![HP invent logo]

Maintenance and Service Guide

HP Compaq nc2400 Notebook PC

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.

MSG revision history

Revision	Publication date	Description
A	January 2010	The part number for the Switch cover has been corrected to 412754-001 in the following locations: "Computer Major Components" on page 3-2, "Sequential Part Number Listing" on page 3-24, and "Switch Cover" on page 5-27.

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1

Product Description

The HP Compaq nc2400 Notebook PC offers advanced modularity, Intel® Core™ Duo, Pentium® M, and Celeron® M processors, and extensive multimedia support.

HP Compaq nc2400 Notebook PC

1.1 **Features**

■ The following processors, varying by computer model:

❏ Intel Core Duo U7600 (1.20-GHz)

❏ Intel Core Duo U2500 (1.20-GHz)

❏ Intel Core Duo U2400 (1.06-GHz)

❏ Intel Pentium M 1200 (1.20-GHz)

❏ Intel Pentium M 1100 (1.06-GHz)

❏ Intel Celeron M 423 (1.06-GHz)

■ 12.1-inch, WXGA+WVA, TFT (1280 × 800) with over 16.8 million colors

■ 80-, 60-, 40-, 30-GB high-capacity hard drive, varying by computer model

■ 256-MB DDR2 synchronous DRAM (SDRAM) at 533 MHz, expandable to 2.0 GB

■ Microsoft® Windows® XP Professional

■ Full-size Windows keyboard with embedded numeric keypad

■ Pointing stick pointing device

■ Integrated 10 Base-T/100 Base-TX Ethernet local area network (LAN) network interface card (NIC) with RJ-45 jack

■ Integrated high-speed 56-K modem with RJ-11 jack

- ■ Integrated wireless support for Mini Card IEEE 802.11a/b/g or 802.11b/g Wireless LAN (WLAN) device
- ■ Support for one Type I or Type II PC Card slot, with support for both 32-bit (CardBus) and 16-bit PC Cards, varying by computer model
- ■ External 65-watt AC adapter with 3-wire power cord
- ■ 9-, 6-, or 3-cell Li-Ion battery, varying by computer model
- ■ Audio speaker
- ■ Volume up, volume mute, and volume down buttons
- ■ Support for the following optical drives:
    - ❏ DVD±RW and CD-RW Double-Layer Combo Drive
    - ❏ DVD±RW and CD-RW Combo Drive
    - ❏ DVD-ROM drive
- ■ Connectors:
    - ❏ Audio-out (headphone)
    - ❏ Audio-in (microphone)
    - ❏ Two Universal Serial Bus (USB) v. 2.0
    - ❏ SmartPower
    - ❏ External monitor
    - ❏ RJ-11 (modem)
    - ❏ RJ-45 (network)
    - ❏ IEEE 1394
    - ❏ 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 5.14, "Top Cover," for more information on replacing the system board.

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

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

1. Prepare the computer for disassembly (refer to Section 5.3, "Preparing the Computer for Disassembly," for more information). Remove the real-time clock (RTC) battery (refer to Section 5.8, "RTC Battery," for more information on removing and replacing the RTC battery).

2. Wait approximately 5 minutes.

3. Replace the RTC battery and reassemble the computer.

4. Connect AC power to the computer. Do not reinsert any batteries at this time.

5. Turn on the computer.

All passwords and all CMOS settings have been cleared.

1.3 **Power Management**

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

■ Standby

■ Hibernation

■ Setting customization by the user

■ Hotkeys for setting the level of performance

■ Battery calibration

■ Lid switch standby/resume

■ Power button

■ Advanced Configuration and Power Management (ACPM) compliance

1.4 External Components

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

Front Components

Table 1-1

Front Components

Item	Component	Function
1	Wireless light	On: An integrated wireless device, such as a wireless local area network (LAN) device and/or a Bluetooth® device, is turned on.
2	Power light	■ On: The computer is on.
		■ Blinking: The computer is in standby.
		■ Blinking rapidly: An AC adapter with a higher power rating should be connected.
		■ Off: The computer is off or in hibernation.

Table 1-1

Front Components *(Continued)*

Item	Component	Function
3	Battery light	■ Amber: A battery is charging.
		■ Green: A battery is close to full charge capacity.
		■ Blinking amber: A battery that is the only available power source has reached a low-battery condition. When the battery reaches a critical low-battery condition, the battery light begins blinking more quickly.
		■ Off: If the computer is connected to an external power source, the light is turned off when all batteries in the computer are fully charged. If the computer is not connected to an external power source, the light is turned off until the battery reaches a low-battery condition.
4	Drive light	■ Blinking: The hard drive or optical drive is being accessed.
		■ Amber: HP Mobile Data Protection with accelerometer software has temporarily parked the internal hard drive.
5	Display release latch	Opens the computer.

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	PC Card slot	Supports optional Type or Type II 32-bit (CardBus) or 16-bit PC Cards.
2	1394 port	Connects an optional 1394a device such as a scanner, digital camera, or digital camcorder.
3	Audio-out (headphone) jack	Connect optional headphones or powered stereo speakers. Also connects the audio function of an audio/video device such as a television or VCR.
4	Audio-in (microphone) jack	Connects an optional monaural microphone.
5	USB port	Connects USB 1.1- and 2.0-compliant devices to the computer using a standard USB cable, or connects an optional External MultiBay II to the computer. The MultiBay II must also be connected to an external power source.
6	External monitor port	Connects an optional VGA external monitor or projector.
7	Docking connector	Connects the computer to an optional docking device.

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

Left-Side Components

Table 1-3

Left-Side Components

Item	Component	Function
1	Smart Adapter power connector	Connects an AC adapter or an optional power adapter.
2	RJ-11 (modem) jack	Connects the modem cable.
3	USB port	Connects USB 1.1- and 2.0-compliant devices to the computer using a standard USB cable, or connects an optional External MultiBay II to the computer. The MultiBay II must also be connected to an external power source.
4	Optical drive	Supports an optical disc. The type of optical drive varies by model.

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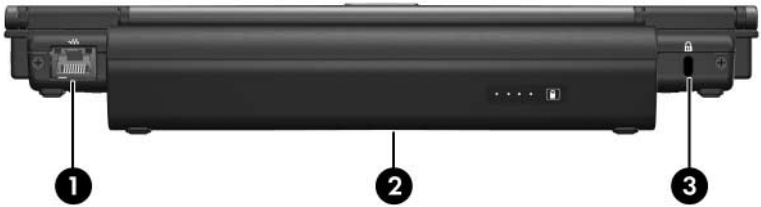
Rear Panel Components

Table 1-4

Rear Panel Components

Item	Component	Function
1	RJ-45 (network) jack	Connects an optional network cable.
2	Battery bay	Holds a battery.
3	Security cable slot	Attaches an optional security cable to the computer. ⚠ Security solutions are designed to act as deterrents. These deterrents may not prevent a product from being mishandled or stolen.

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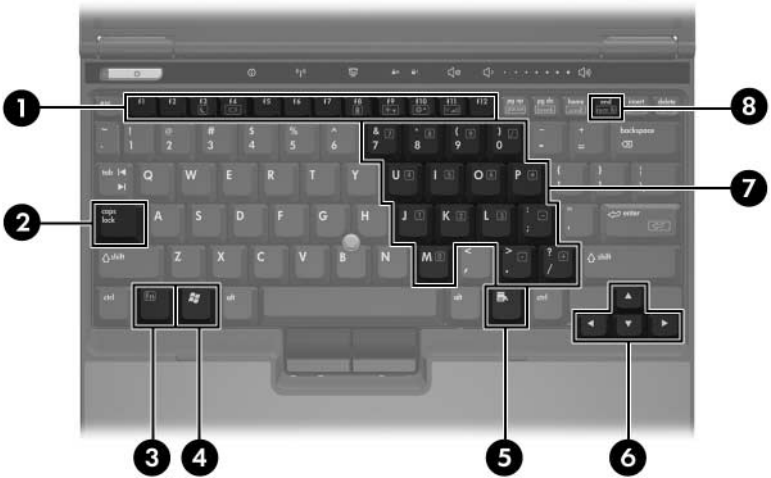
Standard Keyboard Components

Table 1-5

Rear Panel Components

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

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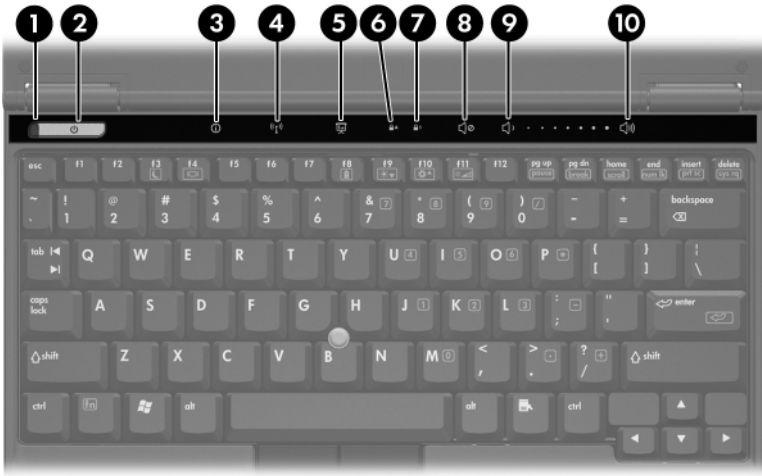
Top Components

Table 1-6

Top Components

Item	Component	Function
1	Power light	■ On: The computer is on.
		■ Blinking: The computer is in standby.
		■ Blinking rapidly: An AC adapter with a higher power rating should be connected.
		■ Off: The computer is off or in hibernation.

Table 1-6

Top Components *(Continued)*

Item	Component	Function
2	Power button	When the computer is ■ Off, press to turn on the computer. ■ On, briefly press to initiate hibernation. ■ In standby, briefly press to resume from standby. ■ In hibernation, briefly press to restore from hibernation. If the system has stopped responding and Windows shutdown procedures cannot be used, press and hold for 5 seconds to turn off the computer.
3	Info Center button	Launches Info Center, which enables you to open various software solutions.
4	Wireless button	Turns the wireless functionality on or off, but does not create a wireless connection. ✎ To establish a wireless connection, a wireless network must already be set up.
5	Presentation button	Starts the Presentation feature.
6	Caps lock light	On: **caps lock** is on.
7	Num lock light	On: **num lock** or the numeric keypad is on.
8	Volume mute button	Mutes or restores speaker volume.
9	Volume down button	Decreases speaker volume.
10	Volume up button	Increases speaker volume.

The computer top components are shown below and described in Table 1-7.
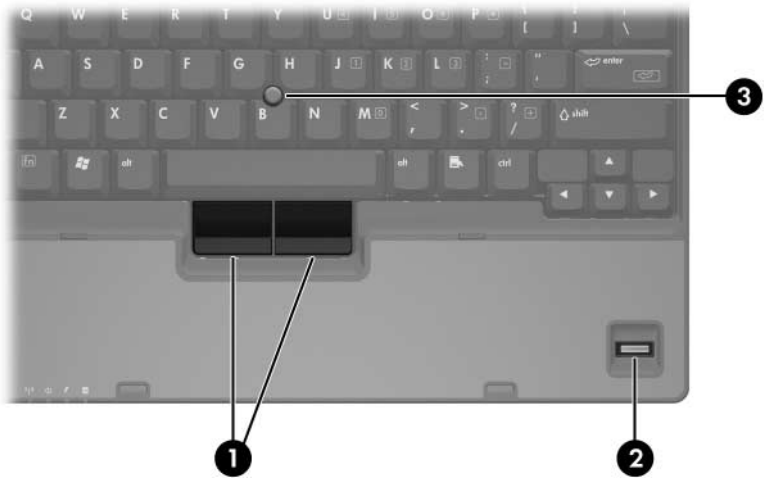
Top Components

Table 1-7

Top Components

Item	Component	Function
1	Pointing stick buttons	Function like the left, middle, and right buttons on an external mouse.
2	Fingerprint reader	Allows a fingerprint logon to Windows instead of using a password.
3	Pointing stick	Moves the pointer and selects or activates items on the screen.

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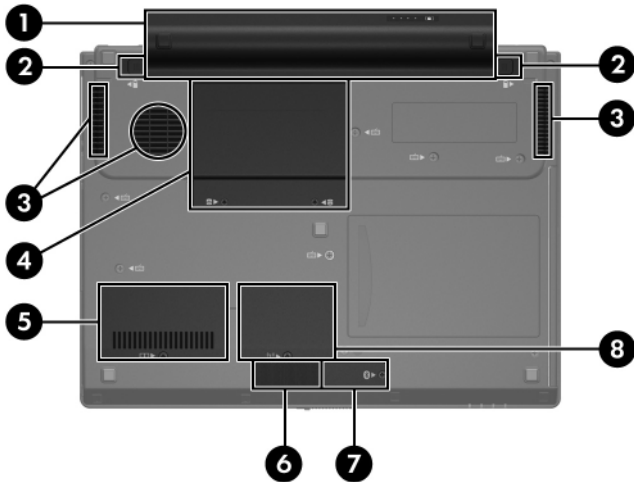
Bottom Components

Table 1-8

Bottom Components

Item	Component	Function
1	Battery bay	Holds the battery.
2	Battery release latches (2)	Release the battery from the battery bay.
3	Exhaust vents	Provides airflow to cool internal components.
		△ To prevent overheating, do not obstruct fans. Do not allow a hard surface, such as a printer, or a soft surface, such as pillows, thick rugs, or clothing, to block airflow.

Table 1-8

Bottom Components *(Continued)*

Item	Component	Function
4	Hard drive bay	Holds the primary hard drive.
5	Memory module compartment	Contains one memory slot that supports replaceable memory modules.
6	Speaker	Produces sound.
7	Bluetooth module compartment	Holds an optional Bluetooth device.
8	Mini Card compartment	Holds an optional wireless LAN device.

△ To prevent an unresponsive system and the display of a warning message, install only a Mini Card device authorized for use in your computer by the governmental agency that regulates wireless devices in your country. If you install a device and then receive a warning message, remove the device to restore computer functionality. Then contact Customer Care.

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 boards provide the following device connections:

■ Audio

■ Display

■ Hard drive

■ Intel Pentium M, Celeron M, Core Duo processors (depending on board)

■ Keyboard and pointing stick

■ Memory modules

■ Mini Card module

■ PC Card

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

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

2

Troubleshooting

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

2.1 Computer Setup

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

Using Computer Setup

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

1. Turn on or restart the computer. Press **f10** while the F10 = ROM-Based Setup message is displayed in the lower-left corner of the screen.

   ❏ To change the language, use the cursor control keys to navigate to the **System Configuration** menu.

   ❏ To view navigation information, press **f1**.

   ❏ To return to the Computer Setup menu, press **esc**.

2. Select the **File**, **Security**, **Diagnostics**, or
   System Configuration menu.

3. To close Computer Setup and restart the computer:

   ❏ Select **File > Save changes and exit**, and then press **enter**.

   – or –

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

   – or –

   ❏ Select **File > Restore defaults**, and then press **enter**.

4. When you are prompted to confirm your action, press **f10**.

Selecting from the File Menu

Table 2-1

File Menu

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

Selecting from the Security Menu

Table 2-2

Security Menu

Select	To Do This
Setup Password	Enter, change, or delete an Setup password.
Power-On Password	Enter, change, or delete a power-on password.
Password Options (Password options can be selected only when a power-on password has been set.)	Enable/disable ■ Stringent security. ■ Requirement of password on restart.
DriveLock Passwords	Enable/disable DriveLock; change a DriveLock user or master password. ✎ DriveLock Settings are accessible only when you enter Computer Setup by turning on (not restarting) the computer.
Smart Card Security	Enable/disable smart card power-on support. ✎ A setup password must be established to use this feature.
TPM Embedded Security	Enable/disable ■ Embedded security device state. ■ Power-on authentication support. ■ Automatic DriveLock support.
System IDs	Establish ■ Notebook asset tracking number. ■ Notebook ownership tags.
Disk Sanitizer	Establish fast, optimum, or custom settings for disk sanitizing.
*Not applicable to SuperDisk LS-120 drives.	

Selecting from the Diagnostics Menu

Table 2-3

Diagnostics Menu

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

Selecting from the System Configuration Menu

Table 2-4

System Configuration Menu

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

2.2 Troubleshooting Flowcharts

Table 2-5

Troubleshooting Flowcharts Overview

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

Flowchart 2.1—Initial Troubleshooting

Flowchart 2.2—No Power, Part 1

```
No power          Remove from
(power LED   →    docking device
is off).          (if applicable).
```

```
      N                              N
Power up  →  Reset   →  Power up  →  Go to
on battery   power.*    on battery   "Flowchart
power?                  power?       2.3—No Power,
  Y                       Y          Part 2."
```

```
      N                              N
Power up  →  Reset   →  Power up  →  Go to
on AC        power.*    on AC        "Flowchart
power?                  power?       2.4—No Power,
  Y                       Y          Part 3."
```

```
      Y
Power up  →  Done
in docking
device?
  N
```

*NOTES
1. On select computer models, there is a separate reset button.
2. On select computer models, the computer can be reset using the standby switch and either the lid switch or the main power switch.

```
1. Reset the power cables in the docking device
   and at the AC outlet.
2. Be sure the AC power source is active.
3. Be sure that the power strip is working.
```

```
              Y        N
Done   ←   Power up  →  Go to
           in docking   "Flowchart
           device?      2.8—Nonfunctioning
                        Docking Device (if
                        applicable)."
```

Flowchart 2.3—No Power, Part 2

Flowchart 2.4—No Power, Part 3

Continued from "Flowchart 2.3—No Power, Part 2."

Plug directly into AC outlet.

Power LED on? — **Y** → Done

N

Reseat AC adapter in computer and at power source.

Power on? — **Y** → Done

N

Power outlet active? — **N** → Try different outlet.

Y

Replace power cord.

Power on? — **Y** → Done

N

Internal or external AC adapter? — **External** → Replace external AC adapter.

Internal

Go to "Flowchart 2.5—No Power, Part 4."

Power on? — **N**

Power on? — **Y** → Done

Flowchart 2.5—No Power, Part 4

Continued from

Open
computer.

Loose or
damaged
parts?

Y

Reseat loose
components and
boards and
replace damaged
items.

N

Close
computer and
retest.

Power on?

N

Replace the following items (if applicable). Check
computer operation after each replacement:
1. Internal DC-DC converter*
2. Internal AC adapter
3. Processor board*
4. System board*

*NOTE: Replace these items as a set to prevent
shorting out among components.

Y

Done

Flowchart 2.6—No Video, Part 1

```
┌─────────────┐
│  No video.  │
└─────────────┘
       │
       │    Docking Device
  ╱ Stand-alone ╲────────────►┌──────────────┐
 ╱  or docking  ╲             │    Go to     │
 ╲   device?    ╱             │ "Flowchart   │
  ╲            ╱              │ 2.7—No Video,│
       │                      │   Part 2."   │
   Stand-alone                └──────────────┘
       │
  ╱ Internal or ╲             ┌──────────────┐        ╱         ╲      Y    ┌──────┐
 ╱   external    ╲───────────►│    Adjust    │───────►╲ Video OK?╱─────────►│ Done │
 ╲   display*?  ╱             │  brightness. │        ╲         ╱           └──────┘
  ╲            ╱              └──────────────┘           │  N
       │        Internal          ▲                      │
   External                    ┌─────┐             ┌──────────────┐
       │                       │  A  │             │  Press lid   │
┌──────────────┐               └─────┘             │ switch to    │
│    Adjust    │                                   │   ensure     │
│  brightness. │                                   │  operation.  │
└──────────────┘                                   └──────────────┘
       │                                                  │
       │    Y                                       ╱         ╲     Y    ┌──────┐
  ╱         ╲      ┌──────┐                         ╲ Video OK?╱────────►│ Done │
 ╲ Video OK?╱─────►│ Done │                         ╲         ╱          └──────┘
  ╲        ╱       └──────┘                            │  N
   N  │                                                │
┌──────────────┐     ┌────────────────────────────────────────────────────────┐
│ Check for    │     │ Replace the following one at a time. Test after each    │
│ bent pins    │     │ replacement.                                            │
│ on cable.    │     │  1. Cable between computer and computer display         │
└──────────────┘     │     (if applicable)                                     │
       │             │  2. Display                                             │
       │             │  3. System board                                        │
       │   N         └────────────────────────────────────────────────────────┘
  ╱         ╲    ┌──────────┐          ╱           ╲     N    ┌──────────┐
 ╲ Video OK?╱───►│   Try    │─────────►╲ Internal  ╱─────────►│ Replace  │
  ╲        ╱     │ another  │          ╲  and      ╱          │ system   │
   Y │          │ display. │          ╲ external  ╱          │ board.   │
     │          └──────────┘          ╲ video OK? ╱          └──────────┘
┌──────────────┐                          Y │
│     Done     │                      ┌──────────┐
└──────────────┘                      │   Done   │
                                      └──────────┘
```

*NOTE: To change from internal to external display, use the hotkey combination.

Flowchart 2.7—No Video, Part 2

```
┌─────────────────────┐
│ Continued from      │
│ "Flowchart          │
│ 2.6—No Video,       │
│ Part 1."            │
└─────────────────────┘
           │
           ▼
┌─────────────────────┐
│ Remove              │
│ computer from       │
│ docking device,     │
│ if connected.       │
└─────────────────────┘
           │
           ▼
┌─────────────────────┐
│ Adjust              │
│ display             │
│ brightness.         │
└─────────────────────┘
           │
           │         N
           ▼
      ◇ Video OK? ◇ ──────────► ┌──────────────────┐
           │                     │ Go to "A" in     │
         Y │                     │ "Flowchart       │
           │                     │ 2.6—No Video,    │
           ▼                     │ Part 1."         │
┌─────────────────────────────┐ └──────────────────┘
│ Check that computer is      │
│ properly seated in docking  │
│ device, for bent pins on    │
│ cable, and for monitor      │
│ connection.                 │
└─────────────────────────────┘
           │
           │         Y
           ▼
      ◇ Video OK? ◇ ──────────► ┌──────────┐
           │                     │  Done    │
         N │                     └──────────┘
           ▼
┌─────────────────────┐
│ Adjust external     │
│ monitor display.    │
└─────────────────────┘
```

```
┌─────────────────────┐
│ Check brightness    │
│ of external         │
│ monitor.            │
└─────────────────────┘
           │
           │         Y
           ▼
      ◇ Video OK? ◇ ──────────► ┌──────────┐
           │                     │  Done    │
         N │                     └──────────┘
           ▼
┌─────────────────────┐
│ Try another         │
│ external            │
│ monitor.            │
└─────────────────────┘
           │
           │             Y
           ▼
   ◇ Internal and  ◇ ──────────► ┌──────────┐
   ◇ external      ◇              │  Done    │
   ◇ video OK?     ◇              └──────────┘
           │
         N │
           ▼
┌─────────────────────┐
│ Go to               │
│ "Flowchart          │
│ 2.8—Nonfunctioning  │
│ Docking Device (if  │
│ applicable)."       │
└─────────────────────┘
```

Flowchart 2.8—Nonfunctioning Docking Device (if applicable)

```
┌─────────────────┐
│  Nonfunctioning │
│ docking device. │
└────────┬────────┘
         │
         ▼
┌─────────────────┐
│Reset power cord in│
│docking device and│
│  power outlet.   │
└────────┬────────┘
         │
         ▼
┌─────────────────┐
│  Check voltage  │
│setting on docking│
│    device.      │
└────────┬────────┘
         │
         ▼
┌─────────────────┐        ┌─────────────────┐
│  Reset monitor  │        │    Reinstall    │
│cable connector at│        │   computer into │
│ docking device. │        │ docking device. │
└────────┬────────┘        └────────┬────────┘
         │                          │
         ▼                          ▼
      ◇ Docking          Y        ◇ Docking          Y
      device    ──────────►        device    ──────────►
      operating?     ┌───────┐    operating?     ┌───────┐
         │   N       │ Done  │       │   N       │ Done  │
         ▼           └───────┘       ▼           └───────┘
┌─────────────────┐        ┌─────────────────┐
│ Replace docking │        │ Test replacement│
│    device.      │        │docking device with│
│                 │        │  new computer.  │
└─────────────────┘        └─────────────────┘
```

Flowchart 2.9—No Operating System (OS) Loading

```
┌─────────────────┐
│   No OS         │
│   loading.*     │
└─────────────────┘
         │
         ▼
┌─────────────────┐
│  Reset power    │
│ cord in docking │
│  device and     │
│ power outlet.   │
└─────────────────┘
         │
         │    ┌──────────────────────────────────┐
         ├───▶│  No OS loading from hard drive,  │
         │    │  go to "Flowchart 2.10—No OS     │
         │    │      Loading, Hard Drive,        │
         │    │          Part 1."                │
         │    └──────────────────────────────────┘
         │
         │    ┌──────────────────────────────────┐
         ├───▶│ No OS loading from diskette drive,│
         │    │  go to "Flowchart 2.13—No OS     │
         │    │      Loading, Diskette Drive."   │
         │    └──────────────────────────────────┘
         │
         │    ┌──────────────────────────────────┐
         ├───▶│ No OS loading from CD-ROM or DVD-ROM│
         │    │  drive, go to "Flowchart 2.14—No OS│
         │    │      Loading, Optical Drive."    │
         │    └──────────────────────────────────┘
         │
         │    ┌──────────────────────────────────┐
         └───▶│  No OS loading from network,     │
              │  go to "Flowchart 2.20—No Network/Modem│
              │          Connection."            │
              └──────────────────────────────────┘
```

*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

```
┌──────────────┐
│   OS not     │
│ loading from │
│  hard drive. │
└──────┬───────┘
       │                          Y
  ╱────┴────╲              ┌──────────────────┐
 ╱ Nonsystem ╲────────────▶│      Go to       │
 ╲ disk message?╱          │   "Flowchart     │
  ╲──────┬──╱              │   2.11—No OS     │
       N │                 │    Loading,      │
         │                 │ Hard Drive, Part 2."│
  ┌──────┴──────┐          └──────────────────┘
  │   Reseat    │
  │  external   │
  │ hard drive. │
  └──────┬──────┘
         │           Y
    ╱────┴────╲          ┌──────────────┐
   ╱ OS loading?╲───────▶│     Done     │
    ╲────┬────╱          └──────────────┘
       N │
         │        N
    ╱────┴────╲──────────────────────────┐
   ╱   Boot    ╲                          │
   ╲   from     ╱                         │         N
    ╲   CD?    ╱                     ╱────┴────╲          ┌──────────────┐
     ╲──┬──╱                        ╱   Boot    ╲────────▶│    Go to     │
   Y    │                          ╲   from      ╱        │  "Flowchart  │
  ┌─────┴───────┐                   ╲ diskette? ╱          │  2.13—No OS  │
  │ Check the Setup│                  ╲──┬──╱              │   Loading,   │
  │ utility for correct│            Y    │                │Diskette Drive."│
  │ booting order. │          ┌──────────┴────────┐       └──────────────┘
  └─────┬───────┘            │  Change boot      │
         │     N             │ priority through   │
    ╱────┴────╲              │ the Setup Utility  │
   ╱   Boot    ╲─────────────│   and reboot.      │
   ╲   from     ╱            └──────────┬─────────┘
    ╲hard drive?╱                       │        N
     ╲──┬──╱                       ╱────┴────╲          ┌──────────────┐
   Y    │                        ╱    Boot    ╲────────▶│    Go to     │
  ┌─────┴───────┐               ╲    from      ╱        │  "Flowchart  │
  │             │◀──────────────╲hard drive? ╱          │2.17—Nonfunctioning│
  │    Done     │                ╲──┬──╱                │   Device."   │
  └─────────────┘              Y    │                   └──────────────┘
```

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

Continued from "Flowchart 2.10—No OS Loading, Hard Drive, Part 1."

CD or diskette in drive?

N → 1. Replace hard drive. 2. Replace system board.

Y ↓

Remove diskette and reboot.

Boot from hard drive?

Y → Done

N ↓

Boot from diskette drive?

N → Go to "Flowchart 2.13—No OS Loading, Diskette Drive."

Y ↓

Hard drive accessible?

N →

Y ↓

Go to "Flowchart 2.12—No OS Loading, Hard Drive, Part 3."

Reseat hard drive.

Hard drive accessible?

Y → Done

N ↓

Run FDISK.

Hard drive partitioned?

N → Create partition, and then format hard drive to bootable C:\ prompt.

Y ↓

Hard drive formatted?

N → Format hard drive and bring to a bootable C:\ prompt.

Y ↓

Load OS using *Operating System* disc (if applicable).

Computer booted?

Y → Done

N ↓

Go to "Flowchart 2.12—No OS Loading, Hard Drive, Part 3."

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

```
Continued from
"Flowchart
2.11—No OS
Loading,
Hard Drive, Part 2."
```

                                        N

System files on hard drive? ——————————→ Install OS and reboot.

Y

Virus on hard drive? —Y→ Clean virus. —→ OS loading from hard drive? —Y→ Done

N   N

Run SCANDISK and check for bad sectors.   Diagnostics on diskette? —Y→ Replace hard drive.

                                        N

Can bad sectors be fixed? —N→ Replace hard drive.   Run diagnostics and follow recommendations.

Y

Fix bad sectors. —→ Boot from hard drive? —N→ Replace hard drive.

                    Y

Done

Flowchart 2.13—No OS Loading, Diskette Drive

Flowchart 2.14—No OS Loading, Optical Drive

No OS loading from CD-ROM or DVD-ROM drive.

Disc in drive?

Y Bootable disc in drive?

N Install bootable disc and reboot computer.

N Install bootable disc.

Y Try another bootable disc.

Boots from CD or DVD?

Y Done

N Reseat drive.

Boots from CD or DVD?

Y Done

N Booting from another device?

N Go to "Flowchart 2.17—Nonfunctioning Device."

Y Booting order correct?

Y Reset the computer. Refer to Section 1.2, "Resetting the Computer," for instructions.

Go to "Flowchart 2.17—Nonfunctioning Device."

N Correct boot order using the Setup Utility.

Flowchart 2.15—No Audio, Part 1

```
┌──────────┐     ┌──────────────┐              Y
│          │     │ Turn up audio│                    ┌──────────┐
│ No audio.│ ──► │ internally or│ ──► ◇ Audio? ◇ ──► │   Done   │
│          │     │  externally. │                    └──────────┘
└──────────┘     └──────────────┘
                                    N

          Y                              N
◇ Computer in ◇     ┌──────────┐       ◇ Internal ◇     ┌──────────────┐
◇ docking device ◇ ─► │  Undock  │ ──► ◇  audio?  ◇ ──► │    Go to     │
◇ (if applicable)? ◇  └──────────┘       ◇          ◇   │ "Flowchart   │
                                              │         │ 2.16—No Audio,│
   N                                          Y         │   Part 2."   │
                                                        └──────────────┘
┌──────────────┐                         ┌──────────────┐
│    Go to     │                         │ Replace the  │
│ "Flowchart   │                         │   the        │
│ 2.16—No Audio,│                        │ docking device.│
│   Part 2."   │                         └──────────────┘
└──────────────┘
                                                  Y
┌──────────────┐                         ◇          ◇     ┌──────────┐
│    Go to     │ ◄─────────────────────  ◇  Audio?  ◇ ──► │   Done   │
│ "Flowchart   │                         ◇          ◇     └──────────┘
│ 2.17—Nonfunctioning │
│   Device."   │                              N
└──────────────┘
```

Flowchart 2.16—No Audio, Part 2

Continued from "Flowchart 2.15—No Audio, Part 1."

Audio driver in OS configured? — N → Reload audio drivers.

Y

Correct drivers for application? — N → Load drivers and set configuration in OS.

Y

Connect to external speaker.

Audio? — N → Replace audio board and speaker connections in computer (if applicable). → Audio? — Y → Done

Y

N

1. Replace internal speakers.
2. Replace audio board (if applicable).
3. Replace system board.

Flowchart 2.17—Nonfunctioning Device

```
                    ┌─────────────────┐
                    │  Nonfunctioning │
                    │     device.     │
                    └─────────────────┘
                             │
                             ▼
                    ┌─────────────────┐
                    │     Reseat      │
                    │     device.     │
                    └─────────────────┘
                             │
                             ▼
      ┌─────────────────────────────────────────────┐
      │ Unplug the nonfunctioning device from the    │
      │ computer and inspect cables and plugs for     │
      │ bent or broken pins or other damage.          │
      └─────────────────────────────────────────────┘
                             │
                             ▼
```

Any physical device detected? — Y → Fix or replace broken item.

N

Clear CMOS. ← (from "Any physical device detected?")

Reattach device. Close computer, plug in power, and reboot.

Device boots properly? — N → Replace hard drive.

Y → Done

Replace NIC. If integrated NIC, replace system board.

Replace diskette drive.

Device boots properly? — N → Go to "Flowchart 2.9—No Operating System (OS) Loading."

Y → Done

Flowchart 2.18—Nonfunctioning Keyboard

Flowchart 2.19—Nonfunctioning Pointing Device

Flowchart 2.20—No Network/Modem Connection

3

Illustrated Parts Catalog

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

3.1 Serial Number Location

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

Serial Number Location

3.2 Computer Major Components
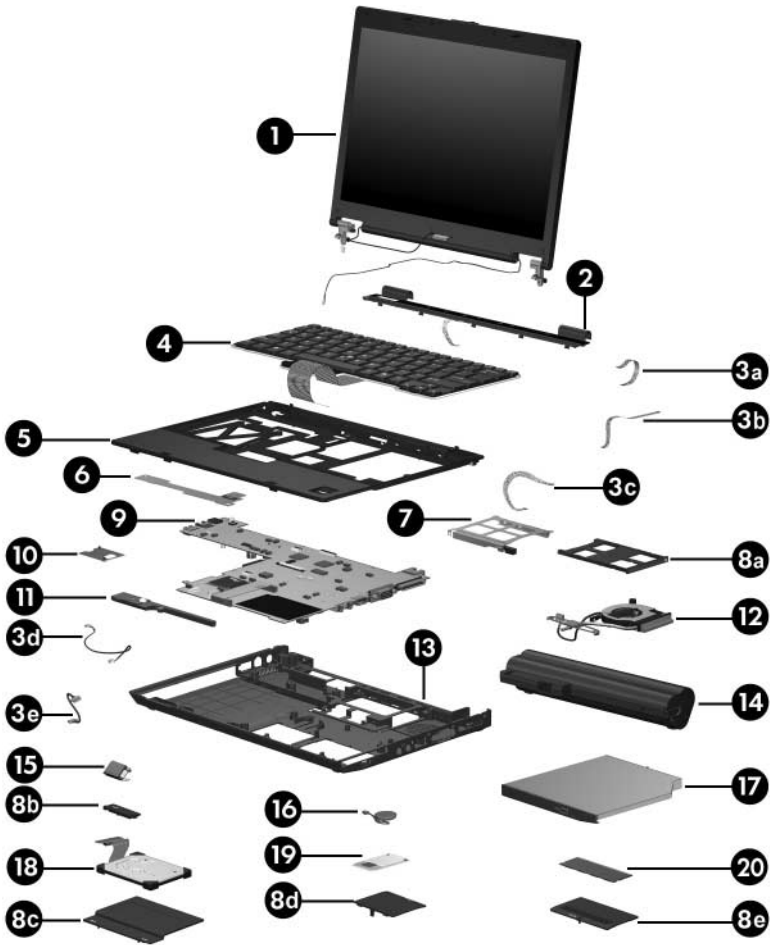
Computer Major Components

Table 3-1

Spare Parts: Computer Major Components

Item	Description	Spare Part Number
1	**12.1-inch, WXGA, TFT display assembly** (includes wireless antenna transceivers and cables) Refer to Section 3.3, "Display Assembly Components," for display assembly internal component spare part number information.	412767-001
	Display switch module (not illustrated)	412757-001
2	***Switch cover** (includes LED board and LED board cable)*	*412754-001*
	Cable Kit Includes:	412753-001
3a	LED board cable	
3b	Pointing stick cable	
3c	Fingerprint reader board cable	
3d	Modem module cable	
3e	Bluetooth module cable	
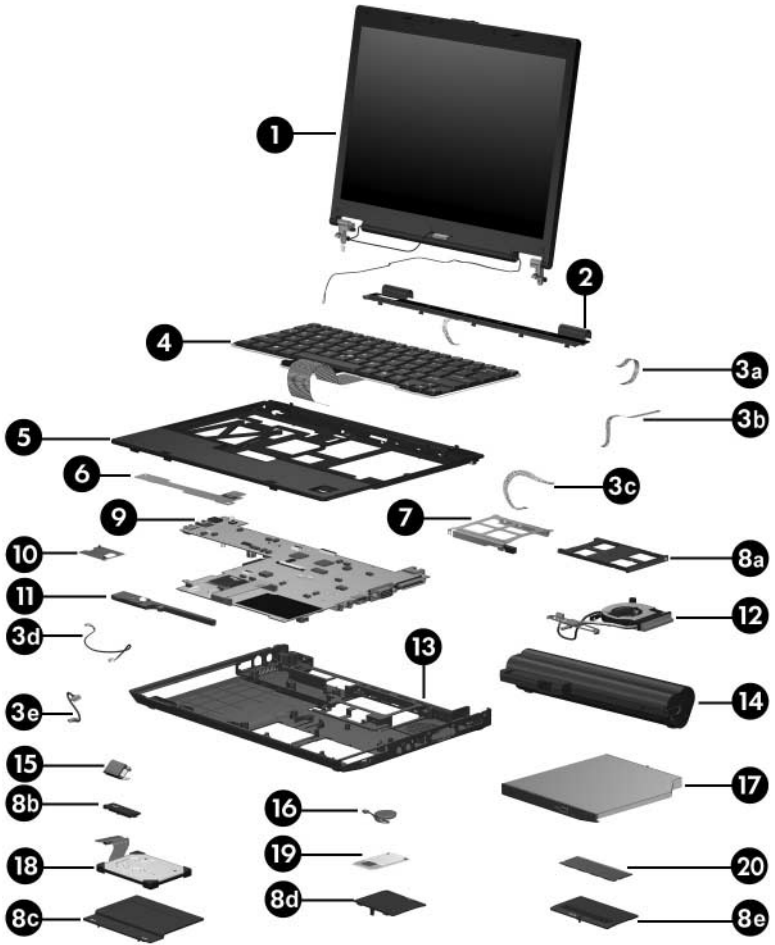
Computer Major Components

Table 3-1

Spare Parts: Computer Major Components *(Continued)*

Item	Description			Spare Part Number
4	**Keyboards with pointing stick** (includes pointing stick cable)			
	For use in:			
	Brazil	412782-201	Norway	412782-091
	The Czech Republic	412782-221	Portugal	412782-131
			Russia	412782-251
	Denmark	412782-081	Saudi Arabia	412782-171
	Europe (A4)	412782-A41	Slovakia	412782-231
	France	412782-051	Slovenia	412782-BA1
	French Canada	412782-121	Spain	412782-071
	Germany	412782-041	Sweden/Finland	412782-101
	Greece	412782-151	Switzerland	412782-111
	Hungary	412782-211	Taiwan	412782-AB1
	Iceland	412782-DD1	Thailand	412782-281
	Internationally	412782-021	Turkey	412782-141
	Israel	412782-BB1	The United Kingdom	412782-031
	Italy	412782-061		
	Japan	412782-291	The United States	412782-001
	Korea	412782-AD1		
	Latin America	412782-161		
5	**Top cover** (includes TouchPad)			412788-001
6	**Fingerprint reader board**			412755-001
7	**PC Card assembly**			412794-001
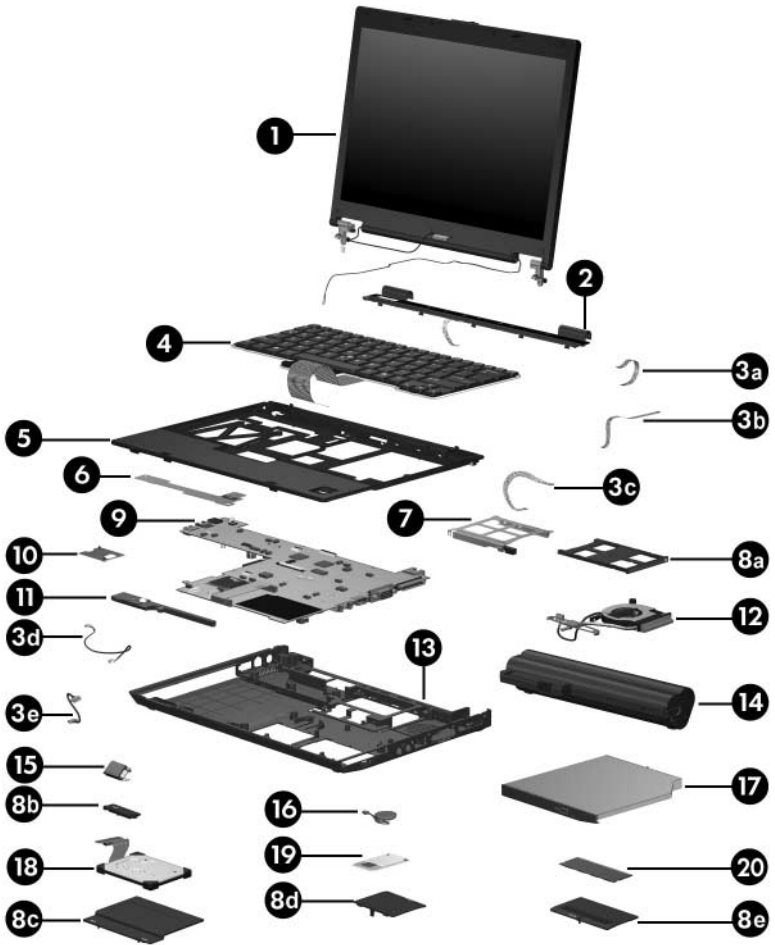
Computer Major Components

Table 3-1

Spare Parts: Computer Major Components *(Continued)*

Item	Description	Spare Part Number
	Plastics Kit	412764-001
	Includes:	
8a	PC Card slot bezel	
8b	Bluetooth module cover	
8c	Hard drive cover	
8d	Mini Card module cover	
8e	Memory module cover	
	Not illustrated:	
	Rubber screw caps	
	Computer feet	
9	**System boards** (include thermal grease, alcohol pad, and thermal pad)	
	Equipped with an Intel Pentium M 1200 (1.20-GHz) processor	412792-001
	Equipped with an Intel Pentium M 1100 (1.06-GHz) processor	412791-001
	Equipped with an Intel Celeron M 423 (1.06-GHz) processor	412790-001
	Equipped with an Intel Duo U7600 (1.20-GHz) processor	454164-001
	Equipped with an Intel Duo U2500 (1.20-GHz) processor	434405-001
	Equipped with an Intel Duo U2400 (1.06-GHz) processor	444814-001
10	**Modem module**	398979-001
11	**Speaker**	412793-001
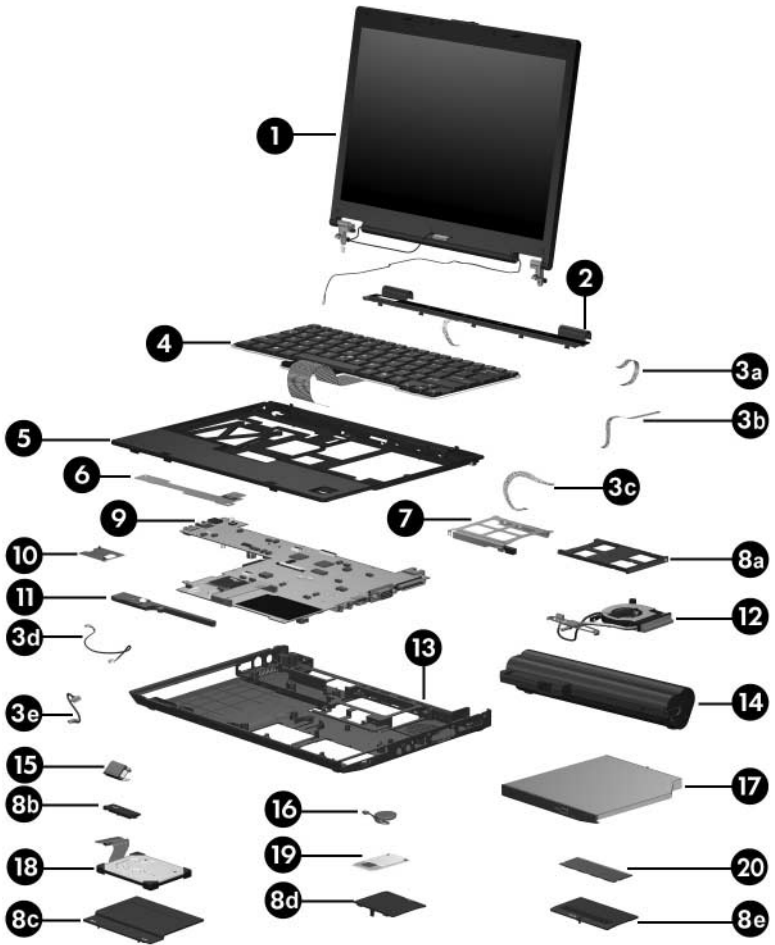
Computer Major Components

Table 3-1

Spare Parts: Computer Major Components *(Continued)*

Item	Description	Spare Part Number
12	**Fan/heat sink assembly** (includes thermal grease, alcohol pad, and thermal pad)	
	For use in computer models with Intel Pentium M or Celeron M processors	412756-001
	For use in computer models with Intel Core Duo processors	434825-001
13	**Base enclosure** (includes LED board and LED board cable)	
	For use in computer models with Intel Pentium M or Celeron M processors	412785-001
	For use in computer models with Intel Duo processors	435567-001
14	**Batteries**	
	9 cell, 84.0-WHr	412789-001
	6 cell, 55.0-WHr	451714-001
	3 cell, 28.8-WHr	412779-001
15	**Bluetooth® module** (includes Bluetooth module cable)	412766-002
16	**RTC battery**	412784-001
17	**Optical drives** (include bezel)	
	DVD±RW and CD-RW Double-Layer Combo Drive	412778-001
	DVD±RW and CD-RW Combo Drive	412777-001
	DVD-ROM drive	412776-001
18	**Hard drives** (all 4200 rpm; include hard drive bracket, rubber hard drive spacer, and hard drive cable)	
	80 GB	438385-001
	60 GB	412774-001
	40 GB	412773-001
	30 GB	412772-001

Computer Major Components

Table 3-1

Spare Parts: Computer Major Components *(Continued)*

Item	Description			Spare Part Number
19	**Mini Card WLAN modules**			
	802.11b/g HS WLAN module for use in the countries listed below. These countries are categorized as most of the world 1 (MOW1).			407159-001
	Antigua & Barbuda Argentina Australia Bahamas Barbados Brunei	Canada Chile Dominican Republic Guam Guatemala Hong Kong	Panama India Indonesia Malaysia Mexico New Zealand	Paraguay Saudi Arabia Taiwan The United States Vietnam
	802.11b/g HS WLAN module for use in the countries listed below. These countries are categorized as the rest of the world (ROW).			407159-002
	China Ecuador Haiti	Honduras Pakistan Peru	Qatar South Korea	Uruguay Venezuela
	802.11b/g HS WLAN module for use in Japan			407159-291
	802.11b/g LJ WLAN module for use in the MOW1 countries listed below:			407160-001
	Antigua & Barbuda Argentina Australia Bahamas Barbados Brunei	Canada Chile Dominican Republic Guam Guatemala Hong Kong	Panama India Indonesia Malaysia Mexico New Zealand	Paraguay Saudi Arabia Taiwan The United States Vietnam

Computer Major Components

Table 3-1

Spare Parts: Computer Major Components *(Continued)*

Item	Description			Spare Part Number
19	**Mini Card WLAN modules** *(Continued)*			
	802.11b/g LJ WLAN module for use in the ROW countries listed below:			407160-002
	China Ecuador Haiti	Honduras Pakistan Peru	Qatar South Korea	Uruguay Venezuela
	802.11b/g LJ WLAN module for use in Japan			407160-291
	802.11a/b/g GL WLAN module for use in the MOW1 countries listed below:			407674-001
	Antigua & Barbuda Argentina Australia Bahamas Barbados Brunei	Canada Chile Dominican Republic Guam Guatemala Hong Kong	Panama India Indonesia Malaysia Mexico New Zealand	Paraguay Saudi Arabia Taiwan The United States Vietnam

Computer Major Components

Table 3-1

Spare Parts: Computer Major Components *(Continued)*

Item	Description			Spare Part Number
19	**Mini Card WLAN modules** *(Continued)*			
	802.11a/b/g GL WLAN module for use in the countries listed below. These countries are categorized as most of the world (MOW 2).			407674-002
	Aruba	El Salvador	Poland	Norway
	Austria	Estonia	Portugal	Oman
	Azerbaijan	Finland	Romania	Slovenia
	Bahrain	France	Russia	South Africa
	Belgium	Georgia	Serbia and Montenegro	Spain
	Bermuda	Germany	Singapore	Sri Lanka
	Bulgaria	Greece	Slovakia	Sweden
	Cayman Islands	Hungary	Liechtenstein	Switzerland
	Columbia	Iceland	Lithuania	Turkey
	Croatia	Ireland	Luxembourg	The United Kingdom
	Cyprus	Italy	Malta	Uzbekistan
	Czech Republic	Latvia	Monaco	
	Denmark	Lebanon	The Netherlands	
	Egypt	Philippines		
	802.11a/b/g GL WLAN module for use in the ROW countries listed below:			407674-003
	China	Honduras	Qatar	Uruguay
	Ecuador	Pakistan	South Korea	Venezuela
	Haiti	Peru		
	802.11a/b/g GL WLAN module for use in Japan			407674-291
20	**DDR2, PC2-5300 memory modules**			
	2048 MB			412771-001
	1024 MB			412770-001
	512 MB			412769-001
	256 MB			412768-001

3.3 Display Assembly Components
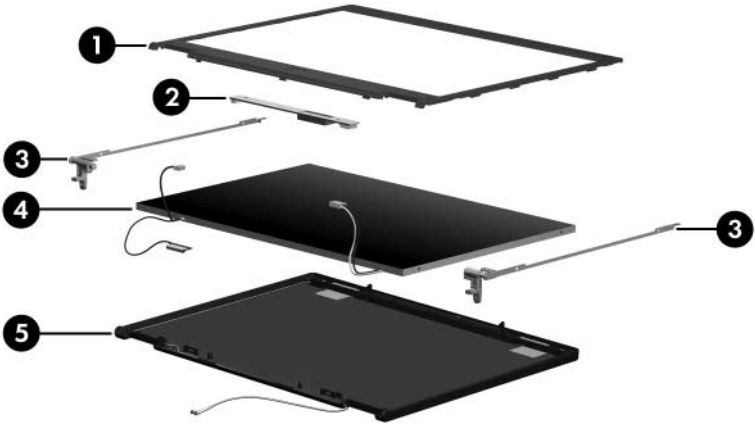
Table 3-2

Display Assembly Components

Spare Part Number Information

Item	Description	Spare Part Number
1	**Display bezel**	412759-001
2	**Display Inverter**	412758-001
3	**Display Hinge Kit**	412762-001
4	**12.1-inch WXGA, TFT display panel**	412760-001
5	**Display enclosure** (includes wireless antenna transceivers and cables)	412763-001
	Not illustrated:	
	Display Cable Kit	412765-001
	Display Screw Kit	412761-001
	Display Rubber Kit (includes all display bezel rubber and mylar screw covers)	417396-001

3.4 Plastics Kit

Table 3-3

Plastics Kit

Spare Part Number Information

Item	Description	Spare Part Number
	Plastics Kit Includes:	412764-001
1	PC Card slot bezel	
2	Hard drive spacer	
3	Hard drive cover (includes 2 captive screws, captured by C-clips)	
4	Bluetooth module cover (includes 1 captive screw, captured by a C clip)	
5	Mini Card module compartment cover (includes 1 captive screw, captured by a C-clip)	
6	Memory module compartment cover (includes 1 captive screw, captured by a C-clip)	
7	Computer rubber feet (5)	
8	Computer rubber feet for 9-cell battery (2)	

3.5 Cable Kit
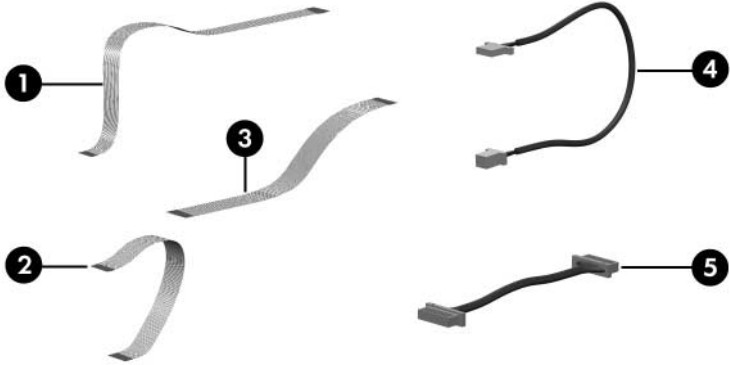
Table 3-4

Cable Kit

Spare Part Number Information

Item	Description	Spare Part Number
	Cable Kit Includes:	412753-001
1	Pointing stick cable	
2	LED board cable	
3	Fingerprint reader board cable	
4	Modem cable	
5	Bluetooth module cable	

3.6 Mass Storage Devices

Table 3-5

Mass Storage Devices

Spare Part Number Information

Item	Description	Spare Part Number
1	**Optical drives** (include bezel)	
	DVD±RW and CD-RW Double-Layer Combo Drive	412778-001
	DVD±RW and CD-RW Combo Drive	412777-001
	DVD-ROM drive	412776-001
2	**Hard drives** (all 4200 rpm; include hard drive bracket, rubber hard drive spacer, and hard drive cable)	
	80 GB	438385-001
	60 GB	412774-001
	40 GB	412773-001
	30 GB	412772-001

3.7 Miscellaneous (Not Illustrated)

Table 3-6

Miscellaneous (Not Illustrated)

Spare Part Information

Description	Spare Part Number
65-watt AC adapter	412786-001
External MultiBay II	366143-001
External MultiBay II power cable and stand	366144-001
HP Extended Life Battery	367456-001
Docking Station	412787-001
Docking Station II	455157-001
Label Kit	412783-001
MultiBay 8X DVD-ROM Drive	373314-001
MultiBay 24X DVD/CD-RW Combo Drive	373315-001
Nylon carrying case	325814-001
USB 1.1 diskette drive	359118-001
Smart card	412781-001
Optical drive spacer	430655-001
Screw Kit (includes the following screws; refer to Appendix A, "Screw Listing," for more information on specifications and usage)	417395-001

- Phillips PM3.0×3.0 screw
- Phillips PM2.5×17.0 screw
- Phillips PM2.5×13.0 spring-loaded screw
- Phillips PM2.5×7.0 screw
- Phillips PM2.5×4.0 screw

- Phillips PM2.0×6.0 screw
- Phillips PM2.0×4.0 screw
- Torx8 T8M2.5×19.0 screw
- Torx8 T8M2.5×9.0 screw
- Torx8 T8M2.5×7.0 screw
- Torx8 T8M2.5×4.0 screw

Table 3-6

Miscellaneous (Not Illustrated)

Spare Part Information *(Continued)*

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

3.8 Sequential Part Number Listing

Table 3-7

Sequential Part Number Listing

Spare Part Number	Description
325814-001	Nylon carrying case
350055-001	Power cord for use in the United States
350055-011	Power cord for use in Australia
350055-021	Power cord for use in Europe
350055-031	Power cord for use in the United Kingdom
350055-61	Power cord for use in Italy
350055-081	Power cord for use in Denmark
350055-201	Power cord for use in Brazil
350055-291	Power cord for use in Japan
350055-AA1	Power cord for use in the People's Republic of China
350055-AD1	Power cord for use in Korea
350055-BB1	Power cord for use in Israel
350055-BG1	Power cord for use in Switzerland
350055-DB1	Power cord for use in French Canada
359118-001	USB 1.1 diskette drive
366143-001	External MultiBay II
366144-001	External MultiBay II power cable and stand
367456-001	HP Extended Life Battery
373314-001	8X DVD-ROM drive for use in the External MultiBay II
373315-001	24X DVD/CD-RW Combo Drive for use in the External MultiBay II

Table 3-7

Sequential Part Number Listing *(Continued)*

Spare Part Number	Description
398979-001	Modem module
407159-001	802.11b/g HS WLAN module for use in the MOW1 countries listed below:

Antigua & Barbuda	Canada	Panama	Paraguay
Argentina	Chile	India	Saudi
Australia	Dominican	Indonesia	Arabia
Bahamas	Republic	Malaysia	Taiwan
Barbados	Guam	Mexico	The United
Brunei	Guatemala	New Zealand	States
	Hong Kong		Vietnam

Spare Part Number	Description
407159-002	802.11b/g HS WLAN module for use in the ROW countries listed below:

China	Honduras	Qatar	Uruguay
Ecuador	Pakistan	South Korea	Venezuela
Haiti	Peru		

Spare Part Number	Description
407159-291	802.11b/g HS WLAN module for use in Japan
407160-001	802.11b/g LJ WLAN module for use in the MOW1 countries listed below:

Antigua & Barbuda	Canada	Panama	Paraguay
Argentina	Chile	India	Saudi
Australia	Dominican	Indonesia	Arabia
Bahamas	Republic	Malaysia	Taiwan
Barbados	Guam	Mexico	The United
Brunei	Guatemala	New Zealand	States
	Hong Kong		Vietnam

Table 3-7

Sequential Part Number Listing *(Continued)*

Spare Part Number	Description
407160-002	802.11b/g LJ WLAN module for use in the ROW countries listed below:

China	Honduras	Qatar	Uruguay
Ecuador	Pakistan	South Korea	Venezuela
Haiti	Peru		

Spare Part Number	Description
407160-291	802.11b/g LJ WLAN module for use in Japan
407674-001	802.11a/b/g GL WLAN module for use in the MOW1 countries listed below:

Antigua & Barbuda	Canada	Panama	Paraguay
Argentina	Chile	India	Saudi Arabia
Australia	Dominican Republic	Indonesia	Taiwan
Bahamas	Guam	Malaysia	The United States
Barbados	Guatemala	Mexico	Vietnam
Brunei	Hong Kong	New Zealand	

Table 3-7

Sequential Part Number Listing *(Continued)*

Spare Part Number	Description
407674-002	802.11a/b/g GL WLAN module for use in the MOW2 countries listed below:

Aruba	El Salvador	Poland	Norway
Austria	Estonia	Portugal	Oman
Azerbaijan	Finland	Romania	Slovenia
Bahrain	France	Russia	South Africa
Belgium	Georgia	Serbia and Montenegro	Spain
Bermuda	Germany	Singapore	Sri Lanka
Bulgaria	Greece	Slovakia	Sweden
Cayman Islands	Hungary	Liechtenstein	Switzerland
Columbia	Iceland	Lithuania	Turkey
Croatia	Ireland	Luxembourg	The United Kingdom
Cyprus	Italy	Malta	Uzbekistan
Czech Republic	Latvia	Monaco	
Denmark	Lebanon	The Netherlands	
Egypt	The Philippines		

Spare Part Number	Description
407674-003	802.11a/b/g GL WLAN module for use in the ROW countries listed below:

China	Honduras	Qatar	Uruguay
Ecuador	Pakistan	South Korea	Venezuela
Haiti	Peru		

Spare Part Number	Description
407674-291	802.11a/b/g GL WLAN module for use in Japan
412753-001	Cable Kit
412754-001	*Switch cover (includes LED board and LED board cable)*
412755-001	Fingerprint reader board

Table 3-7

Sequential Part Number Listing *(Continued)*

Spare Part Number	Description
412756-001	Fan/heat sink assembly for use in computer models with Intel Pentium M or Celeron M processors (includes thermal grease, alcohol pad, and thermal pad)
412757-001	Display switch module
412758-001	Display Inverter
412759-001	Display bezel
412760-001	12.1-inch WXGA, TFT display panel
412761-001	Display Screw Kit
412762-001	Display Hinge Kit
412763-001	Display enclosure
412764-001	Plastics Kit
412765-001	Display Cable Kit
412766-002	Bluetooth module (includes Bluetooth module cable)
412767-001	12.1-inch, WXGA, TFT display assembly (includes wireless antenna transceivers and cables)
412768-001	DDR2, PC2-5300 256-MB memory module
412769-001	DDR2, PC2-5300 512-MB memory module
412770-001	DDR2, PC2-5300 1024-MB memory module
412771-001	DDR2, PC2-5300 2048-MB memory module
412772-001	4200-rpm, 30-GB hard drive (includes hard drive bracket, rubber hard drive spacer, and hard drive cable)
412773-001	4200-rpm, 40-GB hard drive (includes hard drive bracket, rubber hard drive spacer, and hard drive cable)
412774-001	4200-rpm, 60-GB hard drive (includes hard drive bracket, rubber hard drive spacer, and hard drive cable)

Table 3-7

Sequential Part Number Listing *(Continued)*

Spare Part Number	Description
412776-001	DVD-ROM drive
412777-001	DVD±RW and CD-RW Combo Drive
412778-001	DVD±RW and CD-RW Double-Layer Combo Drive
412779-001	3-cell, 28.8-WHr battery
412781-001	Smart card
412782-001	Keyboard with pointing stick for use in the United States (includes pointing stick cable)
412782-021	Keyboard with pointing stick for use internationally (includes pointing stick cable)
412782-031	Keyboard with pointing stick for use in the United Kingdom (includes pointing stick cable)
412782-041	Keyboard with pointing stick for use in Germany (includes pointing stick cable)
412782-051	Keyboard with pointing stick for use in France (includes pointing stick cable)
412782-061	Keyboard with pointing stick for use in Italy (includes pointing stick cable)
412782-071	Keyboard with pointing stick for use in Spain (includes pointing stick cable)
412782-081	Keyboard with pointing stick for use in Denmark (includes pointing stick cable)
412782-091	Keyboard with pointing stick for use in Norway (includes pointing stick cable)
412782-101	Keyboard with pointing stick for use in Sweden/Finland (includes pointing stick cable)
412782-111	Keyboard with pointing stick for use in Switzerland (includes pointing stick cable)

Table 3-7

Sequential Part Number Listing *(Continued)*

Spare Part Number	Description
412782-121	Keyboard with pointing stick for use in French Canada (includes pointing stick cable)
412782-131	Keyboard with pointing stick for use in Portugal (includes pointing stick cable)
412782-141	Keyboard with pointing stick for use in Turkey (includes pointing stick cable)
412782-151	Keyboard with pointing stick for use in Greece (includes pointing stick cable)
412782-161	Keyboard with pointing stick for use in Latin America (includes pointing stick cable)
412782-171	Keyboard with pointing stick for use in Saudi Arabia (includes pointing stick cable)
412782-201	Keyboard with pointing stick for use in Brazil (includes pointing stick cable)
412782-211	Keyboard with pointing stick for use in Hungary (includes pointing stick cable)
412782-221	Keyboard with pointing stick for use in the Czech Republic (includes pointing stick cable)
412782-231	Keyboard with pointing stick for use in Slovakia (includes pointing stick cable)
412782-251	Keyboard with pointing stick for use in Russia (includes pointing stick cable)
412782-281	Keyboard with pointing stick for use in Thailand (includes pointing stick cable)
412782-291	Keyboard with pointing stick for use in Japan (includes pointing stick cable)
412782-A41	Keyboard with pointing stick for use in Europe (A4)(includes pointing stick cable)

Table 3-7

Sequential Part Number Listing *(Continued)*

Spare Part Number	Description
412782-AB1	Keyboard with pointing stick for use in Taiwan (includes pointing stick cable)
412782-AD1	Keyboard with pointing stick for use in Korea (includes pointing stick cable)
412782-BA1	Keyboard with pointing stick for use in Slovenia (includes pointing stick cable)
412782-BB1	Keyboard with pointing stick for use in Israel (includes pointing stick cable)
412782-DD1	Keyboard with pointing stick for use in Iceland (includes pointing stick cable)
412783-001	Label Kit
412784-001	RTC battery
412785-001	Base enclosure for use in computer models with Intel Pentium M or Celeron M processors (includes front LED board and front LED board cable)
412786-001	65-watt AC adapter
412787-001	Docking Station
412788-001	Top cover (includes TouchPad)
412789-001	9-cell, 84.0-WHr battery
412790-001	System board equipped with an Intel Celeron M 423 (1.06-GHz) processor (includes thermal grease, alcohol pad, and thermal pad)
412791-001	System board equipped with an Intel Pentium M 1100 (1.06-GHz) processor (includes thermal grease, alcohol pad, and thermal pad)

Table 3-7

Sequential Part Number Listing *(Continued)*

Spare Part Number	Description
412792-001	System board equipped with an Intel Pentium M 1200 (1.20-GHz) processor (includes thermal grease, alcohol pad, and thermal pad)
412793-001	Speaker
412794-001	PC Card assembly
417395-001	Screw Kit
417396-001	Display Rubber Kit (includes all display bezel rubber and mylar screw covers)
430655-001	Optical drive spacer
434405-001	System board equipped with an Intel Core Duo U2500 (1.20-GHz) processor (includes thermal grease, alcohol pad, and thermal pad)
434825-001	Fan/heat sink assembly for use in computer models with Intel Core Duo processors (includes thermal grease, alcohol pad, and thermal pad)
435567-001	Base enclosure for use in computer models with Intel Core Duo processors (includes front LED board and front LED board cable)
438385-001	4200-rpm, 80-GB hard drive (includes hard drive bracket, rubber hard drive spacer, and hard drive cable)
444814-001	System board equipped with an Intel Core Duo U2400 (1.06-GHz) processor (includes thermal grease, alcohol pad, and thermal pad)
451714-001	6-cell, 55.0-WHr battery
454164-001	System board equipped with an Intel Core Duo U7600 (1.20-GHz) processor (includes thermal grease, alcohol pad, and thermal pad)
455157-001	Docking Station II

4

Removal and Replacement Preliminaries

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

4.1 Tools Required

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

- Magnetic screwdriver
- Phillips P0 and P1 screwdrivers
- Torx5 screwdriver
- 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, ensure that cables are placed in their proper locations during the reassembly process. Improper cable placement can damage the computer.

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

4.3 Preventing Damage to Removable Drives

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

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

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

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

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

■ Avoid dropping drives from any height onto any surface.

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

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

■ Avoid exposing a drive to temperature extremes or liquids.

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

4.4 **Preventing Electrostatic Damage**

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

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

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

4.5 **Packaging and Transporting Precautions**

Use the following grounding precautions when packaging and transporting equipment:

■ To avoid hand contact, transport products in static-safe containers, such as tubes, bags, or boxes.

■ Protect all electrostatic-sensitive parts and assemblies with conductive or approved containers or packaging.

■ Keep electrostatic-sensitive parts in their containers until the parts arrive at static-free workstations.

■ Place items on a grounded surface before removing items from their containers.

■ Always be properly grounded when touching a sensitive component or assembly.

■ Store reusable electrostatic-sensitive parts from assemblies in protective packaging or nonconductive foam.

■ Use transporters and conveyors made of antistatic belts and roller bushings. Ensure that mechanized equipment used for moving materials is wired to ground and that proper materials are selected to avoid static charging. When grounding is not possible, use an ionizer to dissipate electric charges.

4.6 Workstation Precautions

Use the following grounding precautions at workstations:

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

■ Use a wrist strap connected to a properly grounded work surface and use properly grounded tools and equipment.

■ Use conductive field service tools, such as cutters, screwdrivers, and vacuums.

■ When fixtures must directly contact dissipative surfaces, use fixtures made only of static-safe materials.

■ Keep the work area free of nonconductive materials, such as ordinary plastic assembly aids and Styrofoam.

■ Handle electrostatic-sensitive components, parts, and assemblies by the case or PCM laminate. Handle these items only at static-free workstations.

■ Avoid contact with pins, leads, or circuitry.

■ Turn off power and input signals before inserting or removing connectors or test equipment.

4.7 Grounding Equipment and Methods

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

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

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

Other grounding equipment recommended for use in preventing electrostatic damage includes

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

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

Table 4-1

Typical Electrostatic Voltage Levels

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 61 screws, in 8 different sizes, that must be removed, replaced, or loosened when servicing the computer. Make special note of each screw size and location during removal and replacement.

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

5.1 Serial Number

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

Serial Number Location

5.2 Disassembly Sequence Chart

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

Disassembly Sequence Chart

Section	Description	# of Screws Removed
5.3	Preparing the Computer for Disassembly	
	Battery	0
5.4	Hard Drive	2 loosened to remove the hard drive cover 1 loosened to disconnect the hard drive connector 2 loosened to remove the hard drive bracket
5.5	Computer Feet	0
5.6	External Memory Module	1 loosened to remove the memory module compartment cover
5.7	Mini Card WLAN Module	1 loosened to remove the Mini Card compartment cover 2 removed to remove the Mini Card WLAN module
	⚠ To prevent an unresponsive system and the display of a warning message, install only a Mini Card device authorized for use in your computer by the governmental agency that regulates wireless devices in your country. If you install a device and then receive a warning message, remove the device to restore computer functionality. Then contact Customer Care.	
5.8	RTC Battery	0

Disassembly Sequence Chart *(Continued)*

Section	Description	# of Screws Removed
5.9	Bluetooth Module	1 loosened to remove the Bluetooth module cover 1 removed to remove the Bluetooth module
5.10	Optical Drive	2 to remove the optical drive 2 to remove the optical drive bracket
5.11	Switch Cover	0
5.12	Keyboard	5
5.13	Display Assembly Display bezel Display inverter Display panel Display hinges	5 6 0 4 4
5.14	Top Cover	11
5.15	Fingerprint Reader Board	2
5.16	System Board	5
5.17	PC Card Assembly	0
5.18	Modem Module	2
5.19	Speaker	1
5.20	Fan/Heat Sink Assembly	1

5.3 Preparing the Computer for Disassembly

Before you begin any removal or installation procedures:

1. Shut down the computer. If you are unsure whether the computer is off or in hibernation, turn the computer on, and then shut it down through the operating system.

2. Disconnect all external devices connected to the computer.

3. Disconnect the power cord.

Battery Spare Part Number Information

Batteries	
9 cell, 84.0-WHr	412789-001
6 cell, 55.0-WHr	451714-001
3 cell, 28.8-WHr	412779-001

4. Remove the battery by following these steps:

   a. Turn the computer upside down with the rear panel toward you.

   b. Slide and hold the battery release latches ❶ toward the outside edges of the computer.

   c. Slide the battery ❷ straight back and remove it.

Removing the Battery

Reverse the above procedure to install the battery.

5.4 Hard Drive

Hard Drive Spare Part Number Information

Hard drives (all 4200 rpm; include hard drive bracket, rubber hard drive spacer, and hard drive cable)

80 GB	438385-001
60 GB	412774-001
40 GB	412773-001
30 GB	412772-001

1. Prepare the computer for disassembly (refer to 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 front edge of the hard drive cover ❷ and swing it up and to the back.

4. Remove the hard drive cover.

✎ The hard drive cover is included in the Plastics Kit, spare part number 412764-001.
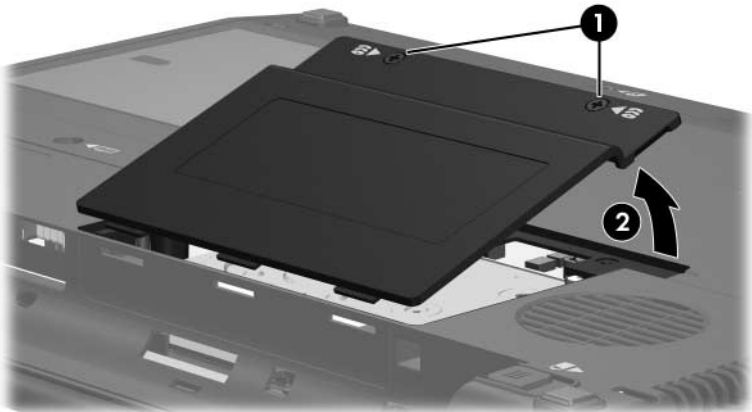
Removing the Hard Drive Cover

5. Loosen the Phillips PM2.0×5.0 hard drive retention screw ❶.

6. Disconnect the hard drive connector ❷ from the system board.
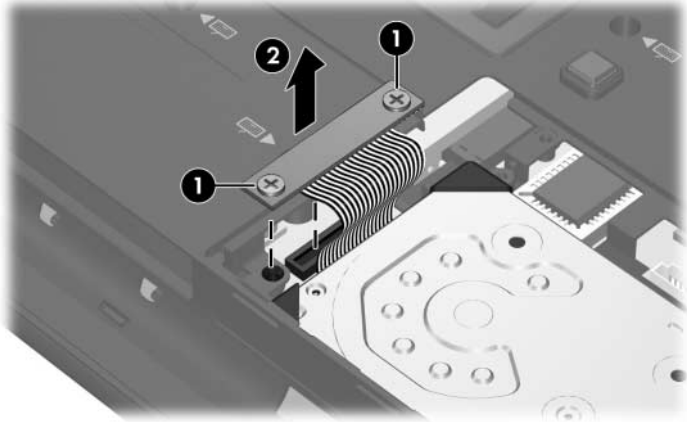
Removing the Hard Drive

7. Remove the two Phillips PM2.0×5.0 hard drive bracket screws ❶ that secure the hard drive bracket to the computer.

8. Lift the bracket ❷ straight up and remove it.
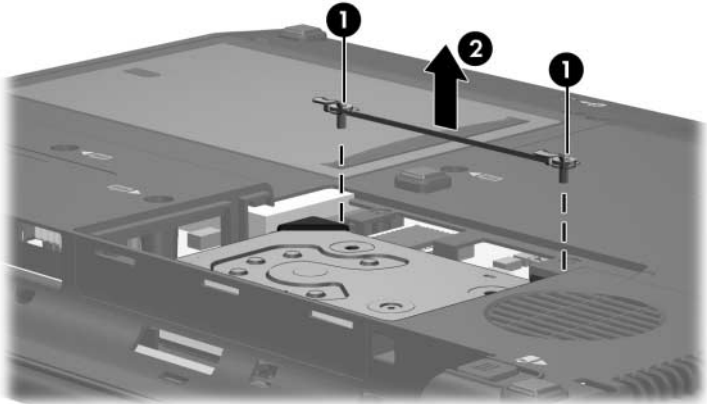
Removing the Hard Drive Bracket

9. Remove the hard drive from the hard drive bay.
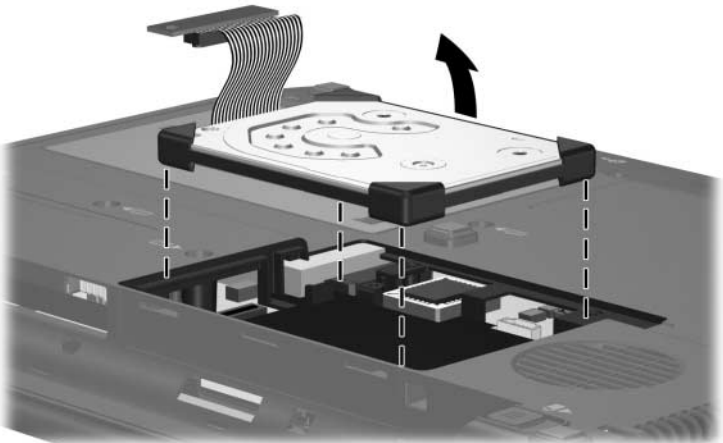
Removing the Hard Drive

10. If it is necessary to replace the hard drive spacer, remove the spacer from the hard drive.
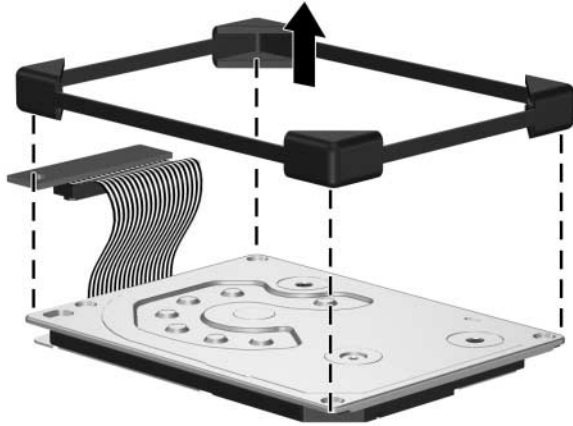
Removing the Hard Drive Spacer

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 412764-001.
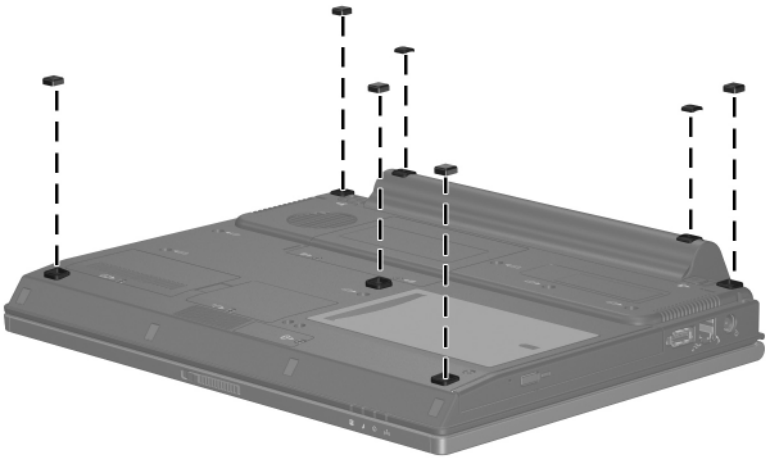
Replacing the Computer Feet

5.6 External Memory Module

Memory Module Spare Part Number Information

DDR2, PC2-5300 memory modules

2048 MB	412771-001
1024 MB	412770-001
512 MB	412769-001
256 MB	412768-001

1. Prepare the computer for disassembly (refer to).

2. Loosen the Phillips PM2.0×5.0 screw ❶ that secures the memory module compartment cover to the computer.

3. Lift the front edge of the cover ❷ and swing it up and toward the back of the computer.

4. Remove the memory module compartment cover.

✎ The memory module compartment cover is included in the Plastics Kit, spare part number 412764-001.
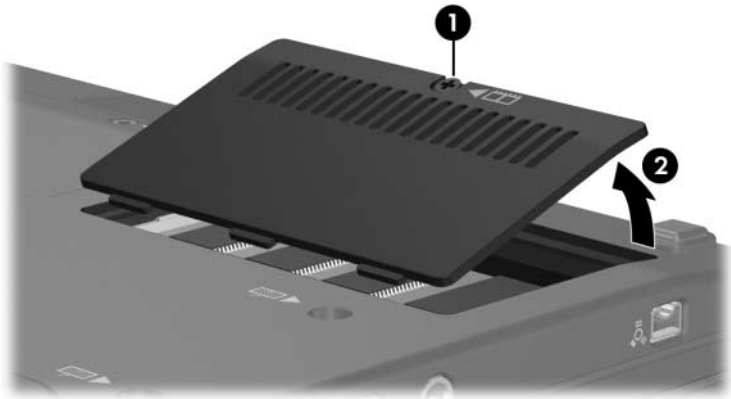
Removing the Memory Module Compartment Cover

5. Spread the retaining tabs ❶ on each side of the memory module socket to release the memory module. (The edge of the module opposite the socket rises away from the computer.)

6. Slide the module ❷ away from the socket at an angle.

7. Remove the memory module.

✎ Memory modules are designed with a notch ❸ to prevent incorrect installation into the memory module socket.
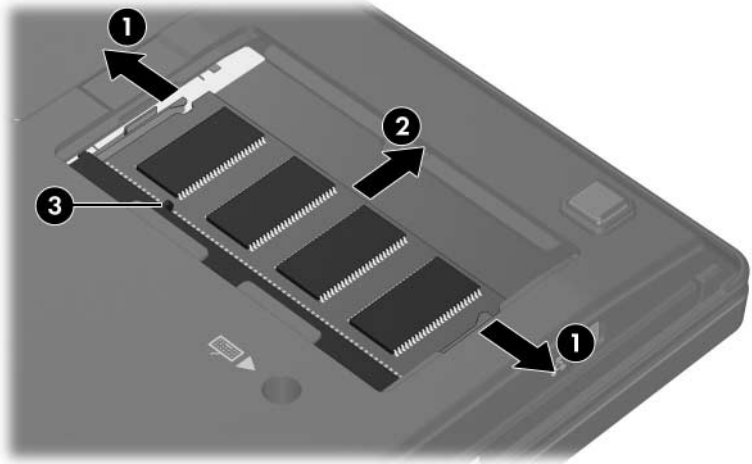
Removing the Memory Module

Reverse the above procedure to install a memory module.

5.7 Mini Card WLAN Module

Mini Card WLAN Module

Spare Part Number Information

802.11b/g HS WLAN module for use in the most of the world 1 (MOW1) countries listed below:			407159-001
Antigua & Barbuda Argentina Australia Bahamas Barbados Brunei Canada	Chile Dominican Republic Guam Guatemala Hong Kong	Panama India Indonesia Malaysia Mexico New Zealand	Paraguay Saudi Arabia Taiwan The United States Vietnam
802.11b/g HS WLAN module for use in the rest of the world (ROW) countries listed below:			407159-002
China Ecuador Haiti	Honduras Pakistan Peru	Qatar South Korea	Uruguay Venezuela
802.11b/g HS WLAN module for use in Japan			407159-291
802.11b/g LJ WLAN module for use in the MOW1 countries listed below:			407160-001
Antigua & Barbuda Argentina Australia Bahamas Barbados Brunei Canada	Chile Dominican Republic Guam Guatemala Hong Kong	Panama India Indonesia Malaysia Mexico New Zealand	Paraguay Saudi Arabia Taiwan The United States Vietnam

Mini Card WLAN Module

Spare Part Number Information *(Continued)*

802.11b/g LJ WLAN module for use in the ROW countries listed below:			407160-002

China	Honduras	Qatar	Uruguay
Ecuador	Pakistan	South Korea	Venezuela
Haiti	Peru		

802.11b/g LJ WLAN module for use in Japan	407160-291

802.11a/b/g GL WLAN module for use in the MOW1 countries listed below:			407674-001

Antigua & Barbuda	Chile	Panama	Paraguay
Argentina	Dominican	India	Saudi Arabia
Australia	Republic	Indonesia	Taiwan
Bahamas	Guam	Malaysia	The United
Barbados	Guatemala	Mexico	States
Brunei	Hong Kong	New Zealand	Vietnam
Canada			

Mini Card WLAN Module

Spare Part Number Information *(Continued)*

802.11a/b/g GL WLAN module for use in the MOW2 countries listed below:			407674-002

Aruba	Estonia	Poland	Norway
Austria	Finland	Portugal	Oman
Azerbaijan	France	Romania	Slovenia
Bahrain	Georgia	Russia	South Africa
Belgium	Germany	Serbia and Montenegro	Spain
Bermuda	Greece	Singapore	Sri Lanka
Bulgaria	Hungary	Slovakia	Sweden
Cayman Islands	Iceland	Liechtenstein	Switzerland
Columbia	Ireland	Lithuania	Turkey
Croatia	Italy	Luxembourg	The United
Cyprus	Latvia	Malta	Kingdom
Czech Republic	Lebanon	Monaco	Uzbekistan
Denmark	The	The Netherlands	
Egypt	Philippines		
El Salvador			

802.11a/b/g GL WLAN module for use in the ROW countries listed below:			407674-003

China	Honduras	Qatar	Uruguay
Ecuador	Pakistan	South Korea	Venezuela
Haiti	Peru		

802.11a/b/g GL WLAN module for use in Japan	407674-291

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

2. Loosen the Phillips PM2.0×5.0 screw ❶ that secures the Mini Card module compartment cover to the computer.

3. Lift the front edge of the cover ❷ and swing it up and toward the back of the computer.

4. Remove the Mini Card module compartment cover.

✎ The Mini Card module compartment cover is included in the Plastics Kit, spare part number 412764-001.
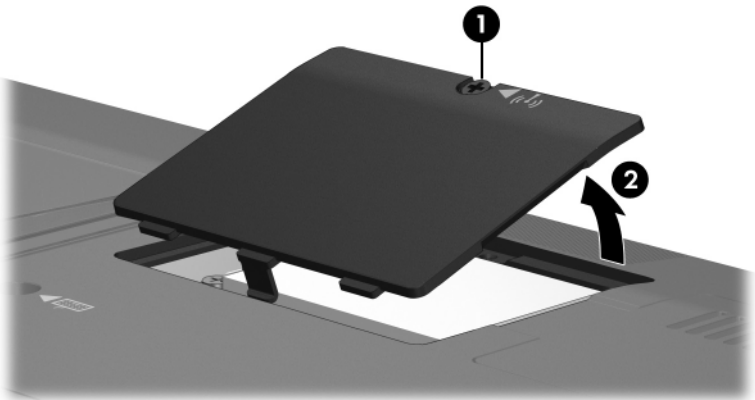
Removing the Mini Card Module Compartment Cover

5. Make note of which wireless antenna cable is attached to which antenna clip on the Mini Card WLAN module before disconnecting the cables, then disconnect the auxiliary and main wireless antenna cables ❶ from the Mini Card WLAN module.

6. Remove the two Phillips PM2.0×3.0 screws ❷ that secure the Mini Card WLAN module to the computer. (The edge of the module opposite the socket rises away from the computer.)
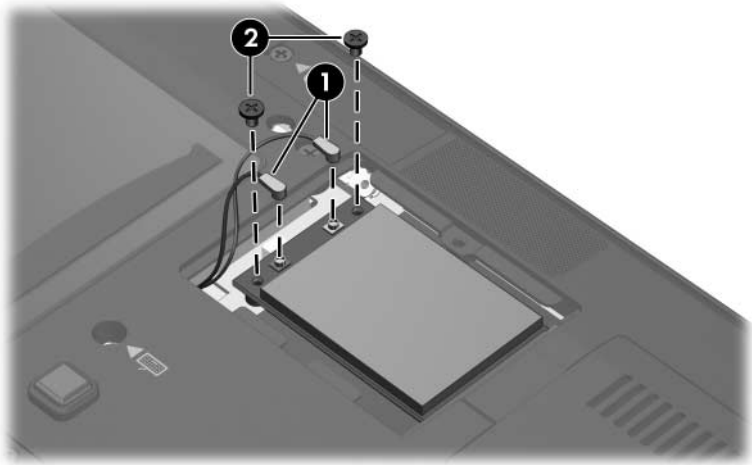
Removing a Mini Card WLAN Module

7. Remove the Mini Card WLAN module by lifting the left edge of the module ❶ until it rests at an angle, and then pulling the module ❷ away from the socket at an angle.

✎ Mini Card modules are designed with a notch ❸ to prevent incorrect installation into the Mini Card socket.
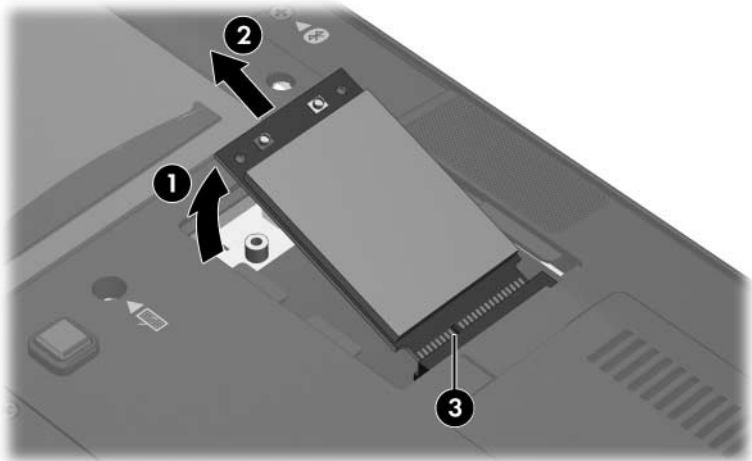
Removing a Mini Card WLAN Module

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

5.8 RTC Battery

RTC Battery Module Spare Part Number Information

| RTC battery | 412784-001 |

1. Prepare the computer for disassembly (Section 5.3).
2. Remove the Mini Card WLAN module (Section 5.7).
3. Disconnect the RTC battery cable ❶ from the system board.
4. Slide the RTC battery ❷ out of the clip in the base enclosure.
5. Remove the RTC battery ❸.
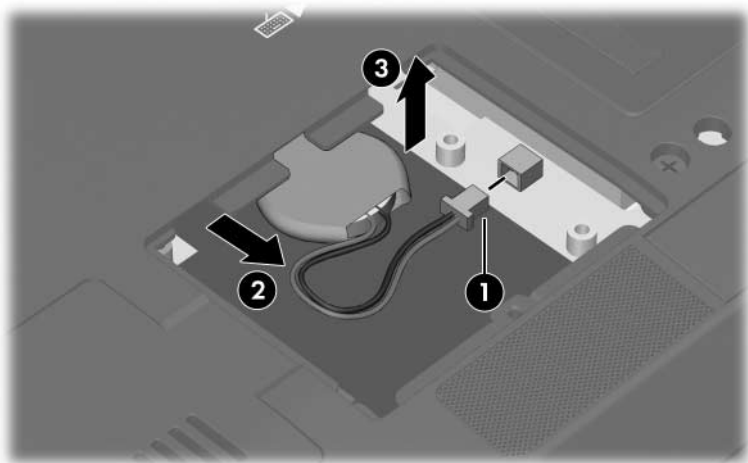
Removing the RTC Battery

Reverse the above procedure to install an RTC battery.

5.9 Bluetooth Module

Bluetooth Module Spare Part Number Information

Bluetooth module (includes Bluetooth module cable)	412766-002

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

2. Loosen the Phillips PM2.0×5.0 screw ❶ that secures the Bluetooth module cover to the computer.

3. Lift the right side of the Bluetooth module cover ❷ until the module is clear of the base enclosure.

4. Remove the Bluetooth module cover ❸.
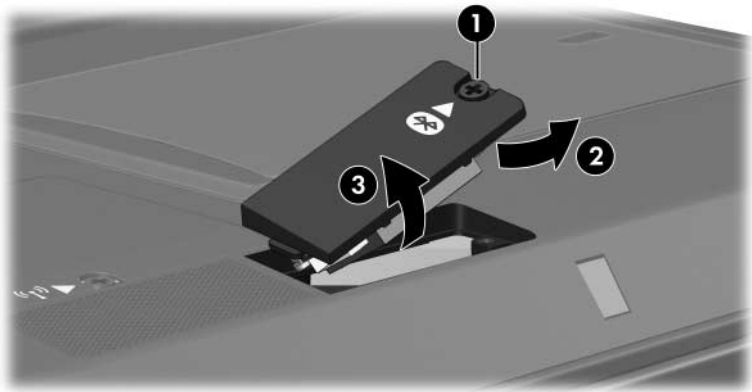
Removing the Bluetooth Module Cover

5. Disconnect the Bluetooth module cable from the Bluetooth module ❶ and the system board ❷.

✎ The Bluetooth module cable is included with the Bluetooth module spare part kit and is also available in the Cable Kit, spare part number 412753-001.
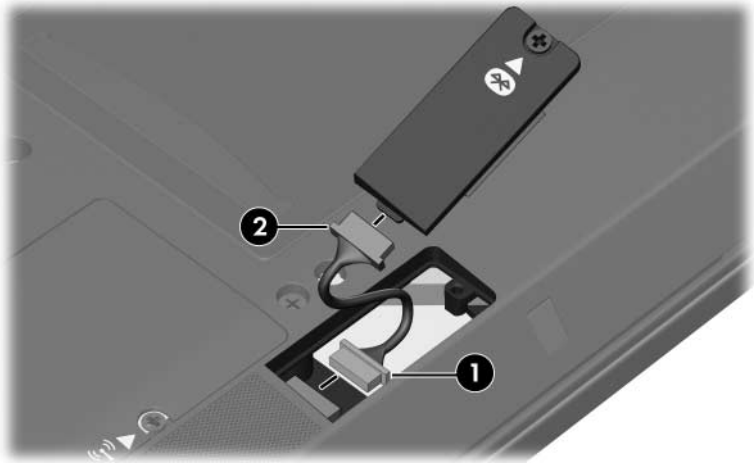
Removing the Bluetooth Module Cover

6. Remove the Phillips PM2.0×3.0 screw ❶ that secures the Bluetooth module to the Bluetooth module cover.

7. Remove the Bluetooth module ❷ from the Bluetooth module cover.

✎ The Bluetooth module cover is available in the Plastics Kit, spare part number 412753-001.
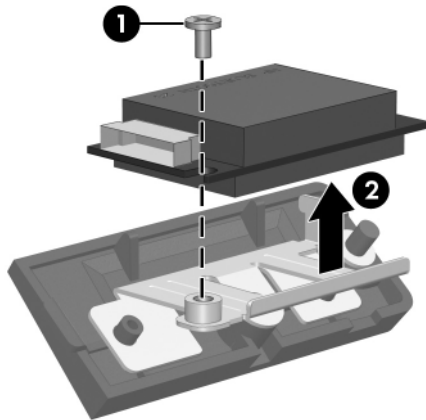
Removing the Bluetooth Module

Reverse the above procedure to install a Bluetooth module.

5.10 Optical Drive

Optical Drive Spare Part Number Information

DVD±RW and CD-RW Double-Layer Combo Drive	412778-001
DVD±RW and CD-RW Combo Drive	412777-001
DVD-ROM drive	412776-001

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

2. Position the computer with left side toward you.

3. Remove the Torx8 T8M2.5×7.0 screw ❶ and the Torx8 T8M2.5×4.0 screw ❷ that secure the optical drive to the computer.

4. Insert a thin tool, such as a paper clip ❸, into the media tray release hole. (The optical drive media tray releases from the optical drive.)

5. Use the media tray frame to slide the optical drive ❹ out of the optical drive bay.
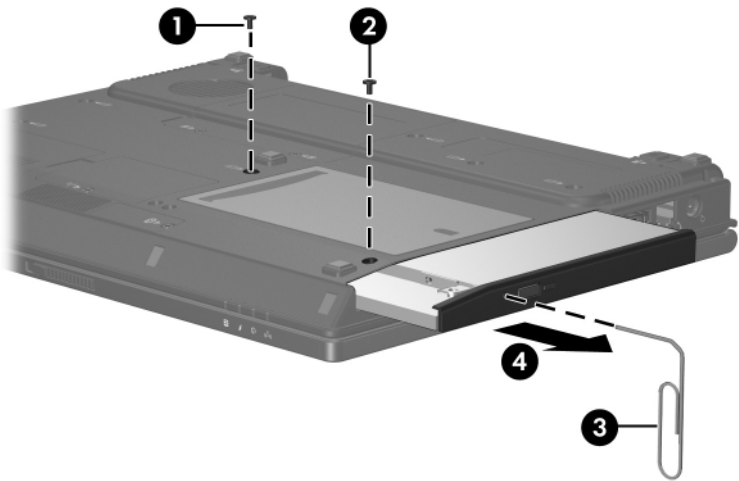
Removing the Optical Drive

6. If it is necessary to replace the optical drive bracket, remove the two Phillips PM2.0×3.0 screws ❶ that secure the bracket to the optical drive.

7. Remove the optical drive bracket ❷.
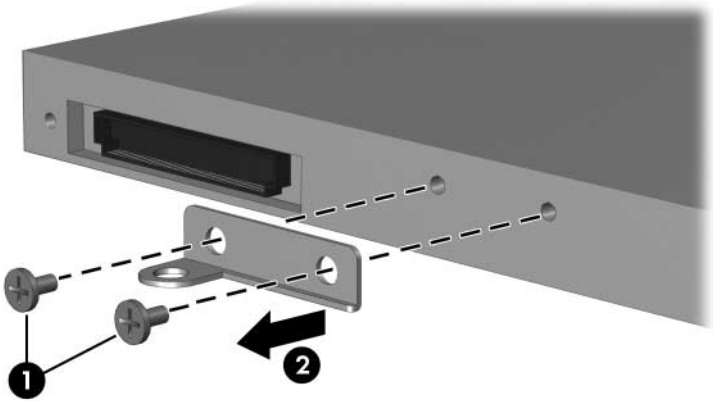
Removing the Optical Drive Bracket

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

5.11   Switch Cover

Switch Cover Spare Part Number Information

Switch cover (includes LED board and LED board cable)   *412754-001*

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

2. Use a thin flat-bladed tool to release the four tabs on the switch cover from the base enclosure.

Releasing the Switch Cover, Part 1

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

4. Open the computer as far as it will open.

5. Lift the left and right hinge cover sections of the switch cover to disengage the switch cover from the computer.

Releasing the Switch Cover, Part 2

6. Release the zero insertion force (ZIF) connector ❶ to which the LED board cable is connected and disconnect the LED board cable ❷ from the LED board.
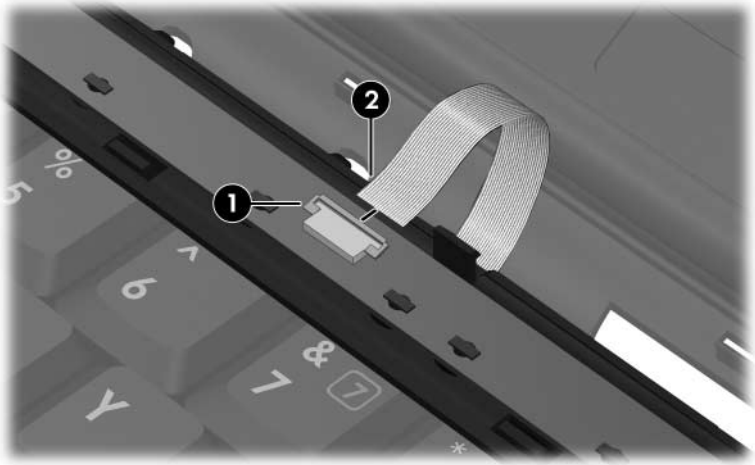
Removing the Switch Cover

7. Remove the switch cover.

Reverse the above procedure to install the switch cover.

5.12 Keyboard

Keyboard Spare Part Number Information

Keyboards with pointing stick (includes pointing stick cable)
For use in:

Brazil	412782-201	Latin America	412782-161
The Czech Republic	412782-221	Norway	412782-091
Denmark	412782-081	Portugal	412782-131
Europe (A4)	412782-A41	Russia	412782-251
France	412782-051	Saudi Arabia	412782-171
French Canada	412782-121	Slovakia	412782-231
Germany	412782-041	Slovenia	412782-BA1
Greece	412782-151	Spain	412782-071
Hungary	412782-211	Sweden/Finland	412782-101
Iceland	412782-DD1	Switzerland	412782-111
Internationally	412782-021	Taiwan	412782-AB1
Israel	412782-BB1	Thailand	412782-281
Italy	412782-061	Turkey	412782-141
Japan	412782-291	The United Kingdom	412782-031
Korea	412782-AD1	The United States	412782-001

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

2. Remove the switch cover (Section 5.11).

3. Remove the five Torx8 T8M2.5×7.0 screws that secure the keyboard to the computer.
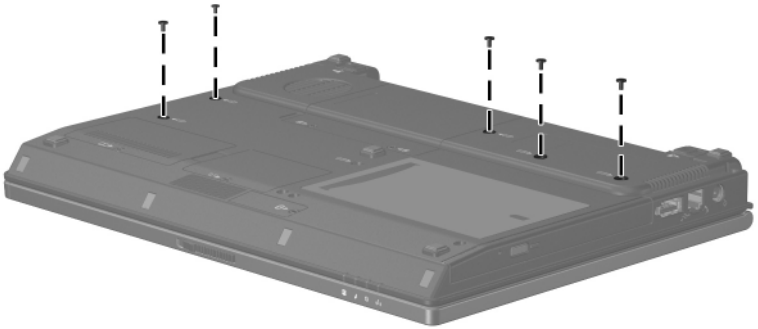
Removing the Keyboard Screws

4. Turn the computer display-side up with the front toward you.

5. Open the computer as far as possible.

6. Lift the rear edge of the keyboard ❶ and slide it back until the keyboard cable ❷ and pointing stick cable ❸ are accessible.
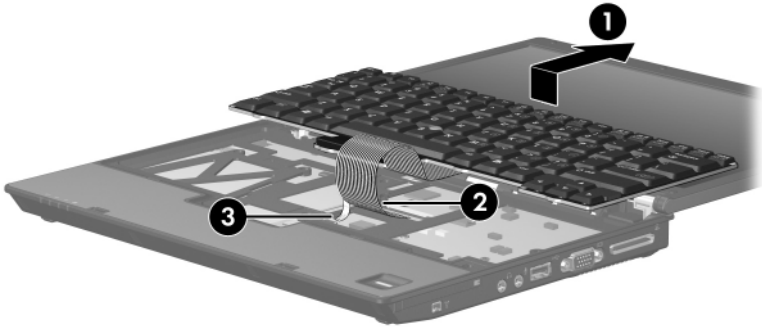
Releasing the Keyboard

7. Release the ZIF connector ❶ to which the keyboard cable is attached and disconnect the keyboard cable ❷.

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

9. Remove the keyboard.
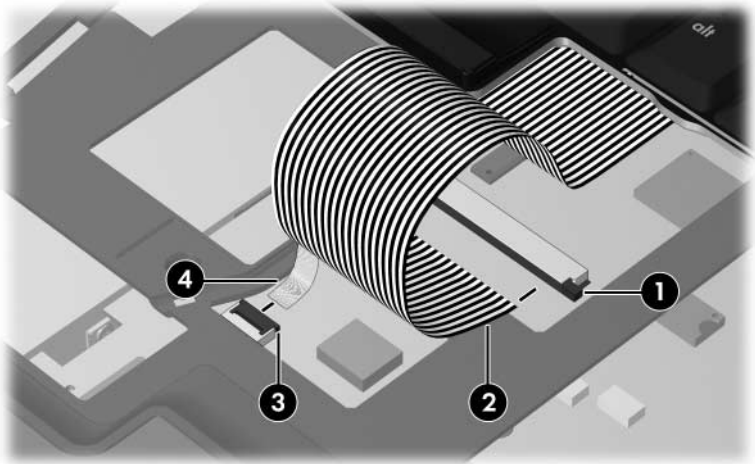
Disconnecting the Keyboard and Pointing Stick Cables

10. Remove the keyboard.

11. If it is necessary to replace the LED board cable, release the ZIF connector ❶ to which the LED board cable is attached and disconnect the LED board cable ❷ from the system board.

12. Remove the LED board cable ❸.

✎ The LED board cable is included with the switch cover spare part kit and is also available in the Cable Kit, spare part number 412753-001.
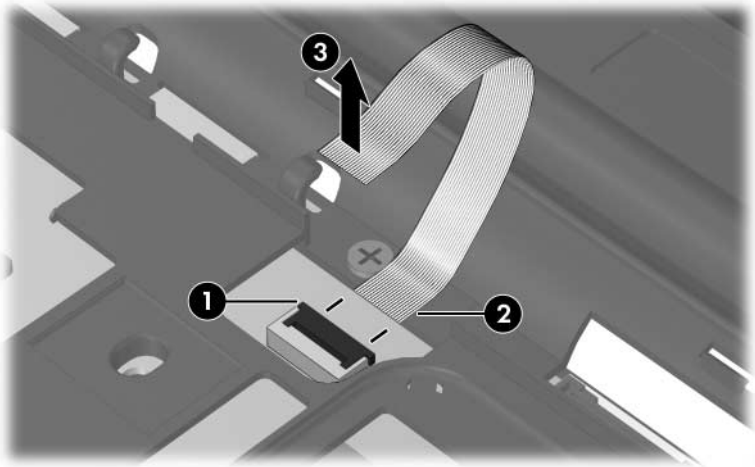
Removing the LED Board Cable

Reverse the above procedure to install the keyboard.

5.13 Display Assembly

Display Assembly Spare Part Number Information

12.1-inch, WXGA, TFT display assembly (includes wireless antenna transceivers and cables)	412767-001

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

2. Disconnect the wireless antenna cables from the Mini Card WLAN module (Section 5.7).

3. Remove the switch cover (Section 5.11).

4. Remove the keyboard (Section 5.12).

5. Close the computer and turn it upside down with the rear panel toward you.

6. Remove the two Torx8 T8M2.5×7.0 screws that secure the display assembly to the computer.

Removing the Display Assembly Screws

7. Turn the computer display-side up with the front toward you.

8. Open the computer as far as it will open.

9. Remove the Torx8 T8M2.5×7.0 screw ❶ that secures the display ground cable to the computer.

10. Disconnect the display cable ❷ from the system board.

11. Remove the wireless antenna cables ❸ from the Mini Card compartment and the top cover clips.
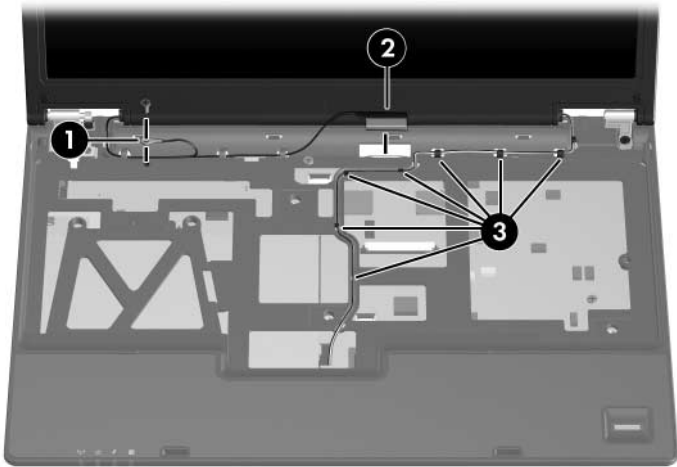
Disconnecting the Display Cable and Removing the Wireless Antenna Cables

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

12. Disconnect the display lid switch module cable ❶ from the system board.

13. Remove the two Torx8 T8M2.5×7.0 screws ❷ that secure the display assembly to the computer.

14. Lift the display assembly ❸ straight up and remove it.
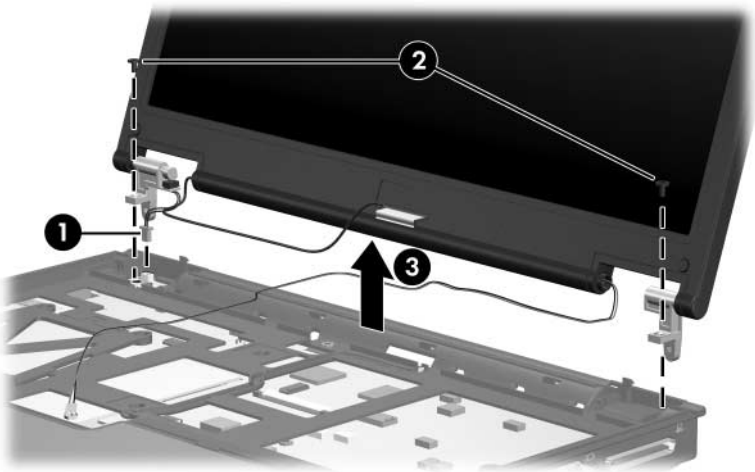
Removing the Display Assembly

Display Assembly Components

Spare Part Number Information

Description	Spare Part Number
Display bezel	412759-001
Display Inverter	412758-001
Display Hinge Kit	412762-001
12.1-inch WXGA, TFT display panel	412760-001
Display enclosure	412763-001
Display Cable Kit	412765-001
Display Screw Kit	412761-001
Display Rubber Kit (includes all display bezel rubber screw covers)	417396-001

15. Remove the six rubber screw covers ❶ and the six Torx5 T5M2.0×5.0 screws ❷ that secure the display bezel to the display assembly.

✎ The display bezel rubber screw covers are available in the Display Rubber Kit, spare part number 417396-001.

All screws used in the display assembly are available in the Display Screw Kit, spare part number 412761-001.
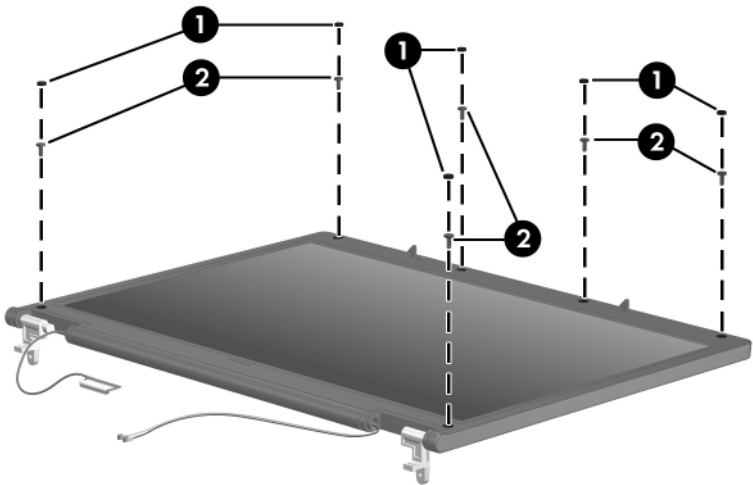
Removing the Display Bezel Screws

Display Assembly Subcomponents

Spare Part Number Information

Display bezel	412759-001

16. Flex the insides edges of the left and right sides ❶ and the top and bottom sides ❷ of the display bezel until the bezel disengages from the display enclosure.

17. Remove the display bezel ❸.
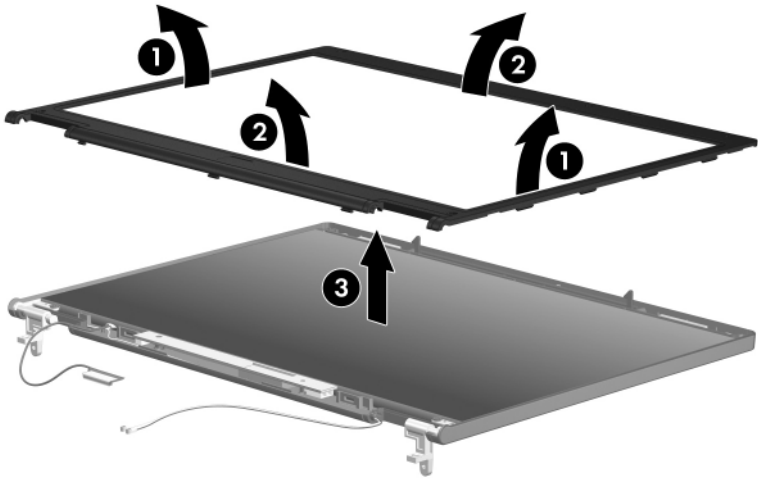
Removing the Display Bezel

Display Assembly Subcomponents

Spare Part Number Information

Display Inverter	412758-001

18. Disconnect the backlight ❶ and display cables ❷ from the inverter.

19. Remove the display inverter ❸.
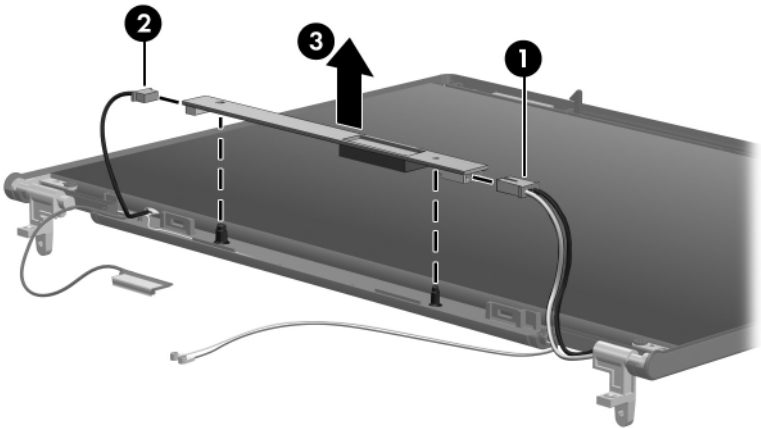
Removing the Display Inverter

Display Assembly Subcomponents

Spare Part Number Information

12.1-inch WXGA, TFT display panel	412760-001

20. Remove the four Torx5 T5M2.0×5.0 screws ❶ that secure the display panel to the display enclosure.

21. Remove the display panel ❷ from the display enclosure.
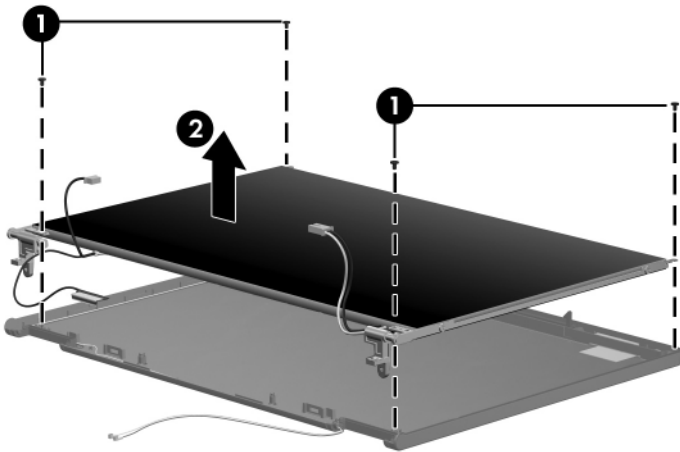
Removing the Display Panel

Display Assembly Subcomponents

Spare Part Number Information

Display Hinge Kit   412762-001

22. If it is necessary to replace the display hinges, remove the Phillips PM2.0×3.0 screws ❶ that secure each hinge to the display panel.

23. Remove the display hinges ❷.
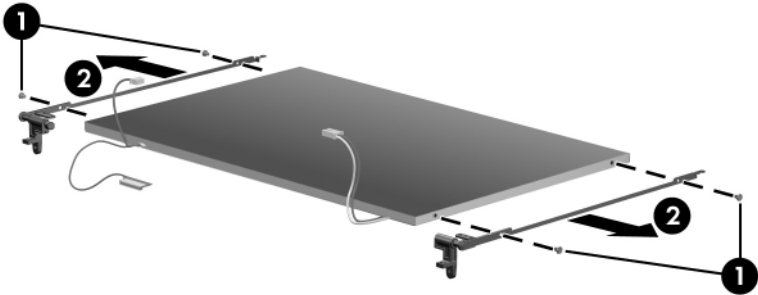
Removing the Display Hinges

Reverse the above procedure to reassemble and install the display assembly

5.14 Top Cover

Top Cover Spare Part Number Information

Top cover (includes TouchPad)	412788-001

1. Prepare the computer for disassembly (Section 5.3),
   and then remove the following components:

   a. Hard drive (Section 5.4)

   b. Optical drive (Section 5.10)

   c. Switch cover (Section 5.11)

   d. Keyboard (Section 5.12)

   e. Display assembly (Section 5.13)

2. Turn the computer upside down with the front toward you.

3. Remove the following:

   ❶ Four rubber screw covers

   ❷ Five Torx8 T8M2.5×4.0 screws that secure the top cover to the base enclosure

   ❸ Three Torx8 T8M2.5×7.0 screw that secures the top cover to the base enclosure

✎ The rubber screw covers are available in the Plastics Kit, spare part number 412764-001.
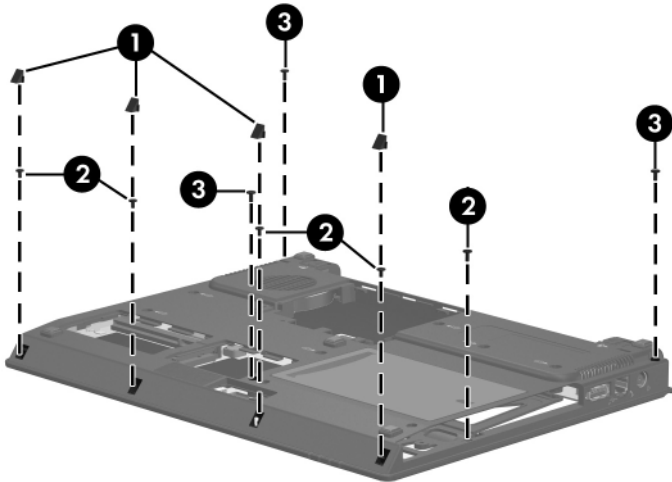
Removing the Top Cover Screws, Part 1

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

5. Remove the Phillips PM2.0×4.0 screw ❶ and the two Torx8 T8M2.5×7.0 screws ❷ that secure the top cover to the computer.
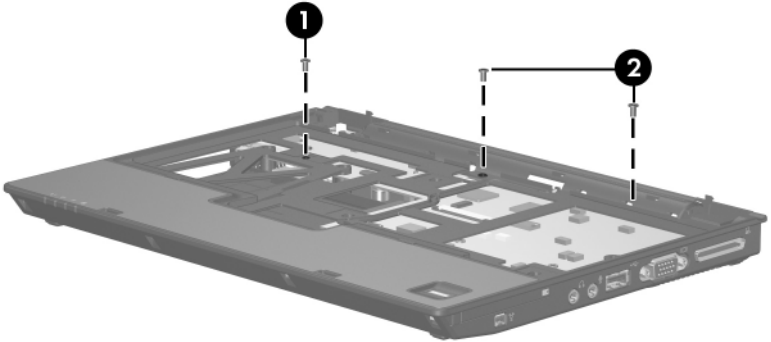
Removing the Top Cover Screws, Part 2

6. Lift the back edge of the top cover and swing it up and forward until it rests in front of the computer.

Releasing the Top Cover

7. Release the ZIF connector ❶ to which the fingerprint reader board cable is attached and disconnect the fingerprint reader board cable ❷ from the system board.
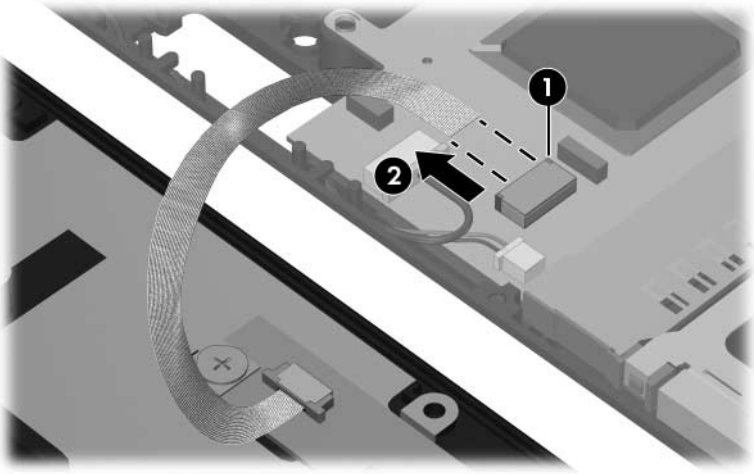
Disconnecting the Fingerprint Reader Board Cable

8. Remove the top cover.

Reverse the above procedure to install the top cover.

5.15 Fingerprint Reader Board

Fingerprint Reader Board Spare Part Number Information

Fingerprint reader board	412755-001

1. Prepare the computer for disassembly (Section 5.3), and then remove the following components:

   a. Hard drive (Section 5.4)

   b. Optical drive (Section 5.10)

   c. Switch cover (Section 5.11)

   d. Keyboard (Section 5.12)

   e. Display assembly (Section 5.13)

   f. Top cover (Section 5.14)

2. Turn the top cover upside down with the front toward you.

3. Release the ZIF connector ❶ to which the fingerprint reader board cable is connected and disconnect the fingerprint reader board cable ❷.

4. Remove the two Phillips PM2.0×2.0 screws ❸ that secure the fingerprint reader board cable to the top cover.

5. Remove the fingerprint reader board ❹.
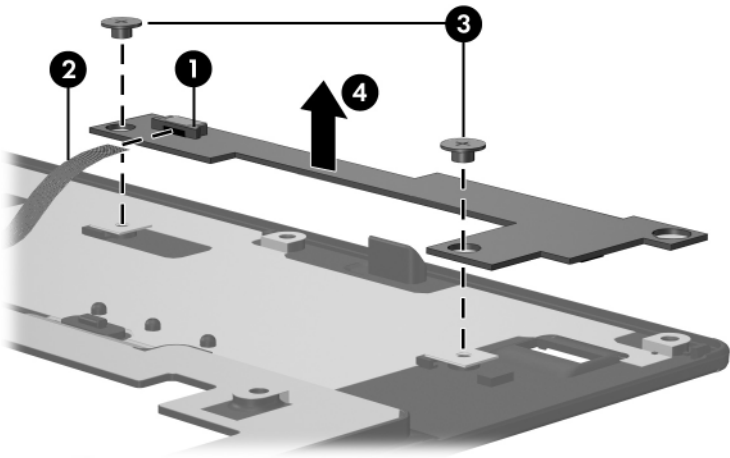
Removing the Fingerprint Reader Board

Reverse the above procedure to install the fingerprint reader board.

5.16 System Board

System Board Spare Part Number Information

Equipped with an Intel Core Duo U7600 (1.20-GHz) processor	454164-001
Equipped with an Intel Core Duo U2500 (1.20-GHz) processor	434405-001
Equipped with an Intel Core Duo U2400 (1.06-GHz) processor	444814-001
Equipped with an Intel Pentium M 1200 (1.20-GHz) processor	412792-001
Equipped with an Intel Pentium M 1100 (1.06-GHz) processor	412791-001
Equipped with an Intel Celeron M 423 (1.06-GHz) processor	412790-001

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

- Memory modules (Section 5.6)
- Mini Card WLAN module (Section 5.7)
- RTC battery (Section 5.8)
- PC Card assembly(Section 5.17)
- Modem module (Section 5.18)

1. Prepare the computer for disassembly (Section 5.3), and then remove the following components:

   a. Hard drive (Section 5.4)

   b. Bluetooth board (Section 5.9)

   c. Optical drive (Section 5.10)

   d. Switch cover (Section 5.11)

   e. Keyboard (Section 5.12)

   f. Display assembly (Section 5.13)

   g. Top cover (Section 5.14)

   h. Fan/heat sink assembly (Section 5.20)

2. Turn the computer upside down with the rear panel toward you.

3. Disconnect the fan cable from the system board.
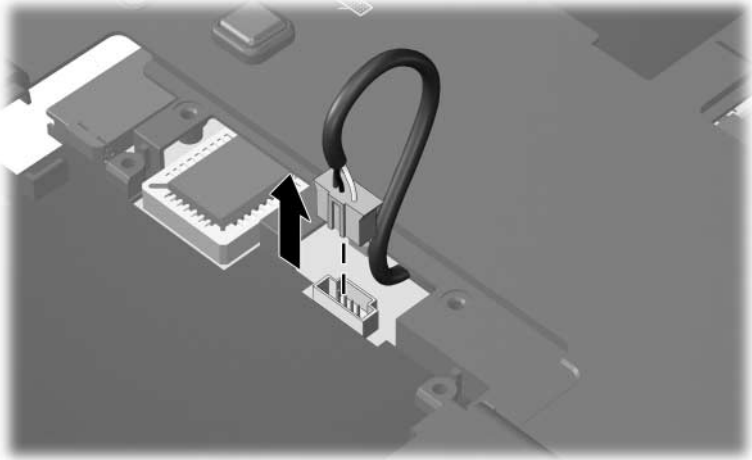
Disconnecting the Fan Cable

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

5. Press the PC Card eject button ❶ once to release the button, then press the button again to eject the PC Card slot bezel ❷ from the PC Card slot.

✎ The PC Card slot bezel is available in the Plastics Kit, spare part number 412753-001.
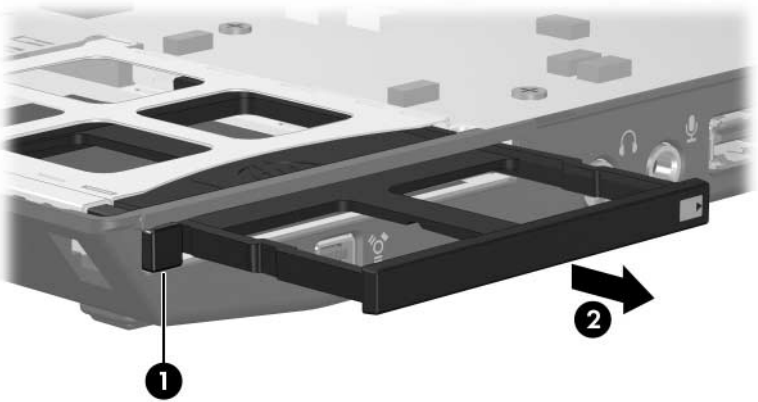
Ejecting the PC Card Slot Bezel

6. Disconnect the LED board cable ❶ and the speaker cable ❷ from the system board.
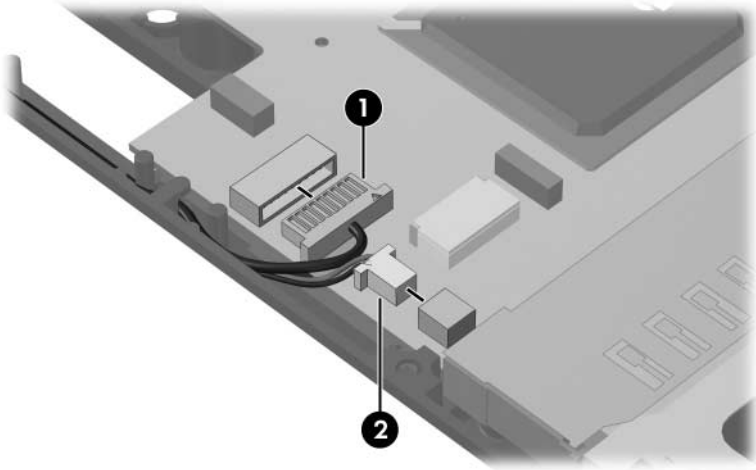
Disconnecting the LED Board Cable and the Speaker Cable

7. Remove the three Torx8 T8M2.5×7.0 screws ❶ and the two Torx8 T8M2.0×10.0 screws ❷ that secure the system board to the base enclosure.
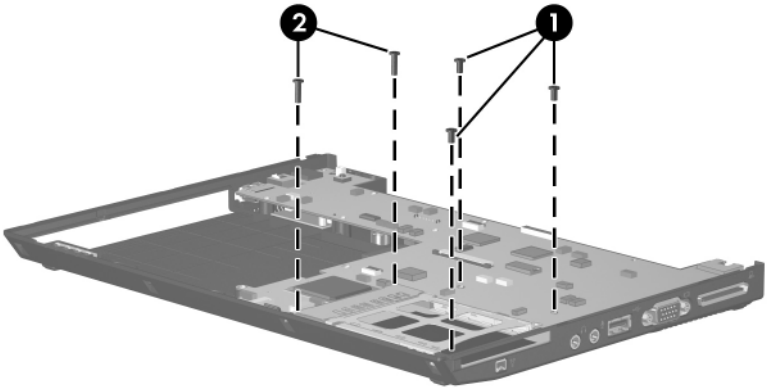
Removing the System Board Screws

8. Use the optical drive connector ❶ to lift the left side of the system board ❷ until it rests at an angle.

9. Slide the system board ❸ to the left at an angle and remove it from the base enclosure.
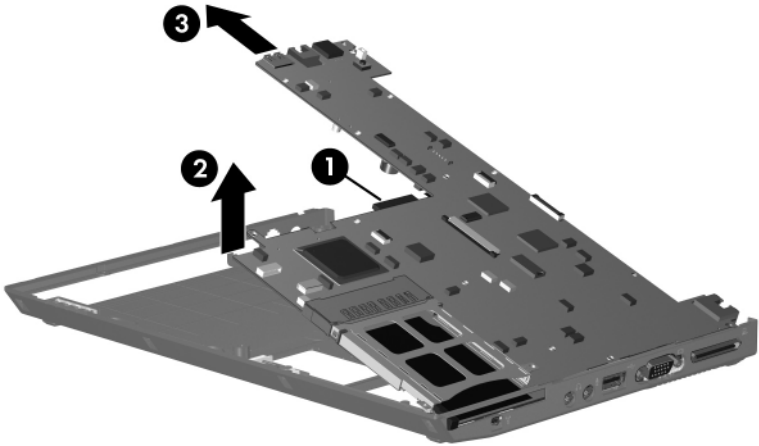
Removing the System Board

Reverse the above procedures to install the system board.

5.17 PC Card Assembly

PC Card Assembly Spare Part Number Information

PC Card assembly	412794-001

1. Prepare the computer for disassembly (Section 5.3), and then remove the following components:

   a. Hard drive (Section 5.4)

   b. Bluetooth board (Section 5.9)

   c. Optical drive (Section 5.10)

   d. Switch cover (Section 5.11)

   e. Keyboard (Section 5.12)

   f. Display assembly (Section 5.13)

   g. Fan/heat sink assembly (Section 5.20)

   h. Top cover (Section 5.14)

   i. System board (Section 5.16)

2. Disengage the hooks ❶ on the PC Card assembly from the slots on the PC Card connector ❷ and remove the PC Card assembly ❸ from the system board.
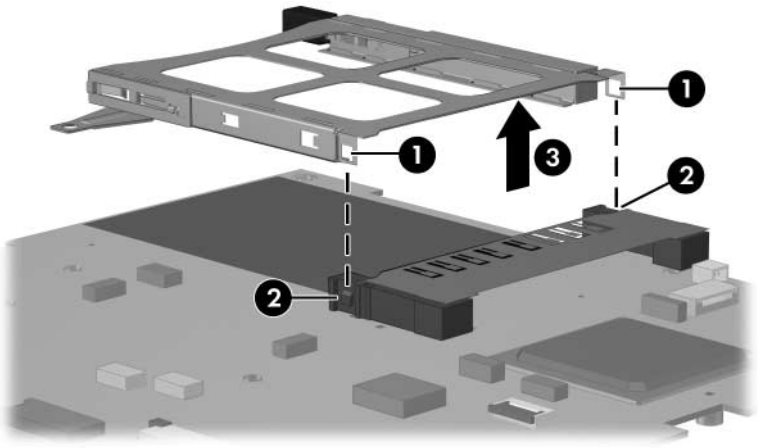
Removing the PC Card Assembly

Reverse the above procedure to install the PC Card assembly.

5.18   Modem Module

Modem Module Spare Part Number Information

Modem module   398979-001

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1. Prepare the computer for disassembly (Section 5.3),
   and then remove the following components:

   a. Hard drive (Section 5.4)

   b. Bluetooth board (Section 5.9)

   c. Optical drive (Section 5.10)

   d. Switch cover (Section 5.11)

   e. Keyboard (Section 5.12)

   f. Display assembly (Section 5.13)

   g. Fan/heat sink assembly (Section 5.20)

   h. Top cover (Section 5.14)

   i. System board (Section 5.16)

2. Turn the system board upside down with the modem and
   power connector toward you.

3. Remove the two Phillips PM2.0×3.0 screws ❶ that secure the modem module to the system board.

4. Lift the rear edge of the modem module ❷ to disconnect it from the system board.

5. Disconnect the modem module cable ❸ from the modem module.

✎ The modem module cable is included in the modem module spare part kit and is also available in the Cable Kit, spare part number 412753-001.

6. If it is necessary to replace the modem module cable, disconnect the cable ❹ from the system board.
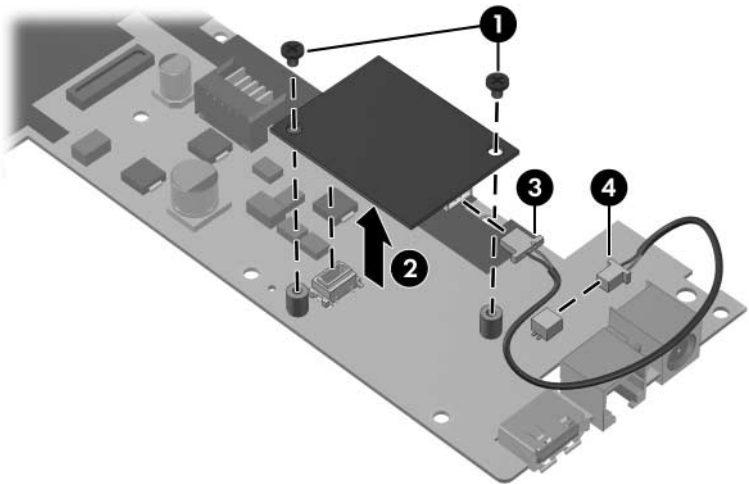
Removing the Modem Module

Reverse the above procedure to install the modem module.

5.19 Speaker

Speaker Spare Part Number Information

Speaker	412793-001

1. Prepare the computer for disassembly (Section 5.3), and then remove the following components:

    a. Hard drive (Section 5.4)

    b. Bluetooth board (Section 5.9)

    c. Optical drive (Section 5.10)

    d. Switch cover (Section 5.11)

    e. Keyboard (Section 5.12)

    f. Display assembly (Section 5.13)

    g. Fan/heat sink assembly (Section 5.20)

    h. Top cover (Section 5.14)

    i. System board (Section 5.16)

2. Remove the Torx8 T8M2.5×4.0 screw ❶ that secures the speaker to the base enclosure.

3. Remove the speaker ❷ from the base enclosure.
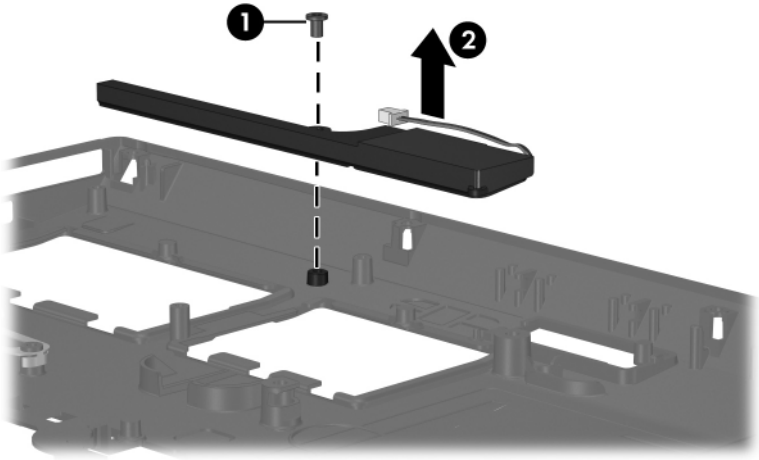
Removing the Speaker

Reverse the above procedure to install the speaker.

5.20 **Fan/Heat Sink Assembly**

Fan/Heat Sink Assembly Assembly

Spare Part Number Information

Fan/heat sink assembly for use in computer models with Intel Pentium M or Celeron M processors	412756-001
Fan/heat sink assembly for use in computer models with Intel Core Duo processors	434825-001

1. Prepare the computer for disassembly (Section 5.3), and then remove the following components:

   a. Hard drive (Section 5.4)

   b. Bluetooth board (Section 5.9)

   c. Optical drive (Section 5.10)

   d. Switch cover (Section 5.11)

   e. Keyboard (Section 5.12)

   f. Display assembly (Section 5.13)

   g. Fan/heat sink assembly (Section 5.20)

   h. Top cover (Section 5.14)

   i. System board (Section 5.16)

2. Remove the Torx8 T8M2.5×7.0 screw ❶ that secures the fan/heat sink assembly to the base enclosure.

3. Remove the fan/heat sink assembly ❷ from the base enclosure.
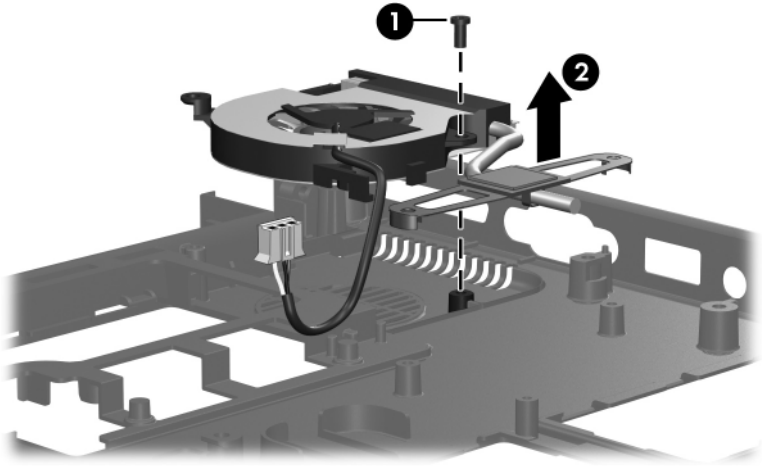
Removing the Fan/Heat Sink Assembly

Reverse the above procedure to install the fan/heat sink assembly.

✎ The thermal paste should be thoroughly cleaned from the surfaces of the fan/heat sink assembly ❶ and processor ❷ each time the fan/heat sink assembly is removed.

The thermal pads should be thoroughly cleaned from the surfaces of the fan/heat sink assembly ❸ and video chip ❹ each time the fan/heat sink assembly is removed.

Thermal paste and thermal pads are included with all fan/heat sink assembly and processor spare part kits.
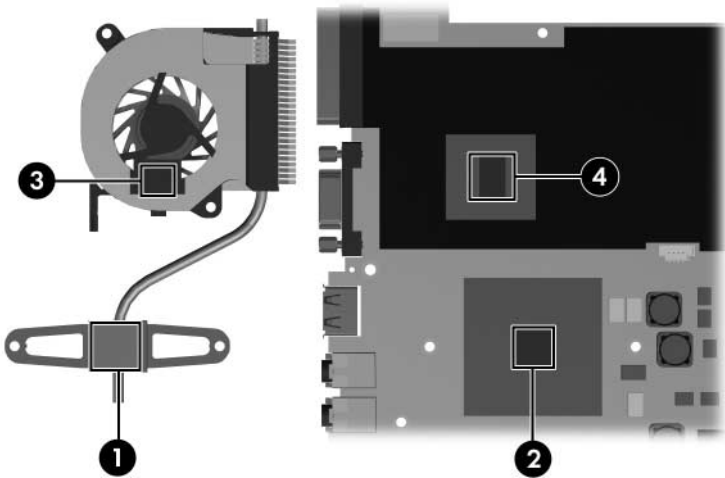
Thermal Paste and Thermal Pad Locations

Reverse the above procedure to install the fan/heat sink assembly.

6

Specifications

This chapter provides physical and performance specifications.

Table 6-1

Computer

Dimensions	Metric	U.S.
Height (front to back)	2.48 to 3.21 cm	0.98 to 1.26 in
Width	28.23 cm	11.1 in
Depth	21.28 cm	8.38 in
Weight		
With optical drive, WLAN, and 9-cell battery	1.84 kg	4.06 lbs
With optical drive, WLAN, and 6-cell battery	1.68 kg	3.70 lbs
With optical drive, WLAN, and 3-cell battery	1.52 kg	3.35 lbs
No optical drive, WLAN, and 9-cell battery	1.68 kg	3.70 lbs
No optical drive, WLAN, and 6-cell battery	1.52 kg	3.35 lbs
No optical drive, WLAN, and 3-cell battery	1.29 kg	2.86 lbs
Input Power		
Operating voltage	18.5 V dc @ 3.5 A - 65 W	
Operating current	3.5 A	

Table 6-1

Computer *(Continued)*

Temperature		
Operating (not writing to optical disc)	0°C to 35°C	32°F to 95°F
Operating (writing to optical disc)	5°C to 35°C	41°F to 95°F
Nonoperating	-20°C to 60°C	-4°F to 140°F
Relative humidity (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, WXGA

Dimensions		
Height	16.9 cm	6.7 in
Width	26.2 cm	10.3 in
Diagonal	30.8 cm	12.1 in
Number of colors	Up to 16.8 million	
Contrast ratio	250:1	
Brightness	180 nits typical	
Pixel resolution		
Pitch	0.279 × 0.279 mm	
Format	1280 × 800	
Configuration	RGB vertical stripe	
Backlight	Edge lit	
Character display	80 × 25	
Total power consumption	4.0 W	
Viewing angle	+/-40° horizontal, +120/-40° vertical typical	

Table 6-3

Hard Drives

	80-GB*	60-GB*	40-GB*	30-GB*
Dimensions				
Height	9.5 mm	9.5 mm	9.5 mm	9.5 mm
Width	70 mm	70 mm	70 mm	70 mm
Weight	99 g	99 g	99 g	99 g
Interface type	SATA	SATA	SATA	SATA
Transfer rate				
Synchronous (maximum)	100 MB/sec ATA	100 MB/sec ATA	100 MB/sec ATA	100 MB/sec ATA
Security	security	security	security	security
Seek times (typical read, including setting)				
Single track	3 ms	3 ms	3 ms	3 ms
Average	15 ms	13 ms	13 ms	13 ms
Maximum	26 ms	24 ms	24 ms	24 ms
Logical blocks[†]	156,301,488	117,210,240	78,140,160	58,605,120
Disc rotational speed	4200 rpm	4200 rpm	4200 rpm	4200 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

DVD±RW and CD-RW Combo Drive

Applicable disc	Read:	Write:
	DVD-R, DVD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18),	CD-R and CD-RW
	CD-ROM (Mode 1 and 2)	DVD-R and DVD-RW
	CD Digital Audio	
	CD-XA ready (Mode 2, Form 1 and 2)	
	CD-I ready (Mode 2, Form 1 and 2)	
	CD-R, CD-RW	
	Photo CD (single and multisession)	
	CD-Bridge	
Center hole diameter	1.5 cm (0.59 in)	
Disc diameter		
Standard disc	12 cm (4.72 in)	
Mini disc	8 cm (3.15 in)	

Table 6-4

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

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

Table 6-5

DVD-ROM Drive

Applicable disc	**Read:** DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18) CD-ROM (Mode 1 and 2) CD Digital Audio CD-XA ready (Mode 2, Form 1 and 2) CD-I ready (Mode 2, Form 1 and 2) CD-R CD-RW Photo CD (single and multisession) CD-Bridge
Center hole diameter	1.5 cm (0.59 in)
Disc diameter	
Standard disc Mini disc	12 cm (4.72 in) 8 cm (3.15 in)
Disc thickness	1.2 mm (0.047 in)
Track pitch	0.74 µm

Access time	CD	DVD
Random Full stroke	< 100 ms < 175 ms	< 125 ms < 225 ms

Audio output level	Line-out, 0.7 Vrms
Cache buffer	512 KB
Data transfer rate	
CD-R (24X) CD-RW (10X) CD-ROM (24X) DVD (8X) Multiword DMA mode 2	3,600 KB/s (150 KB/s at 1X CD rate) 1,500 KB/s (150 KB/s at 1X CD rate) 3,600 KB/s (150 KB/s at 1X CD rate) 10,800 KB/s (1,352 KB/s at 1X DVD rate) 16.6 MB/s
Startup time	< 10 seconds
Stop time	< 3 seconds

Table 6-6

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 6-7

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 6-7

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 6-8

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 6-8

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 6-8

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 6-9

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
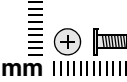
A

Screw Listing

This appendix provides specification and reference information for the screws used in the computer. All screws listed in this appendix are available in the Screw Kit, spare part number 417395-001, and the Display Screw Kit, spare part number 412761-001.

Table A-1

Phillips PM2.0×5.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Black	8	5.0 mm	2.0 mm	5.0 mm
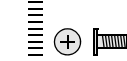
Where used:

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

❷ One screw that secures the memory module compartment cover to the computer (screw is captured on the cover by a C-clip; documented in Section 5.6)

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

❹ One screw that secures the Bluetooth module cover to the computer (screw is captured on the cover by a C-clip; documented in Section 5.9)
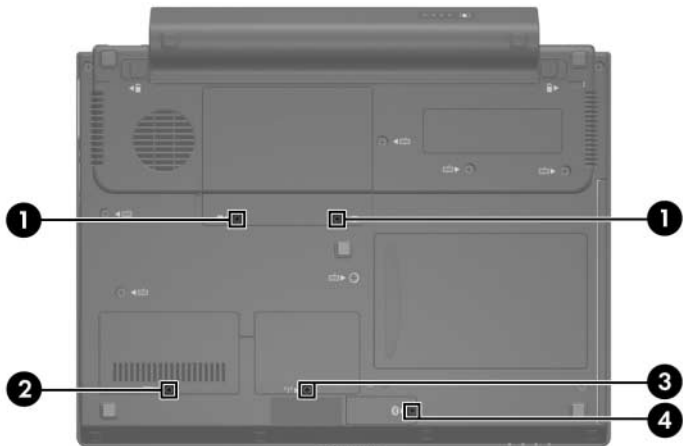
Phillips PM2.0×5.0 Screw Locations

Table A-1

Phillips PM2.0×5.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	8	5.0 mm	2.0 mm	5.0 mm
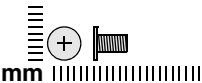
Where used:

❶ One screw that secures the hard drive connector to the system board (screw is captured on the connector by a C-clip; documented in Section 5.4)

❷ Two screws that secure the hard drive bracket to the computer (screws are captured on the bracket by C-clips; documented in Section 5.4)
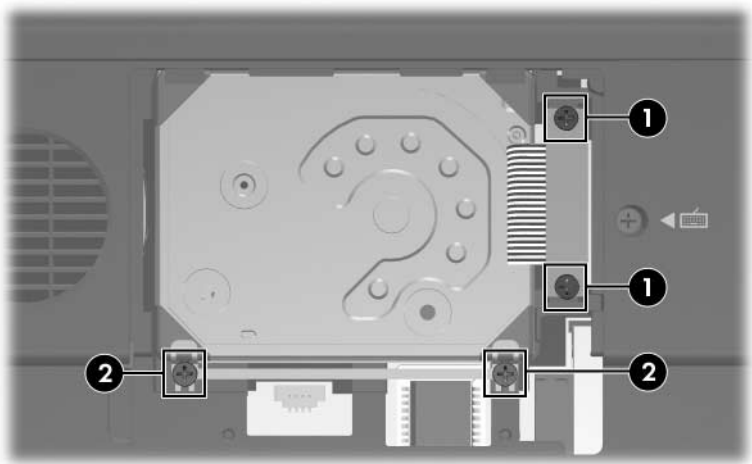
Phillips PM2.0×5.0 Screw Locations

Table A-2

Phillips PM2.0×3.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Silver	11	3.0 mm	2.0 mm	4.0 mm
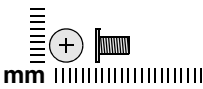
Where used:

2 screws that secure the Mini Card WLAN module to the computer (documented in Section 5.7)
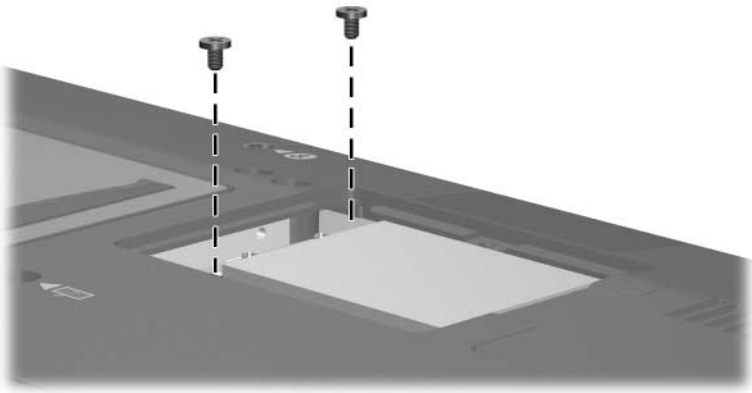
Phillips PM2.0×3.0 Screw Locations

Table A-2

Phillips PM2.0×3.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Silver	11	3.0 mm	2.0 mm	4.0 mm
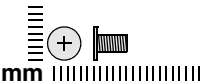
Where used:

One screw that secures the Bluetooth module to the computer (documented in Section 5.9)
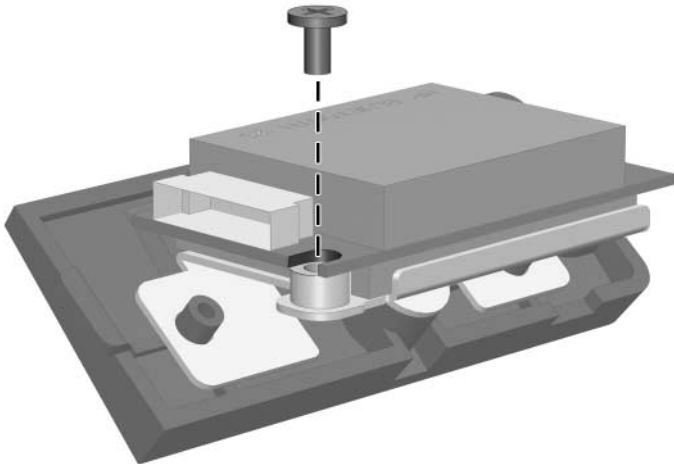
Phillips PM2.0×3.0 Screw Location

Table A-2

Phillips PM2.0×3.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Silver	11	3.0 mm	2.0 mm	4.0 mm
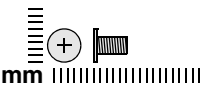
Where used:

2 screws that secure the optical drive bracket to the optical drive (documented in Section 5.10)
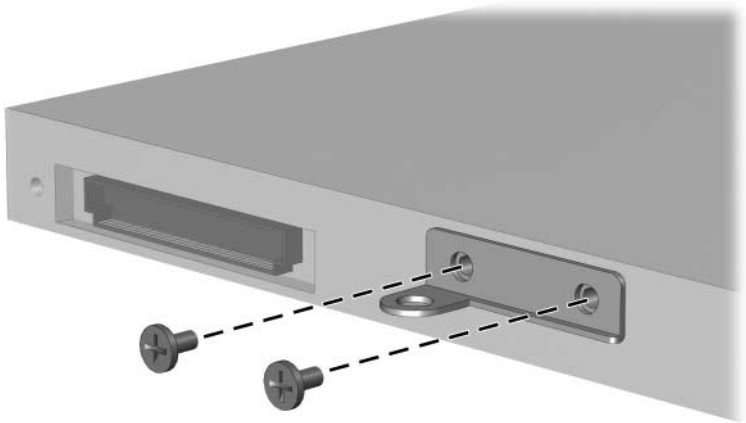
Phillips PM2.0×3.0 Screw Locations

Table A-2

Phillips PM2.0×3.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Silver	11	3.0 mm	2.0 mm	4.0 mm

Where used:

4 screws that secure the display hinges to the display panel (documented in Section 5.13)

Phillips PM2.0×3.0 Screw Locations
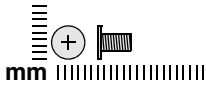
Table A-2

Phillips PM2.0×3.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Silver	11	3.0 mm	2.0 mm	4.0 mm
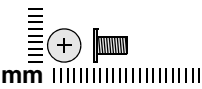
Where used:

2 screws that secure the modem module bracket to the system board (documented in Section 5.18)
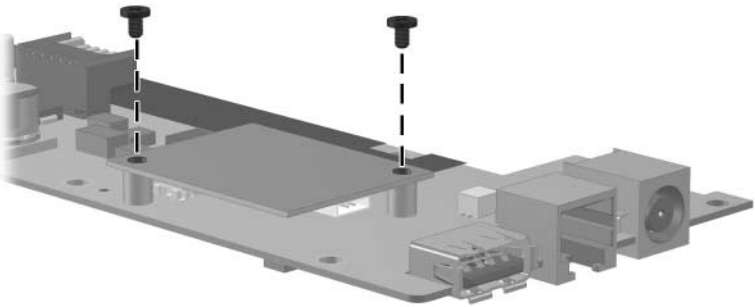
Phillips PM2.0×3.0 Screw Locations

Table A-3

Torx8 T8M2.5×7.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Black	19	7.0 mm	2.5 mm	5.0 mm
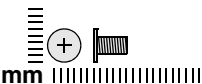
Where used:

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

❷ Five screws that secure the keyboard to the system board (documented in Section 5.12)

❸ Two screws that secure the display assembly to the computer (documented in Section 5.13)
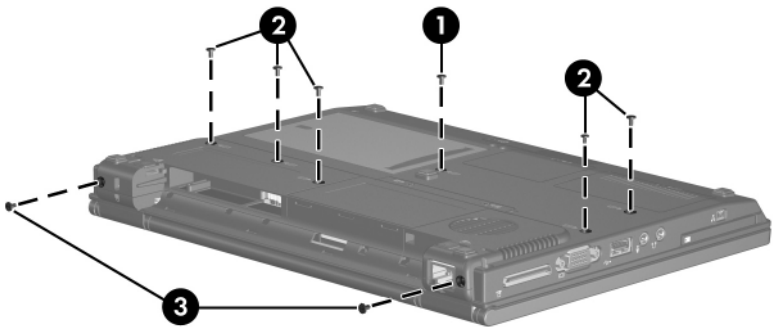
Torx8 T8M2.5×7.0 Screw Locations

Table A-3

Torx8 T8M2.5×7.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	19	7.0 mm	2.5 mm	5.0 mm
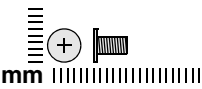
Where used:

❶ One screw that secures the display ground cable screw to the computer (documented in Section 5.13)

❷ Two screws that secure the display assembly to the computer (documented in Section 5.13)

Torx8 T8M2.5×7.0 Screw Locations

Table A-3

Torx8 T8M2.5×7.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	19	7.0 mm	2.5 mm	5.0 mm

Where used:

3 screws that secure the top cover to the computer (documented in Section 5.14)

Torx8 T8M2.5×7.0 Screw Locations

Table A-3

Torx8 T8M2.5×7.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	19	7.0 mm	2.5 mm	5.0 mm

Where used:

2 screws that secure the top cover to the computer (documented in Section 5.14)

Torx8 T8M2.5×7.0 Screw Locations

Table A-3

Torx8 T8M2.5×7.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	19	7.0 mm	2.5 mm	5.0 mm

Where used:

3 screws that secure the system board to the computer (documented in Section 5.16)

Torx8 T8M2.5×7.0 Screw Locations

Table A-4

Torx5 T5M2.0×5.0 Screw

	Color	Qty.	Length	Thread	Head Width
mm	Black	10	5.0 mm	2.0 mm	5.0

Where used:

6 screws that secure the display bezel to the display assembly (documented in Section 5.13)
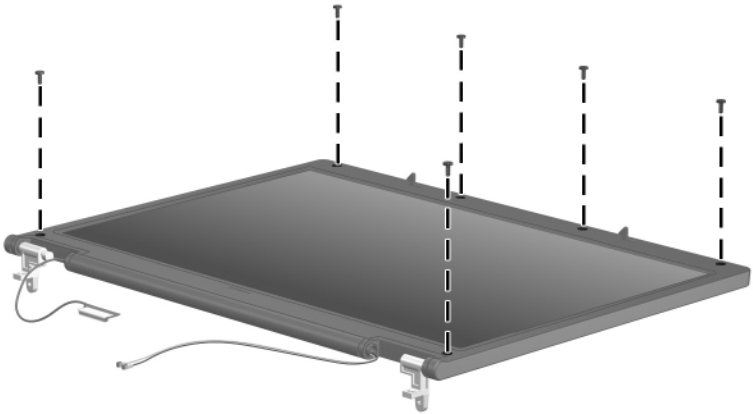
Torx5 T5M2.0×5.0 Screw Locations

Table A-4

Torx5 T5M2.0×5.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	10	5.0 mm	2.0 mm	5.0

Where used:

4 screws that secure the display panel to the display enclosure (documented in Section 5.13)
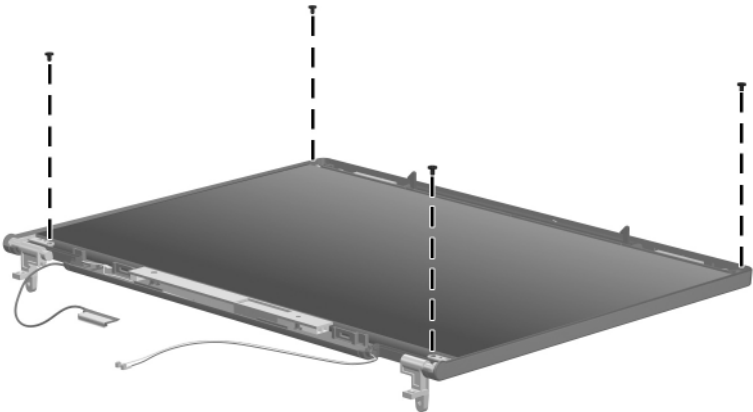
Torx5 T5M2.0×5.0 Screw Locations

Table A-5

Torx8 T8M2.5×4.0 Screw
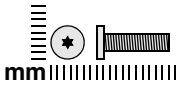
	Color	Qty.	Length	Thread	Head Width
	Black	6	4.0 mm	2.5 mm	5.0
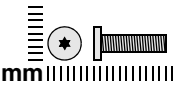
Where used:

❶ Five screws that secure the top cover to the computer (documented in Section 5.14)

❷ One screw that secures the optical drive to the computer (documented in Section 5.10)
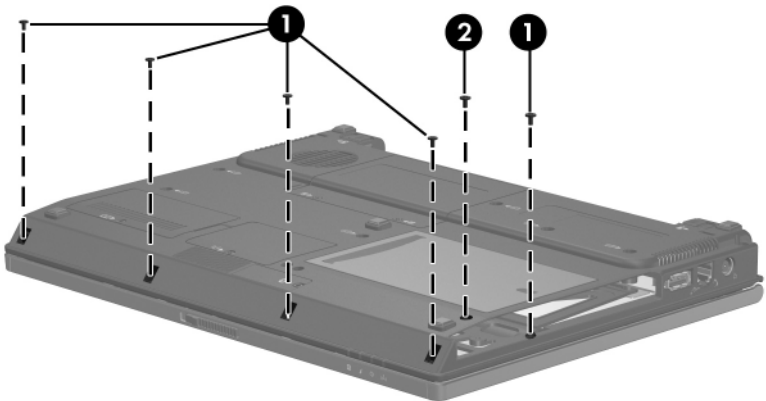
Torx8 T8M2.5×4.0 Screw Locations

Table A-6

Phillips PM2.0×4.0 Screw

	Color	Qty.	Length	Thread	Head Width
	Silver	1	4.0 mm	2.0 mm	4.0 mm
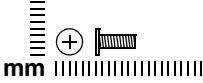
Where used:

One screw that secures the top cover to the computer (documented in Section 5.14)
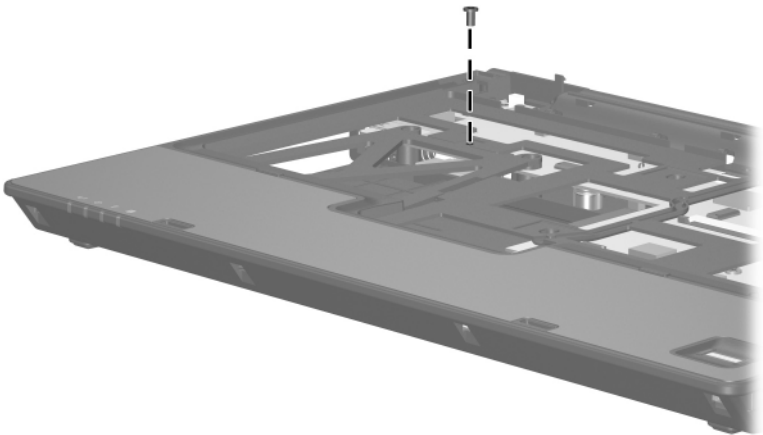
Phillips PM2.0×4.0 Screw Location

Table A-7

Phillips PM2.0×2.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Silver	2	2.0 mm	2.0 mm	6.0 mm
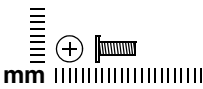
Where used:

2 screws that secure the fingerprint reader board to the top cover (documented in Section 5.15)
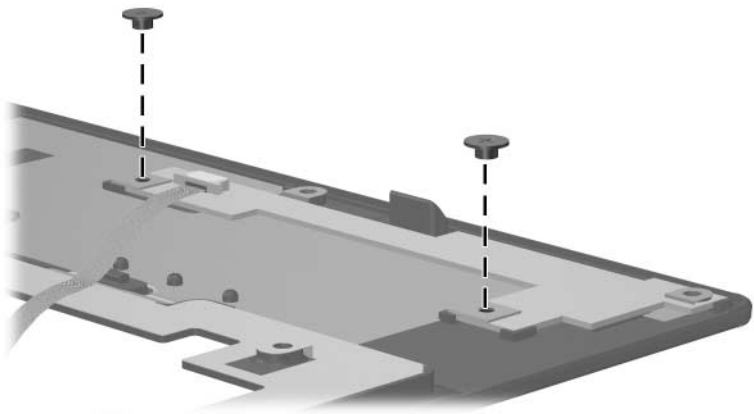
Phillips PM2.0×2.0 Screw Locations

Table A-8

Torx8 T8M2.0×10.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Black	2	10.0 mm	2.0 mm	5.0 mm

Where used:

2 screws that secure the system board to the computer (documented in Section 5.16)
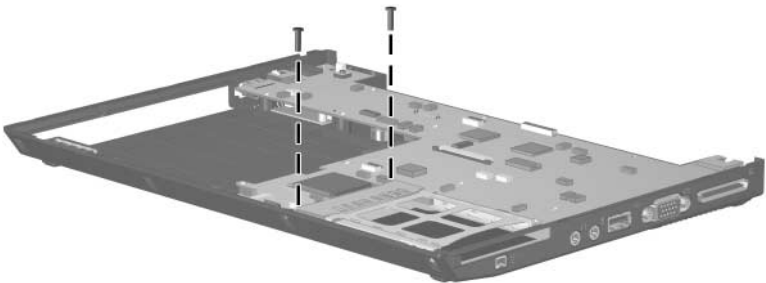
Torx8 T8M2.0×10.0 Screw Locations

B

Backup and Recovery

Backup

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

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

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

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

Safeguarding Your Data

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

Backing Up the System

Using HP Backup and Restore Manager, you can

■ Back up specific files and folders.

■ Back up the entire system.

■ Back up modifications since your last backup, using HP system restore points.

■ Schedule backups.

Backing Up Specific Files or Folders

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

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

To back up specific files or folders:

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

2. Click **Next**.

3. Click **Back up to protect system settings and important data files**, and then click **Next**.

4. Click **Back up individual files and folders**, and then click **Next**.

The Backup Wizard opens.

5. Click **Next**.

6. Click **Backup selected files from most common locations (Recommended)**.

   – or –

   Click **Advanced Backup (Experienced users)** to access advanced filtering techniques.

7. Click **Next**.

8. Follow the on-screen instructions.

Backing Up the Entire Hard Drive

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

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

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

To back up your entire hard drive:

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

2. Click **Next**.

3. Click **Back up to protect system settings and important data files**, and then click **Next**.

4. Click **Back up entire hard drive**, and then click **Next**.

   The "Back up entire hard disk" page opens.

5. Click **Next**.

6. Select the location for the backup files, and then click **Next**.

7. Select the **Protect data access with password** check box, and type your password in the **Password and Confirm** boxes.

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

8. Click **Next**.

9. Follow the on-screen instructions.

Backing Up Modifications Made to the System

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

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

HP recommends that you create recovery points

■ Before you add or extensively modify software or hardware.

■ Periodically, whenever the system is performing optimally.

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

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

To create and schedule a system recovery point:

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

2. Click **Next**.

3. Click **Back up to protect system settings and important data files**, and then click **Next**.

4. Click **Create or manage Recovery Points**, and then click **Next**.

   The "Recovery Point Manager" page opens.

5. Follow the on-screen instructions.

Scheduling Backups

To schedule backups:

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

   The "Backup Scheduler" page opens.

2. Click **Next**.

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

   A summary of your system recovery point settings is displayed.

4. Follow the on-screen instructions.

Recovery

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

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

HP Backup and Recovery Manager allows you to

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

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

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

Creating Recovery Discs (Highly Recommended)

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

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

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

Before creating recovery discs:

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

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

■ Number each disc before inserting it into the optical drive of the computer.

■ If necessary, you can cancel Recovery Media Creator before you have finished creating the recovery discs. The next time you open Recovery Media Creator, you will be prompted to continue the disc creation process where you left off.

To create a set of recovery discs:

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

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

Performing a Recovery

Performing a Recovery from the Recovery Discs

To perform a recovery from the recovery discs:

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

Performing a Recovery from the Hard Drive

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

■ From within Windows.

■ From the recovery partition.

Initiating a Recovery in Windows

To initiate a recovery in Windows:

1. Back up all personal files.

2. Select **Start > All Programs > HP Backup & Recovery > HP Backup and Recovery Manager**.

3. Click **Next**.

4. Click **Recover important files or the entire system**, and then click **Next**.

5. Click a recovery option, and then click **Next**.

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

6. Follow the on-screen instructions.

Initiating a Recovery from the Hard Drive Recovery Partition

To initiate a recovery from the hard drive recovery partition:

1. Back up all personal files.

2. Restart the computer, and then press **f11** before the Windows operating system loads.

3. Click a recovery option, and then click **Next**.

4. Follow the on-screen instructions.

C

Display Component Recycling

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

⚠ **CAUTION:** The procedures in this appendix can result in damage to display components. The only components intended for recycling purposes are the liquid crystal display (LCD) panel and the backlight. Careful handling should be exercised when removing these components.

✎ **Materials Disposal**

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

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

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

✎ Disassembly procedures differ from one display assembly to another. The procedures provided in this appendix are general disassembly instructions. Specific details, such as screw sizes, quantities, and locations, and component shapes and sizes, can vary from one computer model to another.

Perform the following steps to disassemble the display assembly:

1. Remove all screw covers ❶ and screws ❷ that secure the display bezel to the display assembly.
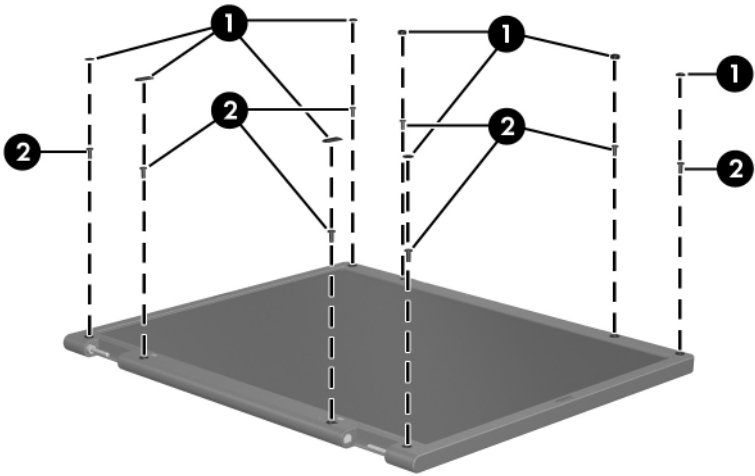
Removing the Display Bezel Screw Covers and Screws

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

3. Remove the display bezel ❸.
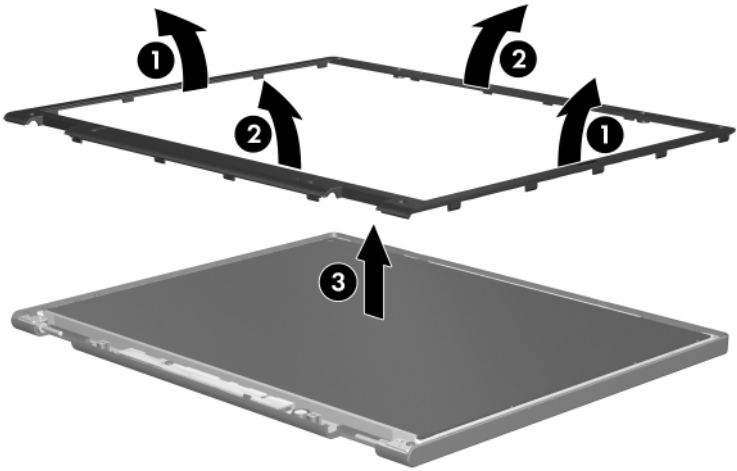
Removing the Display Bezel

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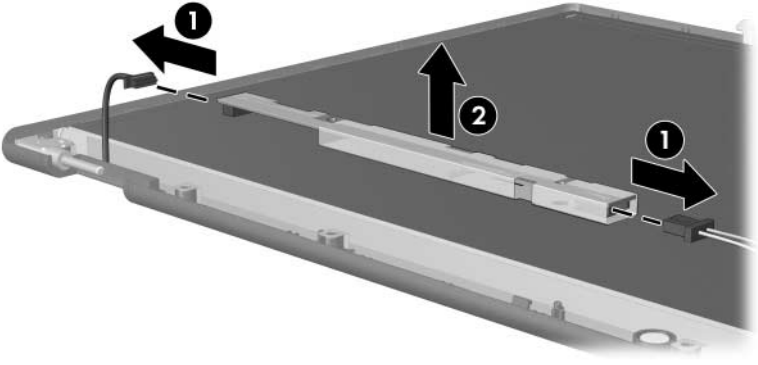
Removing the Display Inverter

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

6. Remove the display panel assembly ❷ from the display enclosure.
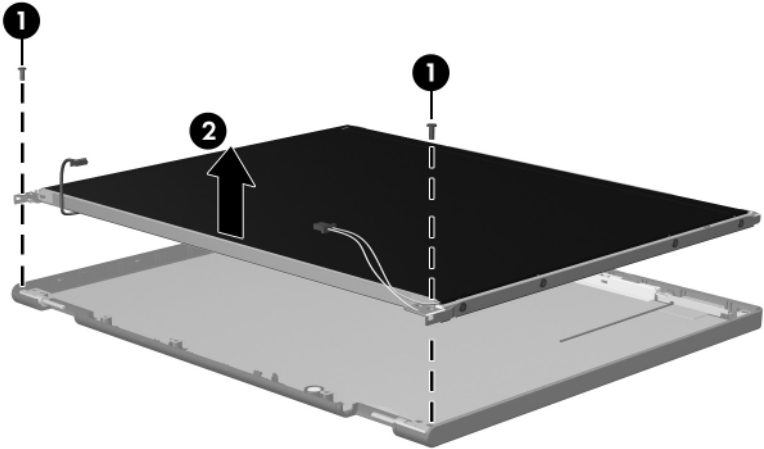
Removing the Display Panel Assembly

7. Turn the display panel assembly upside down.

8. Remove all screws that secure the display panel frame to the display panel.
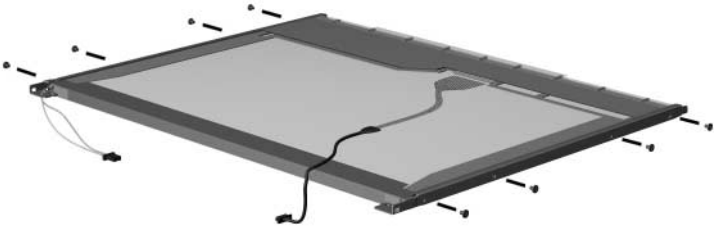
Removing the Display Panel Frame Screws

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

10. Remove the display panel frame ❷ from the display panel.
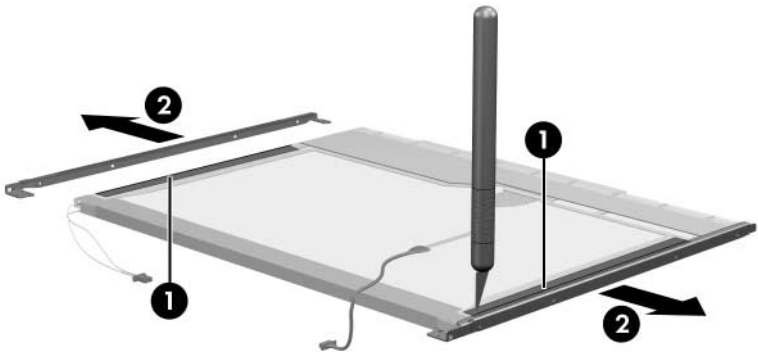
Removing the Display Frame

11. Remove the screws ❶ that secure the backlight cover to the display panel.

12. Lift the top edge of the backlight cover ❷ and swing it forward.

13. Remove the backlight cover.
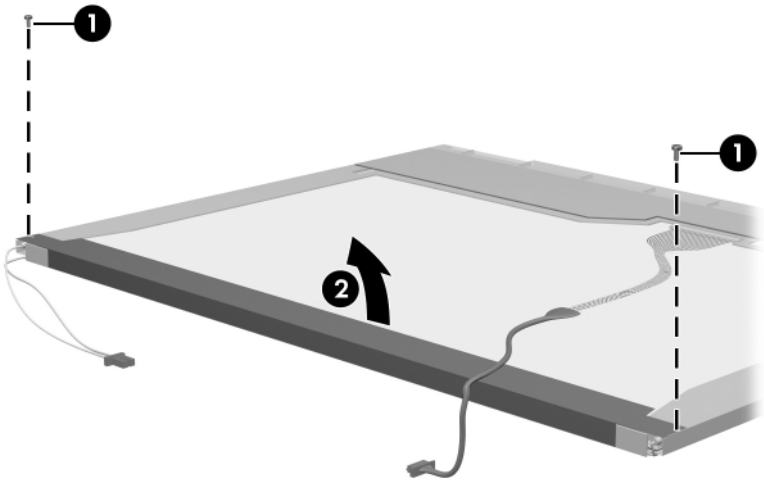
Removing the Backlight Cover

14. Turn the display panel right-side up.

15. Remove the backlight cables ❶ from the clip ❷ in the display panel.
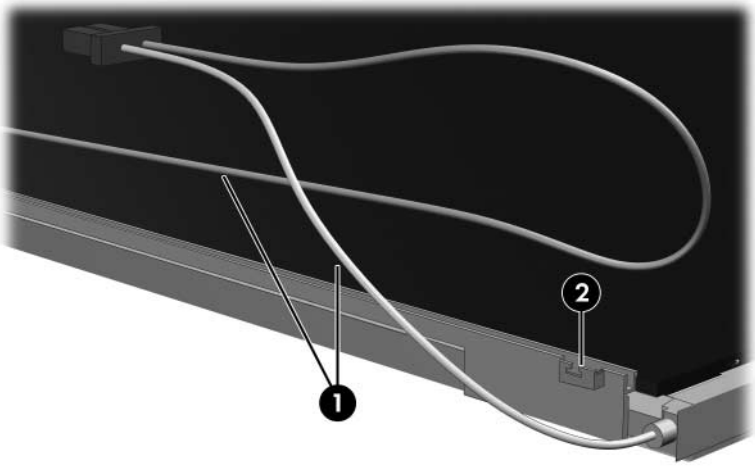
Releasing the Backlight Cables

16. Turn the display panel upside down.

17. Remove the backlight frame from the display panel.
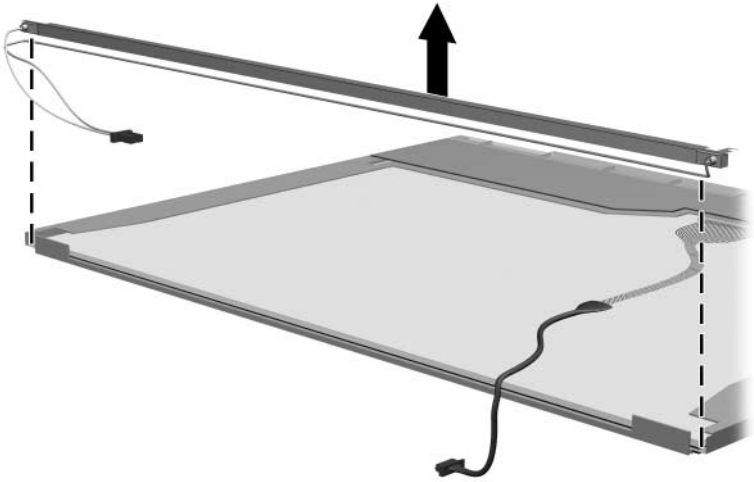
Removing the Backlight Frame

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

18. Slide the backlight out of the backlight frame.
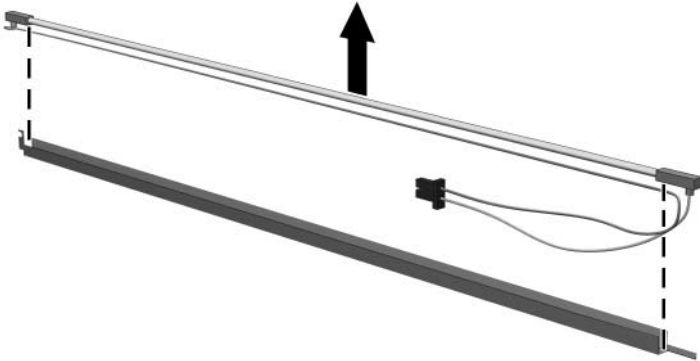
Removing the Backlight

19. Disconnect the display cable ❶ from the LCD panel.

20. Remove the screws ❷ that secure the LCD panel to the display rear panel.

21. Release the LCD panel ❸ from the display rear panel.

22. Release the tape ❹ that secures the LCD panel to the display rear panel.
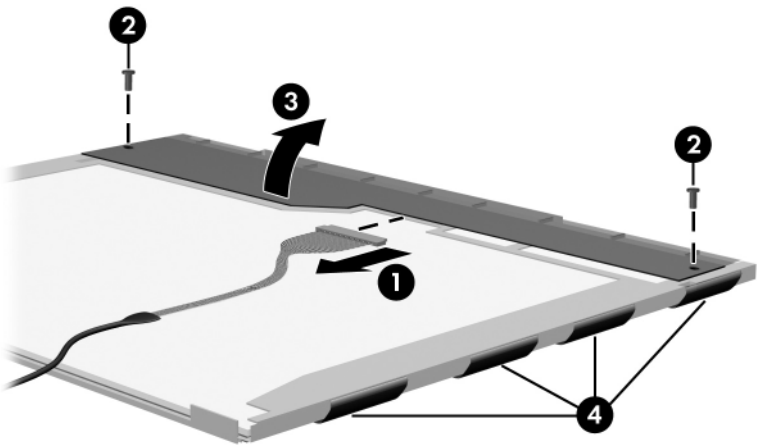
Releasing the LCD Panel

23. Remove the LCD panel.
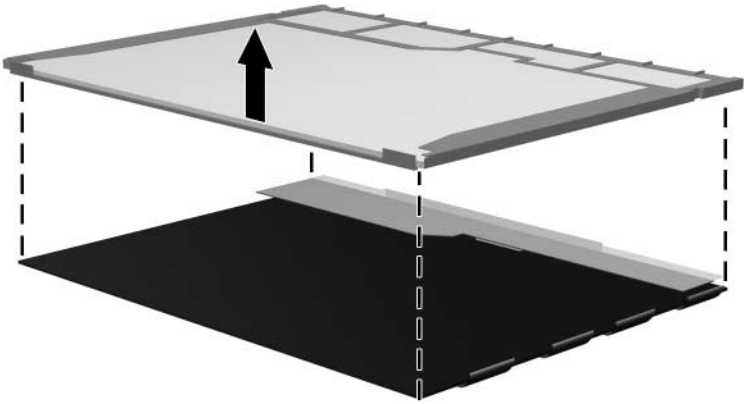
Removing the LCD Panel

24. Recycle the LCD panel and backlight.

D

Connector Pin Assignments

Table D-1

Audio-Out (Headphone)
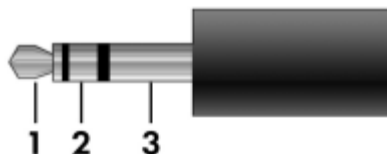
Pin	Signal	Pin	Signal
1	Audio out, left channel	3	Ground
2	Audio out, right channel		

Table D-2

Audio-In (Microphone)
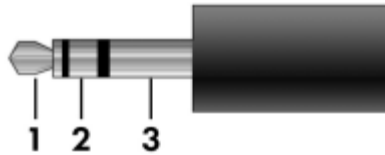
Pin	Signal	Pin	Signal
1	Audio signal in	3	Ground
2	Audio signal in		

Table D-3

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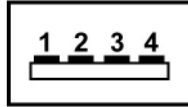
Pin	Signal	Pin	Signal
1	+5 VDC	3	Data +
2	Data –	4	Ground

Table D-4

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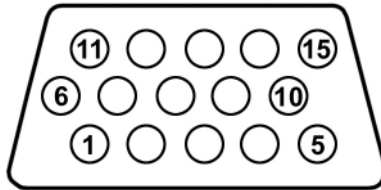
Pin	Signal	Pin	Signal
1	Red analog	9	+5 VDC
2	Green analog	10	Ground
3	Blue analog	11	Monitor detect
4	Not connected	12	DDC 2B data
5	Ground	13	Horizontal sync
6	Ground analog	14	Vertical sync
7	Ground analog	15	DDC 2B clock
8	Ground analog		

Table D-5

RJ-11 (Modem)
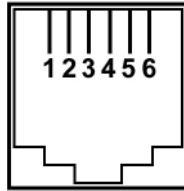
Pin	Signal	Pin	Signal
1	Unused	4	Unused
2	Tip	5	Unused
3	Ring	6	Unused

Table D-6

RJ-45 (Network)
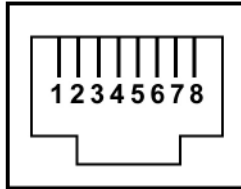
Pin	Signal	Pin	Signal
1	Transmit +	5	Unused
2	Transmit –	6	Receive –
3	Receive +	7	Unused
4	Unused	8	Unused

E

Power Cord Set Requirements

3-Conductor Power Cord Set

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

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

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

General Requirements

The requirements listed below are applicable to all countries.

■ The length of the power cord set must be at least 1.5 m (5.0 ft) and a maximum of 2.0 m (6.5 ft).

■ All power cord sets must be approved by an acceptable accredited agency responsible for evaluation in the country where the power cord set will be used.

■ The power cord sets must have a minimum current capacity of 10 amps and a nominal voltage rating of 125 or 250 V AC, as required by each country's power system.

■ The appliance coupler must meet the mechanical configuration of an EN 60 320/IEC 320 Standard Sheet C13 connector for mating with the appliance inlet on the back of the computer.

Country-Specific Requirements

3-Conductor Power Cord Set Requirements

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

✍ NOTES:

1. The flexible cord must be <HAR> Type HO5VV-F, 3-conductor, 1.0 mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country where it will be used.

2. The flexible cord must be Type SPT-3 or equivalent, No. 18 AWG, 3-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15 A, 125 V) or NEMA 6-15P (15 A, 250 V) configuration.

3. The appliance coupler, flexible cord, and wall plug must bear a "T" mark and registration number in accordance with the Japanese Dentori Law. The flexible cord must be Type VCT or VCTF, 3-conductor, 1.00 mm² conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V) configuration.

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

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

✎ NOTES:

1. The flexible cord must be <HAR> Type HO5VV-F, 3-conductor, 1.0 mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country where it will be used.

2. The flexible cord must be Type SPT-3 or equivalent, No. 18 AWG, 3-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15 A, 125 V) or NEMA 6-15P (15 A, 250 V) configuration.

3. The appliance coupler, flexible cord, and wall plug must bear a "T" mark and registration number in accordance with the Japanese Dentori Law. The flexible cord must be Type VCT or VCTF, 3-conductor, 1.00 mm² conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V) configuration.

4. The flexible cord must be Type RVV, 3-conductor, 0.75 mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country where it will be used.

5. The flexible cord must be Type VCTF, 3-conductor, 0.75 mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country where it will be used.

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