Maintenance and Service Guide

HP Compaq nw9440 Notebook PC
HP Compaq nx9420 Notebook PC

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March 2006

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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Contents

1 Product Description

2 Troubleshooting

3 Illustrated Parts Catalog

4 Removal and Replacement Preliminaries

5 Removal and Replacement Procedures

1

Product Description

The HP Compaq nw9440 Notebook PC and HP Compaq nx9420 Notebook PC offer advanced modularity, Intel® Core Duo processors, and extensive multimedia support.

HP Compaq nw9440 Notebook PC and HP Compaq nx9420 Notebook PC

1.1 Features

- The following processors, varying by computer model:
  - Intel Core Duo T2600 (2.17-GHz)
  - Intel Core Duo T2500 (2.00-GHz)
  - Intel Core Duo T2400 (1.83-GHz)
  - Intel Core Duo T2300 (1.66-GHz)
- The following displays are available, varying by computer model:
  - 17.0-inch, WUXGA+WVA, TFT (1920 × 1200) with over 16.8 million colors with AntiGlare
  - 17.0-inch, WSXGA+WVA, TFT (1680 × 1050) with over 16.8 million colors with AntiGlare
  - 17.0-inch, WXGA+WVA, TFT (1440 × 900) with over 16.8 million colors with AntiGlare
  - 17.0-inch, WSXGA+WVA, TFT (1680 × 1050) with over 16.8 million colors with BrightView
- 100-, 80-, and 60-GB high-capacity hard drive, varying by computer model
- 256-MB DDR2 synchronous DRAM (SDRAM) at 533 MHz and 667 MHz, expandable to 4.0 GB
- Microsoft® Windows® XP Professional
- Full-size Windows keyboard with numeric keypad
- TouchPad and pointing stick pointing devices, including a dedicated vertical scroll region (select models only)
- 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 Card IEEE 802.11a/b/g or 802.11b/g Wireless LAN (WLAN) device
- Support for one Type I or Type II PC Card slot, with support for both 32-bit (CardBus) and 16-bit PC Cards, varying by computer model
- External 120- and 90-watt AC adapters with 3-wire power cord, varying by computer model
- 8-cell Li-Ion battery pack
- Stereo speakers
- Volume up, volume mute, and volume down buttons
- Support for the following optical drives:
  - DVD±RW and CD-RW Combo Drive
  - DVD/CD-RW Combo Drive
  - DVD-ROM drive
- Connectors:
  - Audio-out (headphone)
  - Audio-in (microphone)
  - Four Universal Serial Bus (USB) v. 2.0
  - SmartPower
  - External monitor
  - RJ-11 (modem)
  - RJ-45 (network)
  - IEEE 1394
  - Accessory battery
  - Digital Media Slot
  - Parallel port
  - S-Video-out
  - Docking connector

1.2 Resetting the Computer

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

1. Prepare the computer for disassembly (refer to Section 5.3, "Preparing the Computer for Disassembly," for more information).
2. Remove the real-time clock (RTC) battery (refer to Section 5.9, "RTC Battery," for more information on removing and replacing the RTC battery).
3. Wait approximately 5 minutes.
4. Replace the RTC battery and reassemble the computer.
5. Connect AC power to the computer. Do not reinsert any battery packs at this time.
6. Turn on the computer.

All passwords and all CMOS settings have been cleared.

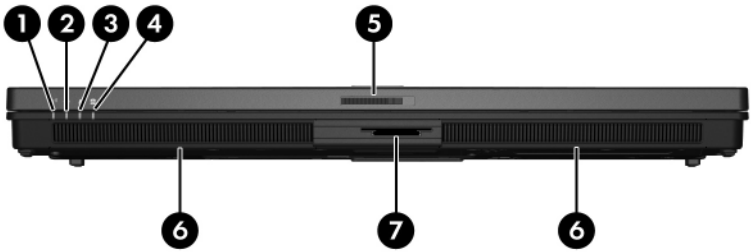
1.3 Power Management

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

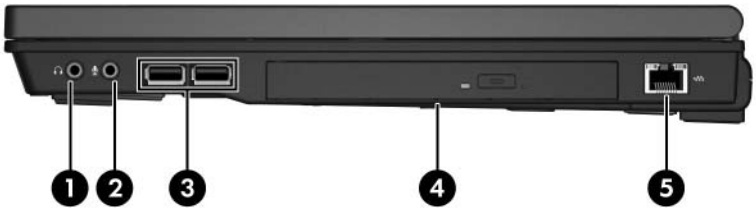
Item	Component	Function
1	Wireless light	On: An integrated wireless device, such as a wireless local area network (LAN) device and/or a Bluetooth® device, is turned on.
2	Power light	■ On: The computer is on. ■ Blinking: The computer is in standby. ■ Blinking rapidly: An AC adapter with a higher power 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 pack is charging. ■ Green: A battery pack is close to full charge capacity. ■ Blinking amber: A battery pack 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	Display release latch	Opens the computer.
6	Stereo speakers (2)	Produce stereo sound.
7	Digital Media Slot	Supports 7 optional digital memory card formats: SD (Secure Digital) Memory Card, MultiMediaCard, Memory Stick, Memory Stick Pro, Memory Stick Duo (with adapter), SmartMedia, and xD-Picture Card.

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



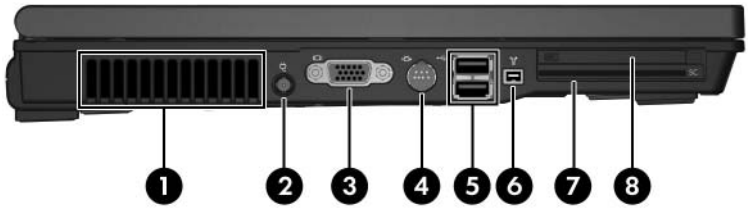
Right-Side Components

Table 1-2

Right-Side Components

Item	Component	Function
1	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.
2	Audio-in (microphone) jack	Connects an optional monaural microphone.
3	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.
4	Optical drive	Supports an optical disc. The type of optical drive varies by model.
5	RJ-45 (network) jack	Connects an optional network cable.

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

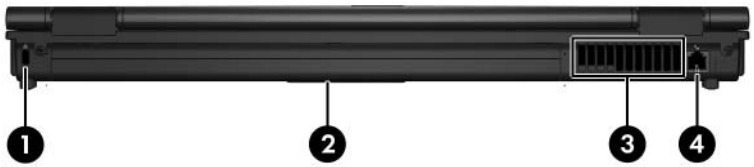
Item	Component	Function
1	Exhaust vent	Provides airflow to cool internal components. △ To prevent overheating, do not obstruct vents. Do not allow a hard surface, such as a printer, or a soft surface, such as pillows, thick rugs, or clothing, to block airflow.
2	Smart Adaptor power connector	Connects an AC adapter or an optional power adapter.
3	External monitor port	Connects an optional VGA external monitor or projector.
4	S-Video-out jack	Connects an optional S-Video device, such as a television, VCR, camcorder, projector, or video capture card.

Table 1-3

Left-Side Components *(Continued)*

Item	Component	Function
5	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.
6	1394 port	Connects an optional 1394a device such as a scanner, digital camera, or digital camcorder.
7	Smart card slot	Supports optional smart cards.
8	PC Card slot	Supports optional Type I, Type II, or Type III 32-bit (CardBus) or 16-bit PC Cards.

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



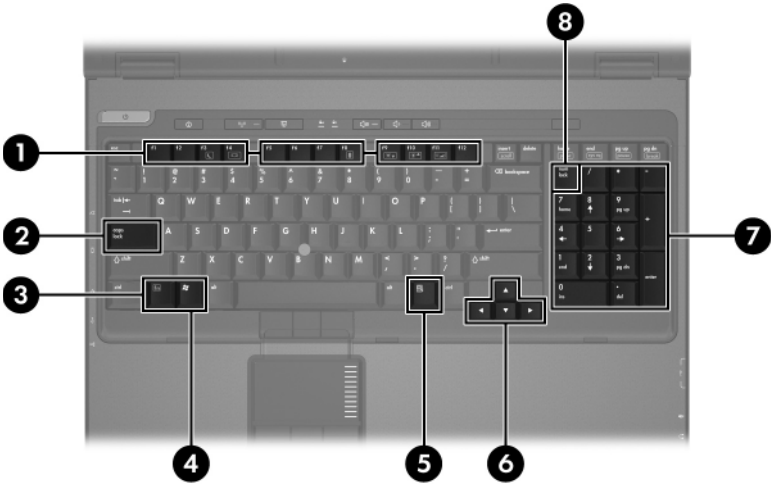
Rear Panel Components

Table 1-4

Rear Panel Components

Item	Component	Function
1	Security cable slot	Attaches an optional security cable to the computer. △ Security solutions are designed to act as deterrents. These deterrents may not prevent a product from being mishandled or stolen.
2	Battery bay	Holds a battery pack.
3	Exhaust vent	Provides airflow to cool internal components. △ To prevent overheating, do not obstruct vents. Do not allow a hard surface, such as a printer, or a soft surface, such as pillows, thick rugs, or clothing, to block airflow.
4	RJ-11 (modem) jack	Connects the modem cable.

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



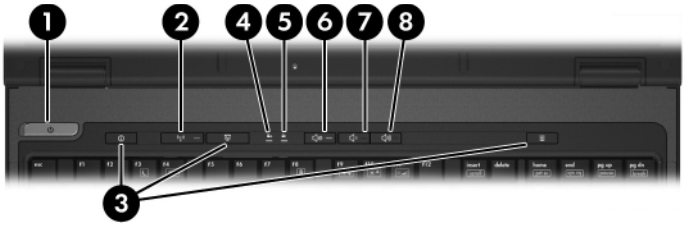
Standard Keyboard Components

Table 1-5

Standard Keyboard Components

Item	Component	Function
1	**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.
2	**caps lock** key	Enables caps lock and turns on the caps lock light.
3	**fn** key	Executes frequently used system functions when pressed in combination with a function key or the **esc** key.
4	Windows logo key	In Windows, displays the Windows Start menu.
5	Windows applications key	In Windows, displays a shortcut menu for items beneath the pointer.
6	Arrow keys	Moves the cursor around the screen.
7	Keypad keys (16)	In Windows, can be used like the keys on an external numeric keypad.
8	**num lock** key	Enables numeric lock, turns on the embedded numeric keypad, and turns on the num lock light.

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



Top Components

Table 1-6

Top Components

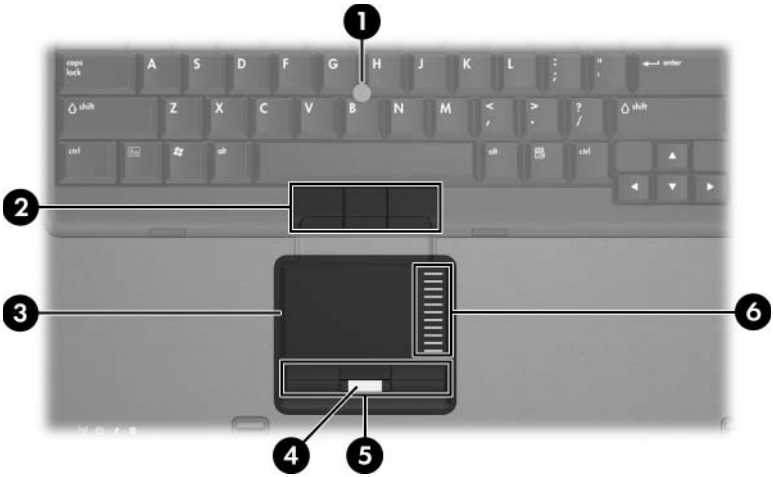
Item	Component	Function
1	Power light	■ On: The computer is on. ■ Blinking: The computer is in standby. ■ Blinking rapidly: An AC adapter with a higher power rating should be connected. ■ Off: The computer is off or in hibernation.
	Power button	When the computer is: ■ Off, press to turn on the computer. ■ 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 *(Continued)*

Item	Component	Function
2	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.
	Wireless light	On: An integrated wireless device, such as a wireless local area network (LAN) device and/or a Bluetooth® device, is turned on.
3	Info Center button	Enables you to view a list of commonly used software solutions.
	Presentation mode button	Turns on Presentation mode.
	QuickLaunch Calculator button	Opens the Microsoft Windows calculator. This button can also be reassigned to an Internet or network destination or to any software application or data file. ✎ When you press the QuickLaunch calculator button, num lock is enabled.
4	Caps lock light	On: **caps lock** is on.
5	Num lock light	On: **num lock** or the numeric keypad is on.
6	Volume mute button	Mutes or restores speaker volume.
7	Volume down button	Decreases speaker volume.
8	Volume up button	Increases speaker volume.

The computer pointing device components shown below and described in Table 1-7.



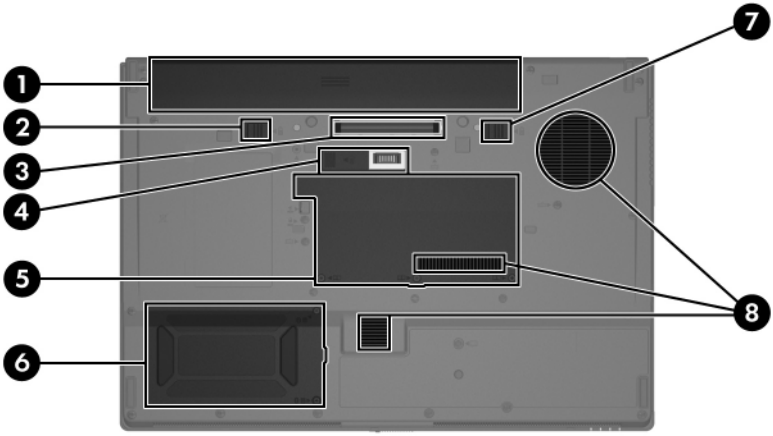
Pointing Device Components

Table 1-7

Pointing Device Components

Item	Component	Function
1	Pointing stick (select models only)	Moves the pointer and selects or activates items on the screen.
2	Pointing stick buttons (select models only)	Function like the left, middle, and right buttons on an external mouse.
3	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.
4	Fingerprint reader (select models only)	Allows a fingerprint logon to Windows instead of using a password.
5	TouchPad buttons (2 or 3 buttons, varying by computer model)	Function like the left, middle, and right buttons on an external mouse.
6	TouchPad scroll zone	Scrolls up or down.

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	Primary battery bay	Holds the primary battery pack.
2	Primary battery locking latch	Secures the primary battery pack into the battery bay.
3	Docking connector	Connects the computer to an optional docking device.
4	Accessory battery connector	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 one memory slot that supports replaceable memory modules.
	Mini Card compartment	Holds an optional wireless LAN device. △ 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.
6	Hard drive bay	Holds the primary hard drive.
7	Primary battery release latch	Releases the primary battery pack from the battery bay.
8	Exhaust vents	Provides airflow to cool internal components. △ To prevent overheating, do not obstruct fans. Do not allow a hard surface, such as a printer, or a soft surface, such as pillows, 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 Core Duo processors
- Keyboard and TouchPad
- Memory modules
- 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 be turned 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 applications. 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 Main, Security, Advanced, or Tools 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 **Advanced** menu.
   - ❏ To view navigation information, press **f1**.
   - ❏ To return to the Computer Setup menu, press **esc**.

2. Select the **Main**, **Security**, **Advanced**, or **Tools** menu.
3. To close Computer Setup and restart the computer:
   - ❑ Select **Exit > Exit Saving Changes**, and then press **enter**.

   – or –

   - ❑ Select **Exit > Exit Discarding Changes**, and then press **enter**.

   – or –

   - ❑ Select **Exit > Load Setup Defaults**, and then press **enter**.
4. When you are prompted to confirm your action, press **f10**.

Selecting from the Main Menu

Table 2-1

Main Menu

Select	To Do This
System Information	■ Change the system time and system date. ■ View identification information about the computer. ■ View specification information about the processor, memory and cache size, and system ROM.

Selecting from the Security Menu

Table 2-2

Security Menu

Select	To Do This
Administrator Password	Enter, change, or delete an Administrator password.
Power-on Password	Enter, change, or delete a power-on password.
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.
Password Options (Password options can be selected only when a power-on password has been set.)	Enable/disable: ■ QuickLock ■ QuickLock on Standby ■ QuickBlank ✎ To enable QuickLock on Standby or QuickBlank, you must first enable QuickLock.
Device Security	Enable/disable: ■ Diskette drive startup* ■ CD-ROM or diskette startup ✎ Settings for a DVD-ROM can be entered in the CD-ROM field.

*Not applicable to SuperDisk LS-120 drives.

Selecting from the Advanced Menu

Table 2-3

Advanced Menu

Select	To Do This
Language	Change the Computer Setup language.
Boot Order	Enable/disable MultiBoot, which sets a startup sequence that can include most bootable devices and media in the system.
Accessibility Options	Allows electronic and information technology to be accessible to people with varying ranges of abilities.
Video Memory	Displays the amount of video memory available on the computer.

Selecting from the Tools Menu

Table 2-4

Tools Menu

Select	To Do This
Hard Drive Self Test	Run a quick comprehensive self test on hard drives in the system that support the test features.

2.2 Troubleshooting Flowcharts

Table 2-5

Troubleshooting Flowcharts Overview

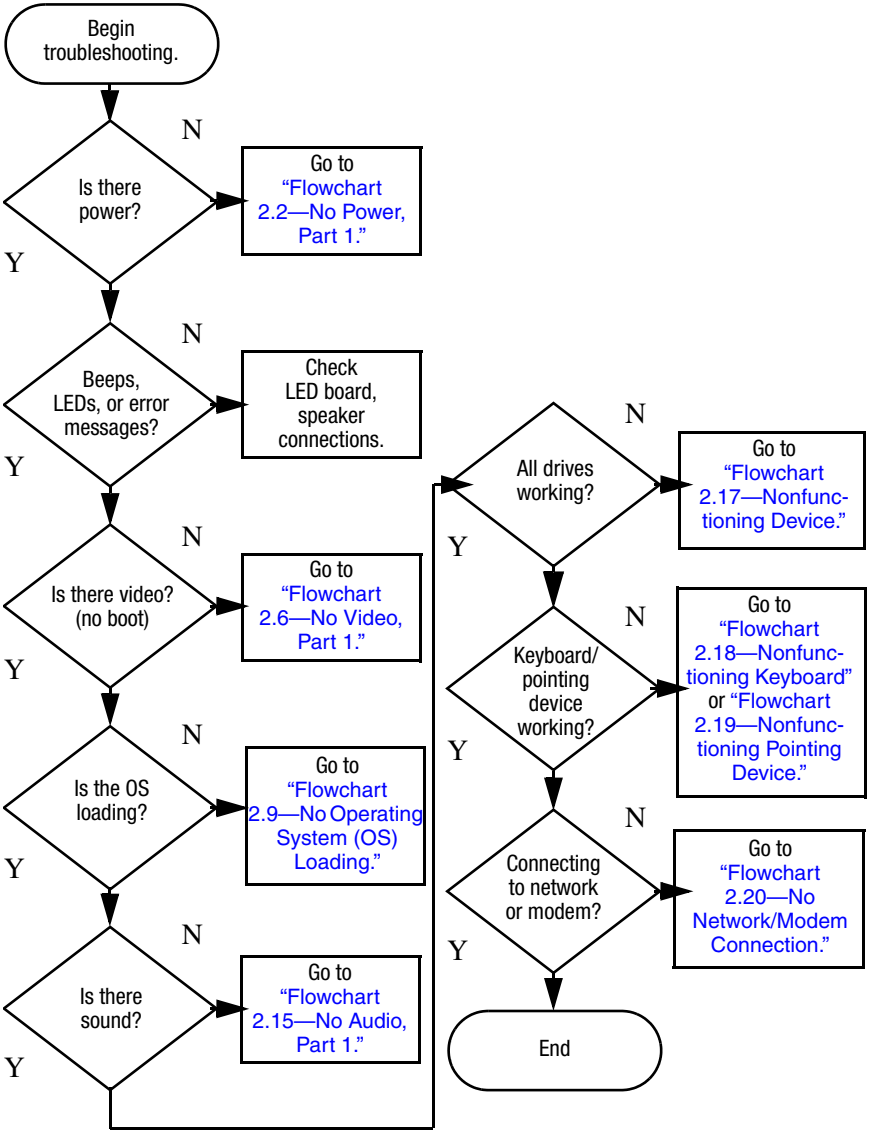
Flowchart	Description
2.1	“Flowchart 2.1—Initial Troubleshooting”
2.2	“Flowchart 2.2—No Power, Part 1”
2.3	“Flowchart 2.3—No Power, Part 2”
2.4	“Flowchart 2.4—No Power, Part 3”
2.5	“Flowchart 2.5—No Power, Part 4”
2.6	“Flowchart 2.6—No Video, Part 1”
2.7	“Flowchart 2.7—No Video, Part 2”
2.8	“Flowchart 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”

Table 2-5

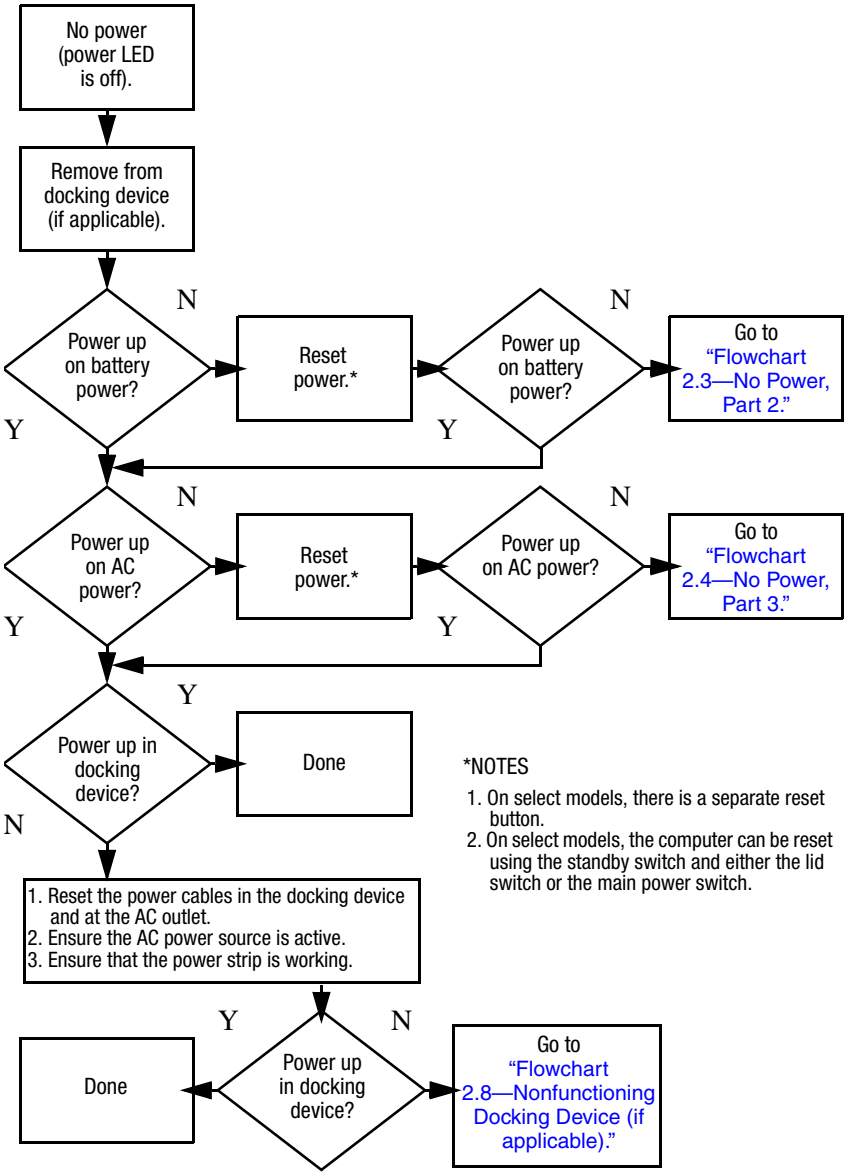
Troubleshooting Flowcharts Overview *(Continued)*

Flowchart	Description
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”

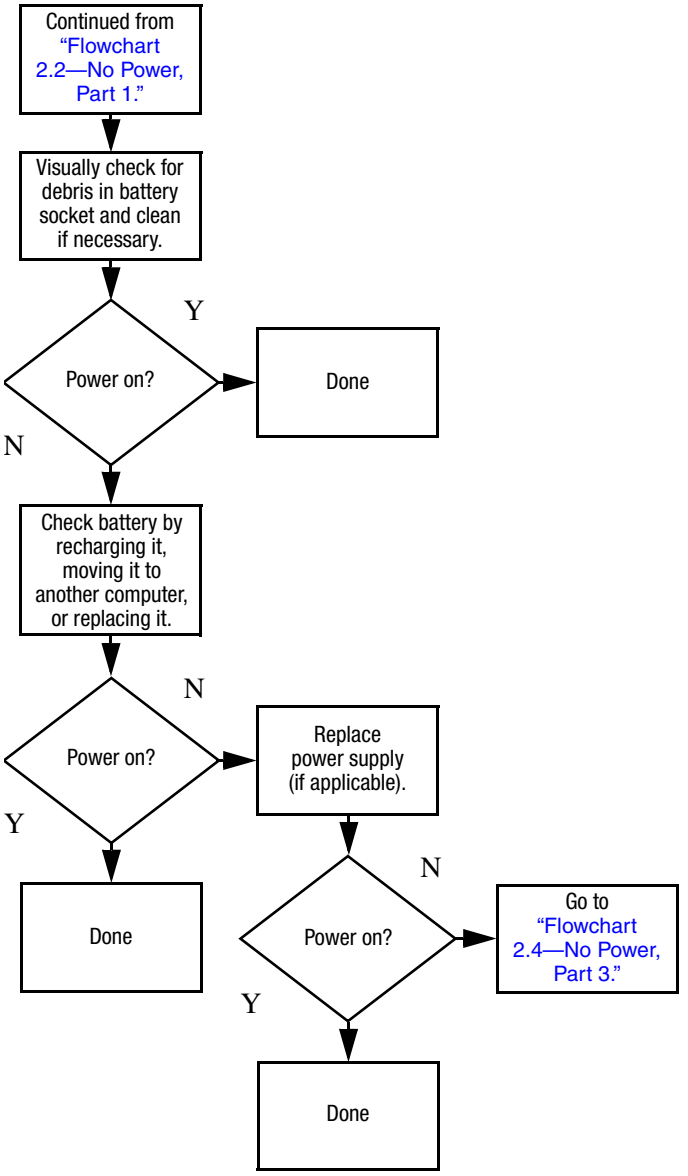
Flowchart 2.1—Initial Troubleshooting



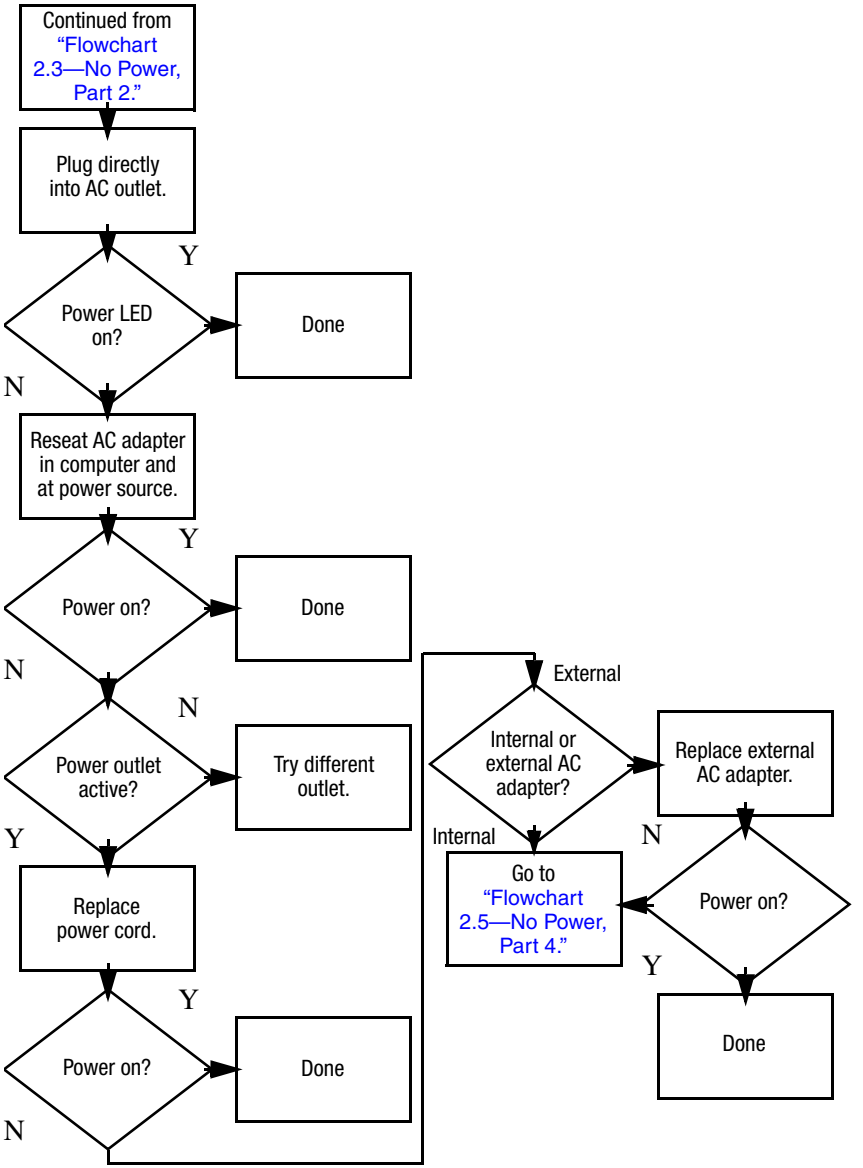
Flowchart 2.2—No Power, Part 1



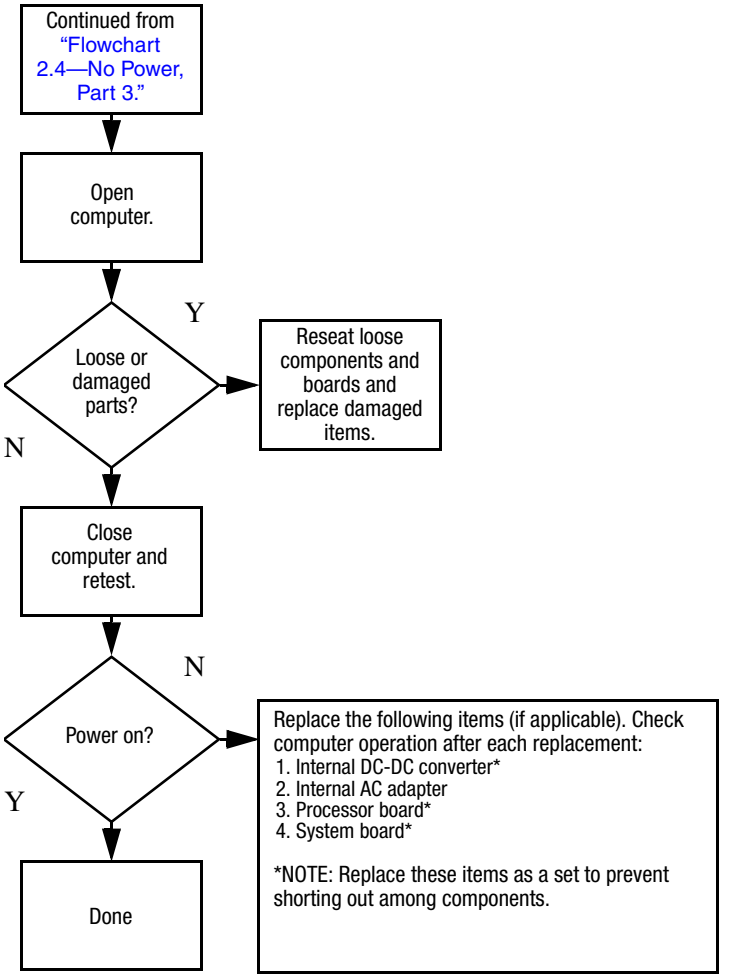
Flowchart 2.3—No Power, Part 2



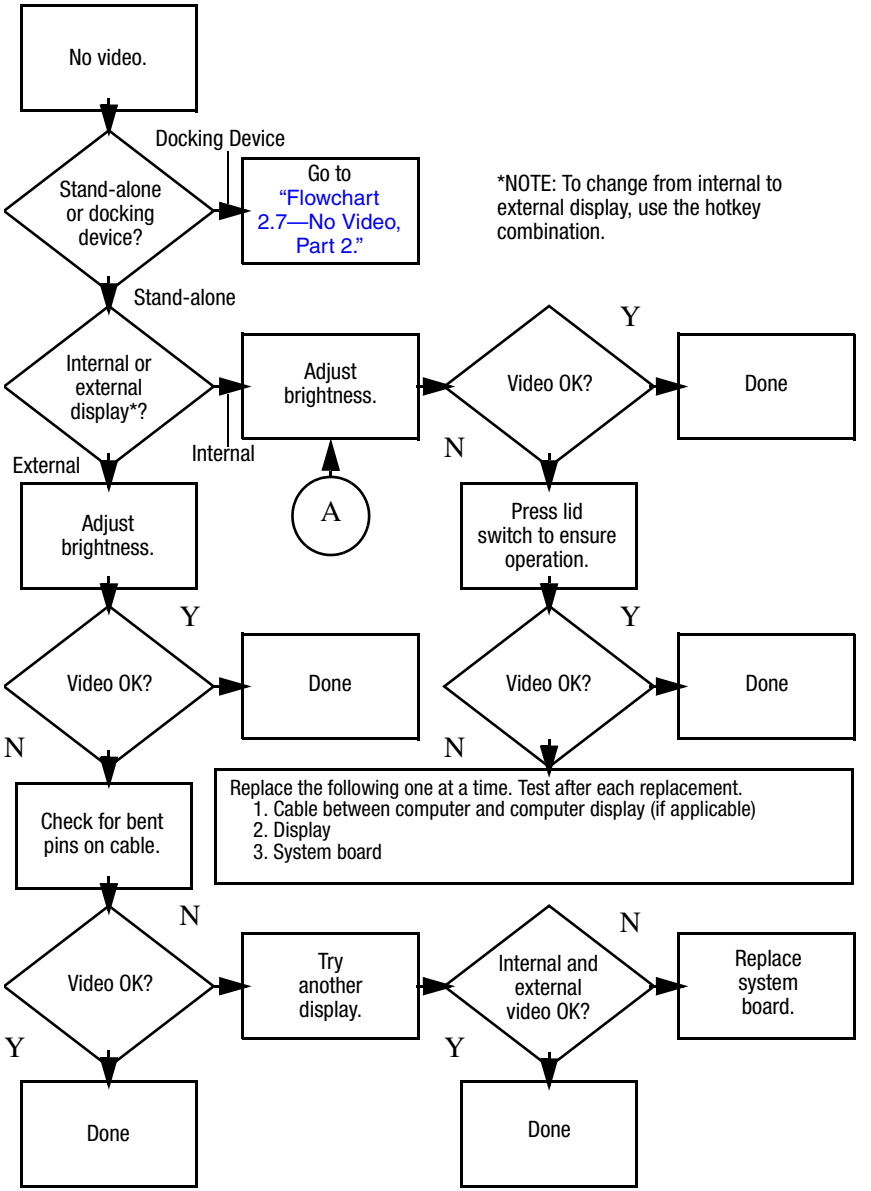
Flowchart 2.4—No Power, Part 3



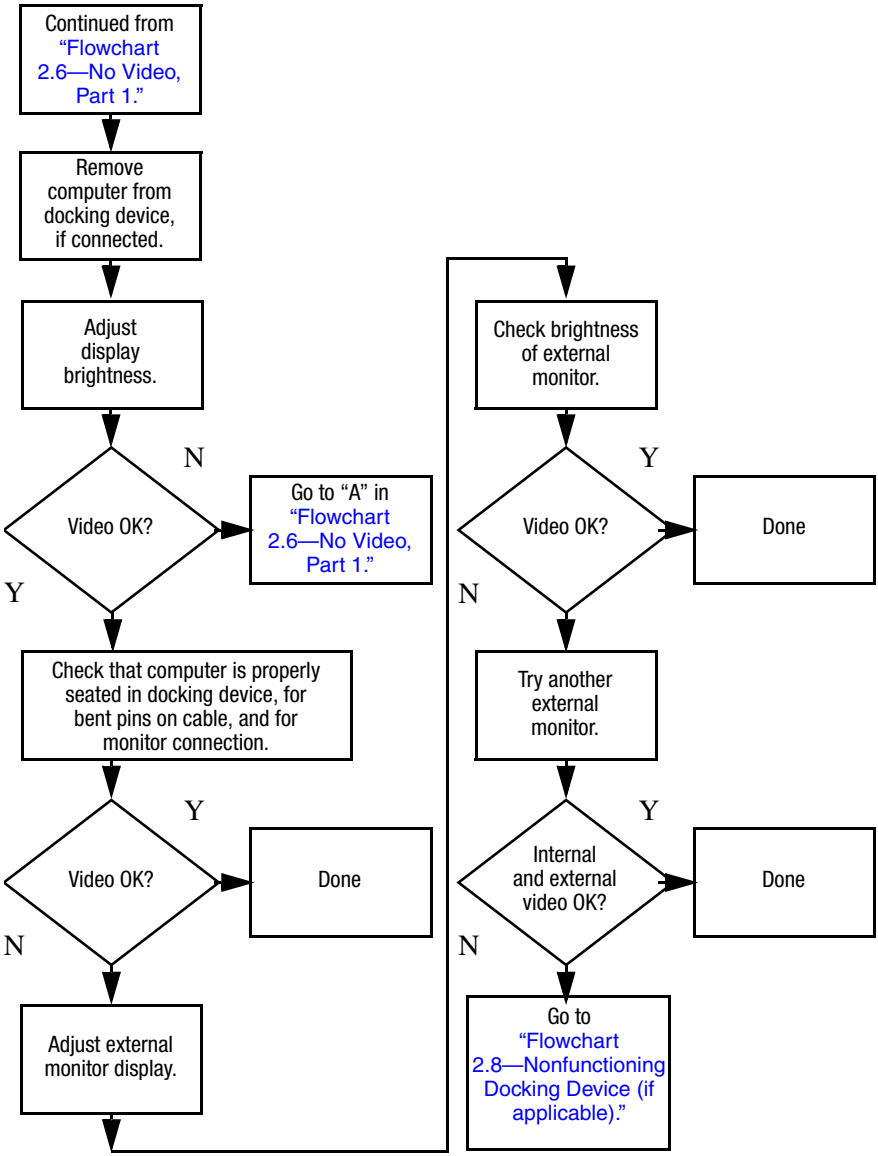
Flowchart 2.5—No Power, Part 4



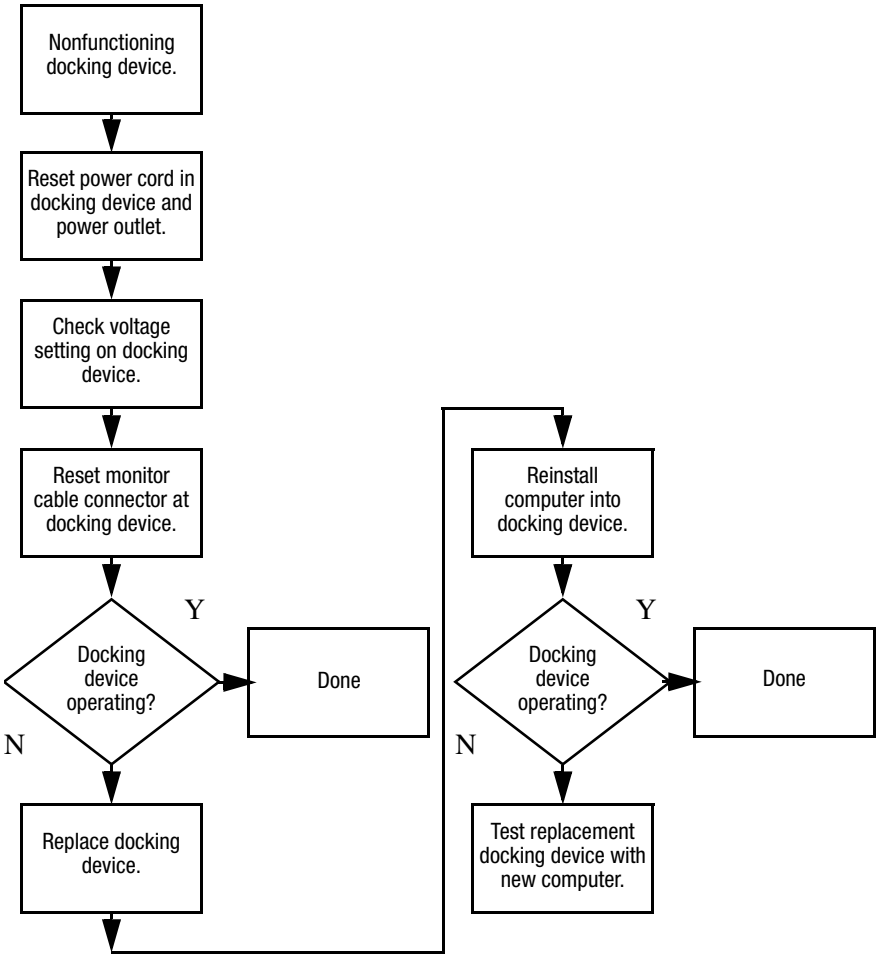
Flowchart 2.6—No Video, Part 1



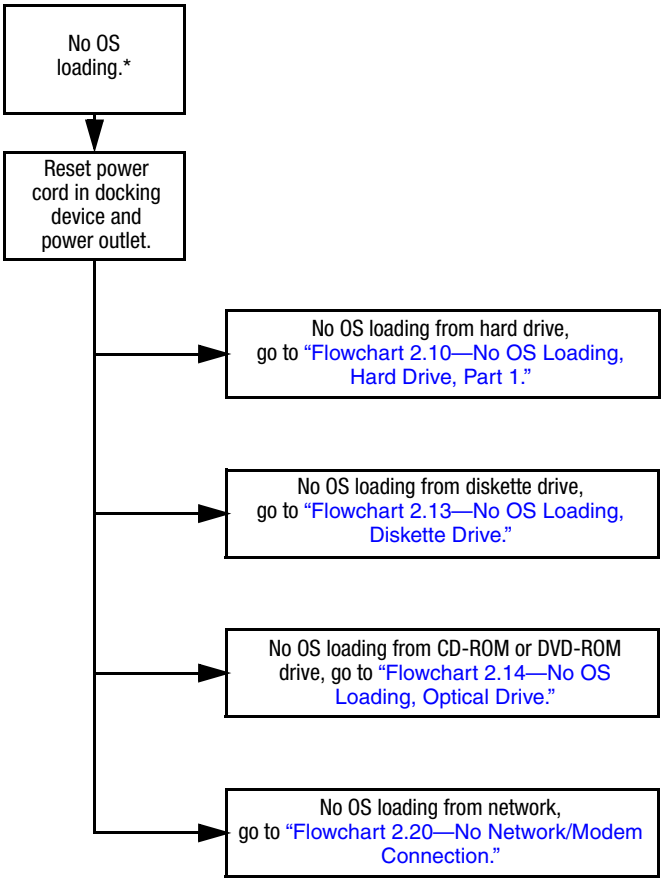
Flowchart 2.7—No Video, Part 2



Flowchart 2.8—Nonfunctioning Docking Device (if applicable)

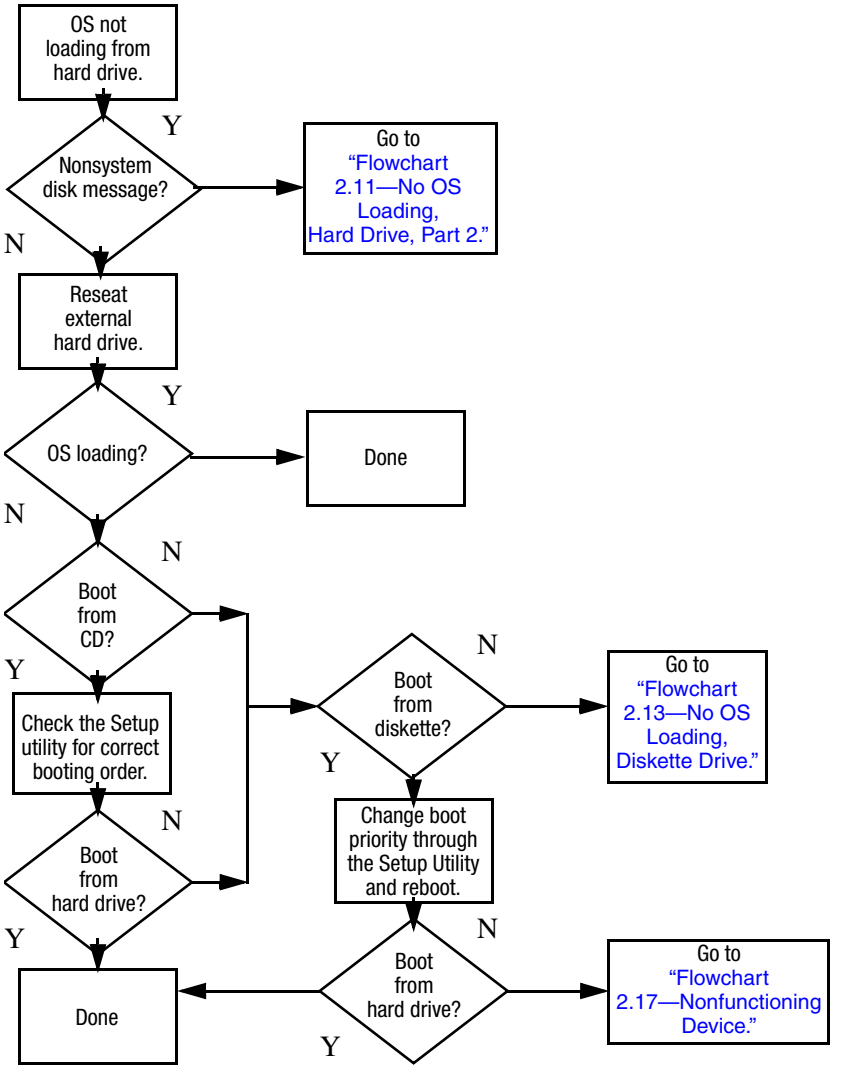


Flowchart 2.9—No Operating System (OS) Loading

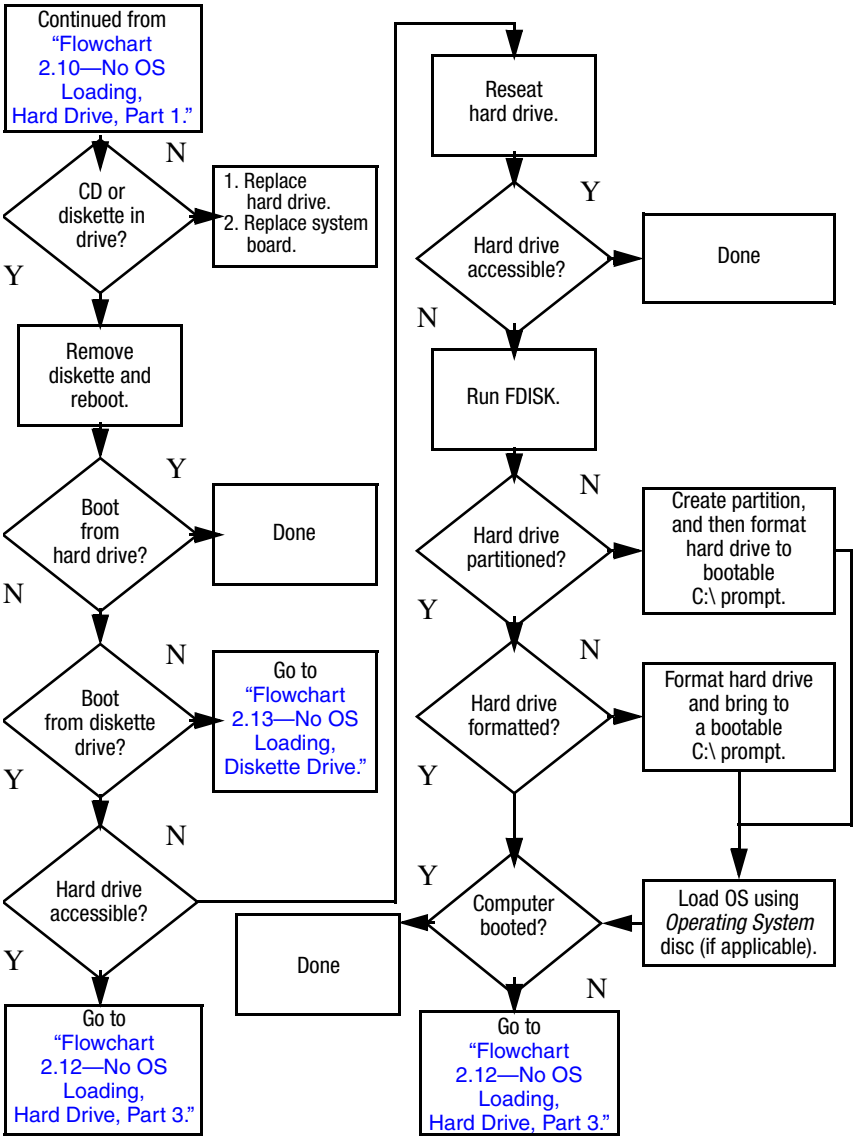


*NOTE: Before beginning troubleshooting, always check cable connections, cable ends, and drives for bent or damaged pins.

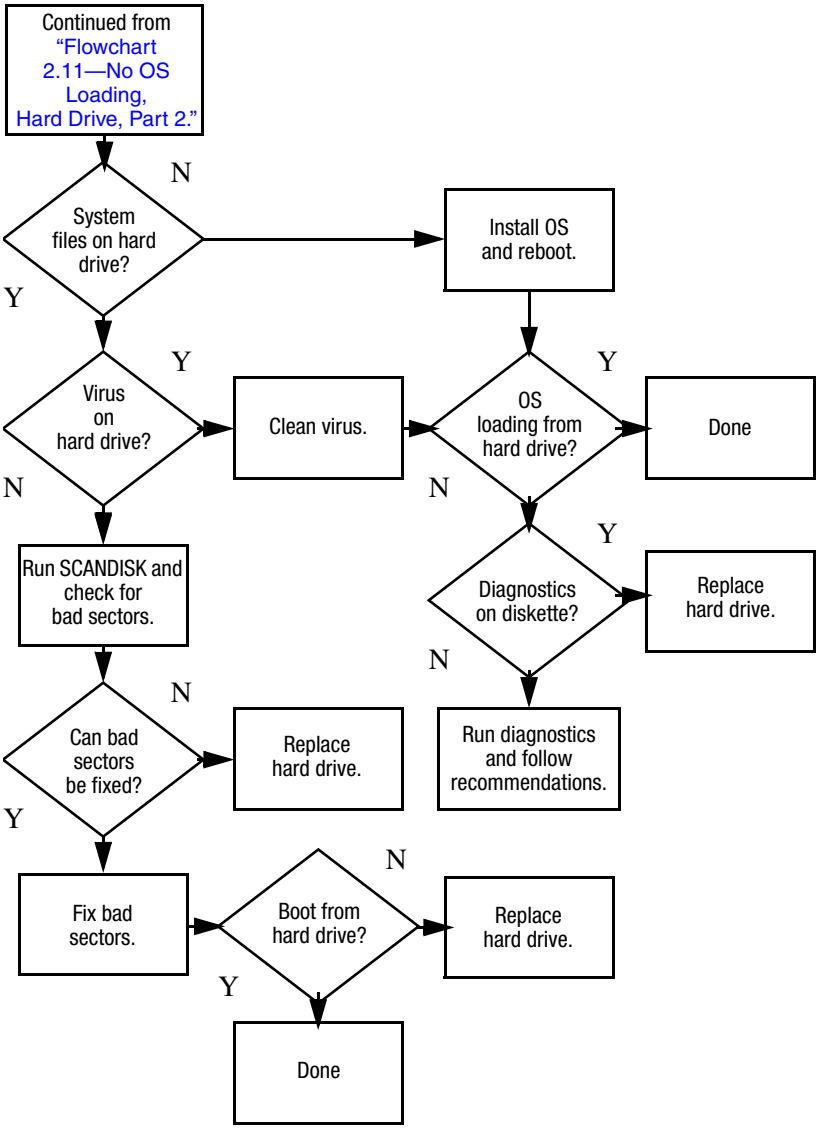
Flowchart 2.10—No OS Loading, Hard Drive, Part 1



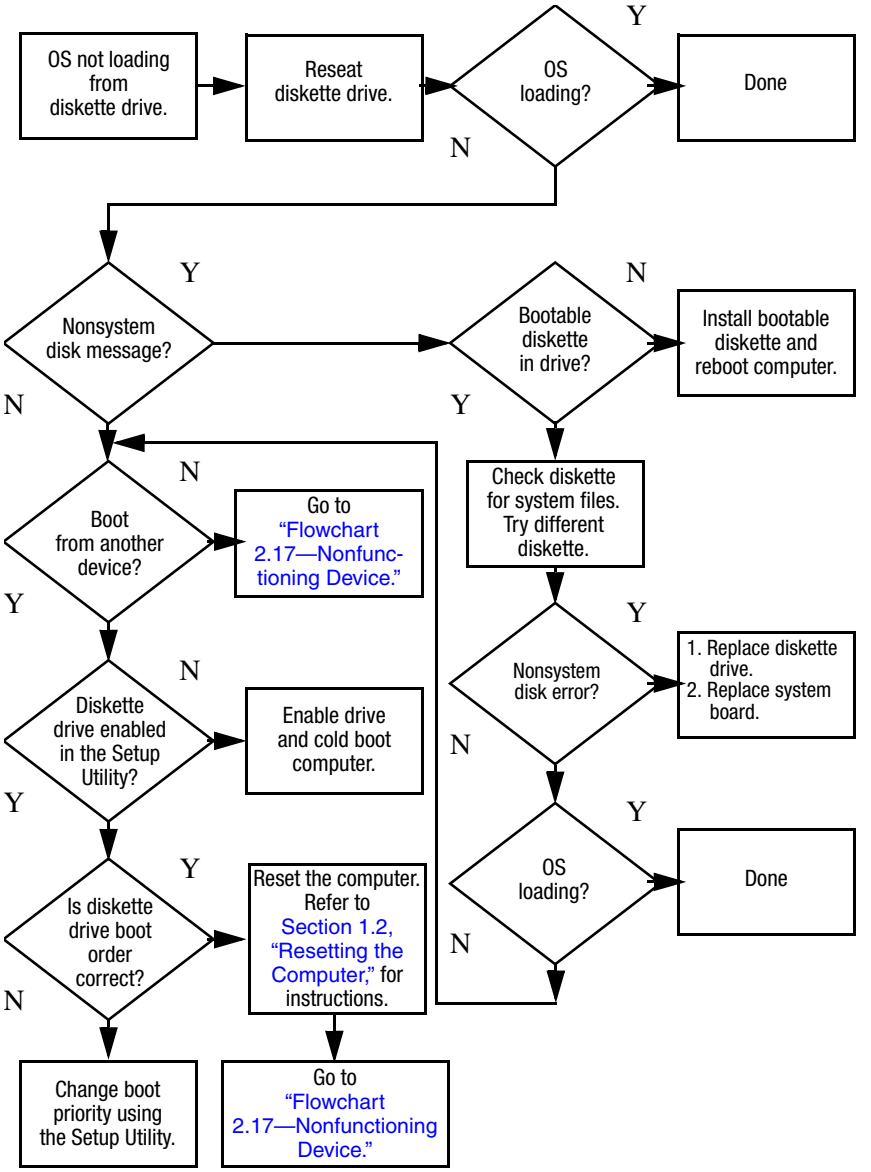
Flowchart 2.11—No OS Loading, Hard Drive, Part 2



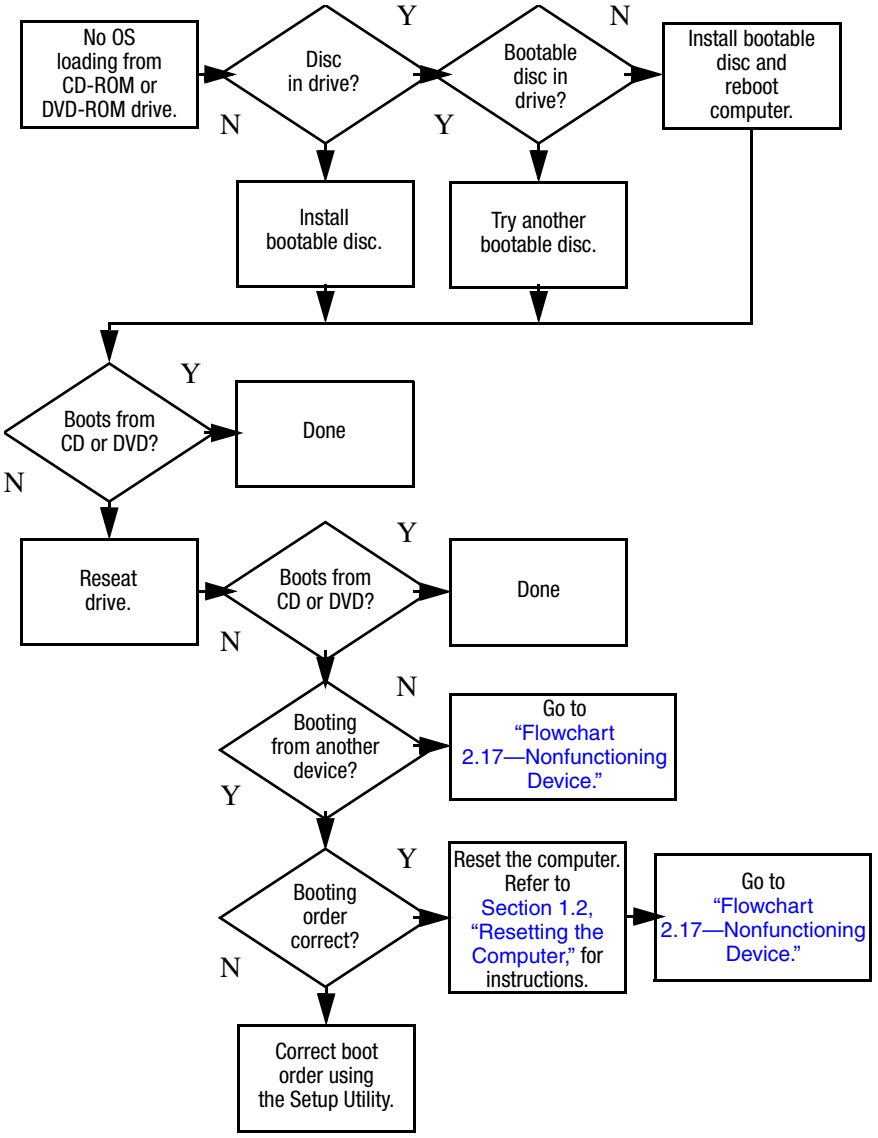
Flowchart 2.12—No OS Loading, Hard Drive, Part 3



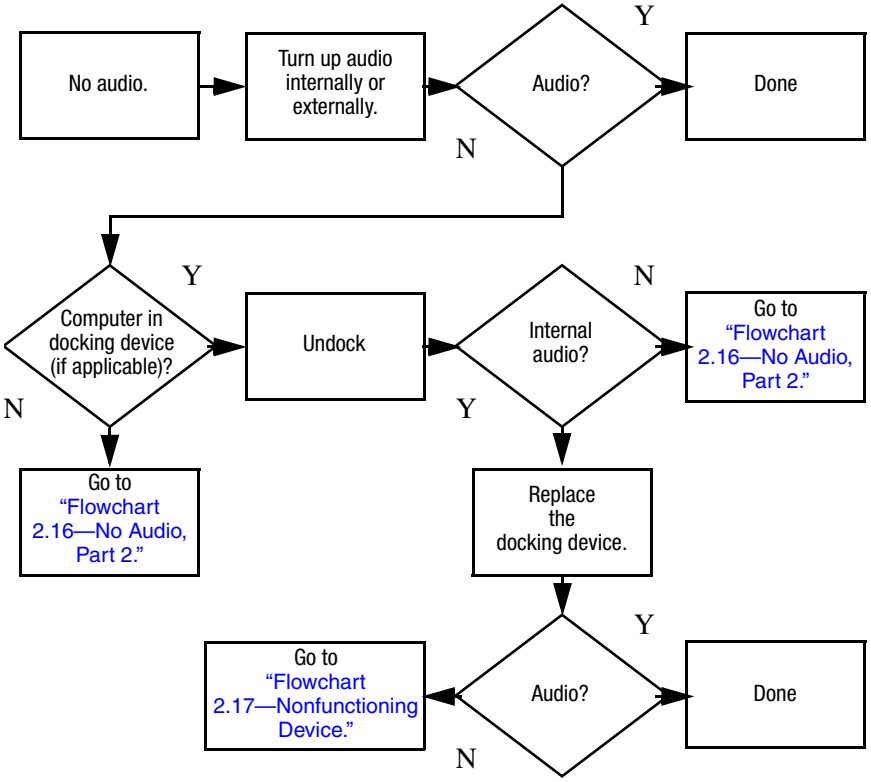
Flowchart 2.13—No OS Loading, Diskette Drive



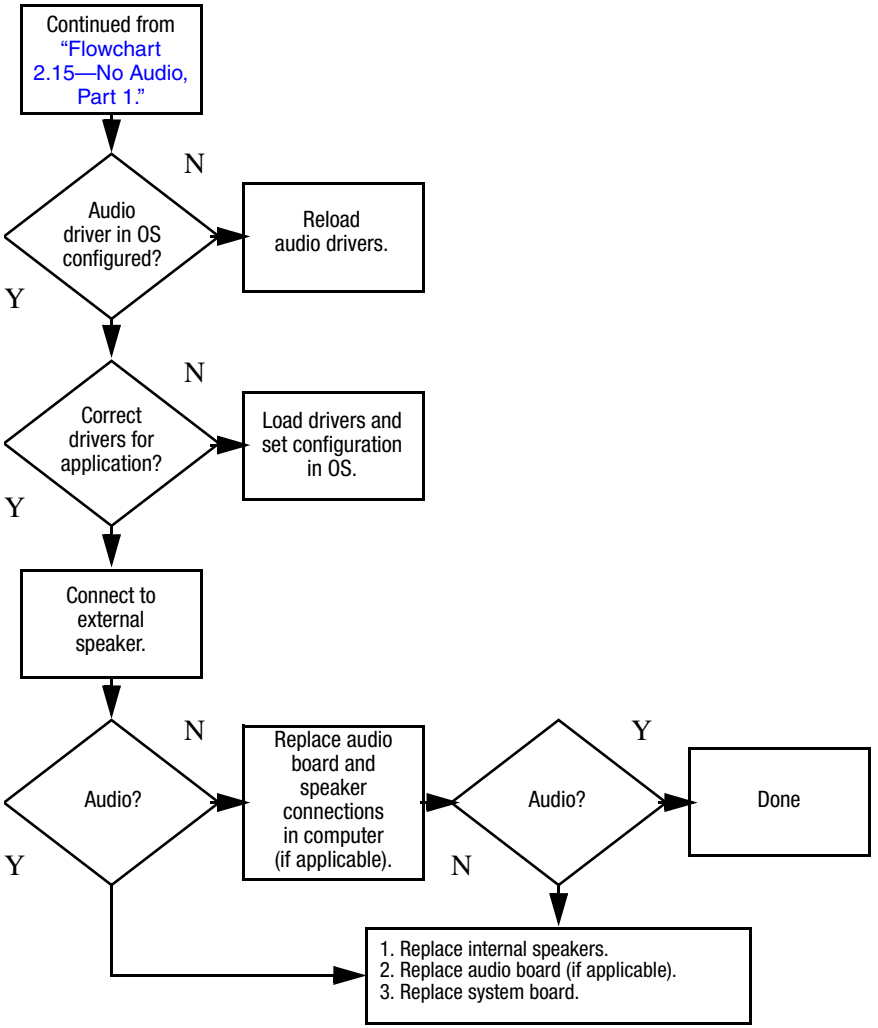
Flowchart 2.14—No OS Loading, Optical Drive



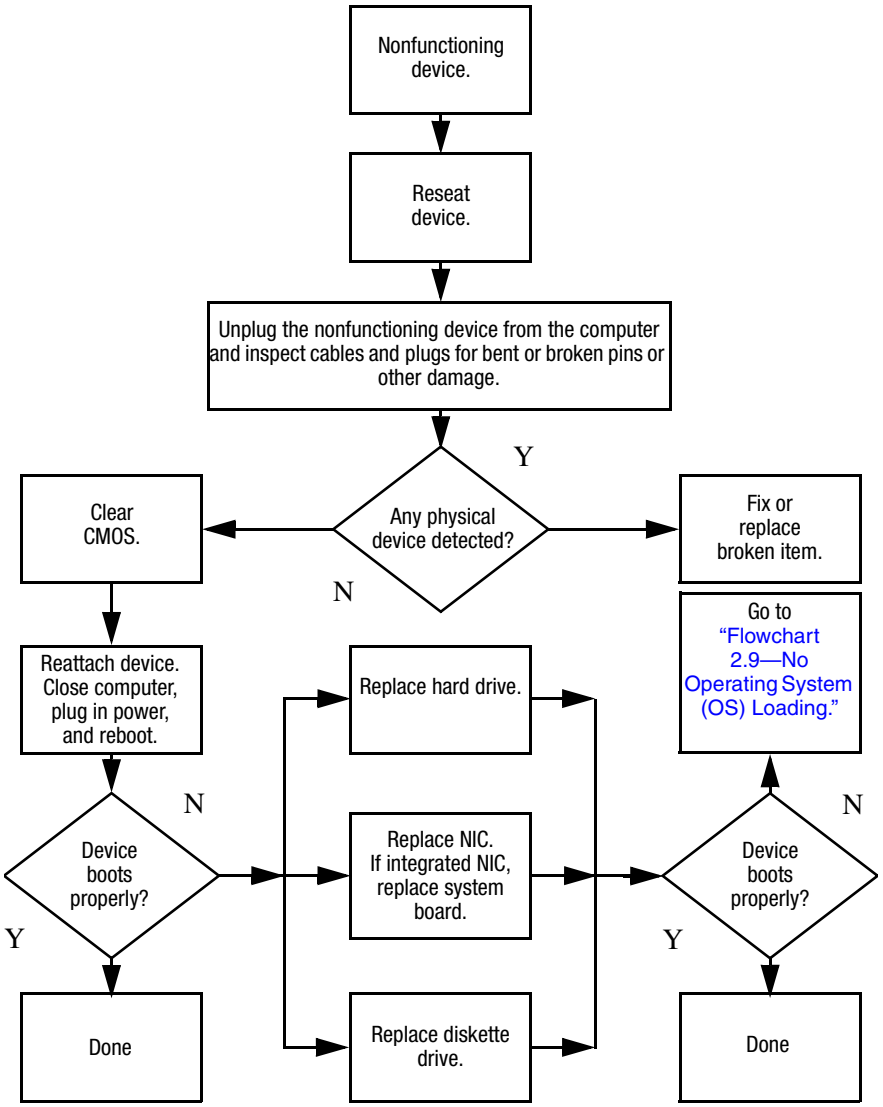
Flowchart 2.15—No Audio, Part 1



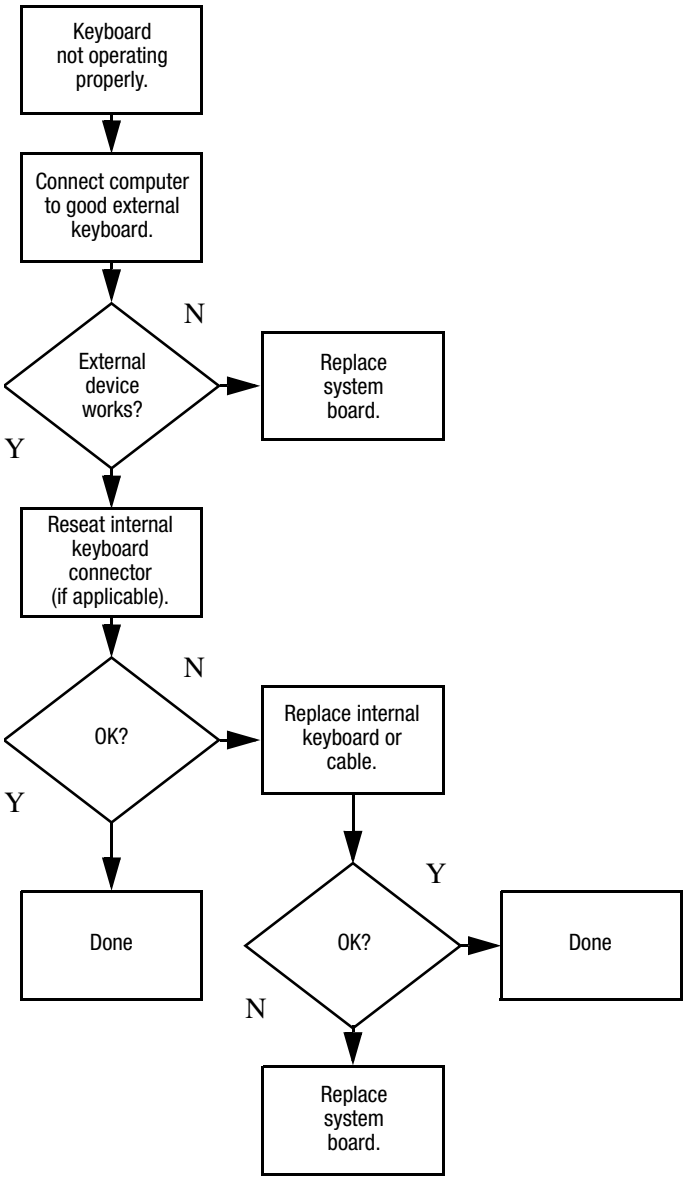
Flowchart 2.16—No Audio, Part 2



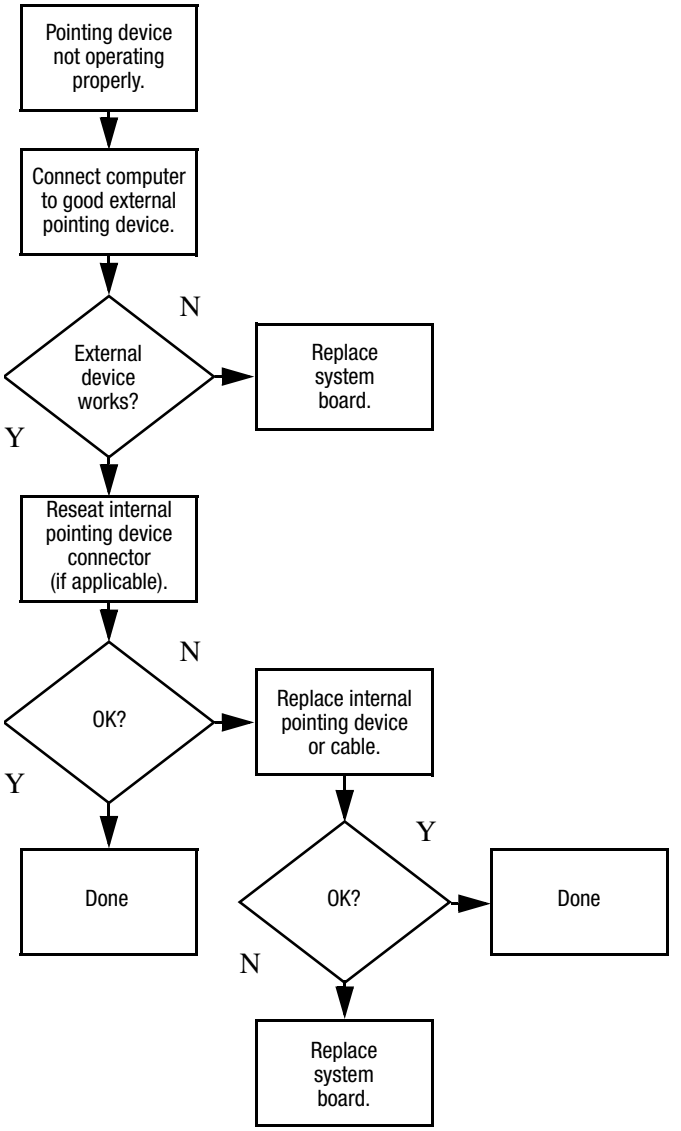
Flowchart 2.17—Nonfunctioning Device



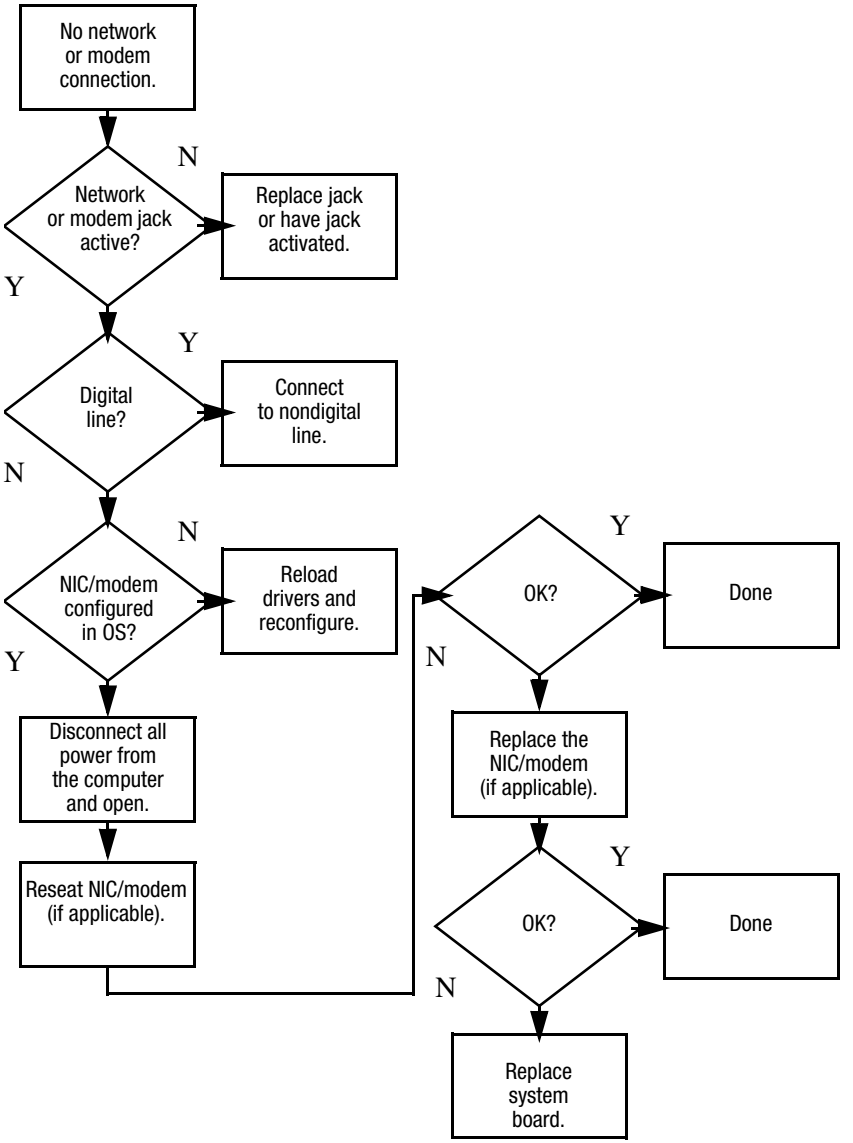
Flowchart 2.18—Nonfunctioning Keyboard



Flowchart 2.19—Nonfunctioning Pointing Device



Flowchart 2.20—No Network/Modem Connection



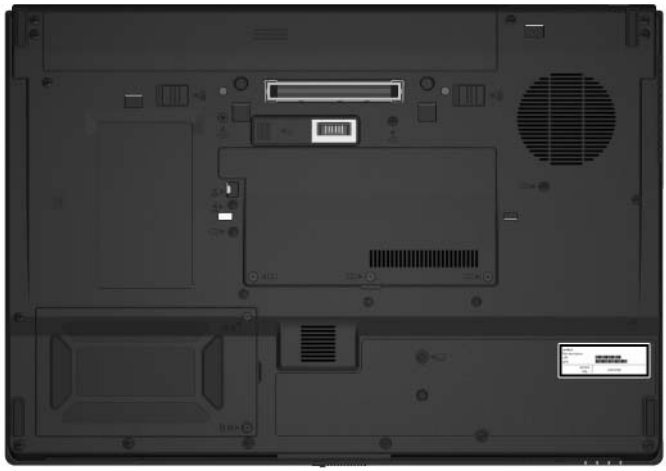
3

Illustrated Parts Catalog

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

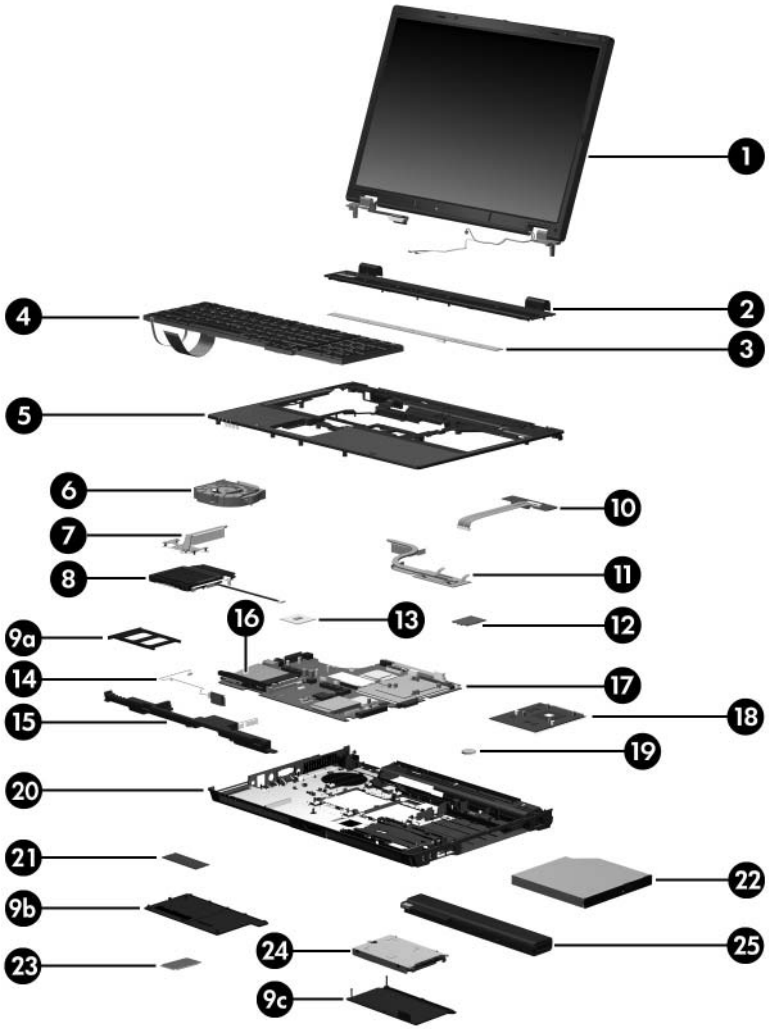
3.1 Serial Number Location

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



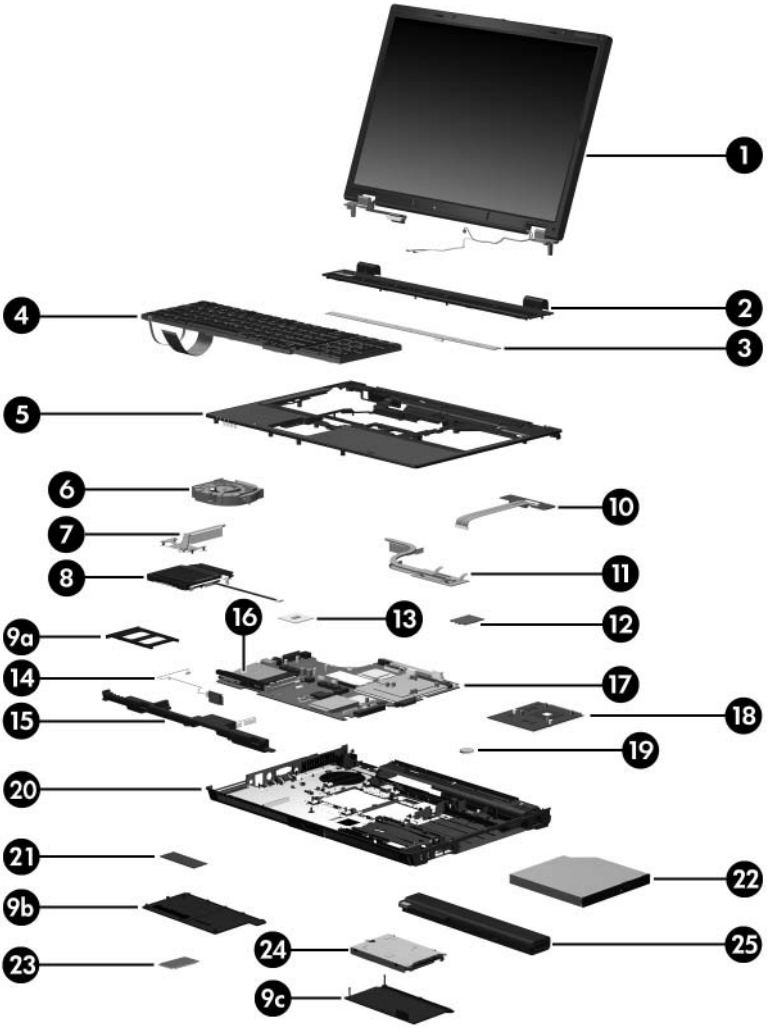
Computer Major Components

Table 3-1

Spare Parts: Computer Major Components

Item	Description	Spare Part Number
1	**Display assemblies** (include wireless antenna transceivers and cables)	
	17.0-inch, WUXGA+WVA with AntiGlare	409977-001
	17.0-inch, WSXGA+WVA with AntiGlare	409975-001
	17.0-inch, WXGA+WVA with AntiGlare	409973-001
	17.0-inch, WSXGA+WVA with BrightView	409988-001
2	**Switch cover**	409948-001
3	**LED board** (includes LED board cable)	409957-001
4	**Keyboards with pointing stick** (includes pointing stick cable) For use in:	

Brazil	409913-201	The People's Republic of China	409913-AA1
The Czech Republic	409913-221	Portugal	409913-131
Denmark	409913-081	Russia	409913-251
France	409913-051	Saudi Arabia	409913-171
French Canada	409913-121	Slovakia	409913-231
Germany	409913-041	Slovenia	409913-BA1
Greece	409913-151	Spain	409913-071
Hungary	409913-211	Sweden	409913-B71
Iceland	409913-DD1	Switzerland	409913-111
Internationally	409913-021	Thailand	409913-281
Israel	409913-BB1	Turkey	409913-141
Italy	409913-061	The United Kingdom	409913-031
Japan	409913-291	The United States	409913-001
Korea	409913-AD1		
Latin America	409913-161		
Norway	409913-091		

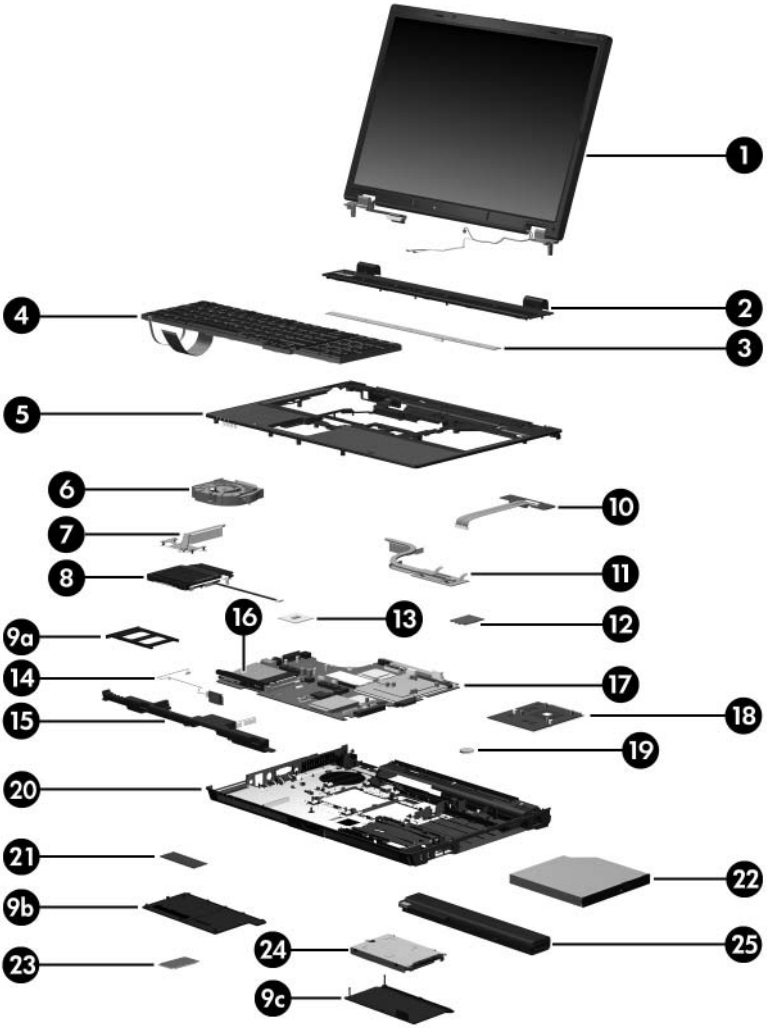


Computer Major Components

Table 3-1

Spare Parts: Computer Major Components *(Continued)*

Item	Description			Spare Part Number
4	**Keyboards without pointing stick** For use in:			
	Brazil	409911-201	The People's Republic of China	409911-AA1
	The Czech Republic	409911-221	Portugal	409911-131
	Denmark	409911-081	Russia	409911-251
	France	409911-051	Saudi Arabia	409911-171
	French Canada	409911-121	Slovakia	409911-231
	Germany	409911-041	Slovenia	409911-BA1
	Greece	409911-151	Spain	409911-071
	Hungary	409911-211	Sweden	409911-B71
	Iceland	409911-DD1	Switzerland	409911-111
	Internationally	409911-021	Thailand	409911-281
	Israel	409911-BB1	Turkey	409911-141
	Italy	409911-061	The United Kingdom	409911-031
	Japan	409911-291	The United States	409911-001
	Korea	409911-AD1		
	Latin America	409911-161		
	Norway	409911-091		
5	**Top cover**			409951-001
	Fingerprint sensor board (not illustrated)			409946-001
6	**Fan assembly**			409932-001
7	**Processor heat sink** (includes thermal paste)			409949-001

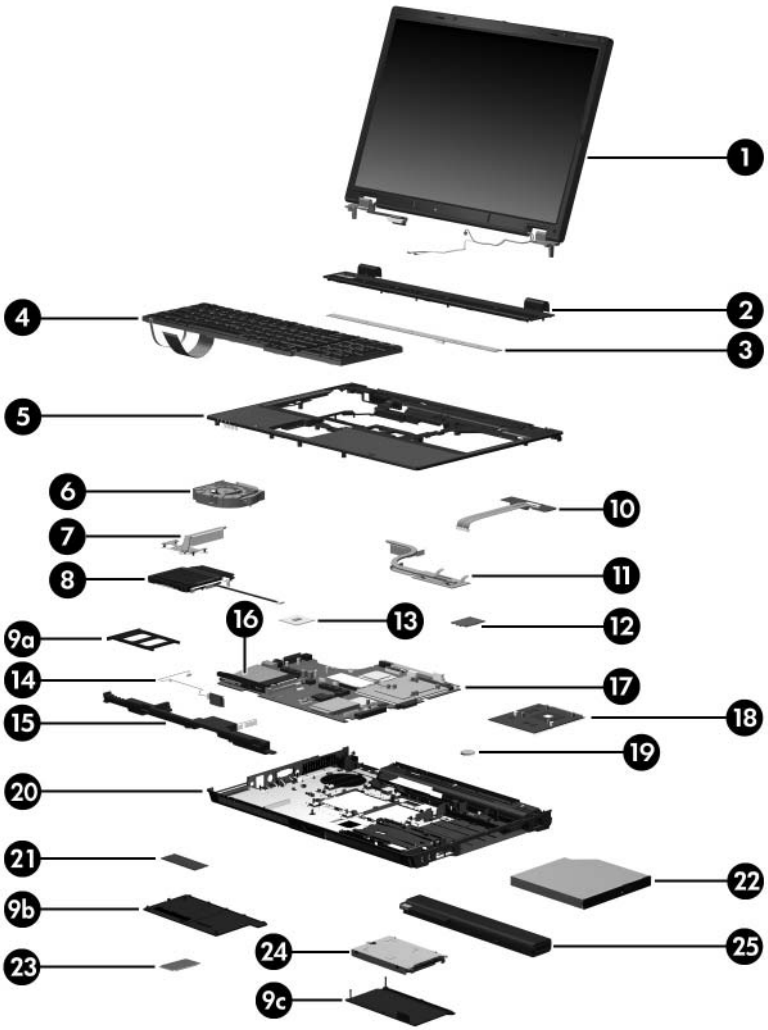


Computer Major Components

Table 3-1

Spare Parts: Computer Major Components *(Continued)*

Item	Description	Spare Part Number
8	**TouchPads** (include TouchPad cable)	
	With 3 pointing stick buttons, 2 TouchPad buttons, and fingerprint sensor, for use with keyboards with pointing stick	409952-001
	With 3 pointing stick buttons and 3 TouchPad buttons, for use with keyboards with pointing stick	409956-001
	With 2 TouchPad buttons and fingerprint sensor, for use with keyboards without pointing stick	409954-001
	With 2 TouchPad buttons, for use with keyboards without pointing stick	409955-001
	Plastics Kit	409944-001
	Includes:	
9a	PC Card slot space saver	
9b	Memory/Mini Card module cover (includes 3 captive screws)	
9c	Hard drive cover (includes 2 captive screws)	
	Not illustrated: computer feet (7)	
10	**USB/audio board** (includes audio board cable and USB board cable)	409968-001
11	**Video board heat sinks** (include thermal pads)	
	For use with M56 video board	409950-001
	For use with G71 video board	413489-001
12	**Modem module**	409941-001
13	**Processors** (include thermal paste)	
	Intel Core DuoT2600 (2.17-GHz) processor	409972-001
	Intel Core Duo T2500 (2.00-GHz) processor	409971-001
	Intel Core Duo T2400 (1.83-GHz) processor	409970-001
	Intel Core Duo T2300 (1.67-GHz) processor	409969-001

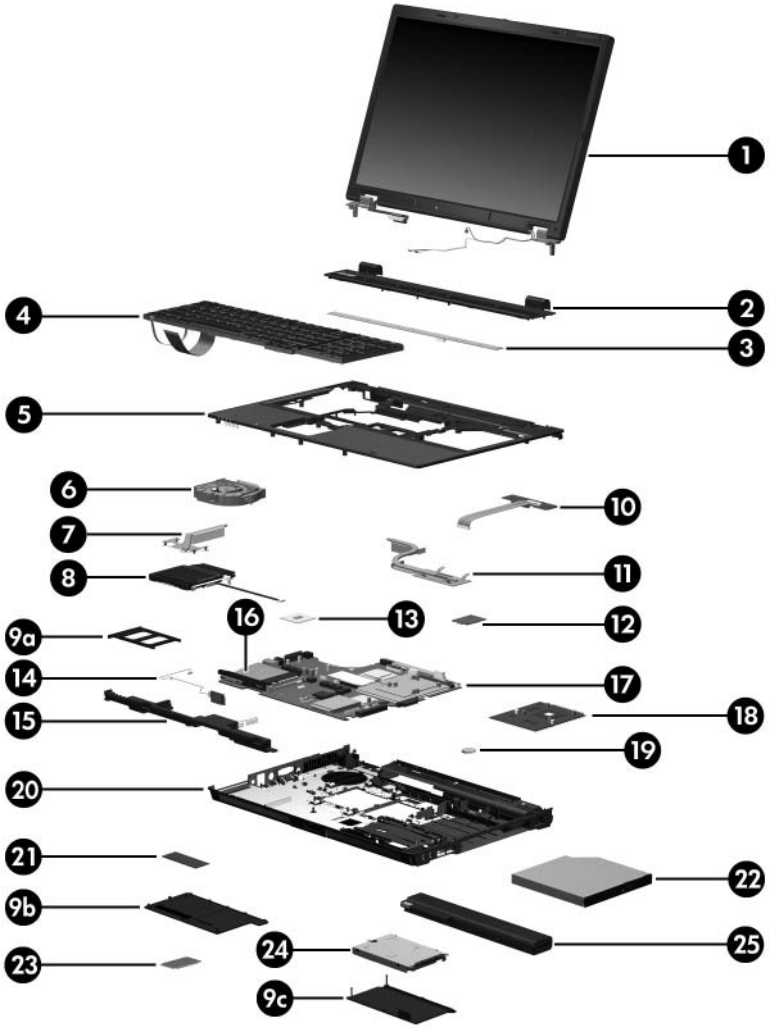


Computer Major Components

Table 3-1

Spare Parts: Computer Major Components *(Continued)*

Item	Description			Spare Part Number
14	**Bluetooth® module** (includes Bluetooth module cable)			409993-001
15	**Speaker**			409947-001
16	**PC Card/smart card assembly**			409943-001
17	**System board**			409959-001
18	**Video board**			409979-001
19	**RTC battery**			409953-001
20	**Base enclosure**			409942-001
21	**Memory modules**, 1-DIMM			
	PC2-5300		PC2-4200	
	2048 MB	409967-001	2048 MB	409963-001
	1024 MB	409966-001	1024 MB	409962-001
	512 MB	409965-001	512 MB	409961-001
	256 MB	409964-001	256 MB	409960-001
22	**Optical drives** (include bezel and optical drive bracket)			
	DVD±RW and CD-RW Double-Layer Combo Drive with LightScribe			409987-001
	DVD±RW and CD-RW Double-Layer Combo Drive			409986-001
	2X Max DVD±RW and CD-RW Combo Drive			409985-001
	8X Max DVD±RW and CD-RW Combo Drive			409984-001

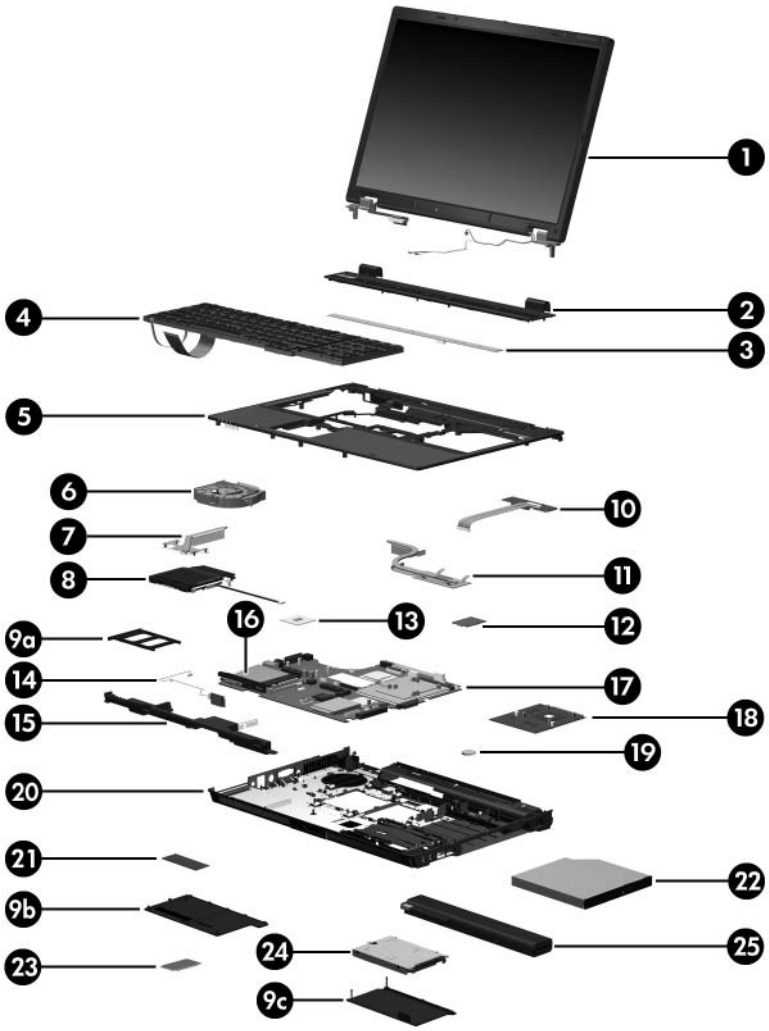


Computer Major Components

Table 3-1

Spare Parts: Computer Major Components *(Continued)*

Item	Description			Spare Part Number
23	**Mini Card modules**			
	802.11b/g HS WLAN module for use in North America			407107-001
	802.11b/g HS WLAN module for use in the countries listed below. These countries are categorized as the rest of the world (ROW).			407107-002
	China Ecuador Haiti	Honduras Pakistan Peru	Qatar South Korea	Uruguay Venezuela
	802.11b/g HS WLAN module for use in Japan			407107-291
	802.11b/g LJ WLAN module for use in North America			407108-001
	802.11b/g LJ WLAN module for use in the countries listed below. These countries are categorized as the rest of the world (ROW).			407108-002
	China Ecuador Haiti	Honduras Pakistan Peru	Qatar South Korea	Uruguay Venezuela
	802.11b/g LJ WLAN module for use in Japan			407108-291
	802.11a/b/g GL WLAN module for use in the countries listed below. These countries are categorized as most of the world (MOW 1).			407576-001
	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

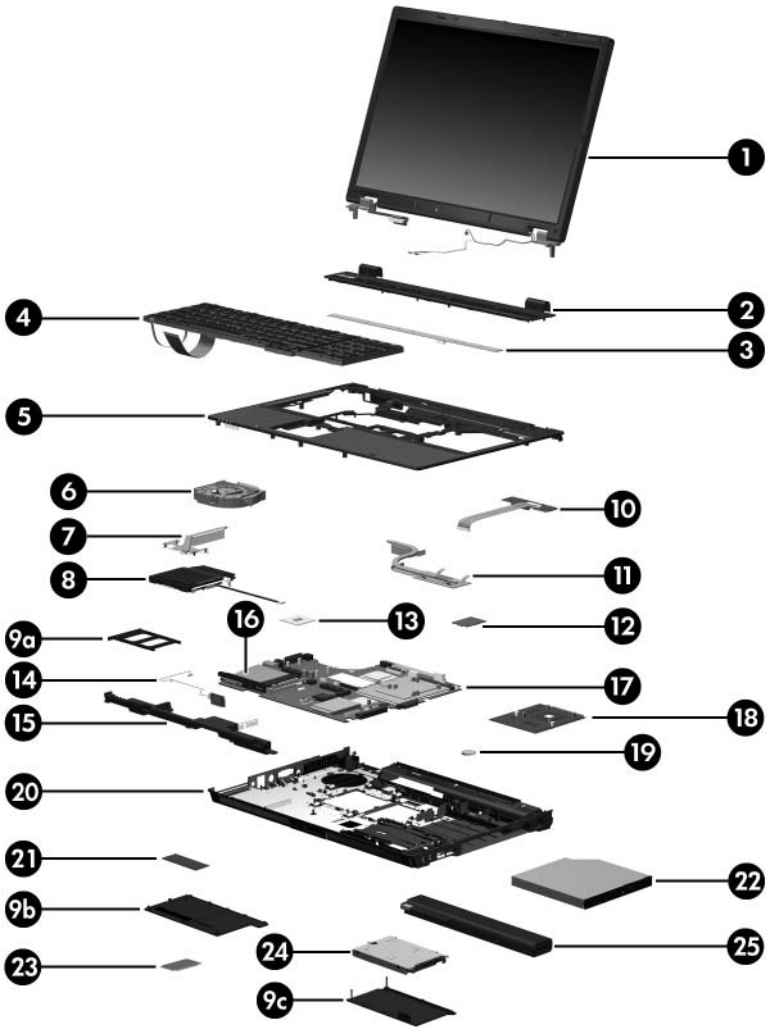


Computer Major Components

Table 3-1

Spare Parts: Computer Major Components *(Continued)*

Item	Description			Spare Part Number
23	**Mini Card modules** *(Continued)*			
	802.11a/b/g GL WLAN module for use in the countries listed below. These countries are categorized as most of the world (MOW 2).			407576-002
	Aruba	El Salvador	Poland	Norway
	Austria	Estonia	Portugal	Oman
	Azerbaijan	Finland	Romania	Slovenia
	Bahrain	France	Russia	South Africa
	Belgium	Georgia	Serbia and Montenegro	Spain
	Bermuda	Germany	Singapore	Sri Lanka
	Bulgaria	Greece	Slovakia	Sweden
	Cayman Islands	Hungary	Liechtenstein	Switzerland
	Columbia	Iceland	Lithuania	Turkey
	Croatia	Ireland	Luxembourg	The United Kingdom
	Cyprus	Italy	Malta	Uzbekistan
	Czech Republic	Latvia	Monaco	
	Denmark	Lebanon	The Netherlands	
	Egypt	The Philippines		
	802.11a/b/g GL WLAN module for use in the countries listed below. These countries are categorized as the rest of the world (ROW).			407576-003
	China	Honduras	Qatar	Uruguay
	Ecuador	Pakistan	South Korea	Venezuela
	Haiti	Peru		
	802.11a/b/g GL WLAN module for use in Japan			407576-291
	802.11b/g GL WLAN module for use in Korea			407576-AD1



Computer Major Components

Table 3-1

Spare Parts: Computer Major Components *(Continued)*

Item	Description			Spare Part Number
23	**Mini Card modules** *(Continued)*			
	802.11b/g GL WLAN module for use in the following countries:			409250-004
	Israel Jordan	Kuwait Thailand	United Arab Emirates	Ukraine
24	**Hard drives**			
	7200 rpm		5400 rpm	
	100 GB	409983-001	100 GB	409982-001
	80 GB	409991-001	80 GB	409981-001
			60 GB	409980-001
25	**Battery pack** (8-cell, 4.8-AH)			398682-001

3.3 Display Assembly Components

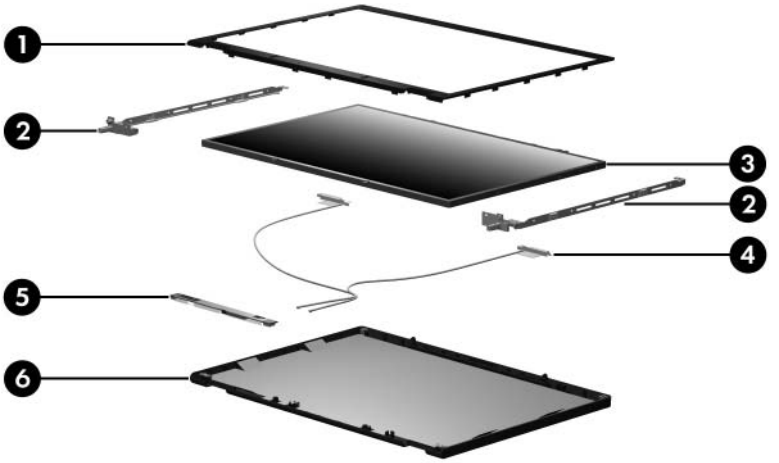


Table 3-2

Display Assembly Components

Spare Part Number Information

Item	Description	Spare Part Number
1	**Display bezel**	409935-001
2	**Display Hinge Kit**	409937-001
3	**Display panels**	
	17.0-inch, WUXGA+WVA with AntiGlare	409978-001
	17.0-inch, WSXGA+WVA with AntiGlare	409976-001
	17.0-inch, WXGA+WVA with AntiGlare	409974-001
	17.0-inch, WSXGA+WVA with BrightView	409989-001
4	**Wireless Antenna Kit**	409931-001
5	**Display Inverter**	409933-001
6	**Display enclosure**	409939-001
	Not illustrated:	
	Display Bracket Kit (includes top, middle, and bottom brackets)	409936-001
	Display Cable Kit	409938-001
	Display Screw Kit	409940-001

3.4 Plastics Kit

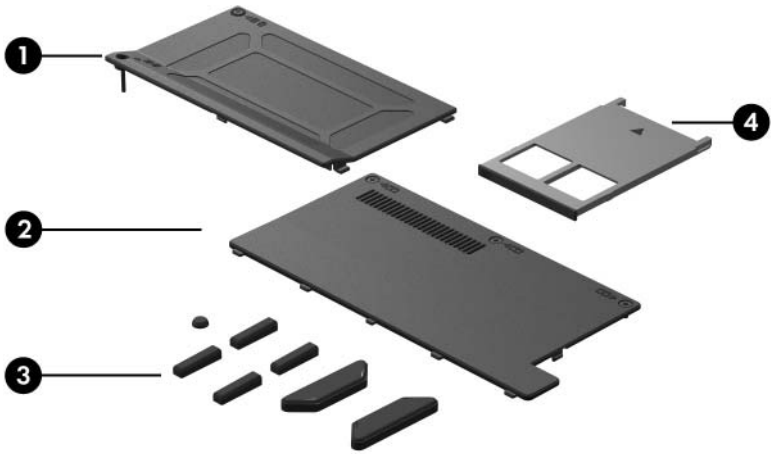


Table 3-3

Plastics Kit

Spare Part Number Information

Item	Description	Spare Part Number
	Plastics Kit Includes:	409944-001
1	Hard drive cover (includes 2 captive screws, captured by C clips)	
2	Memory/Mini Card module cover (includes 3 captive screws, captured by C clips)	
3	Computer feet (7)	
4	PC Card slot space saver	

3.5 Cable Kit

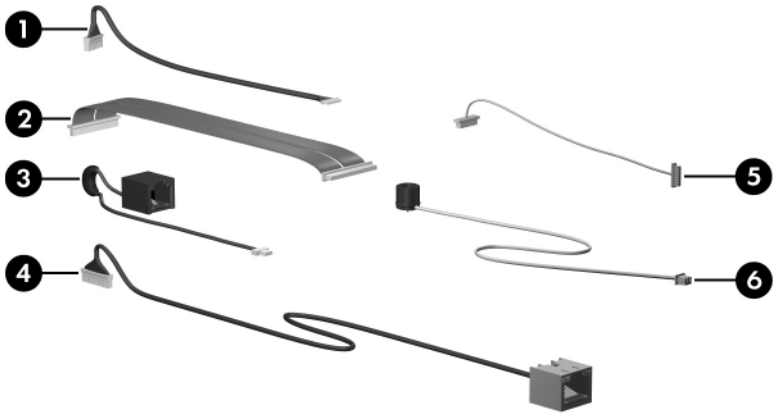


Table 3-4

Cable Kit

Spare Part Number Information

Item	Description	Spare Part Number
	Cable Kit Includes:	409990-001
1	Bluetooth module cable	
2	USB/audio board cable	
3	Modem cable	
4	Network cable	
5	TouchPad cable	
6	Microphone cable	

3.6 Mass Storage Devices

Table 3-5

Mass Storage Devices

Spare Part Number Information

Item	Description			Spare Part Number
1	**Hard drives** (include frame and connector)			
	7200 rpm		5400 rpm	
	100 GB	409983-001	100 GB	409982-001
	80 GB	409991-001	80 GB	409981-001
			60 GB	409980-001
2	**Optical drives** (include bezel)			
	DVD±RW and CD-RW Double-Layer Combo Drive with LightScribe			409987-001
	DVD±RW and CD-RW Double-Layer Combo Drive			409986-001
	2X Max DVD±RW and CD-RW Combo Drive			409985-001
	8X Max DVD±RW and CD-RW Combo Drive			409984-001

3.7 Miscellaneous (Not Illustrated)

Table 3-6

Miscellaneous (Not Illustrated)

Spare Part Information

Description	Spare Part Number
120-watt non-PFC AC adapter	416931-001
120-watt PFC AC adapter	391174-001
90-watt PFC AC adapter	391173-001
90-watt non-PFC AC adapter	409992-001
External MultiBay II	366143-001
External MultiBay II power cable and stand	366144-001
HP Extended Life Battery	367456-001
HP Docking Station	374803-001
HP Docking Station Miscellaneous Plastics Kit	380089-001
Label Kit	409934-001
MultiBay 8X DVD-ROM Drive	373314-001
MultiBay 24X DVD/CD-RW Combo Drive	373315-001
Nylon carrying case	325814-001

Table 3-6

Miscellaneous (Not Illustrated)

Spare Part Information *(Continued)*

Description	Spare Part Number
Power cords:	
For use in the United States	350055-001
For use in Australia	350055-011
For use in Europe	350055-021
For use in the United Kingdom	350055-031
For use in Italy	350055-061
For use in Denmark	350055-081
For use in Brazil	350055-201
For use in Japan	350055-291
For use in the People's Republic of China	350055-AA1
For use in Korea	350055-AD1
For use in Israel	350055-BB1
For use in Switzerland	350055-BG1
For use in French Canada	350055-DB1

Table 3-6

Miscellaneous (Not Illustrated)

Spare Part Information *(Continued)*

Description	Spare Part Number
USB 1.1 diskette drive	359118-001
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 PM3.0×3.0 screw ■ Phillips PM2.5×17.0 screw ■ Phillips PM2.5×13.0 spring-loaded screw ■ Phillips PM2.5×7.0 screw ■ Phillips PM2.5×4.0 screw ■ Phillips PM2.0×6.0 screw ■ Phillips PM2.0×4.0 screw ■ Torx8 T8M2.5×19.0 screw ■ Torx8 T8M2.5×9.0 screw ■ Torx8 T8M2.5×7.0 screw ■ Torx8 T8M2.5×4.0 screw	409945-001

3.8 Sequential Part Number Listing

Table 3-7

Sequential Part Number Listing

Spare Part Number	Description
325814-001	Nylon carrying case
359118-001	USB 1.1 diskette drive
350055-001	Power cord for use in the United States
350055-011	Power cord for use in Australia
350055-021	Power cord for use in Europe
350055-061	Power cord for use in Italy
350055-031	Power cord for use in the United Kingdom
350055-081	Power cord for use in Denmark
350055-201	Power cord for use in Brazil
350055-291	Power cord for use in Japan
350055-AA1	Power cord for use in the People's Republic of China
350055-AD1	Power cord for use in Korea
350055-BB1	Power cord for use in Israel
350055-BG1	Power cord for use in Switzerland
350055-DB1	Power cord for use in French Canada
366143-001	External MultiBay II
366144-001	External MultiBay II power cable and stand
367456-001	HP Extended Life Battery
373314-001	MultiBay 8X DVD-ROM Drive
373315-001	MultiBay 24X DVD/CD-RW Combo Drive
374803-001	HP Docking Station

Table 3-7

Sequential Part Number Listing *(Continued)*

Spare Part Number	Description
380089-001	HP Docking Station Miscellaneous Plastics Kit
391173-001	90-watt PFC AC adapter
391174-001	120-watt PFC AC adapter
398682-001	8-cell, 4.8-AH battery pack
407107-001	802.11b/g HS WLAN Mini Card module for use in North America
407107-002	802.11b/g HS WLAN Mini Card module for use in the ROW countries listed below: China, Ecuador, Haiti, Honduras, Pakistan, Peru, Qatar, South Korea, Uruguay, Venezuela
407107-291	802.11b/g HS WLAN module for use in Japan
407108-001	802.11b/g LJ WLAN module for use in North America
407108-002	802.11b/g LJ WLAN Mini Card module for use in the ROW countries listed below: China, Ecuador, Haiti, Honduras, Pakistan, Peru, Qatar, South Korea, Uruguay, Venezuela
407108-291	802.11b/g LJ WLAN module for use in Japan
407576-001	802.11a/b/g GL WLAN module for use in the MOW1 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

Table 3-7

Sequential Part Number Listing *(Continued)*

Spare Part Number	Description
407576-002	802.11a/b/g GL WLAN Mini Card module for use in the MOW2 countries listed below: Aruba, Austria, Azerbaijan, Bahrain, Belgium, Bermuda, Bulgaria, Cayman Islands, Columbia, Croatia, Cyprus, The 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
407576-003	802.11a/b/g GL WLAN Mini Card module for use in the ROW countries listed below: China, Ecuador, Haiti, Honduras, Pakistan, Peru, Qatar, South Korea, Uruguay, Venezuela
407576-291	802.11a/b/g GL WLAN Mini Card module for use in Japan
407576-AD1	802.11b/g GL WLAN module for use in Korea
409250-004	802.11b/g GL WLAN Mini Card module for use in the following countries: Israel, Jordan, Kuwait, Thailand, United Arab Emirates, Ukraine
409911-001	Keyboard without pointing stick for use in the United States (includes pointing stick cable)

Table 3-7

Sequential Part Number Listing *(Continued)*

Spare Part Number	Description
409911-021	Keyboard without pointing stick for use internationally (includes Pointing Stick cable)
409911-031	Keyboard without pointing stick for use in the United Kingdom (includes pointing stick cable)
409911-041	Keyboard without pointing stick for use in Germany (includes pointing stick cable)
409911-051	Keyboard without pointing stick for use in France (includes pointing stick cable)
409911-061	Keyboard without pointing stick for use in Italy (includes pointing stick cable)
409911-071	Keyboard without pointing stick for use in Spain (includes pointing stick cable)
409911-081	Keyboard without pointing stick for use in Denmark (includes pointing stick cable)
409911-091	Keyboard without pointing stick for use in Norway (includes pointing stick cable)
409911-111	Keyboard without pointing stick for use in Switzerland (includes pointing stick cable)
409911-121	Keyboard without pointing stick for use in French Canada (includes pointing stick cable)
409911-131	Keyboard without pointing stick for use in Portugal (includes pointing stick cable)
409911-141	Keyboard without pointing stick for use in Turkey (includes pointing stick cable)
409911-151	Keyboard without pointing stick for use in Greece (includes pointing stick cable)
409911-161	Keyboard without pointing stick for use in Latin America (includes pointing stick cable)

Table 3-7

Sequential Part Number Listing *(Continued)*

Spare Part Number	Description
409911-171	Keyboard without pointing stick for use in Saudi Arabia (includes pointing stick cable)
409911-201	Keyboard without pointing stick for use in Brazil (includes pointing stick cable)
409911-211	Keyboard without pointing stick for use in Hungary (includes pointing stick cable)
409911-221	Keyboard without pointing stick for use in the Czech Republic (includes pointing stick cable)
409911-231	Keyboard without pointing stick for use in Slovakia (includes pointing stick cable)
409911-251	Keyboard without pointing stick for use in Russia (includes pointing stick cable)
409911-281	Keyboard without pointing stick for use in Thailand (includes Pointing Stick cable)
409911-291	Keyboard without pointing stick for use in Japan (includes pointing stick cable)
409911-AA1	Keyboard without pointing stick for use in the People's Republic of China (includes pointing stick cable)
409911-AD1	Keyboard without pointing stick for use in Korea (includes pointing stick cable)
409911-B71	Keyboard without pointing stick for use in Sweden (includes pointing stick cable)
409911-BA1	Keyboard without pointing stick for use in Slovenia (includes pointing stick cable)
409911-BB1	Keyboard without pointing stick for use in Israel (includes pointing stick stick cable)
409911-DD1	Keyboard without pointing stick for use in Iceland (includes pointing stick cable)

Table 3-7

Sequential Part Number Listing *(Continued)*

Spare Part Number	Description
409913-001	Keyboard with pointing stick for use in the United States (includes pointing stick cable)
409913-021	Keyboard with pointing stick for use internationally (includes pointing stick cable)
409913-031	Keyboard with pointing stick for use in the United Kingdom (includes pointing stick cable)
409913-041	Keyboard with pointing stick for use in Germany (includes pointing stick cable)
409913-051	Keyboard with pointing stick for use in France (includes pointing stick cable)
409913-061	Keyboard with pointing stick for use in Italy (includes pointing stick cable)
409913-071	Keyboard with pointing stick for use in Spain (includes pointing stick cable)
409913-081	Keyboard with pointing stick for use in Denmark (includes pointing stick cable)
409913-091	Keyboard with pointing stick for use in Norway (includes pointing stick cable)
409913-111	Keyboard with pointing stick for use in Switzerland (includes pointing stick cable)
409913-121	Keyboard with pointing stick for use in French Canada (includes pointing stick cable)
409913-131	Keyboard with pointing stick for use in Portugal (includes pointing stick cable)
409913-141	Keyboard with pointing stick for use in Turkey (includes pointing stick cable)
409913-151	Keyboard with pointing stick for use in Greece (includes pointing stick cable)

Table 3-7

Sequential Part Number Listing *(Continued)*

Spare Part Number	Description
409913-161	Keyboard with pointing stick for use in Latin America (includes pointing stick cable)
409913-171	Keyboard with pointing stick for use in Saudi Arabia (includes pointing stick cable)
409913-201	Keyboard with pointing stick for use in Brazil (includes pointing stick cable)
409913-211	Keyboard with pointing stick for use in Hungary (includes pointing stick cable)
409913-221	Keyboard with pointing stick for use in the Czech Republic (includes pointing stick cable)
409913-231	Keyboard with pointing stick for use in Slovakia (includes pointing stick cable)
409913-251	Keyboard with pointing stick for use in Russia (includes pointing stick cable)
409913-281	Keyboard with pointing stick for use in Thailand (includes pointing stick cable)
409913-291	Keyboard with pointing stick for use in Japan (includes pointing stick cable)
409913-AA1	Keyboard with pointing stick for use in the People's Republic of China (includes pointing stick cable)
409913-AD1	Keyboard with pointing stick for use in Korea (includes pointing stick cable)
409913-B71	Keyboard with pointing stick for use in Sweden (includes pointing stick cable)
409913-BA1	Keyboard with pointing stick for use in Slovenia (includes pointing stick cable)
409913-BB1	Keyboard with pointing stick for use in Israel (includes pointing stick cable)

Table 3-7

Sequential Part Number Listing *(Continued)*

Spare Part Number	Description
409913-DD1	Keyboard with pointing stick for use in Iceland (includes pointing stick cable)
409931-001	Wireless Antenna Kit
409932-001	Fingerprint sensor board
409933-001	Display Inverter
409934-001	Label Kit
409935-001	Display bezel
409936-001	Display Bracket Kit (includes top, middle, and bottom brackets)
409937-001	Display Hinge Kit
409938-001	Display Cable Kit
409939-001	Display enclosure
409940-001	Display Screw Kit
409941-001	Modem module
409942-001	Base enclosure
409943-001	PC Card/smart card assembly
409944-001	Plastics Kit
409945-001	Screw Kit
409946-001	Fan assembly
409947-001	Speaker
409948-001	Switch cover
409949-001	Processor heat sink (includes thermal paste)
409950-001	Video board heat sink for use with M56 video board (includes thermal pads)

Table 3-7

Sequential Part Number Listing *(Continued)*

Spare Part Number	Description
409951-001	Top cover with 3 pointing stick buttons and 3 TouchPad buttons, for use with keyboards with Pointing Stick
409952-001	Top cover with 3 pointing stick buttons, 2 TouchPad buttons, and fingerprint sensor, for use with keyboards with Pointing Stick
409953-001	RTC battery
409954-001	Top cover with 2 TouchPad buttons and fingerprint sensor, for use with keyboards without pointing stick
409955-001	Top cover with 2 TouchPad buttons, for use with keyboards without pointing stick
409956-001	Top cover with 3 pointing stick buttons and 3 TouchPad buttons, for use with keyboards with pointing stick
409957-001	LED board (includes LED board cable)
409979-001	Video board
409959-001	System board
409960-001	1-DIMM, PC2-4200, 256-MB memory module
409961-001	1-DIMM, PC2-4200, 512-MB memory module
409962-001	1-DIMM, PC2-4200, 1024-MB memory module
409963-001	1-DIMM, PC2-4200, 2048-MB memory module
409964-001	1-DIMM, PC2-5300, 256-MB memory module
409965-001	1-DIMM, PC2-5300, 512-MB memory module
409966-001	1-DIMM, PC2-5300, 1024-MB memory module
409967-001	1-DIMM, PC2-5300, 2048-MB memory module

Table 3-7

Sequential Part Number Listing *(Continued)*

Spare Part Number	Description
409968-001	USB/audio board (includes audio board cable and USB board cable)
409969-001	Intel Core Duo T2300 (1.67-GHz) processor (includes thermal paste)
409970-001	Intel Core Duo T2400 (1.83-GHz) processor (includes thermal paste)
409971-001	Intel Core Duo T2500 (2.00-GHz) processor (includes thermal paste)
409972-001	Intel Core Duo T2600 (2.17-GHz) processor (includes thermal paste)
409973-001	17.0-inch, WXGA+WVA display assembly with AntiGlare (includes wireless antenna transceivers and cables)
409974-001	17.0-inch, WXGA+WVA display panel with AntiGlare
409975-001	17.0-inch, WSXGA+WVA display assembly with AntiGlare (includes wireless antenna transceivers and cables)
409976-001	17.0-inch, WSXGA+WVA display panel with AntiGlare
409977-001	17.0-inch, WUXGA+WVA display assembly with AntiGlare (includes wireless antenna transceivers and cables)
409978-001	17.0-inch, WUXGA+WVA display panel with AntiGlare
409980-001	5400-rpm, 60-GB hard drive
409981-001	5400-rpm, 80-GB hard drive
409982-001	5400-rpm, 100-GB hard drive
409983-001	7200-rpm, 100-GB hard drive
409984-001	8X Max DVD±RW and CD-RW Combo Drive (includes bezel and optical drive bracket)

Table 3-7

Sequential Part Number Listing *(Continued)*

Spare Part Number	Description
409985-001	2X Max DVD±RW and CD-RW Combo Drive (includes bezel and optical drive bracket)
409986-001	DVD±RW and CD-RW Double-Layer Combo Drive (includes bezel and optical drive bracket)
409987-001	DVD±RW and CD-RW Double-Layer Combo Drive with LightScribe (includes bezel and optical drive bracket)
409989-001	17.0-inch, WSXGA+WVA display assembly with BrightView (includes wireless antenna transceivers and cables)
409988-001	17.0-inch, WSXGA+WVA display panel with BrightView
409990-001	Cable Kit
409991-001	7200 rpm, 80 GB hard drive
409992-001	90-watt non-PFC AC adapter
409993-001	Bluetooth module (includes Bluetooth module cable)
413489-001	Video board heat sink for use with G71 video board (includes thermal pads)
416931-001	120-watt non-PFC AC adapter

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 and P1 screwdrivers
- Torx8 screwdriver
- 5.0-mm socket for video board screw locks
- Flat-bladed screwdriver
- Tool kit—includes connector removal tool, loopback plugs, and case utility tool

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, ensure 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. Ensure 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, ensure that a diskette or disc is not in the drive and ensure that the optical drive tray is closed.
- Before handling a drive, ensure 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. Ensure 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

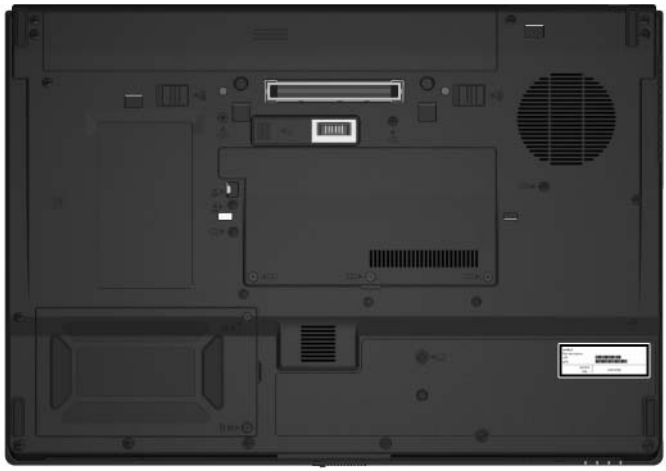
This chapter provides removal and replacement procedures.

There are as many as 101 screws and screw locks, in 12 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
6.3	Preparing the Computer for Disassembly	
	Battery pack	0
6.4	Hard Drive	2 loosened to remove the hard drive cover 1 loosened to remove the hard drive 4 to disassemble the hard drive
6.5	Computer Feet	0
6.6	Bluetooth Module	0
6.7	External Memory Module	3 loosened to remove the memory/Mini PCI module compartment cover
6.8	Mini Card Module	2
	⚠ 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.	
6.9	RTC Battery	0

Disassembly Sequence Chart *(Continued)*

Section	Description	# of Screws Removed
6.10	Optical Drive	1 to remove the optical drive 2 to remove the optical drive bracket
6.11	Keyboard	4
6.12	Internal Memory Module	0
6.13	TouchPad	1
6.14	Modem Module	2
6.15	Switch Cover	4
6.16	LED Board	5
6.17	Fan Assembly	2
6.18	Processor Heat Sink	4 loosened
6.19	Processor	1 loosened
6.20	Video Board Heat Sink	4 loosened 2 removed
6.21	Video Board	2 screw locks
6.22	Display Assembly Display bezel Display panel Ambient light sensor board Display inverter Display hinges	8 8 8 1 1 8
6.23	Top Cover	16
6.24	Speaker	0
6.25	System Board	1
6.26	USB/Audio Board	0
6.27	PC Card/Smart Card Assembly	4

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.

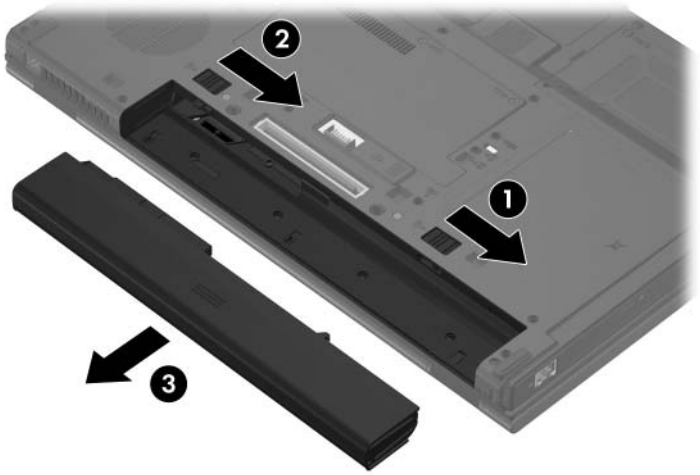
Battery Pack Spare Part Number Information	
8-cell, 4.8-Ah battery pack	398682-001

4. Remove the battery pack by following these steps:
   a. Turn the computer upside down with the rear panel toward you.

b. Slide and hold the battery pack locking latch ❶ to the right. (The battery pack disengages from the computer.)

c. Slide the battery pack release latch ❷ to the right.

d. Slide the battery pack ❸ straight back and remove it.



Removing the Battery Pack

Reverse the above procedure to install the battery pack.

5.4 Hard Drive

Hard Drive Spare Part Number Information

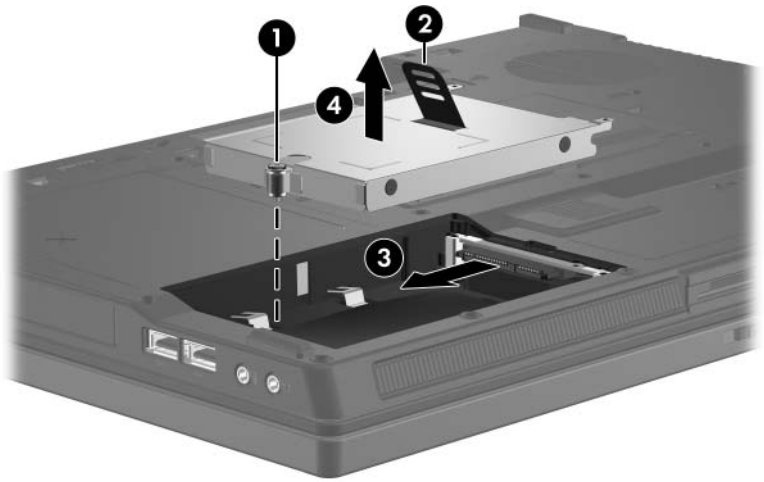
7200 rpm		5400 rpm	
100 GB	409983-001	100 GB	409982-001
80 GB	409991-001	80 GB	409981-001
		60 GB	409980-001

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 PM2.5×17.0 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 to the left.
5. Remove the hard drive cover.

The hard drive cover is included in the Plastics Kit, spare part number 409944-001.

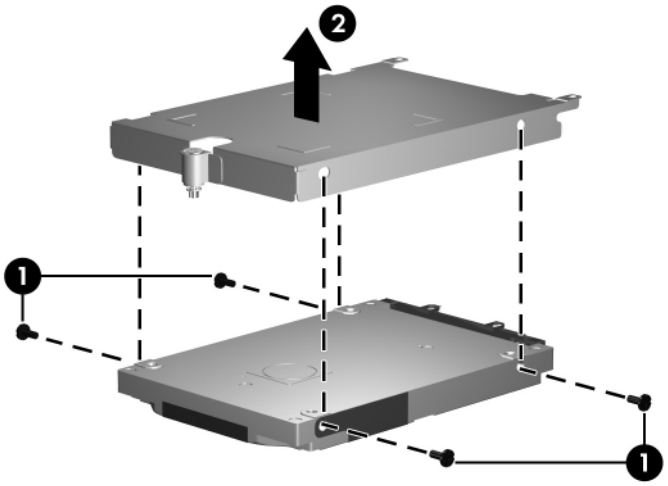
Removing the Hard Drive Cover

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 left 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 PM3.0×3.0 hard drive frame screws ❶ from each side of the hard drive.
10. Lift the frame ❷ straight up to remove it from the hard drive.

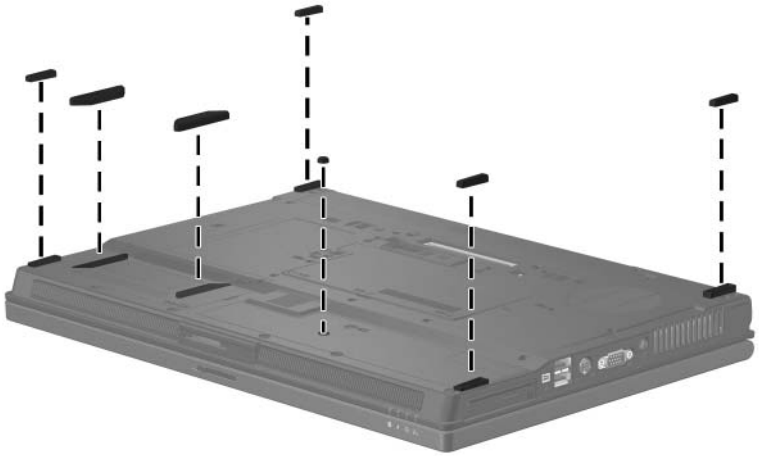


Removing the Hard Drive Frame

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 409944-001.

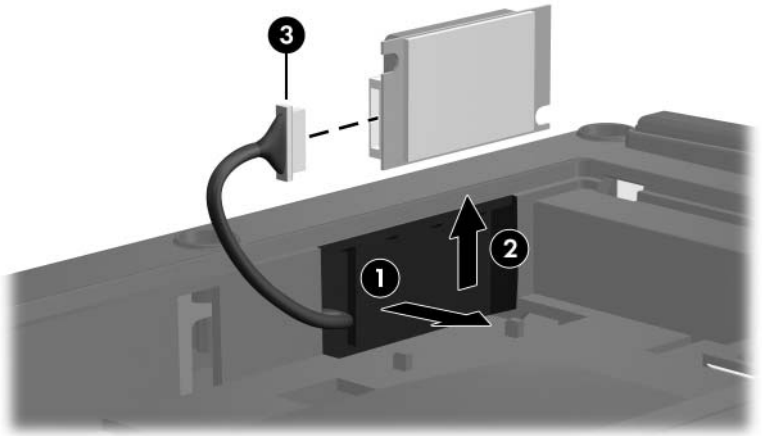


Replacing the Computer Feet

5.6 Bluetooth Module

Bluetooth Module Spare Part Number Information	
Bluetooth module (includes Bluetooth module cable)	409993-001

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. Remove the Bluetooth module ❷ from the hard drive.
5. Disconnect the Bluetooth module cable ❸ from the module.



Removing the Bluetooth Module

Reverse the above procedure to install a Bluetooth module.

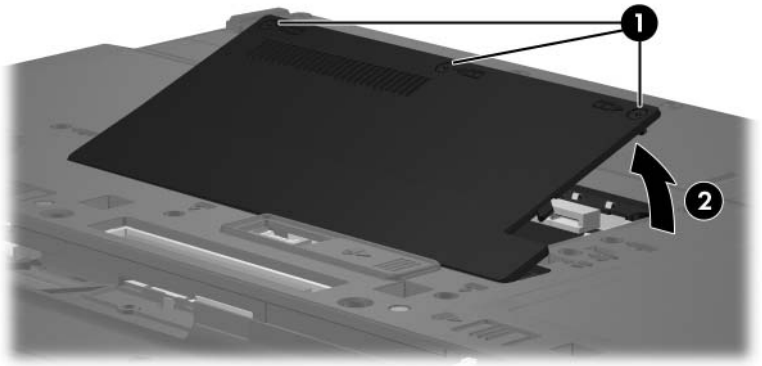
5.7 External Memory Module

Memory Module Spare Part Number Information			
1-DIMM, PC2-5300		1-DIMM, PC2-4200	
2048 MB	409967-001	2048 MB	409963-001
1024 MB	409966-001	1024 MB	409962-001
512 MB	409965-001	512 MB	409961-001
256 MB	409964-001	256 MB	409960-001

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

3. Loosen the three Phillips PM2.5×4.0 screws ❶ that secure the memory/Mini Card module compartment 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 compartment cover.

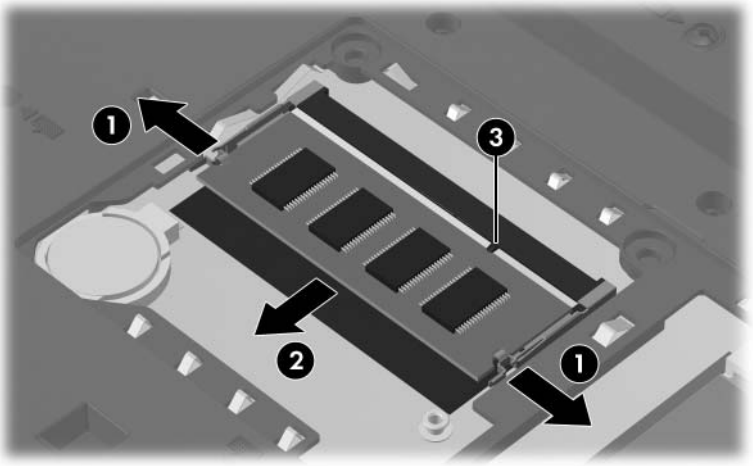
The memory/Mini Card module compartment cover is included in the Plastics Kit, spare part number 409944-001.



Removing the Memory/Mini Card Module Compartment 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 Module

Mini Card Module Spare Part Number Information			
802.11b/g HS WLAN module for use in North America			407107-001
802.11b/g HS WLAN module for use in the ROW countries listed below.			407107-002
China Ecuador Haiti	Honduras Pakistan Peru	Qatar South Korea	Uruguay Venezuela
802.11b/g HS WLAN module for use in Japan			407107-291
802.11b/g LJ WLAN module for use in North America			407108-001
802.11b/g LJ WLAN module for use in the ROW countries listed below.			407108-002
China Ecuador Haiti	Honduras Pakistan Peru	Qatar South Korea	Uruguay Venezuela
802.11b/g LJ WLAN module for use in Japan			407108-291
802.11a/b/g GL WLAN module for use in the MOW 1 countries listed below.			407576-001
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

Mini Card Module

Spare Part Number Information *(Continued)*

802.11a/b/g GL WLAN module for use in the MOW 2 countries listed below.			407576-002
Aruba	El Salvador	Poland	Norway
Austria	Estonia	Portugal	Oman
Azerbaijan	Finand	Romania	Slovenia
Bahrain	France	Russia	South Africa
Belgium	Georgia	Serbia and Montenegro	Spain
Bermuda	Germany	Singapore	Sri Lanka
Bulgaria	Greece	Slovakia	Sweden
Cayman Islands	Hungary	Liechtenstein	Switzerland
Columbia	Iceland	Lithuania	Turkey
Croatia	Ireland	Luxembourg	The United Kingdom
Cyprus	Italy	Malta	Uzbekistan
Czech Republic	Latvia	Monaco	
Denmark	Lebanon	The Netherlands	
Egypt	The Phillippines		
802.11a/b/g GL WLAN module for use in the ROW countries listed below.			407576-003
China	Honduras	Qatar	Uruguay
Ecuador	Pakistan	South Korea	Venezuela
Haiti	Peru		
802.11a/b/g GL WLAN module for use in Japan			407576-291
802.11b/g GL WLAN module for use in Korea			407576-AD1
802.11b/g GL WLAN module for use in the following countries:			409250-004
Israel	Kuwait	United Arab Emirates	Ukraine
Jordan	Thailand		

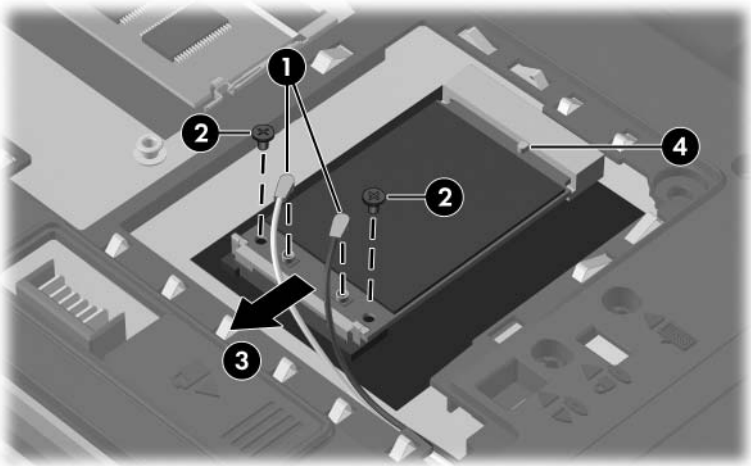
1. Prepare the computer for disassembly (Section 5.3).

2. Remove the memory/Mini Card module compartment cover (Section 5.7).
3. Before disconnecting the wireless antenna cables, make note of which cable is attached to which antenna clip on the Mini Card module, then disconnect the auxiliary and main wireless antenna cables ❶ from the Mini Card module.

The wireless antenna cables are available in the Wireless Antenna Transceiver and Cable Kit, spare part number 409931-001.

4. Remove the two Phillips PM2.0×4.0 screws ❷ that secure the Mini Card to the computer.
5. Remove the Mini Card module ❸ by pulling the card away from the socket at an angle.

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



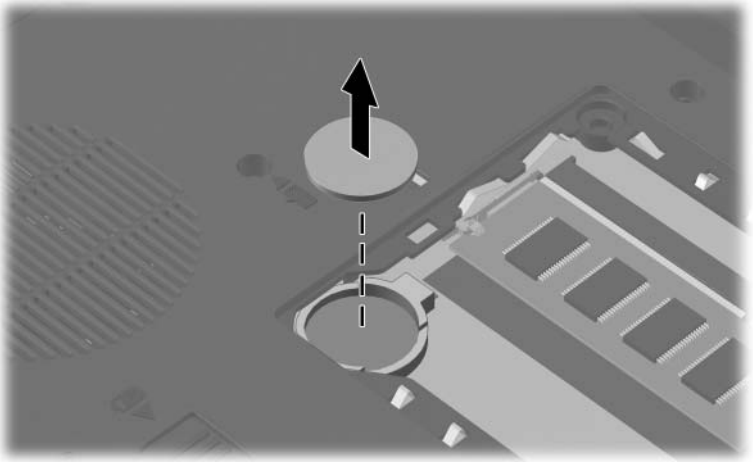
Removing a Mini Card Module

Reverse the above procedure to install a Mini Card module.

5.9 RTC Battery

RTC Battery Spare Part Number Information	
RTC battery	409953-001

1. Prepare the computer for disassembly (Section 5.3).
2. Remove the memory/Mini Card module compartment cover (Section 5.7).
3. Use a non-conductive, flat-bladed tool to pry the RTC battery out of the socket.



Removing the RTC Battery

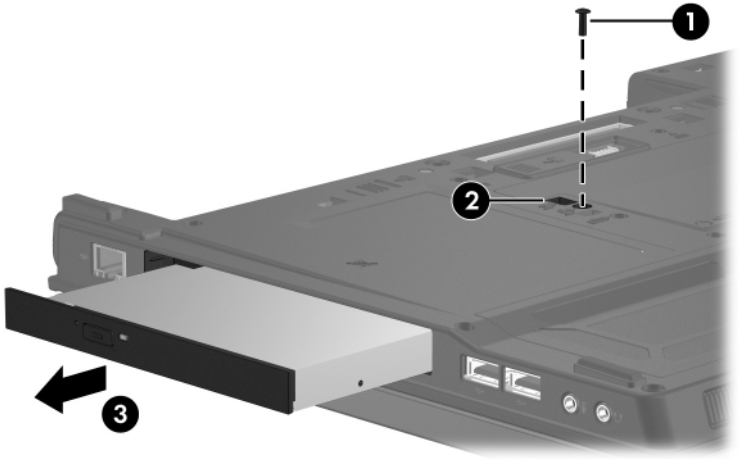
Reverse the above procedure to install the RTC battery. Make sure the RTC battery is installed with the "+" sign facing up.

5.10 Optical Drive

Optical Drive Spare Part Number Information	
All optical drive spare part kits include an optical drive bezel and optical drive bracket.	
DVD±RW and CD-RW Double-Layer Combo Drive with LightScribe	409987-001
DVD±RW and CD-RW Double-Layer Combo Drive	409986-001
2X Max DVD±RW and CD-RW Combo Drive	409985-001
8X Max DVD±RW and CD-RW Combo Drive	409984-001

1. Prepare the computer for disassembly (Section 5.3).
2. Position the computer with right side toward you.

3. Remove the Torx8 T8M2.5×9.0 screw ❶ that secures the optical drive to the computer.
4. Use a flat-bladed tool to push the metal tab ❷ toward the right side of the computer. (The optical drive partially removes from the optical drive bay.)
5. Slide the optical drive ❸ out of the computer.
6. Remove the optical drive.



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 install an optical drive.

5.11 Keyboard

Keyboard Spare Part Number Information

Keyboards with pointing stick (includes Pointing Stick cable) for use in:

Brazil	409913-201	Norway	409913-091
The Czech Republic	409913-221	The People's Republic of China	409913-AA1
Denmark	409913-081	Portugal	409913-131
France	409913-051	Russia	409913-251
French Canada	409913-121	Saudi Arabia	409913-171
Germany	409913-041	Slovakia	409913-231
Greece	409913-151	Slovenia	409913-BA1
Hungary	409913-211	Spain	409913-071
Iceland	409913-DD1	Sweden	409913-B71
Internationally	409913-021	Switzerland	409913-111
Israel	409913-BB1	Thailand	409913-281
Italy	409913-061	Turkey	409913-141
Japan	409913-291	The United Kingdom	409913-031
Korea	409913-AD1	The United States	409913-001
Latin America	409913-161		

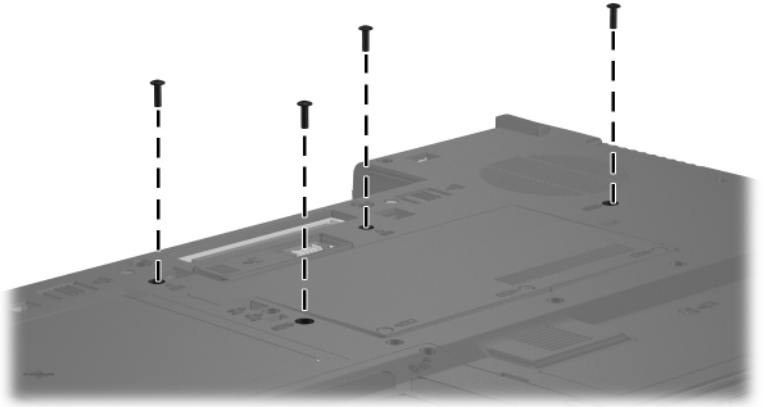
Keyboard Spare Part Number Information *(Continued)*

Keyboards without pointing stick for use in:

Brazil	409911-201	Norway	409911-091
The Czech Republic	409911-221	The People's Republic of China	409911-AA1
Denmark	409911-081		
France	409911-051	Portugal	409911-131
French Canada	409911-121	Russia	409911-251
Germany	409911-041	Saudi Arabia	409911-171
Greece	409911-151	Slovakia	409911-231
Hungary	409911-211	Slovenia	409911-BA1
Iceland	409911-DD1	Spain	409911-071
Internationally	409911-021	Sweden	409911-B71
Israel	409911-BB1	Switzerland	409911-111
Italy	409911-061	Thailand	409911-281
Japan	409911-291	Turkey	409911-141
Korea	409911-AD1	The United Kingdom	409911-031
Latin America	409911-161	The United States	409911-001

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

3. Remove the four Torx8 T8M2.5×9.0 screws that secure the keyboard to the computer.



Removing the Keyboard Screws

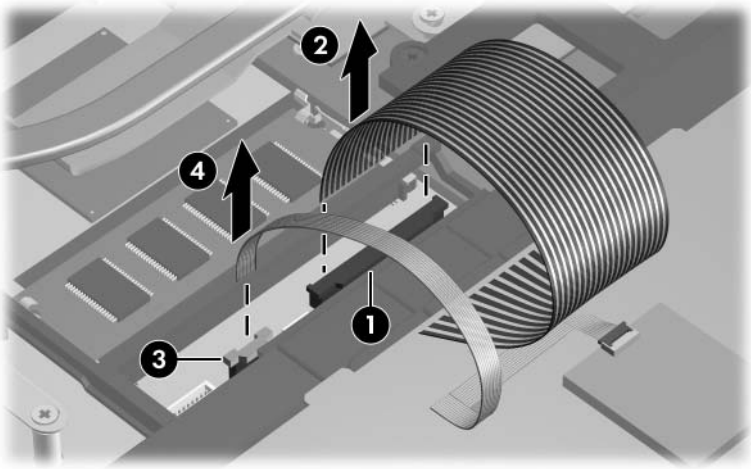
4. Turn the computer display-side up with the front toward you.
5. Open the computer as far as possible.
6. Lift the rear edge of the keyboard and swing it toward you until it rests on the palm rest.

Releasing the Keyboard

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

Step 8 applies only to computer models equipped with a pointing stick.

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



Disconnecting the Keyboard and Pointing Stick Cables

Reverse the above procedure to install the keyboard.

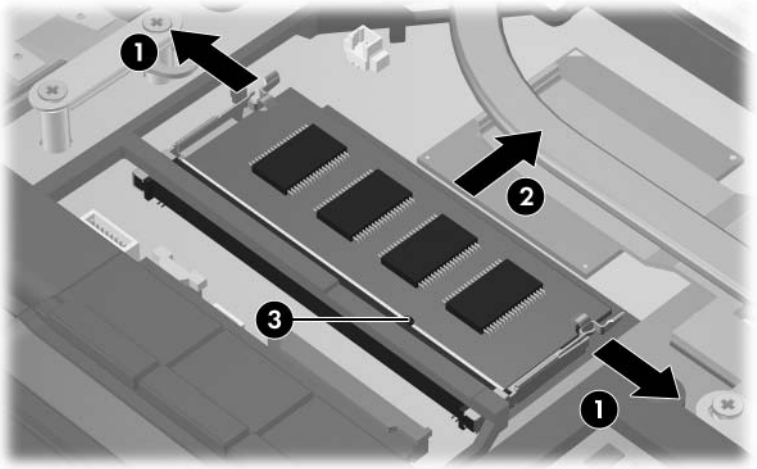
5.12 Internal Memory Module

Memory Module Spare Part Number Information			
1-DIMM, PC2-5300		1-DIMM, PC2-4200	
2048 MB	409967-001	2048 MB	409963-001
1024 MB	409966-001	1024 MB	409962-001
512 MB	409965-001	512 MB	409961-001
256 MB	409964-001	256 MB	409960-001

1. Prepare the computer for disassembly (Section 5.3).
2. Release the keyboard (Section 5.11).

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

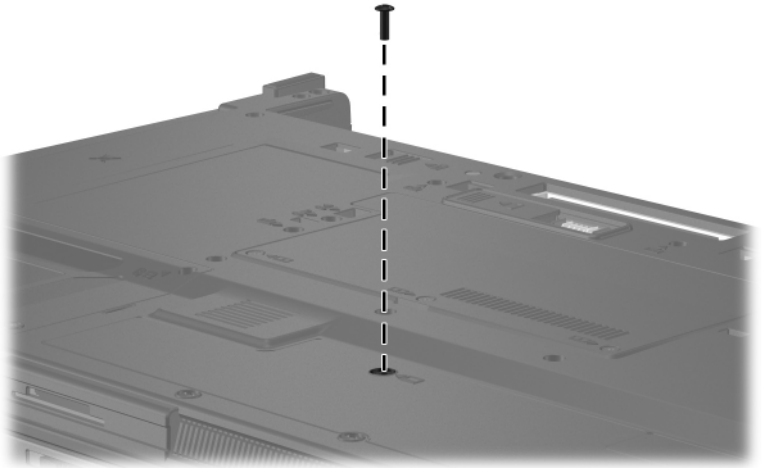
Reverse the above procedure to install a memory module.

5.13 TouchPad

TouchPad Spare Part Number Information	
All TouchPad spare part kits include a TouchPad cable.	
TouchPad with 3 pointing stick buttons, 2 TouchPad buttons, and fingerprint sensor, for use with keyboards with Pointing Stick	409952-001
TouchPad with 3 pointing stick buttons and 3 TouchPad buttons, for use with keyboards with pointing stick	409956-001
TouchPad with 2 TouchPad buttons and fingerprint sensor, for use with keyboards without pointing stick	409954-001
TouchPad with 2 TouchPad buttons, for use with keyboards without pointing stick	409955-001

1. Prepare the computer for disassembly (Section 5.3).
2. Remove the keyboard (Section 5.11).
3. Turn the computer upside down with the front toward you.

4. Remove the Torx8 T8M2.5×9.0 screw that secures the TouchPad to the computer.

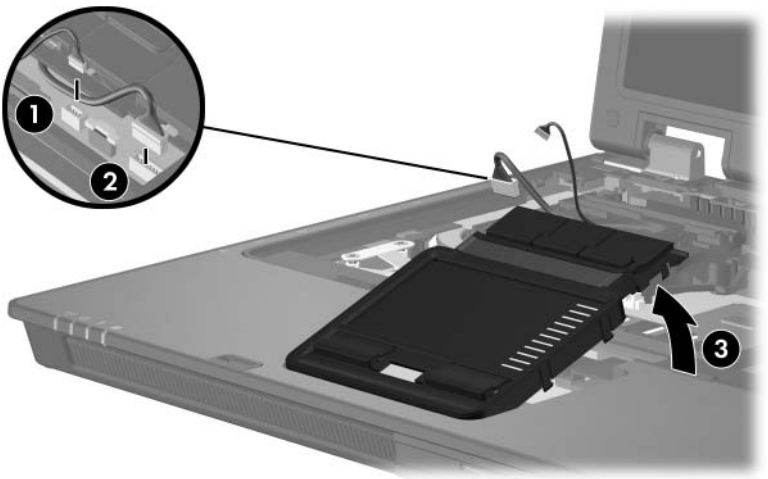


Removing the TouchPad Screw

5. Turn the computer display-side up with the front toward you.
6. Open the computer.
7. Disconnect the TouchPad cable ❶ from the system board.

Step 8 applies only to computer models equipped with a fingerprint reader.

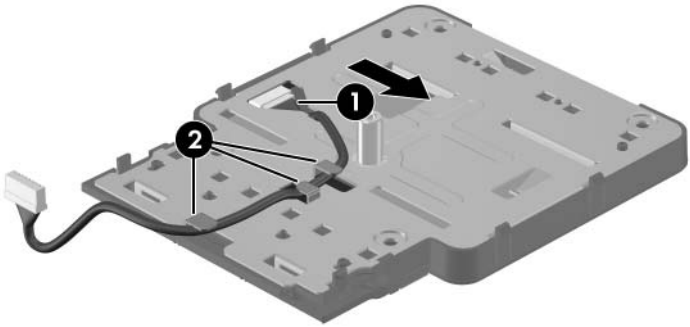
8. Disconnect the fingerprint reader cable ❸ from the system board.
9. Lift up on the rear edge of the TouchPad ❸ to disengage it from the top cover.
10. Remove the TouchPad.



Removing the TouchPad

11. If it is necessary to replace the TouchPad cable, turn the TouchPad upside down.
12. Disconnect the TouchPad cable ❶ from the TouchPad board.
13. Remove the TouchPad cable from the clips ❷ in the TouchPad frame.

The TouchPad cable is included in the Cable Kit, spare part number 409990-001.



Removing the TouchPad Cable

Reverse the above procedure to install the TouchPad.

5.14 Modem Module

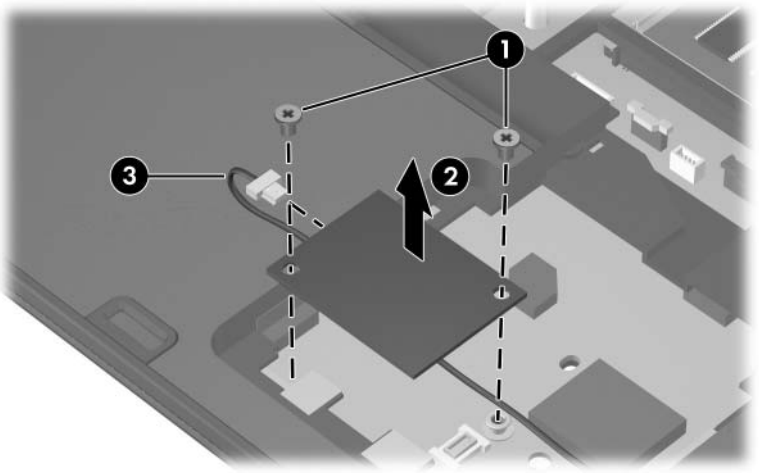
Modem Module Spare Part Number Information	
Modem module	409941-001

1. Prepare the computer for disassembly (Section 5.3).
2. Remove the keyboard (Section 5.11).
3. Remove the TouchPad (Section 5.13).

4. Remove the two Phillips PM2.0×4.0 screws ❶ that secure the modem module to the system board.
5. Lift the right side of the modem module ❷ to disconnect it from the system board.
6. Disconnect the modem cable ❸ from the modem module.

The modem cable is included in the Cable Kit, spare part number 409990-001.

7. Remove the modem module.



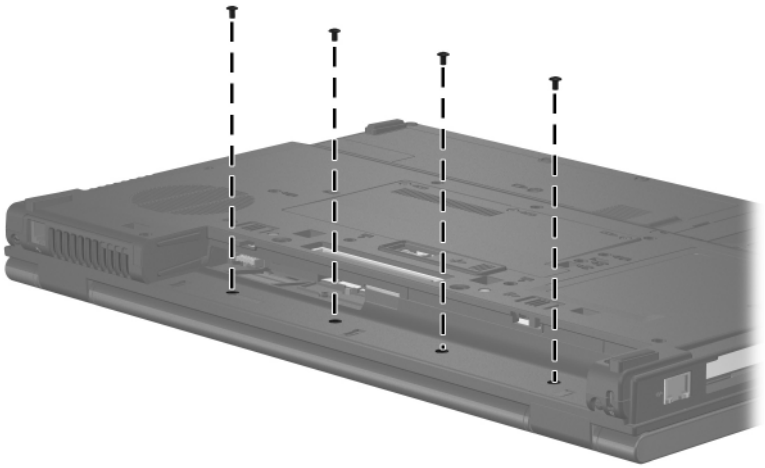
Removing the Modem Module

Reverse the above procedure to install the modem module.

5.15 Switch Cover

Switch Cover Spare Part Number Information	
Switch cover	409948-001
Lid switch board	409958-001

1. Prepare the computer for disassembly (Section 5.3).
2. Turn the computer upside down with the rear panel toward you.
3. Remove the four Torx8 T8M2.5×4.0 screws in the battery bay that secure the switch cover to the computer.



Removing the Switch Cover Screws

4. Turn the computer display-side up with front toward you.
5. Open the computer as far as possible.
6. Insert a thin flat-bladed tool under the hinge cover sections ❶ of the switch cover and lift up until the switch cover ❷ disengages from the computer.
7. Remove the switch cover.

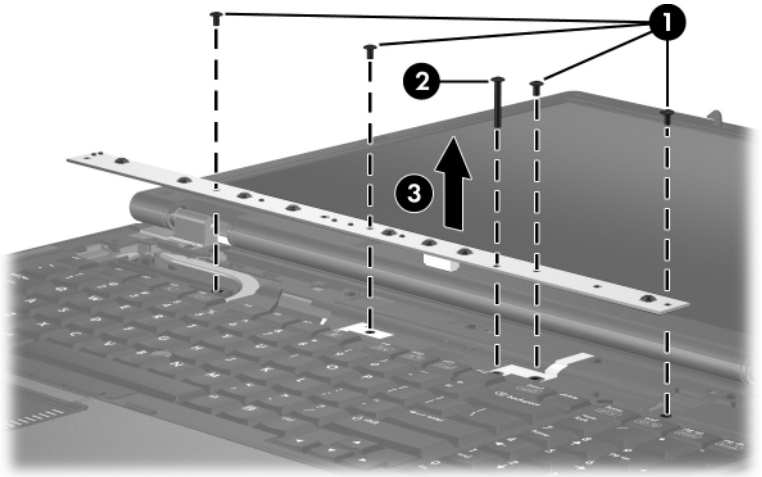
Removing the Switch Cover

Reverse the above procedure to install the switch cover.

5.16 LED Board

LED Board Spare Part Number Information	
LED board (includes LED board cable)	409957-001

1. Prepare the computer for disassembly (Section 5.3).
2. Remove the switch cover (Section 5.15).
3. Remove the four Torx8 T8M2.5×4.0 screws ❶ and the Torx8 T8M2.5×19.0 screw ❷ that secure the LED board to the computer.
4. Lift up on the LED board ❸ between the volume decrease and volume increase buttons to disconnect the LED board from the system board.
5. Remove the LED board.



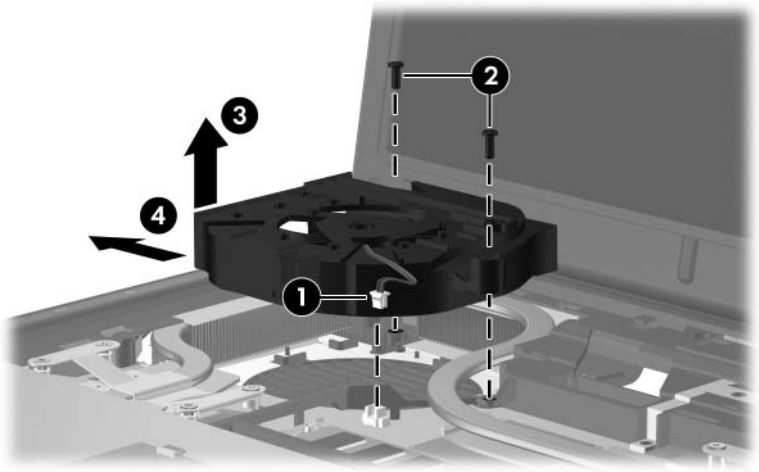
Removing the LED Board

Reverse the above procedure to install the LED board.

5.17 Fan Assembly

Fan Assembly Spare Part Number Information	
Fan Assembly	409932-001

1. Prepare the computer for disassembly (Section 5.3).
2. Release the keyboard (Section 5.11).
3. Disconnect the fan cable ❶ from the system board.
4. Remove the two Torx8 T8M2.5×7.0 screws ❷ that secure the fan assembly to the base enclosure.
5. Lift the left side of the fan ❸ until it clears the left side of the base enclosure.
6. Slide the fan ❹ to the left and remove it from the computer.



Removing the Fan Assembly

Reverse the above procedure to install the fan assembly.

5.18 Processor Heat Sink

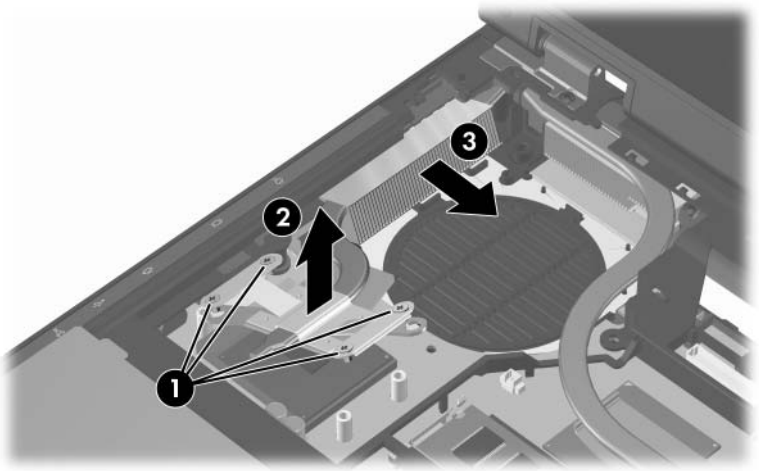
Processor Heat Sink Spare Part Number Information	
Processor heat sink (includes thermal paste)	409949-001

1. Prepare the computer for disassembly (Section 5.3).
2. Release the keyboard (Section 5.11).
3. Remove the fan assembly (Section 5.17).

4. Loosen the four Phillips PM2.5×7.0 screws ❶ that secure the heat sink to the system board.
5. Lift the front edge of the heat sink ❷ to disengage it from the processor.

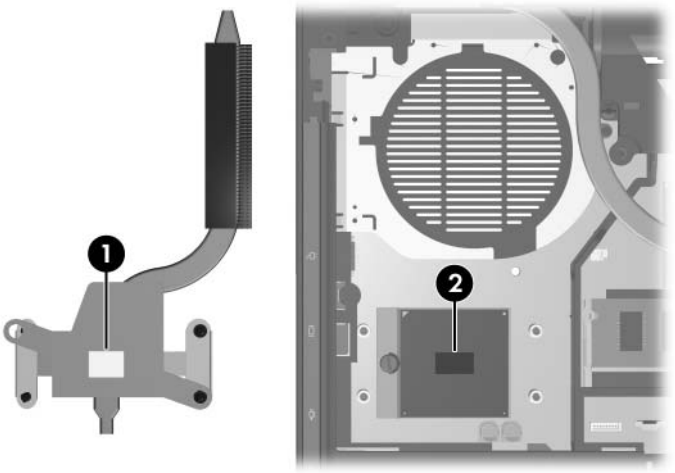
Due to the adhesive quality of the thermal paste located between the heat sink and processor, it may be necessary to move the heat sink from side to side to detach the heat sink from the processor.

6. Slide the heat sink ❸ to the right and remove it.



Removing the Processor 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.

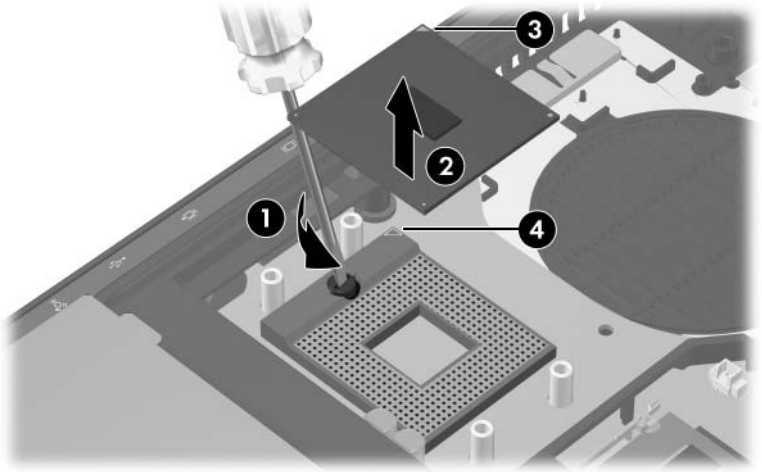
5.19 Processor

Processor Spare Part Number Information	
All processor spare part kits include thermal paste.	
Intel Core Duo T2600 (2.17-GHz) processor	409972-001
Intel Core Duo T2500 (2.00-GHz) processor	409971-001
Intel Core Duo T2400 (1.83-GHz) processor	409970-001
Intel Core Duo T2300 (1.67-GHz) processor	409969-001

1. Prepare the computer for disassembly (Section 5.3), and then remove the following components:
   a. Keyboard (Section 5.11)
   b. Fan assembly (Section 5.17)
   c. Processor heat sink (Section 5.18)

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

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



Removing the Processor

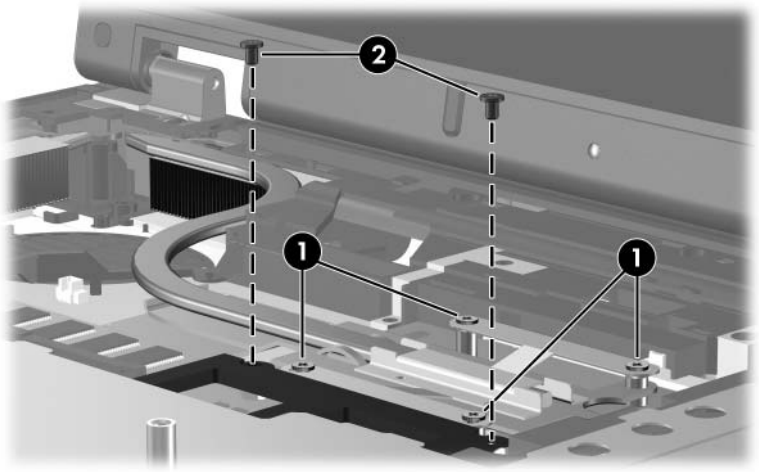
Reverse the above procedure to install the processor.

5.20 Video Board Heat Sink

Video Board Heat Sink Spare Part Number Information	
All video board heat sink spare part kits include thermal pads.	
Video board heat sink for use with M56 video board (includes thermal pads)	409950-001
Video board heat sink for use with G71 video board (includes thermal pads)	413489-001

1. Prepare the computer for disassembly (Section 5.3).
2. Release the keyboard (Section 5.11).
3. Remove the fan assembly (Section 5.17).

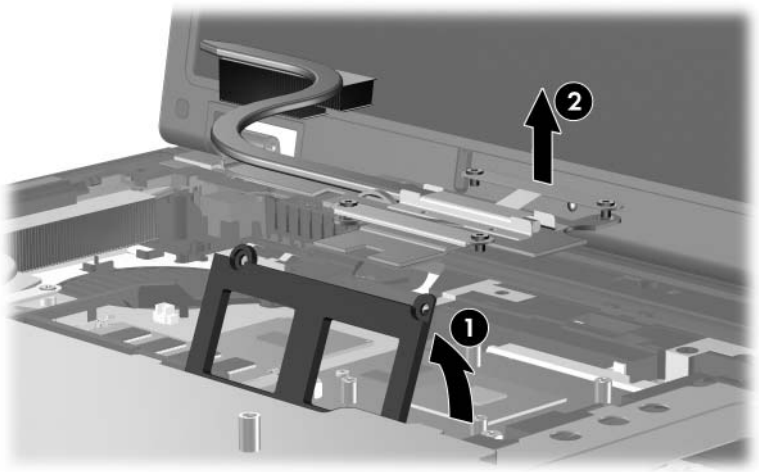
4. Loosen the four Phillips PM2.5×7.0 screws ❶ that secure the video board heat sink to the computer.
5. Remove the two Torx8 T8M2.5×4.0 screws ❷ that secure the top cover hinge to the computer.



Loosening the Video Board Heat Sink Screws

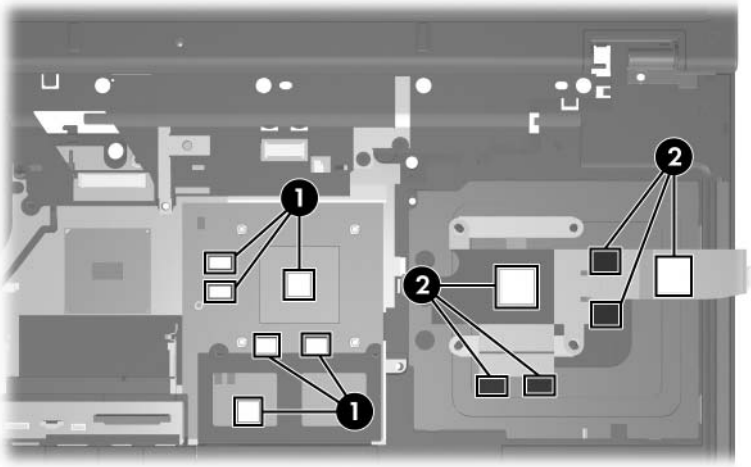
6. Lift the rear edge of the top cover hinge ❶ until it rests at an angle.
7. Lift the front edge of the video board heat sink ❷ until it clears the top cover hinge, and then slide the video board heat sink forward and remove it.

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



Removing the Video Board Heat Sink

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



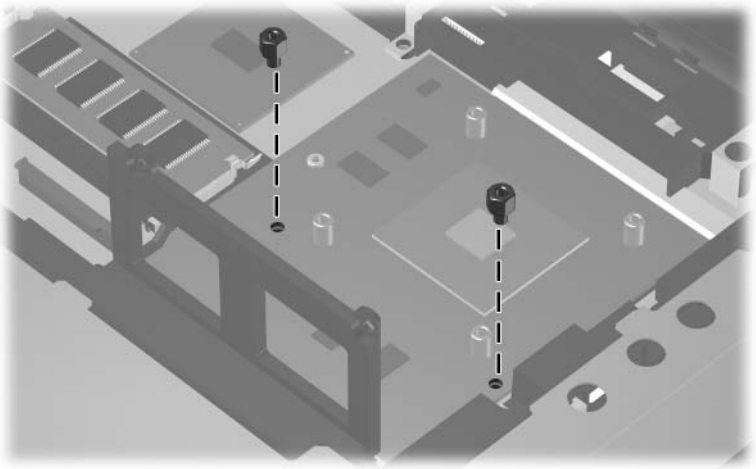
Thermal Paste Locations

Reverse the above procedure to install the video board heat sink and fan assembly.

5.21 Video Board

Video Board Spare Part Number Information	
Video board (includes thermal pads)	409979-001

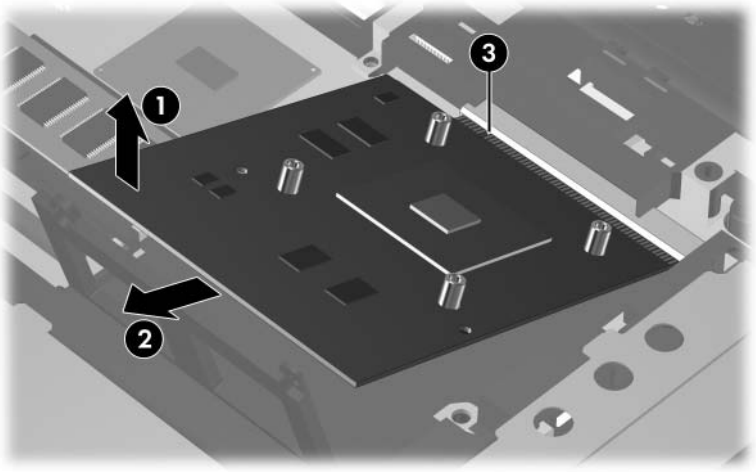
1. Prepare the computer for disassembly (Section 5.3).
2. Remove the fan assembly (Section 5.17).
3. Remove the video board heat sink (Section 5.20).
4. Use a 5.0-mm hex socket to remove the two HM5.0×9.0 screw locks that secure the video board to the computer.



Removing the Video Board Screw Locks

5. Lift the front edge of the video board ❶ until it clears the top cover hinge.
6. Slide the video board forward ❷ at an angle and remove it from the socket.

The video board is designed with a notch ❸ to prevent incorrect installation.



Removing the Video Board

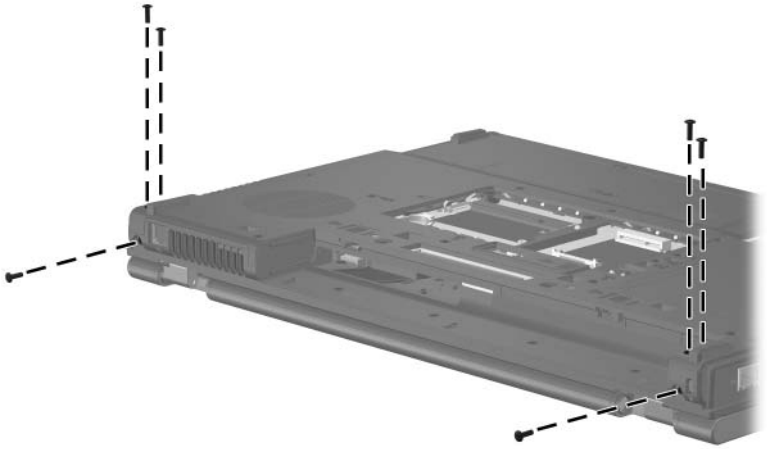
Reverse the above procedure to install the video board.

5.22 Display Assembly

Display Assembly Spare Part Number Information	
All display assemblies include wireless antenna transceivers and cables.	
17.0-inch, WUXGA+WVA with AntiGlare	409977-001
17.0-inch, WSXGA+WVA with AntiGlare	409975-001
17.0-inch, WXGA+WVA with AntiGlare	409973-001
17.0-inch, WSXGA+WVA with BrightView	409988-001

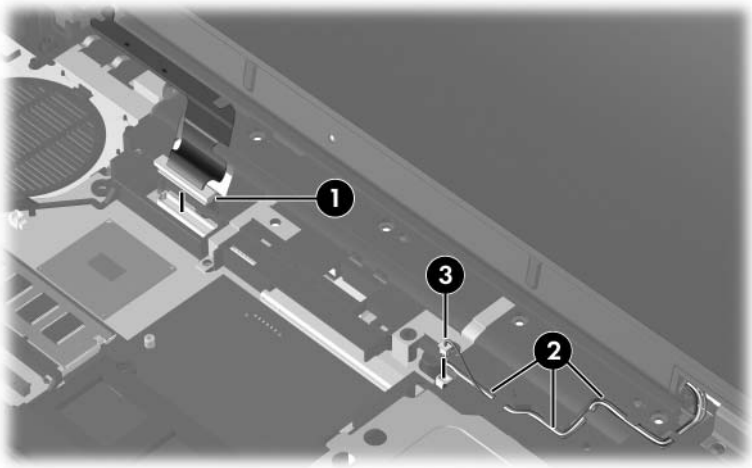
1. Prepare the computer for disassembly (Section 5.3).
2. Remove the memory/Mini PCI module compartment cover (Section 5.7) and disconnect the wireless antenna cables from the Mini Card module (Section 5.8).
3. Remove the following components:
   - ❏ Switch cover (Section 5.15
   - ❏ LED board (Section 5.16)
   - ❏ Keyboard (Section 5.11)

4. Close the computer and turn it upside down with the rear panel toward you.
5. Remove the four Torx8 T8M2.5×9.0 screws ❶ from the computer bottom that secure the display assembly to the computer.
6. Remove the two Torx8 T8M2.5×9.0 screws ❷ from the computer rear panel that secure the display assembly to the computer.



Removing the Display Assembly Screws

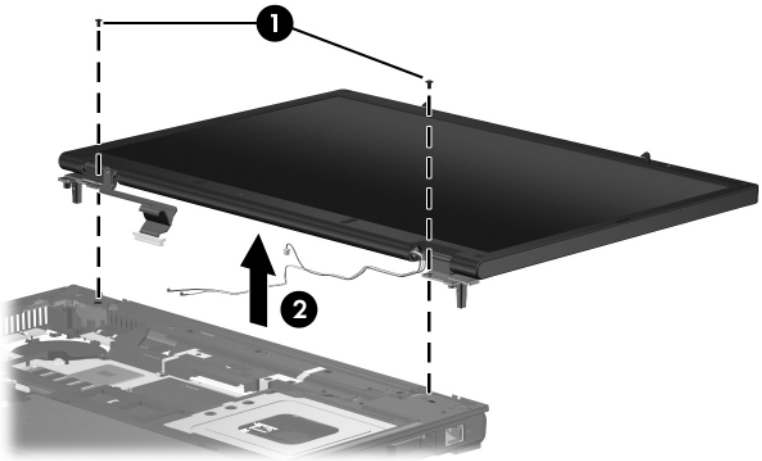
7. Turn the computer display-side up with the front toward you.
8. Open the computer as far as it will open.
9. Disconnect the display cable ❶ from the system board.
10. Remove the wireless antenna cables ❷ from the Mini Card compartment and the top cover clips.
11. Disconnect the microphone cable ❸ from the system board.



Disconnecting the Display Cables and Removing the Wireless Antenna Cables

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.

12. Remove the two Torx8 T8M2.5×4.0 screws ❶ that secure the display assembly to the computer.
13. Lift the display assembly ❷ straight up and remove it.



Removing the Display Assembly

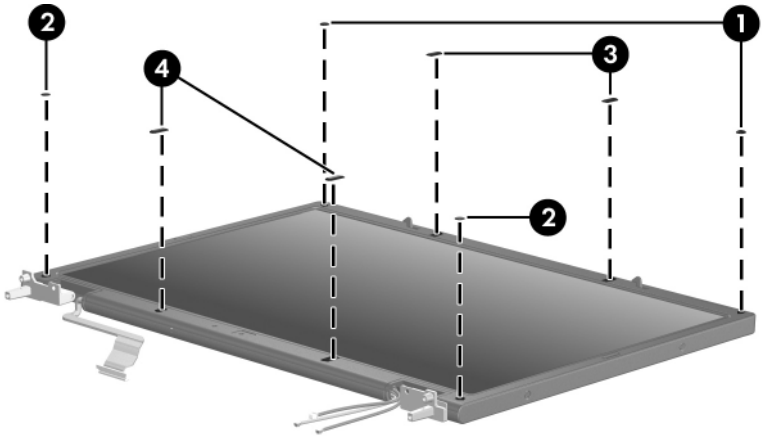
Display Assembly Subcomponents

Spare Part Number Information

Item Description	Spare Part Number
Display bezel	409935-001
Display Hinge Kit	409937-001
Display inverter	409933-001
Display panels	
17.0-inch, WUXGA+WVA with AntiGlare	409978-001
17.0-inch, WSXGA+WVA with AntiGlare	409976-001
17.0-inch, WXGA+WVA with AntiGlare	409974-001
17.0-inch, WSXGA+WVA with BrightView	409989-001
Wireless Antenna Kit	409931-001
Display Screw Kit	409940-001
Display enclosure	409939-001
Display Bracket Kit (includes top, middle, and bottom brackets)	409936-001
Display Cable Kit	409938-001

14. Remove the following display bezel screw covers:
    - ❶ Two rounded rubber screw covers
    - ❷ Two flat rubber screw covers
    - ❸ Two long oblong rubber screw covers
    - ❹ Two short oblong rubber screw covers

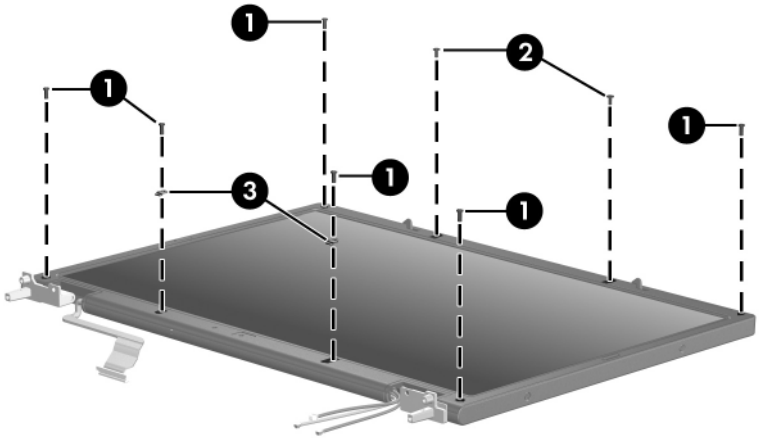
The display bezel screw covers are available in the Display Screw Kit, spare part number 409940-001.



Removing the Display Bezel Screw Covers

15. Remove the following display bezel screws:
    - ❶ Six Torx8 T8M2.5×7.0 screws
    - ❷ Two Phillips PM2.0×6.0 screws
    - ❸ Two stabilizer clips

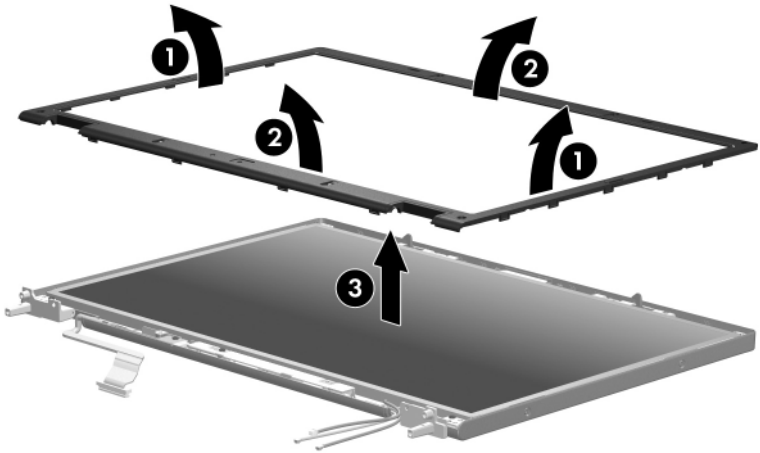
The display bezel screws and the stabilizer clips are available in the Display Screw Kit, spare part number 409940-001.



Removing the Display Bezel Screws

Display Assembly Subcomponents	
Spare Part Number Information	
Display bezel	409935-001

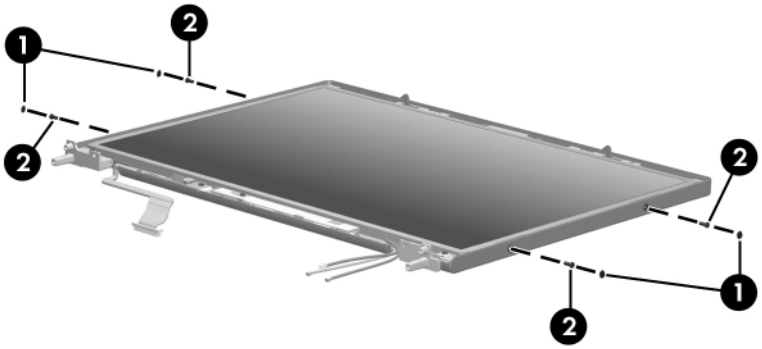
16. Flex the inside edges of the left and right sides ❶ of the display bezel and the inside edges of the top and bottom sides ❷ of the display bezel until the bezel disengages from the display assembly.
17. Remove the display bezel ❸.



Removing the Display Bezel

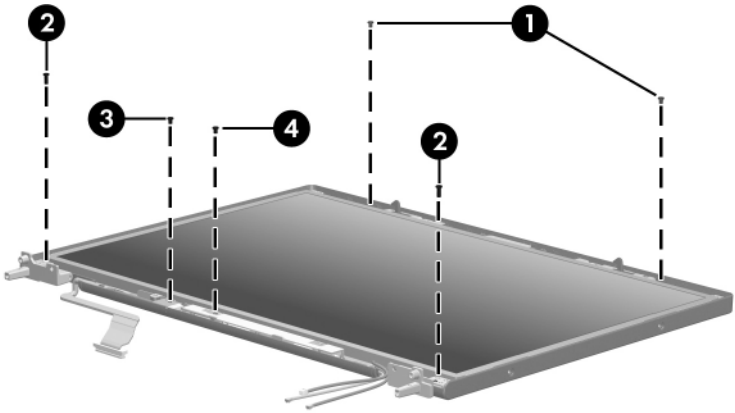
18. Remove the four mylar screw covers ❶ and the four Torx8 T8M2.5×4.0 screws ❷ that secure the display panel to the display enclosure.

The mylar screw covers are available in the Display Screw Kit, spare part number 409940-001.



Removing the Display Panel Screws, Part 1

19. Remove the following display panel screws:
    - ❶ Two Torx8 T8M2.5×4.0 screws that secure the display panel to the display enclosure
    - ❷ Two Phillips PM2.5×7.0 screws that secure the display panel to the display enclosure
    - ❸ One Torx8 T8M2.5×4.0 screw that secures the ambient light sensor board to the display enclosure
    - ❹ One Torx8 T8M2.5×4.0 screw that secures the display inverter to the display enclosure



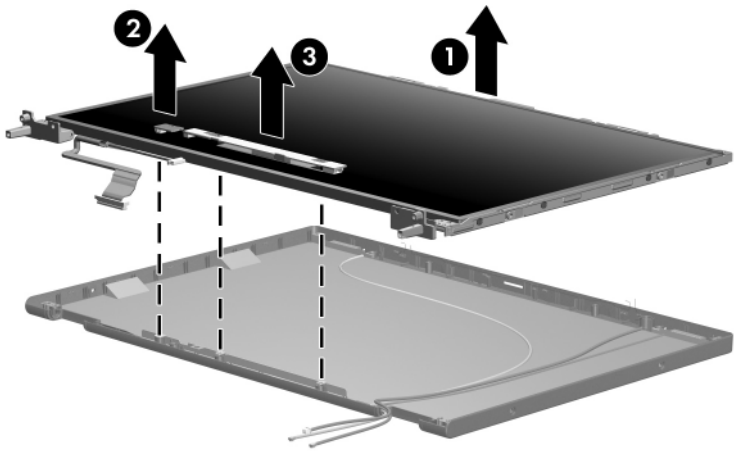
Removing the Display Panel Screws, Part 2

Display Assembly Subcomponents

Spare Part Number Information

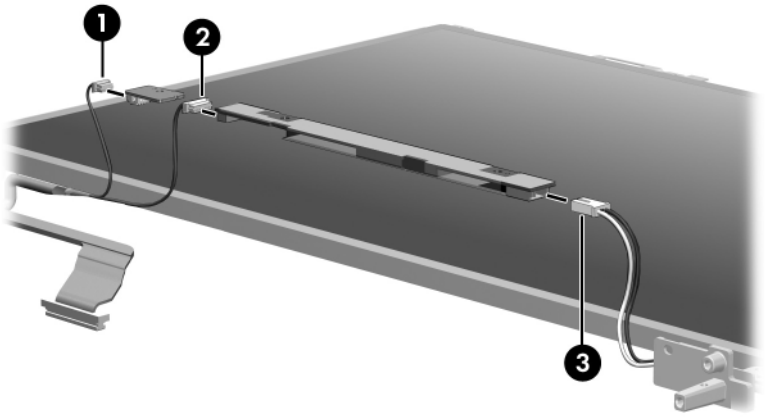
Item Description	Spare Part Number
Display inverter	409933-001
Display panels	
17.0-inch, WUXGA+WVA with AntiGlare	409978-001
17.0-inch, WSXGA+WVA with AntiGlare	409976-001
17.0-inch, WXGA+WVA with AntiGlare	409974-001
17.0-inch, WSXGA+WVA with BrightView	409988-001
Display Cable Kit	409938-001

20. Remove the display panel ❶, ambient light sensor board ❷, and display inverter ❸ from the display enclosoure.



Removing the Display Panel

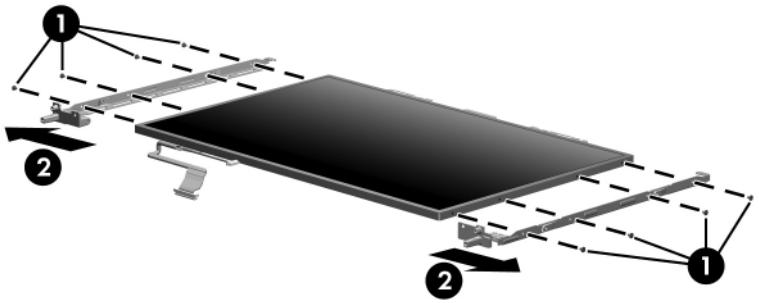
21. Disconnect the following cables:
    - ❶ Ambient light sensor board cable
    - ❷ Display panel cable
    - ❸ Backlight cable
22. Remove the ambient light sensor board and display inverter.



Removing the Display Inverter and Ambient Light Sensor Board

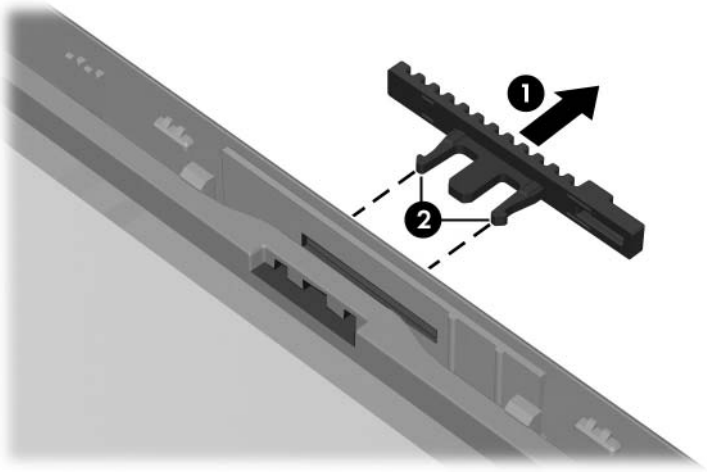
Display Assembly Subcomponents Spare Part Number Information	
Item Description	**Spare Part Number**
Display Hinge Kit	409937-001

23. If it is necessary to replace a display hinges, remove the four Phillips PM2.0×4.0 screws ❶ that secure each hinge to the display panel.
24. Remove the display hinges ❷.



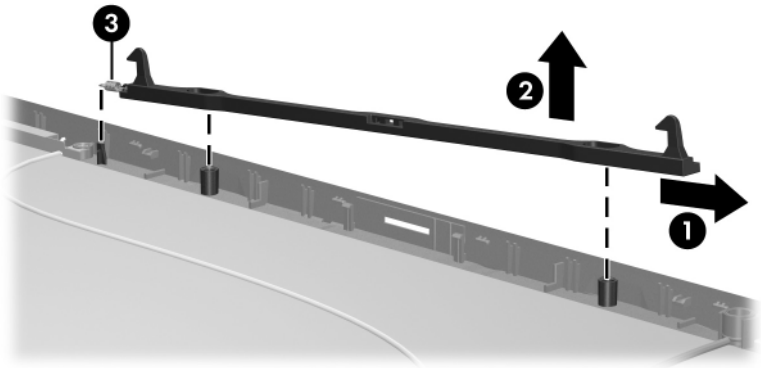
Removing the Display Hingesw

25. If it is necessary to replace the display latch actuator ❶, remove the actuator from the display enclosure by using a small flat-bladed tool to press out on the tabs ❷ on the actuator.



Removing the Display Latch Actuator

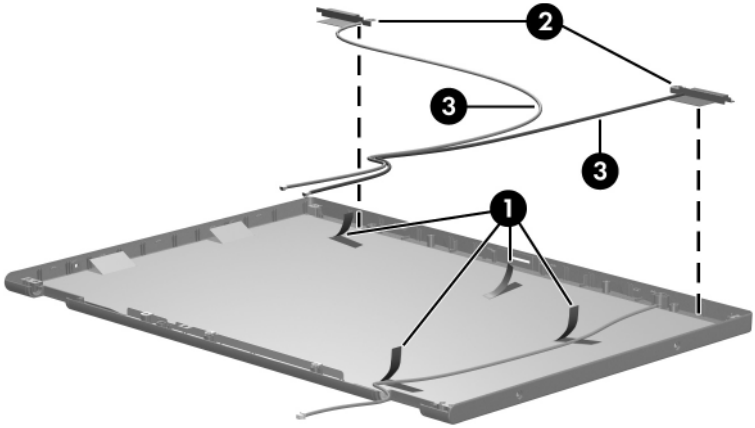
26. If it is necessary to replace the display latch arm, slide and hold the arm ❶ to the right.
27. Lift the right side of the arm ❷ and swing it up and to the left until it rests at an angle.
28. Disengage the display latch arm spring ❸ from the tab to which it is attached.
29. Remove the display latch arm and spring.



Removing the Display Latch Arm

Display Assembly Subcomponents Spare Part Number Information	
Item Description	**Spare Part Number**
Wireless Antenna Kit	409931-001

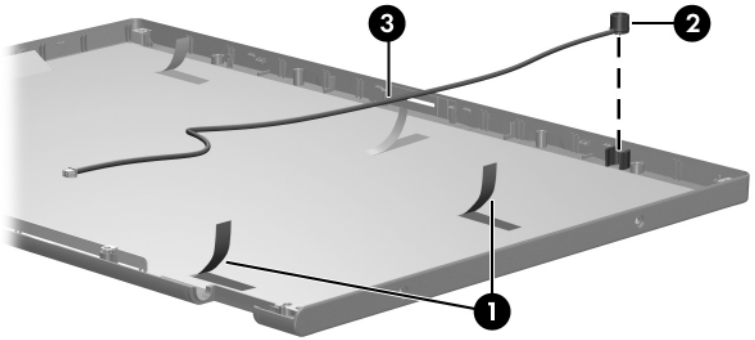
30. If it is necessary to replace the wireless antenna transceivers and cables, release the retention tabs ❶ built in to the display enclosure shield that secure the wireless antenna cables to the display enclosure.
31. Detach the wireless antenna transceivers ❷ from the display enclosure.
32. Remove the wireless antenna transceivers and cables ❸.



Removing the Wireless Antenna Transceivers and Cables

33. If it is necessary to replace the microphone and cable, release the retention tabs ❶ built in to the display enclosure shield that secure the microphone cable to the display enclosure.
34. Remove the microphone ❷ from the clip in the display enclosure.
35. Remove the microphone and cable ❸.

The microphone and cable are available in the Cable Kit, spare part number 409990-001.



Removing the Microphone and Cable

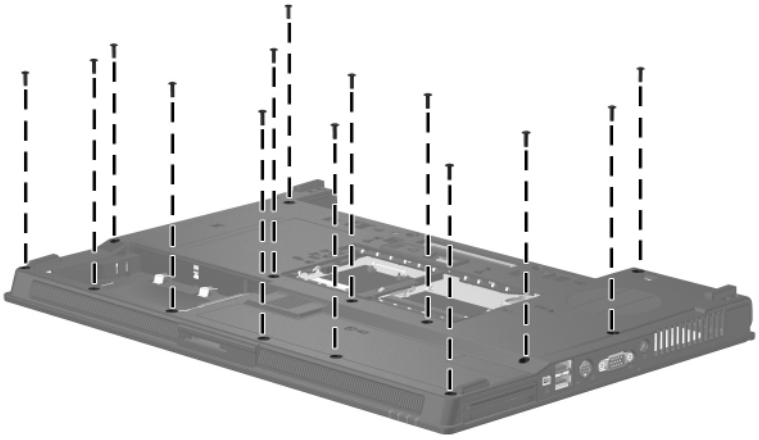
Reverse the above procedure to reassemble and install the display assembly.

5.23 Top Cover

Top Cover Spare Part Number Information	
Top cover	409951-001
Fingerprint sensor board	409946-001

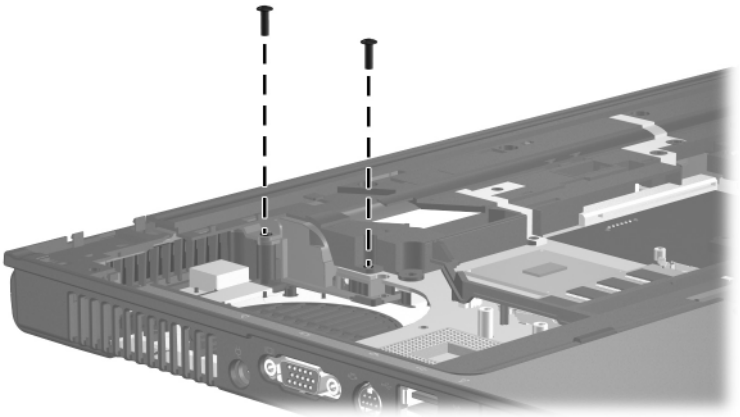
1. Prepare the computer for disassembly (Section 5.3), and then remove the following components:
   a. Hard drive (Section 5.4)
   b. Memory/Mini PCI module compartment cover (Section 5.7)
   c. Optical drive (Section 5.10)
   d. Keyboard (Section 5.11)
   e. Switch cover (Section 5.15)
   f. Display assembly (Section 5.22)
2. Turn the computer upside down with the front toward you.

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



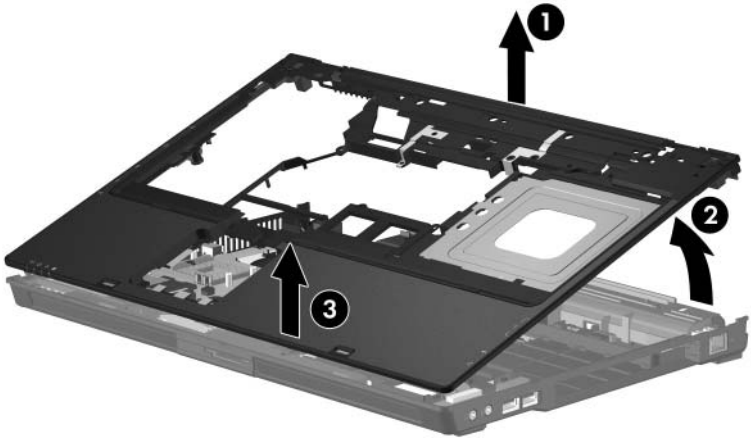
Removing the Top Cover Screws, Part 1

4. Turn the computer right-side up with the front toward you.
5. Remove the two Torx8 T8M2.5×7.0 screws that secure the top cover to the computer.



Removing the Top Cover Screws, Part 2

6. Lift the rear edge of the top cover ❶ to disengage it from the base enclosure.
7. Swing the top cover ❷ up and forward until the left and right sides of the top cover disengage from the base enclosure.
8. Remove the top cover ❸.



Removing the Top Cover

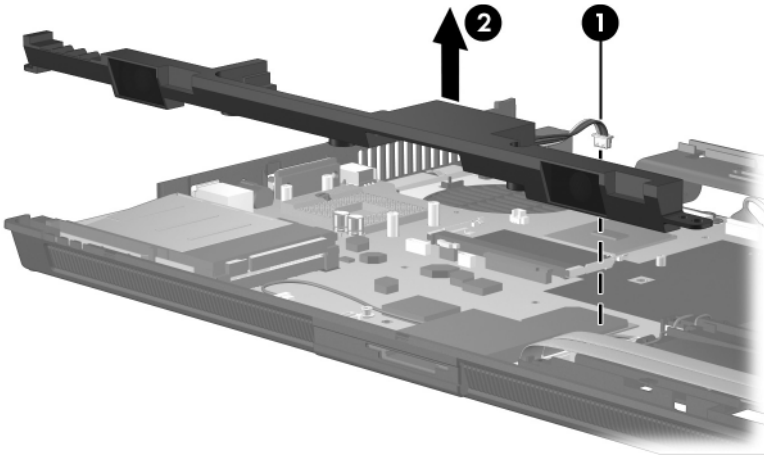
Reverse the above procedure to install the top cover.

5.24 Speaker

Speaker Spare Part Number Information	
Speaker	409947-001

1. Prepare the computer for disassembly (Section 5.3), and then remove the following components:
   a. Hard drive (Section 5.4)
   b. Memory/Mini PCI module compartment cover (Section 5.7)
   c. Optical drive (Section 5.10)
   d. Keyboard (Section 5.11)
   e. Switch cover (Section 5.15)
   f. Display assembly (Section 5.22)
   g. Top cover (Section 5.23)

2. Disconnect the speaker cable ❶ from the system board.
3. Remove the speaker ❷ from the base enclosure.



Removing the Speaker

Reverse the above procedure to install the speaker.

5.25 System Board

System Board Spare Part Number Information	
System board	409959-001

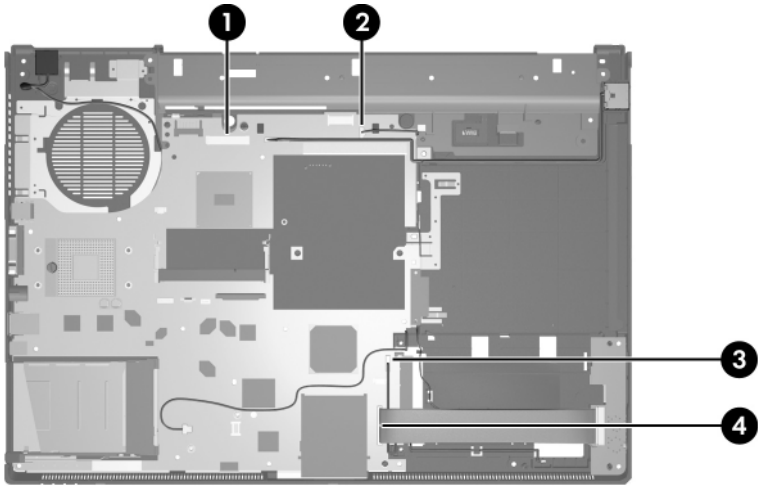
When replacing the system board, ensure that the following components are removed from the defective system board and installed on the replacement system board:

- Memory modules (Section 5.7 and Section 5.12)
- Mini Card card (Section 5.8)
- RTC battery (Section 5.9)
- Modem board (Section 5.14)
- Processor (Section 5.19)
- PC Card/smart card assembly (Section 5.27)

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 5.10)
   d. Keyboard (Section 5.11)
   e. Switch cover (Section 5.15)
   f. LED board (Section 5.16)
   g. Display assembly (Section 5.22)
   h. Top cover (Section 5.23)
   i. Speaker (Section 5.24)
   j. Fan assembly (Section 5.17)
   k. Heat sink (Section 5.18)

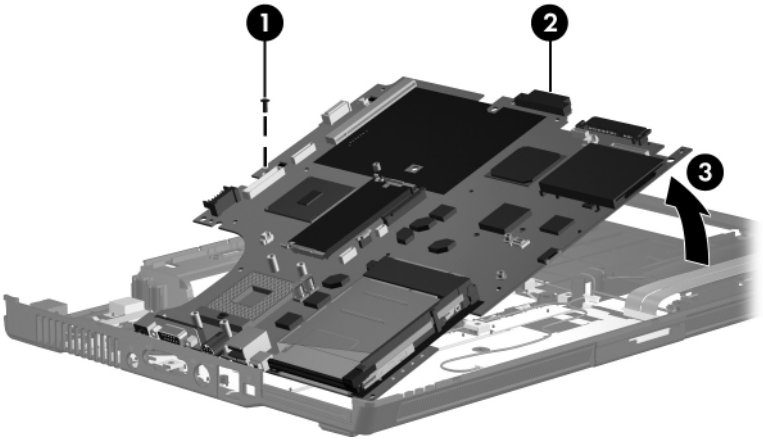
2. Disconnect the the following cables from the system board:
   - ❶ Network cable
   - ❷ Modem cable
   - ❸ Bluetooth module cable
   - ❹ USB/audio board cable

The network cable, modem cable, Bluetooth module cable, and USB/audio cable are available in the Cable Kit, spare part number 409990-001.



Disconnecting the System Board Cables

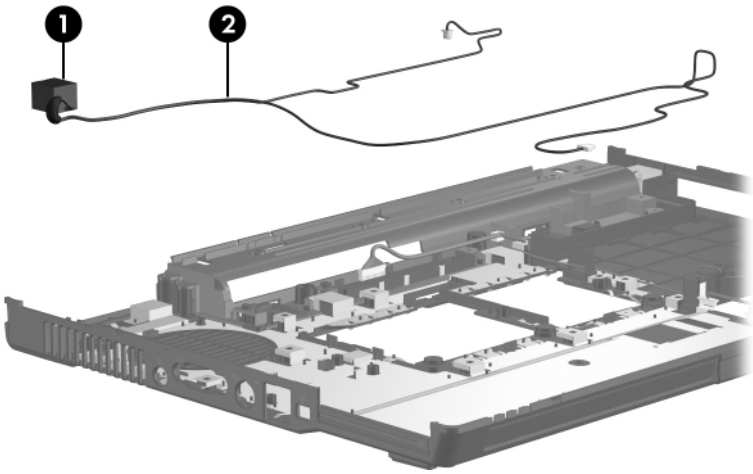
3. Remove the Torx8 T8M2.5×7.0 screw ❶ that secures the system board to the base enclosure.
4. Use the optical drive connector ❷ to lift the right side of the system board until it rests at an angle.
5. Slide the system board ❸ to the right at an angle until it clears the base enclosure.



Removing the System Board

6. If it is necessary to replace the modem connector and cable, remove the connector ❶ from the clip in the base enclosure and remove the cable ❷ from the routing channel in the base enclosure.

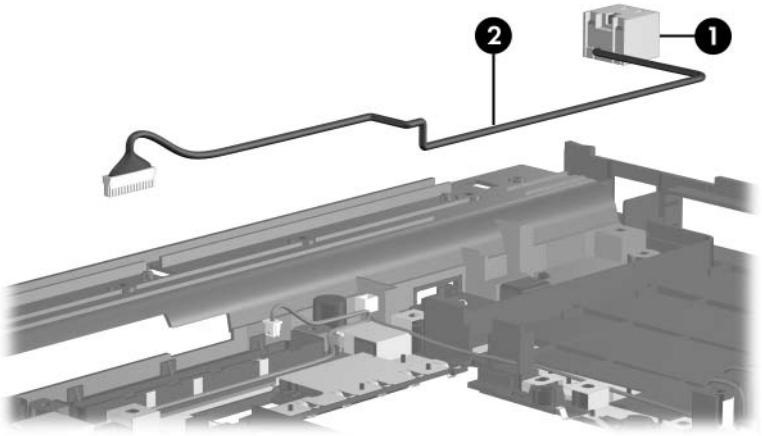
The modem cable is available in the Cable Kit, spare part number 409990-001.



Removing the Modem Connector and Cable

7. If it is necessary to replace the network connector and cable, remove the connector ❶ from the clip in the base enclosure and remove the cable ❷ from the routing channel in the base enclosure.

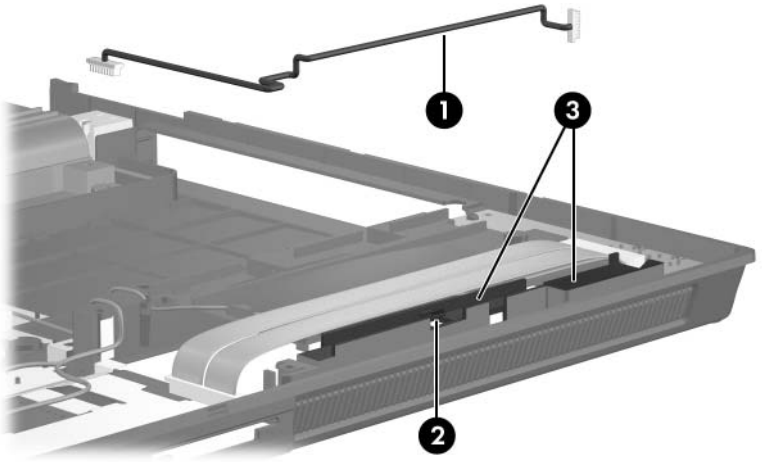
The network cable is available in the Cable Kit, spare part number 409990-001.



Removing the Network Connector and Cable

8. If it is necessary to replace the Bluetooth module cable, remove the cable ❶ from the clips ❷ in the base enclosure and remove the cable from the routing channel ❸ in the base enclosure.

The Bluetooth module cable is included with the Bluetooth module spare part kit and is also available in the Cable Kit, spare part number 409990-001.



Removing the Bluetooth Module Cable

Reverse the above procedures to install the system board.

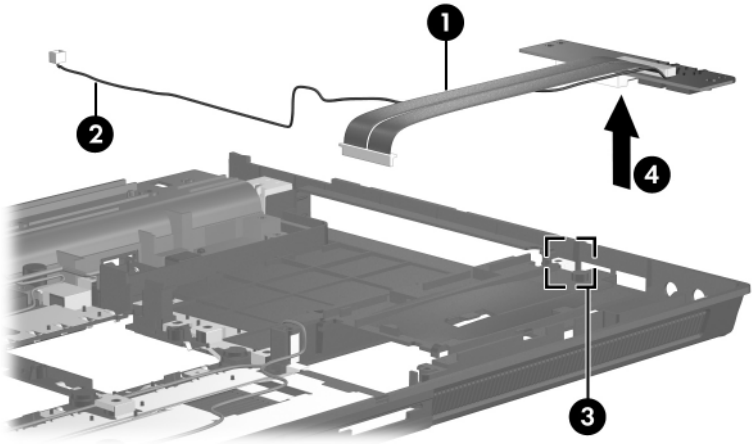
5.26 USB/Audio Board

Full-featured models are equipped with a USB/audio board. Defeatured models are equipped with an audio board. The removal procedures are identical for both boards.

USB/Audio Board Spare Part Number Information	
USB/audio board	409968-001

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 5.10)
   d. Keyboard (Section 5.11)
   e. Switch cover (Section 5.15)
   f. LED board (Section 5.16)
   g. Display assembly (Section 5.22)
   h. Top cover (Section 5.23)
   i. Speaker (Section 5.24)
   j. Fan assembly (Section 5.17)
   k. Heat sink (Section 5.18)
   l. System board (Section 5.25)

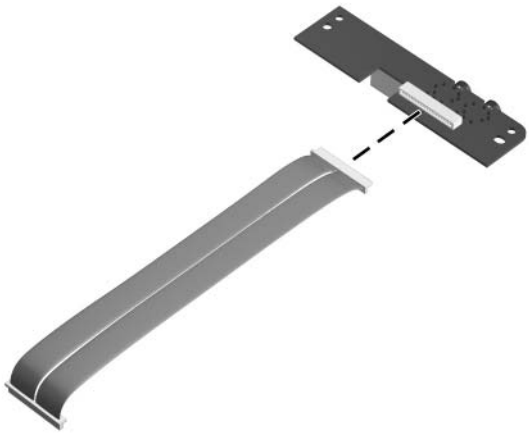
2. Remove the USB cable ❶ and audio cable ❷ from the clips in the base enclosure.
3. Release the clip ❸ that secures the USB/audio board to the base enclosure.
4. Remove the USB/audio board ❹ from the base enclosure.



Removing the USB/Audio Board

5. If it is necessary to replace the USB/audio board cable, disconnect the cable from the board.

The USB/audio board cable is included with the USB/audio board spare part kit and is also available in the Cable Kit, spare part number 409990-001.



Removing the USB/Audio Board Cable

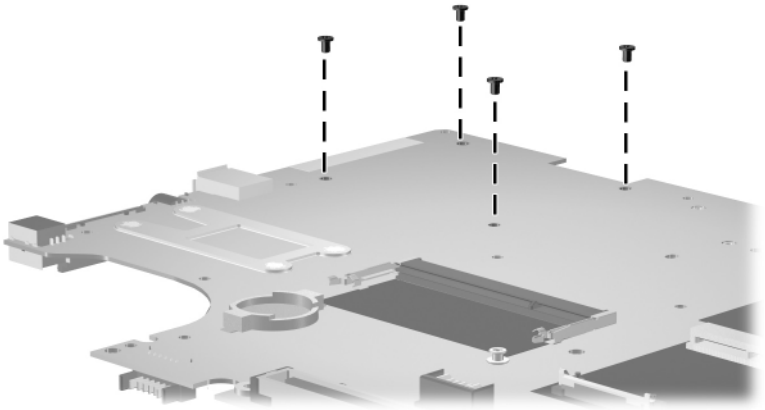
Reverse the above procedure to install the USB/audio board.

5.27 PC Card/Smart Card Assembly

PC Card/Smart Card Assembly Spare Part Number Information	
PC Card/smart card assembly	409943-001

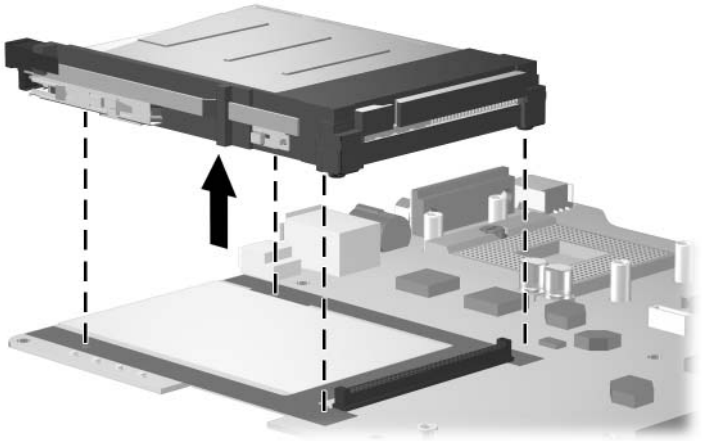
1. Prepare the computer for disassembly (Section 5.3), and then remove the following components:
   a. Hard drive (Section 5.4)
   b. Bluetooth module (Section 5.6)
   c. Optical drive (Section 5.10)
   d. Keyboard (Section 5.11)
   e. Switch cover (Section 5.15)
   f. LED board (Section 5.16)
   g. Display assembly (Section 5.22)
   h. Top cover (Section 5.23)
   i. Speaker (Section 5.24)
   j. Fan assembly (Section 5.17)
   k. Heat sink (Section 5.18)
   l. System board (Section 5.25)

2. Turn the system board upside down with the PC Card eject button facing away from you.
3. Remove the four Phillips PM2.0×4.0 screws that secure the PC Card/smart card assembly to the system board.



Removing the PC Card/Smart Card Assembly Screws

4. Turn the system board top-side up with the PC Card eject button facing away from you.
5. Remove the PC Card/smart card assembly from the system board.



Removing the PC Card/Smart Card Assembly

Reverse the above procedure to install the PC Card/smart card assembly.

6

Specifications

This chapter provides physical and performance specifications.

Table 6-1

Computer

Dimensions	**Metric**	**U.S.**
Height (front to back)	3.3 to 3.8 cm	1.3 to 1.5 in
Width	39.4 cm	15.5 in
Depth	27.4 cm	10.8 in
Weight		
HP Compaq nw9440 with 17.0-inch display, optical drive, and 8-cell battery pack	3.40 kg	7.5 lbs
HP Compaq nx9420 with 17.0-inch display, optical drive, and 8-cell battery pack	3.36 kg	7.4 lbs
Input Power		
Operating voltage	18.5 V dc - 19.0 V dc	
Operating current	4.74 A or 6.5 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

17.0-inch, WUXGA+WVA

Dimensions		
Height	24.4 cm	9.6 in
Width	38.1 cm	15.0 in
Diagonal	43.2 cm	17.0 in
Number of colors	Up to 16.8 million	
Contrast ratio	200:1	
Brightness	180 nits typical	
Pixel resolution		
Pitch	0.172 × 0.172 mm	
Format	1920 × 1200	
Configuration	RGB vertical stripe	
Backlight	CCFT	
Character display	80 × 25	
Total power consumption	6.0 W	
Viewing angle	+/-65° horizontal, +/-50° vertical typical	

Table 6-3

17.0-inch, WSXGA+WVA

Dimensions		
Height	24.4 cm	9.6 in
Width	38.1 cm	15.0 in
Diagonal	43.2 cm	17.0 in
Number of colors	Up to 16.8 million	
Contrast ratio	200:1	
Brightness	180 nits typical	
Pixel resolution		
Pitch	0.197 × 0.197 mm	
Format	1680 × 1050	
Configuration	RGB vertical stripe	
Backlight	CCFT	
Character display	80 × 25	
Total power consumption	7.0 W	
Viewing angle	+/-60° horizontal, +40/-50° vertical typical	

Table 6-4

17.0-inch, WXGA+WVA

Dimensions		
Height	24.4 cm	9.6 in
Width	38.1 cm	15.0 in
Diagonal	43.2 cm	17.0 in
Number of colors	Up to 16.8 million	
Contrast ratio	200:1	
Brightness	180 nits typical	
Pixel resolution		
Pitch	0.259 × 0.259 mm	
Format	1440 × 900	
Configuration	RGB vertical stripe	
Backlight	CCFT	
Character display	80 × 25	
Total power consumption	6.5 W	
Viewing angle	+/-45° horizontal, +15/-35° vertical typical	

Table 6-5

Hard Drives

	100-GB*	80-GB*	60-GB*
Dimensions			
Height	9.5 mm	9.5 mm	9.5 mm
Width	70 mm	70 mm	70 mm
Weight	99 g	99 g	99 g
Interface type	SATA	SATA	SATA
Transfer rate			
Synchronous (maximum)	100 MB/sec	100 MB/sec	100 MB/sec
Security	ATA security	ATA security	ATA security
Seek times (typical read, including setting)			
Single track	3 ms	3 ms	3 ms
Average	13 ms	13 ms	13 ms
Maximum	24 ms	24 ms	24 ms
Logical blocks†	195,363,650	156,301,488	117,210,240
Disc rotational speed	7200 and 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 8-cell, Li-Ion Battery Pack

Dimensions		
Height	2.00 cm	0.79 in
Width	26.80 cm	3.70 in
Depth	5.30 cm	5.28 in
Weight	0.34 kg	0.75 lb
Energy		
Voltage	14.4 V	
Amp-hour capacity	4.8 Ah	
Watt-hour capacity	69 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±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 6-7

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 6-8

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 6-9

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 6-9

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 6-10

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 6-10

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 6-10

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 6-11

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 409945-001, and the Display Screw Kit, spare part number 409940-001.

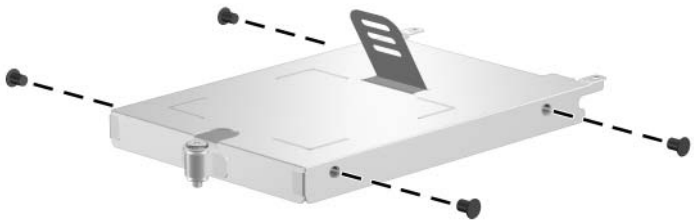
Table A-1

Phillips PM3.0×3.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Black	4	3.0 mm	3.0 mm	5.0 mm

Where used:

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



Phillips PM3.0×3.0 Screw Locations

Table A-2

Phillips PM2.5×17.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Black	2	17.0 mm	2.5 mm	5.0 mm

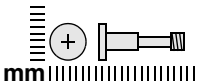
Where used:

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

Phillips PM2.5×17.0 Screw Locations

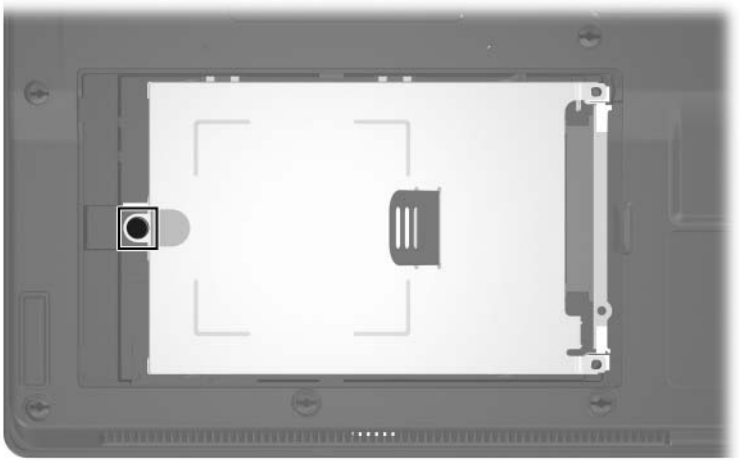
Table A-3

Phillips PM2.5×13.0 Spring-Loaded Screw

	Color	Qty.	Length	Thread	Head Width
	Silver	1	13.0 mm	2.5 mm	6.0 mm

Where used:

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



Phillips PM2.5×13.0 Screw Location

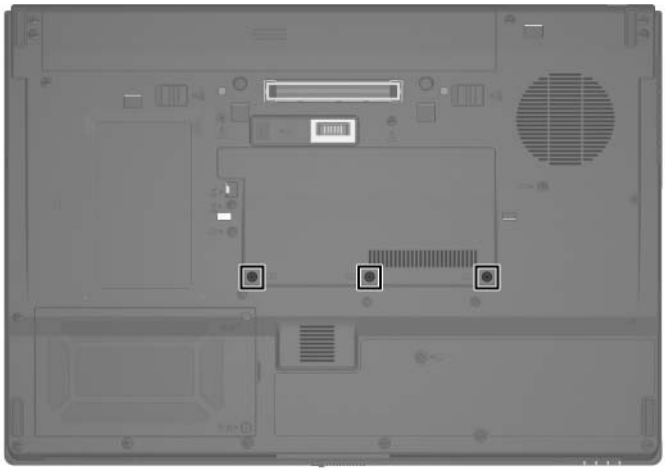
Table A-4

Phillips PM2.5×4.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Black	3	4.0 mm	2.5 mm	5.0 mm

Where used:

3 screws that secure the memory/Mini Card module compartment cover to the computer (screws are captured on the hard drive frame by C clips; documented in Section 5.7)



Phillips PM2.5×4.0 Screw Locations

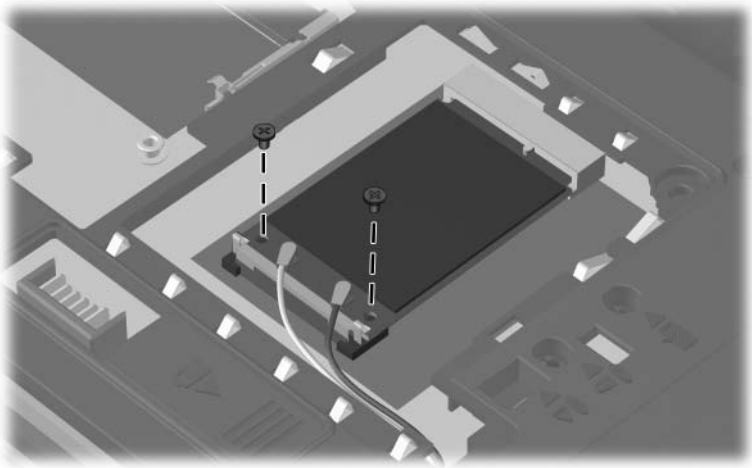
Table A-5

Phillips PM2.0×4.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Silver	18	4.0 mm	2.0 mm	4.5 mm

Where used:

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



Phillips PM2.0×4.0 Screw Locations

Table A-5

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

mm	Color	Qty.	Length	Thread	Head Width
	Silver	18	4.0 mm	2.0 mm	4.5 mm

Where used:

2 screws that secure the optical drive bracket to the optical drive (documented in Section 5.10)

Phillips PM2.0×4.0 Screw Locations

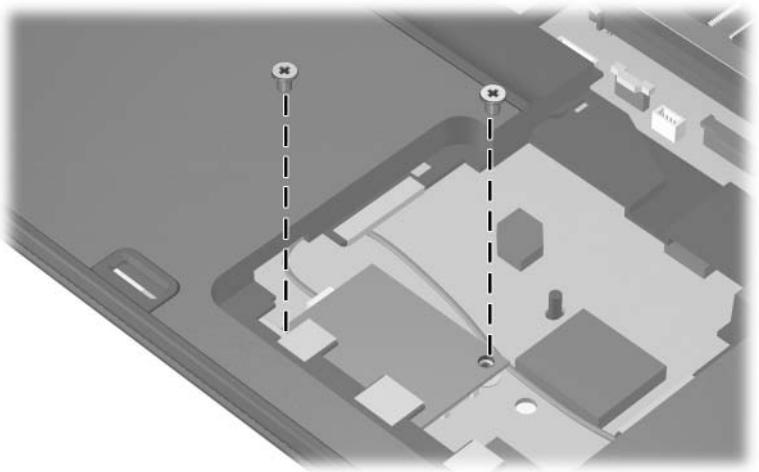
Table A-5

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

mm	Color	Qty.	Length	Thread	Head Width
	Silver	18	4.0 mm	2.0 mm	4.5 mm

Where used:

2 screws that secure the modem module to the computer (documented in Section 5.14)



Phillips PM2.0×4.0 Screw Locations

Table A-5

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

mm	Color	Qty.	Length	Thread	Head Width
	Silver	18	4.0 mm	2.0 mm	4.5 mm

Where used:

8 screws that secure the display hinge to the display panel (documented in Section 5.22)

Phillips PM2.0×4.0 Screw Locations

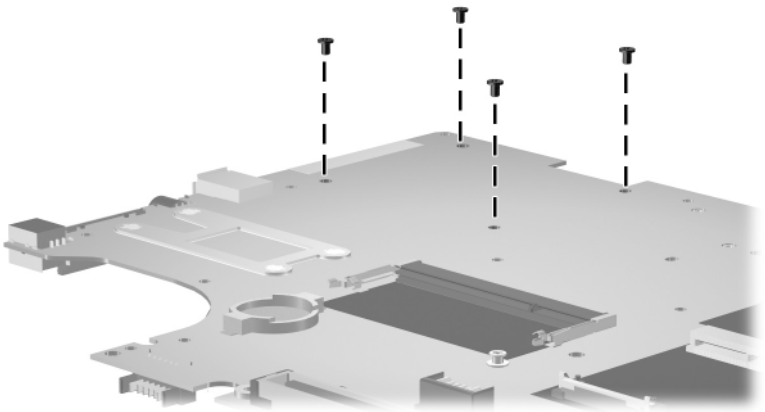
Table A-5

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

mm	Color	Qty.	Length	Thread	Head Width
	Silver	18	4.0 mm	2.0 mm	4.5 mm

Where used:

4 screws that secure the PC Card/smart card assembly to the system board (documented in Section 5.27)



Phillips PM2.0×4.0 Screw Locations

Table A-6

Torx8 T8M2.5×9.0 Screw

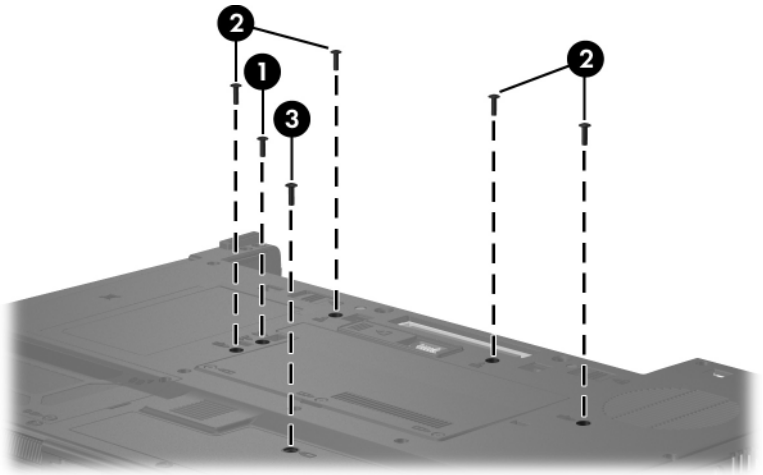
mm	Color	Qty.	Length	Thread	Head Width
	Black	26	9.0 mm	2.5 mm	5.0 mm

Where used:

❶ One screw that secures the optical drive to the computer (documented in Section 5.10)

❷ Four screws that secure the keyboard to the computer (documented in Section 5.11)

❸ One screw that secures the TouchPad to the computer (documented in Section 5.13)



Torx8 T8M2.5×9.0 Screw Locations

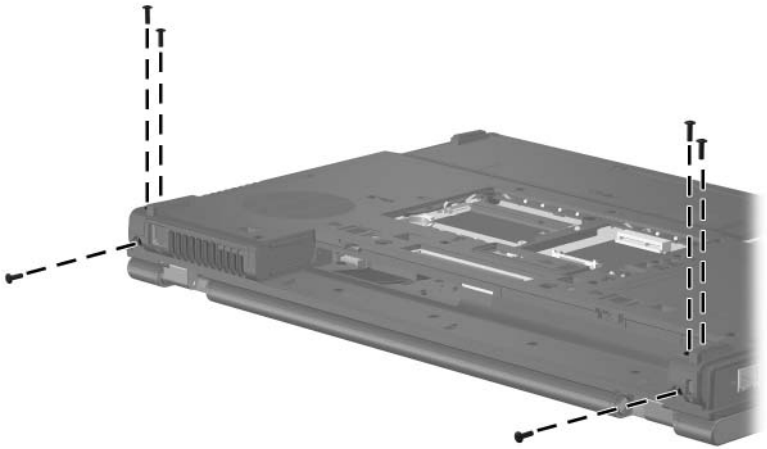
Table A-6

Torx8 T8M2.5×9.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	26	9.0 mm	2.5 mm	5.0 mm

Where used:

6 screws that secure the display assembly to the computer (documented in Section 5.22)



Torx8 T8M2.5×9.0 Screw Locations

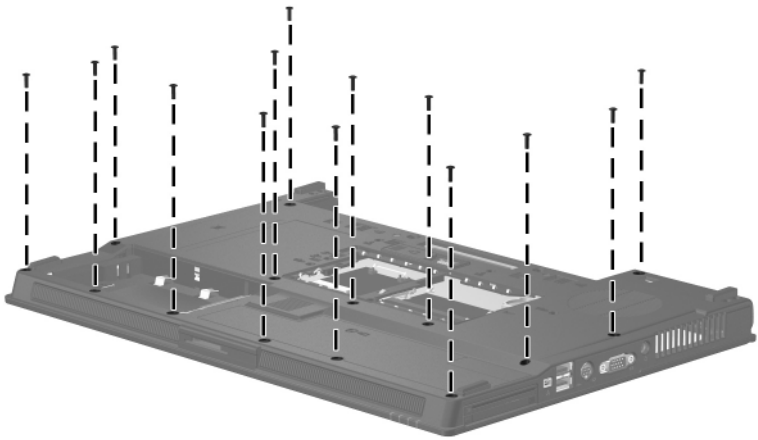
Table A-6

Torx8 T8M2.5×9.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	26	9.0 mm	2.5 mm	5.0 mm

Where used:

14 screws that secure the top cover to the computer (documented in Section 5.23)



Torx8 T8M2.5×9.0 Screw Locations

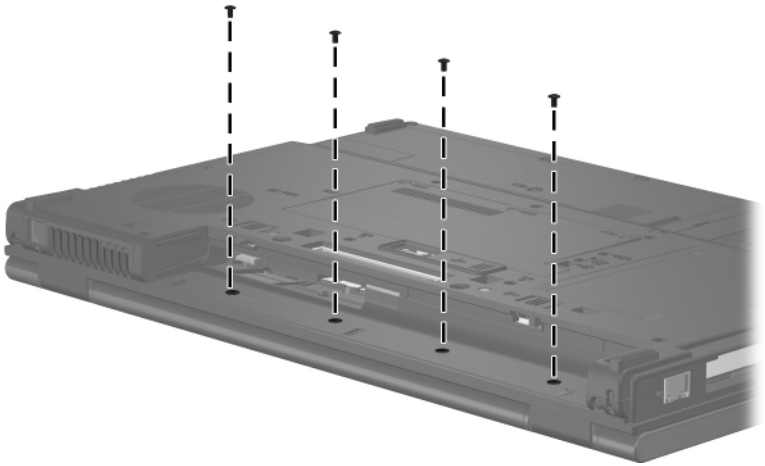
Table A-7

Torx8 T8M2.5×4.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Black	20	4.0 mm	2.5 mm	5.0 mm

Where used:

4 screws that secure the switch cover to the computer (documented in Section 5.15)



Torx8 T8M2.5×4.0 Screw Locations

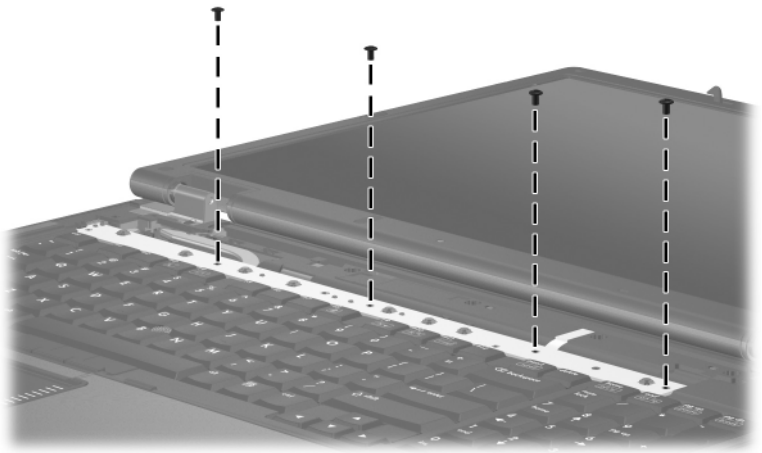
Table A-7

Torx8 T8M2.5×4.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	20	4.0 mm	2.5 mm	5.0 mm

Where used:

4 screws that secure the LED board to the computer (documented in Section 5.16)



Torx8 T8M2.5×4.0 Screw Locations

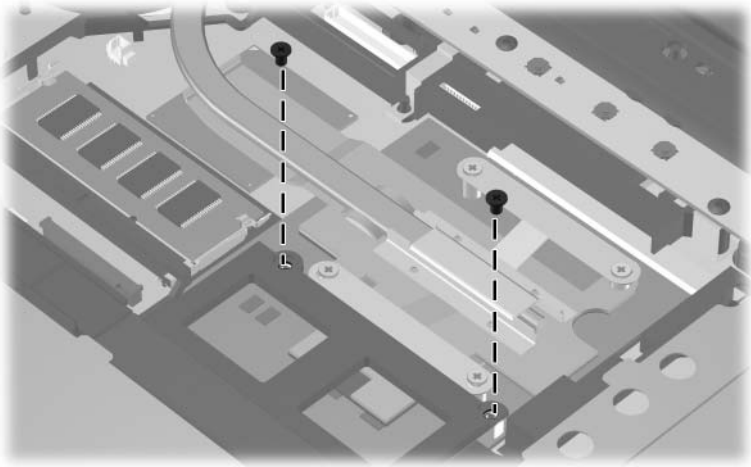
Table A-7

Torx8 T8M2.5×4.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	20	4.0 mm	2.5 mm	5.0 mm

Where used:

2 screws that secure the video board heat sink to the computer (documented in Section 5.20)



Torx8 T8M2.5×4.0 Screw Locations

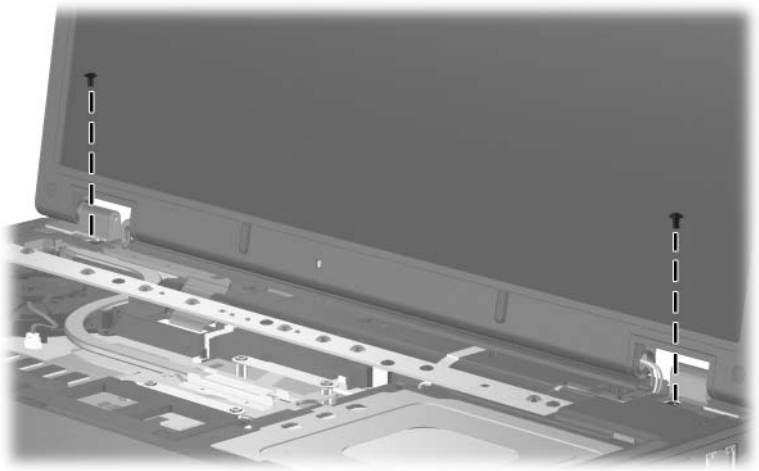
Table A-7

Torx8 T8M2.5×4.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	20	4.0 mm	2.5 mm	5.0 mm

Where used:

2 screws that secure the display assembly to the computer (documented in Section 5.22)



Torx8 T8M2.5×4.0 Screw Locations

Table A-7

Torx8 T8M2.5×4.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	20	4.0 mm	2.5 mm	5.0 mm

Where used:

4 screws that secure the display panel to the display enclosure (documented in Section 5.22)

Torx8 T8M2.5×4.0 Screw Locations

Table A-7

Torx8 T8M2.5×4.0 Screw *(Continued)*

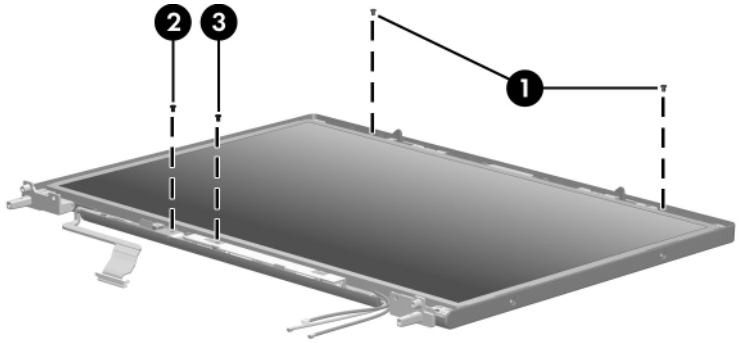
mm	Color	Qty.	Length	Thread	Head Width
	Black	20	4.0 mm	2.5 mm	5.0 mm

Where used:

❶ Two screws that secure the display panel to the display enclosure (documented in Section 5.22)

❷ One screw that secures the ambient light sensor board to the display enclosure (documented in Section 5.22)

❸ One screw that secures the inverter board to the display enclosure (documented in Section 5.22)



Torx8 T8M2.5×4.0 Screw Locations

Table A-8

Torx8 T8M2.5×19.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Black	1	19.0 mm	2.5 mm	5.0 mm

Where used:

One screw that secures the LED board to the computer (documented in Section 5.16)

Torx8 T8M2.5×19.0 Screw Location

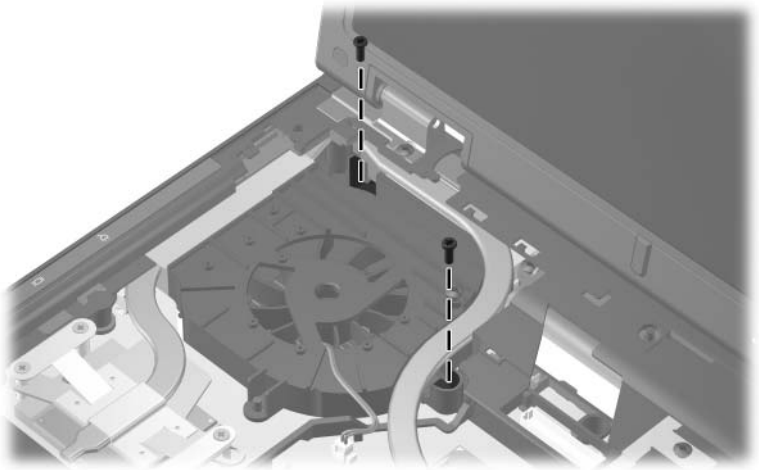
Table A-9

Torx8 T8M2.5×7.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Black	11	7.0 mm	2.5 mm	5.0 mm

Where used:

2 screws that secure the fan assembly to the computer (documented in Section 5.17)



Torx8 T8M2.5×7.0 Screw Locations

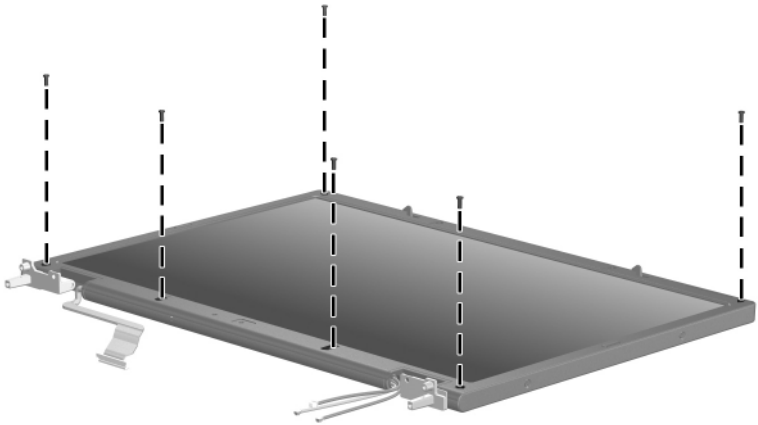
Table A-9

Torx8 T8M2.5×7.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	11	7.0 mm	2.5 mm	5.0 mm

Where used:

6 screws that secure the display bezel to the display assembly (documented in Section 5.22)



Torx8 T8M2.5×7.0 Screw Locations

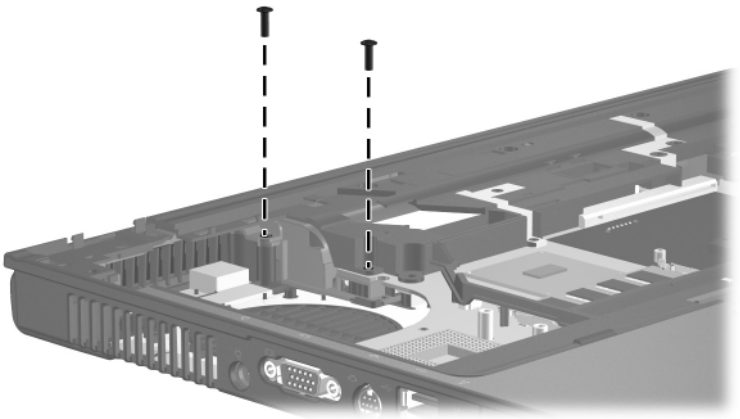
Table A-9

Torx8 T8M2.5×7.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	11	7.0 mm	2.5 mm	5.0 mm

Where used:

2 screws that secure the top cover to the computer (documented in Section 5.23)



Torx8 T8M2.5×7.0 Screw Locations

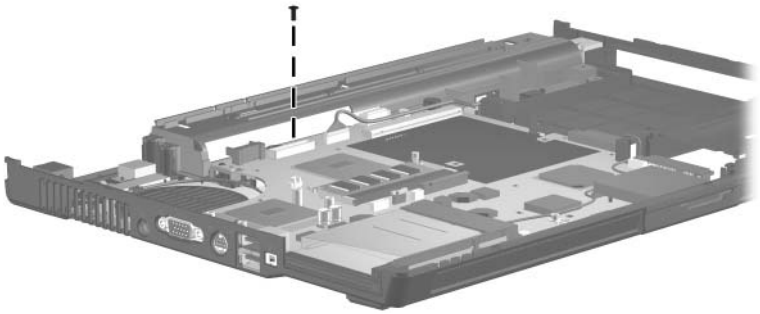
Table A-9

Torx8 T8M2.5×7.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	11	7.0 mm	2.5 mm	5.0 mm

Where used:

One screw that secures the system board to the base enclosure (documented in Section 5.25)



Torx8 T8M2.5×7.0 Screw Location

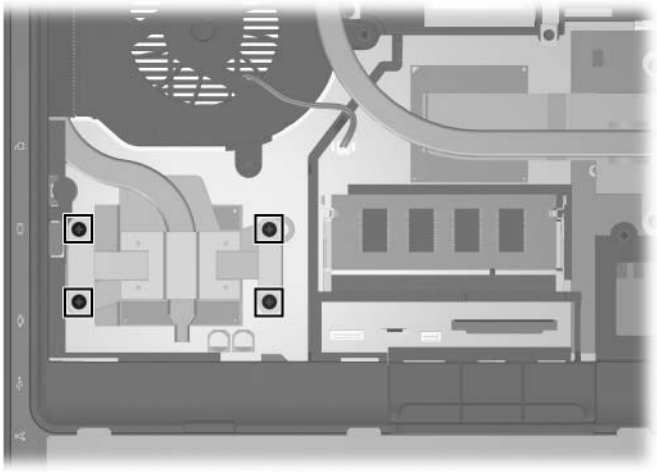
Table A-10

Phillips PM2.5×7.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Silver	10	7.0 mm	2.5 mm	5.0 mm

Where used:

4 screws that the processor heat sink to the computer (screws are secured to the heat sink by C clips; documented in Section 5.18)



Phillips PM2.5×7.0 Screw Locations

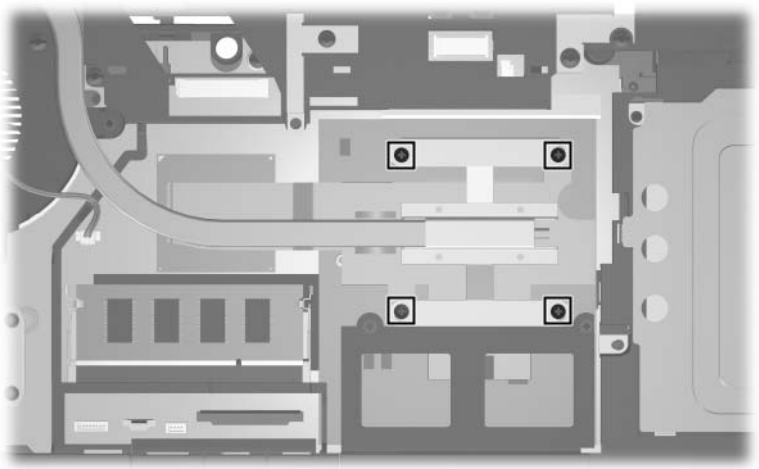
Table A-10

Phillips PM2.5×7.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Silver	10	7.0 mm	2.5 mm	5.0 mm

Where used:

4 screws that secure the video board heat sink to the computer (screws are secured to the heat sink by C clips; documented in Section 5.20)



Phillips PM2.5×7.0 Screw Locations

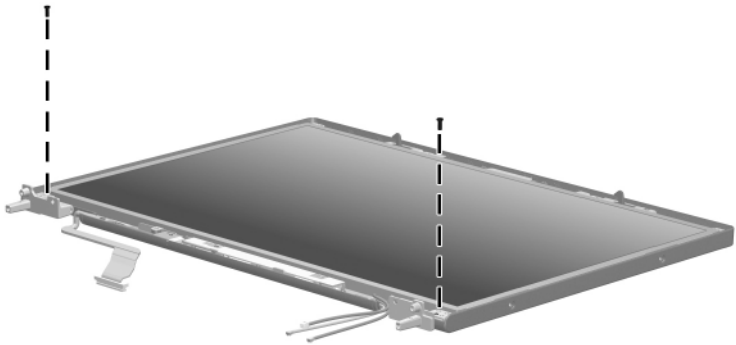
Table A-10

Phillips PM2.5×7.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Silver	10	7.0 mm	2.5 mm	5.0 mm

Where used:

2 screws that secure the display panel to the display enclosure (documented in Section 5.22)



Phillips PM2.5×7.0 Screw Locations

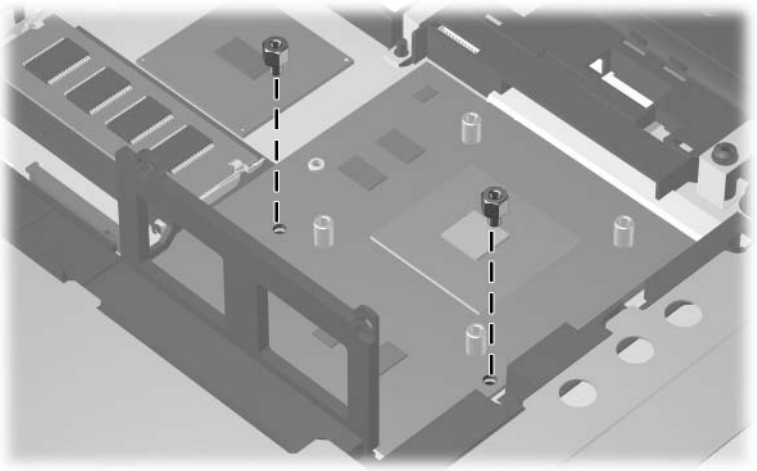
Table A-11

Hex Socket HM5.0×9.0 Screw Locks

mm	Color	Qty.	Length	Thread	Head Width
	Silver	2	9.0 mm	5.0 mm	5.0 mm

Where used:

2 screw locks that secure the video board to the computer (documented in Section 5.21)



HM5.0×9.0 Screw Lock Locations

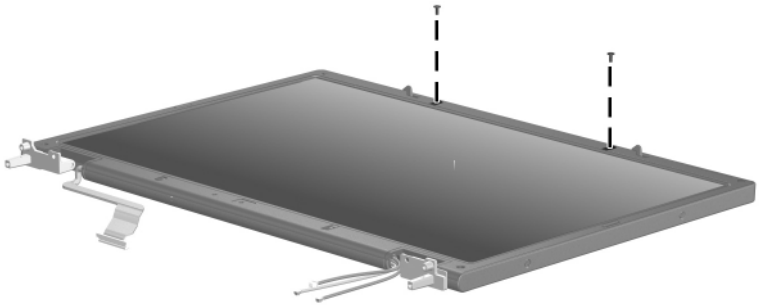
Table A-12

Phillips PM2.0×6.0 Screws

mm	Color	Qty.	Length	Thread	Head Width
	Silver	2	6.0 mm	2.0 mm	4.5 mm

Where used:

2 screws that secure the display bezel to the display enclosure (documented in Section 5.22)



Phillips PM2.0×6.0 Screw 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 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.

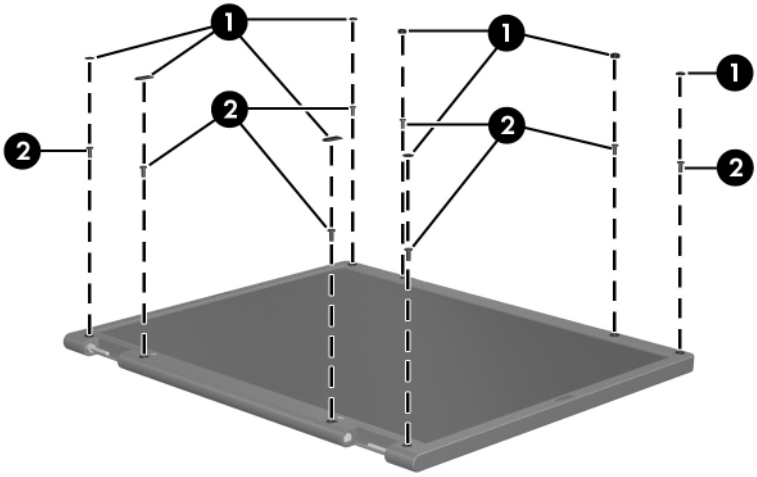
Disposal of mercury may be regulated because of environmental considerations. For disposal or recycling information, contact your local authorities or the Electronic Industries Alliance (EIA) at http://www.eiae.org.

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.

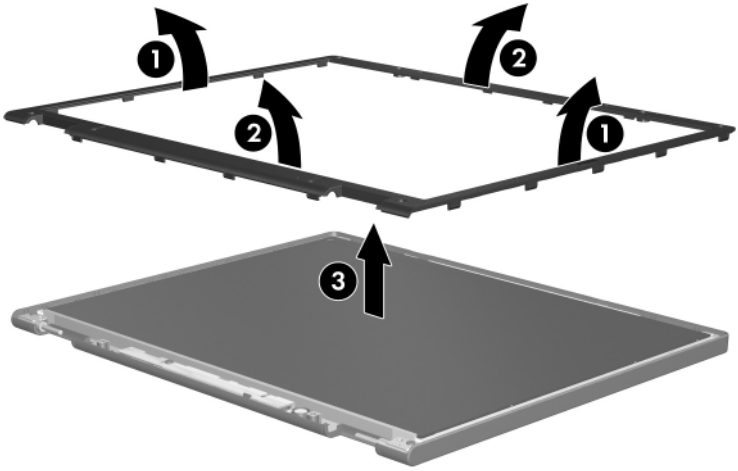
Perform the following steps to disassemble the display assembly:

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



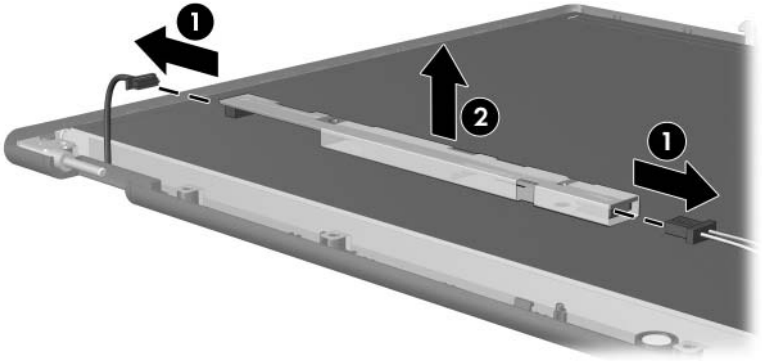
Removing the Display Bezel Screw Covers and Screws

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.



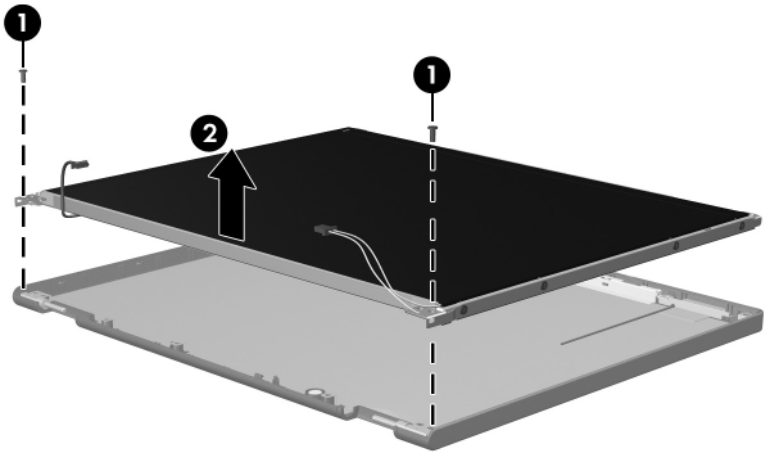
Removing the Display Bezel

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



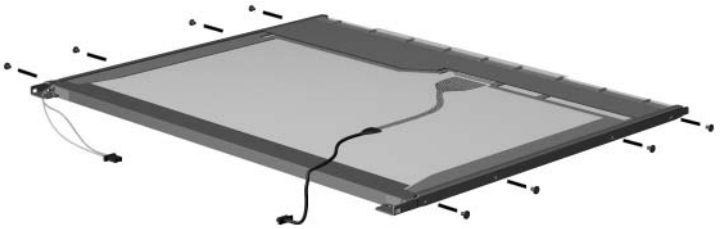
Removing the Display Inverter

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.



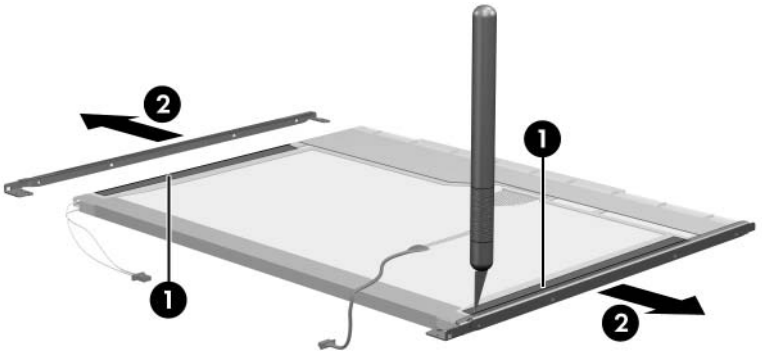
Removing the Display Panel Assembly

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



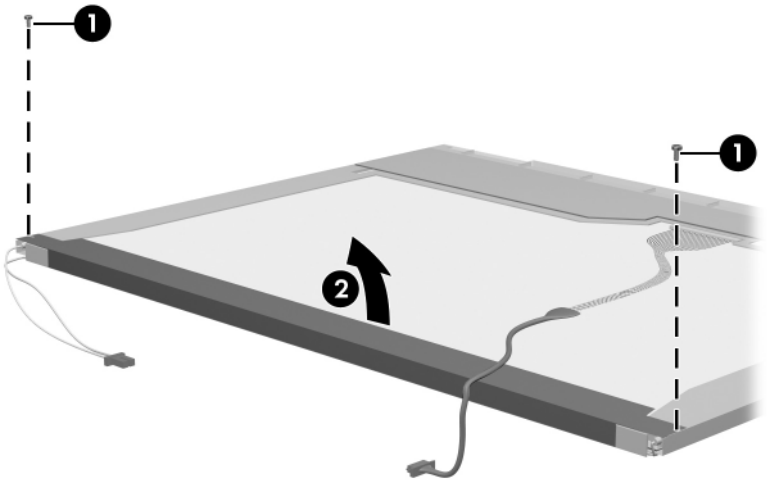
Removing the Display Panel Frame Screws

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.



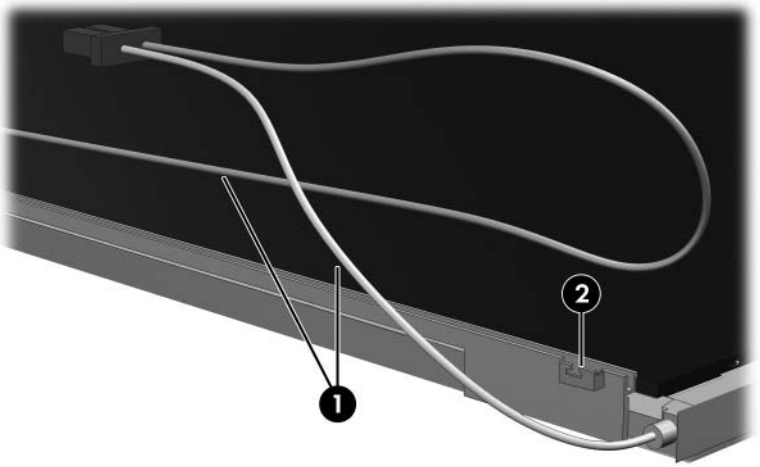
Removing the Display Frame

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.



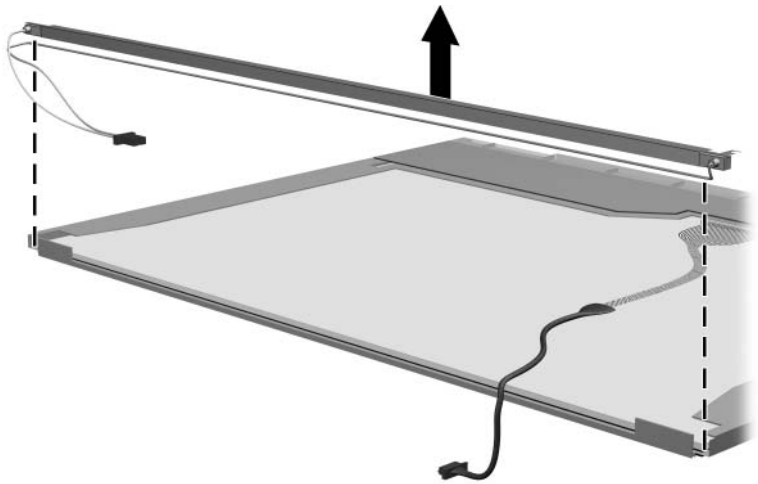
Removing the Backlight Cover

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

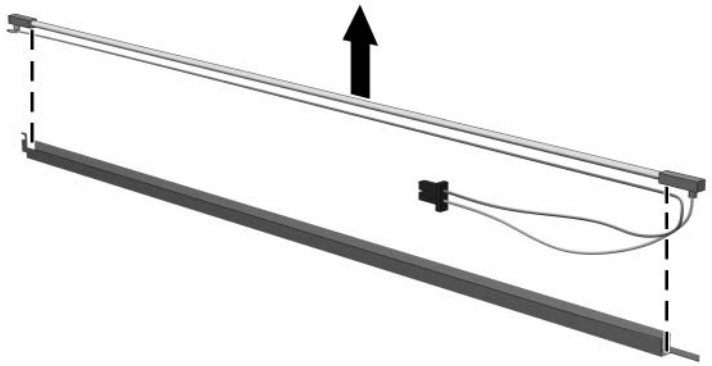
16. Turn the display panel upside down.
17. Remove the backlight frame from the display panel.



Removing the Backlight Frame

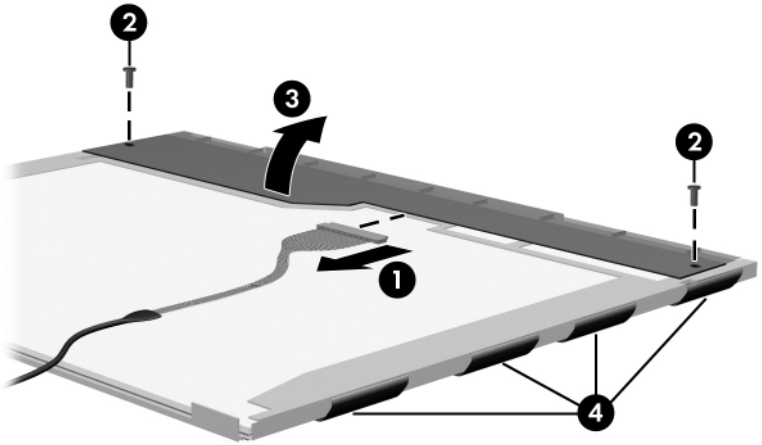
WARNING: The backlight contains mercury. Caution should be exercised when removing and handling the backlight to avoid damaging this component and causing exposure to the mercury.

18. Slide the backlight out of the backlight frame.



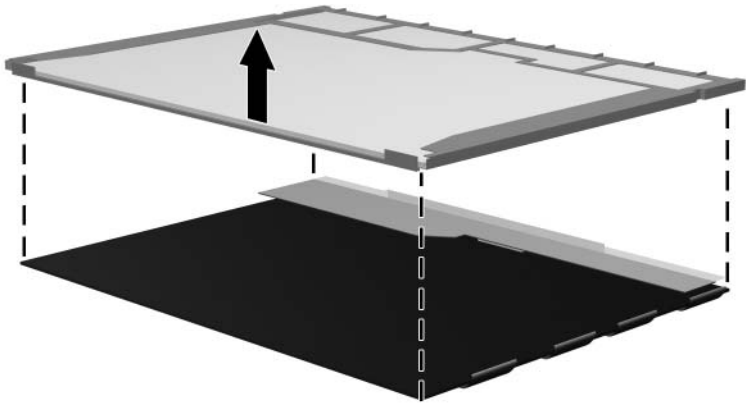
Removing the Backlight

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

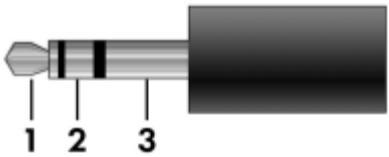
24. Recycle the LCD panel and backlight.

D

Connector Pin Assignments

Table D-1

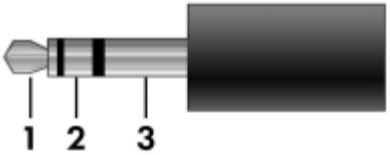
Audio-Out (Headphone)



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

Table D-2

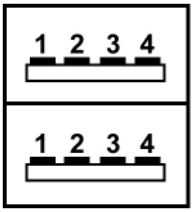
Audio-In (Microphone)



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

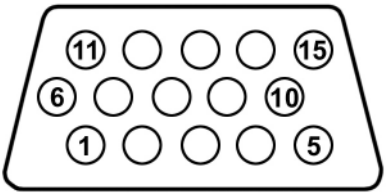
Table D-4

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-5

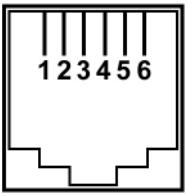
External Monitor



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-6

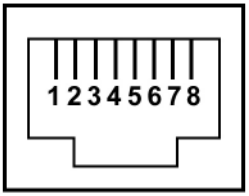
RJ-11 (Modem)



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

Table D-7

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	KE A	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.

Index

D

E

F

N

O

P

R

S

T

U

V

W