



Maintenance and Service Guide

HP Compaq nc4400 Notebook PC

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

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Maintenance and Service Guide
HP Compaq nc4400 Notebook PC
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Contents

1 Product Description

1.1 Features	1-2
1.2 Resetting the Computer.	1-4
1.3 Power Management.	1-5
1.4 External Components	1-6
1.5 Design Overview.	1-20

2 Troubleshooting

2.1 Computer Setup.	2-1
Using Computer Setup	2-1
Selecting from the File Menu	2-2
Selecting from the Security Menu	2-3
Selecting from the Diagnostics Menu	2-4
Selecting from the System Configuration Menu.	2-5
2.2 Troubleshooting Flowcharts	2-6

3 Illustrated Parts Catalog

3.1 Serial Number Location	3-1
3.2 Computer Major Components	3-2
3.3 Display Assembly Components	3-11
3.4 Plastics Kit	3-13
3.5 Cable Kit	3-14
3.6 Miscellaneous (Not Illustrated)	3-15
3.7 Sequential Part Number Listing	3-17

4 Removal and Replacement Preliminaries

4.1 Tools Required	4-1
4.2 Service Considerations	4-2
Plastic Parts	4-2
Cables and Connectors	4-2
4.3 Preventing Damage to Removable Drives	4-3
4.4 Preventing Electrostatic Damage	4-4
4.5 Packaging and Transporting Precautions	4-5
4.6 Workstation Precautions	4-6
4.7 Grounding Equipment and Methods	4-7

5 Removal and Replacement Procedures

5.1	Serial Number	5-2
5.2	Disassembly Sequence Chart	5-3
5.3	Preparing the Computer for Disassembly	5-5
5.4	Hard Drive	5-7
5.5	Computer Feet	5-11
5.6	Bluetooth Module	5-12
5.7	External Memory Module	5-14
5.8	Keyboard Cover	5-17
5.9	Keyboard	5-20
5.10	Fan	5-24
5.11	Heat Sink	5-25
5.12	Processor	5-28
5.13	Internal Memory Module	5-30
5.14	Mini Card WLAN Module	5-32
5.15	Display Assembly	5-34
5.16	Button Board	5-48
5.17	Top Cover	5-51
5.18	TouchPad	5-55
5.19	Speaker	5-59
5.20	Infrared Board	5-61
5.21	System Board	5-63
5.22	Modem Module	5-68
5.23	RTC Battery	5-70

6 Specifications

A Screw Listing

B Software Backup and Recovery

C Display Component Recycling

D Connector Pin Assignments

E Power Cord Set Requirements

Index

1

Product Description

The HP Compaq nc4400 Notebook PC offers advanced modularity, Intel® Core™ Duo and Celeron® M processors, and extensive multimedia support.



HP Compaq nc4400 Notebook PC

1.1 Features

- Intel Core Duo T2600 (2.17-GHz), T2500 (2.00-GHz), T2400 (1.83-GHz), and T2300 (1.67-GHz) or Intel Celeron M 1.60-GHz processors, varying by computer model
- 12.1-inch, XGA, TFT (1024 × 768) display with over 16.8 million colors
- 100-, 80-, or 60-GB high-capacity hard drive, varying by computer model
- 256-MB DDR2 synchronous DRAM (SDRAM) at 633 MHz and 533 MHz, expandable to 4.0 GB
- Microsoft® Windows® XP Home Edition or Windows XP Professional, varying by computer model
- Full-size Windows keyboard with embedded numeric keypad
- TouchPad and pointing stick pointing devices, including a dedicated vertical scroll region
- Integrated 10Base-T/100Base-T/1000Base-T 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 802.11b/g and 802.11a/b/g 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

- External 65-watt AC adapter with 3-wire power cord
- 6-cell Li-Ion battery pack
- Audio speaker
- Volume up, volume mute, and volume down buttons
- Connectors:
 - Infrared
 - Audio-out (headphone)
 - Audio-in (microphone)
 - Universal Serial Bus (USB) v. 2.0 (3 ports, 1 powered)
 - Smart adapter power
 - External monitor
 - RJ-45 (network)
 - RJ-11 (modem)
 - S-Video-out
 - PC Card
 - Digital Media Slot
 - Primary battery pack
 - Accessory battery pack
 - Docking connector

1.2 Resetting the Computer

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



The following steps will not clear an unknown password if the stringent security option has been enabled in the BIOS. If stringent security is enabled, the system board must be replaced to reset an unknown password. Refer to [Section 5.21, “System Board,”](#) for more information on replacing the system board.

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

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

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 5.23, “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 pack 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 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

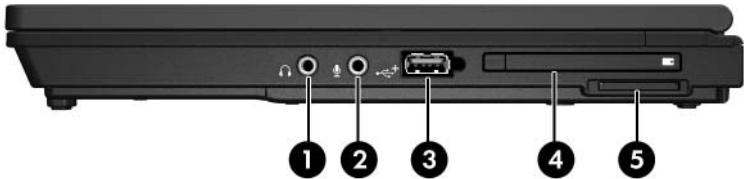
Table 1-1
Front Components

Item	Component	Function
1	Wireless light	On: An integrated wireless device, such as a wireless local area network (WLAN) device and/or Bluetooth® device, is turned on.
2	Power light	<ul style="list-style-type: none">■ On: The computer is on.■ Blinking green: The computer is in standby.■ Blinking rapidly: Wrong AC adapter is connected. Connect an HP Smart AC Adapter.■ Off: The computer is off or in hibernation.

Table 1-1
Front Components (Continued)


Item	Component	Function
3	Battery light	<ul style="list-style-type: none"> ■ 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 pack 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 battery packs 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 pack reaches a low-battery condition, when the light begins blinking amber.
4	Drive light	<ul style="list-style-type: none"> ■ Blinking green: The hard drive or optical drive is being accessed. ■ Amber: HP Mobile Data Protection has temporarily parked the hard drive.
5	Infrared port	Provides wireless communication between the computer and an optional IrDA-compliant device.
6	Display release button	Opens the computer.
7	Internal microphone	Records sound.
8	Fingerprint reader	Allows a fingerprint logon to Windows instead of using a password.

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

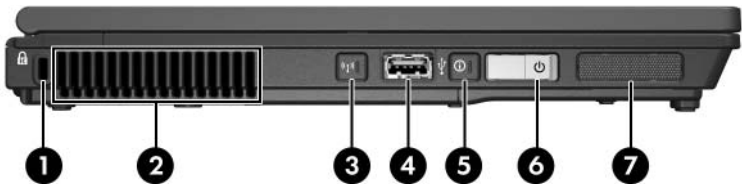


Right-Side Components

Table 1-2
Right-Side Components

Item	Component	Function
1	Audio-out (headphone) jack	Connects an optional headphone 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 (single sound channel) or stereo (dual sound channel) microphone.
3	Powered USB port	Connects USB 1.1- or 2.0-compliant devices to the computer using a standard USB cable, or connects an optional external MultiBay or external MultiBay II to the computer. This USB port is a powered port that can be used without external power.
4	PC Card slot or optional smart card reader	 On select computer models, the PC Card slot may be replaced with an optional smart card reader. If your computer has <ul style="list-style-type: none"> ■ a PC Card slot, it supports optional Type I, Type II, 32-bit (CardBus), or 16-bit PC Cards. ■ a smart card reader, it accepts smart cards or Java™ Cards.
5	Digital Media Slot	Supports Secure Digital (SD) Memory Cards and MultiMediaCards (MMC).

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	Security cable slot	Attaches an optional security cable to the computer.  The purpose of security solutions is to act as deterrents. These deterrents may not prevent a product from being mishandled or stolen.
2	Vent	Provides airflow to cool internal components.  To prevent overheating, do not obstruct vents. Use the computer only a hard, flat surface. Do not allow a hard surface, such as an adjoining printer, or a soft surface, such as pillows or thick rugs or clothing, to block airflow.  Depending on the computer model, vents vary in number and location.

Table 1-3
Left-Side Components (Continued)

Item	Component	Function
3	Wireless button	<p>Turns the wireless functionality of the WLAN or Bluetooth device on or off, but does not establish a connection.</p> <p> To establish a wireless connection, a wireless network must already be set up.</p>
4	USB port	Connects a USB 1.1- and 2.0-compliant device to the computer using a standard USB cable.
5	Info Center button	Launches Info Center, which enables you to open various software solutions.
6	Power switch	<p>When the computer is</p> <ul style="list-style-type: none"> ■ Off, slide toward the front of the computer and release to turn on the computer. ■ In standby, slide toward the front of the computer and release to exit standby. ■ In hibernation, slide toward the front of the computer and release to exit hibernation. <p>If the computer has stopped responding and Microsoft Windows shutdown procedures cannot be used, slide toward the front of the computer and hold for 4 seconds to turn off the computer.</p>
7	Speaker	Enables you to listen to music and hear audio alerts and signals from programs.

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

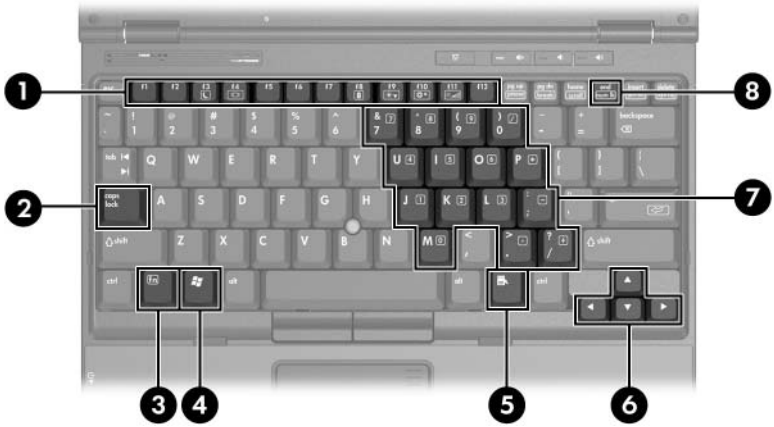


Rear Panel Components

Table 1-4
Rear Panel Components

Item	Component	Function
1	USB port	Connects USB 1.1- and 2.0-compliant devices to the computer using a standard USB cable.
2	RJ-11 (modem) jack	Connects a modem cable. Enabled with 56-K connectivity.
3	RJ-45 (network) jack	Connects a network cable. Enabled with 10BASE-T/100BASE-TX/1000BASE-T connectivity.
4	Smart adapter power connector	Connects an AC adapter, an optional AC adapter, or an optional power cable.
5	External monitor port	Connects an optional VGA external monitor or projector.
6	S-Video-out jack	<p>Is a 7-pin, dual-purpose jack.</p> <p>It connects an optional S-Video device, such as a television, VCR, camcorder, overhead projector, or video capture card, with an optional, standard (4-pin) S-Video cable.</p> <p>The extra 3 pins also enable an optional S-Video-to-composite adapter to be used with the computer.</p>

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	Function keys (6)	Perform system and application tasks. When combined with the fn key, the function keys f3 , f4 , and f8 through f11 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	Displays the Microsoft Windows Start menu.
5	Windows applications key	Displays a shortcut menu for items beneath the pointer.
6	Arrow keys	Moves the cursor around the screen.
7	Embedded numeric keypad	Can be used like 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.

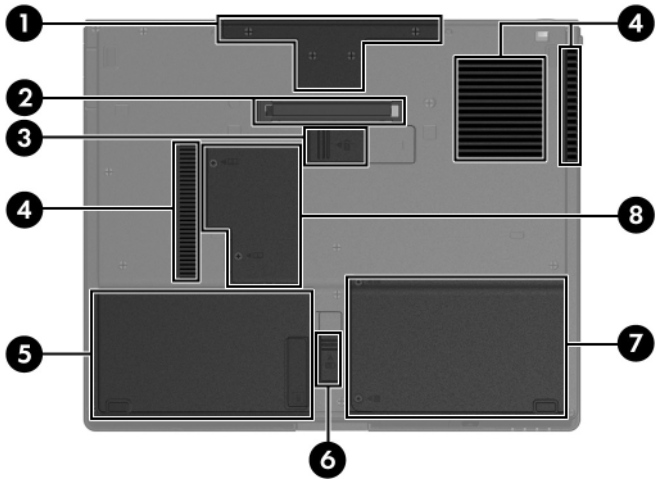


Top Components

Table 1-6
Top Components


Item	Component	Function
1	Left and right TouchPad buttons (2)	Function like the left and right buttons on an external mouse.
2	TouchPad	Moves the pointer. Can be set to perform other mouse functions, such as scrolling, selecting, and double-clicking.
3	Left and right pointing stick buttons (2)	Function like the left and right buttons on an external mouse.
4	Pointing stick	Moves the pointer.
5	Vent	Provides airflow to cool internal components.  To prevent overheating, do not obstruct vents. Use the computer only a hard, flat surface. Do not allow a hard surface, such as an adjoining printer, or a soft surface, such as pillows or thick rugs or clothing, to block airflow.
6	Presentation button	Starts the presentation feature.
7	Volume mute button	Mutes or restores volume.
8	Volume down button	Decreases computer sound.
9	Volume up button	Increases computer sound.
10	TouchPad scroll zone	Scrolls upward or downward.

The external components on the bottom of the computer are shown below and described in Table 1-7.



Bottom Components

Table 1-7
Bottom Components

Item	Component	Function
1	Base enclosure cover	Covers the display cable and connector.
2	Docking connector	Connects the computer to an optional docking device.
3	Accessory battery connector	Connects an optional HP Ultra-Capacity Battery or HP Extended Life Battery.
4	Vents (3)	Provides airflow to cool internal components.  To prevent overheating, do not obstruct vents. Use the computer only a hard, flat surface. Do not allow a hard surface, such as an adjoining printer, or a soft surface, such as pillows or thick rugs or clothing, to block airflow.
5	Battery bay	Holds the battery pack.
6	Battery release latch	Releases the battery pack from the battery bay.
7	Hard drive cover	Holds the primary hard drive.
8	Expansion memory module compartment	Contains one expansion memory module slot.

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
- Bluetooth
- Display
- Hard drive
- Intel Core Duo and Celeron M processors
- Keyboard
- Memory module
- Mini Card devices
- PC Card
- Pointing stick
- TouchPad



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

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

Troubleshooting



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

2.1 Computer Setup

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

Using Computer Setup

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

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

2. Select the **File, Security, Diagnostics, or System Configuration** menu.
3. To close Computer Setup and restart the computer:
 - ❑ Select **File > Save changes and exit**, and then press **enter**.
 - or –
 - ❑ Select **File > Ignore changes and exit**, and then press **enter**.
 - or –
 - ❑ Select **File > Restore defaults**, and then press **enter**.
4. When you are prompted to confirm your action, press **f10**.



Selecting from the File Menu

Table 2-1
File Menu

Select	To Do This
System Information	<ul style="list-style-type: none">■ View identification information about the computer, processor, memory and cache size, and system ROM.■ View BIOS revision, keyboard controller version, and battery pack serial number information.

Selecting from the Security Menu

Table 2-2
Security Menu

Select	To Do This
Setup Password	Enter, change, or delete an Setup password.
Power-On Password	Enter, change, or delete a power-on password.
Password Options (Password options can be selected only when a power-on password has been set.)	Enable/disable: <ul style="list-style-type: none"> ■ Stringent security. ■ Requirement of password on restart.
DriveLock Passwords	Enable/disable DriveLock; change a DriveLock user or master password. <p> DriveLock Settings are accessible only when you enter Computer Setup by turning on (not restarting) the computer.</p>
Smart Card Security	Enable/disable smart card power-on support. <p> A setup password must be established to use this feature.</p>
TPM Embedded Security	Enable/disable: <ul style="list-style-type: none"> ■ Embedded security device state. ■ Power-on authentication support. ■ Automatic DriveLock support.
System IDs	Establish: <ul style="list-style-type: none"> ■ Notebook asset tracking number. ■ Notebook ownership tags.
Disk Sanitizer	Establish fast, optimum, or custom settings for disk sanitizing.

*Not applicable to SuperDisk LS-120 drives.

Selecting from the Diagnostics Menu

Table 2-3
Diagnostics Menu

Select	To Do This
HDD Self-Test Options	Run a quick comprehensive self test on hard drives in the system that support the test features.
Memory Check	Run a quick comprehensive test on system memory on the following categories: <ul style="list-style-type: none">■ Walking 0s■ Walking 1s■ High Address line testing■ Alternate Pattern testing

Selecting from the System Configuration Menu

Table 2-4
System Configuration Menu

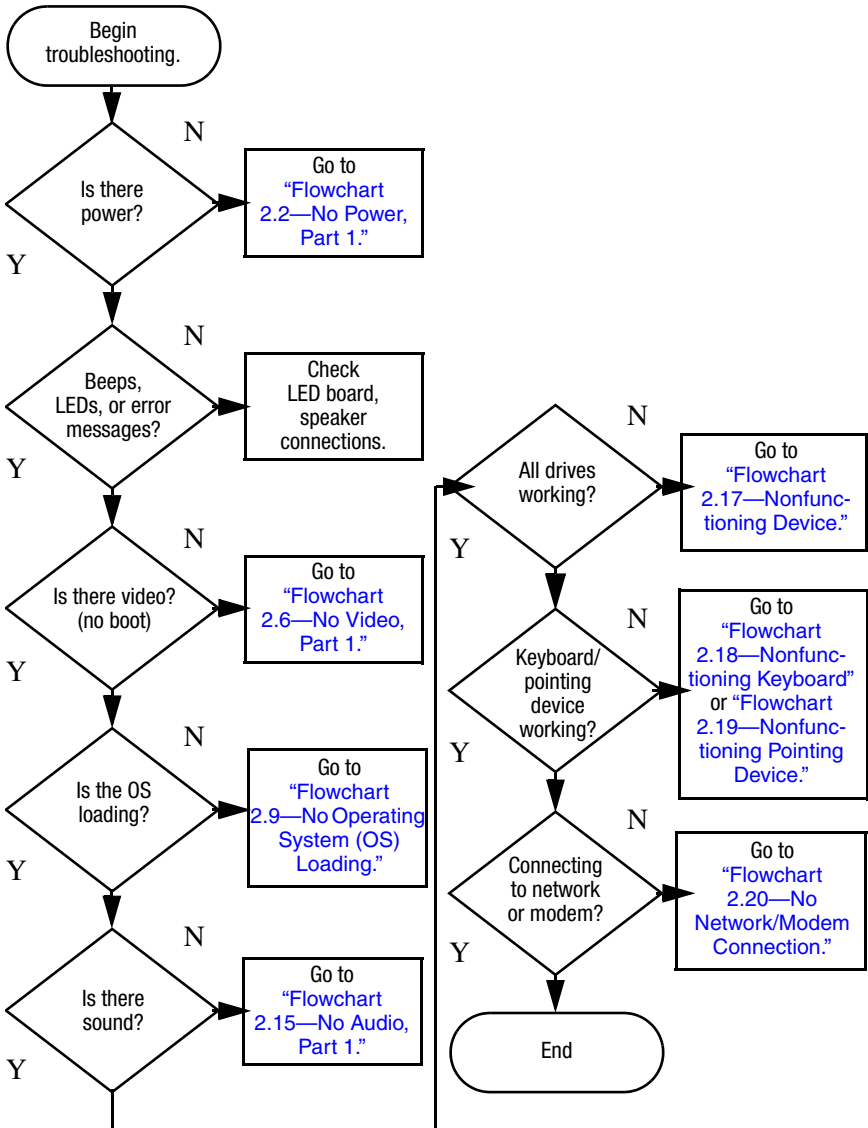
Select	To Do This
Language	Change the Computer Setup language.
Boot Options	Enable/disable MultiBoot, which sets a startup sequence that can include most bootable devices and media in the system.
Device Configurations	Enable/disable: <ul style="list-style-type: none"> ■ Swap Fn/Ctrl keys. ■ USB legacy support. ■ BIOS DMA data transfers. ■ Fan Always on while on AC Power. ■ Data Execution Prevention. ■ LAN Power save.
Built-In Device Options	Enable/disable: <ul style="list-style-type: none"> ■ Embedded WLAN Device Radio. ■ Embedded Bluetooth Device Radio. ■ LAN/WLAN Switching. ■ Wake on LAN from Off.
Port Options	Enable/disable: <ul style="list-style-type: none"> ■ USB Port. ■ 1394 Port. ■ CardBus Slot.

2.2 Troubleshooting Flowcharts

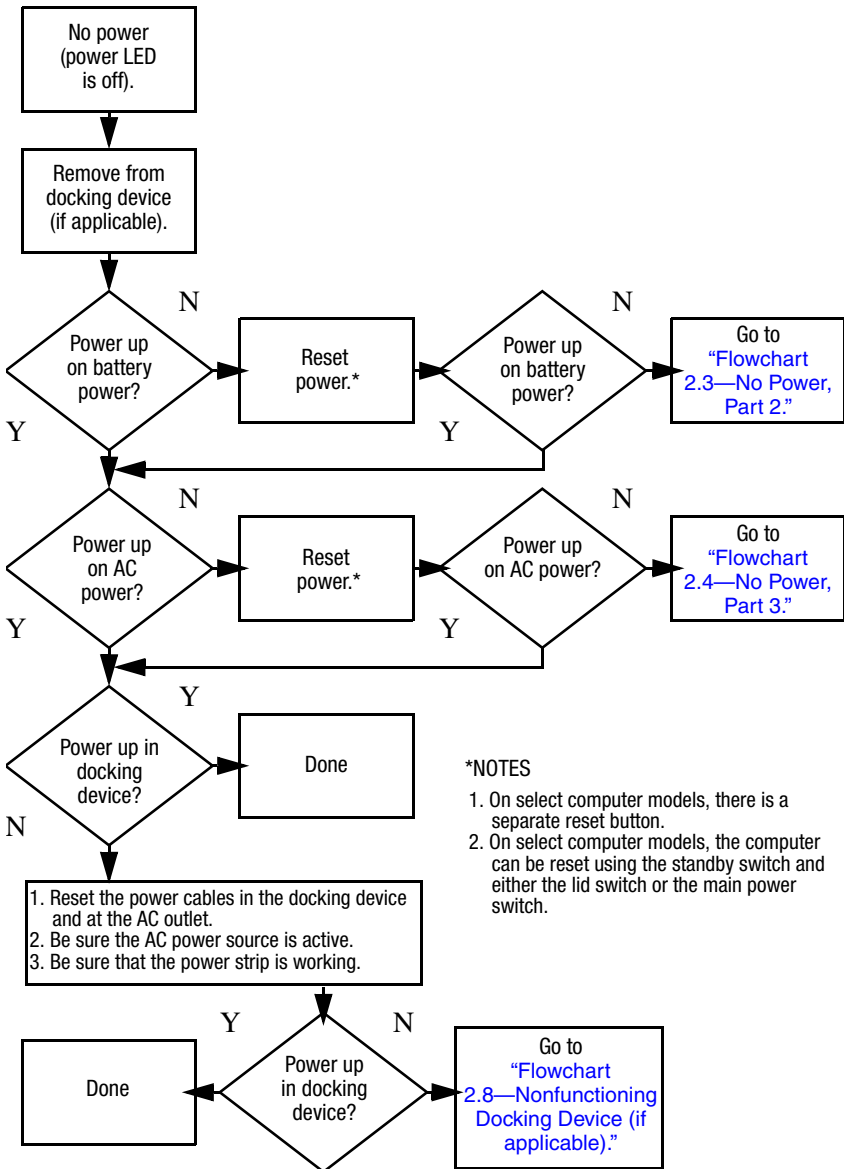
Table 2-5
Troubleshooting Flowcharts Overview

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

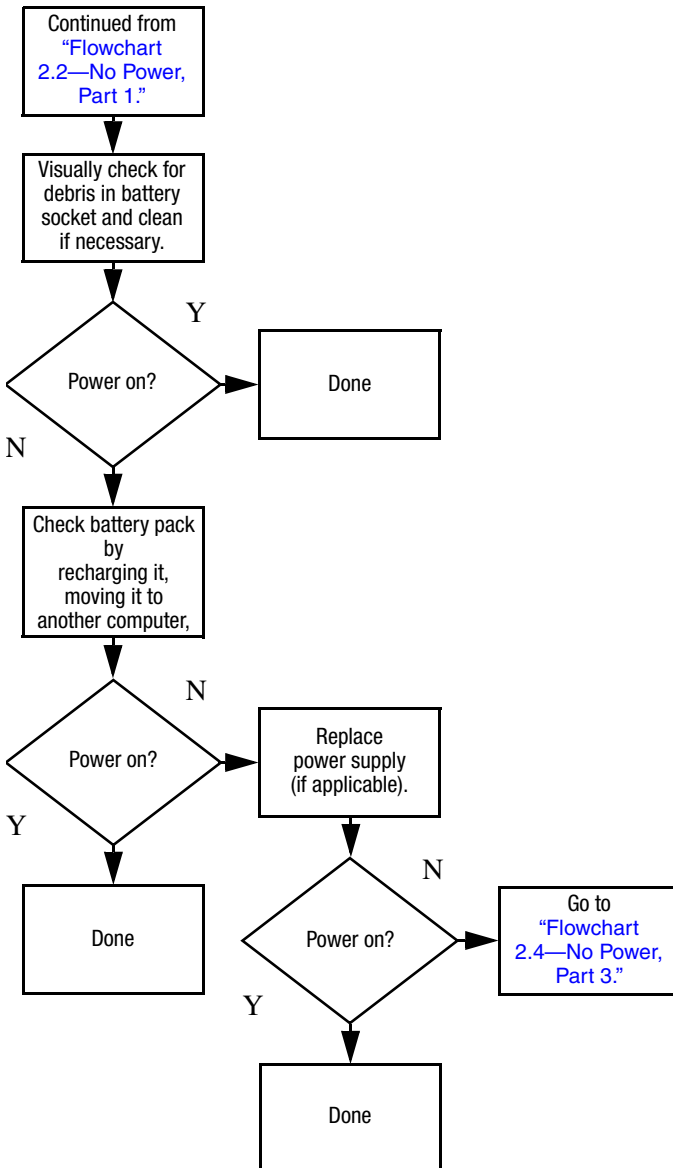
Flowchart 2.1 – Initial Troubleshooting



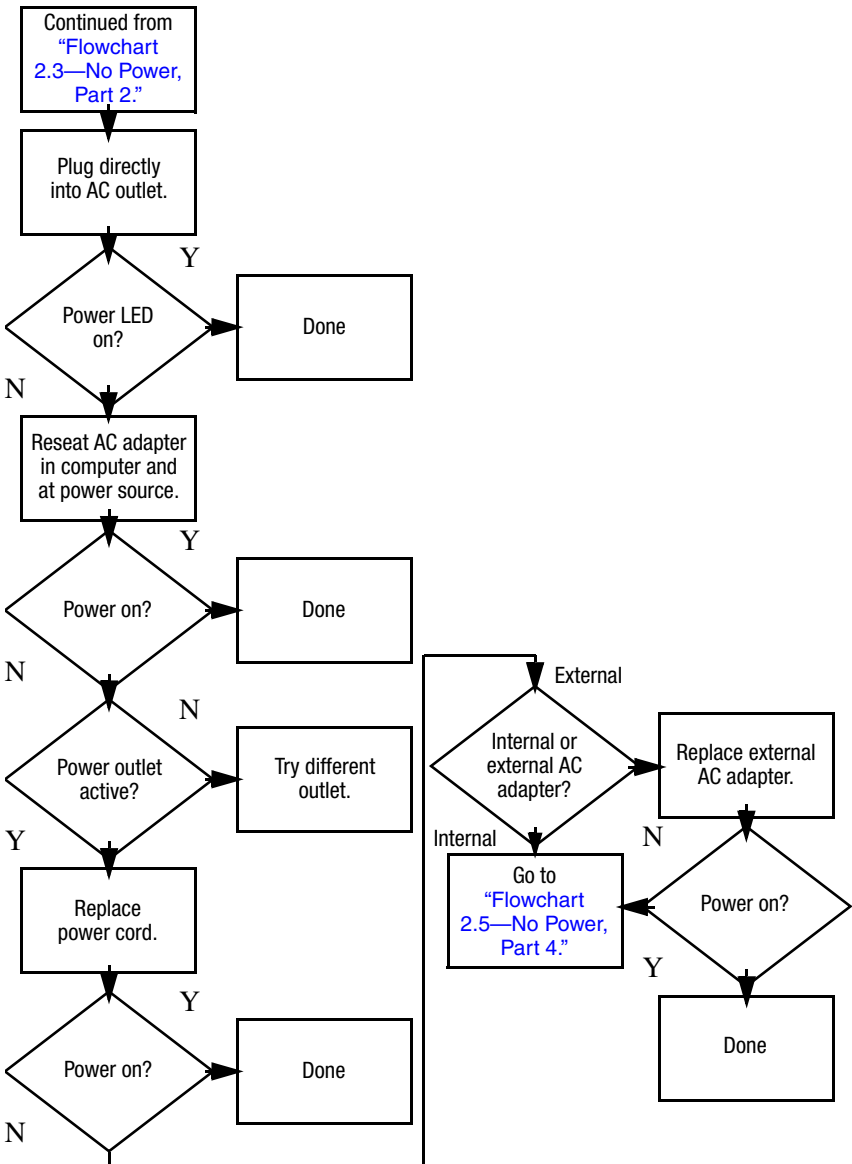
Flowchart 2.2—No Power, Part 1



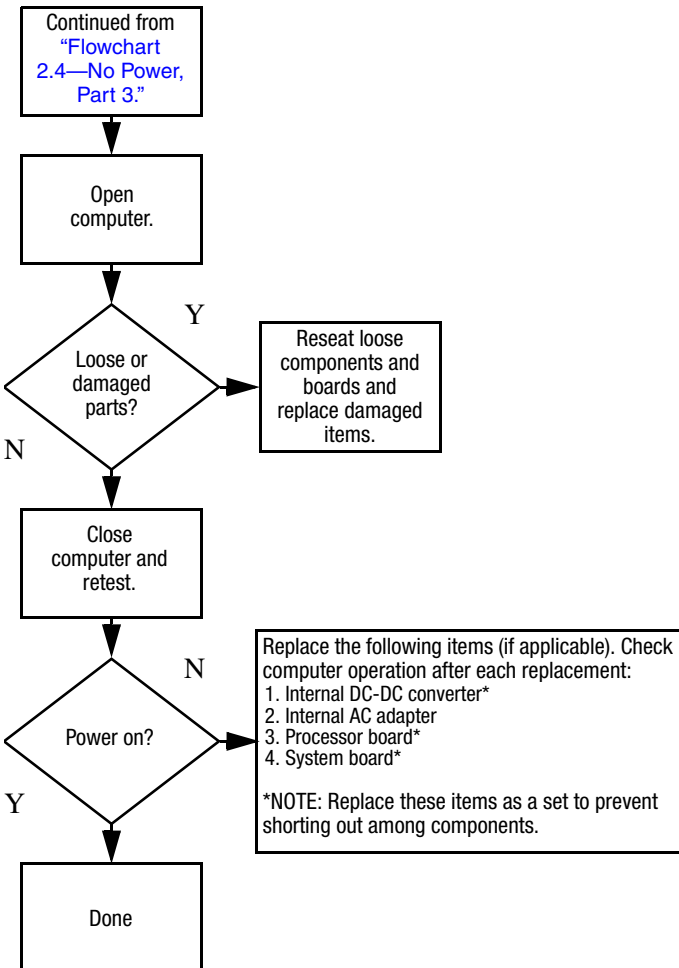
Flowchart 2.3—No Power, Part 2



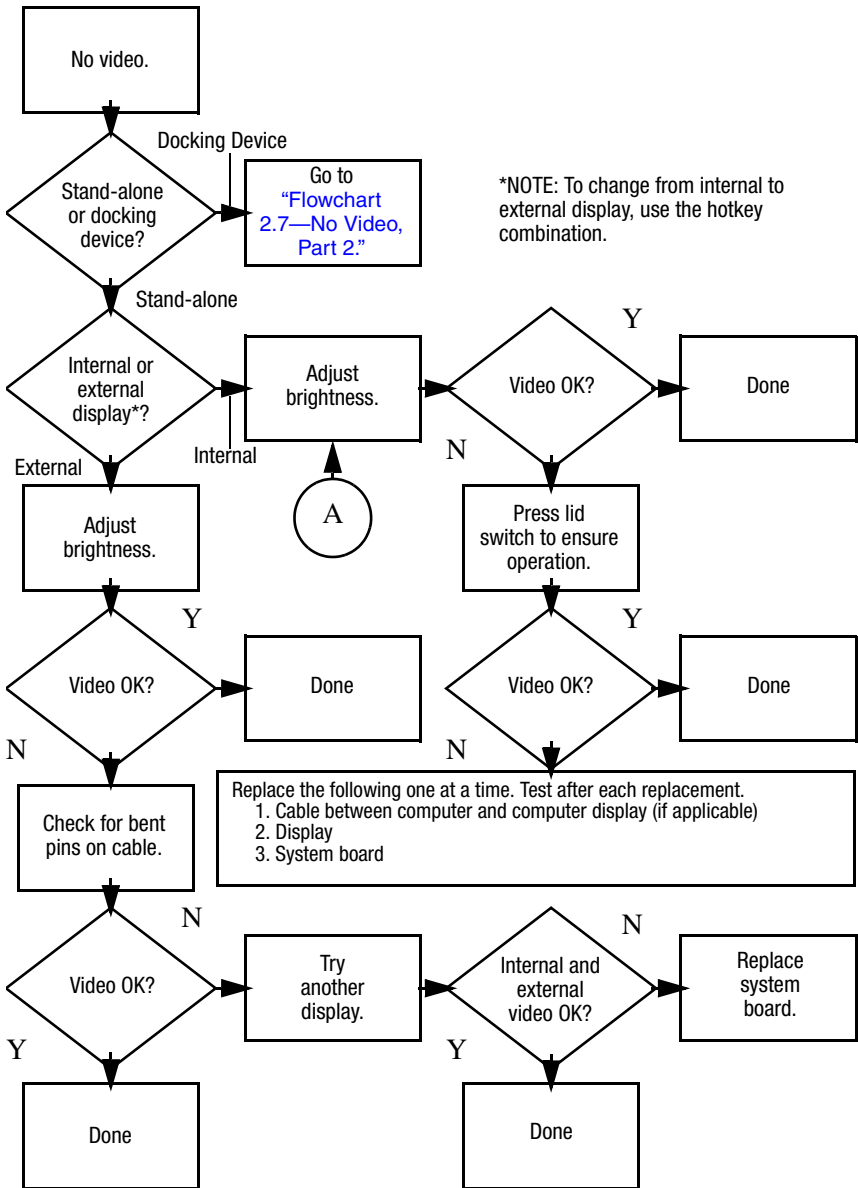
Flowchart 2.4—No Power, Part 3



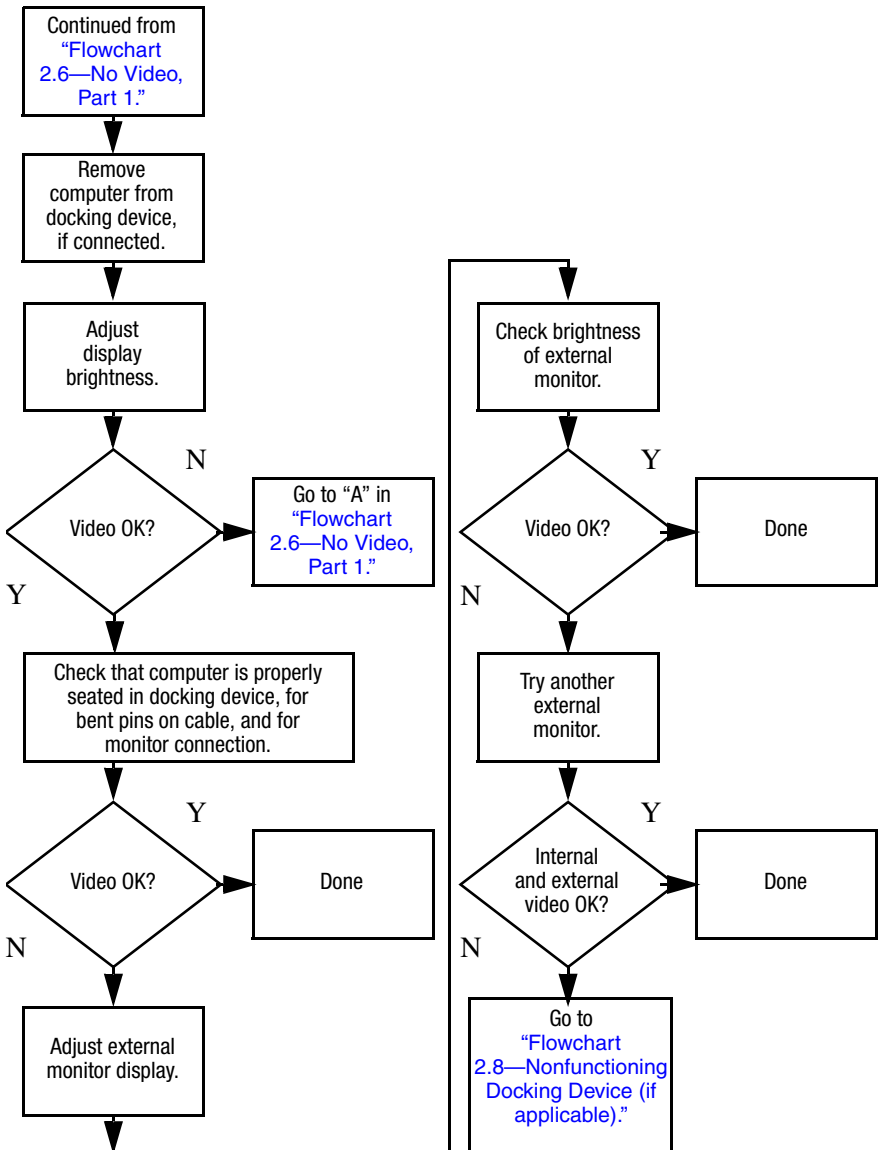
Flowchart 2.5—No Power, Part 4



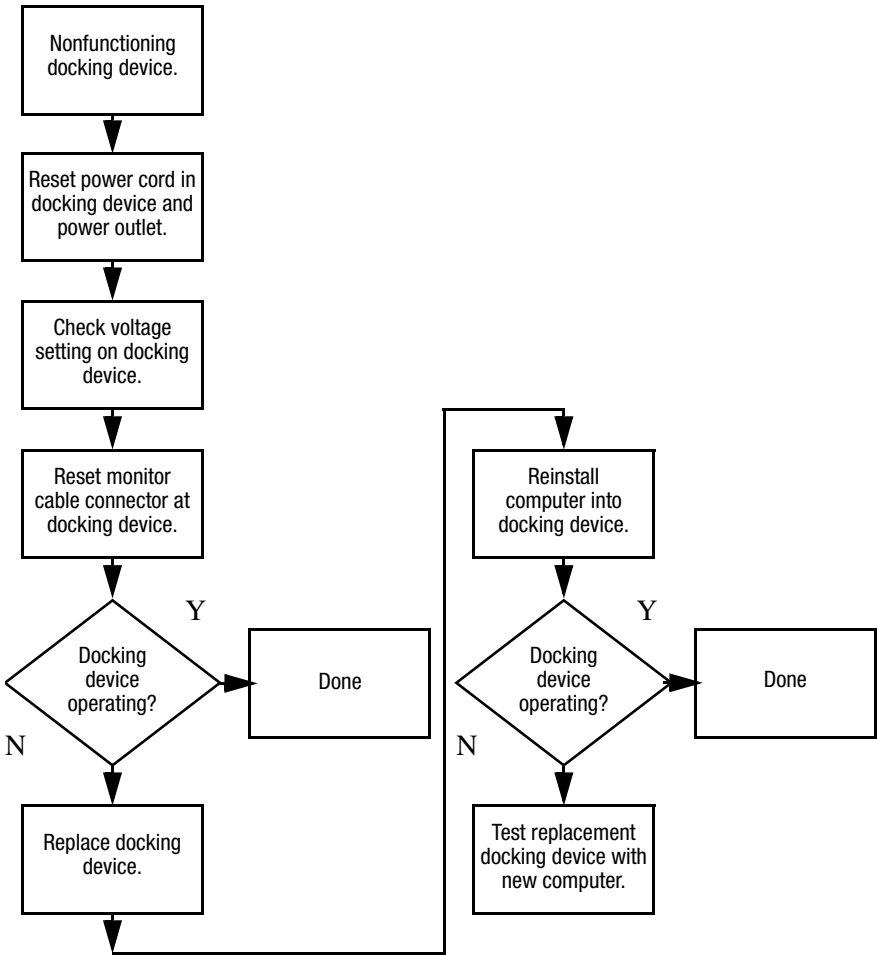
Flowchart 2.6—No Video, Part 1



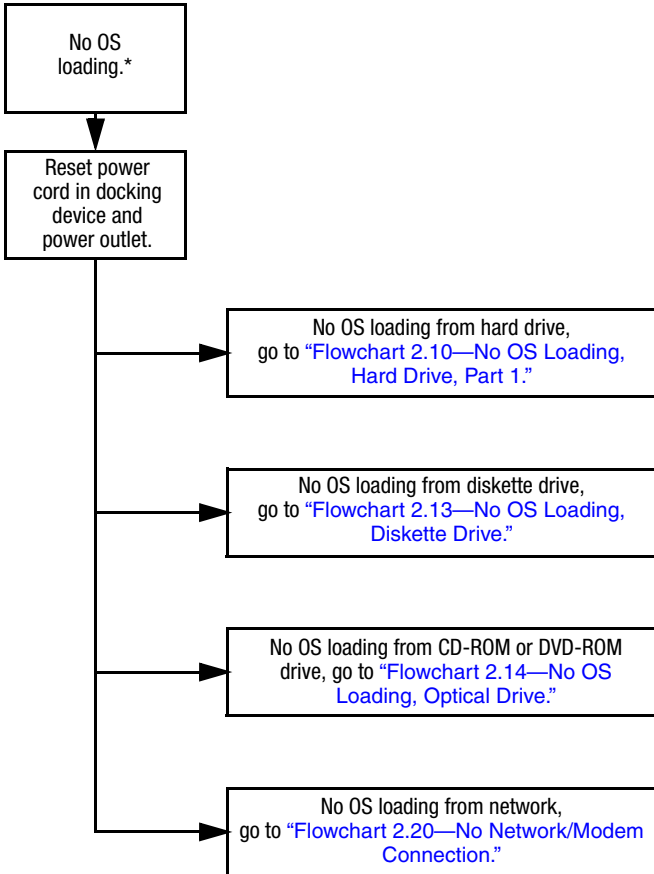
Flowchart 2.7—No Video, Part 2



Flowchart 2.8—Nonfunctioning Docking Device (if applicable)

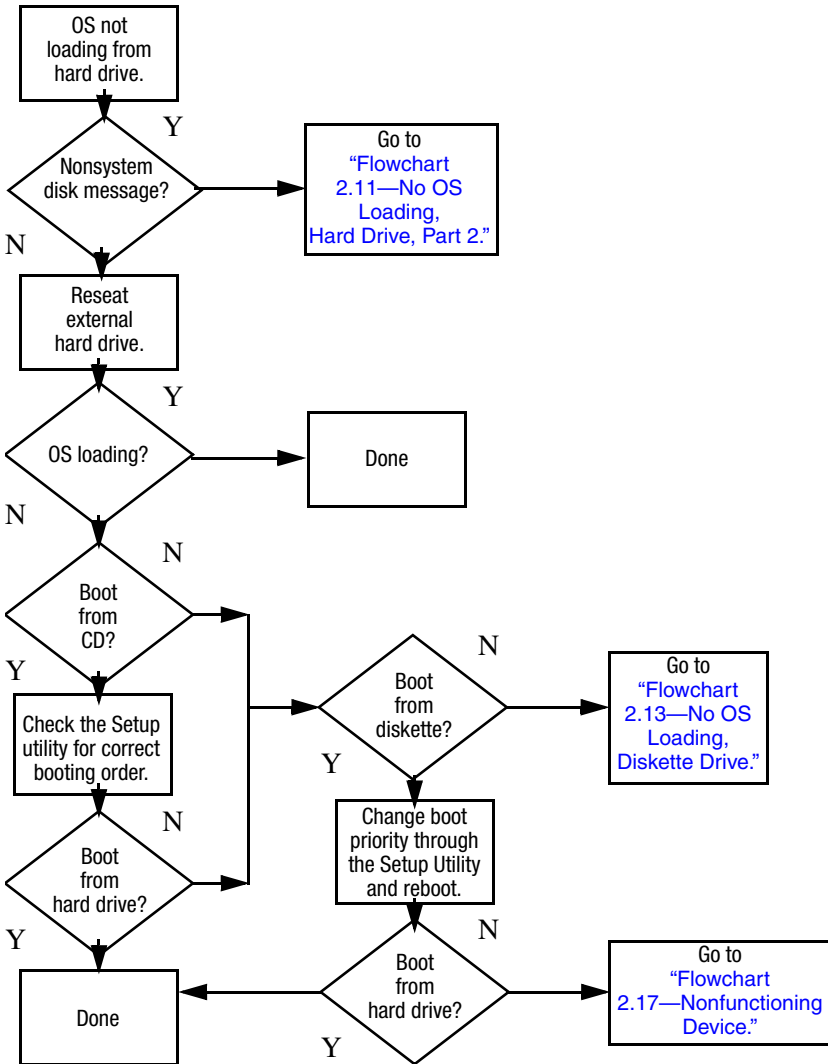


Flowchart 2.9—No Operating System (OS) Loading

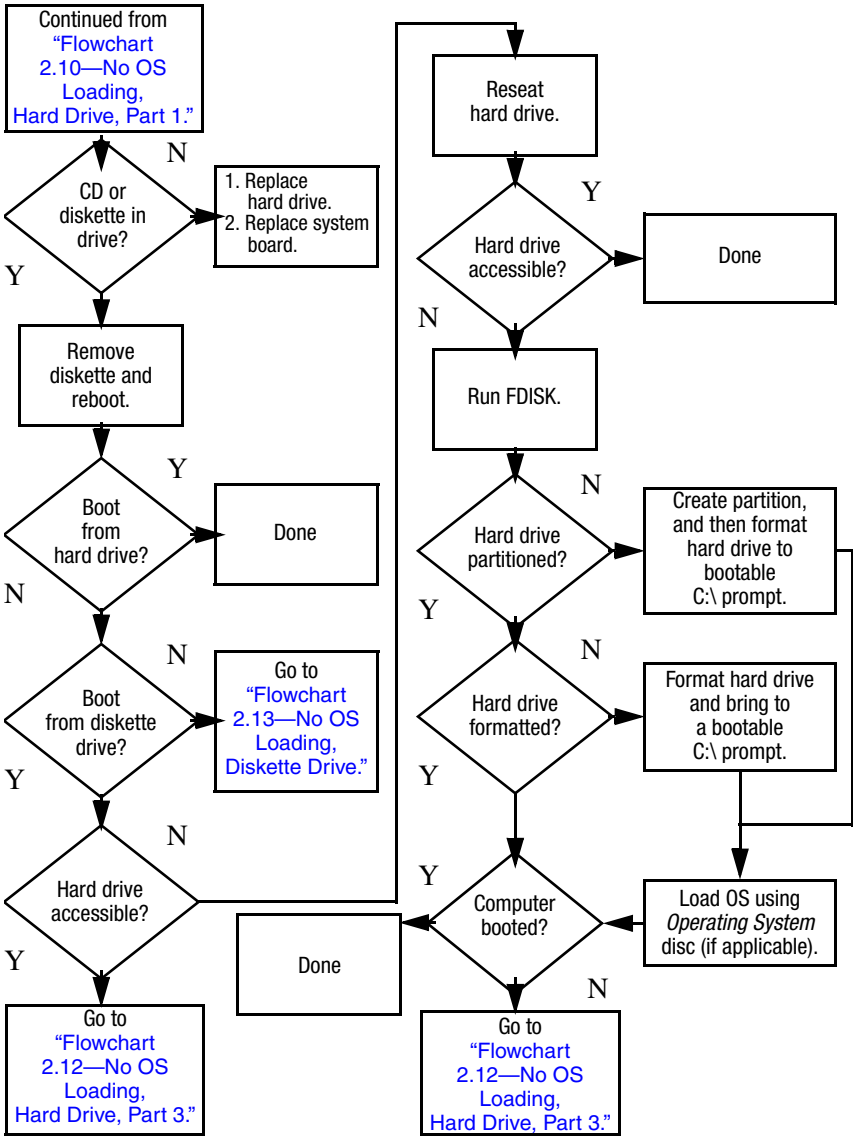


*NOTE: Before beginning troubleshooting, always check cable connections, cable ends, and drives for bent or damaged pins.

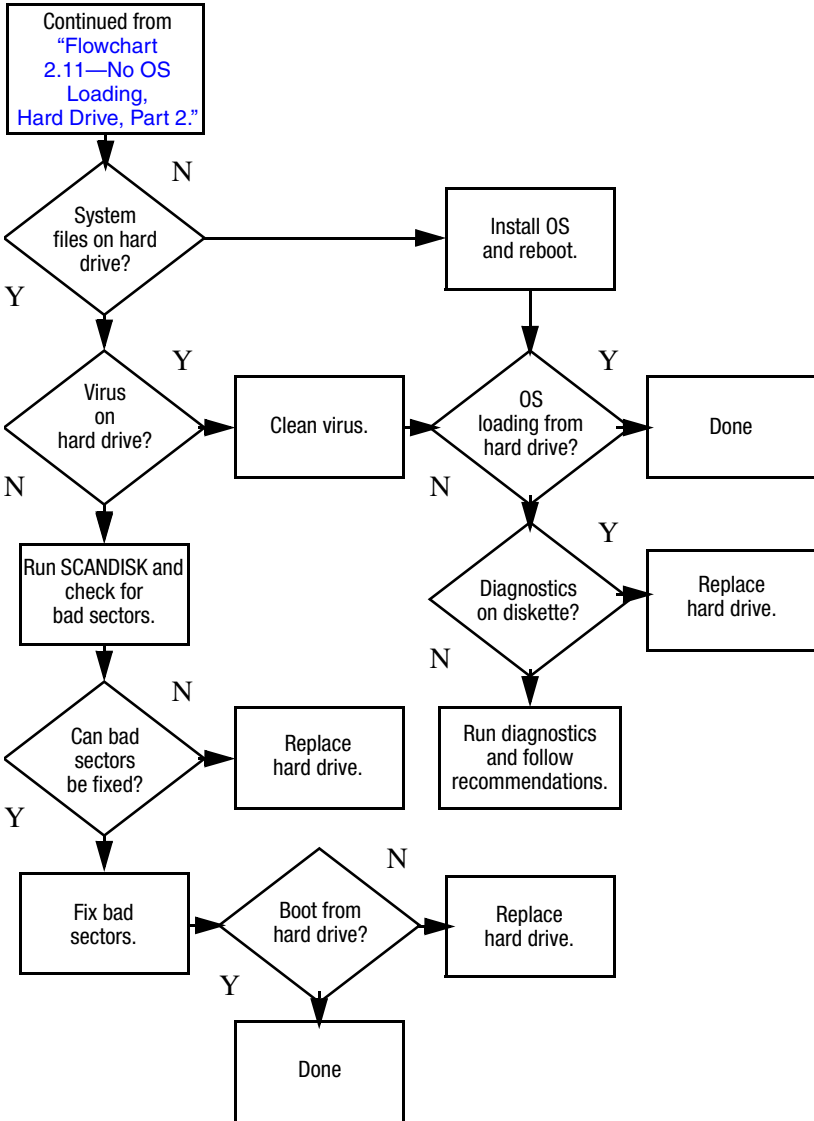
Flowchart 2.10—No OS Loading, Hard Drive, Part 1



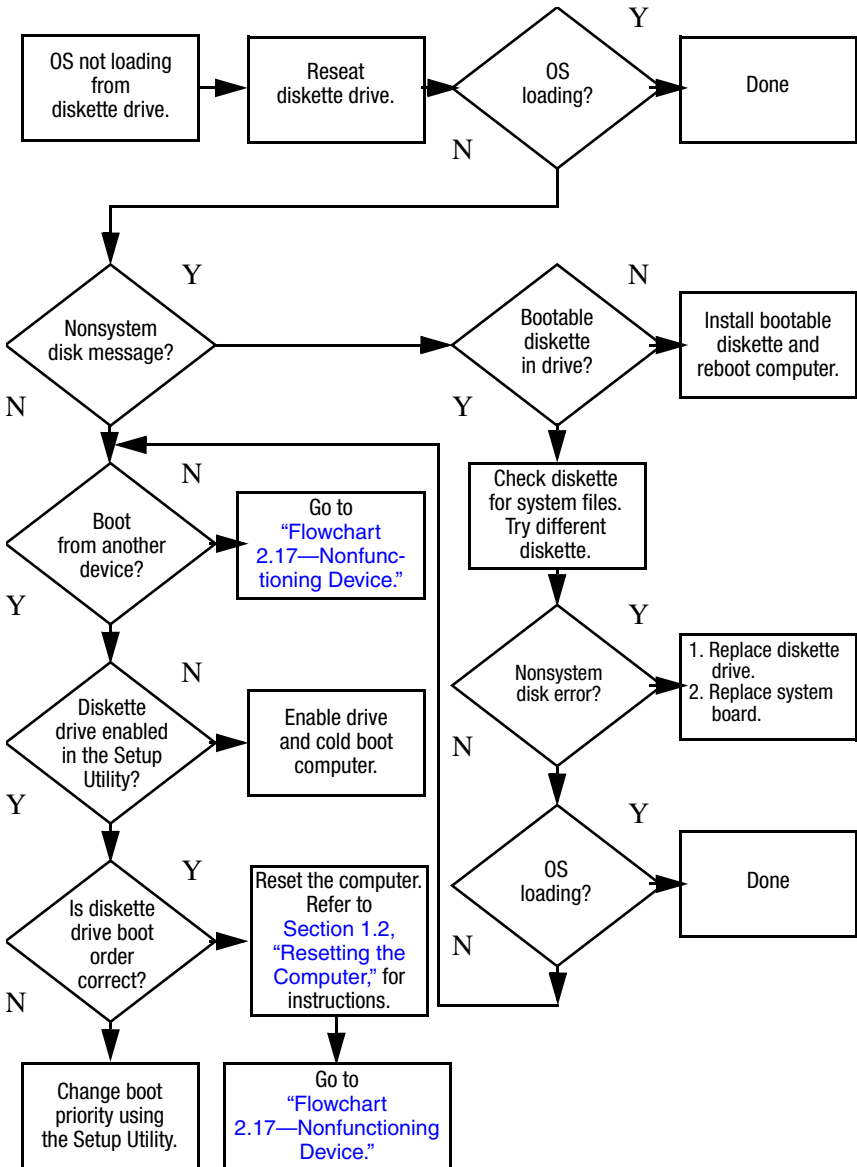
Flowchart 2.11 – No OS Loading, Hard Drive, Part 2



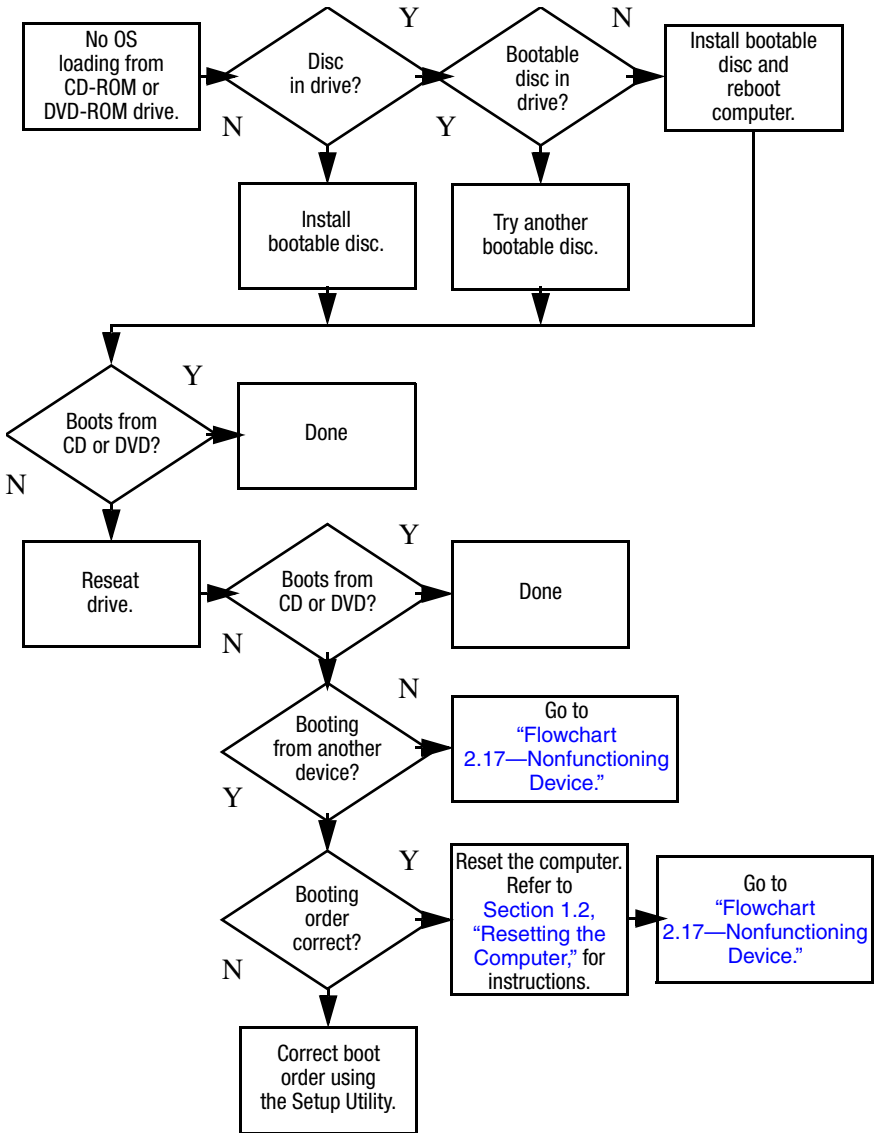
Flowchart 2.12—No OS Loading, Hard Drive, Part 3



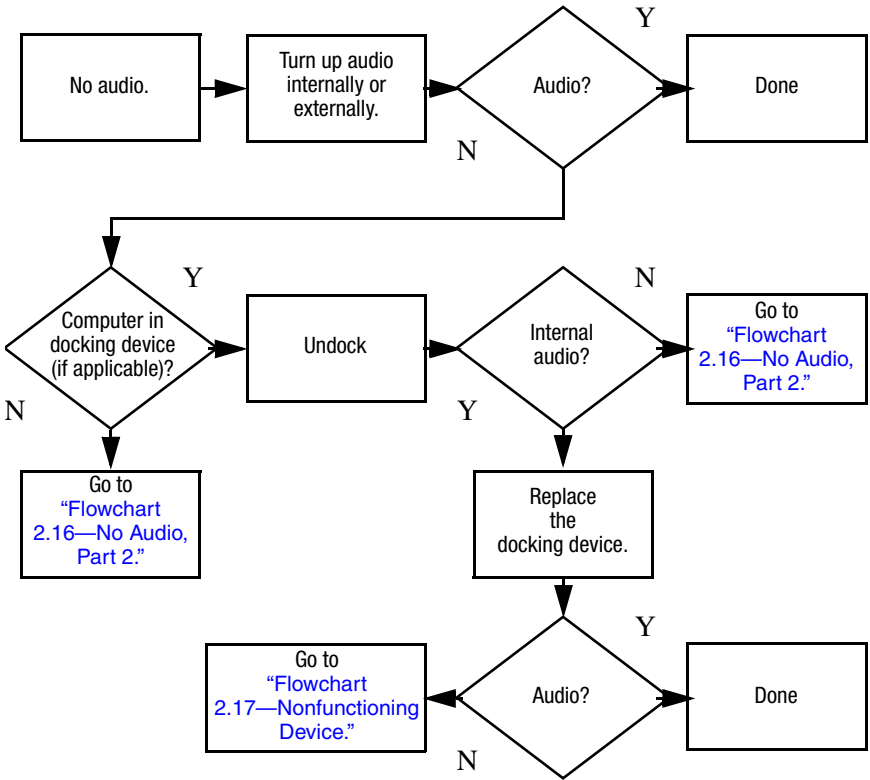
Flowchart 2.13—No OS Loading, Diskette Drive



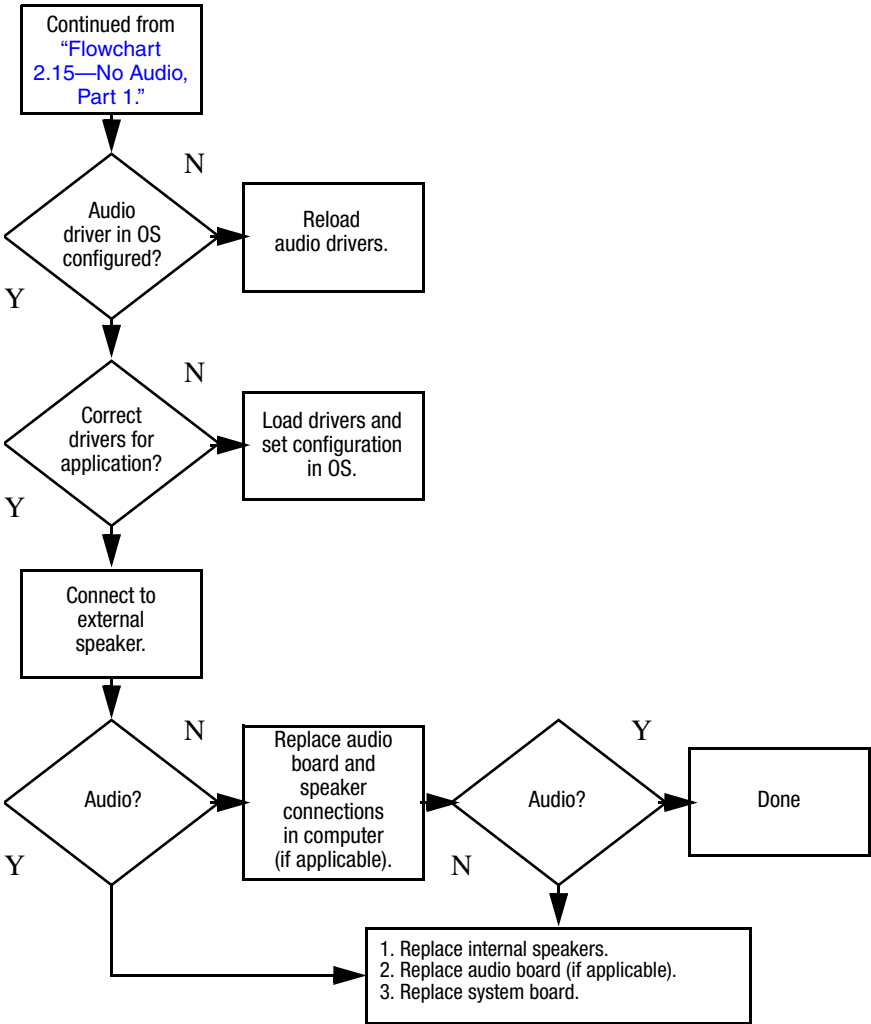
Flowchart 2.14—No OS Loading, Optical Drive



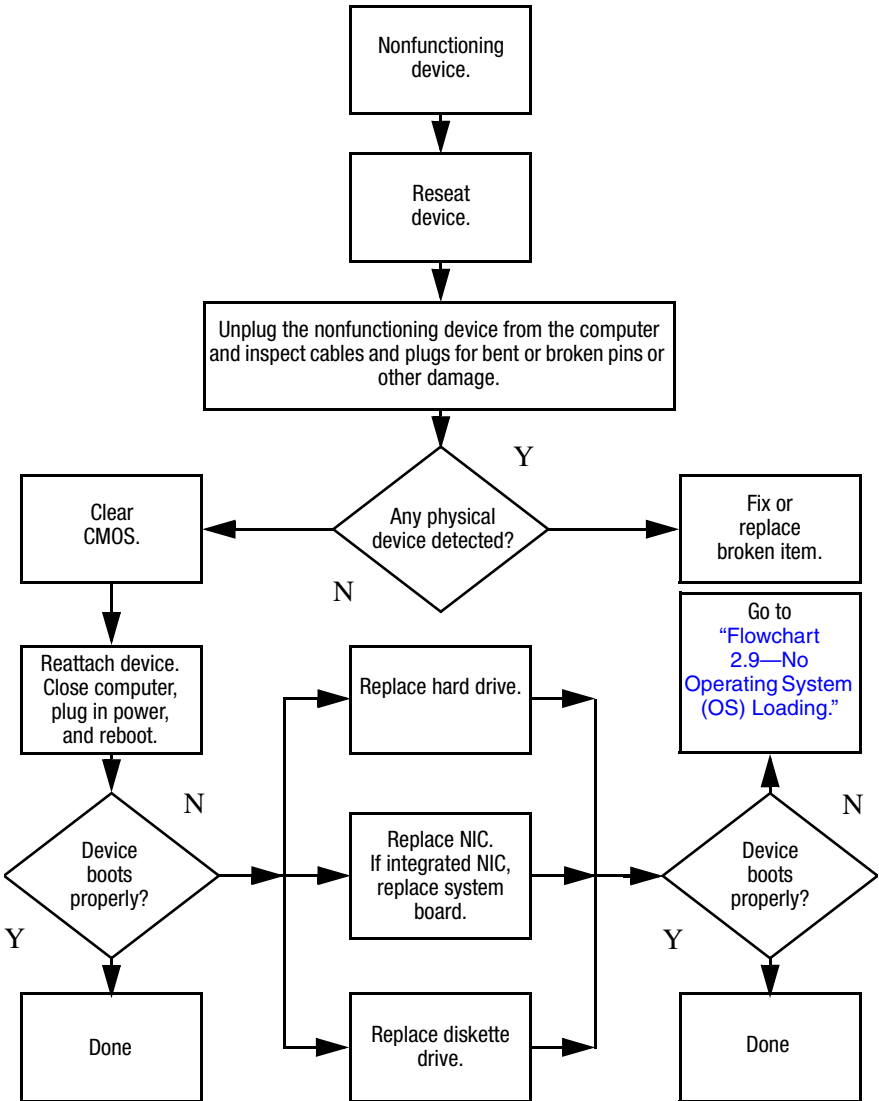
Flowchart 2.15—No Audio, Part 1



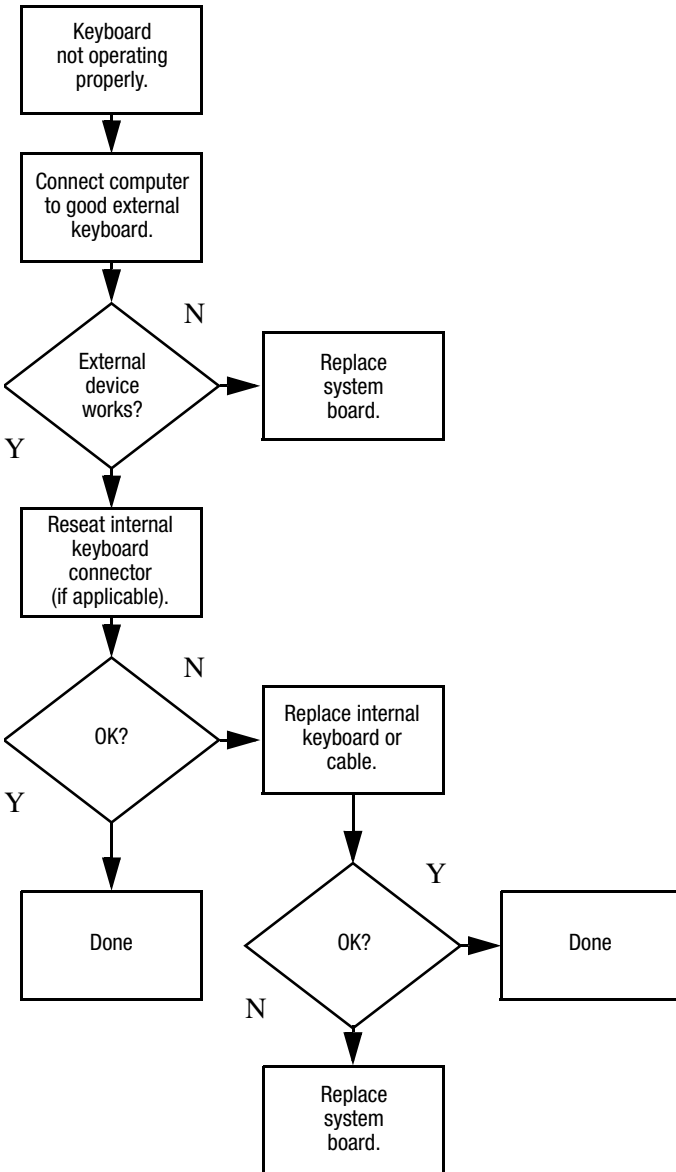
Flowchart 2.16—No Audio, Part 2



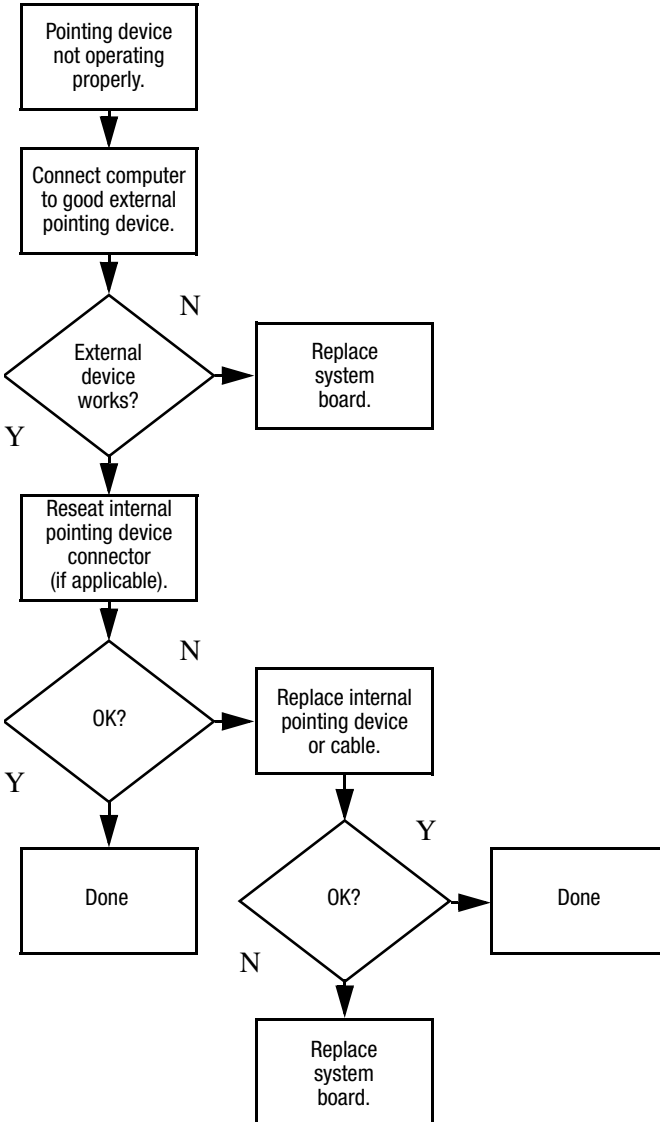
Flowchart 2.17—Nonfunctioning Device



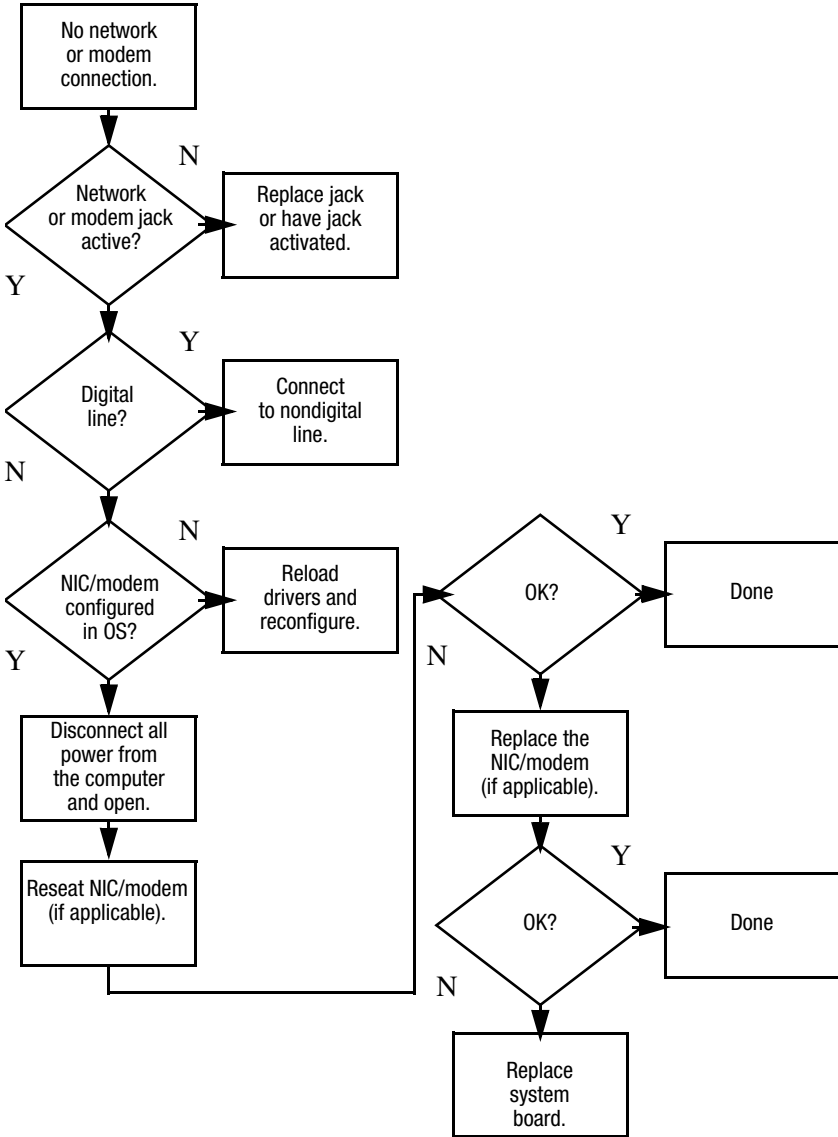
Flowchart 2.18—Nonfunctioning Keyboard



Flowchart 2.19—Nonfunctioning Pointing Device



Flowchart 2.20—No Network/Modem Connection



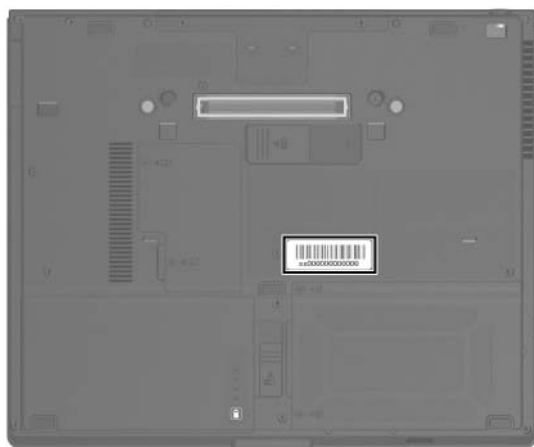
3

Illustrated Parts Catalog

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

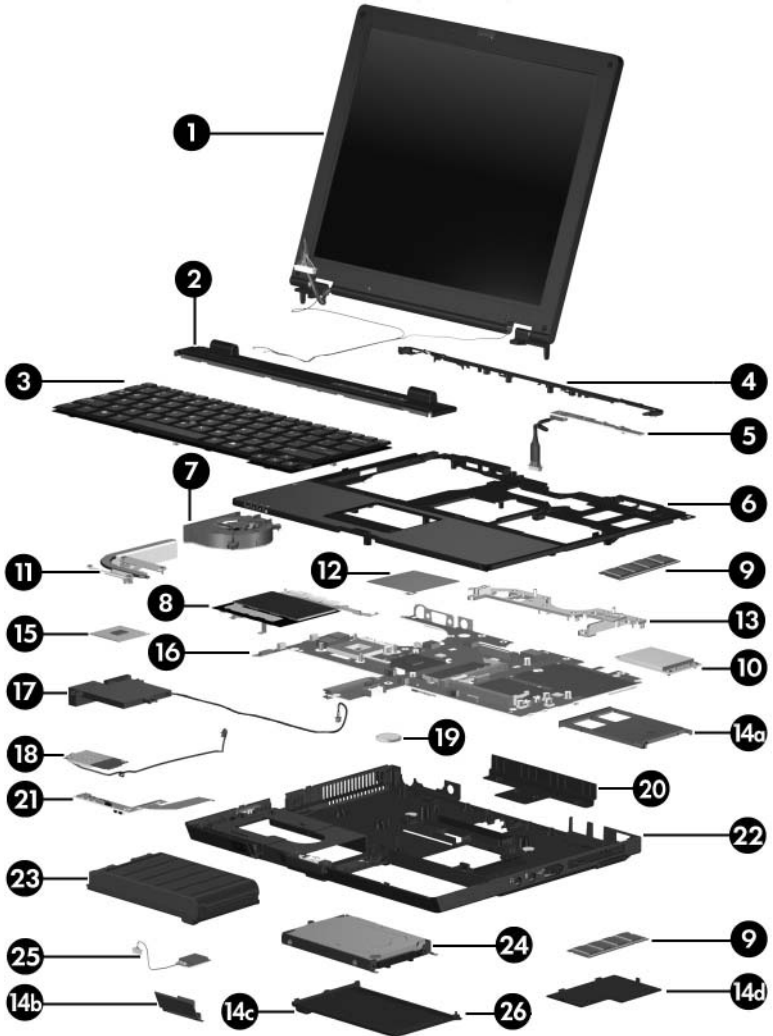
3.1 Serial Number Location

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



Serial Number Location

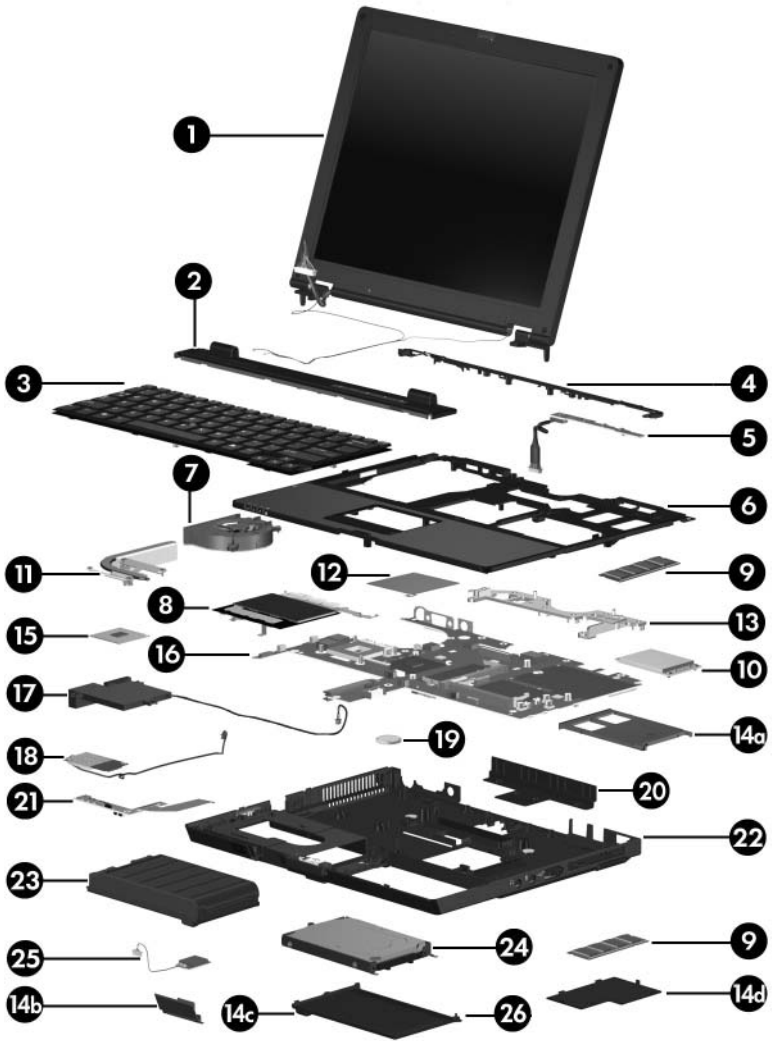
3.2 Computer Major Components



Computer Major Components

Table 3-1
Spare Parts: Computer Major Components

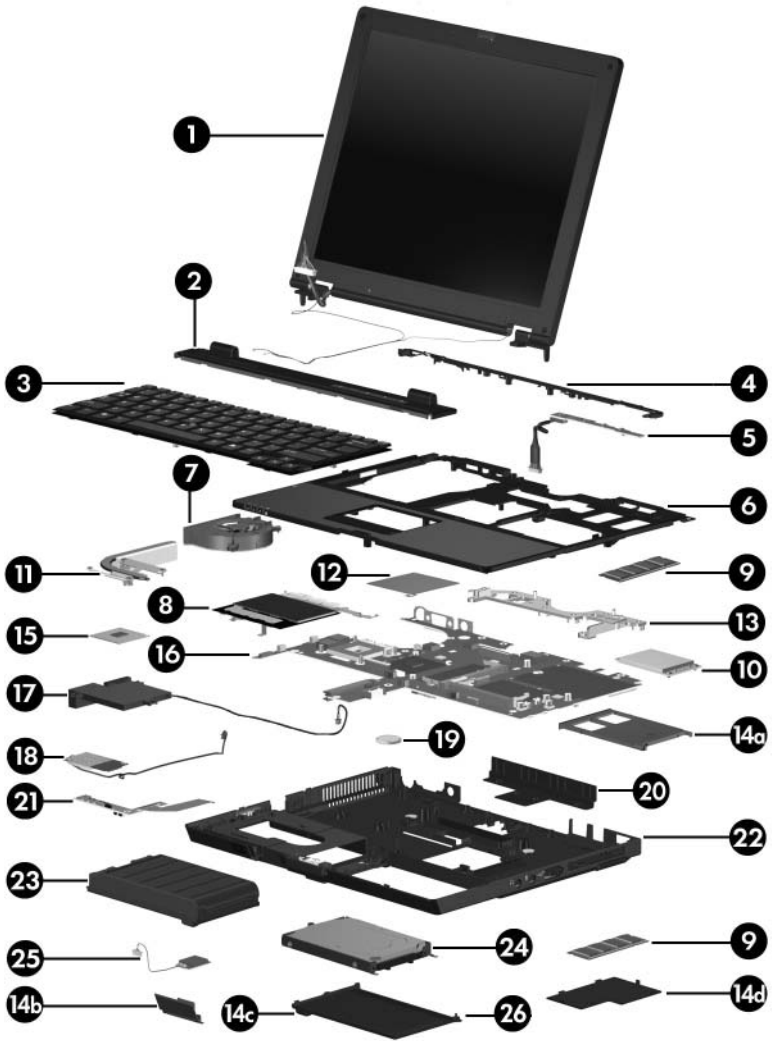
Item	Description	Spare Part Number
1	12.1-inch, XGA, TFT display assembly (includes wireless antenna transceivers and cables, microphone, fingerprint reader board, and display cable)	419155-001
2	Keyboard cover	419119-001
3	Keyboards , with pointing stick	
	Belgium	419171-A41
	Brazil	419171-201
	The Czech Republic	419171-221
	Denmark	419171-081
	Europe	419171-021
	France	419171-051
	French Canada	419171-121
	Germany	419171-041
	Greece	419171-151
	Hungary	419171-211
	Iceland	419171-DD1
	Israel	419171-BB1
	Italy	419171-061
	Japan	419171-291
	Korea	419171-AD1
	Latin America	419171-161
	Norway	419171-091
	Portugal	419171-131
	Russia	419171-251
	Saudi Arabia	419171-141
	Spain	419171-071
	Slovakia	419171-231
	Sweden/Finland	419171-B71
	Switzerland	419171-111
	Taiwan	419171-AB1
	Thailand	419171-281
	Turkey	419171-141
	The United Kingdom	419171-031
	The United States	419171-001
4	Rear keyboard cover	419120-001
5	Button board (includes button board cable)	419112-001
6	Top cover	419163-001
7	Fan	419127-001
8	TouchPad (includes cable and bracket)	419165-001



Computer Major Components

Table 3-1**Spare Parts: Computer Major Components (Continued)**

Item	Description	Spare Part Number
9	Memory modules	
	PC2, 5300	
	2048-MB	419149-001
	1024-MB	419145-001
	512-MB	419151-001
	256-MB	419147-001
	PC2, 4200	
	2048-MB	419148-001
	1024-MB	419144-001
	512-MB	419150-001
	256-MB	419146-001
10	Mini Card WLAN module	
	802.11b/g Silverton WLAN module for use in most of the world (MOW)	359106-001
	802.11b/g Silverton WLAN module for use in the rest of the world (ROW)	359107-001
	802.11a/b/g FRLN WLAN card for MOW use	373888-001
	802.11a/b/g FRLN WLAN card for ROW use	373889-001
	802.11a/b/g FRLN WLAN card for use in Japan	373888-291
	802.11a/b/g FRLN WLAN card for use in Europe	377792-001
	802.11a/b/g DynaStar WLAN card for MOW use	337407-001
	802.11a/b/g DynaStar WLAN card for ROW use	337407-002
	802.11a/b/g DynaStar WLAN card for use in Japan	337407-291
	802.11a/b/g ATMC WLAN card for MOW use	377408-001
	802.11a/b/g ATMC WLAN card for ROW use	377408-002
	802.11a/b/g ATMC WLAN card for use in Japan	377408-291

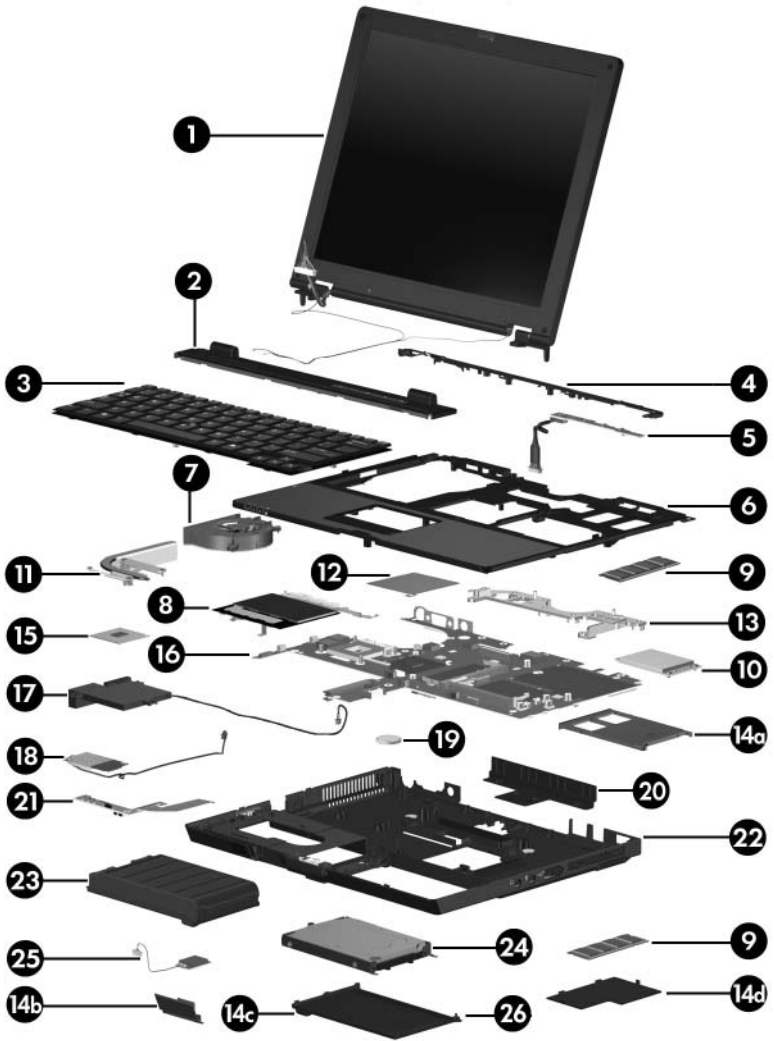


Computer Major Components

Table 3-1

Spare Parts: Computer Major Components (*Continued*)

Item	Description	Spare Part Number
11	Heat sink (includes thermal paste)	419161-001
12	Thermal shield	419162-001
13	Hinge saddle	419129-001
	Plastics Kit , includes:	419157-001
14a	PC Card slot spacer	
14b	Bluetooth board cover	
14c	Hard drive cover	
14d	Memory module compartment cover	
	Not illustrated: Computer feet (5)	
15	Processors (include thermal paste)	
	Intel Core Duo T2600 (2.17-GHz)	409972-001
	Intel Core Duo T2500 (2.00-GHz)	409971-001
	Intel Core Duo T2400 (1.83-GHz)	409970-001
	Intel Core Duo T2300 (1.67-GHz)	409969-001
	Intel Celeron M 1.60-GHz	419159-001
16	System board	419116-001
17	Speaker	419160-001
18	Modem module (high-speed 56 K, includes modem module cable)	419143-001
19	RTC battery	383625-001
20	Base enclosure cover	383520-001
21	Infrared board (includes infrared board cable)	419113-001



Computer Major Components

Table 3-1
Spare Parts: Computer Major Components (Continued)

Item	Description	Spare Part Number
22	Base enclosure	419110-001
23	6-cell battery pack	419111-001
24	Hard drives (all 5400 rpm; include cover and frame)	
	100-GB	419124-001
	80-GB	419126-001
	60-GB	419125-001
25	Bluetooth module (includes Bluetooth module cable)	419117-001
26	Hard drive cover	419128-001

3.3 Display Assembly Components

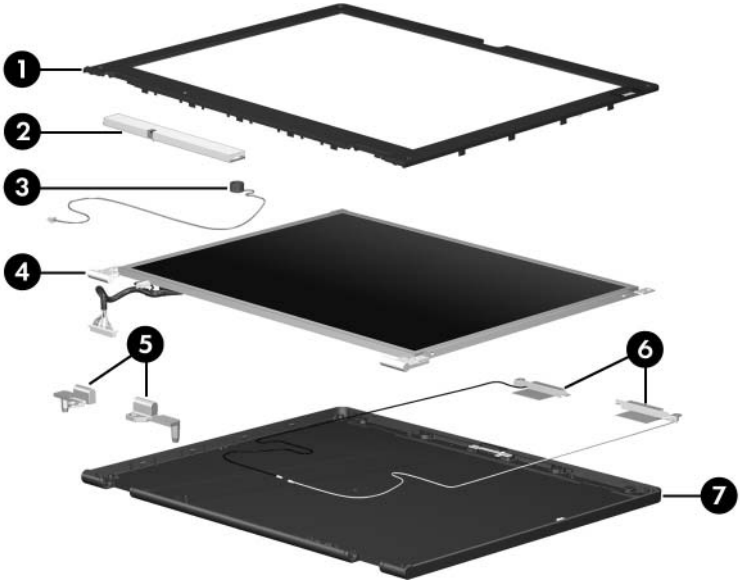


Table 3-2
Display Assembly Components
Spare Parts Number Information

Item	Description	Spare Part Number
1	Display bezel (includes fingerprint reader board)	419133-001
2	Display inverter	419130-001
3	Microphone	419152-001
4	12.1-inch XGA TFT display panel	419141-001
5	Display Bracket Kit (includes display hinges)	431167-001
6	Wireless Antenna Kit	419108-001
7	Display enclosure	419138-001
Not illustrated:		
	■ Display Rubber Screw Cover Kit	419142-001
	■ Display Cable Kit	419136-001

3.4 Plastics Kit

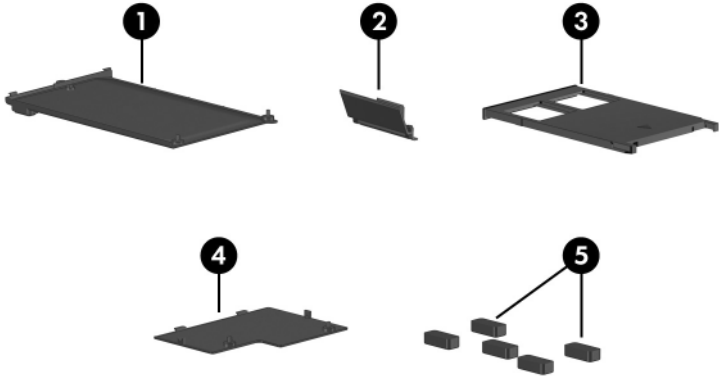


Table 3-3
Plastics Kit
Spare Part Number Information

Item	Description	Spare Part Number
	Plastics Kit	419157-001
	Includes:	
1	Hard drive cover	
2	Bluetooth module cover	
3	PC Card slot bezel	
4	Memory module compartment cover	
5	Computer feet (5)	

3.5 Cable Kit

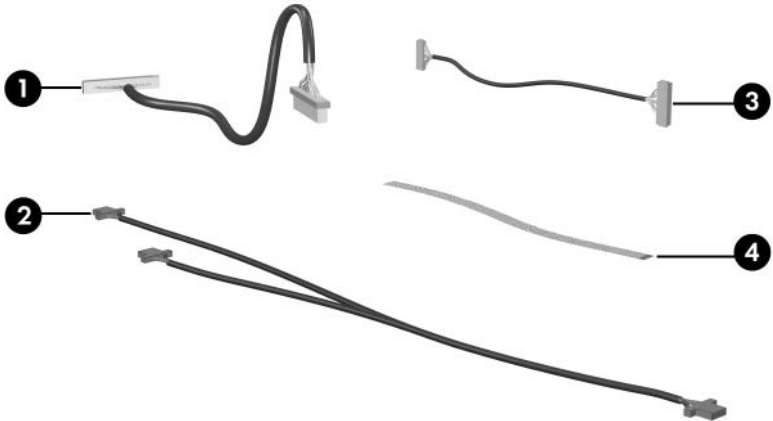


Table 3-4

Cable Kit

Spare Part Number Information

Item	Description	Spare Part Number
	Cable Kit	419118-001
	Includes:	
1	Button board cable	
2	Modem cable	
3	Bluetooth module cable	
4	Pointing stick cable	

3.6 Miscellaneous (Not Illustrated)

Table 3-5
Miscellaneous Spare Part Information

Description	Spare Part Number
8-cell travel battery	367456-001
External MultiBay II	366143-001
External MultiBay II power cable and stand	366144-001
HP Docking Station	413267-001
HP Docking Station 120 W AC adapter	391174-001
Logo Kit	419132-001
HP Docking Station Miscellaneous Plastics Kit	380089-001
MultiBay 8X DVD-ROM Drive (for use in External MultiBay II and HP Docking Station)	373314-001
MultiBay 24X DVD/CD-RW Combo Drive (for use in External MultiBay II and HP Docking Station)	373315-001
DVD±RW and CD-RW Double-Layer Combo Drive (for use in External MultiBay II and HP Docking Station)	375557-001
Screw Kit (includes the following screws; refer to Appendix A, "Screw Listing," for more information on specifications and usage)	373556-001
<ul style="list-style-type: none"> ■ Phillips PM2.5×13.0 spring-loaded screw ■ Phillips PM3.0×4.0 screw ■ Phillips PM2.5×7.0 screw ■ Phillips PM2.0×5.0 screw ■ Phillips PM2.0×4.0 screw 	<ul style="list-style-type: none"> ■ Phillips PM1.5×3.5 screw ■ Torx 8 T8M2.0×20.0 screw ■ Torx 8 T8M2.0×10.0 screw ■ Torx 8 T8M2.0×7.5 screw ■ Torx 8 T8M2.0×5.0 screw

Table 3-5
Miscellaneous Spare Part Information (*Continued*)

Description	Spare Part Number
Power supply, 65 watt	419107-001
Power cords	
For use in:	
Australia and New Zealand	350188-011
Belgium, Europe, Greece, Norway, and Portugal	350188-021
Canada, French Canada, Latin America, Taiwan, Thailand, and the United States	350188-001
Denmark	350188-081
France	350188-041
Germany	350188-051
Hong Kong and the United Kingdom	350188-031
Israel	350188-BB1
Italy	350188-061
Japan	350188-291
The Netherlands	350188-331
The People's Republic of China	350188-AA1
Saudi Arabia	350188-171
Spain	350188-071
Sweden/Finland	350188-B71

3.7 Sequential Part Number Listing

Table 3-6
Sequential Part Number Listing

Spare Part Number	Description
337407-001	802.11a/b/g DynaStar WLAN Mini Card WLAN module for use in most of the world
337407-002	802.11a/b/g DynaStar WLAN Mini Card WLAN module for use in the rest of the world
337407-291	802.11a/b/g DynaStar WLAN Mini Card WLAN module for use in Japan
350188-001	Power cord for use in Canada, French Canada, Latin America, Taiwan, Thailand, and the United States
350188-011	Power cord for use in Australia and New Zealand
350188-021	Power cord for use in Belgium, Europe, Greece, Norway, and Portugal
350188-031	Power cord for use in Hong Kong and the United Kingdom
350188-041	Power cord for use in Germany
350188-051	Power cord for use in France
350188-061	Power cord for use in Italy
350188-071	Power cord for use in Spain
350188-081	Power cord for use in Denmark
350188-171	Power cord for use in Saudi Arabia
350188-291	Power cord for use in Japan

Table 3-6
Sequential Part Number Listing (*Continued*)

Spare Part Number	Description
350188-331	Power cord for use in the Netherlands
350188-AA1	Power cord for use in the People's Republic of China
350188-B71	Power cord for use in Sweden/Finland
350188-BB1	Power cord for use in Israel
359106-001	802.11b/g Silverton WLAN Mini Card WLAN module for use in most of the world
359107-001	802.11b/g Silverton WLAN card Mini Card WLAN module for use in the rest of the world
366143-001	External MultiBay II
366144-001	External MultiBay II power cable and stand
367456-001	8-cell travel battery pack
373314-001	MultiBay 8X DVD-ROM Drive (for use in External MultiBay II and HP Docking Station)
373315-001	MultiBay 24X DVD/CD-RW Combo Drive (for use in External MultiBay II and HP Docking Station)
373556-001	Screw Kit
373888-001	802.11a/b/g FRLN WLAN Mini Card WLAN module for use in most of the world
373888-291	802.11a/b/g FRLN WLAN Mini Card WLAN module for use in Japan
373889-001	802.11a/b/g FRLN WLAN Mini Card WLAN module for use in the rest of the world

Table 3-6
Sequential Part Number Listing (*Continued*)

Spare Part Number	Description
375557-001	DVD±RW and CD-RW Double-Layer Combo Drive (for use in External MultiBay II and HP Docking Station)
377408-001	802.11a/b/g ATMC WLAN Mini Card WLAN module for use in most of the world
377408-002	802.11a/b/g ATMC WLAN Mini Card WLAN module for use in the rest of the world
377408-291	802.11a/b/g ATMC WLAN Mini Card WLAN module for use in Japan
377792-001	802.11a/b/g FRLN WLAN Mini Card WLAN module for use in Europe
380089-001	HP Docking Station Miscellaneous Plastics Kit
383520-001	Base enclosure cover
383556-001	Screw Kit
383625-001	RTC battery
391174-001	HP Docking Station 120-W AC adapter
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)

Table 3-6
Sequential Part Number Listing (*Continued*)

Spare Part Number	Description
413267-001	HP Docking Station
419107-001	65-watt power supply
419108-001	Wireless Antenna Kit (includes wireless antenna transceivers and cables)
419110-001	Base enclosure
419111-001	6-cell, 5.1-Ah battery pack
419112-001	Button board (includes button board cable)
419113-001	Infrared board (includes cable)
419116-001	System board
419117-001	Bluetooth module (includes Bluetooth module cable)
419118-001	Cable Kit
419119-001	Keyboard cover
419120-001	Rear keyboard cover
419124-001	100-GB hard drive (5400 rpm; includes cover and frame)
419125-001	60-GB hard drive (5400 rpm; includes cover and frame)
419126-001	80-GB hard drive (5400 rpm; includes cover and frame)
419127-001	Fan
419128-001	Hard drive cover
419129-001	Hinge saddle
419130-001	Display inverter

Table 3-6
Sequential Part Number Listing (*Continued*)

Spare Part Number	Description
419132-001	Logo Kit
419133-001	Display bezel (includes fingerprint reader board)
419134-001	Display Cable Kit
419135-001	Display enclosure
419141-001	12.1-inch, XGA, TFT display panel
419142-001	Display Rubber Screw Cover Kit
419143-001	Modem module (high-speed 56K, includes modem module cable)
419144-001	PC2, 4200 1024-MB memory module
419145-001	PC2, 5300 1024-MB memory module
419146-001	PC2, 4200 256-MB memory module
419147-001	PC2, 5300 256-MB memory module
419148-001	PC2, 4200 2048-MB memory module
419149-001	PC2, 5300 2048-MB memory module
419150-001	PC2, 4200 512-MB memory module
419151-001	PC2, 5300 512-MB memory module
419152-001	Microphone
419155-001	12.1-inch, XGA, TFT display assembly (includes wireless antenna transceivers and cables, microphone, fingerprint reader board, and display cable)

Table 3-6
Sequential Part Number Listing (*Continued*)

Spare Part Number	Description
419157-001	Plastics Kit
419159-001	Intel Celeron M 1.60-GHz processor (includes thermal paste)
419160-001	Speaker
419161-001	Heat sink
419162-001	Thermal shield (includes thermal pad)
419163-001	Top cover
419165-001	TouchPad (includes cable and bracket)
419171-001	Keyboard with pointing stick for use in the United States
419171-021	Keyboard with pointing stick for use in Europe
419171-031	Keyboard with pointing stick for use in the United Kingdom
419171-041	Keyboard with pointing stick for use in Germany
419171-051	Keyboard with pointing stick for use in France
419171-061	Keyboard with pointing stick for use in Italy
419171-071	Keyboard with pointing stick for use in Spain
419171-081	Keyboard with pointing stick for use in Denmark
419171-091	Keyboard with pointing stick for use in Norway
419171-111	Keyboard with pointing stick for use in Switzerland
419171-121	Keyboard with pointing stick for use in French Canada
419171-131	Keyboard with pointing stick for use in Portugal

Table 3-6
Sequential Part Number Listing (*Continued*)

Spare Part Number	Description
419171-141	Keyboard with pointing stick for use in Turkey
419171-151	Keyboard with pointing stick for use in Greece
419171-161	Keyboard with pointing stick for use in Latin America
419171-171	Keyboard with pointing stick for use in Saudi Arabia
419171-201	Keyboard with pointing stick for use in Brazil
419171-211	Keyboard with pointing stick for use in Hungary
419171-221	Keyboard with pointing stick for use in the Czech Republic
419171-231	Keyboard with pointing stick for use in Slovakia
419171-251	Keyboard with pointing stick for use in Russia
419171-281	Keyboard with pointing stick for use in Thailand
419171-291	Keyboard with pointing stick for use in Japan
419171-A41	Keyboard with pointing stick for use in Belgium
419171-AB1	Keyboard with pointing stick for use in Taiwan
419171-AD1	Keyboard with pointing stick for use in Korea
419171-B71	Keyboard with pointing stick for use in Sweden/Finland
419171-BB1	Keyboard with pointing stick for use in Israel
419171-DD1	Keyboard with pointing stick for use in Iceland
431167-001	Display Bracket Kit (includes display hinges)

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
- Flat-bladed screwdriver

4.2 Service Considerations

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



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

Plastic Parts

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

Cables and Connectors



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

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

4.3 Preventing Damage to Removable Drives

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

- Before removing or inserting a hard drive, shut down the computer. If you are unsure whether the computer is off or in hibernation, turn the computer on, and then shut it down through the operating system.
- Before removing a diskette drive or optical drive, be sure that a diskette or disc is not in the drive and be sure that the optical drive tray is closed.
- Before handling a drive, be sure that you are discharged of static electricity. While handling a drive, avoid touching the connector.
- Handle drives on surfaces covered with at least one inch of shock-proof foam.
- Avoid dropping drives from any height onto any surface.
- After removing a hard drive, an optical drive, or a diskette drive, place it in a static-proof bag.
- Avoid exposing a hard drive to products that have magnetic fields, such as monitors or speakers.
- Avoid exposing a drive to temperature extremes or liquids.
- If a drive must be mailed, place the drive in a bubble pack mailer or other suitable form of protective packaging and label the package “FRAGILE: Handle With Care.”

4.4 Preventing Electrostatic Damage

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

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

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

4.5 Packaging and Transporting Precautions

Use the following grounding precautions when packaging and transporting equipment:

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

4.6 Workstation Precautions

Use the following grounding precautions at workstations:

- Cover the workstation with approved static-shielding material (refer to [Table 4-2, “Static-Shielding Materials”](#)).
- Use a wrist strap connected to a properly grounded work surface and use properly grounded tools and equipment.
- Use conductive field service tools, such as cutters, screwdrivers, and vacuums.
- When fixtures must directly contact dissipative surfaces, use fixtures made only of static-safe materials.
- Keep the work area free of nonconductive materials, such as ordinary plastic assembly aids and Styrofoam.
- Handle electrostatic-sensitive components, parts, and assemblies by the case or PCM laminate. Handle these items only at static-free workstations.
- Avoid contact with pins, leads, or circuitry.
- Turn off power and input signals before inserting or removing connectors or test equipment.

4.7 Grounding Equipment and Methods

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

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

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

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



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 70 screws, in 10 different sizes, that may have to be removed, replaced, or loosened when servicing the computer. Make special note of each screw and screw lock size and location during removal and replacement.

Refer to [Appendix A, “Screw Listing,”](#) for detailed information on screw and screw lock sizes, locations, and usage.

5.1 Serial Number

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




Serial Number Location

5.2 Disassembly Sequence Chart

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

Disassembly Sequence Chart		
Section	Description	# of Screws Removed
5.3	Preparing the Computer for Disassembly battery pack	0
5.4	Hard Drive	2 loosened to remove the hard drive cover 1 loosened to remove the hard drive 4 removed to disassemble the hard drive
5.5	Computer Feet	0
5.6	Bluetooth Module	2 loosened to remove the Bluetooth module cover
5.7	External Memory Module	2 loosened to remove the memory module compartment cover
5.8	Keyboard Cover	2
5.9	Keyboard	4
5.10	Fan	3
5.11	Heat Sink	4
5.12	Processor	1 loosened
5.13	Internal Memory Module	0

Disassembly Sequence Chart (*Continued*)

Section	Description	# of Screws Removed
5.14	<p>Mini Card WLAN Module</p> <p> To prevent an unresponsive system and the display of a warning message, install only a Mini Card WLAN 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.</p>	2
5.15	<p>Display Assembly</p> <p>Display bezel</p> <p>Fingerprint reader board</p> <p>Microphone</p> <p>Display inverter</p> <p>Display panel</p> <p>Display hinges</p> <p>Wireless antenna transceivers and cables</p>	<p>6</p> <p>4</p> <p>0</p> <p>0</p> <p>1</p> <p>2</p> <p>2</p> <p>2</p>
5.16	Button Board	1
5.17	Top Cover	10
5.18	TouchPad	4
5.19	Speaker	2
5.20	Infrared Board	1
5.21	System Board	6
5.22	Modem Module	2
5.23	RTC Battery	0

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

6-cell battery pack

419111-001

4. Remove the battery pack by following these steps:
 - a. Turn the computer upside down with the front toward you.
 - b. Slide the battery release latch **1** toward the back of the computer. (The right side of the battery pack disengages from the computer.)
 - c. Lift the right side of the battery pack and swing it to the left **2** 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

Hard drives (all 5400 rpm; include cover and frame)

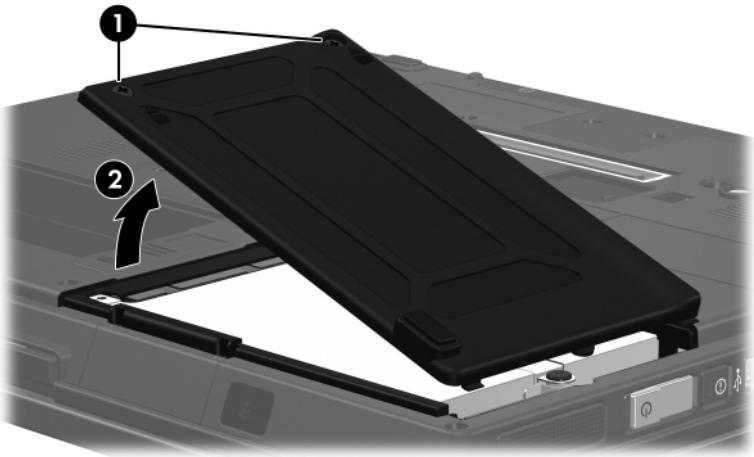
100-GB	419124-001
80-GB	419126-001
60-GB	419125-001

1. Prepare the computer for disassembly ([Section 5.3](#)).

2. Loosen the two Phillips PM2.0×5.0 screws ❶ that secure the hard drive cover to the computer.
3. Lift the left side of the hard drive cover and swing it to the right ❷ and remove it.

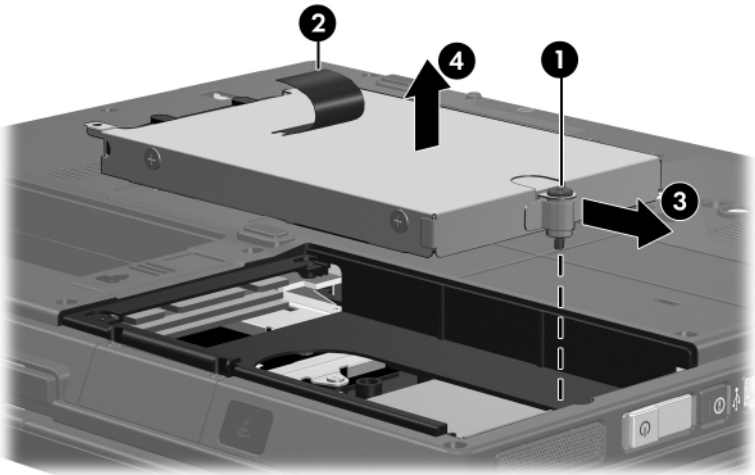


The hard drive cover is available using spare part 419128-001 and is also included in the Plastics Kit, spare part number 419157-001.



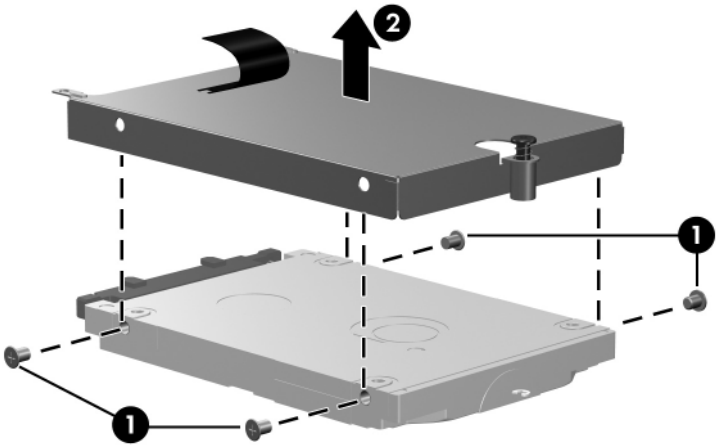
Removing the Hard Drive Cover

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



Removing the Hard Drive

7. Remove the four Phillips PM3.0×4.0 screws ❶ that secure the hard drive frame to the hard drive.
8. Lift the frame straight up ❷ to remove it from the hard drive.

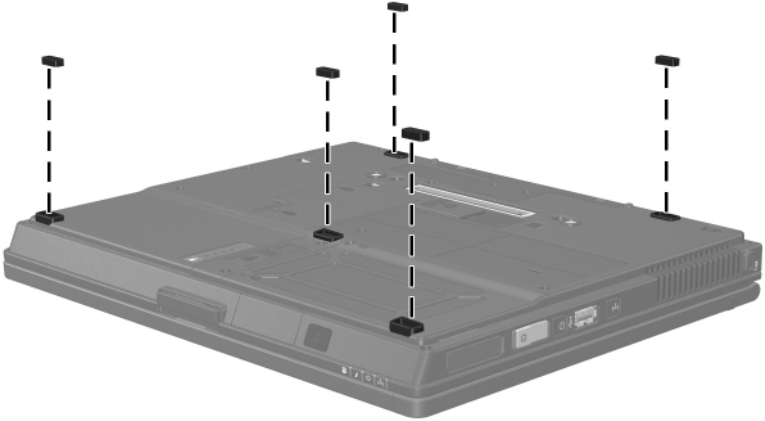


Removing the Hard Drive Frame

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 419157-001.



Replacing the Computer Feet

5.6 Bluetooth Module

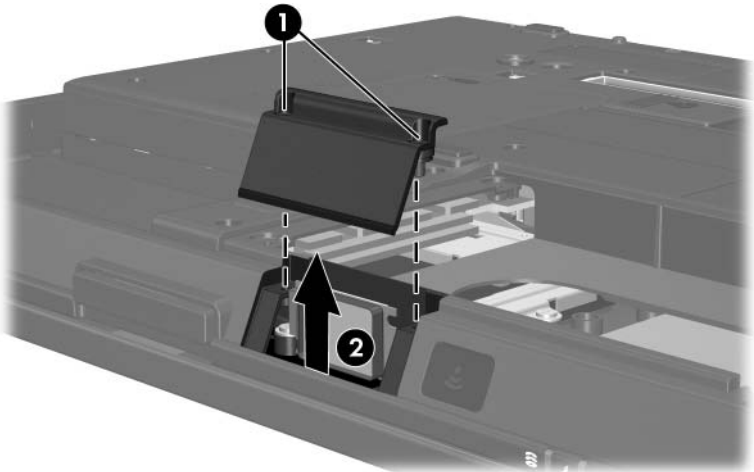
Bluetooth Module Spare Part Number Information

Bluetooth module (includes Bluetooth module cable)	419117-001
--	------------

1. Prepare the computer for disassembly ([Section 5.3](#)).
2. Remove the hard drive cover ([Section 5.4](#)).
3. Position the computer with the front toward you.
4. Loosen the two Phillips PM2.0×5.0 screws **1** that secure the Bluetooth module cover to the computer.
5. Remove the Bluetooth module cover **2**.

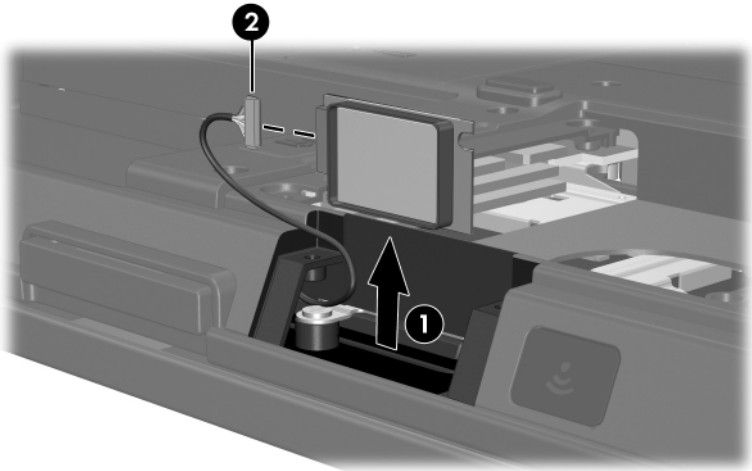


The Bluetooth module cover is included in the Plastics Kit, spare part number 419157-001.



Removing the Bluetooth Module Cover

6. Slide the Bluetooth module out of the computer ❶.
7. Disconnect the Bluetooth module cable ❷ from the board.



Removing the Bluetooth Module

Reverse the above procedure to install the Bluetooth module.

5.7 External Memory Module

Memory Module Spare Part Number Information

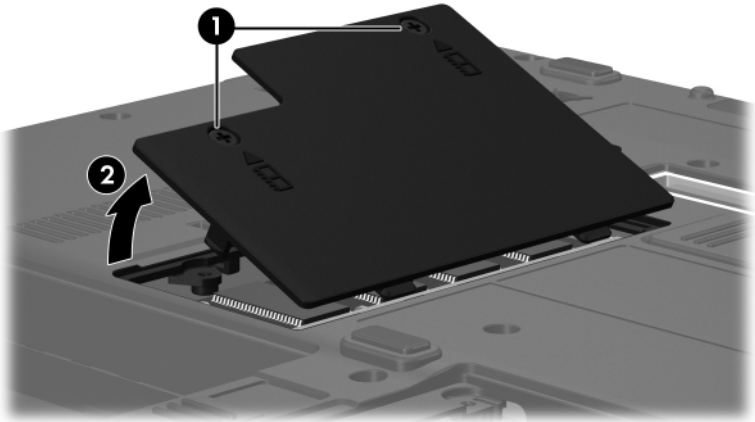
PC2, 5300		PC2, 4200	
2048-MB	419149-001	2048-MB	419148-001
1024-MB	419145-001	1024-MB	419144-001
512-MB	419151-001	512-MB	419150-001
256-MB	419147-001	256-MB	419146-001

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

3. Loosen the two Phillips PM2.0×5.0 screws ❶ that secure the memory module compartment cover to the computer.
4. Lift the left side of the cover and swing it to the right ❷ to remove the memory module compartment cover.



The memory module compartment cover is included in the Plastics Kit, spare part number 419157-001.

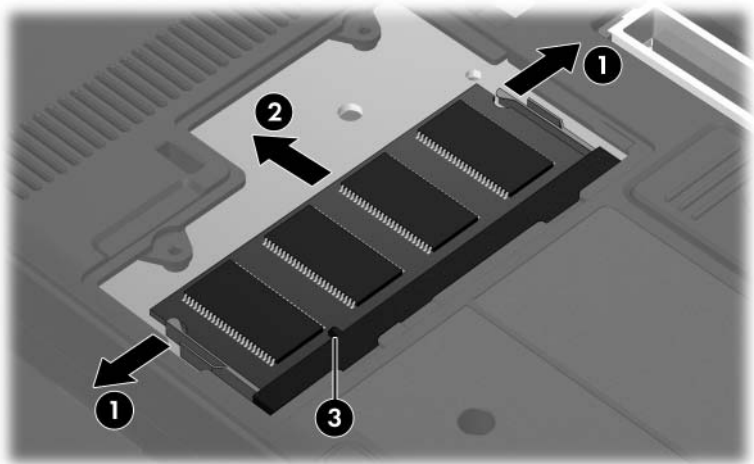


Removing the Memory Module Compartment Cover

5. Spread the retaining tabs **1** on each side of the memory module socket to release the memory module. (The side of the module opposite the socket rises away from the computer.)
6. Slide the module away from the socket at an angle **2**.
7. Remove the memory module.



Memory modules are designed with a notch **3** to prevent incorrect installation into the memory module socket.



Removing the Memory Module

Reverse the above procedure to install an external memory module.

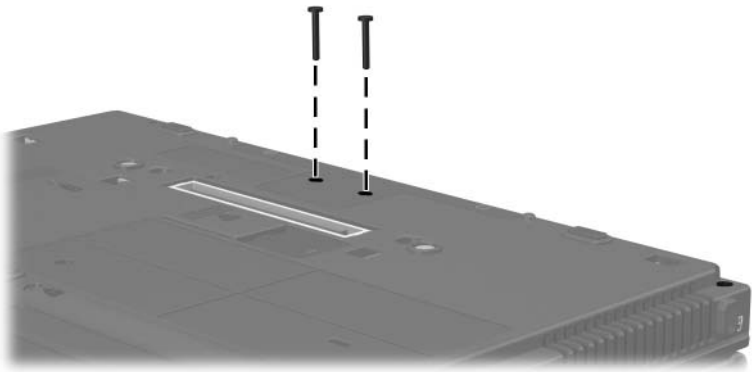
5.8 Keyboard Cover

Keyboard Cover Spare Part Number Information

Keyboard cover

419119-001

1. Prepare the computer for disassembly ([Section 5.3](#)).
2. Position the computer with the front toward you.
3. Remove the two Torx8 T8M2.0×20.0 screws that secure the keyboard cover to the computer.



Removing the Keyboard Cover Screws

4. Turn the computer right-side up with the front toward you.
5. Open the computer as far as possible.
6. Lift the front edge of the keyboard cover until it detaches from the computer.



Releasing the Keyboard Cover

7. Lift the keyboard cover straight up and remove it.



Removing the Keyboard Cover

Reverse the above procedure to install the keyboard cover.

5.9 Keyboard

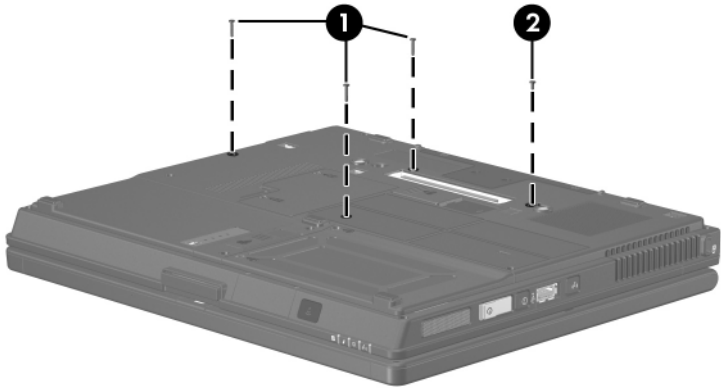
Keyboard Spare Part Number Information

Belgium	419171-A41	Latin America	419171-161
Brazil	419171-201	Norway	419171-091
The Czech Republic	419171-221	Portugal	419171-131
Denmark	419171-081	Russia	419171-251
Europe	419171-021	Saudi Arabia	419171-141
France	419171-051	Spain	419171-071
French Canada	419171-121	Slovakia	419171-231
Germany	419171-041	Sweden/Finland	419171-B71
Greece	419171-151	Switzerland	419171-111
Hungary	419171-211	Taiwan	419171-AB1
Iceland	419171-DD1	Thailand	419171-281
Israel	419171-BB1	Turkey	419171-141
Italy	419171-061	The United Kingdom	419171-031
Japan	419171-291	The United States	419171-001
Korea	419171-AD1		

1. Prepare the computer for disassembly ([Section 5.3](#)).
2. Remove the keyboard cover ([Section 5.8](#)).
3. Turn the computer upside down with the front toward you.

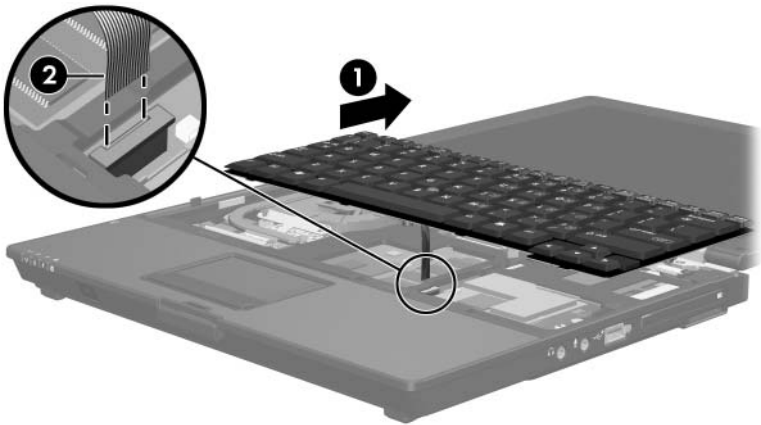
4. Remove the following:

- ❶ Three Torx8 T8M2.0×10.0 screws
- ❷ One Torx8 T8M2.0×5.0 screw



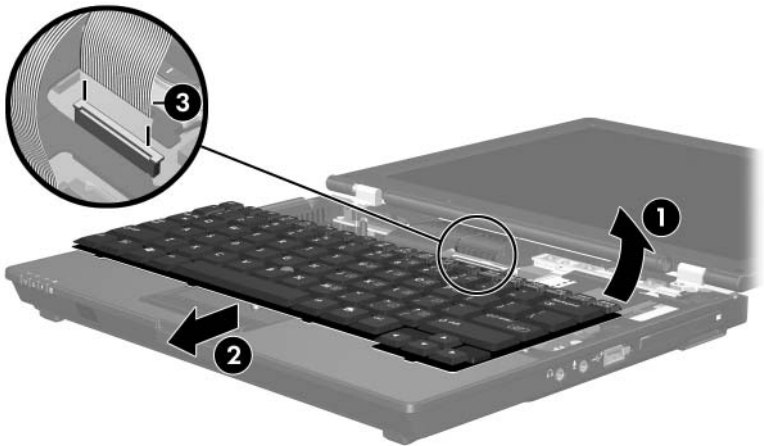
Removing the Keyboard Screws

5. Turn the computer right-side up with the front toward you.
6. Open the computer as far as possible.
7. Slide the keyboard back **1** until the pointing stick cable is accessible.
8. Release the zero insertion force (ZIF) connector to which the pointing stick cable is connected and disconnect the pointing stick cable **2** from the system board.



Disconnecting the Pointing Stick Cable

9. Lift the rear edge of the keyboard **1** until it disengages from the computer.
10. Slide the keyboard forward **2** until it rests on the palm rest.
11. Release the ZIF connector to which the keyboard cable is connected and disconnect the keyboard cable **3** from the system board.
12. Remove the keyboard.



Removing the Keyboard

Reverse the above procedure to install the keyboard.

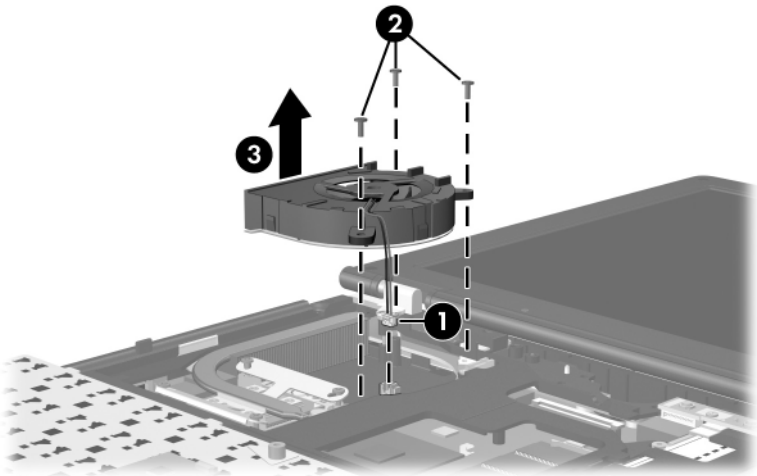
5.10 Fan

Fan Spare Part Number Information

Fan

419127-001

1. Prepare the computer for disassembly ([Section 5.3](#)).
2. Remove the keyboard cover ([Section 5.8](#)).
3. Release the keyboard ([Section 5.9](#)).
4. Disconnect the fan cable **1** from the system board.
5. Remove the three Torx8 T8M2.0×7.0 screws **2** that secure the fan to the computer.
6. Remove the fan **3**.



Removing the Fan

Reverse the above procedure to install the fan.

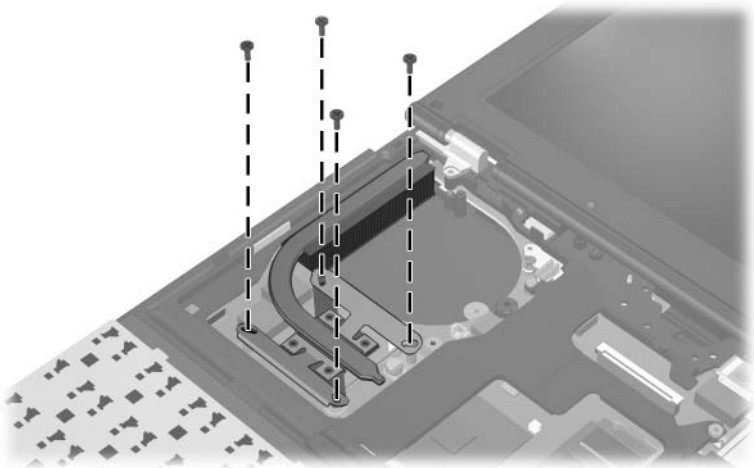
5.11 Heat Sink

Heat Sink Spare Part Number Information

Heat sink (includes thermal paste)

419161-001

1. Prepare the computer for disassembly ([Section 5.3](#)).
2. Remove the keyboard cover ([Section 5.8](#)).
3. Release the keyboard ([Section 5.9](#)).
4. Remove the fan ([Section 5.10](#)).
5. Remove the four Phillips PM2.5×7.0 screws that secure the heat sink to the computer.

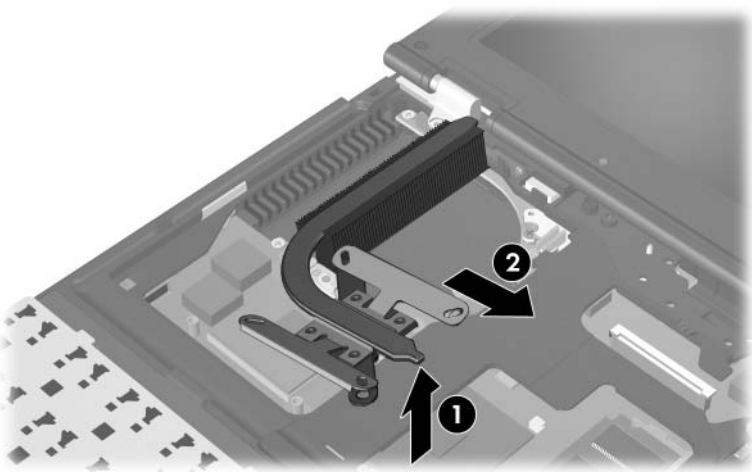


Removing the Heat Sink Screws

6. Lift the right side of the heat sink **1** to disengage it from the processor.
7. Slide the heat sink up and to the right **2** to remove it.



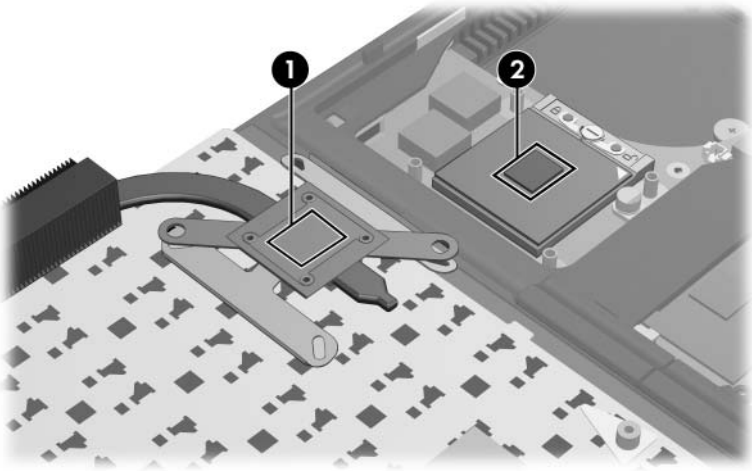
Due to the adhesive quality of the thermal paste located between the heat sink and processor, it may be necessary to move the heat sink from side to side to detach the heat sink from the processor.



Removing the Heat Sink



The thermal paste should be thoroughly cleaned from the surfaces of the heat sink **1** and processor **2** 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.

5.12 Processor



All processor spare part kits include thermal paste.

Processor Spare Part Number Information

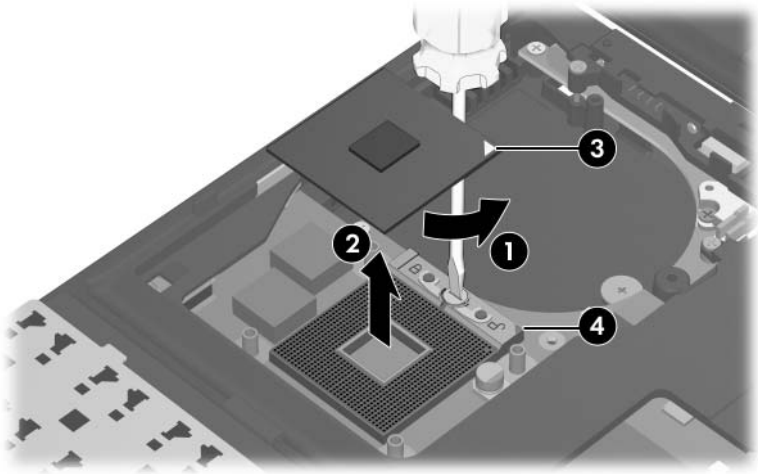
Intel Core Duo T2600 (2.17-GHz)	409972-001
Intel Core Duo T2500 (2.00-GHz)	409971-001
Intel Core Duo T2400 (1.83-GHz)	409970-001
Intel Core Duo T2300 (1.67-GHz)	409969-001
Intel Celeron M 1.60-GHz	419159-001

1. Prepare the computer for disassembly ([Section 5.3](#)).
2. Remove the keyboard cover ([Section 5.8](#)).
3. Release the keyboard ([Section 5.9](#)).
4. Remove the fan ([Section 5.10](#)).
5. Remove the heat sink ([Section 5.11](#)).

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



The gold triangle **3** on the processor should be aligned with the triangle icon **4** on the processor socket when you install the processor.



Removing the Processor

Reverse the above procedure to install the processor.

5.13 Internal Memory Module

Memory Module Spare Part Number Information

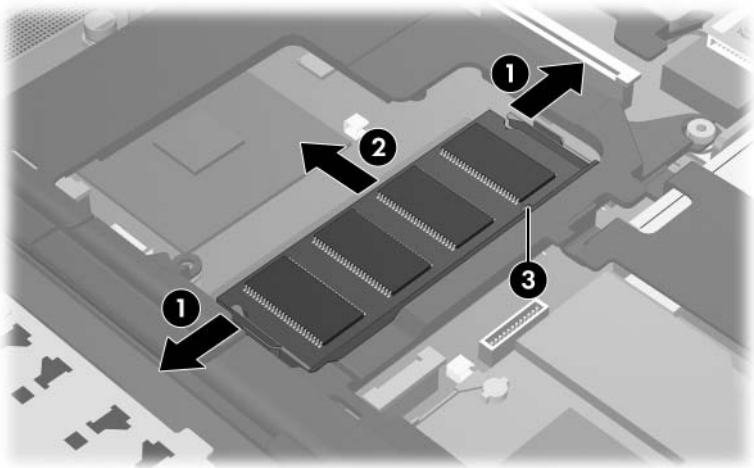
PC2, 5300		PC2, 4200	
2048-MB	419149-001	2048-MB	419148-001
1024-MB	419145-001	1024-MB	419144-001
512-MB	419151-001	512-MB	419150-001
256-MB	419147-001	256-MB	419146-001

1. Prepare the computer for disassembly ([Section 5.3](#)).
2. Remove the keyboard cover ([Section 5.8](#)).
3. Release the keyboard ([Section 5.9](#)).

4. Spread the retaining tabs **1** on each side of the memory module socket to release the memory module. (The side of the memory module opposite the socket rises away from the computer.)
5. Slide the memory module away from the socket at an angle **2**.
6. Remove the memory module.



Memory modules are designed with a notch **3** to prevent incorrect installation into the memory module socket.



Removing the Internal Memory Module

Reverse the above procedure to install a memory module.

5.14 Mini Card WLAN Module

Mini Card WLAN Module Spare Part Number Information

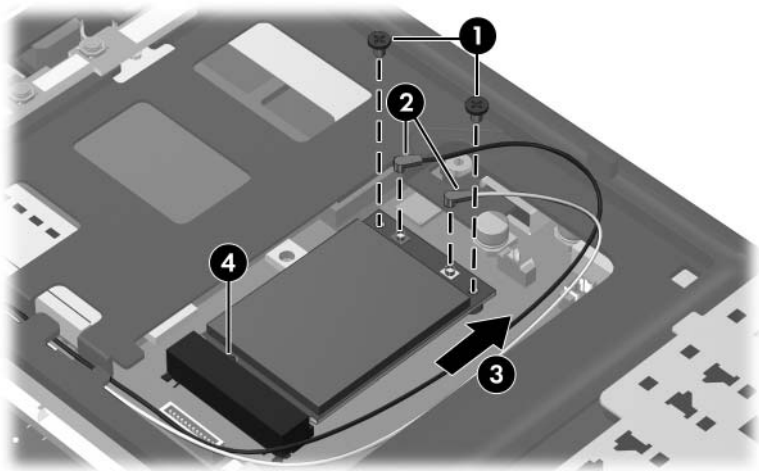
802.11b/g Silverton WLAN module for most of the world (MOW) use	359106-001
802.11b/g Silverton WLAN module for rest of the world (ROW) use	359107-001
802.11a/b/g FRLN WLAN card for MOW use	373888-001
802.11a/b/g FRLN WLAN card for ROW use	373889-001
802.11a/b/g FRLN WLAN card for use in Japan	373888-291
802.11a/b/g FRLN WLAN card for use in Europe	377792-001
802.11a/b/g DynaStar WLAN card for MOW use	337407-001
802.11a/b/g DynaStar WLAN card for ROW use	337407-002
802.11a/b/g DynaStar WLAN card for use in Japan	337407-291
802.11a/b/g ATMC WLAN card for MOW use	377408-001
802.11a/b/g ATMC WLAN card for ROW use	377408-002
802.11a/b/g ATMC WLAN card for use in Japan	377408-291

1. Prepare the computer for disassembly ([Section 5.3](#)).
2. Remove the keyboard cover ([Section 5.8](#)).
3. Release the keyboard ([Section 5.9](#)).

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



The Mini Card WLAN modules are designed with a notch ❹ to prevent incorrect installation.



Removing a Mini Card WLAN Module

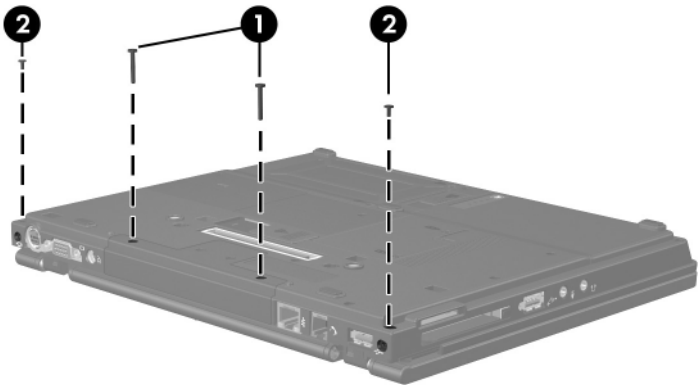
Reverse the above procedure to install a Mini Card WLAN module.

5.15 Display Assembly

Display Assembly Spare Part Number Information

12.1-inch, XGA, TFT display assembly (includes wireless antenna transceivers and cables, microphone, fingerprint reader board, and display cable)	419155-001
---	------------

1. Prepare the computer for disassembly ([Section 5.3](#)).
2. Remove the keyboard cover ([Section 5.8](#)).
3. Remove the keyboard ([Section 5.9](#)).
4. Close the computer.
5. Turn the computer upside down with the rear panel toward you.
6. Remove the two Torx8 T8M2.0×20.0 screws ❶ that secure the base enclosure cover to the computer.
7. Remove the two Torx8 T8M2.0×10.0 screws ❷ that secure the display assembly to the computer.

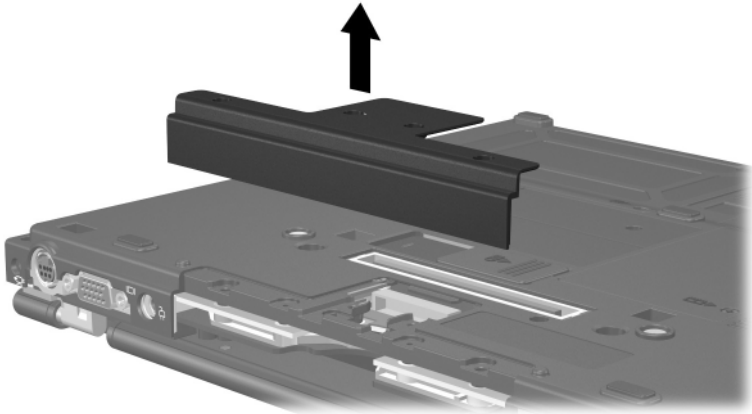


Removing the Display Assembly Screws

8. Remove the base enclosure cover.

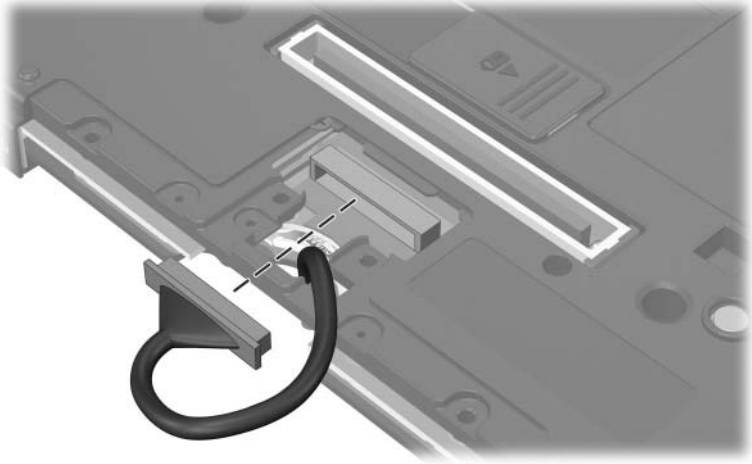


The base enclosure cover is available using spare part number 383520-001.



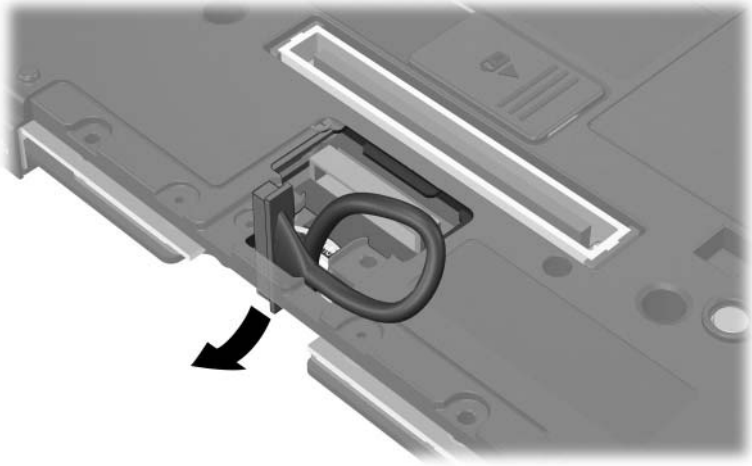
Removing the Base Enclosure Cover

9. Disconnect the display cable from the system board.



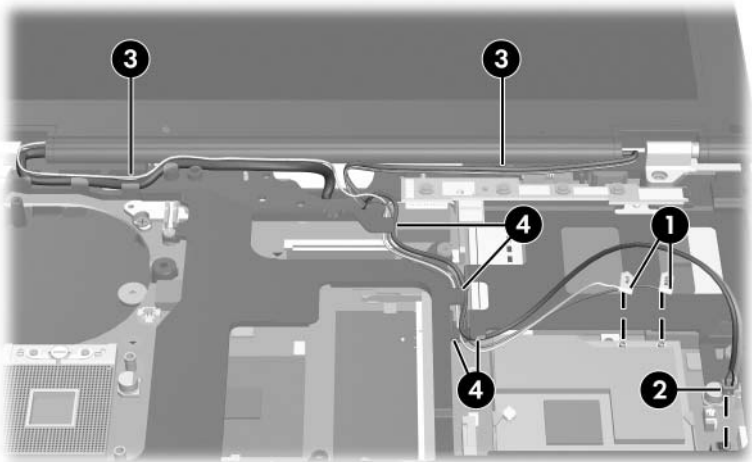
Disconnecting the Display Cable

10. Route the display cable through the opening between the base enclosure and the top cover.



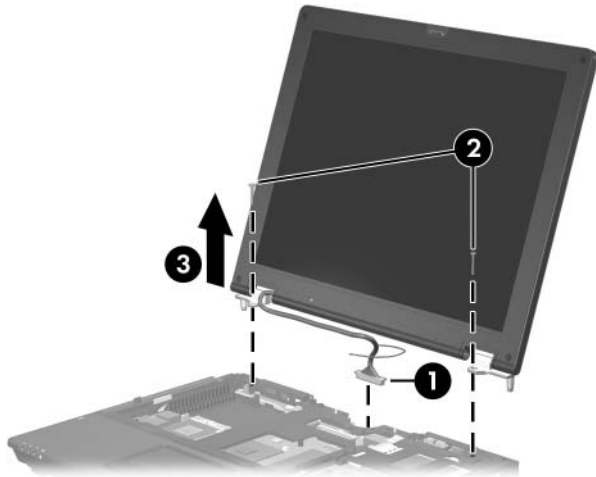
Releasing the Display Cable

11. Turn the computer right-side up with the front toward you.
12. Open the computer as far as possible.
13. Disconnect the wireless antenna cables from the Mini Card WLAN module **1**.
14. Disconnect the microphone cable **2** from the system board.
15. Remove the wireless antenna cables and the microphone cable from the routing channel **3** and clips **4** through which the cables are routed.



Disconnecting the Display Cables

16. Route the display cable through the opening in the computer ❶.
17. Remove the two Phillips PM2.0×20.0 screws ❷ that secure the display assembly to the computer.
18. Remove the display assembly ❸.



Removing the Display Assembly

Display Assembly Subcomponents

Spare Parts Number Information

Display bezel (includes fingerprint reader board)

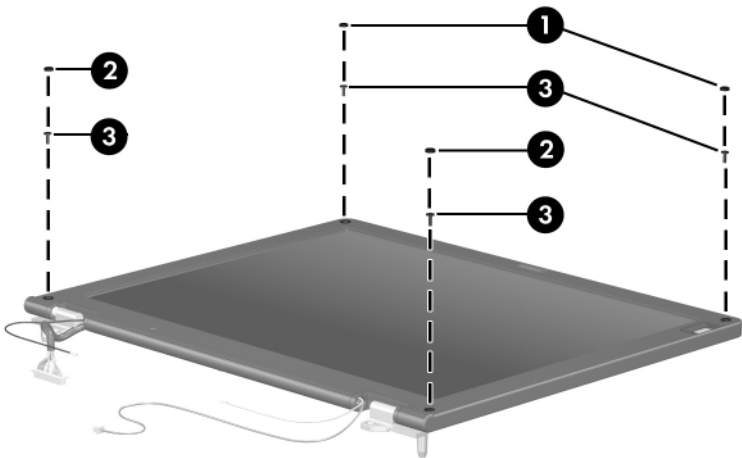
419133-001

19. Remove the four rubber screw covers **1** and **2** and the four Phillips PM2.0×6.0 screws **3** that secure the display bezel to the display assembly.



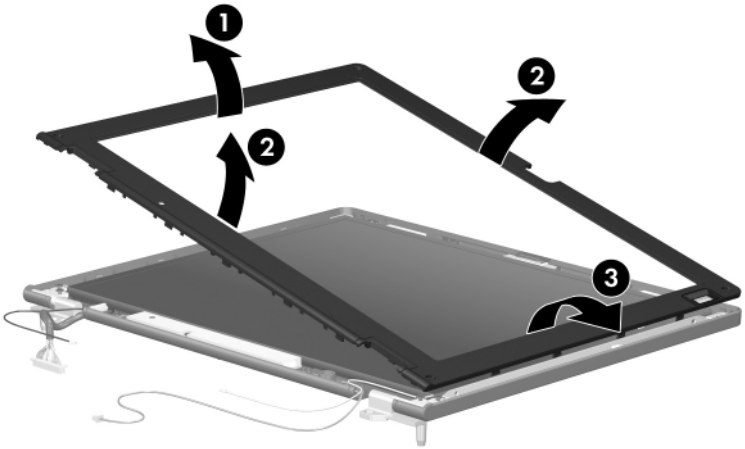
The display bezel rubber screw covers **1** on the top edge of the display bezel are thicker than the rubber screw covers **2** on the bottom edge of the display bezel.

The rubber screw covers are available in the Display Rubber Screw Cover Kit, spare part number 419142-001.



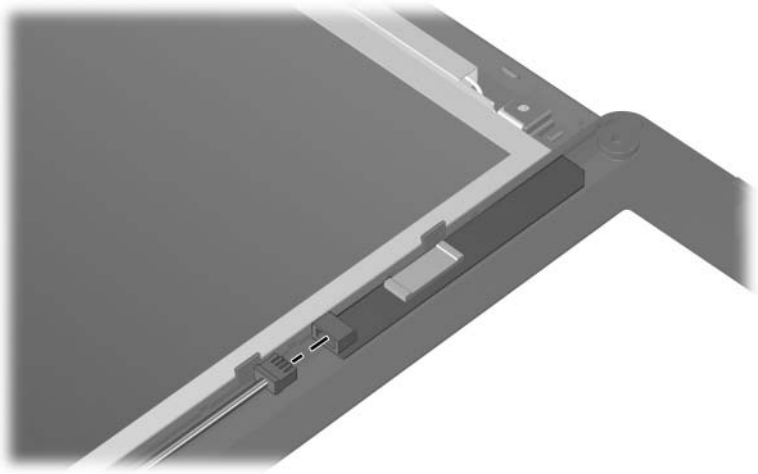
Removing the Display Bezel Screws

20. Flex the inside edges of the left **1** and top and bottom **2** edges of the display bezel until the bezel disengages from the display enclosure.
21. Swing the bezel **3** up and to the right until it rests beside the display assembly.



Releasing the Display Bezel

22. Disconnect the fingerprint reader board cable from the fingerprint reader board.



Removing the Fingerprint Reader Board

23. Remove the display bezel.

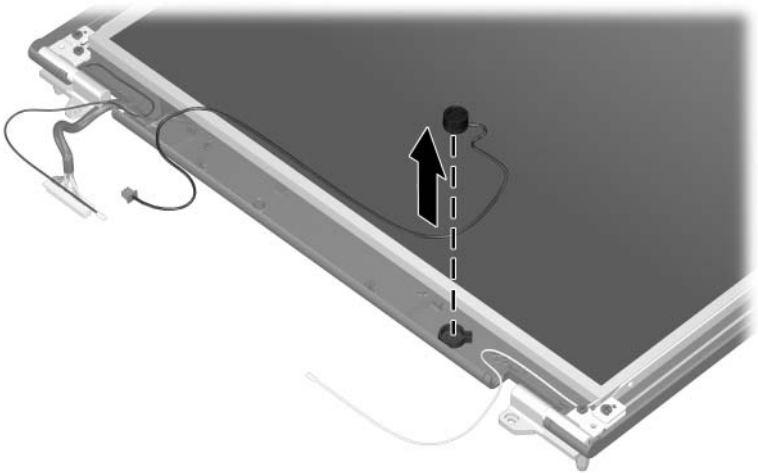
Display Assembly Subcomponents

Spare Part Number Information

Microphone

419152-001

24. Remove the microphone from the clip in the display enclosure.



Removing the Microphone

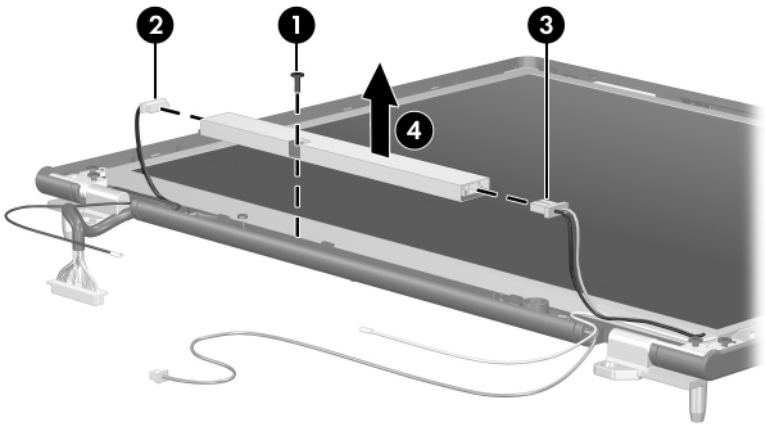
Display Assembly Subcomponents

Spare Part Number Information

Display inverter

419130-001

25. Remove the Phillips PM2.0×6.0 screw **1** that secures the display inverter to the display enclosure.
26. Disconnect the display **2** and backlight cables **3** from the inverter.
27. Remove the display inverter **4**.



Removing the Display Inverter

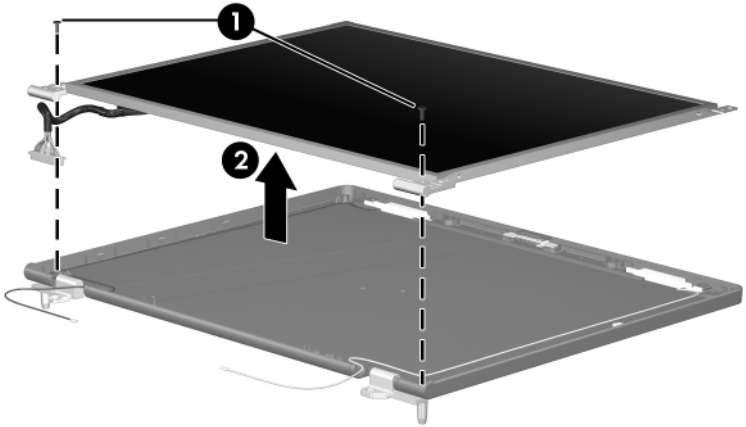
Display Assembly Subcomponents

Spare Part Number Information

12.1-inch WXGA, TFT display panel

419141-001

28. Remove the two Phillips PM2.0×6.0 screws ❶ that secure the display panel to the display enclosure.
29. Remove the display panel ❷ from the display enclosure.

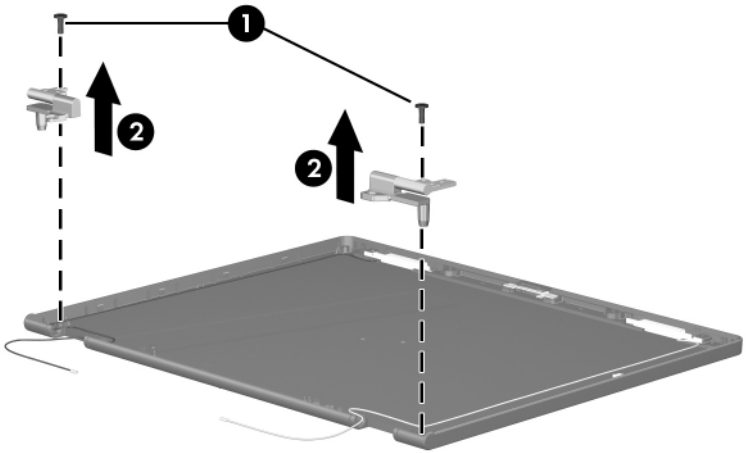


Removing the Display Panel



The display hinges are included in the Display Bracket Kit, spare part number 431167-001.

30. If it is necessary to replace the display hinges, remove the Phillips PM2.0×6.0 screw ❶ that secures each hinge to the display enclosure.
31. Remove the display hinges ❷.



Removing the Display Hinges

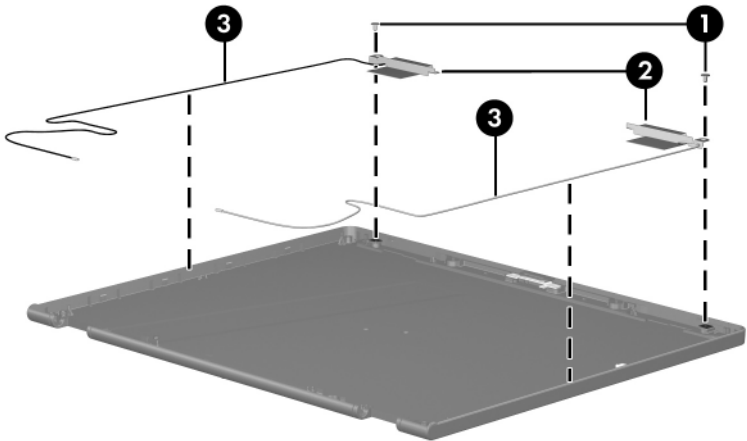
Display Assembly Subcomponents

Spare Part Number Information

Wireless Antenna Kit

419108-001

32. If it is necessary to replace the wireless antenna transceivers and cables, remove the Phillips PM2.0×6.0 screw **1** that secures each transceiver to the display enclosure.
33. Remove the wireless antenna transceivers **2** and cables **3** from the display enclosure.



Removing the Wireless Antenna Transceivers and Cables

Reverse the above procedure to reassemble and install the display assembly

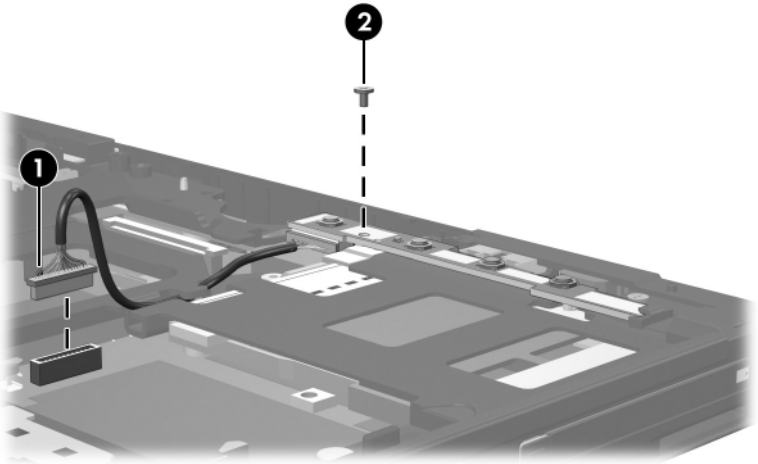
5.16 Button Board

Button Board Spare Part Number Information

Button board (includes button board cable)	419112-001
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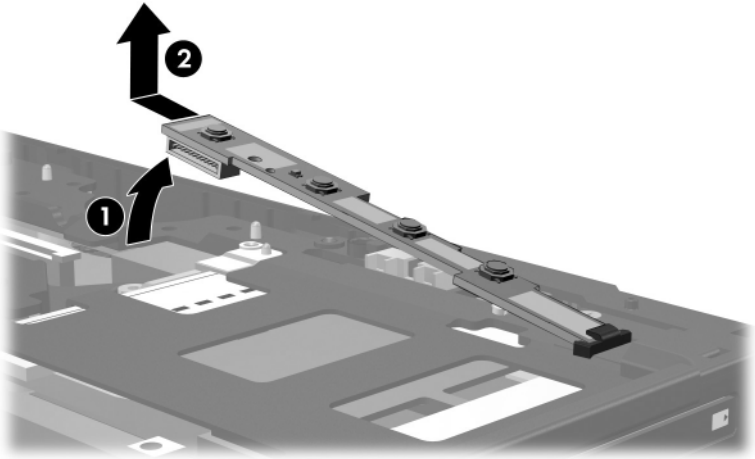
1. Prepare the computer for disassembly ([Section 5.3](#)) and remove the following components:
 - a. Keyboard cover ([Section 5.8](#))
 - b. Keyboard ([Section 5.9](#))
 - c. Display assembly ([Section 5.15](#))

2. Disconnect the button board cable ❶ from the system board.
3. Remove the Phillips PM2.0×4.0 screw ❷ that secures the button board to the top cover.



Removing the Button Board Screw

4. Lift the left side of the button board ❶.
5. Slide the button board to the left ❷ and remove it.



Removing the Button Board

Reverse the above procedure to install the button board.

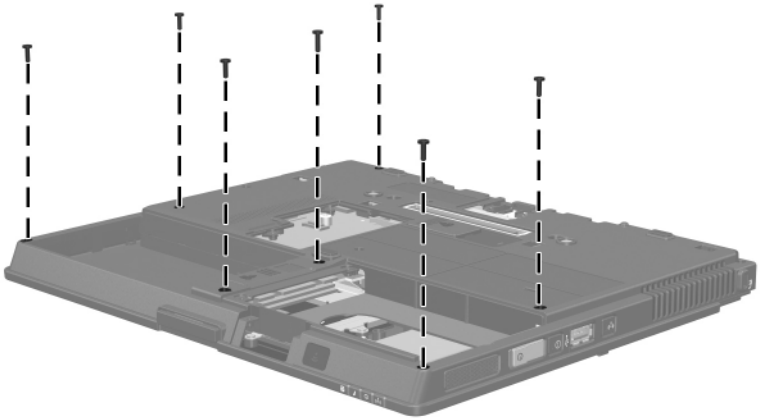
5.17 Top Cover

Top Cover Spare Part Number Information

Top cover	419163-001
-----------	------------

1. Prepare the computer for disassembly ([Section 5.3](#)) and remove the following components:
 - a. Hard drive ([Section 5.4](#))
 - b. Keyboard cover ([Section 5.8](#))
 - c. Keyboard ([Section 5.9](#))
 - d. Display assembly ([Section 5.15](#))
 - e. Button board ([Section 5.16](#))
2. Turn the computer upside down with the front toward you.

3. Remove the seven Torx8 T8M2.0×10.0 screws that secure the top cover to the computer.



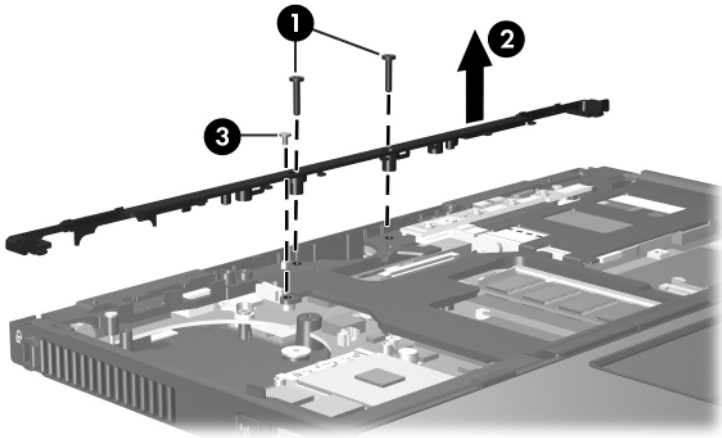
Removing the Top Cover Screws, Part 1

4. Turn the computer right-side up with the front toward you.
5. Remove the two Torx8 T8M2.0×20.0 screws ❶ that secure the rear keyboard cover to the computer.
6. Remove the rear keyboard cover ❷.



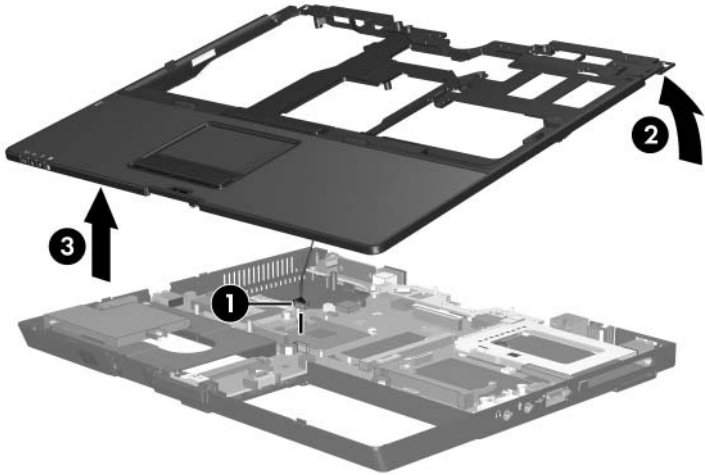
The rear keyboard cover is available using spare part number 419120-001.

7. Remove the Phillips PM2.0×4.0 screw ❸ that secures the top cover to the computer.



Removing the Rear Keyboard Cover

8. Disconnect the TouchPad cable ❶ from the system board.
9. Lift the rear edge of the top cover ❷ until it disengages from the base enclosure.
10. Lift the top cover straight up ❸ and remove it.



Removing the Top Cover

Reverse the above procedure to install the top cover.

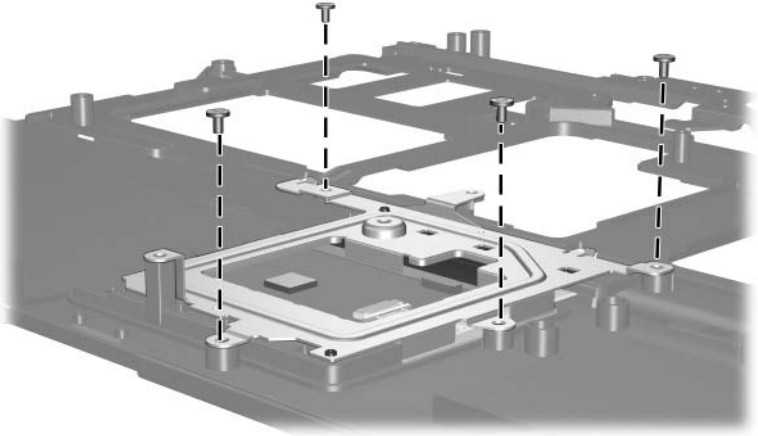
5.18 TouchPad

TouchPad Spare Part Number Information

TouchPad (includes cable and bracket)	419165-001
---------------------------------------	------------

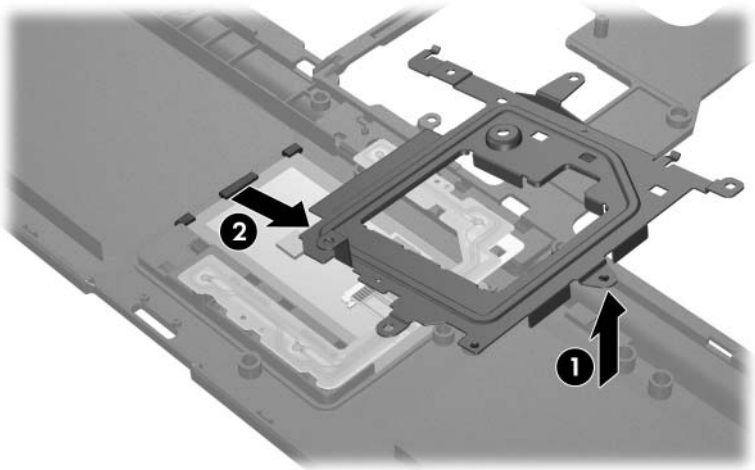
1. Prepare the computer for disassembly ([Section 5.3](#)) and remove the following components:
 - a. Hard drive ([Section 5.4](#))
 - b. Keyboard cover ([Section 5.8](#))
 - c. Keyboard ([Section 5.9](#))
 - d. Display assembly ([Section 5.15](#))
 - e. Button board ([Section 5.16](#))
 - f. Top cover ([Section 5.17](#))
2. Turn the top cover upside down with the front toward you.

3. Remove the four Phillips PM2.0×4.0 screws that secure the TouchPad bracket to the top cover.



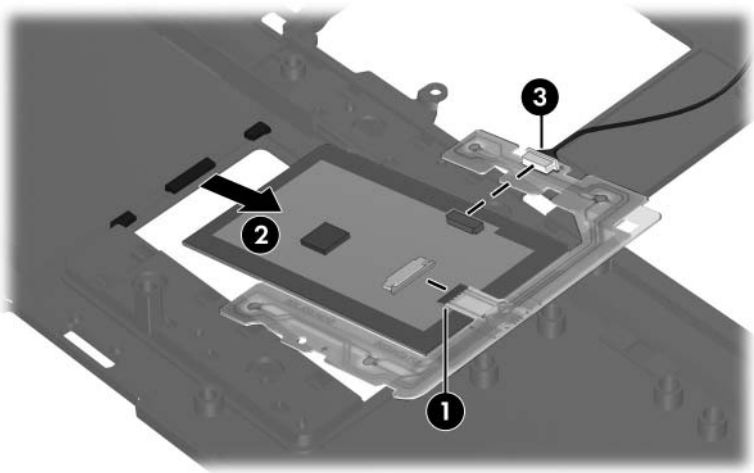
Removing the TouchPad Bracket Screws

4. Lift the right side of the TouchPad bracket **1** until it rests at an angle.
5. Slide the TouchPad bracket to the right **2** and remove it.



Removing the TouchPad Bracket

6. Release the ZIF connector to which the TouchPad cable is attached and disconnect the TouchPad cable **1**.
7. Slide the TouchPad **2** to the right and remove it.
8. If it is necessary to replace the TouchPad cable, disconnect the cable **3** from the TouchPad board.



Removing the TouchPad

Reverse the above procedure to install the TouchPad.

5.19 Speaker

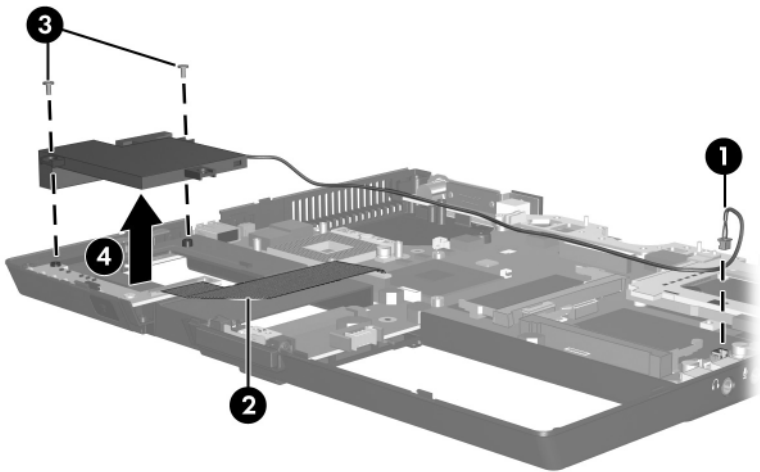
Speaker Spare Part Number Information

Speaker

419160-001

1. Prepare the computer for disassembly ([Section 5.3](#)) and remove the following components:
 - a. Hard drive ([Section 5.4](#))
 - b. Keyboard cover ([Section 5.8](#))
 - c. Keyboard ([Section 5.9](#))
 - d. Display assembly ([Section 5.15](#))
 - e. Button board ([Section 5.16](#))
 - f. Top cover ([Section 5.17](#))

2. Disconnect the speaker cable **1** from the system board and route the cable under the infrared board cable **2**.
3. Remove the two Torx8 T8M2.0x5.0 screws **3** that secure the speaker to the computer.
4. Remove the speaker **4**.



Removing the Speaker

Reverse the above procedure to install the speaker.

5.20 Infrared Board

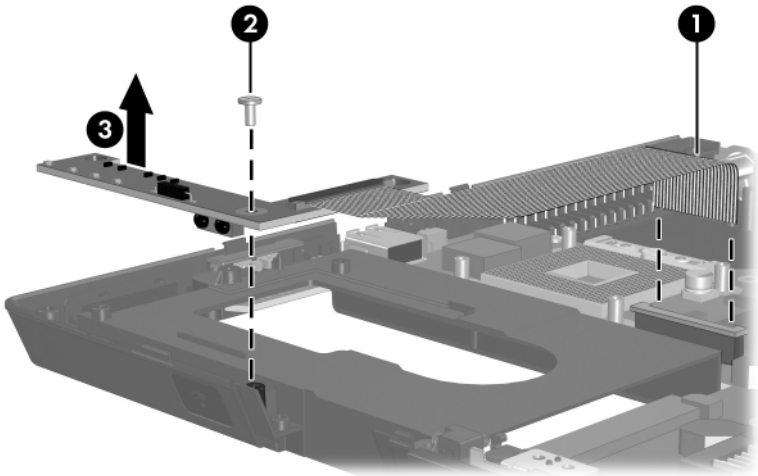
Infrared Board Spare Part Number Information

Infrared board (includes cable)

419113-001

1. Prepare the computer for disassembly ([Section 5.3](#)) and remove the following components:
 - a. Hard drive ([Section 5.4](#))
 - b. Keyboard cover ([Section 5.8](#))
 - c. Keyboard ([Section 5.9](#))
 - d. Display assembly ([Section 5.15](#))
 - e. Button board ([Section 5.16](#))
 - f. Top cover ([Section 5.17](#))
 - g. Speaker ([Section 5.19](#))

2. Release the ZIF connector to which the infrared board cable is connected and disconnect the cable ❶ from the system board.
3. Remove the Torx8 T8M2.0x5.0 screw ❷ that secures the infrared board to the system board.
4. Remove the infrared board ❸.



Removing the Infrared Board

Reverse the above procedure to install the infrared board .

5.21 System Board

System Board Spare Part Number Information

System board

419116-001

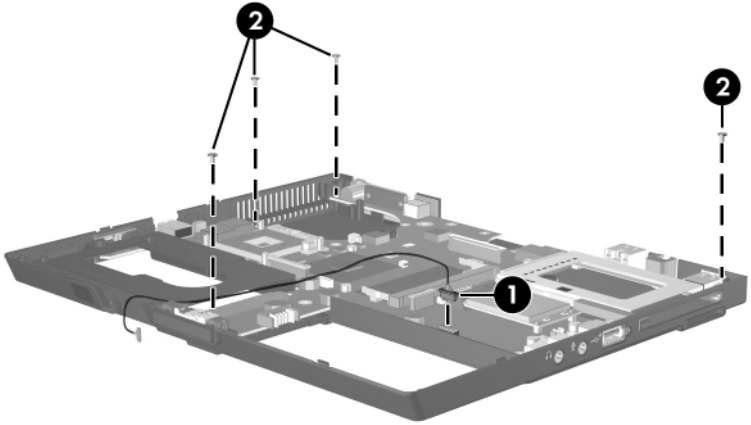


When replacing the system board, be sure that the following components are removed from the defective system board and installed on the replacement system board:

- Memory modules ([Section 5.7](#) and [Section 5.13](#))
 - Processor ([Section 5.12](#))
 - Mini Card WLAN module ([Section 5.14](#))
 - Modem module ([Section 5.22](#))
 - RTC battery ([Section 5.23](#))
-

1. Prepare the computer for disassembly ([Section 5.3](#)) and remove the following components:
 - a. Hard drive ([Section 5.4](#))
 - b. Bluetooth module ([Section 5.6](#))
 - c. Keyboard cover ([Section 5.8](#))
 - d. Keyboard ([Section 5.9](#))
 - e. Fan ([Section 5.10](#))
 - f. Heat sink ([Section 5.11](#))
 - g. Display assembly ([Section 5.15](#))
 - h. Button board ([Section 5.16](#))
 - i. Top cover ([Section 5.17](#))
 - j. Speaker ([Section 5.19](#))
 - k. Infrared board ([Section 5.20](#))

2. Disconnect the Bluetooth module cable ❶ from the system board and remove the cable.
3. Remove the four Torx8 T8M2.0×5.0 screws ❷ that secure the system board to the computer.



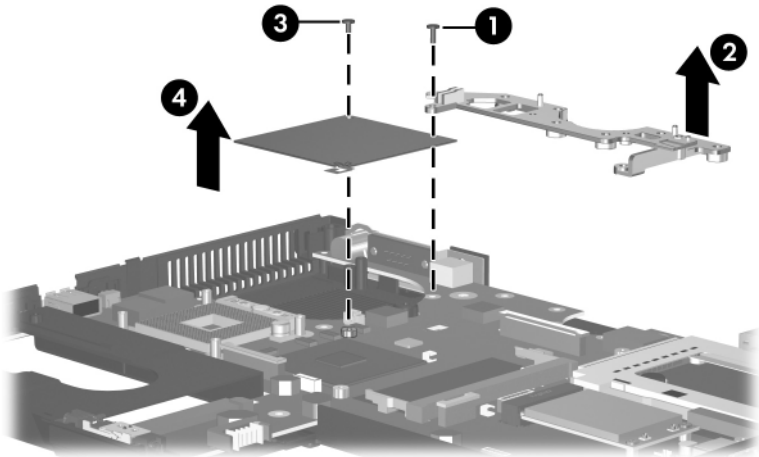
Removing the System Board Screws, Part 1

4. Remove the Torx8 T8M2.0×8.0 screw ❶ that secures the display support frame to the computer.
5. Remove the hinge saddle ❷.
6. Remove the Torx8 T8M2.0×8.0 screw ❸ that secures the thermal shield to the computer.
7. Remove the thermal shield ❹.



The hinge saddle is available using spare part number 419129-001.

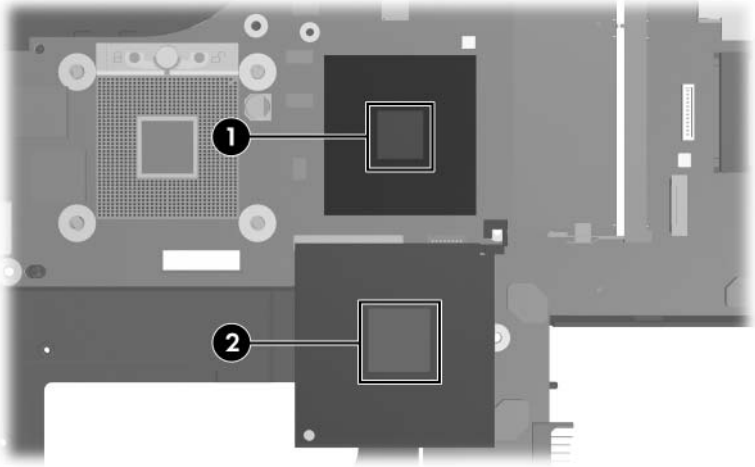
The thermal shield is available using spare part number 419162-001.



Removing the System Board Screws, Part 2

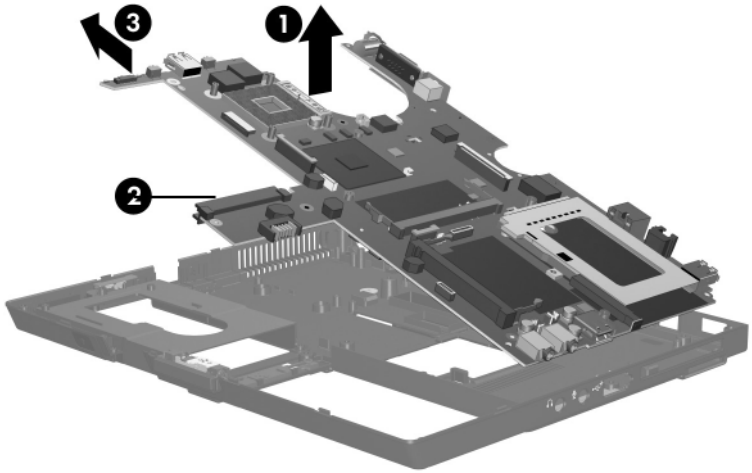


The thermal paste should be thoroughly cleaned from the surfaces of the video chip shield **1** and video chip **2** each time the shield is removed. Thermal paste is included with the system board spare part kit.



Video Chip Shield and Video Chip Thermal Paste Locations

8. Lift the left side of the system board **1** until the hard drive connector **2** is clear of the base enclosure.
9. Slide the system board **3** to the left at an angle and remove it.



Removing the System Board

Reverse the above procedure to install the system board.

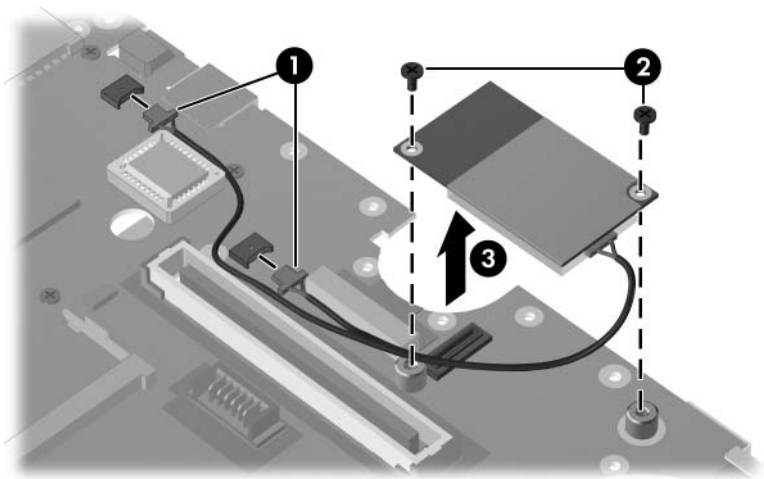
5.22 Modem Module

Modem Module Spare Part Number Information

Modem module (high-speed 56 K, includes modem module cable)	419143-001
---	------------

1. Prepare the computer for disassembly ([Section 5.3](#)) and remove the following components:
 - a. Hard drive ([Section 5.4](#))
 - b. Bluetooth module ([Section 5.6](#))
 - c. Keyboard cover ([Section 5.8](#))
 - d. Keyboard ([Section 5.9](#))
 - e. Fan ([Section 5.10](#))
 - f. Heat sink ([Section 5.11](#))
 - g. Display assembly ([Section 5.15](#))
 - h. Button board ([Section 5.16](#))
 - i. Top cover ([Section 5.17](#))
 - j. Speaker ([Section 5.19](#))
 - k. Infrared board ([Section 5.20](#))
 - l. System board ([Section 5.21](#))
2. Turn the system board upside down with the front toward you.

3. Disconnect the modem module cable from the two connectors **1** on the system board.
4. Remove the two Phillips PM2.0x4.0 screws **2** that secure the modem board to the system board.
5. Lift the right side of the modem board **3** to disconnect it from the system board.
6. Remove the modem board.



Removing the Modem Board

Reverse the above procedure to install the modem board.

5.23 RTC Battery

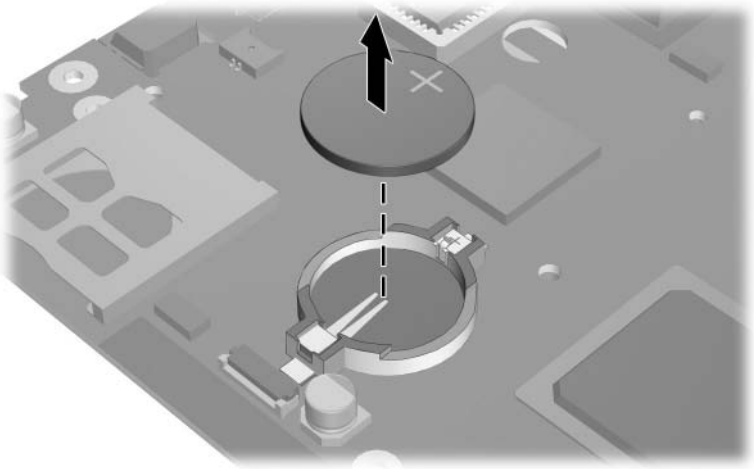
RTC Battery Spare Part Number Information

RTC battery

383625-001

1. Prepare the computer for disassembly ([Section 5.3](#)) and remove the following components:
 - a. Hard drive ([Section 5.4](#))
 - b. Bluetooth module ([Section 5.6](#))
 - c. Keyboard cover ([Section 5.8](#))
 - d. Keyboard ([Section 5.9](#))
 - e. Fan ([Section 5.10](#))
 - f. Heat sink ([Section 5.11](#))
 - g. Display assembly ([Section 5.15](#))
 - h. Button board ([Section 5.16](#))
 - i. Top cover ([Section 5.17](#))
 - j. Speaker ([Section 5.19](#))
 - k. Infrared board ([Section 5.20](#))
 - l. System board ([Section 5.21](#))
2. Turn the system board upside down with the left side toward you.

3. Remove the RTC battery from the system board 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.

6

Specifications

This chapter provides physical and performance specifications.

Table 6-1
Computer

Dimensions	Metric	U.S.
Height (front to back)	30.2 to 31.5 mm	1.19 to 1.24 in
Width	285 mm	11.22 in
Depth	235 mm	9 in
Weight	1.81 kg	3.99 lbs
Input Power		
Operating voltage	18.5 V dc @ 3.5 A - 65 W	
Operating current	3.5 A	
Temperature		
Operating (not writing to optical disc)	0°C to 35°C	32°F to 95°F
Operating (writing to optical disc)	5°C to 35°C	41°F to 95°F
Nonoperating	-20°C to 60°C	-4°F to 140°F

Table 6-1
Computer (Continued)

Relative humidity (noncondensing)		
Operating	10% to 90%	10% to 90%
Nonoperating	5% to 95%	5% to 95%
Maximum altitude (unpressurized)		
Operating (14.7 to 10.1 psia)	-15 m to 3,048 m	-50 ft to 10,000 ft
Nonoperating (14.7 to 4.4 psia)	-15 m to 12,192 m	-50 ft to 40,000 ft
Shock		
Operating	125 g, 2 ms, half-sine	
Nonoperating	200 g, 2 ms, half-sine	
Random Vibration		
Operating	0.75 g zero-to-peak, 10 Hz to 500 Hz, 0.25 oct/min sweep rate	
Nonoperating	1.50 g zero-to-peak, 10 Hz to 500 Hz, 0.5 oct/min sweep rate	



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

Table 6-2
12.1-inch, XGA, TFT Display

Dimensions		
Height	20.7 cm	8.1 in
Width	33.1 cm	13.0 in
Diagonal	39.1 cm	15.4 in
Number of colors	Up to 16.8 million	
Contrast ratio	150:1	
Brightness	150 nits typical	
Pixel resolution		
Pitch	0.300 × 0.300 mm	
Format	1024 × 768	
Configuration	RGB vertical stripe	
Backlight	Edge lit	
Character display	80 × 25	
Total power consumption	3.5 W	
Viewing angle	+/-65° horizontal, +/-50° vertical typical	

Table 6-3
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	102 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
Disk rotational speed			
	5400 rpm	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 6-4
Primary 6-cell, Li-Ion Battery Pack

Dimensions

Height	2.00 cm	0.79 in
Width	9.40 cm	3.70 in
Depth	13.40 cm	5.28 in
Weight	0.34 kg	0.75 lb

Energy

Voltage	10.8 V
Amp-hour capacity	4.8 Ah
Watt-hour capacity	52 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 6-5
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 6-6
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 6-6
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 6-7
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 6-7
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 6-7
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 6-8
System Memory Map

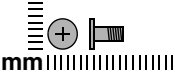
Size	Memory Address	System Function
640 KB	00000000-0009FFFF	Base memory
128 KB	000A0000-000BFFFF	Video memory
48 KB	000C0000-000CBFFF	Video BIOS
160 KB	000C8000-000E7FFF	Unused
64 KB	000E8000-000FFFFF	System BIOS
15 MB	00100000-00FFFFFF	Extended memory
58 MB	01000000-047FFFFF	Super extended memory
58 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

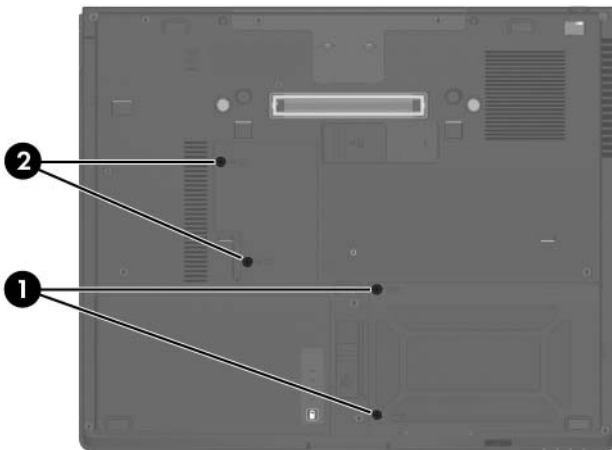
This appendix provides specification and reference information for the screws and screw locks used in the computer. All screws and screw locks listed in this appendix are available in the Screw Kit, spare part number 373556-001.

Table A-1
Phillips PM2.0x5.0 Screw

 mm	Color	Qty.	Length	Thread	Head Width
	Black	6	5.0 mm	2.0 mm	4.5 mm

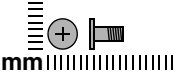
Where used:

- ❶ Two screws that secure the hard drive cover to the computer (screws are captured on the cover by C-clips; documented in [Section 5.4](#))
- ❷ Two screws that secure the memory module compartment cover to the computer (screws are captured on the cover by C-clips; documented in [Section 5.7](#))



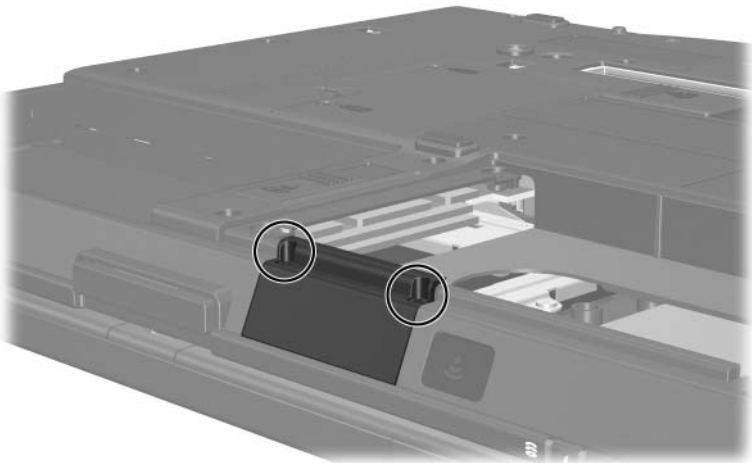
Phillips PM2.0x5.0 Screw Locations

Table A-1
Phillips PM2.0x5.0 Screw (Continued)

	Color	Qty.	Length	Thread	Head Width
	Black	6	5.0 mm	2.0 mm	4.5 mm

Where used:

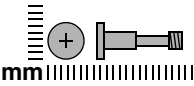
2 screws that secure the Bluetooth module cover to the computer (screws are captured on the cover by C-clips; documented in [Section 5.6](#))



Phillips PM2.0x5.0 Screw Locations

Table A-2

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

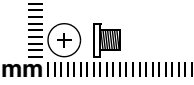
	Color	Qty.	Length	Thread	Head Width
	Black	1	13.0 mm	2.5 mm	5.5 mm

Where used:

- ① One screw that secures the hard drive to the computer (screw is captured on the cover by a C-clip; documented in [Section 5.4](#))

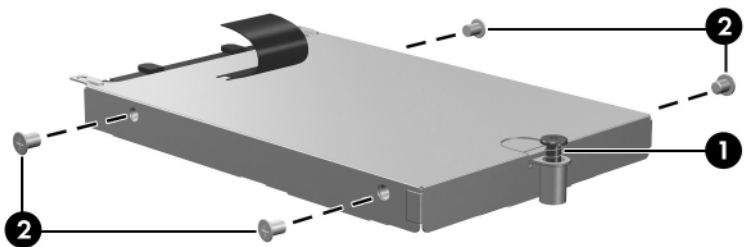
Table A-3

Phillips PM3.0×4.0 Screw

	Color	Qty.	Length	Thread	Head Width
	Silver	4	4.0 mm	3.0 mm	5.0 mm

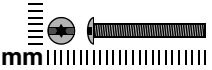
Where used:

- ② Four screws that secure the hard drive frame to the hard drive (documented in [Section 5.4](#))



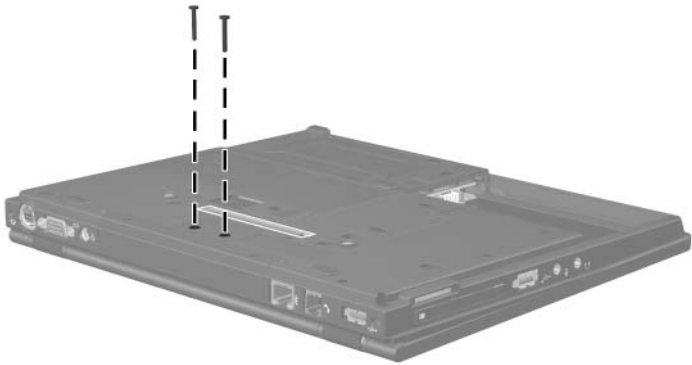
Phillips PM2.5×13.0 and Phillips PM3.0×4.0 Screw Locations

Table A-4
Torx T8M2.0×20.0 Screw

 mm	Color	Qty.	Length	Thread	Head Width
	Black	8	20.0 mm	2.0 mm	4.5 mm

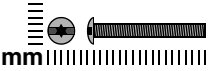
Where used:

2 screws that secure the keyboard cover to the computer (documented in [Section 5.8](#))



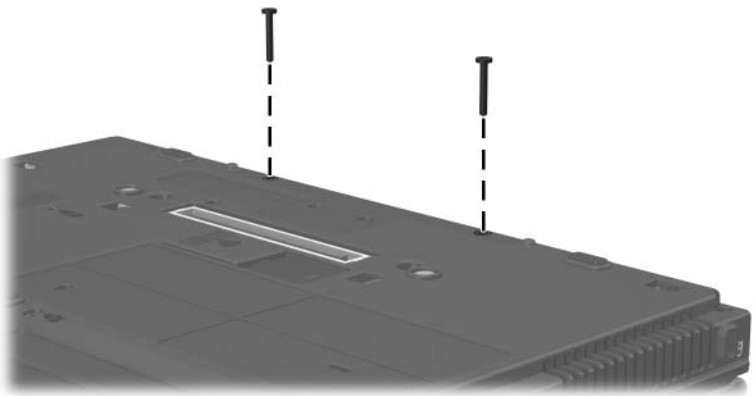
Torx T8M2.0×20.0 Screw Locations

Table A-4
Torx T8M2.0×20.0 Screw (Continued)

	Color	Qty.	Length	Thread	Head Width
	Black	8	20.0 mm	2.0 mm	4.5 mm

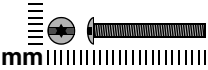
Where used:

2 screws that secure the base enclosure cover to the computer (documented in [Section 5.15](#))



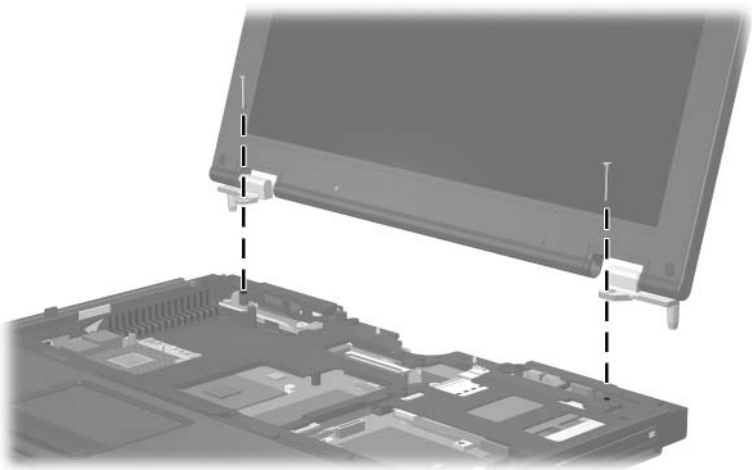
Torx T8M2.0×20.0 Screw Locations

Table A-4
Torx T8M2.0×20.0 Screw (Continued)

 mm	Color	Qty.	Length	Thread	Head Width
	Black	8	20.0 mm	2.0 mm	4.5 mm

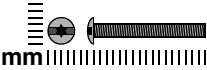
Where used:

2 screws that secure the display assembly to the computer (documented in [Section 5.15](#))



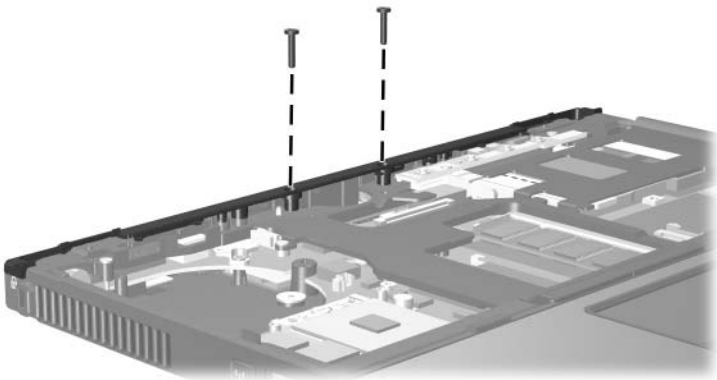
Torx T8M2.0×20.0 Screw Locations

Table A-4
Torx T8M2.0×20.0 Screw (Continued)

 mm	Color	Qty.	Length	Thread	Head Width
	Black	8	20.0 mm	2.0 mm	4.5 mm

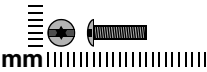
Where used:

2 screws that secure the rear keyboard cover to the computer (documented in [Section 5.17](#))



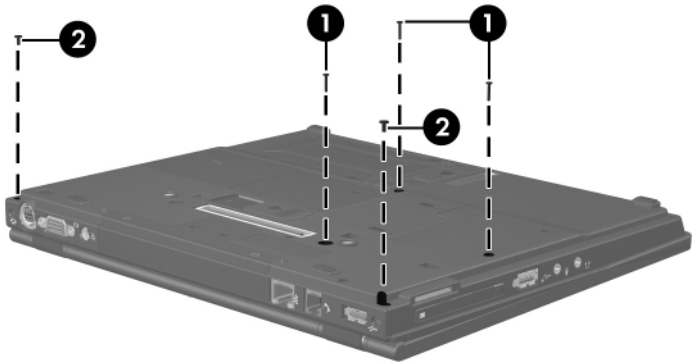
Torx T8M2.0×20.0 Screw Locations

Table A-5
Torx T8M2.0×10.0 Screw

 mm	Color	Qty.	Length	Thread	Head Width
	Black	12	10.0 mm	2.0 mm	4.5 mm

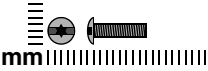
Where used:

- ❶ Three screws that secure the keyboard to the computer (documented in [Section 5.9](#))
- ❷ Two screws that secure the display assembly to the computer (documented in [Section 5.15](#))



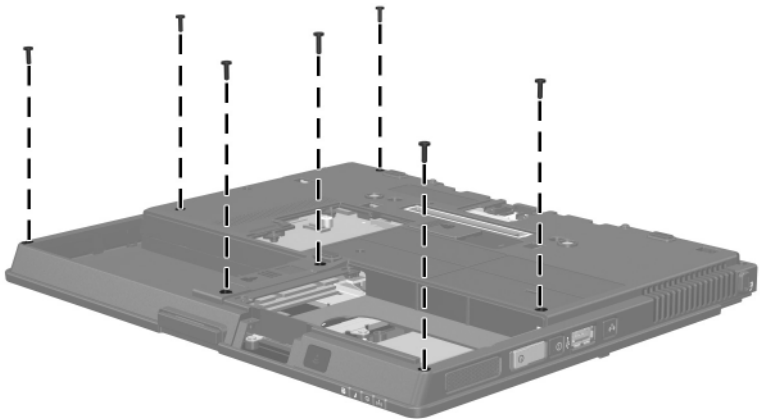
Torx T8M2.0×10.0 Screw Locations

Table A-5
Torx T8M2.0×10.0 Screw (Continued)

	Color	Qty.	Length	Thread	Head Width
	Black	12	10.0 mm	2.0 mm	4.5 mm



Where used:

7 screws that secure the top cover to the computer (documented in [Section 5.17](#))



Torx T8M2.0×10.0 Screw Locations

Table A-6
Torx T8M2.0×5.0 Screw

 mm 	Color	Qty.	Length	Thread	Head Width
	Black	8	5.0 mm	2.0 mm	4.5 mm



Where used:

One screw that secures the keyboard to the computer (documented in [Section 5.9](#))



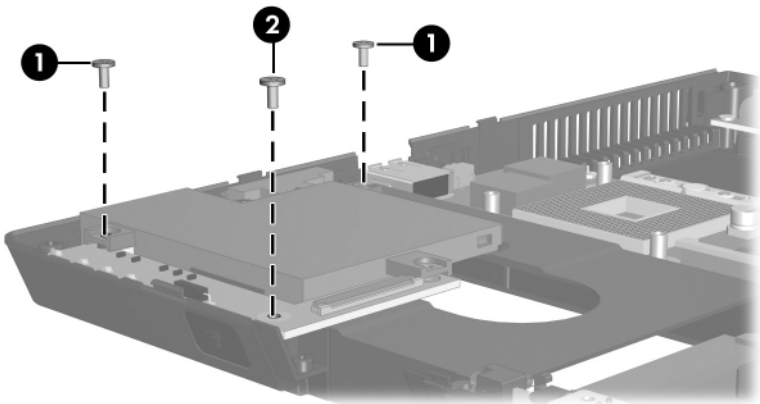
Torx T8M2.0×5.0 Screw Location

Table A-6
Torx T8M2.0x5.0 Screw (Continued)

 mm 	Color	Qty.	Length	Thread	Head Width
	Black	8	5.0 mm	2.0 mm	4.5 mm



Where used:

- 1 Two screws that secure the speaker to the computer (documented in [Section 5.19](#))
- 2 One screw that secures the infrared board to the computer (documented in [Section 5.20](#))



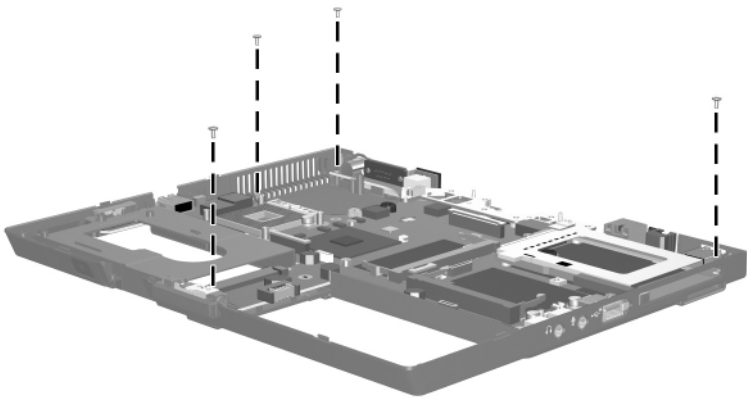
Torx T8M2.0x5.0 Screw Locations

Table A-6
Torx T8M2.0×5.0 Screw (Continued)

 mm 	Color	Qty.	Length	Thread	Head Width
	Black	8	5.0 mm	2.0 mm	4.5 mm

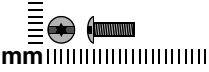
Where used:

4 screws that secure the system board to the computer (documented in [Section 5.21](#))



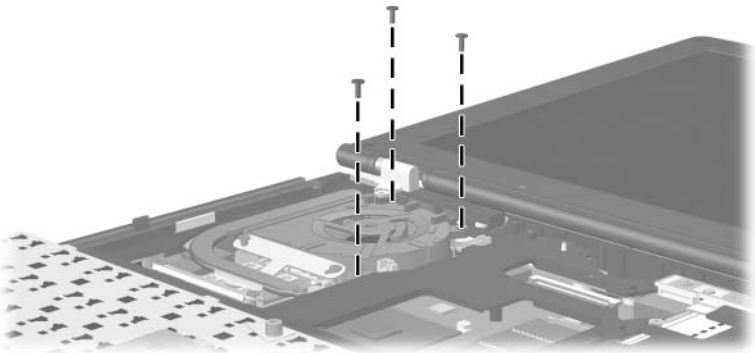
Torx T8M2.0×5.0 Screw Locations

Table A-7
Torx T8M2.0x8.0 Screw

	Color	Qty.	Length	Thread	Head Width
	Black	5	8.0 mm	2.0 mm	5.0 mm

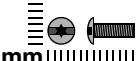

Where used:

3 screws that secure the fan to the computer (documented in [Section 5.10](#))



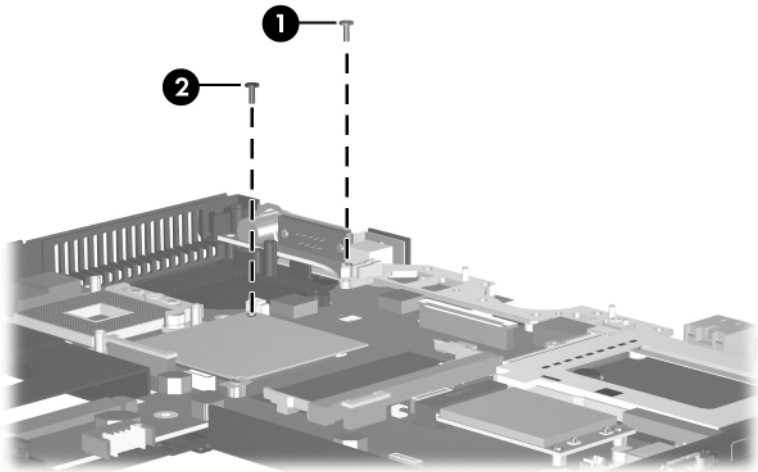
Torx T8M2.0x8.0 Screw Locations

Table A-7
Torx T8M2.0×8.0 Screw (Continued)

 mm 	Color	Qty.	Length	Thread	Head Width
	Black	5	8.0 mm	2.0 mm	5.0 mm

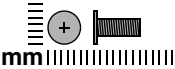
Where used:

- ❶ One screw that secures the system board and display support frame to the computer (documented in [Section 5.21](#))
- ❷ One screw that secures the system board and thermal shield to the computer (documented in [Section 5.21](#))



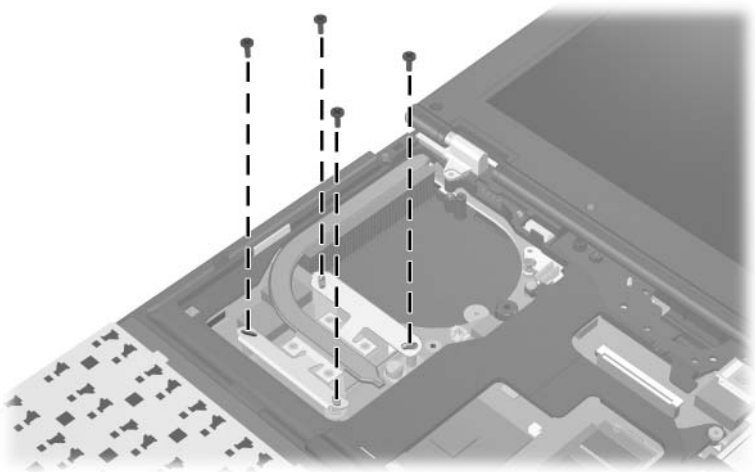
Torx T8M2.0×8.0 Screw Location

Table A-8
Phillips PM2.5×7.0 Screw

 mm	Color	Qty.	Length	Thread	Head Width
	Black	4	7.0 mm	2.5 mm	5.0 mm

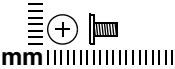
Where used:

4 screws that secure the heat sink to the computer (documented in [Section 5.11](#))



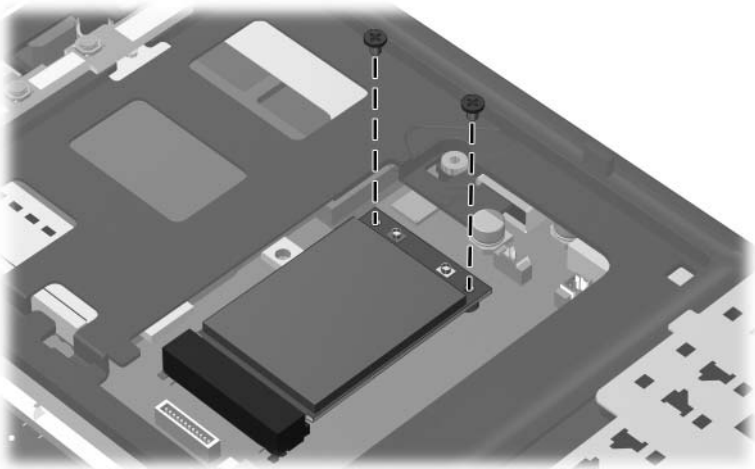
Phillips PM2.5×7.0 Screw Locations

Table A-9
Phillips PM2.0×4.0 Screw

 mm	Color	Qty.	Length	Thread	Head Width
	Silver	10	4.0 mm	2.0 mm	4.0 mm

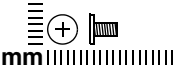
Where used:

2 screws that secure the Mini Card WLAN module to the computer (documented in [Section 5.14](#))



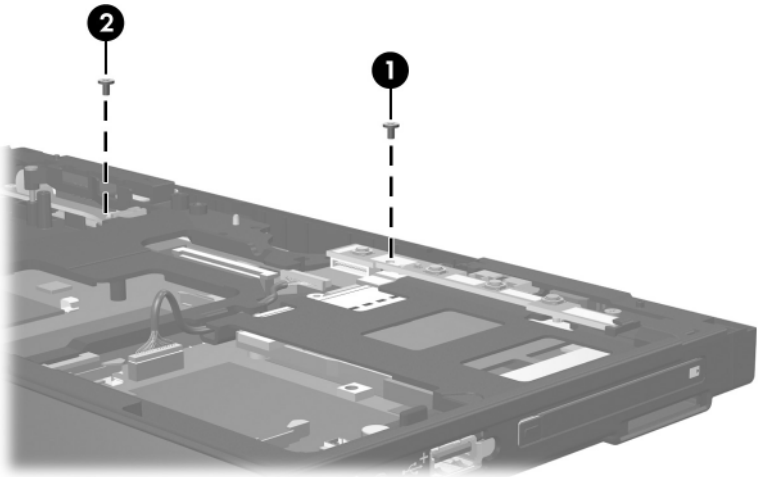
Phillips PM2.0×4.0 Screw Locations

Table A-9
Phillips PM2.0×4.0 Screw (Continued)

 mm	Color	Qty.	Length	Thread	Head Width
	Silver	10	4.0 mm	2.0 mm	4.0 mm

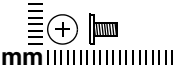
Where used:

- ① One screw that secures the button board to the computer (documented in [Section 5.16](#))
- ② One screw that secures the top cover to the computer (documented in [Section 5.17](#))



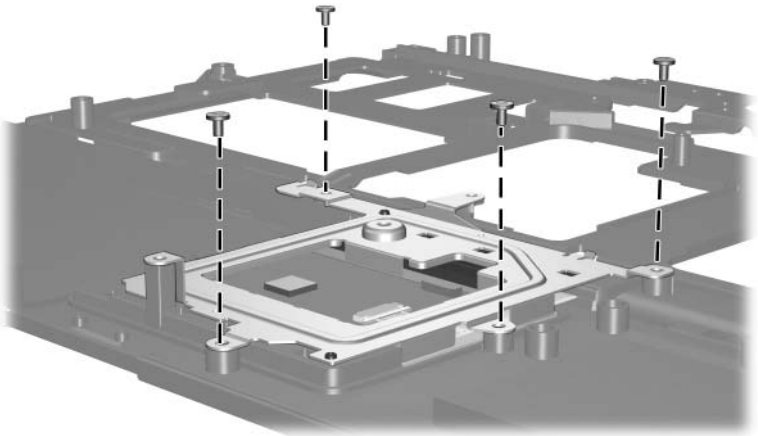
Phillips PM2.0×4.0 Screw Locations

Table A-9
Phillips PM2.0×4.0 Screw (Continued)

	Color	Qty.	Length	Thread	Head Width
	Silver	10	4.0 mm	2.0 mm	4.0 mm

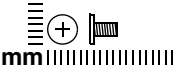
Where used:

4 screws that secure the TouchPad bracket to the top cover (documented in [Section 5.18](#))



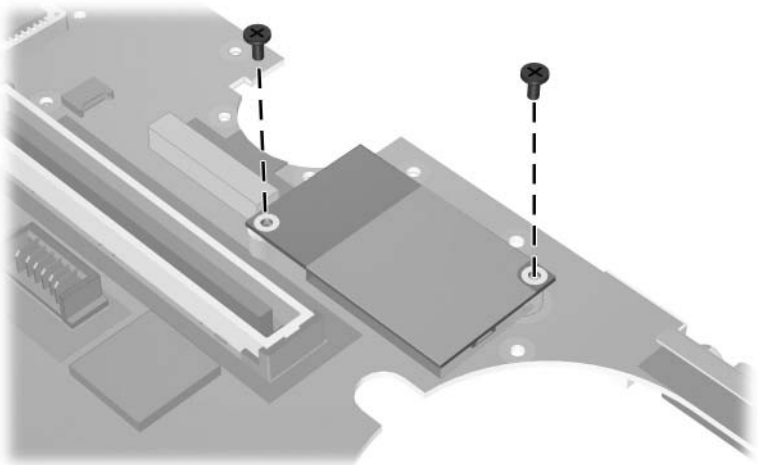
Phillips PM2.0×4.0 Screw Locations

Table A-9
Phillips PM2.0x4.0 Screw (Continued)

	Color	Qty.	Length	Thread	Head Width
	Silver	10	4.0 mm	2.0 mm	4.0 mm

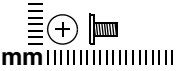
Where used:

2 screws that secure the modem module to the system board (documented in [Section 5.22](#))



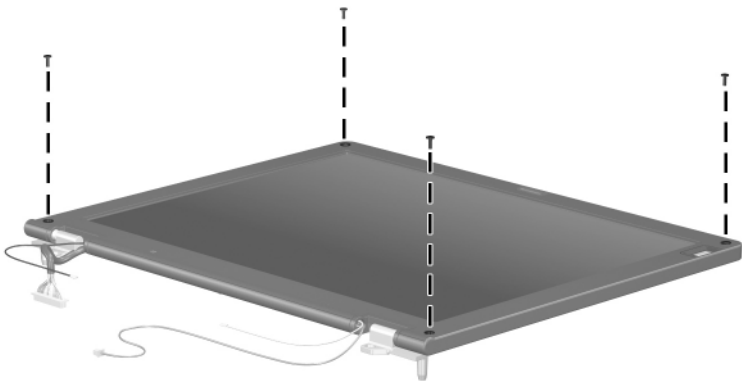
Phillips PM2.0x4.0 Screw Locations

Table A-10
Phillips PM2.0×6.0 Screw

	Color	Qty.	Length	Thread	Head Width
mm	Silver	11	6.0 mm	2.0 mm	5.0 mm

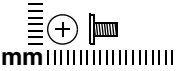
Where used:

4 screws that secure the display bezel to the display assembly (documented in [Section 5.15](#))



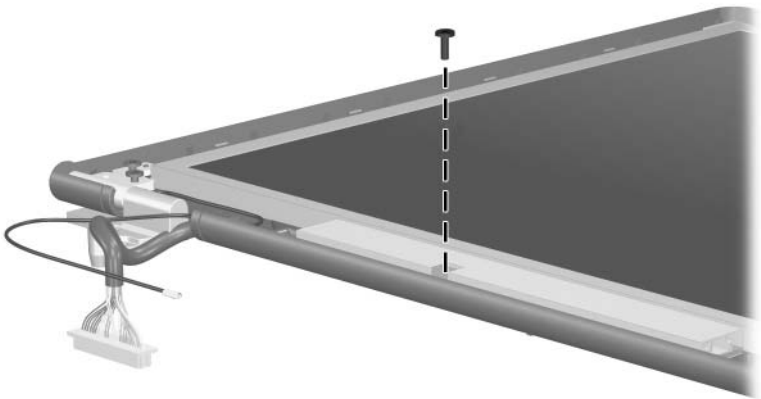
Phillips PM2.0×6.0 Screw Locations

Table A-10
Phillips PM2.0x6.0 Screw (Continued)

	Color	Qty.	Length	Thread	Head Width
	Silver	11	6.0 mm	2.0 mm	5.0 mm

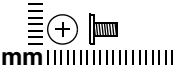
Where used:

One screw that secures the display inverter to the display assembly (documented in [Section 5.15](#))



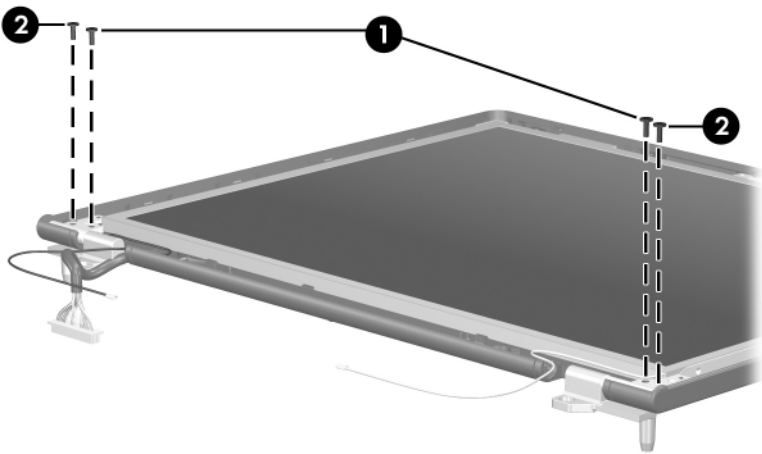
Phillips PM2.0x6.0 Screw Location

Table A-10
Phillips PM2.0×6.0 Screw (Continued)

 mm	Color	Qty.	Length	Thread	Head Width
	Silver	11	6.0 mm	2.0 mm	5.0 mm

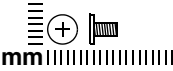
Where used:

- ❶ Two screws that secure the display panel to the display assembly (documented in [Section 5.15](#))
- ❷ Two screws that secure the display hinges to the display assembly (documented in [Section 5.15](#))



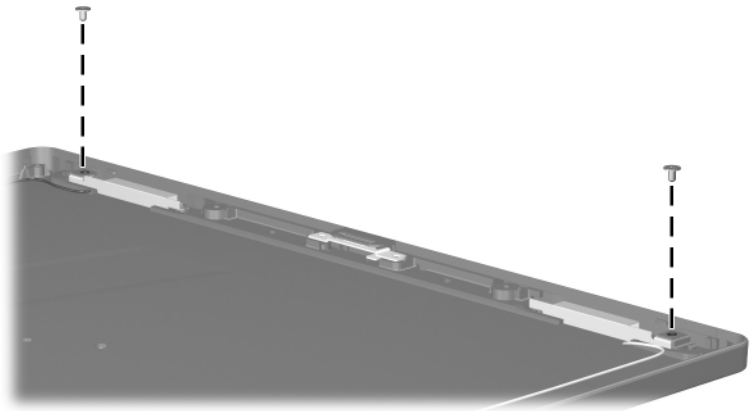
Phillips PM2.0×6.0 Screw Locations

Table A-10
Phillips PM2.0x6.0 Screw (Continued)

	Color	Qty.	Length	Thread	Head Width
mm	Silver	11	6.0 mm	2.0 mm	5.0 mm

Where used:

2 screws that secure the wireless antenna transceivers to the display assembly (documented in [Section 5.15](#))



Phillips PM2.0x6.0 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 computer models only), by clicking one of the available options. Click **Next** to further define the settings.

A summary of your system recovery point settings is displayed.

4. Follow the on-screen instructions.

Recovery

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



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

HP Backup and Recovery Manager allows you to

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



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

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

Creating Recovery Discs (Highly Recommended)

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



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



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

Before creating recovery discs:

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



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

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

To create a set of recovery discs:

1. Select **Start > All Programs > HP Backup & Recovery > HP Backup and Recovery Manager**.
2. Click **Next**.
3. Click **Create factory software recovery CDs or DVDs to recover the system (Highly recommended)**, and then click **Next**.
The “Recovery Media Creator” page opens.
4. Click **Next**.
5. Click **Write to CD/DVD**, and then click **Next**.
6. Follow the on-screen instructions.

Performing a Recovery

Performing a Recovery from the Recovery Discs

To perform a recovery from the recovery discs:

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

Performing a Recovery from the Hard Drive

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

- From within Windows.
- From the recovery partition.

Initiating a Recovery in Windows

To initiate a recovery in Windows:

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



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

6. Follow the on-screen instructions.

Initiating a Recovery from the Hard Drive Recovery Partition

To initiate a recovery from the hard drive recovery partition:

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

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.

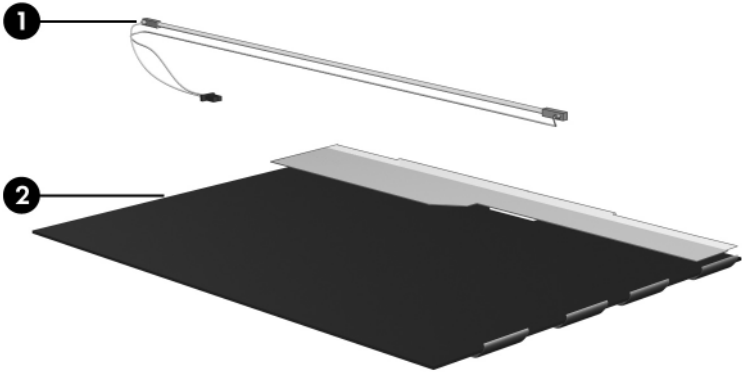


Materials Disposal

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>.

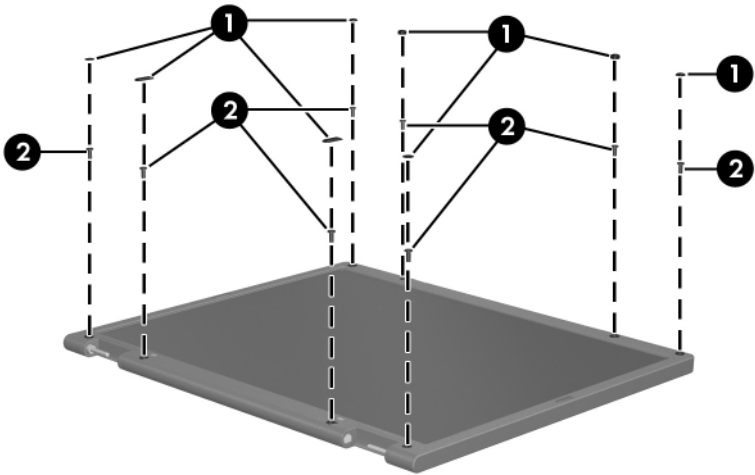
This appendix provides disassembly instructions for the display assembly. The display assembly must be disassembled to gain access to the backlight ❶ and the liquid crystal display (LCD) panel ❷.



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.

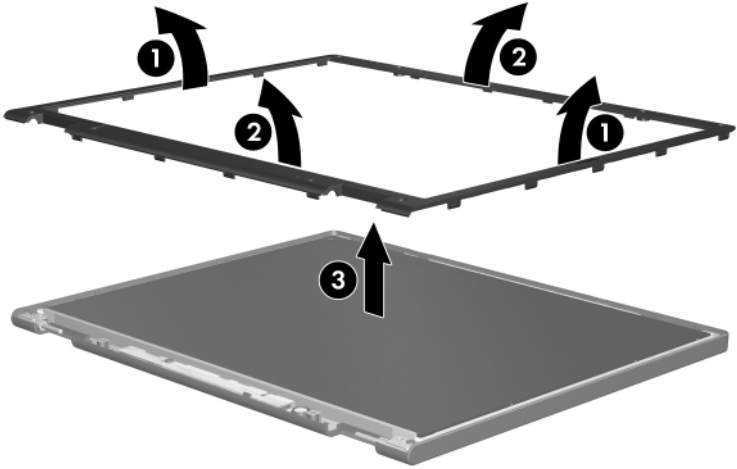
Perform the following steps to disassemble the display assembly:

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



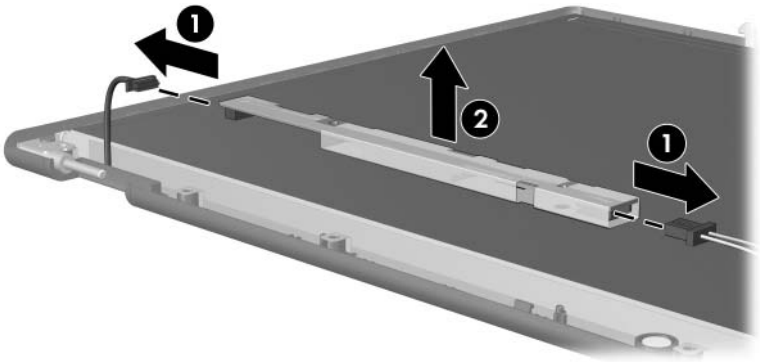
Removing the Display Bezel Screw Covers and Screws

-
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.



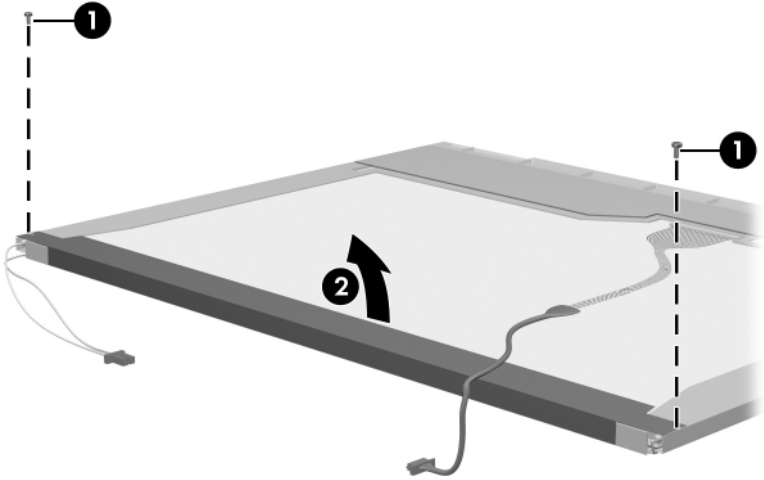
Removing the Display Bezel

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



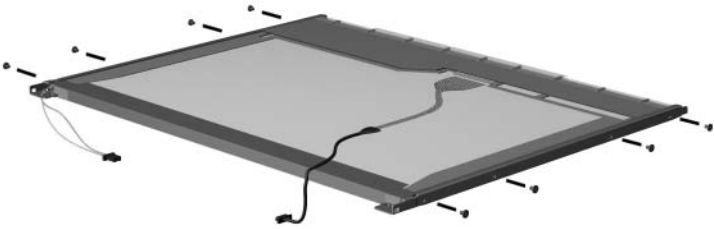
Removing the Display Inverter

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



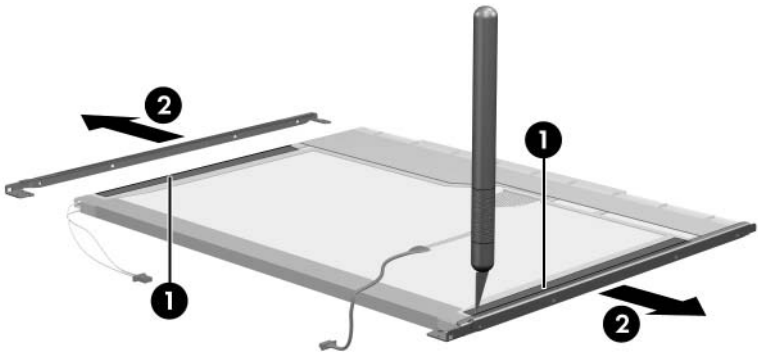
Removing the Display Panel Assembly

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



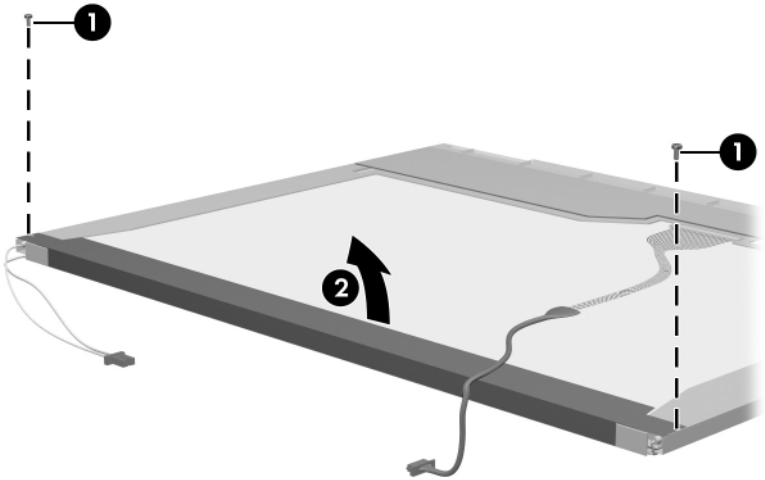
Removing the Display Panel Frame Screws

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.



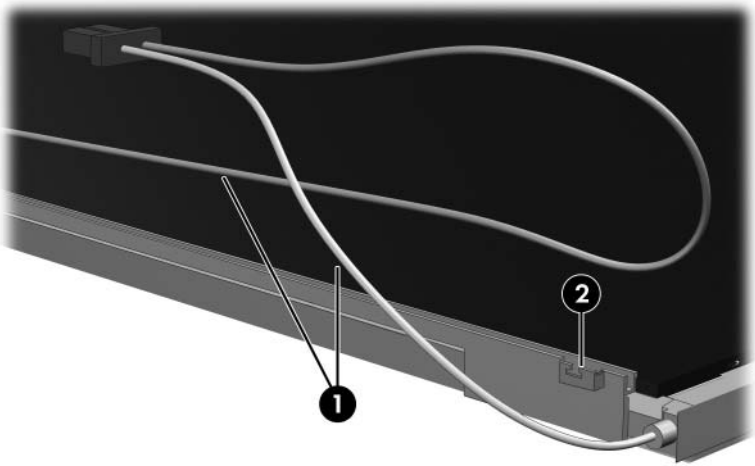
Removing the Display Frame

11. Remove the screws **1** that secure the backlight cover to the display panel.
12. Lift the top edge of the backlight cover **2** and swing it forward.
13. Remove the backlight cover.



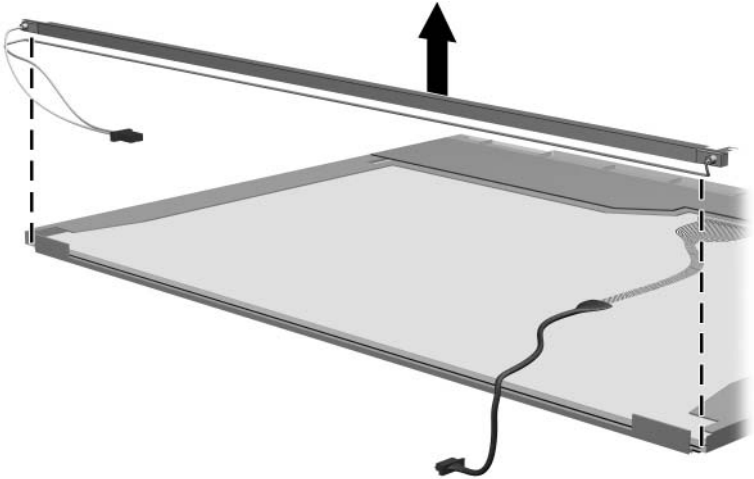
Removing the Backlight Cover

14. Turn the display panel right-side up.
15. Remove the backlight cables **1** from the clip **2** in the display panel.



Releasing the Backlight Cables

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

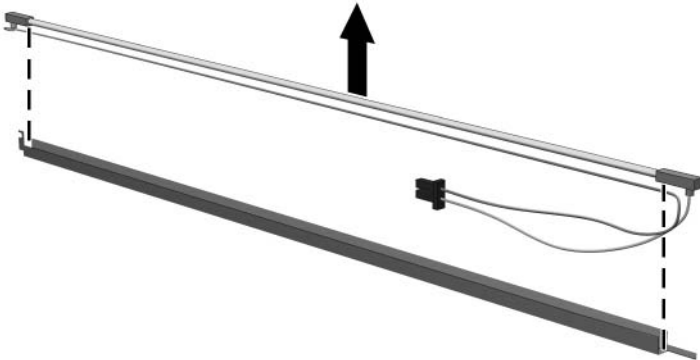


Removing the Backlight Frame



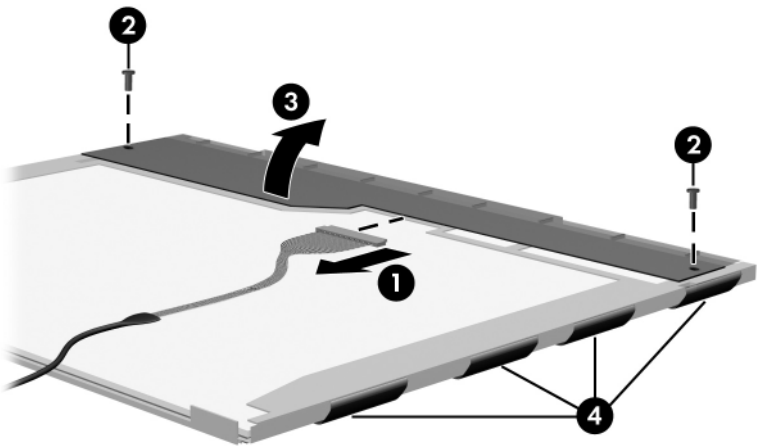
WARNING: The backlight contains mercury. Caution should be exercised when removing and handling the backlight to avoid damaging this component and causing exposure to the mercury.

18. Slide the backlight out of the backlight frame.



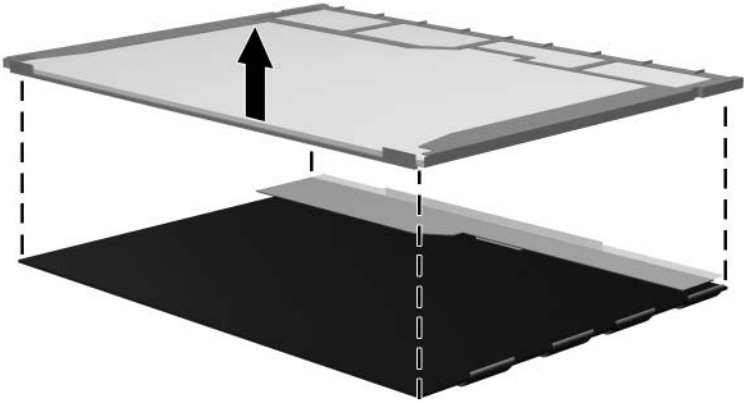
Removing the Backlight

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



Releasing the LCD Panel

23. Remove the LCD panel.



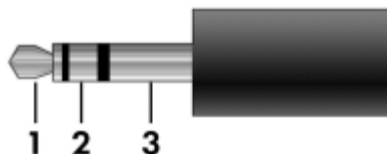
Removing the LCD Panel

24. Recycle the LCD panel and backlight.

D

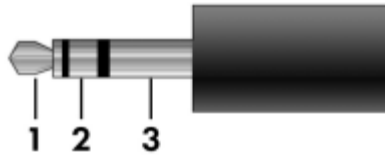
Connector Pin Assignments

Table D-1
Audio-Out (Headphone)



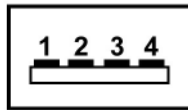
Pin	Signal	Pin	Signal
1	Audio out, left channel	3	Ground
2	Audio out, right channel		

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



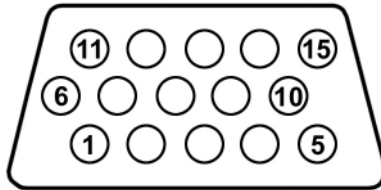
Pin	Signal	Pin	Signal
1	+5 VDC	3	Data +
2	Data -	4	Ground

Table D-4
S-Video-Out



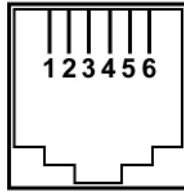
Pin	Signal	Pin	Signal
1	S-VHS color (C) signal	5	TV-CD
2	Composite video signal	6	S-VHS intensity ground
3	S-VHS intensity (Y) signal	7	Composite video ground
4	S-VHS color ground		

Table D-5
External Monitor



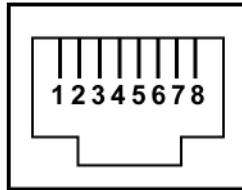
Pin	Signal	Pin	Signal
1	Red analog	9	+5 VDC
2	Green analog	10	Ground
3	Blue analog	11	Monitor detect
4	Not connected	12	DDC 2B data
5	Ground	13	Horizontal sync
6	Ground analog	14	Vertical sync
7	Ground analog	15	DDC 2B clock
8	Ground analog		

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

Power Cord Set Requirements

3-Conductor Power Cord Set

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

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

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

General Requirements

The requirements listed below are applicable to all countries.

- The length of the power cord set must be at least 1.5 m (5.0 ft) and a maximum of 2.0 m (6.5 ft).
- All power cord sets must be approved by an acceptable accredited agency responsible for evaluation in the country where the power cord set will be used.
- The power cord sets must have a minimum current capacity of 10 amps and a nominal voltage rating of 125 or 250 V AC, as required by each country's power system.
- The appliance coupler must meet the mechanical configuration of an EN 60 320/IEC 320 Standard Sheet C13 connector for mating with the appliance inlet on the back of the computer.

Country-Specific Requirements

3-Conductor Power Cord Set Requirements

Country/Region	Accredited Agency	Applicable Note Number
Australia	EANSW	1
Austria	OVE	1
Belgium	CEBC	1
Canada	CSA	2
Denmark	DEMKO	1
Finland	FIMKO	1
France	UTE	1
Germany	VDE	1
Italy	IMQ	1
Japan	METI	3



NOTES:

1. The flexible cord must be <HAR> Type HO5VV-F, 3-conductor, 1.0 mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country where it will be used.
2. The flexible cord must be Type SPT-3 or equivalent, No. 18 AWG, 3-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15 A, 125 V) or NEMA 6-15P (15 A, 250 V) configuration.
3. The appliance coupler, flexible cord, and wall plug must bear a "T" mark and registration number in accordance with the Japanese Dentori Law. The flexible cord must be Type VCT or VCTF, 3-conductor, 1.00 mm² conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V) configuration.

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

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



NOTES:

1. The flexible cord must be <HAR> Type HO5VV-F, 3-conductor, 1.0 mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country where it will be used.
2. The flexible cord must be Type SPT-3 or equivalent, No. 18 AWG, 3-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15 A, 125 V) or NEMA 6-15P (15 A, 250 V) configuration.
3. The appliance coupler, flexible cord, and wall plug must bear a "T" mark and registration number in accordance with the Japanese Dentori Law. The flexible cord must be Type VCT or VCTF, 3-conductor, 1.00 mm² conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V) configuration.
4. The flexible cord must be Type RVV, 3-conductor, 0.75 mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country where it will be used.
5. The flexible cord must be Type VCTF, 3-conductor, 0.75 mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country where it will be used.

Index

A

- accessory battery connector
1–19
- arrow keys 1–15
- audio troubleshooting 2–21
- audio-in jack
 - location 1–9
 - pin assignments D–2
- audio-out jack
 - location 1–9
 - pin assignments D–1

B

- base enclosure cover
 - location 1–19
 - removal 5–35
 - spare part number 3–8,
3–19
- base enclosure, spare part
number 3–10, 3–20
- battery bay 1–19
- battery light 1–7
- battery pack
 - removal 5–6
 - spare part number 3–10,
3–20, 5–6
 - specifications 6–5
- battery release latch 1–19

Bluetooth module

- removal 5–12
 - spare part number 3–10,
3–20, 5–12
- ## Bluetooth module cable 3–14
- ## Bluetooth module cover
- illustrated 3–13
 - removal 5–12
- ## bottom components 1–18
- ## button board
- removal 5–48
 - spare part number 3–3,
3–20, 5–48
- ## button board cable 3–14

C

- ## Cable Kit
- components 3–14
 - spare part number 3–14,
3–20
- ## cables, service considerations 4–2
- ## caps lock key 1–15
- ## CMOS clearing 1–4
- ## components
- bottom 1–18
 - front 1–6
 - keyboard 1–14

- left-side 1–10, 1–12
- rear 1–10, 1–12
- right-side 1–8
- top 1–16
- computer feet
 - illustrated 3–13
 - locations 5–11
- Computer Setup
 - Advanced Menu 2–5
 - Diagnostics Menu 2–4
 - File Menu 2–2
 - overview 2–1
 - Security Menu 2–3
- computer specifications 6–1
- connector pin assignments
 - audio-in D–2
 - audio-out D–1
 - external monitor D–4
 - headphone D–1
 - microphone D–2
 - modem D–5
 - monitor D–4
 - network D–6
 - RJ-11 D–5
 - RJ-45 D–6
 - S-Video-out D–3
 - Universal Serial Bus (USB)
 - D–2
- connectors, service
 - considerations 4–2
- D**
- design overview 1–20
- Digital Media Slot 1–9
- disassembly sequence chart
 - 5–3
- diskette drive
 - OS loading problems 2–19
 - precautions 4–3
- display assembly
 - removal 5–34
 - spare part number 3–3,
3–21, 5–34
 - specifications 6–3
- display bezel
 - illustrated 3–11
 - spare part number 3–12,
3–21, 5–40
- Display Bracket Kit, spare part
number 3–12, 3–23
- Display Cable Kit, spare part
number 3–12, 3–21
- display component recycling
 - C–1
- display enclosure
 - illustrated 3–11
 - spare part number 3–12,
3–21
- display hinge
 - illustrated 3–11
 - removal 5–46
- display inverter
 - illustrated 3–11
 - removal 5–44
 - spare part number 3–12,
3–20, 5–44
- display panel
 - illustrated 3–11
 - removal 5–45
 - spare part number 3–12,
3–21, 5–45
- display release button 1–7

- Display Rubber Screw Cover Kit, spare part number 3-12, 3-21
- docking connector 1-19
- drive light 1-7
- drives, preventing damage 4-3
- DVD±RW and CD-RW
 - Double-Layer Combo Drive, spare part number 3-15
- E**
- electrostatic discharge 4-4, 4-8
- expansion product, troubleshooting 2-14
- external monitor port
 - location 1-13
 - pin assignments D-4
- External MultiBay II power cable and stand, spare part number 3-15, 3-18
- External MultiBay II, spare part number 3-15, 3-18
- F**
- fan
 - removal 5-24
 - spare part number 3-3, 3-20, 5-24
- features 1-2
- feet
 - illustrated 3-13
 - locations 5-11
- fingerprint reader 1-7
- flowcharts, troubleshooting
 - no audio 2-21, 2-22
 - no network/modem connection 2-26
 - no OS loading 2-15
 - no OS loading from diskette drive 2-19
 - no OS loading from hard drive 2-16, 2-17, 2-18
 - no OS loading from optical drive 2-20
 - no power 2-8, 2-10, 2-11
 - no video 2-12, 2-13
 - nonfunctioning device 2-23
 - nonfunctioning docking device 2-14
 - nonfunctioning keyboard 2-24
 - nonfunctioning pointing device 2-25
- fn** key 1-15
- front components 1-6
- function keys 1-15
- G**
- grounding equipment and methods 4-7
- H**
- hard drive
 - OS loading problems 2-16
 - precautions 4-3
 - removal 5-7
 - spare part numbers 3-10, 3-20, 5-7
 - specifications 6-4

- hard drive cover
 - illustrated 3–13
 - location 1–19
 - removal 5–8
 - spare part number 3–10, 3–20
- hard drive frame, removal 5–10
- headphone jack
 - location 1–9
 - pin assignments D–1
- heat sink
 - removal 5–25
 - spare part number 3–8, 3–22, 5–25
- hinge saddle
 - removal 5–65
 - spare part number 3–8, 3–20, 5–65
- HP Docking Station 120-W
 - AC adapter, spare part number 3–19
- HP Docking Station Miscellaneous Plastics Kit, spare part number 3–15, 3–19
- HP Docking Station, spare part number 3–15, 3–20

I

- I/O address specifications 6–9
- Info Center button 1–11
- infrared board
 - removal 5–61
 - spare part number 3–8, 3–20, 5–61

- infrared port 1–7
- interrupt specifications 6–7

K

- keyboard
 - removal 5–20
 - spare part numbers 3–3, 3–22, 3–23, 5–20
 - troubleshooting 2–24
- keyboard components 1–14
- keyboard cover
 - removal 5–17
 - spare part number 3–3, 3–20, 5–17
- keypad keys 1–15

L

- left-side components 1–10, 1–12
- Logo Kit, spare part number 3–15, 3–21

M

- memory map specifications 6–12
- memory module
 - removal 5–14, 5–30
 - spare part numbers 3–5, 3–21, 5–14, 5–30
- memory module compartment 1–19
- memory module compartment cover
 - illustrated 3–13
 - removal 5–15

- microphone 1–7
 - disconnecting 5–38
 - illustrated 3–11
 - removal 5–43
 - spare part number 3–12, 3–21, 5–43
 - microphone jack
 - location 1–9
 - pin assignments D–2
 - Mini Card WLAN module
 - removal 5–32
 - spare part numbers 3–5, 3–17, 3–18, 3–19, 5–32
 - modem cable
 - illustrated 3–14
 - removal 5–69
 - modem jack
 - location 1–13
 - pin assignments D–5
 - modem module
 - removal 5–68
 - spare part number 3–8, 3–21, 5–68
 - troubleshooting 2–26
 - monitor port
 - location 1–13
 - pin assignments D–4
 - MultiBay DVD/CD-RW Combo Drive, spare part number 3–15, 3–18
 - MultiBay DVD-ROM Drive, spare part number 3–15, 3–18
- N**
- network jack
 - location 1–13
 - pin assignments D–6
 - network, troubleshooting 2–26
 - nonfunctioning device, troubleshooting 2–14, 2–23
 - num lock** key 1–15
- O**
- optical drive
 - OS loading problems 2–20
 - precautions 4–3
- P**
- packing precautions 4–5
 - password clearing 1–4
 - PC Card slot 1–9
 - PC Card slot bezel 3–13
 - plastic parts 4–2
 - Plastics Kit
 - components 3–13
 - spare part number 3–8, 3–13, 3–22
 - pointing device, troubleshooting 2–25
 - pointing stick 1–17
 - pointing stick buttons 1–17
 - pointing stick cable 3–14
 - pointing stick cable, disconnecting 5–22
 - power connector 1–13
 - power cord
 - set requirements E–2
 - spare part numbers 3–16, 3–17, 3–18
 - power light 1–6

- power management features
1-5
- power supply, spare part
number 3-16, 3-20
- power switch 1-11
- power, troubleshooting 2-8
- presentation button 1-17
- processor
 - removal 5-28
 - spare part numbers 3-8,
3-19, 3-22, 5-28

R

- rear components 1-10, 1-12
- rear keyboard cover
 - removal 5-53
 - spare part number 3-3,
3-20, 5-53
- removal/replacement
 - preliminaries 4-1
 - procedures 5-1
- right-side components 1-8
- RJ-11 jack
 - location 1-13
 - pin assignments D-5
- RJ-45 jack
 - location 1-13
 - pin assignments D-6
- RTC battery
 - removal 5-70
 - spare part number 3-8,
3-19, 5-70

S

- Screw Kit
 - contents A-1
 - spare part number 3-15,
3-18, 3-19, A-1
- screw listing A-1
- security cable slot 1-10
- serial number 3-1, 5-2
- service considerations 4-2
- smart card reader 1-9
- software backup and recovery
B-1
- speaker
 - location 1-11
 - removal 5-59
 - spare part number 3-8,
3-22, 5-59
- specifications
 - battery pack 6-5
 - computer 6-1
 - display 6-3
 - hard drive 6-4
 - I/O addresses 6-9
 - interrupts 6-7
 - memory map 6-12
 - system DMA 6-6
- static shielding materials 4-8
- stringent security 1-4
- S-Video-out jack
 - location 1-13
 - pin assignments D-3
- system board
 - removal 5-63
 - spare part number 3-8,
3-20, 5-63

system DMA 6–6
system memory map 6–12

T

thermal paste, replacing 5–27,
5–66

thermal shield

removal 5–65
spare part number 3–8,
3–22, 5–65

tools required 4–1

top components 1–16

top cover

removal 5–51
spare part number 3–3,
3–22, 5–51

TouchPad

location 1–17
removal 5–55
spare part number 3–3,
3–22, 5–55

TouchPad bracket, removal
5–57

TouchPad buttons 1–17

TouchPad cable,
disconnecting 5–54

TouchPad scroll zone 1–17

transporting precautions 4–5

travel battery, spare part
number 3–15, 3–18

troubleshooting

audio 2–21
Computer Setup 2–1
expansion product 2–14
flowcharts 2–6
keyboard 2–24

modem 2–26

network 2–26

nonfunctioning device
2–14, 2–23

OS loading 2–15

overview 2–1

pointing device 2–25

power 2–8

video 2–12

U

Universal Serial Bus (USB)

port

location 1–9, 1–11, 1–13
pin assignments D–2

unknown password 1–4

V

vents 1–10, 1–17, 1–19

video troubleshooting 2–12

volume buttons 1–17

W

Windows applications key
1–15

Windows logo key 1–15

Wireless Antenna Kit, spare
part number 3–12, 3–20,
5–47

wireless button 1–11

wireless light 1–6

workstation precautions 4–6