm (4.72 in)	
Mini disc	8 cm (3.15 in)	
Disc thickness	1.2 mm (0.047 in)	
Track pitch	0.74 µm	
Access time	CD	DVD
Random	< 100 ms	< 125 ms
Full stroke	< 175 ms	< 225 ms
Audio output level	Line-out, 0.7 Vrms	
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	
Startup time	< 10 seconds	
Stop time	< 3 seconds	

Table 6-8

DVD/CD-RW Combo Drive

Applicable disc	**Read:** DVD-R, DVD-RW, 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 2) CD-I ready (Mode 2, Form 1 and 2) CD-R, CD-RW Photo CD (single and multisession) CD-Bridge	**Write:** CD-R and CD-RW
Center hole diameter	1.5 cm (0.59 in)	
Disc diameter		
Standard disc	12 cm (4.72 in)	
Mini disc	8 cm (3.15 in)	

Table 6-8

DVD/CD-RW Combo Drive *(Continued)*

Disc thickness	1.2 mm (0.047 in)	
Track pitch	0.74 µm	
Access time	CD media	DVD media
Random	< 110 ms	< 130 ms
Full stroke	< 210 ms	< 225 ms
Audio output level	Line-out, 0.7 V rms	
Cache buffer	2 MB	
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 (1352 KB/s at 1X DVD rate)	
Multiword DMA mode 2	16.6 MB/s	
Startup time	< 15 seconds	
Stop time	< 6 seconds	

Table 6-9

DVD±RW and CD-RW Combo Drive

Applicable disc	**Read:** DVD-R, DVD-RW, 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 2) CD-I ready (Mode 2, Form 1 and 2) CD-R, CD-RW Photo CD (single and multisession) CD-Bridge	**Write:** CD-R and CD-RW DVD-R and DVD-RW
Center hole diameter	1.5 cm (0.59 in)	
Disc diameter		
Standard disc	12 cm (4.72 in)	
Mini disc	8 cm (3.15 in)	

Table 6-9

DVD±RW and CD-RW Combo Drive *(Continued)*

Disc thickness	1.2 mm (0.047 in)	
Track pitch	0.74 µm	
Access time	CD	DVD
Random	< 175 ms	< 230 ms
Full stroke	< 285 ms	< 335 ms
Audio output level	Audio-out, 0.7 Vrms	
Cache buffer	2 MB	
Data transfer rate		
CD-R (16X)	2,400 KB/s (150 KB/s at 1X CD rate)	
CD-RW (8X)	1,200 KB/s (150 KB/s at 1X CD rate)	
CD-ROM (24X)	3,600 KB/s (150 KB/s at 1X CD rate)	
DVD (8X)	10,800 KB/s (1,352 KB/s at 1X DVD rate)	
DVD-R (4X)	5,400 KB/s (1,352 KB/s at 1X DVD rate)	
DVD-RW (2X)	2,700 KB/s (1,352 KB/s at 1X DVD rate)	
Multiword DMA mode 2	16.6 MB/s	
Startup time	< 15 seconds	
Stop time	< 6 seconds	

Table 6-10

CD-ROM Drive

Applicable disc	CD-ROM (Mode 1 and 2) CD Digital Audio CD-XA ready (Mode 2, Form 1 and 2) CD-I ready (Mode 2, Form 1 and 2) CD-RCD-RW Photo CD (single and multisession) CD-Bridge
Center hole diameter	1.5 cm (0.59 in)
Disc diameter	
Standard disc	12 cm (4.72 in)
Mini disc	8 cm (3.15 in)
Disc thickness	1.2 mm (0.047 in)

Table 6-11

System DMA

Hardware DMA	System Function
DMA0	Not applicable
DMA1*	Not applicable
DMA2*	Not applicable
DMA3	Not applicable
DMA4	Direct memory access controller
DMA5*	Available for PC Card
DMA6	Not assigned
DMA7	Not assigned

*PC Card controller can use DMA 1, 2, or 5.

Table 6-12

System Interrupts

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

Table 6-12

System Interrupts *(Continued)*

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.

PC Cards may assert IRQ3, IRQ4, IRQ5, IRQ7, IRQ9, IRQ10, IRQ11, or IRQ15. Either the infrared or the serial port may assert IRQ3 or IRQ4.

Table 6-13

System I/O Addresses

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

Table 6-13

System I/O Addresses *(Continued)*

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
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

Table 6-13

System I/O Addresses *(Continued)*

I/O Address (hex)	**System Function** (shipping configuration)
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	PC Card 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)

Table 6-14

System Memory Map

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	01000000-047FFFFF	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

A

Screw Listing

This appendix provides specification and reference information for the screws and screw locks used in the computer. All screws and screw locks listed in this appendix are available in the Screw Kit, spare part number 378235-001.

Table A-1

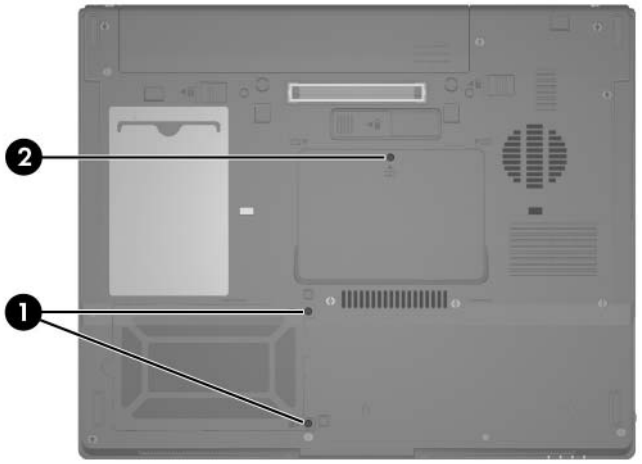
Phillips PM2.0×4.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Black	9	4.0 mm	2.0 mm	4.0 mm

Where used:

❶ Two screws that secure the hard drive cover to the computer (screws are captured on the cover by C-clips; documented in Section 5.4)

❷ One screw that secures the memory/Mini Card module cover to the computer (screw is captured on the cover by a C-clip; documented in Section 5.7)



Phillips PM2.0×4.0 Screw Locations

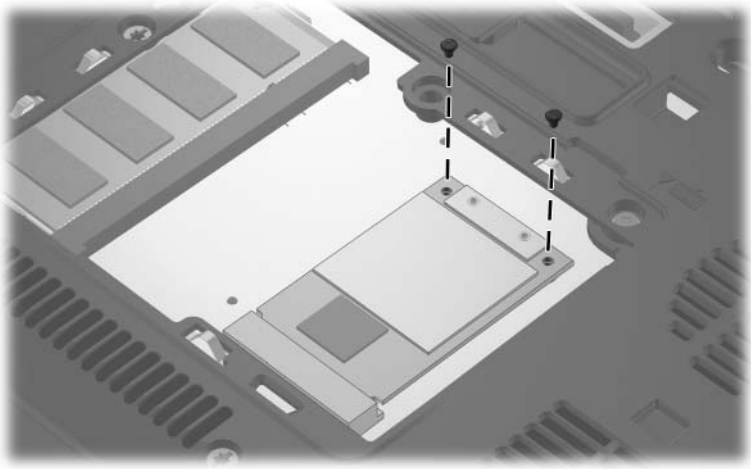
Table A-1

Phillips PM2.0×4.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	9	4.0 mm	2.0 mm	4.0 mm

Where used:

2 screws that secure the Mini Card WLAN to the computer (documented in Section 5.8)



Phillips PM2.0×4.0 Screw Locations

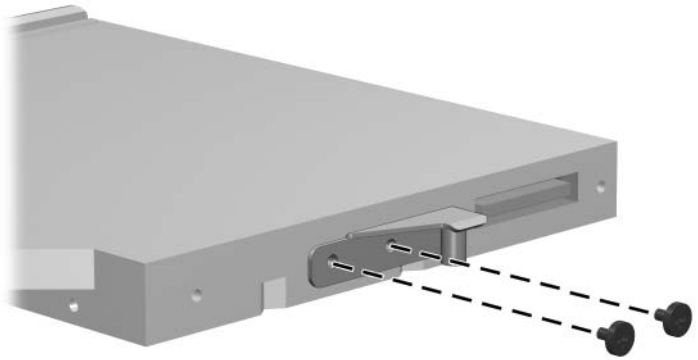
Table A-1

Phillips PM2.0×4.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	9	4.0 mm	2.0 mm	4.0 mm

Where used:

2 screws that secure the optical drive bracket to the optical drive (documented in Section 5.9)



Phillips PM2.0×4.0 Screw Locations

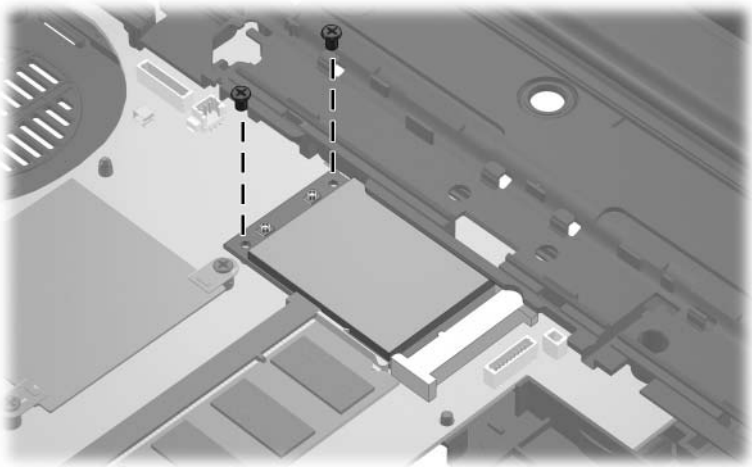
Table A-1

Phillips PM2.0×4.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	9	4.0 mm	2.0 mm	4.0 mm

Where used:

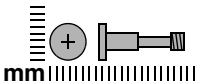
2 screws that secure the Mini Card WWAN to the computer (documented in Section 5.16)



Phillips PM2.0×4.0 Screw Locations

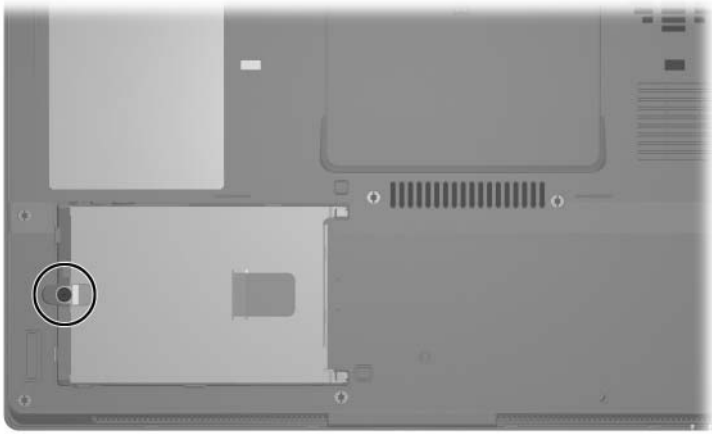
Table A-2

Phillips PM2.5×13.0 Spring-loaded Hard Drive Retention Screw

	Color	Qty.	Length	Thread	Head Width
	Silver	1	13.0 mm	2.5 mm	5.5 mm

Where used:

One screw that secures the hard drive to the computer (screw is captured on the hard drive frame by a C-clip; documented in Section 5.4)



Phillips PM2.5×13.0 Screw Location

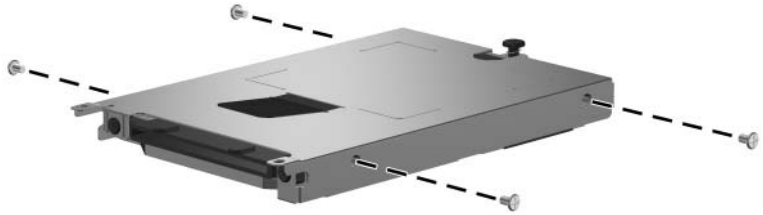
Table A-3

Phillips PM3.0×4.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Silver	4	4.0 mm	3.0 mm	4.5 mm

Where used:

Four screws that secure the hard drive frame to the hard drive (documented in Section 5.4)



Phillips PM3.0×4.0 Screw Locations

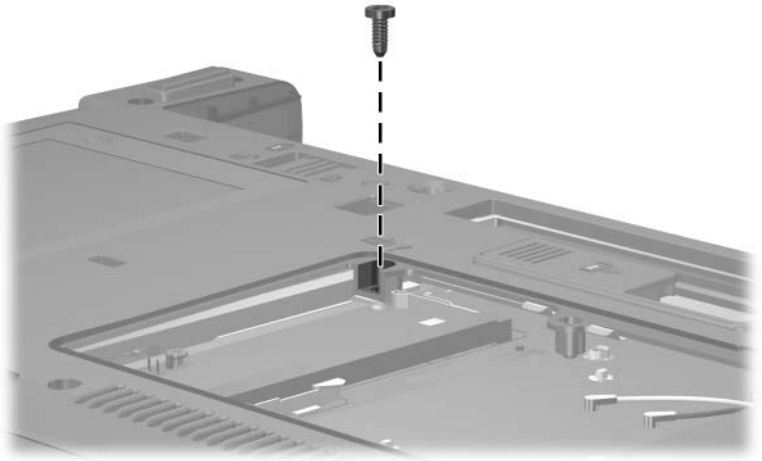
Table A-4

Torx8 T8M2.5×9.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Black	24	9.0 mm	2.5 mm	4.0 mm

Where used:

One screw that secures the optical drive to the computer (documented in Section 5.9)



Torx8 T8M2.5×9.0 Screw Location

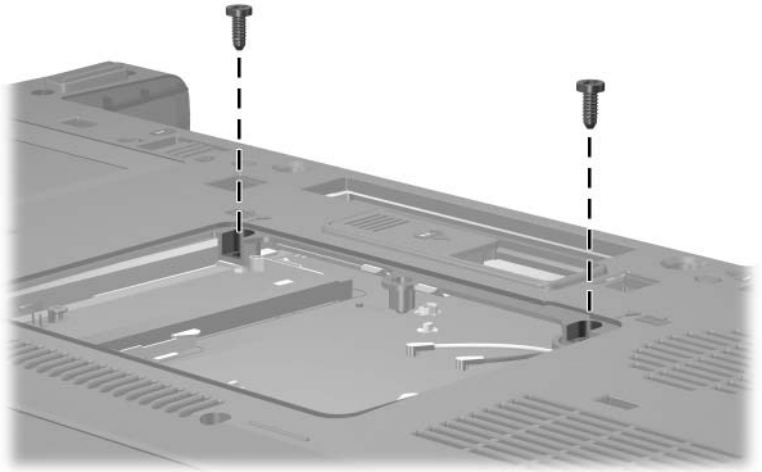
Table A-4

Torx8 T8M2.5×9.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	24	9.0 mm	2.5 mm	4.0 mm

Where used:

2 screws that secure the keyboard to the computer (documented in Section 5.10; left screw also secures optical drive)



Torx8 T8M2.5×9.0 Screw Locations

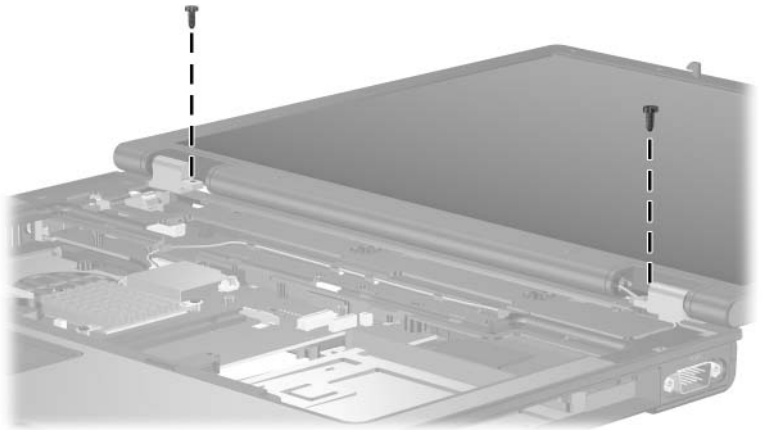
Table A-4

Torx8 T8M2.5×9.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	24	9.0 mm	2.5 mm	4.0 mm

Where used:

2 screws that secure the display assembly to the computer (documented in Section 5.18)



Torx8 T8M2.5×9.0 Screw Locations

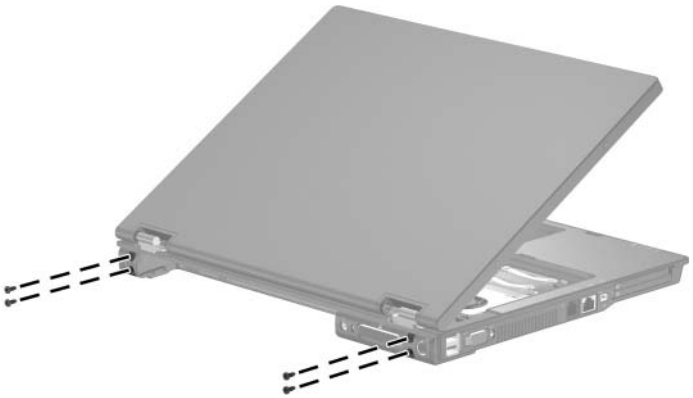
Table A-4

Torx8 T8M2.5×9.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	24	9.0 mm	2.5 mm	4.0 mm

Where used:

4 screws that secure the display assembly to the computer (documented in Section 5.18)



Torx8 T8M2.5×9.0 Screw Locations

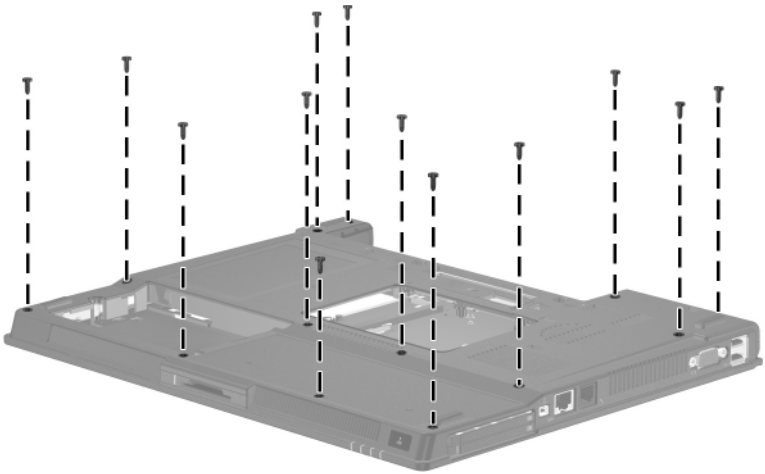
Table A-4

Torx8 T8M2.5×9.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	24	9.0 mm	2.5 mm	4.0 mm

Where used:

13 screws that secure the top cover to the computer (documented in Section 5.19)



Torx8 T8M2.5×9.0 Screw Locations

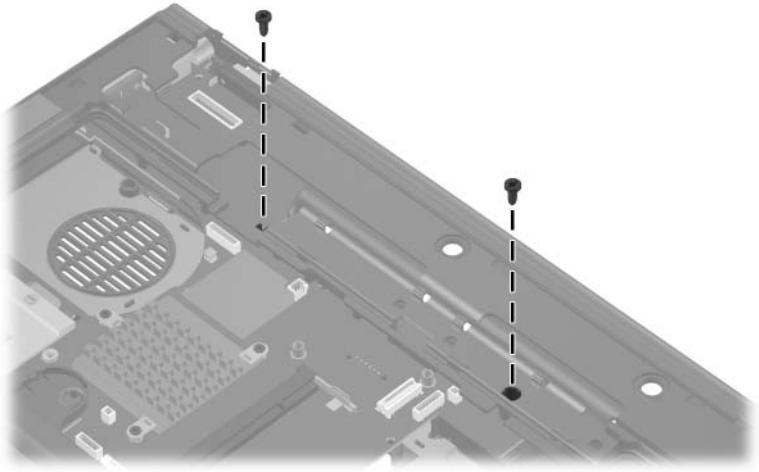
Table A-4

Torx8 T8M2.5×9.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	24	9.0 mm	2.5 mm	4.0 mm

Where used:

2 screws that secure the top cover to the computer (documented in Section 5.19)



Torx8 T8M2.5×9.0 Screw Locations

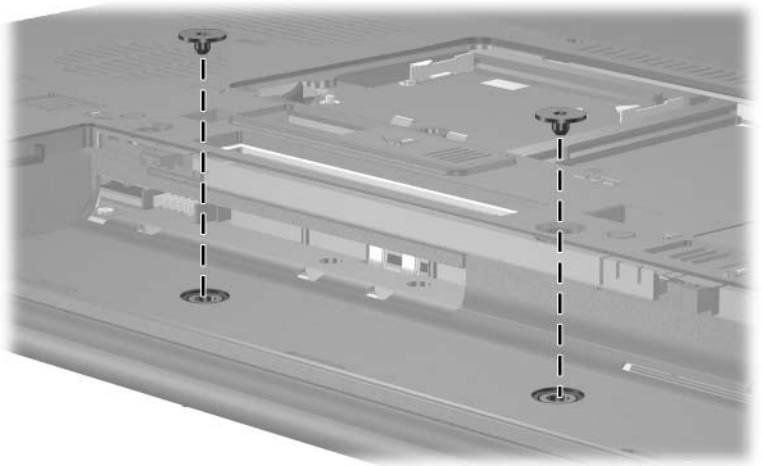
Table A-5

Torx8 T8M2.5×2.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Black	2	2.0 mm	2.5 mm	6.0 mm

Where used:

2 screws that secure the switch cover to the computer (documented in Section 5.17)



Torx8 T8M2.5×2.0 Screw Locations

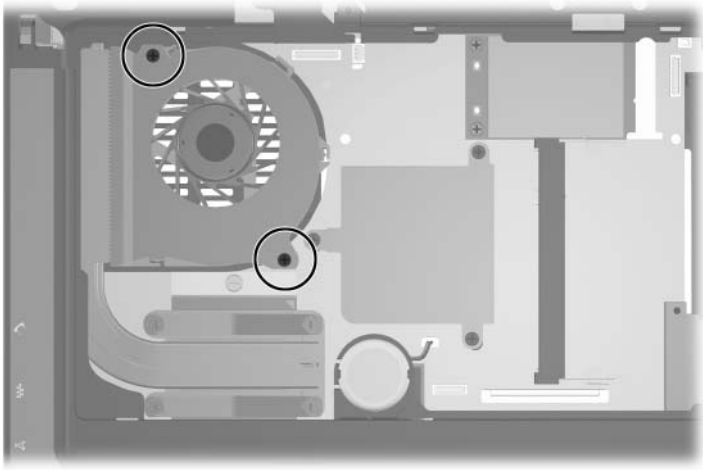
Table A-6

Phillips PM2.5×7.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Silver	2	7.0 mm	2.5 mm	4.5 mm

Where used:

2 screws that secure the fan to the computer (screws are captured on the fan assembly by an O-clip; documented in Section 5.11)



Phillips PM2.5×7.0 Screw Locations

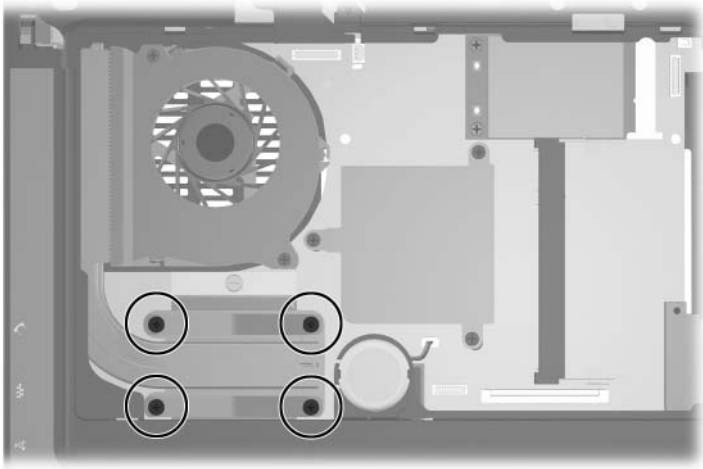
Table A-7

Phillips PM2.5×8.0 Shoulder Screw

mm	Color	Qty.	Length	Thread	Head Width
	Silver	4	8.0 mm	2.5 mm	5.0 mm

Where used:

4 screws that secure the heat sink to the computer (screws are captured on the heat sink by C-clips; documented in Section 5.12)



Phillips PM2.5×8.0 Shoulder Screw Locations

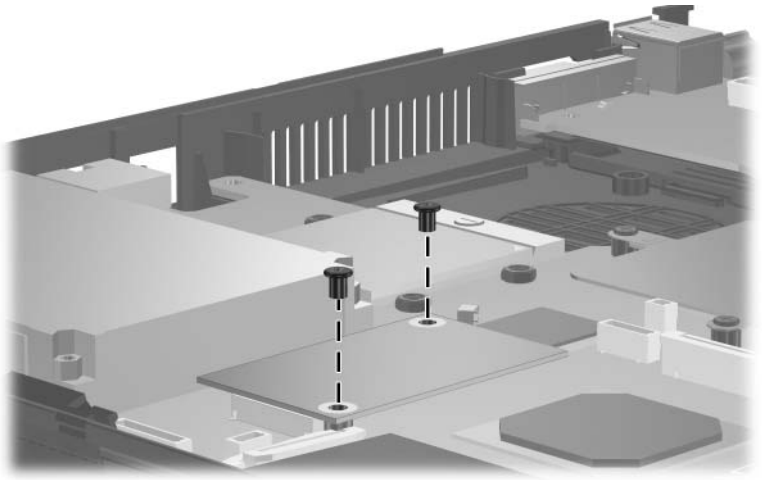
Table A-8

Phillips PM2.5×3.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Black	2	3.0 mm	2.5 mm	4.0 mm

Where used:

2 screws that secure the modem module to the computer (documented in Section 5.22)



Phillips PM2.5×3.0 Screw Locations

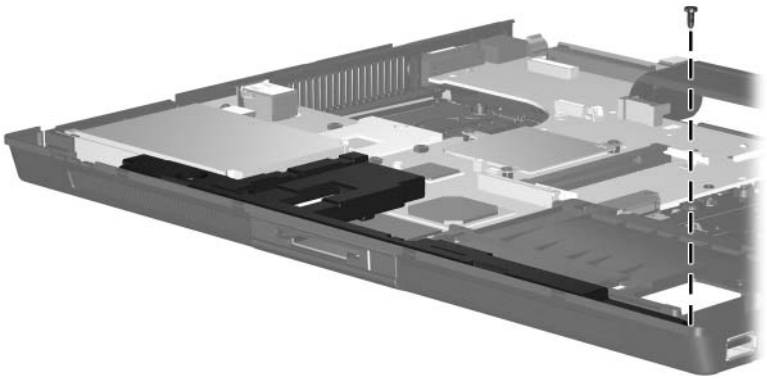
Table A-9

Torx8 T8M2.5×4.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Black	2	4.0 mm	2.5 mm	4.0 mm

Where used:

One screw that secures the speaker to the computer (documented in Section 5.20)



Torx8 T8M2.5×4.0 Screw Location

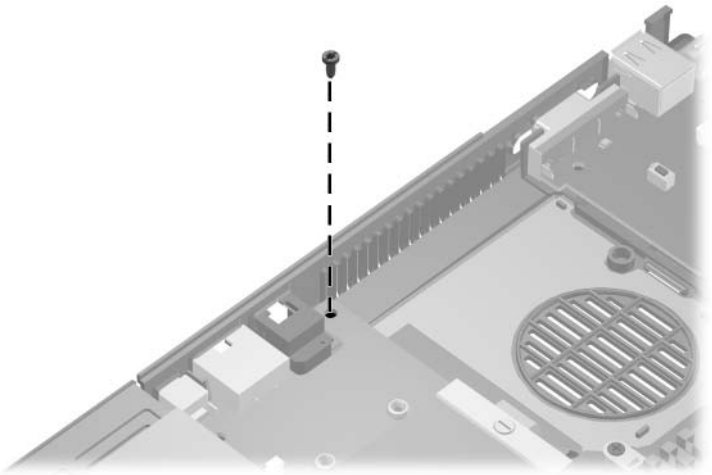
Table A-9

Torx8 T8M2.5×4.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	2	4.0 mm	2.5 mm	4.0 mm

Where used:

One screw that secures the system board to the computer (documented in Section 5.24)



Torx8 T8M2.5×4.0 Screw Location

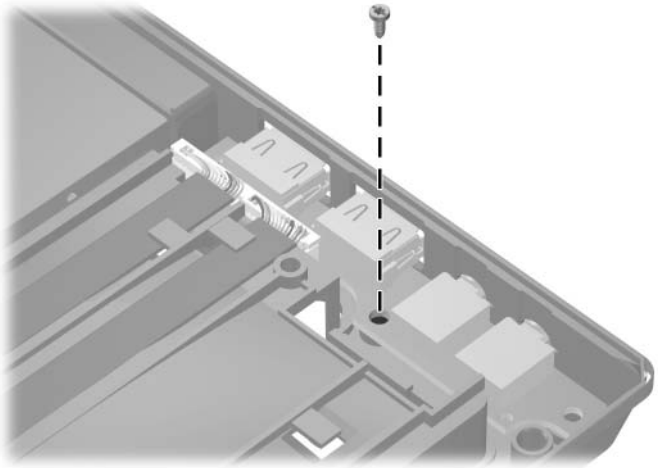
Table A-10

Phillips PM1.5×3.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Silver	1	3.0 mm	1.5 mm	4.0 mm

Where used:

One screw that secures the USB/audio board the computer (documented in Section 5.23)



Phillips PM1.5×3.0 Screw Location

Table A-11

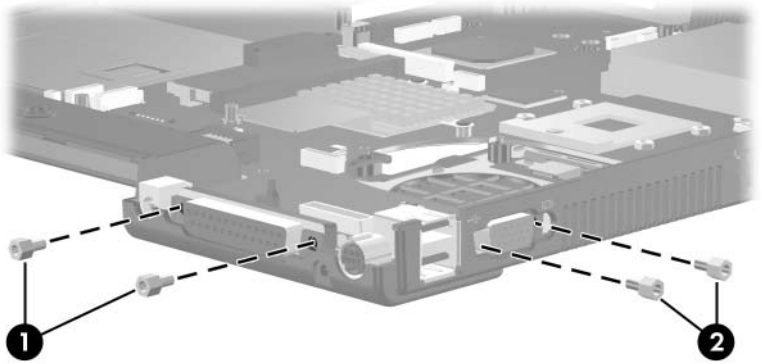
Hex Socket HM5.0×9.0 Screw Lock

mm	Color	Qty.	Length	Thread	Head Width
	Silver	6	9.0 mm	5.0 mm	5.0 mm

Where used:

❶ Two screw locks that secure the system board to the computer (documented in Section 5.24)

❷ Two screw locks that secure the system board to the computer (documented in Section 5.24)



Hex Socket HM5.0×9.0 Screw Lock Locations

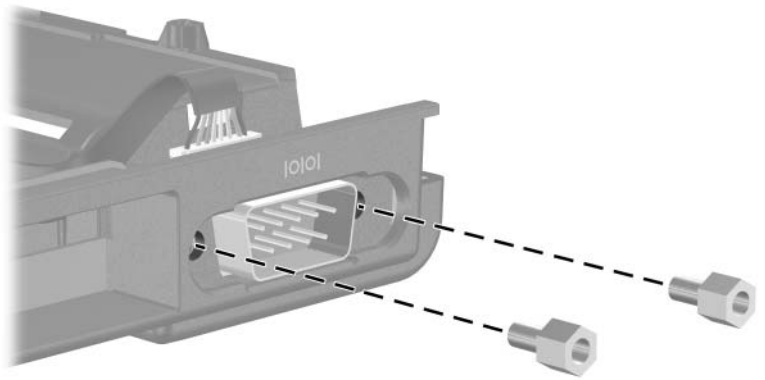
Table A-11

Hex Socket HM5.0×9.0 Screw Lock *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Silver	6	9.0 mm	5.0 mm	5.0 mm

Where used:

2 screw locks that secure the serial connector board to the system board (documented in Section 5.25)



Hex Socket HM5.0×9.0 Screw Lock Locations

B

Software Backup and Recovery

Backup

HP Backup and Recovery Manager provides several ways to back up the system and to recover optimal system functionality.

HP installed drivers, utilities, and applications can be copied to a CD or to a DVD using HP Backup and Recovery Manager.

Formatted DVD±RW discs and DVD±RW double-layer discs are not compatible with HP Backup and Recovery Manager.

The computer must be connected to external power before you perform backup and recovery procedures.

Safeguarding Your Data

To safeguard your documents, store personal files in the My Documents folder and periodically create a backup copy of the folder.

Backing Up the System

Using HP Backup and Restore Manager, you can

- Back up specific files and folders.
- Back up the entire system.
- Back up modifications since your last backup, using HP system restore points.
- Schedule backups.

Backing Up Specific Files or Folders

You can back up specific files or folders to the hard drive, to an optional external hard drive, or to discs.

This process will take several minutes, depending on the file size and the speed of the computer.

To back up specific files or folders:

1. Select **Start > All Programs > HP Backup & Recovery > HP Backup and Recovery Manager**.
2. Click **Next**.
3. Click **Back up to protect system settings and important data files**, and then click **Next**.
4. Click **Back up individual files and folders**, and then click **Next**.

   The Backup Wizard opens.
5. Click **Next**.
6. Click **Backup selected files from most common locations (Recommended)**.

   – or –

   Click **Advanced Backup (Experienced users)** to access advanced filtering techniques.
7. Click **Next**.
8. Follow the on-screen instructions.

Backing Up the Entire Hard Drive

When you perform a complete backup of the hard drive, you are saving the full factory image, including the Windows operating system, software applications, and all personal files and folders.

A copy of the entire hard drive image can be stored on another hard drive, on a network drive, or on recovery discs that you create.

This process may take over an hour, depending on your computer speed and the amount of data being stored.

To back up your entire hard drive:

1. Select **Start > All Programs > HP Backup & Recovery > HP Backup and Recovery Manager**.
2. Click **Next**.
3. Click **Back up to protect system settings and important data files**, and then click **Next**.
4. Click **Back up entire hard drive**, and then click **Next**.

   The "Back up entire hard disk" page opens.
5. Click **Next**.
6. Select the location for the backup files, and then click **Next**.
7. Select the **Protect data access with password** check box, and type your password in the **Password and Confirm** boxes.

This step is optional. If you do not want to password-protect your data access, clear the **Protect data access with password** check box.

8. Click **Next**.
9. Follow the on-screen instructions.

Backing Up Modifications Made to the System

When you back up modifications since your last backup, you are creating system recovery points. This allows you to save a snapshot of your hard drive at a specific point in time. You can then recover back to that point if you want to reverse subsequent changes made to your system.

The first system recovery point, a snapshot of the entire image, is automatically created the first time you perform a backup. Subsequent recovery points make a copy of changes made after that time.

HP recommends that you create recovery points

- Before you add or extensively modify software or hardware.
- Periodically, whenever the system is performing optimally.

Recovering to an earlier recovery point does not affect data files or e-mails created since that recovery point.

After you create a recovery point, you are prompted to schedule subsequent recovery points. You can schedule recovery points for a specific time or event in your system.

To create and schedule a system recovery point:

1. Select **Start > All Programs > HP Backup & Recovery > HP Backup and Recovery Manager**.
2. Click **Next**.
3. Click **Back up to protect system settings and important data files**, and then click **Next**.
4. Click **Create or manage Recovery Points**, and then click **Next**.

   The “Recovery Point Manager” page opens.
5. Follow the on-screen instructions.

Scheduling Backups

To schedule backups:

1. Select **Start > All Programs > HP Backup & Recovery > HP Backup Scheduler**.

   The "Backup Scheduler" page opens.

2. Click **Next**.

3. Schedule system recovery points at specific intervals (now, daily, weekly, or monthly) or at specific events, such as at system start or when you dock to an optional docking station (select computer models only), by clicking one of the available options. Click **Next** to further define the settings.

   A summary of your system recovery point settings is displayed.

4. Follow the on-screen instructions.

Recovery

HP Backup and Recovery Manager analyzes the hard drive and creates a dedicated hard drive recovery partition on the hard drive large enough to store a copy of the full factory image. You can choose whether you want to store that copy on the recovery partition, on another drive, or on external recovery discs.

Before using HP Backup and Recovery Manager, try repairing the system by running Microsoft Windows System Restore. For more information, select **Start > Help and Support**, and then search for "System Restore."

HP Backup and Recovery Manager allows you to

- **Create recovery discs (highly recommended).** The recovery discs are used to start up your computer and to recover the full factory image (operating system and software) in case of system failure or instability.

If you do not have a CD or DVD burner, a copy of the entire hard drive image can be stored on another hard drive or on a network drive.

- **Perform a recovery.** You can perform a full system recovery or recover important files from the recovery partition on the hard drive, from another drive, or from recovery discs that you create.

Creating Recovery Discs (Highly Recommended)

After setting up the computer for the first time, you can create a set of recovery discs of the full factory image, using Recovery Media Creator in the HP Backup and Recovery Manager. The recovery discs are used to start up (boot) the computer and recover the operating system and software to factory settings in case of system failure or instability.

CAUTION: After you create the recovery discs, you can increase the amount of available space on the hard drive by deleting the recovery partition. However, doing this is not recommended. If you delete this partition, you will lose any information that is on the partition.

Only one set of recovery discs can be created for this computer.

Before creating recovery discs:

- Obtain high-quality CD-R, DVD-R, or DVD+R media, purchased separately.

Formatted DVD±RW discs and DVD±RW double-layer discs are not compatible with HP Backup and Recovery Manager.

- Number each disc before inserting it into the optical drive of the computer.
- If necessary, you can cancel Recovery Media Creator before you have finished creating the recovery discs. The next time you open Recovery Media Creator, you will be prompted to continue the disc creation process where you left off.

To create a set of recovery discs:

1. Select **Start > All Programs > HP Backup & Recovery > HP Backup and Recovery Manager**.
2. Click **Next**.
3. Click **Create factory software recovery CDs or DVDs to recover the system (Highly recommended)**, and then click **Next**.

   The "Recovery Media Creator" page opens.
4. Click **Next**.
5. Click **Write to CD/DVD**, and then click **Next**.
6. Follow the on-screen instructions.

Performing a Recovery

Performing a Recovery from the Recovery Discs

To perform a recovery from the recovery discs:

1. Back up all personal files.
2. Insert the first recovery disc into the optical drive and restart the computer.
3. Follow the on-screen instructions.

Performing a Recovery from the Hard Drive

There are 2 ways to initiate a recovery from the hard drive:

- From within Windows.
- From the recovery partition.

Initiating a Recovery in Windows

To initiate a recovery in Windows:

1. Back up all personal files.
2. Select **Start > All Programs > HP Backup & Recovery > HP Backup and Recovery Manager**.
3. Click **Next**.
4. Click **Recover important files or the entire system**, and then click **Next**.
5. Click a recovery option, and then click **Next**.

If you choose to recover the system, the computer restarts and recovery begins.

6. Follow the on-screen instructions.

Initiating a Recovery from the Hard Drive Recovery Partition

To initiate a recovery from the hard drive recovery partition:

1. Back up all personal files.
2. Restart the computer, and then press **f11** before the Windows operating system loads.
3. Click a recovery option, and then click **Next**.
4. Follow the on-screen instructions.

C

Display Component Recycling

WARNING: The backlight contains mercury. Caution should be exercised 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 should be exercised when removing these components.

Materials Disposal

This HP product contains mercury in the backlight in the display assembly that might require special handling at end-of-life.

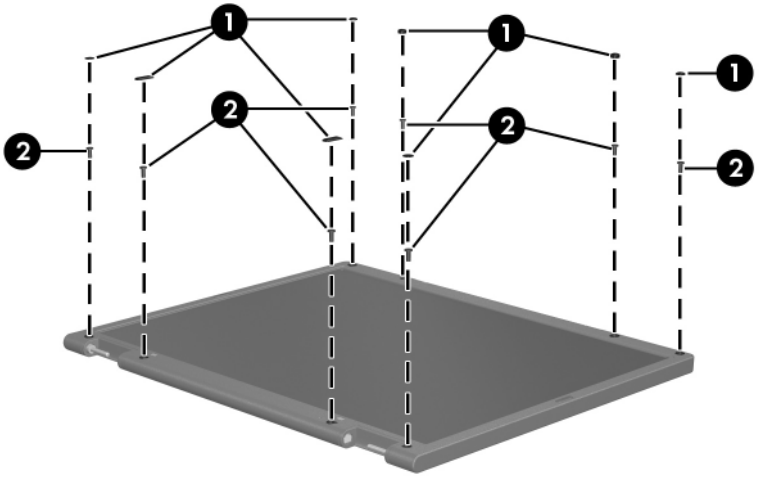
Disposal of mercury may be regulated because of environmental considerations. For disposal or recycling information, contact your local authorities or the Electronic Industries Alliance (EIA) at http://www.eiae.org.

This appendix provides disassembly instructions for the display assembly. The display assembly must be disassembled to gain access to the backlight ❶ and the liquid crystal display (LCD) panel ❷.

Disassembly procedures differ from one display assembly to another. 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.

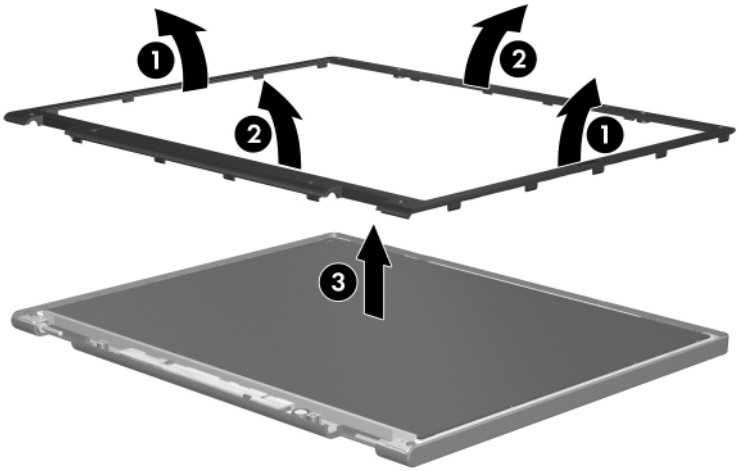
Perform the following steps to disassemble the display assembly:

1. Remove all screw covers ❶ and screws ❷ that secure the display bezel to the display assembly.



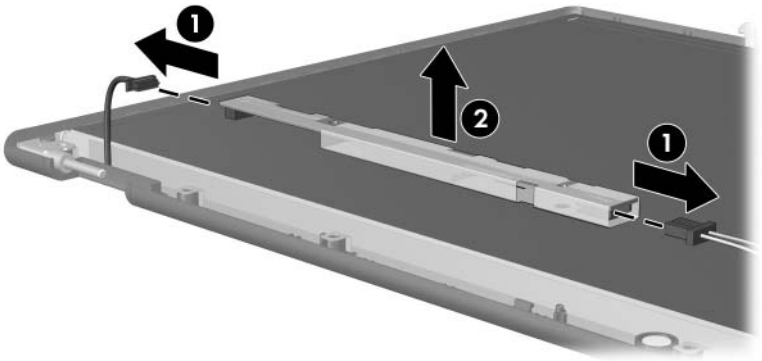
Removing the Display Bezel Screw Covers and Screws

2. Lift up and out on the left and right inside edges ❶ and the top and bottom inside edges ❷ of the display bezel until the bezel disengages from the display assembly.
3. Remove the display bezel ❸.



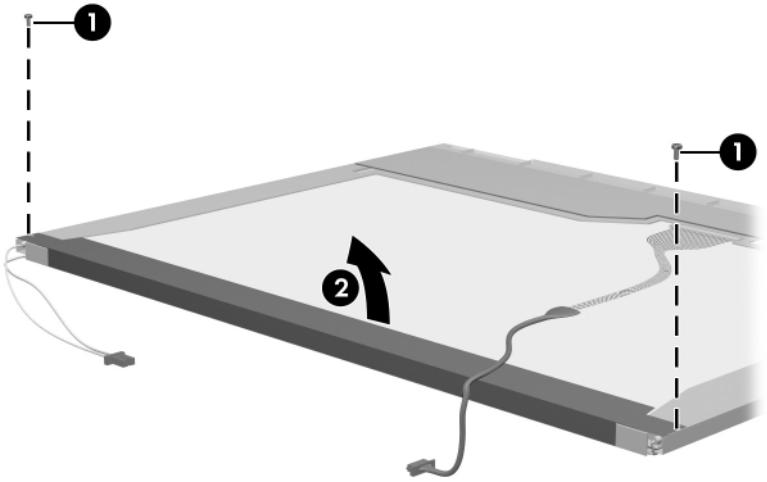
Removing the Display Bezel

4. Disconnect all display panel cables ❶ from the display inverter and remove the inverter ❷.



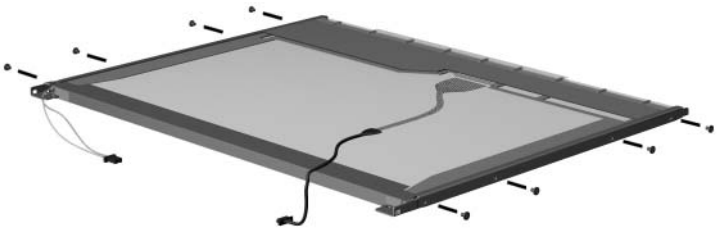
Removing the Display Inverter

5. Remove all screws ❶ that secure the display panel assembly to the display enclosure.
6. Remove the display panel assembly ❷ from the display enclosure.



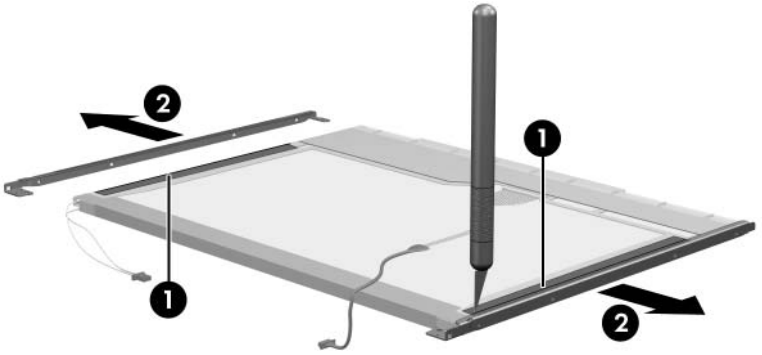
Removing the Display Panel Assembly

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



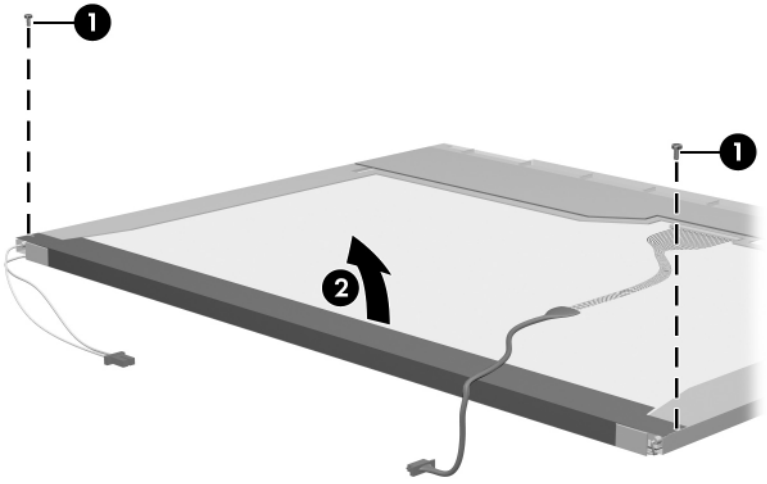
Removing the Display Panel Frame Screws

9. Use a sharp-edged tool to cut the tape ❶ that secures the sides of the display panel to the display panel frame.
10. Remove the display panel frame ❷ from the display panel.



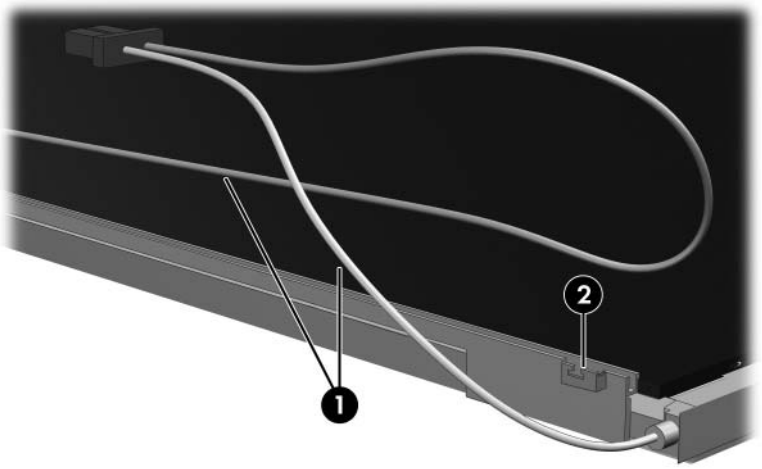
Removing the Display Frame

11. Remove the screws ❶ that secure the backlight cover to the display panel.
12. Lift the top edge of the backlight cover ❷ and swing it forward.
13. Remove the backlight cover.



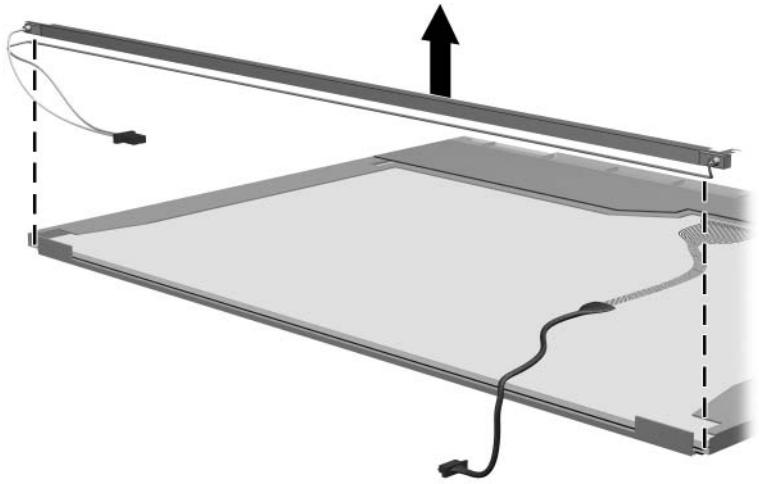
Removing the Backlight Cover

14. Turn the display panel right-side up.
15. Remove the backlight cables ❶ from the clip ❷ in the display panel.



Releasing the Backlight Cables

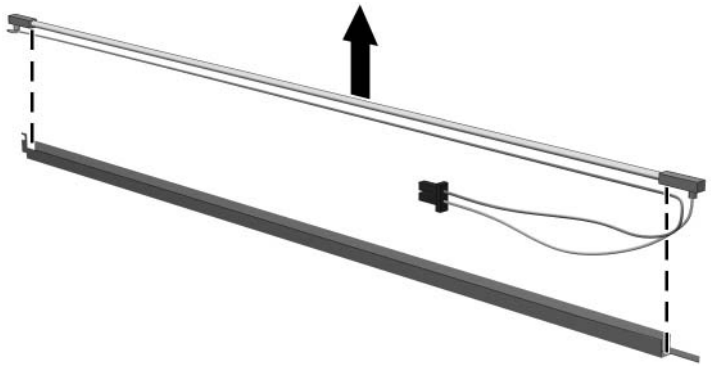
16. Turn the display panel upside down.
17. Remove the backlight frame from the display panel.



Removing the Backlight Frame

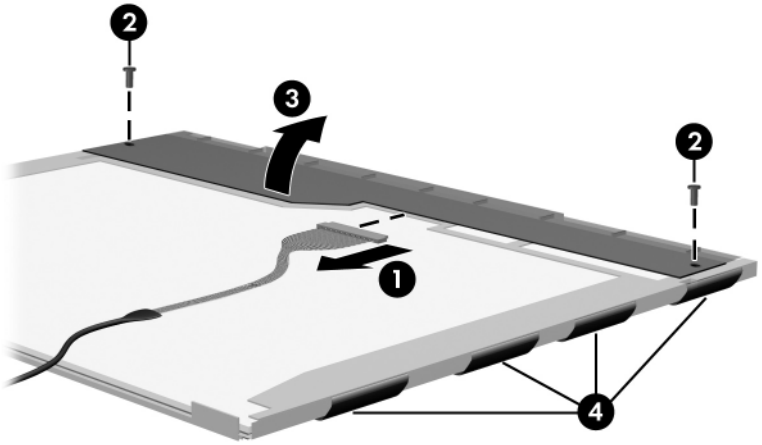
WARNING: The backlight contains mercury. Caution should be exercised when removing and handling the backlight to avoid damaging this component and causing exposure to the mercury.

18. Slide the backlight out of the backlight frame.



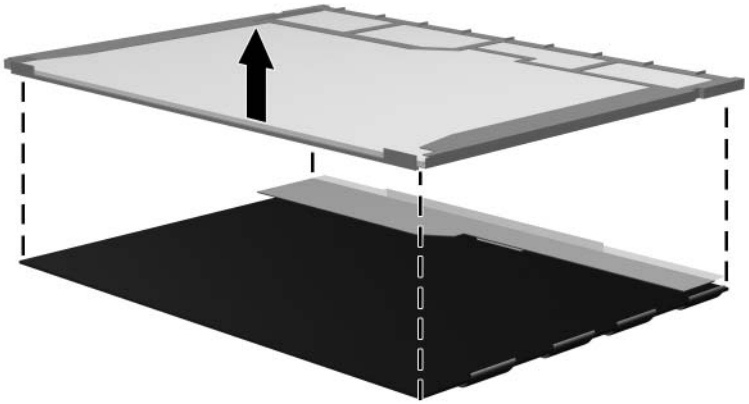
Removing the Backlight

19. Disconnect the display cable ❶ from the LCD panel.
20. Remove the screws ❷ that secure the LCD panel to the display rear panel.
21. Release the LCD panel ❸ from the display rear panel.
22. Release the tape ❹ that secures the LCD panel to the display rear panel.



Releasing the LCD Panel

23. Remove the LCD panel.



Removing the LCD Panel

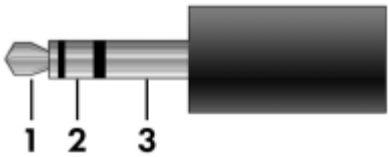
24. Recycle the LCD panel and backlight.

D

Connector Pin Assignments

Table D-1

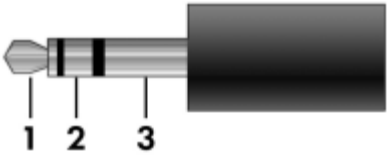
Audio-Out (Headphone)



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

Table D-2

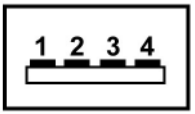
Audio-In (Microphone)



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

Table D-3

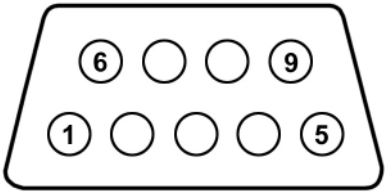
Universal Serial Bus



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

Table D-4

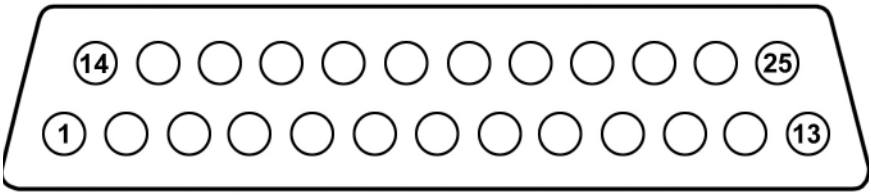
Serial



Pin	Signal	Pin	Signal
1	Carrier detect	6	Data set ready
2	Receive data	7	Ready to send
3	Transmit data	8	Clear to send
4	Data terminal ready	9	Ring indicator
5	Ground		

Table D-5

Parallel Port



Pin	Signal	Pin	Signal
1	Strobe	14	Auto linefeed
2	Data bit 0	15	Error
3	Data bit 1	16	Initialize printer
4	Data bit 2	17	Select in
5	Data bit 3	18	Ground
6	Data bit 4	19	Ground
7	Data bit 5	20	Ground
8	Data bit 6	21	Ground
9	Data bit 7	22	Ground
10	Acknowledge	23	Ground
11	Busy	24	Ground
12	Paper end	25	Ground
13	Select		

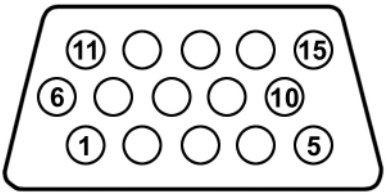
Table D-6

S-Video-Out

Pin	Signal	Pin	Signal
1	S-VHS color (C) signal	5	TV-CD
2	Composite video signal	6	S-VHS intensity ground
3	S-VHS intensity (Y) signal	7	Composite video ground
4	S-VHS color ground		

Table D-7

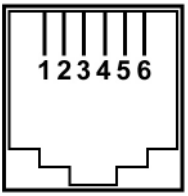
External Monitor



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

Table D-8

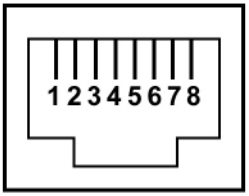
RJ-11 (Modem)



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

Table D-9

RJ-45 (Network)



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

E

Power Cord Set Requirements

3-Conductor Power Cord Set

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

The power cord set included with the computer meets the requirements for use in the country where the equipment is purchased.

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

General Requirements

The requirements listed below are applicable to all countries.

- The length of the power cord set must be at least 1.5 m (5.0 ft) and a maximum of 2.0 m (6.5 ft).
- All power cord sets must be approved by an acceptable accredited agency responsible for evaluation in the country 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 each country's power system.
- 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.

Country-Specific Requirements

3-Conductor Power Cord Set Requirements

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

NOTES:

1. The flexible cord must be <HAR> 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 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.

3-Conductor Power Cord Set Requirements *(Continued)*

Country/Region	Accredited Agency	Applicable Note Number
Korea	EK	4
The Netherlands	KEMA	1
Norway	NEMKO	1
People's Republic of China	CCC	5
Sweden	SEMKO	1
Switzerland	SEV	1
Taiwan	BSMI	4
United Kingdom	BSI	1
United States	UL	2

NOTES:

1. The flexible cord must be <HAR> 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 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 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 where it will be used.

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